

CPC COOPERATIVE PATENT CLASSIFICATION

Y GENERAL TAGGING OF NEW TECHNOLOGICAL DEVELOPMENTS; GENERAL TAGGING OF CROSS-SECTIONAL TECHNOLOGIES SPANNING OVER SEVERAL SECTIONS OF THE IPC; TECHNICAL SUBJECTS COVERED BY FORMER USPC CROSS-REFERENCE ART COLLECTIONS [XRACs] AND DIGESTS

(NOTES omitted)

Y10 TECHNICAL SUBJECTS COVERED BY FORMER USPC

Y10T TECHNICAL SUBJECTS COVERED BY FORMER US CLASSIFICATION

NOTE

This subclass has been introduced in January 2015 in view of the CPC to accommodate for technical subjects formerly covered by USPC

Former US Class 16 series

16/00	Miscellaneous hardware [e.g., bushing, carpet fastener, caster, door closer, panel hanger, attachable or adjunct handle, hinge, window sash balance, etc.]	16/191	. . Detachable
16/05	. Bushing	16/193	. . Leg elevators
16/063	. . Providing a restricted or insulated environment [i.e., sealable] for internal elements	16/1937	. . . Sliding
16/075	. . Bung or tap	16/1943	. . . Swinging
16/082	. . . Threaded	16/195	. . Locked
16/088	. . Providing strain relief	16/196	. . . Shimmy dampening
16/10	. Carpet fasteners	16/197	. . Lubricators
16/104	. . Combined fasteners and stretchers	16/199	. . Pintles
16/109	. . Hook	16/201	. . Pintle retainers
16/113	. . Moldings	16/202	. . . Frame
16/118	. . Rug	16/203	. . Frame
16/122	. . Stair	16/204	. . . Single leg frame or fork
16/124	. . . Risers	16/205	. . Rigid wheel supports
16/125	. . . Rods	16/207	. . Scrapers
16/126	. . . . Catches	16/209	. . Sliding
16/1263	. . . . . Sliding	16/21	. . . for tubular leg
16/1267	. . . . . Swinging	16/211	. . Sockets
16/127	. . Sliding	16/212	. . Spring supported
16/131	. . Strips	16/214	. . Inclined axle
16/134	. . Swinging	16/216	. . Caster guard
16/14	. Carpet stiffener or anti-slip device, <u>per se</u>	16/218	. . Obstruction climbing aid
16/18	. Casters	16/22	. Thermally released check or closer
16/182	. . Adjustable	16/27	. Checks and closers
16/184	. . Wheels	16/276	. . Liquid
16/1847	. . . Antifrictionally mounted	16/2766	. . . Concentric spring chamber
16/1853	. . . Multiple	16/2769	. . . . Cam
16/1857	. . . . Antifrictionally swivelled	16/2771	. . . Hinge
16/186	. . Antifrictionally swivelled	16/2774	. . . . Floor pivot
16/1867	. . . Ball	16/2777	. . . Multiple piston
16/1873	. . . Cylinder	16/2782	. . . Oscillating cylinder
16/1877	. . . . Pivoted	16/2788	. . . Oscillating piston
16/188	. . Ball	16/2793	. . . Side spring chamber
16/1887	. . . Antifrictionally mounted	16/2796	. . . . Cam
16/1889	. . . . Ball	16/2799	. . . Spring and flexible link
16/1891	. . . . Cylinder	16/2804	. . . Spring and gear
16/1893	. . . Pivoted	16/281	. . Pneumatic
16/19	. . Bracket supports	16/282	. . . Flexible link
		16/283	. . . Hinge
		16/285	. . . Spring and gear
		16/286	. . . Spring and lever
		16/287	. . Spring and flexible link
		16/293	. . Spring and gear

16/299	. . Spring and lever	16/462	. . Drawer pull
16/304	. . Hinge	16/4628	. . . Lift
16/31	. Gate hangers	16/4636	. . . Knob type
16/33	. . Sliding and swinging	16/464	. . . . Swinging
16/35	. Panel hangers, travelers and/or tracks	16/4644	. . . Loop type
16/353	. . with flexible panel attaching means	16/4652	. . . Ring type
16/354	. . . Covered, hollow or slotted track	16/466	. . Handle having mounted grip means [e.g., bicycle handlebar grips, etc.]
16/3543	. . . . with antifriction means	16/469	. . Detachable handle
16/3545	. . . . . Wood track	16/4696	. . . for battery
16/3547	. . . . . Wood track	16/4701	. . . for casket
16/355	. . . with antifriction means	16/4707	. . . for container
16/356	. . Ball	16/4713	. . . Auxiliary handle
16/359	. . Cylinder	16/4719	. . . Extension
16/361	. . Guide brackets	16/4724	. . . Cord or rope related
16/364	. . Guide rollers	16/473	. . Extensible handle
16/367	. . Link and lever	16/476	. . Handle with ergonomic structure [e.g., finger engagement structure such as indents, grooves, etc.] and handle user-interaction [human engineering] enhancements such as improved handle dimensions and handle positioning
16/37	. . Sliding shoe	16/48	. Insulated handle
16/372	. . . Drapery supports	16/484	. . Handwheel
16/373	. . Track and bracket	16/487	. . Knob type
16/375	. . . Drapery supports	16/491	. . Wire type
16/376	. . Covered, hollow or slotted track	16/495	. . Unshaped or unattached pad
16/377	. . . Wood	16/498	. . Bar-type handle
16/378	. . . Drapery supports	16/499	. . . for lawnmower
16/3785	. . . . Wood	16/50	. . . Swinging
16/379	. . Tracks	16/501	. . . . Casket handle
16/3797	. . . Drapery supports	16/502	. . Braced handle
16/3803	. . . Laminated	16/506	. . Knob-type handle
16/381	. . Wheel mounts	16/508	. . . with flexible suspending means
16/3813	. . . Antifrictionally mounted wheels	16/509	. . Lift
16/3816	. . . Door elevating	16/513	. . Loop-type handle
16/3819	. . . Floor	16/515	. . . Swinging
16/3822	. . . Reciprocating track	16/516	. . Ring-type handle
16/3825	. . . Traveling wheel	16/52	. Hinge
16/3828	. . . Swinging	16/521	. . including frangible or fusible portion
16/3831	. . . Swiveling	16/522	. . with diverse art portion or attachment
16/3834	. . . Vertically adjustable	16/524	. . Ball and socket
16/3837	. . . Wheel and guide roller	16/525	. . Pliant or elastic hinge
16/384	. . Wheels	16/5253	. . . Metallic
16/387	. . Overlapping doors, common track	16/5257	. . . Snap or X hinge
16/39	. Ferrules, rings, and thimbles	16/526	. . Eyeglass hinge
16/42	. . Ring ferrules	16/527	. . Retractable pintle
16/44	. Handle, handle component, or handle adjunct	16/5275	. . . Latch hinge
16/444	. . having receptacle within	16/528	. . Latch hinge
16/447	. . for plow	16/5285	. . . Resilient securing means
16/451	. . Length adjustable pull handle for luggage or luggage cart [e.g., wheeled suitcase handle, etc.]	16/529	. . including lever for shifting one member of hinge relative to another
16/455	. . Luggage-type [loop style] handgrip for carrying [e.g., suitcase, handbag, briefcase, shopping bag, package, etc.]	16/531	. . having staggered leaves
16/4554	. . . Extensible handle	16/532	. . including adjustment for changing relative orientation of hinged members
16/4559	. . . Detachable handle	16/5321	. . . having plural independent adjustments
16/4563	. . . Welded or adhesively attached handle	16/5322	. . . . All rectilinear
16/4567	. . . Swinging handle	16/53225	. . . . . including screw-operated means to move hinged members
16/4569	. . . . with means permanently connecting the handle to a carried article	16/5323	. . . Pivotal adjustment
16/4571	. . . with means permanently connecting the handle to a carried article	16/53235	. . . . including screw-operated means to move hinged members
16/4576	. . . with carrier handle including a user enhanced grip attachment	16/53238	. . . . . About hinge axis
16/458	. . Door handle		
16/459	. . . Detachable handle		
16/46	. . . Knob type		

16/5324	. . . including means to move hinged members	16/53833	. . . . . Four or more axes
16/53247	. . . . Along or parallel to hinge axis	16/53834	. . . . to counterbalance weight of hinged member [e.g., closure biased to open position]
16/5325	. . . . . including threaded hinge pin	16/53835	. . . . . including pivoted coaxial spring retaining bar
16/53253	. . . . . Screw-operated	16/53836	. . . . Over-center spring or linkage travel [e.g., "holdback hinge"]
16/53257	. . . . . to shift plate toward or away from hinged member	16/53838	. . . . having means to hold hinged members against pivotal movement about hinge axis [i.e., catch]
16/5326	. . . having adjustable spacer between leaf and hinged member [e.g., shim]	16/5384	. . . Over-center spring or linkage travel [e.g., "holdback hinge"]
16/5327	. . . Adjustable along or parallel to hinge axis	16/53843	. . . . Plural hinge axes
16/5329	. . . having interdigitated surfaces or slot for hinge-to-member fastener	16/53845	. . . . Coil spring having axis along or parallel to hinge axis
16/533	. . having cover	16/53848	. . . . including camming or sliding surface to deflect spring perpendicularly to the hinge axis
16/5335	. . . Leaf cover	16/5385	. . . having means to hold hinged members against pivotal movement about hinge axis [e.g., catch]
16/534	. . having clamp for attaching hinge to hinged member	16/5386	. . . having force adjustment
16/5345	. . . Circumferential clamp	16/53862	. . . . Rotatable spring-engaging collar
16/535	. . having means to facilitate assembly and disassembly of hinge sections to join or disjoin hinged members	16/538627	. . . . . having detention aperture or protuberance
16/5353	. . . Resiliently biased hinge	16/538633	. . . . . having tool-receiving aperture
16/5355	. . . . having helical spring along hinge axis	16/53864	. . . Plural hinge axes [e.g., multiple pintle]
16/5357	. . . Resiliently biased retaining means	16/5387	. . . having axially biased camming surface
16/5358	. . . . having discrete latch and spring to slide or pivot latch	16/5388	. . . Coil
16/5359	. . . . Discrete retaining means for pivotal contacting surfaces	16/53883	. . . . Plural coils
16/536	. . . Separation of pivotal contacting surfaces	16/53885	. . . . to counterbalance weight of hinged member [e.g., horizontal closure biased to open position]
16/53605	. . . . having movable or removable connector	16/53888	. . . . On pintle
16/53607	. . . . . Pintle removable from remainder of hinge	16/5389	. . . torsion spring
16/536075	. . . . . and additional connector for pintle or separate pintle sections	16/539	. . Gravitating hinge having vertical axis
16/53608	. . . . . Screw-threaded connector	16/5393	. . . having lift rod
16/5361	. . . . Axially shifting hinge sections	16/5395	. . . having plural spaced hinge axes
16/53613	. . . . . At specific angular orientation of hinge sections	16/5398	. . . including cam surface and follower
16/53615	. . . . Hook and pin	16/53984	. . . . and rolling element
16/5362	. . . . Hook in aperture	16/53985	. . . . . Between opposing surfaces
16/53625	. . . . Hook to hook	16/53987	. . . . . and detent in cam surface
16/5363	. . . and discrete movable or removable connector to fasten one hinge section to another	16/53988	. . . . On axially twisted or helically fluted element
16/5367	. . . by relatively sliding connection [e.g., dovetail]	16/53992	. . . . including means to hold hinged members against pivotal movement
16/5369	. . . . including receiving connector attachable to hinged member	16/53996	. . . . having aperture for slidably receiving pintle [e.g., camming knuckle]
16/537	. . having means to reduce friction between hinge parts	16/54	. . including means to hold or retard hinged members against pivotal movement [e.g., catch]
16/5373	. . . by fluid lubricant	16/5401	. . . Magnetic
16/5377	. . . Ball or roller bearing	16/5402	. . . Resiliently biased catch
16/5379	. . . . Circularly distributed balls or rollers	16/54021	. . . . having spring force adjustment
16/538	. . Resiliently biased hinge	16/54023	. . . . including toggle linkage
16/5381	. . . including means to render spring ineffective through all or a portion of swing	16/54024	. . . . having discrete manipulatable release means [e.g., lever]
16/53815	. . . . comprising manipulatable element or portion	16/540243	. . . . . including cam or eccentric
16/5382	. . . Biased from either direction toward neutral position [e.g., double acting]	16/540247	. . . . . Sliding release means or lever-actuated sliding catch
16/53822	. . . . Helical spring transverse to hinge axis	16/54025	. . . . Sliding
16/53824	. . . . Plural hinge axes [e.g., multiple pintle]	16/540253	. . . . . Movement along or parallel to hinge axis
16/53825	. . . . . and barrels for helical springs on separate axes	16/540254	. . . . . Interdigitated or plural sockets
16/53826	. . . . Resiliently biased rolling or sliding cam surface	16/540255	. . . . . Opposed interdigitated sliding collars on hinge axis
16/53828	. . . . by helical spring along hinge axis	16/540256	. . . . . and catch receiving socket
16/5383	. . . having transverse helical spring or elastic strip	16/540257	. . . . . and catch receiving socket
16/53832	. . . . Plural hinge axes [e.g., multiple pintle]		

16/54026	. . . . Pivoted	16/555	. . Specified material
16/54028	. . . . Plural alternately useable detents	16/557	. . Specific pintle structure
16/54029	. . . . Spring arm	16/558	. . Specific leaf structure
16/540295	. . . . . Plural opposed arms	16/559	. . having prongs or cooperating structure on leaf
16/5403	. . . by friction	16/5595	. . . Angular leaf sections
16/54033	. . . . Screw-threaded adjustment	16/55963	. . . . Parallel sections
16/54034	. . . . . Along or parallel to hinge axis	16/55975	. . . . Coplanar sections
16/540345	. . . . . Threaded pintle	16/55988	. . . . including planar section perpendicular to hinge axis
16/54035	. . . . Cam or wedge actuator		
16/54038	. . . . On hinge pin or between surfaces surrounding hinge axis	16/56	. Closers
16/5404	. . . Pivoted	16/568	. . Spring and flexible link
16/54044	. . . . Plural alternately useable detents	16/577	. . Spring and gear
16/54048	. . . . and sliding	16/585	. . Spring and lever
16/54052	. . . . Serially connected pivoted arms between leaves [e.g., brace]	16/593	. . Spring
16/54056	. . . . About axis along or parallel to hinge axis	16/595	. . . Bow
16/5406	. . . by transversely moving pin in slot	16/597	. . . Rubber
16/5407	. . . having discrete manipulatable release means [e.g., lever operated]	16/599	. . . torsional
16/5408	. . . by shifting hinged members	16/5995	. . . . Coil
16/54085	. . . . Along hinge axis	16/60	. . . Volute
16/5409	. . . Sliding	16/602	. . Weight
16/54095	. . . . Along or parallel to hinge axis	16/61	. Closure checks
16/541	. . including toothed gear	16/615	. . Inertia
16/542	. . comprising nested open curved portions attached to hinged members	16/62	. . Pneumatic
16/543	. . . including hinge pin	16/625	. . Spring
16/544	. . including transversely moving pin in slot	16/628	. . . Rubber
16/5443	. . . Plural noncollinear pins and slots	16/6285	. . . . Rubber cushioned
16/5444	. . . . Parallel slots	16/629	. . . . Multiple or opposed buffer surfaces
16/5445	. . . having pin fixed to pivoted arm or plate	16/6295	. . . . Link type
16/5448	. . . Hinge pin movable along slot	16/6298	. Sash balances
16/545	. . including sliding surfaces to permit relative translation of hinged members	16/63	. . Cord and counterweight
16/5453	. . . and stop or abutment for pivotal movement	16/635	. . Sash and cord
16/5457	. . . Movement transverse to hinge axis	16/64	. . Spring
16/546	. . Three-hinged members	16/641	. . . Drum and cord
16/547	. . having plural hinge axes [e.g., multiple pintle]	16/642	. . . Friction roller
16/5472	. . . having transverse or skewed axes	16/643	. . . Lever
16/5474	. . . Connected by serially arranged pivoted links between hinged members	16/644	. . . Rack and pinion
16/5475	. . . . Plural sets of serially arranged pivoted links	16/645	. . Rack and pinion
16/5476	. . . Four or more axes	16/65	. Sash-cord fasteners
16/5478	. . . including stop or latch	16/655	. . Bendable
16/548	. . including laminated leaf	16/66	. . Chain
16/549	. . Wire hinge	16/665	. . Clamps
16/551	. . having stop or abutment	16/67	. . Hooks
16/5513	. . . Adjustable or resilient	16/675	. . Knot
16/5515	. . . comprising relieved axially opposed relatively rotating surfaces	16/68	. . Slack-cord holders
16/5518	. . . comprising platelike bearing portion curved about hinge axis	16/685	. . Weight
16/552	. . Hinge axis passes through hinged member [e.g., floor hinge]	16/69	. Sash-cord guides
16/5525	. . . Pintle or pivot concealed in hinged member	16/698	. . Wheel and casing
16/553	. . including means to retain pintle in hinge [e.g., tamper proof, nonrising pintle, etc.]	16/706	. . Casings
16/5535	. . . Threaded or slotted pintle or knuckle	16/71	. . . Sheet metal, single piece
16/554	. . including means to fasten leaf to member	16/714	. . Multiple wheel
16/5543	. . . by expandable connector	16/722	. . Sliding
16/5547	. . . Self-penetrating fastener	16/73	. Sash weights
		16/743	. . Composite
		16/755	. . Sectional
		16/767	. . Weight and wheel
		16/78	. Window-bead fasteners
		16/82	. Counterbalance device, <u>per se</u>
		16/84	. . Spring
		16/86	. Door escutcheon or similar element
		16/90	. Paper weight
		16/95	. Miscellaneous element or attachment

Former US Class 24 series**24/00 Buckles, buttons, clasps, etc.**

- 24/10 . Miscellaneous
- 24/11 . Album fasteners
- 24/12 . Gun band type
- 24/13 . Article holder attachable to apparel or body
- 24/1303 . . Chatelaine safety hooks
- 24/1306 . . Flower
- 24/1309 . . . Pin attached
- 24/1312 . . Napkin
- 24/1315 . . . Hook
- 24/1318 . . . Neck enclosing
- 24/1321 . . Pencil
- 24/1324 . . . Clasp attached
- 24/1326 Finger ear, belt attached pencil holder
- 24/1329 Pencil holder with paper clip
- 24/1332 Combined and convertible pencil holder
- 24/1335 Container type pencil holder
- 24/1338 Separate pencil holder and pocket engaging clip
- 24/1341 Sliding jaw pencil holding clip
- 24/1344 Wire pencil holder
- 24/1347 Flexible shank pencil holder
- 24/135 with movable catch [e.g., pin pivoted lever, roller, etc.]
- 24/1353 Pivoted jaw pencil holder
- 24/1356 . . . Pin attached
- 24/1359 . . . Rule holder
- 24/1362 . . Sleeve holder [e.g., for inner coat]
- 24/1365 . . Pin attached
- 24/1368 . . Arm or leg carried holder
- 24/1371 . . Eyeglass holder including retaining means
- 24/1374 . . Neck supported holder
- 24/1376 . . Holder contains pocket engager [e.g., antitheft device, wallet protector]
- 24/1379 . . Key ring holder
- 24/1382 . . Receptacle type holder
- 24/1385 . . . Eyeglass or spectacle case
- 24/1388 . . Open-ended holster type holder
- 24/1391 . . Article held by clip with spring [e.g., leaf, coil] member
- 24/1394 . . Article held by clip
- 24/1397 . . Article held by flexible connector [e.g., chain]
- 24/14 . Bale and package ties, hose clamps
- 24/1402 . . Packet holders
- 24/1404 . . . Cord
- 24/1406 . . . Adjustable bands
- 24/1408 . . . Closed loops
- 24/141 . . . Plastic bands
- 24/1412 . . with tighteners
- 24/1414 . . . Wedge
- 24/1416 . . . Winder
- 24/1418 . . . Self-locking [dead center or snap action]
- 24/142 Adjustable girth
- 24/1422 Rack bar
- 24/1424 . . . Lever
- 24/1427 . . . Worm and tooth
- 24/1429 Pivotal worm band clamp
- 24/1431 Radial worm band clamp
- 24/1433 . . . Integral thread
- 24/1435 External thread
- 24/1437 Both ends threaded
- 24/1439 . . . Radial screw
- 24/1441 . . . Tangential screw
- 24/1443 Adjustable girth
- 24/1445 Step adjustment
- 24/1447 Plural separable parts
- 24/1449 Wire
- 24/1451 Plural separable parts
- 24/1453 Pivotal strap parts
- 24/1455 Plural wrap
- 24/1457 . . Metal bands
- 24/1459 . . . Separate connections
- 24/1461 One piece
- 24/1463 Sheet metal
- 24/1465 Buckle band connection
- 24/1467 Swedged sheet metal band connection
- 24/1469 End-to-end integral with band connecting means
- 24/1471 Pivoted parts
- 24/1473 Wedging parts
- 24/1476 Wire
- 24/1478 . . . Circumferentially swagged band clamp
- 24/148 . . . End-to-end integral band end connection
- 24/1482 . . . Ratchet and tool tightened band clamp
- 24/1484 . . . Spring closed band clamp
- 24/1486 . . . Screw locked band clamp
- 24/1488 . . . Swedged to lock band ends
- 24/149 . . Wire
- 24/1492 . . . Separate connections
- 24/1494 Wire
- 24/1496 . . . Wooden bands
- 24/1498 . . . Plastic band
- 24/15 . Bag fasteners
- 24/152 . . Swedged bag tie
- 24/153 . . Plastic band bag tie
- 24/155 . . Resilient slot bag tie
- 24/157 . . Twist-to-close bag tie
- 24/158 . . Slides to lock bag end within housing
- 24/16 . Belt fasteners
- 24/1604 . . Tighteners
- 24/1608 . . Hinged
- 24/1612 . . . Ring connected belt ends
- 24/1616 . . . Bent over flanged ends
- 24/162 . . . Pintle pin connected belt ends
- 24/1624 . . . V and round belts
- 24/1628 . . . Overlapped belt ends
- 24/1632 . . . Sheet metal knuckles, common pintle
- 24/1636 . . . Wire knuckles, common pintle
- 24/164 . . . Knuckle integral with belt material
- 24/1644 . . . Multiple pintles interconnected V-belt type
- 24/1648 . . Lacing
- 24/1652 . . One piece
- 24/1656 . . . Deflecting prong
- 24/166 . . Screw clamp
- 24/1664 . . Splices
- 24/1668 . . Wire
- 24/1672 . . Butt connected belt ends
- 24/1676 . . V, round, trapezoidal belts
- 24/168 . . Flanged belt ends, connector hold ends
- 24/1684 . . Lapped ends of endless belts
- 24/1688 . . Hinged ends of endless belts

24/1692	. . Wire strands reinforce belts	24/2115	. . . . Jewelry
24/1696	. . Hook and loop type fastener and zipper belt end connection	24/2117	. . . Strap tighteners
24/17	. Buttoners	24/2119	. . . Tie chain tighteners
24/18	. Cuff holder	24/2121	. . . Cargo tie down
24/181	. . Adjustable	24/2123	. . . Cover fasteners
24/183	. . Sleeve clasp and button for cuff	24/2125	. . . Chain tighteners
24/184	. . Sleeve clasp and clasp for cuff	24/2126	. . . Strap tightener machine
24/185	. . Sleeve clasp and hook for cuff	24/2128	. . . toggle actuated sliding jaw
24/186	. . Sleeve clasp and pin for cuff	24/213	. . . Jewelry
24/188	. . Sleeve pin and button for cuff	24/2132	. . . Split ring with tightener
24/189	. . Pin fastener	24/2134	. . . Concrete form panels
24/19	. Necktie fastener	24/2136	. . . Seat belt buckles
24/1903	. . Bands	24/2138	. . . Chain, cable, wire tighteners, and anchors
24/1907	. . . End-securing pin	24/214	. . . Envelope fasteners
24/191	. . . Gripping	24/2142	. . . Ski boot and garment fasteners
24/1914	. . . Depressors	24/2143	. . Strap-attached folding lever
24/1917	. . . . Button engaging	24/2145	. . . toggle latch
24/1921	. . . . Pin or spur	24/2147	. . . Strap tightener
24/1924	. . Button engaging	24/2149	. . . Tire antiskid strap tightener
24/1928	. . . Adjustable	24/2151	. . . Seat belts
24/1931	. . . Cord loop	24/2153	. . . Split ring fasteners
24/1934	. . . Pivoted or sliding jaw	24/2155	. . . Jewelry-watch straps
24/1938	. . . Pin attached	24/2157	. . . Tie downs [covers, articles]
24/1941	. . Collar button combined	24/2158	. . . Cable, wire, rope tightener
24/1945	. . . Clasp attached	24/216	. . . Ski boot and garment fasteners
24/1948	. . . Pin attached	24/2162	. . . Dress hem raisers
24/1952	. . . Separable fastener	24/2164	. . Midline
24/1955	. . Tie, attached hook	24/2166	. . Jewelry
24/1959	. . Magnetic, adhesive, or snap type fastener connects tie to shirt	24/2168	. . Seat belt
24/1962	. . Tie engaging loop with shirt engaging fastener	24/217	. . Accordion straps
24/1966	. . Tie knot engaging and collar attaching	24/2172	. . Parallel poles clamp
24/1969	. . Tie clip and shirt clasp attaching	24/2174	. . form panels for walls
24/1972	. . Tie clip and fastening pin	24/2175	. . Cargo tie down
24/1976	. . Tie pin with shirt fastener	24/2177	. . Chain tighteners
24/1979	. . Tie stiffener with shirt fastener	24/2179	. . Split band with tightener
24/1983	. . with pivotal jaws having spring means	24/2181	. . Tire chain tighteners
24/1986	. . Slider	24/2183	. . Ski, boot, and shoe fasteners
24/199	. . Ornamental	24/2185	. . Fixed jaw with sliding or pivoted jaw
24/1993	. . . Key shaped	24/2187	. . Rack and pinion and circular tighteners
24/1997	. . Resilient clasp	24/2189	. . Circular flange container clamp
24/20	. Paper fastener	24/2191	. . Strap stretching tools, tighteners, and sealers
24/201	. . with screw threaded or notch engaging securing means	24/2192	. . Buckle type
24/202	. . Resiliently biased	24/2194	. . Integral piece
24/203	. . . including means to open or close fastener	24/2196	. . toggle
24/204	. . . . Pivotaly mounted on pintle	24/2198	. . Stocking top
24/205	. . . One piece	24/22	. Trouser guards, clips, straps [e.g., above shoetops]
24/206	. . . . Mounted on support means	24/23	. Bedclothes holders
24/207	. . Adhesive	24/24	. T-head nongripping, fabric engaging type
24/208	. . Corner fastened	24/25	. Zipper or required component thereof
24/209	. . Paper-penetrating	24/2502	. . Plural zippers
24/21	. Strap tighteners	24/2504	. . . Zipper chain
24/2102	. . Cam lever and loop	24/2505	. . . having surface sealing structure
24/2104	. . . Step adjusted	24/2507	. . having slider or interconnected sliders with access opening for diverse-art member
24/2106	. . . . Ski boot and garment fasteners	24/2509	. . Plural independently movable sliders
24/2108	. . . . Split ring tightener	24/2511	. . with distinct, stationary means for anchoring slider
24/2109	. . . . Chain and rope tighteners	24/2513	. . . and for aligning surfaces or obstructing slider movement
24/2111	. . . . Tire chain tighteners	24/2514	. . with distinct member for sealing surfaces
24/2113	. . . . Strap tighteners	24/2516	. . with distinct separable-fastener

- 24/2518 . . . having coiled or bent continuous wire interlocking surface
- 24/252 . . . with stringer tape interwoven or knitted therewith
- 24/2521 . . . with stringer tape having specific weave or knit pattern
- 24/2523 . . . with core encircled by coils or bends
- 24/2525 . . . with mounting portion having structural formations complementary to stitching
- 24/2527 . . . Attached by stitching
- 24/2529 String or stringer tape having distinctive property [e.g., heat sensitive]
- 24/253 . . . with stringer tape having distinctive property [e.g., heat sensitive]
- 24/2532 . . having interlocking surface with continuous cross section
- 24/2534 . . . Opposed interlocking surface having dissimilar cross section
- 24/2536 . . having interlocking surface formed from single member with varying cross section
- 24/2538 . . . Opposed surface having dissimilar cross section
- 24/2539 . . Interlocking surface constructed from plural elements in series
- 24/2541 . . . having either noninterlocking element in, interrupted, or unequal length series
- 24/2543 . . . with element structural feature unrelated to interlocking or securing portion
- 24/2545 . . . Dissimilar opposed elements
- 24/2546 . . . Wire element
- 24/2548 . . . Preattached to mounting cord
- 24/255 . . . having interlocking portion with specific shape
- 24/2552 including symmetrical formations on opposite walls for engaging mating elements
- 24/2554 including complementary formations on opposite walls for engaging mating elements
- 24/2555 Mating elements having reversed orientation of formations
- 24/2557 . . . having mounting portion with specific shape or structure
- 24/2559 including embracing jaws
- 24/2561 . . Slider having specific configuration, construction, adaptation, or material
- 24/2563 . . . including relatively movable spaced wings [i.e., restraining walls]
- 24/2564 . . . including converging channel and relatively movable separator island
- 24/2566 . . . including position locking-means attached thereto
- 24/2568 Protrusion on pull tab directly engaging interlocking surfaces
- 24/257 having surface engaging element shifted by reorientation of pull tab
- 24/2571 Resilient or spring biased element
- 24/2573 Selectively shifted by either of two pull tabs
- 24/2575 with relatively movable link
- 24/2577 Biased by distinct spring
- 24/2579 having aperture cooperating with guide post
- 24/258 . . . including means preventing bunching of structure-to-be-secured or stringer
- 24/2582 . . . having specific contour or arrangement of converging channel, separator island, or wing
- 24/2584 Spaced segments of each wall of channel supported by different wings
- 24/2586 . . . including pull tab attaching means
- 24/2588 . . . including means for attaching components of slider together
- 24/2589 . . . with ornamental slider
- 24/2591 . . with means for concealing surfaces
- 24/2593 . . including complementary, aligning means attached to ends of interlocking surfaces
- 24/2595 . . . having specific mounting connection or reinforcing structure at connection
- 24/2596 . . including means attaching interlocking surfaces together
- 24/2598 . . including means for obstructing movement of slider
- 24/26 . . Slit closing means including guides on opposite edges of slit and slidable bridging component
- 24/262 . . with hand-actuated lever for shifting bridging component
- 24/264 . . including structure linking and allowing variations in separation between opposite-guide-contacting portions of component
- 24/266 . . having bridging components attached in series along carrying element
- 24/268 . . having separate, independently movable, bridging components
- 24/27 . . including readily dissociable fastener having numerous, protruding, unitary filaments randomly interlocking with, and simultaneously moving towards, mating structure [e.g., hook-loop type fastener]
- 24/2708 . . Combined with diverse fastener
- 24/2717 . . with distinct structure for sealing securement joint
- 24/2725 . . with feature facilitating, enhancing, or causing attachment of filament mounting surface to support therefor
- 24/2733 . . having filaments formed from continuous element interwoven or knitted into distinct, mounting surface fabric
- 24/2742 . . having filaments of varied shape or size on same mounting surface
- 24/275 . . with feature facilitating or causing attachment of filaments to mounting surface
- 24/2758 . . . Thermal or adhesive
- 24/2767 . . having several, repeating, interlocking formations along length of filaments
- 24/2775 . . having opposed structure formed from distinct filaments of diverse shape to those mating therewith
- 24/2783 . . having filaments constructed from coated, laminated, or composite material
- 24/2792 . . having mounting surface and filaments constructed from common piece of material
- 24/28 . . Freight container to freight container fastener
- 24/29 . . Drum or can spacer fastener
- 24/30 . . Trim molding fastener
- 24/301 . . having externally threaded attaching means
- 24/302 . . . and laterally extending biasing appendage
- 24/303 . . having laterally extending biasing appendage
- 24/304 . . Resilient metal type
- 24/306 . . . Strip formed
- 24/307 . . . Sheet metal formed
- 24/308 . . . Wire formed
- 24/309 . . Plastic type

24/31	. Plural fasteners having intermediate flaccid connector	24/3467	. . Pin
24/312	. . Chain connector	24/3468	. . . and pin
24/314	. . Elastic connector	24/3469	. . . . and disconnect means
24/316	. . . Strap connector	24/3471	. . . . . Hook and eye type
24/318	. . Strap connector	24/3472	. . . . and hook
24/32	. having magnetic fastener	24/3473	. . . . . having connector allowing movement
24/33	. having adhesive fastener	24/3475	. . . . having intermediate connector allowing movement
24/34	. Combined diverse multipart fasteners	24/3476	. . . and hook
24/3401	. . Buckle	24/3477	. . . . having intermediate connector allowing movement
24/3403	. . . and buckles	24/3479	. . . . . and adjustment means
24/3404	. . . . having separate material adjustment means	24/348	. . . . Hook having locking means
24/3405	. . . . having separate disconnect means	24/3481	. . . including a button fastening element
24/3407	. . . . . Pivotal lever type	24/3483	. . . and penetrating prong
24/3408	. . . . having disconnect structure	24/3484	. . Hook
24/3409	. . . . . Resilient cooperating means	24/3485	. . . and hook
24/3411	. . . . and pin	24/3487	. . . . having biasing spring
24/3412	. . . . Crossed belt accommodating	24/3488	. . . . Separately connected
24/3413	. . . and clasp	24/3489	. . . . having securing means
24/3415	. . . and pin	24/3491	. . . . . Sliding
24/3416	. . . and hook	24/3492	. . . . . Snap type
24/3417	. . . . having disconnect means	24/3493	. . . . . Pivoted
24/3419	. . . . having penetrating prong	24/3495	. . . having penetrating prong
24/342	. . . . Buckle having plural receiving slots	24/3496	. . . including a button fastening element
24/3421	. . . including a button fastening element	24/3497	. . Button fastening element including another fastener element
24/3423	. . . and separable fastening means for attached fastener	24/3499	. . Penetrating prong
24/3424	. . . . Snap fastener	24/35	. Interchangeable button loop and pin
24/3425	. . . having roller means	24/36	. Button with fastener
24/3427	. . Clasp	24/3602	. . Loss-preventing devices
24/3428	. . . having pivoted members	24/3604	. . Adjustable
24/3429	. . . . Cam type member	24/3606	. . Cloth shanks and covers
24/3431	. . . . Plural clasps	24/3609	. . Multiple attachment
24/3432	. . . . . and toggle operator	24/3611	. . Deflecting prong or rivet
24/3433	. . . . . Spring biased	24/3613	. . . Anvil or plate
24/3435	. . . . . . Coil	24/3615	. . . Integral
24/3436	. . . . . and cam	24/3617	. . Hinged leaf
24/3437	. . . . Coil spring biased	24/3619	. . . Axially rotating
24/3439	. . . Plural clasps	24/3621	. . . Double
24/344	. . . . Resilient type clasp	24/3623	. . . Sliding
24/3441	. . . . . and cam	24/3626	. . Sliding bar
24/3443	. . . . . Spring biased jaw	24/3628	. . Integral or rigid stud
24/3444	. . . . . Circular work engageable	24/363	. . . Bent sheet metal [integral]
24/3445	. . . . . and pin attachment	24/3632	. . Link
24/3447	. . . . . and disconnect means	24/3634	. . . Integral rubber button, extendable shank
24/3448	. . . including a button fastening element	24/3636	. . . Extendably connected
24/3449	. . . and hook	24/3638	. . . Pivoted leaf
24/3451	. . . . having intermediate connector allowing movement	24/364	. . . Releasably locked
24/3452	. . . . . and adjustment means	24/3643	. . . French cuff
24/3453	. . . . having gripping configuration on clasp jaw	24/3645	. . . Tufting
24/3455	. . . . . Penetrating type	24/3647	. . . Integral piece
24/3456	. . . . having cam	24/3649	. . Pin attached
24/3457	. . . . having separable jaws	24/3651	. . Separable
24/3459	. . . and penetrating prong	24/3653	. . . Screw
24/346	. . . and pin	24/3655	. . . Spring
24/3461	. . . . having separate pin loss prevention means	24/3657	. . . . Resilient head
24/3463	. . . . . Pin coextensive, coplanar, and contiguous with clasp jaw	24/366	. . . . Resilient socket
24/3464	. . . . Pin coextensive, coplanar, and contiguous with clasp jaw	24/3662	. . . . Rotating head
24/3465	. . . . Pin forms part of clasp jaw	24/3664	. . . . with operating devices
		24/3666	. . Separate thread bar

24/3668	. . Spiral fastener	24/3789	. . having means covering tip of lacing
24/367	. . Covers	24/3792	. . . Tasseled
24/3672	. . . Metal or plastic caps	24/3795	. . . with plural components
24/3674	. . Pads	24/3797	. . . with permanently deformed mounting structure
24/3677	. . Flexible button	24/38	. Strap cable or pipe button
24/3679	. . Swivel button	24/39	. Cord and rope holders
24/3681	. . Tufting type	24/3902	. . Chain
24/3683	. . Button with cavity for friction grip fastener	24/3904	. . . Bead chain fasteners
24/3685	. . Button with shank for friction grip fastener	24/3907	. . Sheathed strand
24/3687	. . Heat or adhesive secured type	24/3909	. . Plural-strand cord or rope
24/3689	. . Thread or wire through apertured button	24/3911	. . Friction disk
24/3691	. . Eye shank type button	24/3913	. . Knot engaging
24/3694	. . Ornamental type	24/3916	. . One-piece
24/3696	. . for cuff or collar	24/3918	. . . Wedge slot
24/3698	. . Fabric embracing	24/392	. . . Wire
24/37	. Drawstring, laced-fastener, or separate essential cooperating device therefor	24/3922	. . . . Cord runs through center of coil
24/3703	. . Includes separate device for holding drawn portion of lacing	24/3924	. . . Sheet material
24/3705	. . . Device engages tie in lacing	24/3927	. . . Slack adjuster
24/3708	. . . . and fully covers tie	24/3929	. . . Rubber
24/3711	. . . Device engages element or formation on lacing	24/3931	. . . Wire
24/3713	. . . having relatively movable holding components or surfaces	24/3933	. . . Swagged, deformable
24/3716	. . . . with pivotal connection therebetween	24/3936	. . Pivoted part
24/3718	. . . . with integral resilient linking structure therebetween	24/3938	. . . Lever tension
24/3721	. . . . . formed from wire	24/394	. . . Cam lever
24/3724	. . . having lacing wound thereabout or wedged therein	24/3942	. . . . Laterally shifted rope
24/3726	. . with holding means fixedly mounted on lacing	24/3944	. . . . Cam engaging or disengaging
24/3729	. . . and forming lacing tips	24/3947	. . . . Fixed and movable jaws, movable jaw pulled
24/3732	. . Includes lacing holding structure within directing means therefor	24/3949	. . . . Link-connected parallel jaws
24/3734	. . having diverse shaped directing means for lacing	24/3951	. . . . Dual cam
24/3737	. . having lacing directing means in particular pattern	24/3953	. . . Pivotal means with plate aperture
24/3739	. . Includes lacing guiding roller within directing means	24/3956	. . . Jaws locked together by cam, wedge, lever, or screw
24/3742	. . having eyelet type directing means	24/3958	. . Screw clamp
24/3745	. . . with permanently deformed mounting structure	24/396	. . . Screw clamp with snubber
24/3747	. . . . Mounting structure formed from different material than directing passage	24/3962	. . . Tangential bolt
24/375	. . having hook shaped directing means	24/3964	. . . J-shaped bolt
24/3753	. . . and movable component or surface for closing throat	24/3967	. . . Bolt perpendicular to cable axis
24/3755	. . . Mounted by structure allowing bodily movement thereof	24/3969	. . Sliding part or wedge
24/3758	. . . formed from wire	24/3971	. . . Rope looped about movable member
24/3761	. . . with mounting structure formed from different material	24/3973	. . . Rope clamped between cone and socket
24/3763	. . . with permanently deformed mounting structure	24/3976	. . . Sliding ball
24/3766	. . . . Expanding stud	24/3978	. . . Screw actuated
24/3768	. . having loop or sleeve shaped directing means	24/398	. . Bendable, ductile
24/3771	. . . Entirely formed from flaccid material	24/3982	. . Safety release
24/3774	. . . Mounted by structure allowing bodily movement thereof	24/3984	. . Alignable aperture and spring pressed moving element
24/3776	. . . formed from wire	24/3987	. . Loop, adjustable
24/3779	. . . with permanently deformed mounting structure	24/3989	. . Snubbers, cleats by dielectric loss
24/3782	. . . . Loop or sleeve closed when mounted	24/3991	. . Loop engaging
24/3784	. . . . Expanding stud	24/3993	. . Ball or roller
24/3787	. . having elastic segment in lacing	24/3996	. . Sliding wedge
		24/3998	. . Helical preform
		24/40	. Buckles
		24/4002	. . Harness
		24/4005	. . . Combined buckles and snap hooks
		24/4007	. . . Lock
		24/4009	. . . . Key
		24/4012	. . . Clamping
		24/4014	. . . . One-piece
		24/4016	. . . . Pivoted part or lever
		24/4019	. . . . Sliding part or wedge

24/4021	. . . Cross bails	24/4412	. . . . with separate, cavity-blocking gate on receiving member
24/4023	. . . . Pivoted stud plate	24/44128	. . . . Resilient inserted or receiving member
24/4026	. . . . Rigid stud	24/44137	. . . . . Inserted or receiving member substantially covered or coated for protection or to promote gripping
24/4028	. . . Penetrating tongue	24/44145	. . . . . Resilient inserted member
24/403	. . . . Guarded	24/44154	. . . . . having engaging face formed from nonmetallic material
24/4033	. . . . One-piece	24/44162	. . . . . having head and neck type engaging face
24/4035	. . . . Multiple	24/44171	. . . . . having internal supporting or reinforcing element
24/4037	. . . . Pivoted	24/44179	. . . . . Circular head or neck
24/404	. . . . . Lever actuated	24/44188	. . . . having wedge shaped, inserted and receiving members
24/4042	. . . . . Stud	24/44197	. . . . with specific means for attaching to flaccid strap or supporting strap
24/4044	. . . . Sliding part or wedge	24/44205	. . . . . On the inserted member
24/4047	. . . Strap loops and attaching devices	24/44214	. . . . having necked button sliding along length of closed, variable width loop
24/4049	. . . Loop shields	24/44222	. . having flaccid gripping member
24/4051	. . Garment shielded	24/44231	. . . formed from elastic material
24/4053	. . Combined pressure bar and guard	24/44239	. . Encircling gripping member including semirigid band and operator for tightening
24/4056	. . . Hook attached	24/44248	. . Encircling gripping member including semirigid band and means for adjusting girth
24/4058	. . Penetrating prong	24/44256	. . with specifically shaped, nongripping, rigid structure for connecting independently operable clasps, clips, or support-clamps
24/406	. . . One-piece	24/44265	. . Gripping member face integral with or rigidly affixed to screw-driving portion
24/4063	. . . . Hook attached	24/44274	. . having either discrete flaccid or thin, nonbiasing, integral, connecting hinge
24/4065	. . . Pivoted	24/44282	. . having equally spaced or continual gripping faces revolving about central axis
24/4067	. . . . Hook attached	24/44291	. . including pivoted gripping member
24/407	. . . Slide	24/44299	. . . Pivoted member also slides
24/4072	. . Pivoted lever	24/44308	. . . . Tapered face
24/4074	. . . Hook attached	24/44316	. . . Pivoting gripping member either supports or coacts with sliding engaging face
24/4077	. . . Looped strap	24/44325	. . . having three or more pivotally connected gripping members
24/4079	. . Sliding part of wedge	24/44333	. . . having toggle operator for moving
24/4081	. . . Hook attached	24/44342	. . . having rigid linking arm pivotally connected to each gripping member
24/4084	. . . Looped strap	24/4435	. . . . with extended lever portion
24/4086	. . Looped strap	24/44359	. . . . having lever end modified for attachment to support
24/4088	. . One-piece	24/44368	. . . Pivoted gripping member applies camming force
24/4091	. . . Hook attached	24/44376	. . . Spring or resiliently biased about pivot
24/4093	. . . Looped strap	24/44385	. . . . Distinct spring
24/4095	. . Fabric covered	24/44393	. . . . . Attached solely by spring
24/4098	. . Ornamental and/or object supported	24/44402	. . . . . with operator for moving pivoted member
24/41	. Pierced earring fastener	24/4441	. . . . . Camming or wedging element
24/42	. Independent, headed, aperture pass-through fastener	24/44419	. . . . . Pivoted or rotated element
24/43	. Fastener with revolving component wrapping structure-to-be-secured about fastener	24/44427	. . . . . with position locking-means for gripping members
24/44	. Clasp, clip, support-clamp, or required component thereof	24/44436	. . . . . including pivoted arm
24/44009	. . Gripping member adapted for tool actuation or release	24/44444	. . . . . having specific surface material or irregularity on or along engaging face
24/44017	. . with specific mounting means for attaching to rigid or semirigid supporting structure or structure-to-be-secured	24/44453	. . . . . having specific handle structure
24/44026	. . . for cooperating with aperture in supporting structure or structure-to-be-secured		
24/44034	. . Dissociable gripping members		
24/44043	. . . Channel and inserted bar		
24/44051	. . . . having operator or locking means		
24/4406	. . . . Resilient channel or bar		
24/44068	. . having gripping member actuated by fluid force		
24/44077	. . having inserted and receiving interlocking members connected by bendable, nonbiasing strap		
24/44085	. . . Discrete flaccid strap		
24/44094	. . . . with distinct means for preventing separation of members		
24/44103	. . . . . Slidably mounted		
24/44111	. . . . with separate flaccid flap or pocket for protecting structure-to-be-secured		

24/44462	Coil spring	24/44786	Opposed faces located in and bias towards common plane in nonuse position
24/4447	having coil portion coaxial or parallel with pivotal axis	24/44795	Resilient gripping member having tightly twisted portion
24/44479	Flat or leaf spring	24/44803	Resilient gripping member having coiled portion
24/44487	Closed by gravity or weight of structure-to-be-secured	24/44812	Convolutions of coil form faces
24/44496	with operator means for moving pivoted member	24/44821	Relatively movable segments of resilient gripping member contact and cross in nonuse position
24/44504	Threaded cylindrical rod and mating cavity	24/44829	Segments form opposed engaging faces
24/44513	Camming or wedging element	24/44838	having specific handle structure
24/44521	Pivoted or rotated element	24/44846	having specific handle structure
24/4453	with position locking-means for gripping members	24/44855	Terminal end of resilient member having engagement or disengagement enhancing structural modifications
24/44538	Integral locking-means	24/44863	having specific surface irregularity on or along engaging face
24/44547	having inserted and receiving interlocking engaging faces	24/44872	having specific handle structure
24/44556	Resilient gripping member	24/4488	Movably attached to gripping member
24/44564	having specific surface material or irregularity on or along engaging face	24/44889	Interlocking faces
24/44573	including track or way guided and retained gripping member	24/44897	with reinforcing member
24/44581	Biased by distinct spring	24/44906	having specific surface irregularity on or along engaging face
24/4459	with operator for moving guided member	24/44915	Corrugated or toothed face
24/44598	Threaded cylindrical rod and mating cavity	24/44923	Clasp, clip, or support-clamp cut or shaped from a single sheet of resilient, uniformly thick, planar material
24/44607	Track or way oblique to path of gripping member	24/44932	having specific surface material or irregularity on or along engaging face
24/44615	with position locking-means for gripping members	24/4494	having specific handle structure
24/44624	Integral locking-means	24/44949	including resilient biasing wire
24/44632	with specific mounting means for attaching to flaccid supporting structure or structure-to-be-secured	24/44957	Coiled wire
24/44641	having gripping member formed from, biased by, or mounted on resilient member	24/44966	having gripping member shifted by operator
24/4465	Integrally combined, independently operable, diverse clasps, clips, or support-clamps	24/44974	Threaded cylindrical rod and mating cavity
24/44658	with specific means for mounting to flaccid supporting structure or structure-to-be-secured	24/44983	formed from single rigid piece of material
24/44667	Mounting means made entirely from integral wire portion of resilient gripping member	24/44991	having specific surface irregularity on or along engaging face
24/44675	Wire coiled about flaccid supporting structure	24/45	Separable-fastener or required component thereof [e.g., projection and cavity to complete interlock]
24/44684	with operator for moving biased engaging face	24/45005	with third detached member completing interlock [e.g., hook type]
24/44692	Camming or wedging element	24/4501	Quick connect or release [e.g., spring and detent]
24/44701	Encircling sleeve type element	24/45016	for jewelry
24/44709	Pivoted or rotated element	24/45021	including eyelet [e.g., shoes]
24/44718	Element pivots or rotates in plane parallel to plane bisecting opposed engaging faces	24/45026	for key holder
24/44726	Elongated element with pivot between cam and handle portions	24/45031	for tire chain, strap, etc. [e.g., rotatable or sliding spring gate]
24/44735	for moving engaging face of U-shaped gripping member	24/45037	for apparel and related accessories
24/44744	with position locking-means for engaging faces	24/45042	Button, button related
24/44752	Integral locking-means	24/45047	Snap [e.g., key hole type]
24/44761	Pivoted lock member	24/45052	Post and receiver [e.g., pin and slot]
24/44769	Opposed engaging faces on gripping member formed from single piece of resilient material	24/45058	Hook [e.g., within cavity]
24/44778	Piece totally forms clasp, clip, or support-clamp and has shaped, wirelike, or bandlike configuration with uniform cross section throughout its length	24/45063	Belt, strap, etc. [e.g., buckle or snap fastener]
		24/45068	Glove
		24/45073	Purse, wallet, etc.
		24/45079	Belt, strap, harness, etc.
		24/45084	for safety belt buckle, strap, harness, etc.
		24/45089	Sliding or rotating element
		24/45094	Element having key slot
		24/45099	Resilient element [e.g., snap type]

24/45105	for upholstery, panel, trim strip, etc. [e.g., spring biased]	24/4534	and position locking-means for gate
24/4511	Link with pivoted gate	24/45346	Includes distinct biasing spring
24/45115 . . .	Hook	24/45351	Coil type spring
24/4512	Snap with spring bias [e.g., gate]	24/45356	Coiled about pivotal axis of gate
24/45126	for connecting chains [e.g., opposed pivoted hook]	24/45361	having position locking-means for gate
24/45131	for heavy load bearing device [e.g., chain, rope, cable, etc.]	24/45366	Locking-means pivotally connected
24/45136	Haim, harness, whiffletree, rein, etc.	24/45372	Locking-means slidably mounted
24/45141 . . .	for chain, rope, cable, etc.	24/45377	Gate closes when structure-to-be-secured is tensioned
24/45147	Coupler with sliding socket to complete interlock	24/45382	Track or way guided gate
24/45152 . .	Each mating member having similarly shaped, sized, and operated interlocking or intermeshable face	24/45387	having means biasing gate
24/45157 . . .	Zipper-type [e.g., slider]	24/45393	Guide of gate encircles shank
24/45162	for garment [e.g., with ribs and grooves interlocking elements]	24/45398	Cavity in shank forms track or way
24/45168	for container [e.g., bag]	24/45403	with position locking-means for gate
24/45173 . . .	Resilient element	24/45408	Resilient, self-biased gate
24/45178	Snap [e.g., identical elements]	24/45414	with position locking-means for gate
24/45183 . . .	Clasp [e.g., spring type]	24/45419	Gate and hook formed from plastic
24/45188	for jewelry [e.g., buckle type]	24/45424	Gate and hook formed solely from wire
24/45194	for belt or strap	24/45429	Gate and hook formed from single piece of sheet metal
24/45199 . . .	Hook	24/45435	Projection pivotally attached to shank or mounting structure
24/45204	for belt, strap, etc. [e.g., with pivoted gate locking member]	24/4544	Projection slidably mounted to shank or mounting structure
24/45209	for apparel	24/45445	Projection self-biased towards shank or mounting structure
24/45215 . . .	Slot and tab or tongue	24/4545	and formed solely from wire
24/4522 . . .	Sliding or rotating element	24/45455	Cooperating with relatively stationary wire gate
24/45225 . .	including member having distinct formations and mating member selectively interlocking therewith	24/45461 . . .	Interlocking portion actuated or released responsive to preselected condition [e.g., heat, pressure]
24/4523 . . .	Hook	24/45466 . . .	having electric or fluid powered, actuation or release, of interlock
24/45236	Multiple catch [e.g., with pivoted gate]	24/45471 . . .	Projection having movable connection between components thereof or variable configuration
24/45241 . . .	Slot and tab or tongue	24/45476	with additional, similar projection for engaging different cavity
24/45246	having teeth or serrations [e.g., sliding with respect to each other]	24/45482	and operator therefor
24/45251 . . .	Resilient element [e.g., with spring]	24/45487	including camming or wedging element on projection member
24/45257	Snap with cavity	24/45492	Pivotally attached element
24/45262 . . .	Pin, post and receiver	24/45497	including pivotal connection between projection components
24/45267 . . .	Notched clasp [e.g., with receiving slot]	24/45503	Component slides relative to connection
24/45272 . . .	Projection passes through cavity then moves toward noninserted portion of its member to complete interlock [e.g., snap hook]	24/45508	and spring or resilient extension biasing about pivot
24/45277	Entire projection member forms loop or ring when interlocked	24/45513	including slidably guided connection between nonself-biasing projection components
24/45283	Includes slidable gate closing entrance throat	24/45518	and distinct spring biasing component
24/45288	Hook type projection member	24/45524	including resiliently biased projection component or surface segment
24/45293	Plural hooks entering opposite sides of same cavity	24/45529	Requiring manual force applied against bias to interlock or disengage
24/45298	Hooks formed solely from wire	24/45534	having connected leading edge and separated trailing arms
24/45304	Noninserted portion of projection member includes movably connected gate for closing access throat	24/45539	Cooperating with cavity having side walls and axially biased component capping end
24/45309	Threaded gate		
24/45314	Revolvably mounted disc shaped gate		
24/45319	Pivotally connected gate		
24/45325	Gate swings transversely to plane of hook		
24/4533	Gate also slides relative to pivot		
24/45335	having means biasing gate about pivot		

24/45545	forming total external surface of projection	24/45707	having aperture therein alignable with parallel access opening
24/4555	and encircling hollow central area	24/45712	having interlocking portion thereof housed continuously within cavity
24/45555	having separate mounting means inserted into area	24/45717	having cavity with side walls and axially biased component capping end
24/4556	Plastic deformation of means or surface required for mounting	24/45723	having slidably connected, nonself-biasing interlocking component
24/45565	having separate mounting means encompassing cross section of projection	24/45728	Blocking removal of formation on projection from complementary formation on side wall of cavity
24/45571	having dome-shaped head and expansion slit along side	24/45733	and position locking-means therefor
24/45576	and connected surface at tip of head	24/45738	and relatively movable handle therefor
24/45581	having inserted end formed by oppositely biased surface segments	24/45743	Requiring manual force thereon to interlock or disengage
24/45586	Constructed from wire	24/45749	Plural, oppositely shifting, similar interlocking components
24/45592	having both resiliently biased and rigid components forming external surface of projection	24/45754	having closed aperture therethrough alignable with parallel access opening
24/45597	Projection member including noninserted spring for engaging and pushing against receiving member	24/45759	having flaccid component defining access opening of cavity
24/45602	Receiving member includes either movable connection between interlocking components or variable configuration cavity	24/45764	Component formed solely by flaccid cord
24/45607	with additional cavity for engaging different projection	24/4577	with nonflaccid component
24/45613	having common means actuating or releasing interlocking components or surfaces	24/45775	having resiliently biased interlocking component or segment
24/45618	and interlocking with independently associated or dissociated projection members	24/4578	Cavity or projection rotates about axis of cavity to dissociate
24/45623	and operator therefor	24/45785	Requiring manual force applied against bias to interlock or disengage
24/45628	for plural, oppositely shifting, similar interlocking components or segments	24/45791	and partially blocking separate, nonresilient access opening of cavity
24/45634	Operator includes camming or wedging element	24/45796	and closed elongated access opening for guiding transverse projection travel after insertion
24/45639	including pivotally connected element on receiving member	24/45801	Nonresilient walls define opening
24/45644	for shifting pivotally connected interlocking component	24/45806	formed from wire
24/45649	Element and component pivot about same axis	24/45812	and access opening with gapped perimeter for allowing movement of noninserted projection support therepast
24/45654	for shifting slidably connected and guided, nonself-biasing interlocking component	24/45817	Cavity constructed solely from wire
24/4566	including slidably connected and guided element on receiving member	24/45822	Partially blocking separate, nonresilient, access opening of cavity
24/45665	for shifting pivotally connected interlocking component	24/45827	and bodily shifted into or out of interlock location by manual force thereon
24/4567	for shifting slidably connected and guided, nonself-biasing, interlocking component	24/45832	formed from wire
24/45675	having pivotally connected interlocking component	24/45838	having curved or bent engaging section conforming to contour of projection
24/45681	Blocking removal of formation on projection from complementary formation on side wall of cavity	24/45843	Similar, distinct sections
24/45686	and position locking-means therefor	24/45848	having distinct sections engaging projection at spaced points
24/45691	and relatively movable handle therefor	24/45853	including separate, nonprojection-engaging spring for biasing
24/45696	Requiring manual force thereon to interlock or disengage	24/45859	Biased component or segment entirely formed from wire
24/45702	Plural, oppositely shifting, similar interlocking components	24/45864	having portion of cavity deformed during mounting
		24/45869	and cooperating with separate mounting component
		24/45874	having axially extending expansion slit along side of cavity
		24/4588	Means for mounting projection or cavity portion

24/45885	. . . .	Allows bodily movement facilitating interlock	24/4627	. . . . .	and nonresilient structure for guiding portion thereto
24/4589	. . . . .	About pivotal connection	24/4629	. . . .	including structure for cooperating with formation [e.g., cavity] formed on penetrating portion
24/45895	. . . . .	Includes resilient component separate from portion	24/463	. . . .	for pin having plural penetrating portions
24/45901	. . . . .	Allows relocation of portion	24/4632	. . . . .	Each independently movable towards and into cooperation with means
24/45906	. . . . .	having component of means permanently deformed during mounting operation	24/4634	. . . .	including relatively movable guiding, holding, or protecting components or surfaces
24/45911	. . . . .	and formed from or fixedly attached to projection or cavity portion	24/4636	. . . . .	with connection allowing component to revolve about axis of held penetrating portion
24/45916	. . . . .	Cooperates with detached component of means	24/4638	. . . . .	with pivotal connection therebetween
24/45921	. . . . .	having shape facilitating impaling of mounting surface	24/4639	. . . . .	having position locking means therefor
24/45927	. . . . .	and inserted into or through cavity or projection	24/4641	. . . . .	Spring or resiliently biased
24/45932	. . . . .	and encircling cavity or projection	24/4643	. . . . .	with slidable connection between nonself-biasing components
24/45937	. . . . .	Consisting of thermally fusible substance	24/4645	. . . . .	Component slides parallel to axis of held penetrating portion
24/45942	. . . . .	having threaded formation	24/4646	. . . . .	Means engages formation formed on penetrating portion
24/45948	. . . . .	having specific structure for cooperating with stitching	24/4648	. . . . .	having nonresilient and resilient components
24/45953	. . . . .	having shape facilitating impaling of mounting surface	24/465	. . . . .	Means formed from single resilient wire
24/45958	. . . .	Plural distinct cavities or projections	24/4652	. . . . .	Means formed from resilient sheet metal
24/45963	. . . . .	Hook type	24/4654	. . . . .	with independent, spaced, intermediate connections, or formations [e.g., coils], about which portion or means move
24/45969	. . . .	Hook-shaped projection member passing through cavity	24/4655	. . . . .	Includes slidable connection
24/45974	. . . . .	formed from single piece of sheet metal	24/4657	. . . . .	with pivotal connection between penetrating portion and means
24/45979	. . . . .	formed solely from wire	24/4659	. . . . .	Connection also permits sliding movement
24/45984	. . . .	Cavity having specific shape	24/4661	. . . . .	Resiliently biased about connection
24/4599	. . . . .	including closed elongated access opening for guiding transverse projection travel after insertion	24/4663	. . . . .	with slidable connection intermediate penetrating portion and means
24/45995	. . . . .	having access opening with gapped perimeter for allowing movement of noninserted projection support therepast	24/4664	. . . . .	having resilient bridging structure between portion and means
24/46	. .	Pin or separate essential cooperating device therefor	24/4666	. . . . .	Means includes structure for cooperating with formation [e.g., cavity] formed on portion
24/4602	. . .	with separately operable, manually releasable, nonpenetrating means for mounting [e.g., drapery hook]	24/4668	. . . . .	and penetrating portion formed from wire
24/4604	. . .	having distinct guiding, holding, or protecting means for penetrated portion	24/467	. . . . .	Bridging structure includes elongated nonwire element
24/4605	. . .	Means detachable from or flaccidly connected to pin [e.g., hatpin type]	24/4671	. . . . .	Wire also forms coiled bridging structure about which portion moves
24/4607	. . . . .	for pin having plural penetrating portions	24/4673	. . . . .	including distinct device for cooperating with coil
24/4609	. . . . .	including relatively movable guiding, holding, or protecting components or surfaces	24/4675	. . . . .	having means also formed from same wire
24/4611	. . . . .	having operator for moving holding component or surface	24/4677	. . . .	with cavity for guiding structure-to-be-secured towards penetrating portion [e.g., stocking support]
24/4613	. . . . .	Moves pivoting holding component	24/4679	. . . .	having penetrating portion retractable or of changeable length
24/4614	. . . . .	Moves slidably guided, nonself-biasing, holding component	24/468	. . . .	having interconnected distinct penetrating portions
24/4616	. . . . .	having pierceable [e.g., cork] or naturally resilient [e.g., rubber] surfaces	24/4682	. . . .	Connection allows movement therebetween
24/4618	. . . . .	with pivotal connection therebetween	24/4684	. . . . .	Slidable connection
24/462	. . . . .	with slidable connection between nonself-biasing components	24/4686	. . . . .	Resilient connection
24/4621	. . . . .	having resiliently biased component or surface	24/4688	. . . . .	formed from common wire
24/4623	. . . . .	Coiled about longitudinal axis of held portion	24/4689	. . . . .	and pointing in same direction
24/4625	. . . . .	and aperture therein alignable with another spaced aperture of means	24/4691	. . . .	Penetrating portion includes relatively movable structure for resisting extraction

- 24/4693 . . having specific wire penetrating portion
- 24/4695 . . . Wire curved or bent
- 24/4696 . . having distinct head structure
- 24/4698 . . . Movably connected to penetrating portion
- 24/47 . Strap-end-attaching devices
- 24/4709 . . Bendable sheet material
- 24/4718 . . Watch pintle connected
- 24/4727 . . Webbing to tube [lawn chair]
- 24/4736 . . Buckle connected
- 24/4745 . . End clasp
- 24/4755 . . Hook
- 24/4764 . . Ring-loop
- 24/4773 . . Cargo tiedown
- 24/4782 . . Watch strap
- 24/4791 . . Enlarged end epoxy
- 24/48 . Pivoted edge stays
- 24/49 . Fastener destructively secured by reshaping distortion force [e.g., ductile fastener]
- 24/492 . . Distorted structure having shape facilitating impaling
- 24/493 . . . and distinct fastener structure cooperating with impaled structure
- 24/495 Detached cooperating structure
- 24/497 . . . including plural impaling elements
- 24/498 Elements form single aperture [e.g., split shank type]
- 24/50 . Readily interlocking, two-part fastener requiring either destructive or tool disengagement
- 24/505 . . including additional fastener structure linking parts
- 24/51 . Hanger on portable article support for manual attachment thereof to overhead support [e.g., drapery hook]
- 29/15 . Cord heddle making
- 29/16 . Cotter-pin making
- 29/17 . Crankshaft making apparatus
- 29/18 . Expanded metal making
- 29/185 . . by use of reciprocating perforator
- 29/19 . Eyebolt or hook making
- 29/20 . Fence barb making
- 29/203 . . by use of reciprocating cutter or die
- 29/207 . . by use of rotary cutter or die
- 29/21 . Finger-ring forming or sizing
- 29/22 . Fishhook making
- 29/23 . Gem and jewel setting
- 29/24 . Hinge making or assembling
- 29/25 . Lacing-stud making
- 29/26 . Paper-fastener making
- 29/27 . Plow or cultivator iron making
- 29/28 . Puddlers balls making
- 29/29 . Railway-chair making
- 29/30 . Foil or other thin sheet-metal making or treating
- 29/301 . . Method
- 29/302 . . . Clad or other composite foil or thin metal making
- 29/303 . . . with assembling or disassembling of a pack
- 29/304 Using transitory solid cover material
- 29/305 including bond prevention treatment
- 29/306 Disassembling of a pack
- 29/307 . . . by shaving or longitudinal cutting
- 29/308 . . . Using transitory material
- 29/309 . . Means for opening or separating a pack
- 29/31 . Spectacle-frame making
- 29/32 . Spiral cutting of flat stock
- 29/33 . Stereotype-plate finishing
- 29/34 . Means for forming clench-tongue [eg, for tieband]
- 29/35 . Tire upsetting, with cutting, punching, etc.
- 29/36 . toothed-cylinder making apparatus [e.g., texture working cylinder]
- 29/37 . Impeller making apparatus
- 29/38 . Type finishing and grooving
- 29/39 . Venetian blind assembling
- 29/40 . Umbrella-frame making
- 29/42 . Piezoelectric device making
- 29/43 . Electric condenser making
- 29/435 . . Solid dielectric type
- 29/44 . Filing
- 29/442 . . of key article
- 29/444 . . Continuous band type
- 29/446 . . Reciprocating type
- 29/448 . . File-blank stripper
- 29/45 . Scale remover or preventor
- 29/4506 . . for hollow workpiece
- 29/4511 . . . Interior surface
- 29/4517 . . Rolling deformation or deflection
- 29/4522 . . . for wire or rod
- 29/4528 . . with rotary head
- 29/4533 . . Fluid impingement
- 29/4539 . . . with heater
- 29/4544 . . . Liquid jet
- 29/455 . . . Airblast
- 29/4556 . . Chainer
- 29/4561 . . Scraper or scalper
- 29/4567 . . Brush type

Former US Class 29 Series**29/00 Metal working**

- 29/10 . Battery-grid making
- 29/11 . Bias [i.e., helically] cutting of tubular stock
- 29/1106 . . including orbital cutter
- 29/1113 . . . within stock support
- 29/1119 . . . with orbiting strip accumulator
- 29/1125 . . including means to inflate stock
- 29/1131 . . with means to feed stock along support or mandrel
- 29/1138 . . . Single means produces compound motion
- 29/1144 Endless belt drive means
- 29/115 . . . Axially
- 29/1156 . . . Rotatably
- 29/1163 . . with means to rotate and store stock supply
- 29/1169 . . . Axis of rotation parallel to support or mandrel
- 29/1175 . . with means for arcuate shift of mandrel
- 29/1181 . . including means to handle produced strip or web
- 29/1188 . . . with common adjustment for cutter
- 29/1194 . . Method
- 29/12 . Buckle making
- 29/13 . Button-fastener making
- 29/14 . Shredding metal or metal wool article making
- 29/142 . . Metal wool making
- 29/143 . . . Shaving or longitudinal cutting
- 29/145 Soap-pad making
- 29/147 . . Metal wool bundling
- 29/148 . . . Soap-pad making

29/4572	. . Mechanically powered operator	29/49053	. . . . . Multitrack heads having integral holding means
29/4578	. . . Tack or needle type	29/49055	. . . . . with bond/laminating preformed parts, at least two magnetic
29/4583	. . . Hammer	29/49057	. . . . . Using glass bonding material
29/4589	. . . Blade or chisel	29/49059	. . . . . with work positioning means
29/4594	. . Hand tool	29/4906	. . . . . Providing winding
29/46	. Burning in, wearing in, or oil burnishing	29/49062	. . . . . Multilayered winding
29/47	. Burnishing	29/49064	. . . . . by coating
29/471	. . of water laid fibrous article [e.g., paper]	29/49066	. . . . . Preformed winding
29/473	. . . Heated burnishing member	29/49067	. . . . . Specified diverse magnetic materials
29/474	. . . . Burnishing tool reciprocates across work surface	29/49069	. . . . . Data storage inductor or core
29/476	. . Continuous feed	29/49071	. . . . . by winding or coiling
29/477	. . of gear article	29/49073	. . . . . by assembling coil and core
29/479	. . by shot peening or blasting	29/49075	. . . . . including permanent magnet or core
29/48	. Upholstered article making	29/49076	. . . . . From comminuted material
29/481	. . Method	29/49078	. . . . . Laminated
29/482	. . Tufting	29/4908	. . . . . Acoustic transducer
29/483	. . . with means to clench fastener	29/49082	. . . Resistor making
29/484	. . . with means to insert guide pin or fastener	29/49083	. . . . . Heater type
29/486	. . Cover stretching	29/49085	. . . . . Thermally variable
29/487	. . Edge-roll forming	29/49087	. . . . . with envelope or housing
29/488	. . form or holder	29/49089	. . . . . Filling with powdered insulation
29/489	. . . with follower	29/49091	. . . . . with direct compression of powdered insulation
29/49	. Method of mechanical manufacture	29/49092	. . . . . Powdering the insulation
29/49002	. . Electrical device making	29/49094	. . . . . by oxidation
29/49004	. . . including measuring or testing of device or component part	29/49096	. . . . . with winding
29/49005	. . . Acoustic transducer	29/49098	. . . . . Applying terminal
29/49007	. . . Indicating transducer	29/49099	. . . . . Coating resistive material on a base
29/49009	. . . Dynamoelectric machine	29/49101	. . . . . Applying terminal
29/49011	. . . . Commutator or slip ring assembly	29/49103	. . . . . Strain gauge making
29/49012	. . . . Rotor	29/49105	. . . Switch making
29/49014	. . . Superconductor	29/49107	. . . Fuse making
29/49016	. . . Antenna or wave energy "plumbing" making	29/49108	. . . Electric battery cell making
29/49018	. . . . with other electrical component	29/4911	. . . . including sealing
29/4902	. . . Electromagnet, transformer or inductor	29/49112	. . . . including laminating of indefinite length material
29/49021	. . . . Magnetic recording reproducing transducer [e.g., tape head, core, etc.]	29/49114	. . . . including adhesively bonding
29/49023	. . . . . including disassembly step	29/49115	. . . . including coating or impregnating
29/49025	. . . . . Making disc drive	29/49117	. . . Conductor or circuit manufacturing
29/49027	. . . . . Mounting preformed head/core onto other structure	29/49119	. . . . . Brush
29/49028	. . . . . Mounting multitrack head	29/49121	. . . . . Beam lead frame or beam lead device
29/4903	. . . . . with bonding	29/49123	. . . . . Co-axial cable
29/49032	. . . . . Fabricating head structure or component thereof	29/49124	. . . . . On flat or curved insulated base, e.g., printed circuit, etc.
29/49034	. . . . . Treating to affect magnetic properties	29/49126	. . . . . Assembling bases
29/49036	. . . . . including measuring or testing	29/49128	. . . . . Assembling formed circuit to base
29/49037	. . . . . Using reference point/surface to facilitate measuring	29/4913	. . . . . Assembling to base an electrical component, e.g., capacitor, etc.
29/49039	. . . . . with dual gap materials	29/49131	. . . . . by utilizing optical sighting device
29/49041	. . . . . with significant slider/housing shaping or treating	29/49133	. . . . . with component orienting
29/49043	. . . . . Depositing magnetic layer or coating	29/49135	. . . . . and shaping, e.g., cutting or bending, etc.
29/49044	. . . . . Plural magnetic deposition layers	29/49137	. . . . . Different components
29/49046	. . . . . with etching or machining of magnetic material	29/49139	. . . . . by inserting component lead or terminal into base aperture
29/49048	. . . . . Machining magnetic material [e.g., grinding, etching, polishing]	29/4914	. . . . . with deforming of lead or terminal
29/4905	. . . . . Employing workholding means	29/49142	. . . . . including metal fusion
29/49052	. . . . . by etching	29/49144	. . . . . by metal fusion
		29/49146	. . . . . with encapsulating, e.g., potting, etc.
		29/49147	. . . . . Assembling terminal to base

29/49149	by metal fusion bonding	29/49243	Centrifugal type
29/49151	by deforming or shaping	29/49245	Vane type or other rotary, e.g., fan
29/49153	with shaping or forcing terminal into base aperture	29/49247	Valve lifter making
29/49155	Manufacturing circuit on or in base	29/49249	Piston making
29/49156	with selective destruction of conductive paths	29/4925	Repairing, converting, servicing or salvaging
29/49158	with molding of insulated base	29/49252	Multi-element piston making
29/4916	Simultaneous circuit manufacturing	29/49254	Utilizing a high energy beam, e.g., laser, electron beam
29/49162	by using wire as conductive path	29/49256	with assembly or composite article making
29/49163	with sintering of base	29/49258	with thermal barrier or heat flow provision
29/49165	by forming conductive walled aperture in base	29/49259	with fiber reinforced structure
29/49167	with deforming of conductive path	29/49261	by composite casting or molding
29/49169	Assembling electrical component directly to terminal or elongated conductor	29/49263	by coating or cladding
29/49171	with encapsulating	29/49265	Ring groove forming or finishing
29/49172	by molding of insulating material	29/49266	Gudgeon pin, wrist pin, piston pin, or boss therefor
29/49174	Assembling terminal to elongated conductor	29/49268	with other attaching provision for connecting rod
29/49176	with molding of electrically insulating material	29/4927	Cylinder, cylinder head or engine valve sleeve making
29/49178	by shrinking of cover	29/49272	with liner, coating, or sleeve
29/49179	by metal fusion bonding	29/49274	Piston ring or piston packing making
29/49181	by deforming	29/49275	including forging or hammering
29/49183	of ferrule about conductor and terminal	29/49277	including casting or molding
29/49185	of terminal	29/49279	including rolling or die forming, e.g., drawing, punching
29/49187	with forming eyelet from elongated conductor	29/49281	including coating or plating
29/49188	with penetrating portion	29/49282	including grinding or honing
29/4919	Through insulation	29/49284	including machining or angular cutting
29/49192	with insulation removal	29/49286	Crankshaft making
29/49194	Assembling elongated conductors, e.g., splicing, etc.	29/49288	Connecting rod making
29/49195	with end-to-end orienting	29/4929	including metallurgical bonding
29/49197	including fluid evacuating or pressurizing	29/49291	including metal forging or die shaping
29/49199	including deforming of joining bridge	29/49293	Camshaft making
29/49201	with overlapping orienting	29/49295	Push rod or rocker arm making
29/49202	including oppositely facing end orienting	29/49297	Seal or packing making
29/49204	Contact or terminal manufacturing	29/49298	Poppet or I.C. engine valve or valve seat making
29/49206	by powder metallurgy	29/493	Valve guide making
29/49208	by assembling plural parts	29/49302	Repairing, converting, servicing or salvaging
29/4921	with bonding	29/49304	Valve tappet making
29/49211	of fused material	29/49306	Valve seat making
29/49213	Metal	29/49307	Composite or hollow valve stem or head making
29/49215	by impregnating a porous mass	29/49309	including forging
29/49217	by elastic joining	29/49311	including extruding
29/49218	with deforming	29/49313	including casting
29/4922	with molding of insulation	29/49314	with assembly or composite article making
29/49222	forming array of contacts or terminals	29/49316	Impeller making
29/49224	with coating	29/49318	Repairing or disassembling
29/49226	Electret making	29/4932	Turbomachine making
29/49227	Insulator making	29/49321	Assembling individual fluid flow interacting members, e.g., blades, vanes, buckets, on rotary support member
29/49229	Prime mover or fluid pump making	29/49323	Assembling fluid flow directing devices, e.g., stators, diaphragms, nozzles
29/49231	I.C. [internal combustion] engine making	29/49325	Shaping integrally bladed rotor
29/49233	Repairing, converting, servicing or salvaging	29/49327	Axial blower or fan
29/49234	Rotary or radial engine making	29/49329	Centrifugal blower or fan
29/49236	Fluid pump or compressor making	29/4933	Fluid coupling device
29/49238	Repairing, converting, servicing or salvaging	29/49332	Propeller making
29/4924	Scroll or peristaltic type	29/49334	Utilizing hollow tube blank
29/49242	Screw or gear type, e.g., Moineau type		

29/49336 . . . Blade making	29/49435 . . . Flexible conduit or fitting therefor
29/49337 Composite blade	29/49437 . . . Flue connector device making
29/49339 Hollow blade	29/49439 . . . Trap making
29/49341 with cooling passage	29/4944 . . . Return connector device making
29/49343 Passage contains tubular insert	29/49442 . . . T-shaped fitting making
29/49345 . . Catalytic device making	29/49444 . . . Elbow or L-shaped fitting making
29/49346 . . Rocket or jet device making	29/49446 . . . Ferrule making or reforming
29/49348 . . Burner, torch or metallurgical lance making	29/49448 . . Agricultural device making
29/4935 . . Heat exchanger or boiler making	29/49449 . . . Traction apparatus, e.g., for tractor
29/49352 . . . Repairing, converting, servicing or salvaging	29/49451 . . . Harvester guard
29/49353 . . . Heat pipe device making	29/49453 . . Pulley making
29/49355 . . . Solar energy device making	29/49455 . . . Assembly
29/49357 . . . Regenerator or recuperator making	29/49456 with shaping
29/49359 . . . Cooling apparatus making, e.g., air conditioner, refrigerator	29/49458 . . . Disc splitting to form pulley rim groove
29/49361 . . . Tube inside tube	29/4946 . . . Groove forming in sheet metal pulley rim
29/49362 . . . Tube wound about tube	29/49462 . . Gear making
29/49364 . . . Tube joined to flat sheet longitudinally, i.e., tube sheet	29/49464 . . . Assembling of gear into force transmitting device
29/49366 . . . Sheet joined to sheet	29/49465 . . . Gear mounting
29/49368 with inserted tubes	29/49467 . . . Gear shaping
29/49369 Utilizing bond inhibiting material	29/49469 Worm gear
29/49371 with subsequent fluid expansion	29/49471 Roll forming
29/49373 . . . Tube joint and tube plate structure	29/49472 Punching or stamping
29/49375 including conduit expansion or inflation	29/49474 Die-press shaping
29/49377 . . . Tube with heat transfer means	29/49476 Gear tooth cutting
29/49378 Finned tube	29/49478 Gear blank making
29/4938 Common fin traverses plurality of tubes	29/4948 with specific gear material
29/49382 Helically finned	29/49481 . . Wheel making
29/49384 Internally finned	29/49483 . . . Railway or trolley wheel making
29/49385 Made from unitary workpiece, i.e., no assembly	29/49485 Multiple part or composite
29/49387 . . . Boiler making	29/49487 with axle or hub
29/49389 . . . Header or manifold making	29/49488 . . . Steering wheel
29/49391 . . . Tube making or reforming	29/4949 . . . Material winding, e.g., reel, spool
29/49393 . . . with metallurgical bonding	29/49492 . . . Land wheel
29/49394 . . Accumulator making	29/49494 Assembling tire to wheel body
29/49396 . . Condenser, evaporator or vaporizer making	29/49496 Disc type wheel
29/49398 . . Muffler, manifold or exhaust pipe making	29/49497 Assembling wheel disc to rim and hub
29/494 . . Fluidic or fluid actuated device making	29/49499 Assembling wheel disc to rim
29/49401 . . Fluid pattern dispersing device making, e.g., ink jet	29/49501 with disc shaping
29/49403 . . Tapping device making	29/49503 Integral rim and disc making
29/49405 . . Valve or choke making	29/49504 Disc shaping
29/49407 . . . Repairing, converting, servicing or salvaging	29/49506 Tensioned spoke type wheel making
29/49409 . . . Valve seat forming	29/49508 Tensioning all spokes simultaneously
29/4941 . . . Valve stem or tire valve making	29/4951 Tensioning spokes in series
29/49412 . . . with assembly, disassembly or composite article making	29/49512 Tensioning spokes individually
29/49414 Joining plural semi-circular components	29/49513 Compression, e.g., nontension, spoke type wheel making
29/49416 with material shaping or cutting	29/49515 Joining spokes to rim and hub
29/49417 including molding or casting	29/49517 Joining spokes to rim
29/49419 including machining or drilling	29/49519 Joining spokes to hub
29/49421 including metallurgical bonding	29/4952 Making plural spokes from a single blank
29/49423 including metal deforming	29/49522 Individual spoke making
29/49425 including metallurgical bonding	29/49524 Rim making
29/49426 . . . including metal shaping and diverse operation	29/49526 with assembling
29/49428 . . Gas and water specific plumbing component making	29/49528 Demountable rim making
29/4943 . . . Plumbing fixture making	29/49529 Die-press shaping
29/49432 . . . Nozzle making	29/49531 Roller forming
29/49433 Sprayer	29/49533 Hub making
	29/49535 with assembling
	29/49536 Hub shaping
	29/49538 Tire making

29/4954	. . . .	Wheel trim making, e.g., wheel cover, hubcap	29/49632	. . . .	Metal reinforcement member for nonmetallic, e.g., concrete, structural element
29/49542	. . . . .	with means for retaining trim member on wheel	29/49634	. . . .	Beam or girder
29/49544	. .	Roller making	29/49636	. .	Process for making bearing or component thereof
29/49545	. . .	Repairing or servicing	29/49638	. . .	Repairing
29/49547	. . .	Assembling preformed components	29/49639	. . .	Fluid bearing
29/49549	. . . .	Work contacting surface element assembled to core	29/49641	. . .	Linear bearing
29/49551	. . . . .	Work contacting surface wound about core	29/49643	. . .	Rotary bearing
29/49552	. . . . .	with prestressing of component by heat differential, e.g., shrink, fit	29/49645	. . . .	Thrust bearing
29/49554	. . . . .	Work contacting surface having annular axial sections	29/49647	. . . .	Plain bearing
29/49556	. . . .	Work contacting surface element assembled to end support members	29/49648	. . . . .	Self-adjusting or self-aligning, including ball and socket type, bearing and component making
29/49558	. . . .	Includes securing removable cover on roller	29/4965	. . . . .	Deforming socket to secure ball
29/4956	. . .	Fabricating and shaping roller work contacting surface element	29/49652	. . . . .	Die-press shaping
29/49561	. . . .	toothed roller	29/49654	. . . . .	having liner
29/49563	. . . .	with coating or casting about a core	29/49655	. . . . .	having liner
29/49565	. . .	One-piece roller making	29/49657	. . . . .	Socket making
29/49567	. .	Dental appliance making	29/49659	. . . . .	by molding or casting
29/49568	. . .	Orthodontic device making	29/49661	. . . . .	Nonmetallic socket
29/4957	. .	Sound device making	29/49663	. . . . .	by assembling
29/49572	. . .	Hearing aid component making	29/49664	. . . . .	Ball making
29/49574	. . .	Musical instrument or tuning fork making	29/49666	. . . . .	with metallurgical bonding
29/49575	. . .	including diaphragm or support therefor	29/49668	. . . . .	Sleeve or bushing making
29/49577	. . .	Phonograph component making	29/4967	. . . . .	Nonmetallic
29/49579	. .	Watch or clock making	29/49671	. . . . .	Strip or blank material shaping
29/49581	. . .	having arbor, pinion, or balance	29/49673	. . . . .	Die-press shaping
29/49583	. . .	having indicia, face, or dial	29/49675	. . . . .	having inner lining layer
29/49584	. . .	having case, cover, or back	29/49677	. . . . .	having liner
29/49586	. . .	having crown, stem, or pendent	29/49679	. . . .	Anti-friction bearing or component thereof
29/49588	. .	Jewelry or locket making	29/4968	. . . . .	Assembling of race, cage, and rolling anti-friction members
29/4959	. . .	Human adornment device making	29/49682	. . . . .	Assembling of race and rolling anti-friction members
29/49591	. . . .	Bracelet making	29/49684	. . . . .	with race making
29/49593	. . . .	Finger ring making	29/49686	. . . . .	Assembling of cage and rolling anti-friction members
29/49595	. . .	Latch, clasp, or fastener component making	29/49687	. . . . .	with cage making
29/49597	. . .	Ornamental stock making	29/49689	. . . . .	Race making
29/49599	. .	Knob or knob shank making	29/49691	. . . . .	Cage making
29/496	. .	Multiperforated metal article making	29/49693	. . . . .	Roller making
29/49602	. . .	Coil wound wall screen	29/49694	. . . . .	Ball making
29/49604	. . .	Filter	29/49696	. . .	Mounting
29/49606	. .	Turnbuckle making	29/49698	. . .	Demounting
29/49607	. .	Spring-head clip making	29/497	. . .	Pre-usage process, e.g., preloading, aligning
29/49609	. .	Spring making	29/49702	. . .	Lubricating
29/49611	. . .	for vehicle or clutch	29/49703	. . .	Sealing
29/49613	. . .	for human comfort	29/49705	. . .	Coating or casting
29/49615	. . .	Resilient shock or vibration absorber utility	29/49707	. . .	Bearing surface treatment
29/49616	. .	Structural member making	29/49709	. . .	Specific metallic composition
29/49618	. . .	Restoring existing member, e.g., reinforcing, repairing	29/4971	. . .	Nonmetallic bearing element
29/4962	. . .	Grille making	29/49712	. .	Ball making
29/49622	. . .	Vehicular structural member making	29/49714	. . .	Hollow ball
29/49623	. . .	Static structure, e.g., a building component	29/49716	. .	Converting
29/49625	. . . .	Openwork, e.g., a truss, joist, frame, lattice-type or box beam	29/49718	. .	Repairing
29/49627	. . . . .	Frame component	29/49719	. . .	Seal or element thereof
29/49629	. . . .	Panel	29/49721	. . .	with disassembling
29/49631	. . . .	Columnar member	29/49723	. . . .	including reconditioning of part
			29/49725	. . . . .	by shaping
			29/49726	. . . . .	Removing material
			29/49728	. . . . .	and by a metallurgical operation, e.g., welding, diffusion bonding, casting

29/4973	. . . .	Replacing of defective part	29/49813	. .	Shaping mating parts for reassembly in different positions
29/49732	. . .	by attaching repair preform, e.g., remaking, restoring, or patching	29/49815	. .	Disassembling
29/49734	. . . .	and removing damaged material	29/49817	. . .	with other than ancillary treating or assembling
29/49735	. . . . .	Mechanically attaching preform with separate fastener	29/49819	. . .	with conveying of work or disassembled work part
29/49737	. . . . .	Metallurgically attaching preform	29/49821	. . .	by altering or destroying work part or connector
29/49739	. . . .	Metallurgically attaching preform by separate fastener	29/49822	. . .	by applying force
29/49741	. . . . .	Screw threaded fastener	29/49824	. . . .	to elastically deform work part or connector
29/49742	. . . .	Metallurgically attaching preform	29/49826	. .	Assembling or joining
29/49744	. . . .	Screw threaded preform	29/49828	. . .	Progressively advancing of work assembly station or assembled portion of work
29/49746	. . .	by applying fluent material, e.g., coating, casting	29/49829	. . . .	Advancing work to successive stations [i.e., assembly line]
29/49748	. . .	by shaping, e.g., bending, extruding, turning, etc.	29/49831	. . . .	Advancing station
29/4975	. . . .	including heating	29/49833	. . .	Punching, piercing or reaming part by surface of second part
29/49751	. .	Scrap recovering or utilizing	29/49835	. . . .	with shaping
29/49753	. . .	Metalworking to consolidate scrap	29/49837	. . . . .	of first part
29/49755	. . .	Separating one material from another	29/49838	. . .	by stringing
29/49757	. . . .	by burning or heating	29/4984	. . .	Retaining clearance for motion between assembled parts
29/49758	. .	During simulated operation or operating conditions	29/49842	. . . .	Between tube-forming helical coils
29/4976	. . .	Temperature	29/49844	. . . .	Through resilient media
29/49762	. .	Center locating and shaping	29/49845	. . . .	by deforming interlock
29/49764	. .	with testing or indicating	29/49847	. . . . .	by folding part into plural ears
29/49766	. . .	torquing threaded assemblage or determining torque herein	29/49849	. . . . .	by wrapping around
29/49767	. . . .	Determining relative number of threaded member rotations	29/49851	. . . . .	of link closure
29/49769	. . .	Using optical instrument [excludes mere human eyeballing]	29/49853	. . . . .	of sphere, i.e., ball, in socket
29/49771	. . .	Quantitative measuring or gauging	29/49854	. . . . .	Ball point pen making
29/49773	. . . .	by radioactive tracing	29/49856	. . . . .	Allowing assembled sphere to move in single plane only
29/49774	. . . .	by vibratory or oscillatory movement	29/49858	. . . . .	of flange into tubular socket
29/49776	. . . .	Pressure, force, or weight determining	29/4986	. . . . .	Outwardly deforming internally fitted rod
29/49778	. . .	with aligning, guiding, or instruction	29/49861	. . .	Sizing mating parts during final positional association
29/4978	. . . .	Assisting assembly or disassembly	29/49863	. . .	with prestressing of part
29/49782	. .	of a slide fastener	29/49865	. . . .	by temperature differential [e.g., shrink fit]
29/49783	. . .	of slider	29/49867	. . . .	of skin on frame member
29/49785	. . .	of interlocking element	29/49869	. . . . .	by flexing
29/49787	. .	Obtaining plural composite product pieces from preassembled workpieces	29/4987	. . . .	Elastic joining of parts
29/49789	. .	Obtaining plural product pieces from unitary workpiece	29/49872	. . . . .	Confining elastic part in socket
29/4979	. . .	Breaking through weakened portion	29/49874	. . . .	Prestressing rod, filament or strand
29/49792	. . .	Dividing through modified portion	29/49876	. . . .	by snap fit
29/49794	. . .	Dividing on common outline	29/49877	. . .	of flexible wall, expansible chamber devices [e.g., bellows]
29/49796	. . .	Coacting pieces	29/49879	. . .	Spaced wall tube or receptacle
29/49798	. . .	Dividing sequentially from leading end, e.g., by cutting or breaking	29/49881	. . .	of separate helix [e.g., screw thread]
29/49799	. .	Providing transitory integral holding or handling portion	29/49883	. . .	Ribbing
29/49801	. .	Shaping fiber or fibered material	29/49885	. . .	with coating before or during assembling
29/49803	. .	Magnetically shaping	29/49886	. . . .	to roughen surface
29/49805	. .	Shaping by direct application of fluent pressure	29/49888	. . .	Subsequently coating
29/49806	. . .	Explosively shaping	29/4989	. . .	with spreading of cable strands
29/49808	. .	Shaping container end to encapsulate material	29/49892	. . .	Joining plate edge perpendicularly to frame
29/4981	. .	Utilizing transitory attached element or associated separate material	29/49893	. . .	Peripheral joining of opposed mirror image parts to form a hollow body
29/49812	. . .	Temporary protective coating, impregnation, or cast layer	29/49895	. . .	Associating parts by use of aligning means [e.g., use of a drift pin or a "fixture"]
			29/49897	. . . .	Registering mating opposed tool parts [e.g., registering a punch and a cooperating die]
			29/49899	. . . .	by multiple cooperating aligning means

29/49901	. . . .	Sequentially associating parts on stationary aligning means	29/49995	. .	Shaping one-piece blank by removing material
29/49902	. . . .	by manipulating aligning means	29/49996	. . .	Successive distinct removal operations
29/49904	. . .	Assembling a subassembly, then assembling with a second subassembly	29/49998	. .	Work holding
29/49906	. . .	Metal deforming with nonmetallic bonding	29/50	. .	Convertible metal working machine
29/49908	. . .	Joining by deforming	29/505	. .	Vise type
29/49909	. . . .	Securing cup or tube between axially extending concentric annuli	29/51	. .	Plural diverse manufacturing apparatus including means for metal shaping or assembling
29/49911	. . . . .	by expanding inner annulus	29/5101	. .	Slide fastener or slide fastener element
29/49913	. . . . .	by constricting outer annulus	29/5102	. .	Binding or covering and cutting
29/49915	. . . .	Overedge assembling of seated part	29/5103	. . .	Cutting covering material only
29/49917	. . . . .	by necking in cup or tube wall	29/5104	. .	Type of machine
29/49918	. . . . .	At cup or tube end	29/5105	. . .	Drill press
29/4992	. . . . .	by flaring inserted cup or tube end	29/5107	. . . .	Drilling and other
29/49922	. . . . .	by bending over projecting prongs	29/5108	. . . .	Portable
29/49924	. . . .	of parallel side-by-side elongated members	29/5109	. . .	Lathe
29/49925	. . . .	Inward deformation of aperture or hollow body wall	29/511	. . . .	Grinding attachment
29/49927	. . . . .	Hollow body is axially joined cup or tube	29/5111	. . . .	Pulley or wheel
29/49929	. . . . .	Joined to rod	29/5112	. . . .	Convertible
29/49931	. . . . .	Joined to overlapping ends of plural rods	29/5113	. . . .	Commutator
29/49933	. . . . .	After thinning	29/5114	. . . .	Lathe and tool
29/49934	. . . . .	by axially applying force	29/5115	. . .	Planer
29/49936	. . . .	Surface interlocking	29/5116	. .	forging and bending, cutting or punching
29/49938	. . . .	Radially expanding part in cavity, aperture, or hollow body	29/5117	. . .	Fastener [zipper]
29/4994	. . . . .	Radially expanding internal tube	29/5118	. . .	Riveting
29/49941	. . . . .	Peripheral edge joining of abutting plates	29/512	. . .	Ball making
29/49943	. . . . .	Riveting	29/5121	. . .	Wire working
29/49945	. . .	by driven force fit	29/5122	. .	with means to feed work during tool contact
29/49947	. . .	by applying separate fastener	29/5123	. . .	including nonrotary flying tool
29/49948	. . . .	Multipart cooperating fastener [e.g., bolt and nut]	29/5124	. .	with means to feed work intermittently from one tool station to another
29/4995	. . . . .	Nonthreaded	29/5125	. . .	Stock turret
29/49952	. . . . .	At least one part is nonmetallic	29/5126	. . . .	Swiss type
29/49954	. . . .	Fastener deformed after application	29/5127	. . .	Blank turret
29/49956	. . . . .	Riveting	29/5128	. . . .	Rotary work - vertical axis
29/49957	. . . . .	At least one part nonmetallic	29/5129	. . . .	Rotary work - horizontal axis
29/49959	. . . .	Nonresilient fastener	29/513	. . . .	Stationary work
29/49961	. . . . .	At least one part nonmetallic	29/5132	. . . .	Belt drive
29/49963	. . . .	Threaded fastener	29/5133	. . . .	Crankshaft
29/49964	. . . . .	At least one part nonmetallic	29/5134	. . . .	Collapsible tube
29/49966	. . . .	with supplemental joining	29/5135	. . .	Endless belt
29/49968	. . . . .	Metal fusion joining	29/5136	. .	Separate tool stations for selective or successive operation on work
29/4997	. . . . .	At least one part nonmetallic	29/5137	. . .	including assembling or disassembling station
29/49972	. .	with separating, localizing, or eliminating of as-cast defects from a metal casting [e.g., anti-pipe]	29/5138	. . . .	and means to machine work part to fit cooperating work part
29/49973	. . .	Compressing ingot while still partially molten	29/5139	. . . .	and means to sever work prior to disassembling
29/49975	. . .	Removing defects	29/514	. . . . .	comprising means to strip insulation from wire
29/49977	. . . .	From center of ingot to leave hollow blank	29/5141	. . . .	and means to stake electric wire to commutator or armature in assembling of electric motor or generator
29/49979	. . . .	After deforming	29/5142	. . . .	and means to sever work from supply
29/4998	. .	Combined manufacture including applying or shaping of fluent material	29/5143	. . . .	and means to machine product
29/49982	. . .	Coating	29/5145	. . . . .	to sever product to length
29/49984	. . . .	and casting	29/5146	. .	Common reciprocating support for spaced tools
29/49986	. . . .	Subsequent to metal working	29/5147	. .	including composite tool
29/49988	. . .	Metal casting	29/5148	. . .	including severing means
29/49989	. . . .	Followed by cutting or removing material	29/5149	. . . .	to sever electric terminal from supply strip
29/49991	. . . .	Combined with rolling	29/515	. . . .	to trim electric component
29/49993	. . .	Filling of opening	29/5151	. . . . .	Means comprising hand-manipulatable implement

29/5152	. . with turret mechanism	29/53048	. . . Multiple station assembly or disassembly apparatus
29/5153	. . . Multiple turret	29/53052	. . . . including position sensor
29/5154	. . . tool turret	29/53057	. . . Responsive to timer
29/5155	. . . . Rotary tool holder	29/53061	. . . Responsive to work or work-related machine element
29/5157	. . . . Sliding tool holder	29/53065	. . . . with means to fasten by deformation
29/5158	. . . . Fluid operated	29/5307	. . . . . Self-piercing work part
29/5159	. . . . Cam operated	29/53074	. . . . with means to fasten by elastic joining
29/516	. . . . . Longitudinal turret axis	29/53078	. . . . with means to fasten by frictional fitting
29/5161	. . . . . Transverse turret axis	29/53083	. . . . including means to apply magnetic force directly to position or hold work
29/5162	. . . . Lever operated	29/53087	. . with signal, scale, illuminator, or optical viewer
29/5163	. . . . Rack-and-pinion operated	29/53091	. . . for work-holder for assembly or disassembly
29/5164	. . . . Screw operated	29/53096	. . including means to provide a controlled environment
29/5165	. . . including rotating and/or locking means	29/531	. . Nuclear device
29/5166	. . . . Frictional and positive	29/53104	. . Roller or ball bearing
29/5167	. . . . Lock means for tool or work turrets	29/53109	. . . including deforming means
29/5168	. . Multiple-tool holder	29/53113	. . Heat exchanger
29/517	. . . Laterally movable stock holder	29/53117	. . . including means to manipulate heat exchanger tube bundle
29/5171	. . . Axial tool and transversely movable slide rest	29/53122	. . . including deforming means
29/5172	. . . . Rotary tool spindle	29/53126	. . Means to place sheath on running-length core
29/5173	. . . Longitudinally and transversely movable	29/5313	. . Means to assemble electrical device
29/5174	. . . . Rotary tool spindle	29/53135	. . . Storage cell or battery
29/5175	. . . Oscillating tool	29/53139	. . . . including deforming means
29/5176	. . including machining means	29/53143	. . . Motor or generator
29/5177	. . . and work-holder for assembly	29/53148	. . . . Means to assemble commutator
29/5178	. . Attachment	29/53152	. . . . Means to position insulation
29/5179	. . Speed controller	29/53157	. . . . Means to stake wire to commutator or armature
29/518	. . Carriage stop mechanism	29/53161	. . . . including deforming means
29/5182	. . Flash remover	29/53165	. . . Magnetic memory device
29/5183	. . Welding strip ends	29/5317	. . . Laminated device
29/5184	. . Casting and working	29/53174	. . . Means to fasten electrical component to wiring board, base, or substrate
29/5185	. . Tube making	29/53178	. . . . Chip component
29/5186	. . Covering	29/53183	. . . . Multilead component
29/5187	. . Wire working	29/53187	. . . Multiple station assembly apparatus
29/5188	. . Radiator making	29/53191	. . . Means to apply vacuum directly to position or hold work part
29/5189	. . Printing plate	29/53196	. . . Means to apply magnetic force directly to position or hold work part
29/519	. . Turret	29/532	. . . Conductor
29/5191	. . Assembly	29/53204	. . . . Electrode
29/5192	. . Armature	29/53209	. . . . Terminal or connector
29/5193	. . Electrical connector or terminal	29/53213	. . . . . Assembled to wire-type conductor
29/5195	. . Tire valve or spark plug	29/53217	. . . . . Means to simultaneously assemble multiple, independent conductors to terminal
29/5196	. . Multiple station with conveyor	29/53222	. . . . . Means comprising hand-manipulatable implement
29/5197	. . Multiple stations working strip material	29/53226	. . . . . . Fastening by deformation
29/5198	. . Continuous strip	29/5323	. . . . . . Fastening by elastic joining
29/5199	. . Work on tubes	29/53235	. . . . . . Means to fasten by deformation
29/52	. Plural diverse manufacturing apparatus	29/53239	. . . . . . Means to fasten by elastic joining
29/53	. Means to assemble or disassemble	29/53243	. . . . . Multiple, independent conductors
29/53004	. . with means to regulate operation by use of templet, tape, card or other replaceable information supply	29/53248	. . . . Switch or fuse
29/53009	. . . with comparator	29/53252	. . . Means to simultaneously fasten three or more parts
29/53013	. . . . Computer input		
29/53017	. . . Web or strand-carried information supply		
29/53022	. . with means to test work or product		
29/53026	. . with randomly actuated stopping or disabling means		
29/5303	. . . Responsive to condition of work or product		
29/53035	. . . Responsive to operative [e.g., safety device, etc.]		
29/53039	. . with control means energized in response to activator stimulated by condition sensor		
29/53043	. . . including means to divert defective work part		

29/53257 . . . Means comprising hand-manipulatable implement	29/53487 . . . Assembling means comprising hand-manipulatable implement
29/53261 . . . Means to align and advance work part	29/53491 One work part comprising living tissue
29/53265 . . . with work-holder for assembly	29/53496 comprising driver for snap-off-mandrel fastener; e.g., Pop [TM] riveter
29/5327 . . . Means to fasten by deforming	29/535 One work part comprising nut or screw
29/53274 . . Means to disassemble electrical device	29/53504 One work part comprising paper clip
29/53278 . . . Storage cell or battery	29/53509 Means to assemble tire stud into tire tread
29/53283 . . . Means comprising hand-manipulatable implement	29/53513 Means to fasten by deforming
29/53287 . . Means to place traveler on ring or ring on bobbin of a textile machine	29/53517 Fastening sinker to fishing line
29/53291 . . Slide fastener	29/53522 . . . Means to fasten by deforming
29/53296 . . . Means to assemble stop onto stringer	29/53526 . . Running-length work
29/533 . . . Means to assemble slider onto stringer	29/5353 . . . Assembled on core
29/53304 . . . Means to assemble teeth onto stringer	29/53535 . . including means to vibrate work
29/53309 . . . Disassembly means	29/53539 . . including work conveyor
29/53313 . . Means to interrelatedly feed plural work parts from plural sources without manual intervention	29/53543 . . . including transporting track
29/53317 . . . Box or pallet assembly means	29/53548 and work carrying vehicle
29/53322 . . . Means to assemble container	29/53552 . . Valve applying or removing
29/53326 Handle to container	29/53557 . . . Engine valve unit puller or applier
29/5333 Label to container	29/53561 . . . Engine valve spring compressor [only]
29/53335 Pressurized dispensing container	29/53565 Plural spring engagement
29/53339 Hypodermic syringe	29/5357 Screw operated
29/53343 including fluid component	29/53574 Parallel or tong type, side entrance
29/53348 . . . Running-length work	29/53578 Lever operated
29/53352 Means including orbiting running-length work supply	29/53583 Single jaw or valve engagement
29/53357 Pipe section	29/53587 Plier type
29/53361 Assembled to article	29/53591 . . . to or from wheel rim of resilient tire or tube
29/53365 . . . Multiple station assembly apparatus	29/53596 . . . Removal tool
29/5337 . . . including assembly pallet	29/536 . . . Piston ring inserter or remover
29/53374 . . . including turret-type conveyor	29/53604 . . . Plier-type operation
29/53378 . . . including converging conveyors	29/53609 with ring encirclement
29/53383 . . . and means to fasten work parts together	29/53613 . . Spring applier or remover
29/53387 by deforming	29/53617 . . . Transmission spring
29/53391 by elastic joining	29/53622 . . . Helical spring
29/53396 by friction fit	29/53626 . . . Flat spiral spring [e.g., watch or clock type]
29/534 . . Multiple station assembly or disassembly apparatus	29/5363 . . . Circular spring
29/53404 . . . including turret-type conveyor	29/53635 . . . Leaf spring
29/53409 . . . including converging conveyors	29/53639 . . Means to stake watch or clock
29/53413 and primary central conveyor	29/53643 . . . Plier type
29/53417 . . . Means to fasten work parts together	29/53648 . . Brake lining to brake shoe
29/53422 by deforming	29/53652 . . Tube and coextensive core
29/53426 by elastic joining	29/53657 . . to apply or remove a resilient article [e.g., tube, sleeve, etc.]
29/5343 . . Means to drive self-piercing work part	29/53661 . . . Nipple to nursing bottle
29/53435 . . including assembly pallet	29/53665 . . . Well protector to sucker rod
29/53439 . . including provision to utilize thermal expansion of work	29/5367 . . Coupling to conduit
29/53443 . . Means to assemble or disassemble container and fluid component	29/53674 . . Loose-leaf sheet binder
29/53448 . . Vehicle wheel	29/53678 . . Compressing parts together face to face
29/53452 . . . Railway wheel	29/53683 . . Spreading parts apart or separating them from face to face engagement
29/53457 . . Tumbler lock	29/53687 . . by rotation of work part
29/53461 . . toy doll	29/53691 . . . Means to insert or remove helix
29/53465 . . Film or tape cartridge	29/53696 . . Means to string
29/5347 . . Crystal to watch or clock	29/537 . . tool handle and tool
29/53474 . . Means to insert or extract pen point	29/53704 . . tool chuck and tool
29/53478 . . with magazine supply	29/53709 . . Overedge assembling means
29/53483 . . . and magnetic work-holder or positioner	29/53713 . . . Belt-hook attacher
	29/53717 . . . Annular work
	29/53722 with radially acting tool inside annular work
	29/53726 with second workpiece inside annular work one workpiece moved to shape the other

29/5373 comprising driver for snap-off-mandrel fastener; e.g., Pop [TM] riveter
 29/53735 including near side fastener shaping tool
 29/53739 Pneumatic- or fluid-actuated tool
 29/53743 Liquid
 29/53748 and gas
 29/53752 having rotary drive mechanism
 29/53757 having allochiral actuating handles
 29/53761 having repositionable annulus engaging tool
 29/53765 including near side fastener shaping tool
 29/5377 . . . Riveter
 29/53774 Single header
 29/53778 Pipe joiner
 29/53783 . . . Clip applier
 29/53787 . . . Binding or covering
 29/53791 . . . Edge binding
 29/53796 . . Puller or pusher means, contained force multiplying operator
 29/538 . . . Hubcap and hub
 29/53804 . . . Battery post and terminal
 29/53809 . . . Cotter pin and cooperating member
 29/53813 . . . Plier type means
 29/53817 . . . Valve stem pin or key and another member
 29/53822 . . . Machine key and another member
 29/53826 . . . Arbor-type press means
 29/5383 . . . having fluid operator
 29/53835 . . . having wedge operator
 29/53839 . . . having percussion or explosive operator
 29/53843 Tube, sleeve, or ferrule inserting or removing
 29/53848 . . . having screw operator
 29/53852 C-frame
 29/53857 Central screw, work-engagers around screw
 29/53861 Work-engager arms along or parallel to screw
 29/53865 with arm connecting engaging means
 29/5387 Pivotal arms
 29/53874 Pivotal grippers on screw
 29/53878 Tubular or tube segment forms work-engager
 29/53883 Screw threaded work-engager
 29/53887 Movable grippers on screw
 29/53891 Plate or bar forms work-engager
 29/53896 . . . having lever operator
 29/539 Plier type means
 29/53904 . . Means comprising piston ring group contractor or holder
 29/53909 . . Means comprising hand manipulatable tool
 29/53913 . . . Aligner or center
 29/53917 . . . Tube with tube
 29/53922 . . . Auto wheel with auto chassis
 29/53926 . . . Clutch plates
 29/5393 . . . Means comprising impact receiving tool
 29/53935 C-frame
 29/53939 Thread protector [e.g., wheel axle type]
 29/53943 . . . Hand gripper for direct push or pull
 29/53948 Centrifugal separator
 29/53952 Tube sleeve or ferrule applying or removing
 29/53957 Thread-tapping grip
 29/53961 . . with work-holder for assembly
 29/53965 . . . for assembling a luminescent mantle

29/5397 . . . and assembling press [e.g., truss assembling means, etc.]
 29/53974 . . . having means to permit support movement while work is thereon
 29/53978 . . including means to relatively position plural work parts
 29/53983 . . Work-supported apparatus
 29/53987 . . Tube, sleeve or ferrule
 29/53991 . . Work gripper, anvil, or element
 29/53996 . . by deforming
 29/54 . . Miscellaneous apparatus

Former US Class 70 series

70/00 Locks
 70/10 . Miscellaneous
 70/20 . Attack-actuated defeating mechanisms
 70/25 . . With reset mechanisms
 70/30 . Hasp
 70/308 . . Combination lock
 70/317 . . . Hasp-carried
 70/325 . . . Keeper-carried
 70/333 . . Key lock
 70/342 . . . Hasp-carried
 70/35 Keeper-encasing
 70/358 Dead bolt
 70/367 Latching bolt
 70/375 Dead bolt
 70/383 Latching bolt
 70/392 . . . Keeper-carried
 70/40 . Portable
 70/402 . . Fetters
 70/404 . . . Manacles and cuffs
 70/407 Nippers
 70/409 . . . Shackles
 70/411 . . Clamps
 70/413 . . Padlocks
 70/415 . . . Combination and/or key-controlled
 70/417 . . . Combination-controlled
 70/42 Non-shackle type
 70/422 Rigid shackle
 70/424 Sliding
 70/426 Removable
 70/428 Pivoted
 70/43 Sliding detent
 70/433 Swinging detent
 70/435 Flexible shackle
 70/437 . . . Key-controlled
 70/439 Non-shackle type
 70/441 Housing extension and cooperating detent
 70/443 Single stem or shank
 70/446 Rigid shackle
 70/448 Divided shackle
 70/45 Divided jaw type
 70/452 Sliding
 70/454 Removable
 70/457 Arcuate locus
 70/459 Both legs engaged
 70/461 Short leg engaged
 70/463 Long leg engaged
 70/465 Pivoted
 70/467 Sliding detent

70/47	. . . . .	Free end only engaged	70/5208	. . . . .	Multiple dead bolts
70/472	. . . . .	Pivoted end only engaged	70/5212	. . . . .	Sliding dead bolt
70/474	. . . . .	Swinging detent	70/5217	. . . . .	Swinging dead bolt
70/476	. . . . .	Free end only engaged	70/5221	. . . . .	Locking latch bolt, biased
70/478	. . . . .	Pivoted end only engaged	70/5226	. . . . .	Combined dead bolt and latching bolt
70/48	. . . . .	Arcuate locus	70/523	. . . . .	Multiple dead bolts
70/483	. . . .	Flexible shackle	70/5235	. . . . .	Multiple latch bolts
70/485	. . .	With seal	70/5239	. . . . .	Dead bolt, dogged latch bolt
70/487	. . .	Parts, accessories, attachments and adjuncts	70/5243	. . . . .	Manually dogged latch bolt
70/489	. . . .	Housings	70/5246	. . . . .	Dead bolts
70/491	. . . .	Shackles	70/5248	. . . . .	Multiple
70/493	. . . .	Protectors	70/5252	. . . . .	Sliding and swinging
70/496	. . . . .	Sheaths	70/5257	. . . . .	Combination operable only
70/498	. . . . .	Shields or canopies	70/5261	. . . . .	Key operable only
70/50	. .	Special application	70/5265	. . . . .	Sliding and rotary
70/5004	. .	For antitheft signaling device on protected article	70/527	. . . . .	Sliding
70/5009	. . .	For portable articles	70/5274	. . . . .	Combination operable only
70/5013	. . .	Canes, umbrellas, apparel	70/5279	. . . . .	Key operable only
70/5018	. . .	Robes	70/5283	. . . . .	Swinging
70/5022	. . .	Tools	70/5288	. . . . .	Combination operable only
70/5027	. . .	Supporting stands	70/5292	. . . . .	Key operable only
70/5031	. . .	Receptacle	70/5296	. . . . .	Single
70/5035	. . . .	Bag	70/5301	. . . . .	Sliding and swinging
70/504	. . . . .	Collapsible throat	70/5305	. . . . .	Combination operable only
70/5044	. . . . .	Pivoted rigid jaw	70/531	. . . . .	Key operable only
70/5049	. . . . .	Attache or briefcase, portfolio	70/5314	. . . . .	Sliding and rotary
70/5053	. . . . .	Interengageable slide fastener type	70/5319	. . . . .	Sliding
70/5058	. . . . .	Trunk and/or suitcase	70/5323	. . . . .	Multidirectional displacement
70/5062	. . . . .	Projecting fixed or movable lug type	70/5327	. . . . .	Keeper interlocking
70/5066	. . . . .	Bolt type	70/5332	. . . . .	Curved
70/5071	. . . . .	Hasp controlled	70/5336	. . . . .	Combination operable only
70/5075	. . . . .	Link and lever of hasp type	70/5341	. . . . .	Key operable only
70/508	. . . . .	Hasp type	70/5345	. . . . .	Swinging
70/5084	. . . . .	Hasp-carried lock	70/535	. . . . .	Keeper and housing interlocking
70/5089	. . . . .	Loop type	70/5354	. . . . .	With hooked end
70/5093	. . .	For closures	70/5358	. . . . .	Combination operable only
70/5097	. . .	Cabinet	70/5363	. . . . .	Key operable only
70/5102	. . . .	Projecting lug type	70/5367	. . . . .	Screw
70/5106	. . . . .	External catch	70/5372	. . . . .	Locking latch bolts, biased
70/5111	. . . . .	Projectable bolt	70/5376	. . . . .	Keeper interlocking
70/5115	. . . . .	Multiple bolts	70/5381	. . . . .	Projectable beyond normal biased position
70/5119	. . . . .	Multidirectional displacement	70/5385	. . . . .	Spring projected
70/5124	. . . . .	Swinging and hooked end	70/5389	. . . . .	Manually operable
70/5128	. . . .	Drawer	70/5394	. . . . .	Directly acting dog for exterior, manual, bolt manipulator
70/5133	. . . . .	Dead bolt	70/5398	. . . . .	Related dog for interior, manual, bolt manipulator
70/5137	. . . . .	Till	70/5403	. . . . .	Dog having a dog
70/5142	. . . . .	Combination	70/5407	. . . . .	Related dogging means for latch-bolt
70/5146	. . . .	Window	70/5412	. . . . .	Dog and dog actuator always interconnected
70/515	. . . . .	Sliding sash	70/5416	. . . . .	Exterior manipulator declutched from bolt when dogged
70/5155	. . . .	Door	70/542	. . . . .	Manual dog-controller concentric with bolt manipulator
70/5159	. . . . .	Emergency exit	70/5425	. . . . .	Shiftable rollback serves as dog
70/5164	. . . . .	Links to limit opening	70/5429	. . . . .	Additional dog-controller key actuated for dogging and undogging
70/5168	. . . . .	Braces			
70/5173	. . . . .	Sliding door			
70/5177	. . . . .	Extending keeper			
70/5181	. . . . .	Rigid or fixed			
70/5186	. . . . .	Extensible			
70/519	. . . . .	Projecting or extending bolt			
70/5195	. . . . .	Projectable bolt			
70/5199	. . . . .	Swinging door			
70/5204	. . . . .	Interfitting lock housing and keeper			

70/5434	. . . . .	Dog-controller axially slidable and axially rotatable	70/5659	. . . . .	Dead bolt
70/5438	. . . . .	Dog-controller rotatable	70/5664	. . . . .	Latching bolt
70/5442	. . . . .	Key-actuated lock releases dog	70/5668	. . . . .	Shaft-carried lock
70/5447	. . . . .	Manual bolt-manipulator operation releases dog	70/5673	. . . . .	Freely movable when locked
70/5451	. . . . .	Manual bolt-manipulator operation releases dog	70/5677	. . . . .	Shaft-carried clutch
70/5456	. . . . .	Interior manual bolt-manipulator serves as dog-controller	70/5681	. . . . .	Gear
70/546	. . . . .	For both dogging and undogging	70/5686	. . . . .	Planetary
70/5465	. . . . .	Manual dog-controller	70/569	. . . . .	Lever
70/5469	. . . . .	With additional lock actuated dog-controller	70/5695	. . . . .	Guide
70/5473	. . . . .	Additional dog-controller controls both dogging and undogging	70/5699	. . . . .	Quadrant
70/5478	. . . . .	Accessible at door edge	70/5704	. . . . .	Lever-carried lock
70/5482	. . . . .	Slidable only	70/5708	. . . . .	Fixed lever-receiving keeper
70/5487	. . . . .	Manual bolt-manipulator is slidable only	70/5712	. . . . .	Lever-carried lock
70/5491	. . . . .	Manual bolt-manipulator is lever	70/5717	. . . . .	Multiple
70/5496	. . . . .	Freely movable external manipulator	70/5721	. . . . .	Externally mounted locking device
70/55	. . . . .	Dogged bolt or connections	70/5726	. . . . .	With padlock
70/5504	. . . . .	Automatic	70/573	. . . . .	Single
70/5509	. . . . .	Snub bolt	70/5735	. . . . .	Externally mounted locking device
70/5513	. . . . .	By manipulator	70/5739	. . . . .	With padlock
70/5518	. . . . .	Connections only	70/5743	. . . . .	Disconnectable
70/5522	. . . . .	Gravity projected	70/5748	. . . . .	Foldable
70/5527	. . . . .	Projecting mechanism is lock controlled	70/5752	. . . . .	Universal mounting
70/5531	. . . . .	Combination and/or key operable	70/5757	. . . . .	Handle, handwheel or knob
70/5535	. . . . .	Trip release	70/5761	. . . . .	Retractable or flush handle
70/554	. . . . .	Cover, lid, cap, encasing shield	70/5765	. . . . .	Rotary or swinging
70/5544	. . . . .	Pivoted	70/577	. . . . .	Locked stationary
70/5549	. . . . .	Cover-carried lock	70/5774	. . . . .	Externally mounted locking device
70/5553	. . . . .	Dead bolt	70/5779	. . . . .	With padlock
70/5558	. . . . .	Latching bolt	70/5783	. . . . .	Combination lock
70/5562	. . . . .	Removable	70/5788	. . . . .	Push pin or button
70/5566	. . . . .	External locking devices	70/5792	. . . . .	Handle-carried key lock
70/5571	. . . . .	Freely movable when locked	70/5796	. . . . .	Coaxially mounted
70/5575	. . . . .	Directly seating	70/5801	. . . . .	Axially movable bolt
70/558	. . . . .	Cover-carried lock	70/5805	. . . . .	Freely movable when locked
70/5584	. . . . .	Dead bolt	70/581	. . . . .	Combination lock
70/5589	. . . . .	Latching bolt	70/5814	. . . . .	Push pin or button
70/5593	. . . . .	Movably seating	70/5819	. . . . .	Handle-carried key lock
70/5597	. . . . .	Cover-carried lock	70/5823	. . . . .	Coaxial clutch connection
70/5602	. . . . .	Dead bolt	70/5827	. . . . .	Axially movable clutch
70/5606	. . . . .	Latching bolt	70/5832	. . . . .	Lock and handle assembly
70/5611	. . . . .	For control and machine elements	70/5836	. . . . .	Wheel
70/5615	. . . . .	Valve	70/5841	. . . . .	Rotation blocking
70/5619	. . . . .	Locked stationary	70/5845	. . . . .	Spoke gap traversing type
70/5624	. . . . .	Externally mounted locking device	70/585	. . . . .	Brake type
70/5628	. . . . .	Valve encasing	70/5854	. . . . .	Bolt, nut, stud, stud-cap
70/5633	. . . . .	Housing-carried lock	70/5858	. . . . .	Locked stationary
70/5637	. . . . .	With padlock	70/5863	. . . . .	Freely movable when locked
70/5642	. . . . .	Rod	70/5867	. . . . .	Encased
70/5646	. . . . .	Rotary shaft	70/5872	. . . . .	For cycles
70/565	. . . . .	Locked stationary	70/5876	. . . . .	Anchors
70/5655	. . . . .	Housing-carried lock	70/5881	. . . . .	Stands
			70/5885	. . . . .	Drive
			70/5889	. . . . .	For automotive vehicles
			70/5894	. . . . .	Plural point
			70/5898	. . . . .	With switch
			70/5903	. . . . .	Hood
			70/5907	. . . . .	With switch
			70/5912	. . . . .	Fuel valve
			70/5916	. . . . .	With switch
			70/592	. . . . .	Cap combined
			70/5925	. . . . .	Transmission

70/5929	. . . . .	Cover combined	70/7198	. . . . .	Single tumbler set
70/5934	. . . . .	Selective-type shift rod, fork or block	70/7203	. . . . .	With ball or roller
70/5938	. . . . .	With switch	70/7209	. . . . .	Intersect sliding tumblers
70/5942	. . . . .	Planetary type	70/7215	. . . . .	Individually set sliding tumblers
70/5947	. . . . .	With switch	70/722	. . . . .	Manually operable
70/5951	. . . . .	With switch	70/7226	. . . . .	Associated movable operator
70/5956	. . . . .	Steering mechanism with switch	70/7232	. . . . .	Removable
70/596	. . . . .	Pilot wheel control or linkage	70/7237	. . . . .	Rotary or swinging tumblers
70/5965	. . . . .	Control levers with switch	70/7243	. . . . .	Intersect tumblers
70/5969	. . . . .	Other element with switch	70/7249	. . . . .	Tumblers released
70/5973	. . . . .	Remote control	70/7254	. . . . .	Fence held spaced from tumblers
70/5978	. . . . .	With switch	70/726	. . . . .	Individually set
70/5982	. . . . .	Accessories	70/7266	. . . . .	Movable selector
70/5987	. . . . .	Spare or mounted wheel or tire	70/7271	. . . . .	Associated movable operator
70/5991	. . . . .	Tire or rim only	70/7277	. . . . .	Removable
70/5996	. . . . .	For seats	70/7282	. . . . .	Pin or rod and slot
70/60	. . . . .	Systems	70/7288	. . . . .	Spindle operator
70/625	. . . . .	Operation and control	70/7294	. . . . .	Concentric spindles
70/65	. . . . .	Central control	70/7299	. . . . .	Axially shiftable spindle
70/675	. . . . .	Serially operable	70/7305	. . . . .	Manually operable
70/70	. . . . .	Operating mechanism	70/7311	. . . . .	Step-by-step
70/7006	. . . . .	Predetermined time interval controlled	70/7316	. . . . .	Combination upsetting
70/7011	. . . . .	Positively initiated delay interval	70/7322	. . . . .	Permutation
70/7017	. . . . .	Interval terminating	70/7328	. . . . .	Compound tumblers
70/7023	. . . . .	Repeating interval	70/7333	. . . . .	With fastener or holder
70/7028	. . . . .	Electric	70/7339	. . . . .	Pin and socket
70/7034	. . . . .	Clockwork control	70/7345	. . . . .	Removable change element
70/704	. . . . .	Continuously operating once initiated	70/735	. . . . .	Operating elements
70/7045	. . . . .	Emergency release	70/7356	. . . . .	Fences
70/7051	. . . . .	Using a powered device [e.g., motor]	70/7362	. . . . .	Bolt or lock housing supported
70/7057	. . . . .	Permanent magnet	70/7367	. . . . .	Tumbler structure and position
70/7062	. . . . .	Electrical type [e.g., solenoid]	70/7373	. . . . .	Nested
70/7068	. . . . .	Actuated after correct combination recognized [e.g., numerical, alphabetical, or magnet[s] pattern]	70/7379	. . . . .	Variant diameter
70/7073	. . . . .	Including use of a key	70/7384	. . . . .	Mounts
70/7079	. . . . .	Key rotated [e.g., Eurocylinder]	70/739	. . . . .	Motion-restraining means
70/7085	. . . . .	Using a dial having indicia or pointer and indicia	70/7395	. . . . .	Friction holder
70/709	. . . . .	Plural interdependent or plural independently operable tumbler sets	70/7401	. . . . .	Spindles
70/7096	. . . . .	With mechanism having rocker arm or linked bars	70/7407	. . . . .	Operating indicators
70/7102	. . . . .	And details of blocking system [e.g., linkage, latch, pawl, spring]	70/7412	. . . . .	Portable combination setting guide
70/7107	. . . . .	And alternately mechanically actuated by a key, dial, etc.	70/7418	. . . . .	Dials
70/7113	. . . . .	Projected and retracted electrically	70/7424	. . . . .	Tampering prevention or attach defeating
70/7119	. . . . .	Projected electrically only	70/7429	. . . . .	Resonance type
70/7124	. . . . .	Retracted electrically only	70/7435	. . . . .	Hidden or covered dial
70/713	. . . . .	Dogging manual operator	70/7441	. . . . .	Key
70/7136	. . . . .	Key initiated actuation of device	70/7446	. . . . .	Multiple keys
70/7141	. . . . .	Combination and key	70/7452	. . . . .	Selective shutout type
70/7147	. . . . .	Combination or key	70/7458	. . . . .	Interdependent
70/7153	. . . . .	Combination	70/7463	. . . . .	Master- and change-key
70/7158	. . . . .	Individual blocking elements	70/7469	. . . . .	Change-key shutout
70/7164	. . . . .	Selectively operable	70/7475	. . . . .	Submaster- and change-key
70/7169	. . . . .	Complex movement or puzzle type	70/748	. . . . .	Change-key shutout
70/7175	. . . . .	Labyrinthian passage	70/7486	. . . . .	Single key
70/7181	. . . . .	Tumbler type	70/7492	. . . . .	Tumblerless push or pull key
70/7186	. . . . .	Plural interdependent sets	70/7497	. . . . .	Tumblerless warded
70/7192	. . . . .	Plural independently operable sets	70/7503	. . . . .	Tumbler and ward type
			70/7508	. . . . .	Tumbler type
			70/7514	. . . . .	Sliding and rotary or swinging tumblers
			70/752	. . . . .	Sliding tumblers
			70/7525	. . . . .	Longitudinal
			70/7531	. . . . .	Transverse
			70/7537	. . . . .	Rotary or swinging tumblers

70/7542	. . . . .	Single set	70/7876	. . . . .	Bow or head
70/7548	. . . . .	Directly key engaged	70/7881	. . . . .	Bitting
70/7554	. . . . .	Cylinder type with auxiliary tumblers or wards	70/7887	. . . . .	Frangible
70/7559	. . . . .	Cylinder type	70/7893	. . . . .	Permutation
70/7565	. . . . .	Plural tumbler sets	70/7898	. . . . .	Threaded
70/7571	. . . . .	Concentric tumblers	70/7904	. . . . .	Magnetic features
70/7576	. . . . .	Sliding and rotary plug	70/791	. . . . .	Ejecting feature
70/7582	. . . . .	Sliding plug	70/7915	. . .	Tampering prevention or attack defeating
70/7588	. . . . .	Rotary plug	70/7921	. . . .	Armoring
70/7593	. . . . .	Sliding tumblers	70/7927	. . . .	Anti-jimmy
70/7599	. . . . .	Transverse of plug	70/7932	. . . .	Anti-pick
70/7605	. . . . .	Pin tumblers	70/7938	. . . . .	Guard ward
70/761	. . . . .	Rotatable pins [e.g., MEDECO lock]	70/7944	. . . . .	Guard tumbler
70/7616	. . . . .	Including sidebar	70/7949	. . . .	Yielding or frangible connections
70/7621	. . . . .	Including sidebar	70/7955	. . . .	Keyhole guards
70/7627	. . . . .	Rotary or swinging tumblers	70/796	. . . . .	Portable
70/7633	. . . . .	Transverse of plug	70/7966	. . . . .	Combination-controlled
70/7638	. . . . .	Cylinder and plug assembly	70/7972	. . . . .	Portable
70/7644	. . . . .	Key- and tool-controlled	70/7977	. . . . .	Key-controlled
70/765	. . . . .	Key only controlled	70/7983	. . . . .	Portable
70/7655	. . . . .	Cylinder attaching or mounting means	70/7989	. . . .	Key securers, fasteners or retainers
70/7661	. . . . .	Detachable or removable cylinder	70/7994	. . . . .	Portable
70/7667	. . . . .	Operating elements, parts and adjuncts	70/80	. .	Parts, attachments, accessories and adjuncts
70/7672	. . . . .	Cylinder	70/8027	. .	Condition indicators
70/7678	. . . . .	Adjustable	70/8054	. . .	With recorder
70/7684	. . . . .	Plug	70/8081	. . . .	Electric
70/7689	. . . . .	Tumblers	70/8108	. . . .	Padlock
70/7695	. . . . .	Plate	70/8135	. . .	With register
70/7701	. . . . .	Pin	70/8162	. . . .	Padlock
70/7706	. . . . .	Operating connections	70/8189	. . .	Contactual feeler
70/7712	. . . . .	Rollbacks	70/8216	. . .	Tampering detector
70/7718	. . . . .	Intermediate	70/8243	. . . .	With seal
70/7723	. . . . .	Cylinder rings	70/827	. . .	Attention-directing
70/7729	. . .	Permutation	70/8297	. .	For combination-operated mechanism
70/7734	. . . .	Automatically key set combinations	70/8324	. . .	Housings
70/774	. . . .	Adjustable tumblers	70/8351	. . .	Operating attachments
70/7746	. . . .	Removable change element	70/8378	. . .	Knobs, hand grips, etc.
70/7751	. . .	With ball or roller	70/8405	. . .	Combination finders
70/7757	. . .	Push or pull key operation	70/8432	. .	For key-operated mechanism
70/7763	. . .	Key ejecting	70/8459	. . .	Housings
70/7768	. . .	Key-removal preventing	70/8486	. . . .	Cylindrical
70/7774	. . .	False or picking key trapping	70/8514	. . . .	Face plate
70/778	. . .	Operating elements	70/8541	. . . .	Mounting arrangements
70/7785	. . . .	Tumblers	70/8568	. . .	Escutcheons
70/7791	. . . .	Keys	70/8595	. . .	Key guides, internal
70/7797	. . . .	Picking	70/8622	. . .	Key insertion guides
70/7802	. . . .	Multi-part structures	70/8649	. . .	Keyhole covers
70/7808	. . . .	With foldable shank or stem	70/8676	. . .	Key holders
70/7814	. . . .	With extensible shank or stem	70/8703	. . . .	Flexible
70/7819	. . . .	With slidable bit portion	70/873	. . . .	One-piece
70/7825	. . . .	With pivoted or swinging bit portion	70/8757	. . . .	Releasable catches
70/7831	. . . .	Nested second key	70/8784	. . . .	Parallel key loops, coaxially mounted, individually movable
70/7836	. . . .	Plural shanks, stems or bit wings	70/8811	. . .	Key identification
70/7842	. . . .	Single shank or stem	70/8838	. .	Adjustment provisions
70/7847	. . . .	Round rigid	70/8865	. .	Reversible structures
70/7853	. . . .	Tubular	70/8892	. .	Silencers or mufflers
70/7859	. . . .	Flat rigid	70/8919	. .	Antifriction provisions
70/7864	. . . .	Cylinder lock type	70/8946	. .	Emergency unlocking or release arrangements
70/787	. . . .	Irregular nonplanar or undulated	70/8973	. .	Mounting aids, guides and assistors

Former US Class 74 Series**74/00 Machine element or mechanism**

- 74/10 . High frequency vibratory devices
- 74/11 . Tripping mechanism
- 74/111 . . Speed controlled
- 74/113 . . . Valve gear trips [e.g., steam engine "Corliss" type]
- 74/114 . . Retarded
- 74/115 . . . Plural, sequential, trip actuations
- 74/116 . . . Clock train
- 74/118 Winding knob trip [e.g., alarm mechanism]
- 74/119 . . Hit and miss
- 74/12 . Gyroscopes
- 74/1204 . . with caging or parking means
- 74/1207 . . . Rotor spin and cage release type
- 74/1211 . . . and resetting means
- 74/1214 . . with gimbal lock preventing means
- 74/1218 . . Combined
- 74/1221 . . Multiple gyroscopes
- 74/1225 . . . with rotor drives
- 74/1229 . . Gyroscope control
- 74/1232 . . . Erecting
- 74/1236 by plural diverse forces
- 74/1239 by jet
- 74/1243 by weight
- 74/1246 by friction
- 74/125 by magnetic field
- 74/1254 by motor torque
- 74/1257 . . . Damping
- 74/1261 . . with pick off
- 74/1264 . . . Optical
- 74/1268 . . . Pneumatic
- 74/1271 . . . Conducting liquid
- 74/1275 . . . Electrical
- 74/1279 . . . Electrical and magnetic
- 74/1282 . . with rotor drive
- 74/1286 . . Vertical gyroscopes
- 74/1289 . . Horizontal gyroscopes
- 74/1293 . . Flexure hinges for gyros
- 74/1296 . . Flywheel structure
- 74/13 . Machine starters
- 74/131 . . Automatic
- 74/132 . . . Separate power mesher
- 74/133 . . . Holders
- 74/134 . . . Clutch connection
- 74/136 . . . Worm and wheel
- 74/137 . . . Reduction gearing
- 74/138 . . Radial meshing
- 74/139 . . Cam operated
- 74/14 . Rotary member or shaft indexing, e.g., tool or work turret
- 74/1406 . . with safety device or drive disconnect
- 74/1412 . . with locating point adjusting
- 74/1418 . . Preselected indexed position
- 74/1424 . . . Sequential
- 74/1429 Skip position
- 74/1435 Held by torque
- 74/1441 Geneva or mutilated gear drive
- 74/1447 Velocity control
- 74/1453 Interlocked rotator and brake
- 74/1459 Diverse-type brakes
- 74/1465 with axially acting friction brake
- 74/1471 . . Plural operators or input drives
- 74/1476 . . with means to axially shift shaft
- 74/1482 . . Single revolution input effects desired fractional output
- 74/1488 . . Control means
- 74/1494 . . Locking means
- 74/15 . Intermittent grip type mechanical movement
- 74/1502 . . Escapement
- 74/1503 . . Rotary to intermittent unidirectional motion
- 74/1505 . . . Automatically controlled
- 74/1506 Speed
- 74/1508 . . . Rotary crank or eccentric drive
- 74/151 Adjustable
- 74/1511 Lever transmitter
- 74/1513 Adjustable leverage
- 74/1515 Rack and pinion transmitter
- 74/1516 Adjustable throw
- 74/1518 Rotary cam drive
- 74/1519 Adjustable throw
- 74/1521 Radial cam
- 74/1523 Radial cam
- 74/1524 . . . Intermittently engaged clutch
- 74/1526 . . Oscillation or reciprocation to intermittent unidirectional motion
- 74/1527 . . . Screw and nut devices
- 74/1529 . . . Slide actuator
- 74/1531 Multiple acting
- 74/1532 . . . Rack actuator
- 74/1534 Multiple acting
- 74/1535 Inwardly facing racks
- 74/1537 Oscillating
- 74/1539 Multiple acting
- 74/154 Inwardly facing racks
- 74/1542 . . . Strap actuator
- 74/1544 Multiple acting
- 74/1545 Spring or weight return
- 74/1547 Single acting
- 74/1548 Engine starter type
- 74/155 Spring or weight return
- 74/1552 Spring or weight return
- 74/1553 . . . Lever actuator
- 74/1555 Rotary driven element
- 74/1556 Multiple acting
- 74/1558 . . Grip units and features
- 74/156 . . Compound movement handle
- 74/1561 Reversible
- 74/1563 Transverse pivots
- 74/1565 . . . Gripper releasing devices
- 74/1566 Power pawl lifter
- 74/1568 Automatic
- 74/1569 Idle stroke
- 74/1571 Cooperating holding pawl
- 74/1573 Power stroke
- 74/1574 Cooperating holding pawl
- 74/1576 Holding pawl lifter
- 74/1577 . . . Gripper mountings, lever
- 74/1579 Reversible
- 74/1581 Multiple acting
- 74/1582 Single ratchet or clutch
- 74/1584 . . . Gripper mountings, slide

74/1585	. . . . Multiple acting	74/1824	. . . . Slidable connections
74/1587	. . . Grip features	74/18248	. . . Crank and slide
74/1589	. . . . Driving band	74/18256	. . . . Slidable connections [e.g., scotch yoke]
74/159	. . . . . Clamping	74/18264	. . . Crank and multiple pitmans
74/1592	. . . . Driven band and gripper	74/18272	. . . Planetary gearing and slide
74/1594	. . . . . Positive grip	74/1828	. . . Cam, lever, and slide
74/1595	. . . . Driving ratchet-bar or rack	74/18288	. . . Cam and lever
74/1597	. . . . . Multiple acting	74/18296	. . . Cam and slide
74/1598	. . . . Driven ratchet-bar and power dog	74/18304	. . . . Axial cam
74/16	. Alternating-motion driven device with means during operation to adjust stroke	74/18312	. . . . . Grooved
74/1608	. . Constant length stroke with means to displace end limits	74/1832	. . . . . Multiple screw
74/1616	. . . Cyclical displacement responsive to the alternating-motion	74/18328	. . . . . Alternately rotated screw
74/1625	. . Stroke adjustable to zero and/or reversible in phasing	74/18336	. . . . Wabblers type
74/1633	. . . Plural driving means to jointly drive the driven device	74/18344	. . . Unbalanced weights
74/1642	. . . Device driven from selected points on oscillating link	74/18352	. . . Trammel-pitman
74/165	. . . Driving lever with adjustable pivot point	74/1836	. . Rotary to rotary
74/1658	. . . Eccentric and strap drive, shiftable eccentric	74/18368	. . . Inertia or centrifugal transmitters
74/1667	. . . . Changing the extent of eccentricity	74/18376	. . . Crank, pitman, lever, and crank
74/1675	. . . Crank pin drive, shiftable pin	74/18384	. . . Crank, lever, and crank
74/1683	. . . Cam and follower drive	74/18392	. . . Crank, pitman, and crank
74/1692	. . . . Axial-type cam [e.g., wabblers type]	74/184	. . . Cranks, link connected
74/17	. Rotary driven device adjustable during operation relative to its supporting structure	74/18408	. . . Cranks, slidable connections
74/173	. . Screw and nut adjusting means	74/18416	. . Rotary to alternating rotary
74/177	. . Rack and pinion adjusting means	74/18424	. . . Mangle connections
74/18	. Mechanical movements	74/18432	. . . . Shiftable driven gear
74/18008	. . Oscillating to reciprocating and alternating rotary	74/1844	. . . . . Central teeth
74/18016	. . Oscillating to reciprocating and intermittent rotary	74/18448	. . . . Mutilated gearing connections
74/18024	. . Rotary to reciprocating and rotary	74/18456	. . . Crank, pitman, and lever
74/18032	. . . Rotary to reciprocating or rotary	74/18464	. . . Reciprocating rack connections
74/1804	. . Rotary to reciprocating and alternating rotary	74/18472	. . . . Crank and pitman actuator
74/18048	. . Rotary to reciprocating and intermittent rotary	74/1848	. . . . Simple crank actuator
74/18056	. . Rotary to or from reciprocating or oscillating	74/18488	. . . Oscillating rack connections
74/18064	. . . Head motions	74/18496	. . . . Mangle actuated
74/18072	. . . Reciprocating carriage motions	74/18504	. . . . Crank and pitman actuator
74/1808	. . . . Phonograph type	74/18512	. . . Flexible connector type
74/18088	. . . Rack and pinion type	74/1852	. . . Associated inertia devices
74/18096	. . . . Shifting rack	74/18528	. . Rotary to intermittent unidirectional motion
74/18104	. . . . Shiftable pinion	74/18536	. . . Space machines
74/18112	. . . . Segmental pinion	74/18544	. . Rotary to gyratory
74/1812	. . . . Alternately rotated pinion	74/18552	. . . Unbalanced weight
74/18128	. . . . Clutchable gears	74/1856	. . Reciprocating or oscillating to intermittent unidirectional motion
74/18136	. . . . . Bevel	74/18568	. . Reciprocating or oscillating to or from alternating rotary
74/18144	. . . Overcoming dead center	74/18576	. . . including screw and nut
74/18152	. . . Belt or chain carried member	74/18584	. . . . Shaft shorter than nut
74/1816	. . . Crank, lever, toggle, and slide	74/18592	. . . . Auxiliary drive [e.g., fluid piston, etc.] for load
74/18168	. . . Crank, lazy-tong, and slide	74/186	. . . . Alternate power path operable on failure of primary
74/18176	. . . Crank, pitman, lever, and slide	74/18608	. . . . Single input split into two intermediate outputs that are subsequently superposed into a single output
74/18182	. . . . Pump jack type	74/18616	. . . . Single input, plural outputs
74/18184	. . . Crank, pitman, and lever	74/18624	. . . . Plural inputs, single output
74/182	. . . . Multiple levers	74/18632	. . . . . Plural nuts driving shaft
74/18208	. . . Crank, pitman, and slide	74/1864	. . . . . Shaft and nut driven
74/18216	. . . Crank, lever, and slide	74/18648	. . . . Carriage surrounding, guided by, and primarily supported by member other than screw [e.g., linear guide, etc.]
74/18224	. . . . Rack connections		
74/18232	. . . Crank and lever		

74/18656	Carriage surrounded, guided, and primarily supported by member other than screw [e.g., linear guide, etc.]	74/19051	Single driven plural drives
74/18664	Shaft moves through rotary drive means	74/19056	Parallel
74/18672	Plural screws in series [e.g., telescoping, etc.]	74/1906	Nonparallel
74/1868	Deflection related	74/19065	Aligned
74/18688	Limit stop	74/1907	Parallel and aligned
74/18696	including means to selectively transmit power [e.g., clutch, etc.]	74/19074	Single drive plural driven
74/18704	Means to selectively lock or retard screw or nut	74/19079	Parallel
74/18712	Contamination related	74/19084	Spur
74/1872	Imperforate enclosure	74/19088	Bevel
74/18728	Backlash	74/19093	Spur and bevel
74/18736	Pressurized fluid introduced between nut and screw	74/19098	Helical
74/18744	Lubrication	74/19102	Belt or chain
74/18752	Manually driven	74/19107	Nonparallel
74/1876	including inertia device	74/19112	Aligned
74/18768	with rack and pinion	74/19116	Vehicle
74/18776	Rectilinear rack	74/19121	Concentric
74/18784	including bevel gears	74/19126	Plural drivers plural driven
74/18792	including worm	74/1913	Bevel
74/188	including spur gear	74/19135	Spur
74/18808	with rack	74/1914	Alternate drivers and driven
74/18816	Curvilinear rack	74/19144	Miscellaneous [plural power paths]
74/18824	with biasing means	74/19149	with fluid drive
74/18832	including flexible drive connector [e.g., belt, chain, strand, etc.]	74/19153	Condition responsive control
74/1884	with sprocket wheel	74/19158	with one or more controllers for gearing, fluid drive, or clutch
74/18848	with pulley	74/19163	with interrelated controls
74/18856	Oscillating to oscillating	74/19167	In series plural interchangeably locked nonplanetary units
74/18864	Snap action	74/19172	Reversal of direction of power flow changes power transmission to alternate path
74/18872	Plate spring	74/19177	Input and output exchange functions
74/1888	Geared connections	74/19181	toothed gear and recirculated unconnected elements
74/18888	Reciprocating to or from oscillating	74/19186	Alternating rotary or continuous
74/18896	Snap action	74/19191	Alternating rotary
74/18904	Plate spring	74/19195	Progressive
74/18912	Compound lever and slide	74/192	Shiftable and/or slidable gears
74/1892	Lever and slide	74/19205	Clutchable gears
74/18928	Straight line motions	74/1921	On single driven member
74/18936	Slidable connections	74/19214	On single driving member
74/18944	Link connections	74/19219	Interchangeably locked
74/18952	toggle transmissions	74/19223	Disconnectable counter shaft
74/1896	Cam connections	74/19228	Multiple concentric clutch shafts
74/18968	Flexible connections	74/19233	Plurality of counter shafts
74/18976	Rack and pinion	74/19237	Internal-external gears
74/18984	Inclined ramp	74/19242	Combined gear and clutch
74/18992	Reciprocating to reciprocating	74/19247	Preselector
74/19	Gearing	74/19251	Control mechanism
74/19005	Nonplanetary gearing differential type [e.g., gearless differentials]	74/19256	Automatic
74/19009	Single gearing unit includes fluid drive	74/1926	Speed responsive
74/19014	Plural prime movers selectively coupled to common output	74/19265	Governor
74/19019	Plural power paths from prime mover	74/1927	with belt gearing
74/19023	Plural power paths to and/or from gearing	74/19274	torque responsive
74/19028	Alternate input connections single hand crank	74/19279	Cam operated
74/19033	Fluid drive divides or combines alternate paths	74/19284	Meshing assisters
74/19037	One path includes fluid drive	74/19288	Double clutch and interposed transmission
74/19042	Friction-type gearing	74/19293	Longitudinally slidable
74/19047	Worm-type gearing	74/19298	Multiple spur gears
		74/19302	with tumbler gear
		74/19307	Selective
		74/19312	Direct clutch and drive
		74/19316	Progressive

74/19321	Direct clutch and drive	74/19609 . . .	Governor control
74/19326	Fluid operated	74/19614 . .	Disconnecting means
74/1933	Multiple bevel gears	74/19619 . .	Displaceable elements
74/19335	Single spur gear	74/19623 . .	Backlash take-up
74/1934	Tumbler and cone	74/19628 . .	Pressure distributing
74/19344	Multiple cone	74/19633 . .	Yieldability in gear trains
74/19349	Single bevel gear	74/19637 . .	with brake means for gearing
74/19353	Pin or crown gears	74/19642 . .	Directly cooperating gears
74/19358 . . .	Laterally slidable gears	74/19647 . . .	Parallel axes or shafts
74/19363	Rotary carriage	74/19651	External type
74/19367	Swinging carriage	74/19656	Pin teeth
74/19372 . . .	Single forward and reverse speeds	74/1966 . . .	Intersecting axes
74/19377 . . .	Slidable keys or clutches	74/19665	Bevel gear type
74/19381	Alternative clutch shaft	74/1967 . . .	Rack and pinion
74/19386	Multiple clutch shafts	74/19674 . . .	Spur and bevel
74/19391	Progressive	74/19679 . . .	Spur
74/19395	Keys simultaneously slidable	74/19684	Motor and gearing
74/194	Selective	74/19688 . . .	Bevel
74/19405	Multiple forward and reverse	74/19693	Motor vehicle drive
74/19409	Single forward and reverse	74/19698 . . .	Spiral
74/19414	Single clutch shaft	74/19702	Screw and nut
74/19419	Progressive	74/19707	Plural longitudinally variably spaced nuts
74/19423	Multiple key	74/19712	Threadless
74/19428	Spur	74/19716	Non-linear screw
74/19433	Fluid operated	74/19721	Thread geometry
74/19437	Electrically operated	74/19726	Thread pitch varies over axial length
74/19442	Single key	74/1973	Shaft thread is spirally wound wire
74/19447	Clutch and ratchet	74/19735	Nut disengageable from screw
74/19451	Spur gears	74/1974	Nut segments hinged parallel to shaft [e.g., clam shell-type, etc.]
74/19456	Intermediate clutch	74/19744	Rolling element engaging thread
74/1946	Sliding clutch carrier	74/19749	Recirculating rolling elements
74/19465	Sliding clutch operator	74/19753	Plural independent recirculating element paths
74/1947	Selective	74/19758	Single thread common to plural paths
74/19474	Multiple key	74/19763	Roller return path in shaft
74/19479	Spur gears	74/19767	Return path geometry
74/19484	Single speed forward and reverse	74/19772	Rolling element deflector
74/19488	Spur gears	74/19777	Interconnected or cooperating rollers or roller structure
74/19493	Bevel gears	74/19781	Non-recirculating rolling elements
74/19498	Bevel and idler gears	74/19786	Captured sphere
74/19502 . .	Pivotally supported	74/19791	Cylindrical or quasi-cylindrical roller element [e.g., inclined roller, etc.]
74/19507 . . .	Windmill turntable	74/19795	Parallel to shaft
74/19512 . . .	Screw	74/198	Perpendicular to shaft
74/19516 . . .	Spur	74/19805	Less than 360 degrees of contact between nut and screw
74/19521 . . .	Bevel	74/19809	Independent nut segments
74/19526	Wheel type	74/19814	Integral deformable tangs engaging screw
74/1953	Wringer type	74/19819	Driven rack or shaft
74/19535 . .	Follow-up mechanism	74/19823	Screw
74/1954 . .	Eccentric driving shaft and axle	74/19828	Worm
74/19545 . .	Central driving shaft in axle	74/19833	Variable speed
74/1955 . .	Parallel shafts, adjustable gear mesh	74/19837	Intermittent motion
74/19555 . .	Varying speed ratio	74/19842	Distribution of pressure
74/1956 . .	Adjustable	74/19847 . . .	torque actuated safety devices
74/19565 . . .	Relative movable axes	74/19851 . .	Gear and rotary bodies
74/1957	Parallel shafts	74/19856 . . .	Laterally-spaced wheels
74/19575	Automatic control	74/1986 . . .	Radially-spaced wheels
74/1958	Parallel shafts	74/19865 . . .	with flywheel
74/19585 . . .	Fixed axes		
74/1959	Parallel shafts		
74/19595	Automatic control		
74/196	Parallel shafts		
74/19605 . . .	Reversing means		

74/1987	. . .	Rotary bodies	74/20159	. . . . .	Control lever movable through plural planes
74/19874	. . .	Mutilated	74/20165	. . . . .	Spherical mount [e.g., ball and socket]
74/19879	. . .	Geneva	74/20171	. . . . .	Resiliently biased control lever
74/19884	. . .	Irregular teeth and bodies	74/20177	. . . . .	Particular element [e.g., shift fork, template, etc.]
74/19888	. . .	External and internal teeth	74/20183	. . . . .	Shift fork structure
74/19893	. . .	Sectional	74/20189	. . .	Foot operated
74/19898	. . . . .	Backlash take-up	74/20195	. . . . .	Offset extension
74/19902	. . . . .	Screw and nut	74/20201	. . .	Control moves in two planes
74/19907	. . . . .	Sound deadening	74/20207	. . .	Multiple controlling elements for single controlled element
74/19912	. . . . .	Differential disks	74/20213	. . .	Interconnected
74/19916	. . . . .	Multiple disks	74/2022	. . . . .	Hand and foot
74/19921	. . . . .	Separate rim	74/20226	. . . . .	Accelerator
74/19926	. . . . .	Detachable	74/20232	. . . . .	Marine
74/1993	. . . . .	Segmental rim	74/20238	. . .	Interlocked
74/19935	. . . . .	Sheet metal	74/20244	. . . . .	Push button
74/1994	. . . . .	Diametrically split	74/2025	. . . . .	Rod blocks actuation of rotary member
74/19944	. . . . .	Shaft-admitting insert	74/20256	. . .	Steering and controls assemblies
74/19949	. . .	Teeth	74/20262	. . . . .	Rotary control shaft
74/19953	. . .	Worm and helical	74/20268	. . . . .	Reciprocating control elements
74/19958	. . .	Bevel	74/20274	. . . . .	Flexible
74/19963	. . .	Spur	74/2028	. . . . .	Handle bar type
74/19967	. . . . .	Yieldable	74/20287	. . . . .	Flexible control element
74/19972	. . . . .	form	74/20293	. . . . .	with horn control
74/19977	. . . . .	Antifriction	74/20299	. . .	Antirattling elements
74/19981	. . . . .	Roller	74/20305	. . .	Robotic arm
74/19986	. . . . .	Twisted	74/20311	. . . . .	including power cable or connector
74/19991	. . .	Lubrication	74/20317	. . . . .	including electric motor
74/19995	. . .	Teeth	74/20323	. . . . .	including flaccid drive element
74/20	. . .	Control lever and linkage systems	74/20329	. . . . .	Joint between elements
74/20006	. . .	Resilient connections	74/20335	. . . . .	Wrist
74/20012	. . .	Multiple controlled elements	74/20341	. . .	Power elements as controlling elements
74/20018	. . .	Transmission control	74/20348	. . . . .	Planar surface with orthogonal movement and rotation
74/20024	. . . . .	Fluid actuator	74/20354	. . . . .	Planar surface with orthogonal movement only
74/2003	. . . . .	Electrical actuator	74/2036	. . . . .	Pair of power elements
74/20037	. . . . .	Occupant propelled vehicle	74/20366	. . .	Power and manual controlling elements
74/20043	. . . . .	Transmission controlled by flexible cable	74/20372	. . .	Manual controlling elements
74/20049	. . . . .	Transmission controlled by flexible cable	74/20378	. . . . .	Planar surface with orthogonal movement or rotation
74/20055	. . . . .	Foot operated	74/20384	. . . . .	Levers
74/20061	. . . . .	Multiple foot-operated controls	74/2039	. . . . .	Pair of levers
74/20067	. . . . .	Control convertible between automatic and manual operation	74/20396	. . .	Hand operated
74/20073	. . . . .	Control of plural mechanisms [e.g., control of transmission and control of 4 - wheel drive]	74/20402	. . .	Flexible transmitter [e.g., Bowden cable]
74/20079	. . . . .	Separate control levers	74/20408	. . . . .	Constant tension sustaining
74/20085	. . . . .	Restriction of shift, gear selection, or gear engagement	74/20414	. . . . .	Hydraulic control
74/20091	. . . . .	Prevention of reverse shift	74/2042	. . . . .	and hand operator
74/20098	. . . . .	Separate actuator to disengage restrictor	74/20426	. . . . .	Slidable
74/20104	. . . . .	Shift element interlock	74/20432	. . . . .	for moving a mirror
74/2011	. . . . .	with detent, recess, notch, or groove	74/20438	. . . . .	Single rotatable lever [e.g., for bicycle brake or derailleur]
74/20116	. . . . .	Resiliently biased interlock	74/20444	. . . . .	including rolling antifriction elements
74/20122	. . . . .	Spherical restrictor	74/2045	. . . . .	and sheath support, connector, or anchor
74/20128	. . . . .	Resiliently biased restrictor	74/20456	. . . . .	Specific cable or sheath structure
74/20134	. . . . .	having vibration damper	74/20462	. . . . .	Specific cable connector or guide
74/2014	. . . . .	Manually operated selector [e.g., remotely controlled device, lever, push button, rotary dial, etc.]	74/20468	. . .	Sliding rod
74/20146	. . . . .	Control lever on steering column	74/20474	. . .	Rotatable rod, shaft, or post
74/20152	. . . . .	Control lever movable through plural planes	74/2048	. . . . .	Gear, drum, and cable
			74/20486	. . . . .	Drum and cable

74/20492	Gear	74/20858	Releasable
74/20498	Variable ratio	74/20864	Handles
74/20504	Screw and nut	74/2087	Rim grips and covers
74/2051	Adjustable	74/20876	Caps and covers
74/20516	Mountings	74/20882	Rocker arms
74/20522	Antenna	74/20888	Pedals
74/20528	Foot operated	74/20894	Treadles
74/20534	Accelerator	74/209	Extension
74/2054	Signal	74/20906	Offset
74/20546	Knee operated	74/20912	Pads and covers
74/20552	Elbow	74/20918	Foot rests
74/20558	Variable output force	74/20924	Controller checks
74/20564	Flexible	74/2093	Slot closers and lever guards
74/2057	Variable input leverage	74/21	Elements
74/20576	Elements	74/2101	Cams
74/20582	Levers	74/2102	Adjustable
74/20588	toggle	74/2104	Flexible strip
74/20594	Lazy tongs	74/2105	Memory devices
74/206	Adjustable	74/2106	Timer devices
74/20606	Swing posts	74/2107	Follower
74/20612	Hand	74/2109	Balancing for drum, e.g., washing machine or arm-type structure, etc., centrifuge, etc.
74/20618	Jointed	74/211	Eccentric
74/20624	Adjustable	74/2111	Plural, movable relative to each other [including ball[s]]
74/2063	Stops	74/2112	Concentric
74/20636	Detents	74/2114	Adjustable
74/20642	Hand crank	74/2115	Radially
74/20648	Interrelated lever release	74/2116	having anti-friction means, e.g., roller bearing, lubrication, etc.
74/20654	Gear	74/2117	Power generating-type flywheel
74/2066	Friction	74/2119	Structural detail, e.g., material, configuration, superconductor, discs, laminated, etc.
74/20666	Lever engaging	74/212	Containing fiber or filament
74/20672	Lever engaging rack	74/2121	Flywheel, motion smoothing-type
74/20678	Pivoted	74/2122	with fluid balancing means
74/20684	Lever carried pawl	74/2123	and pressure compensation
74/2069	Handle release	74/2125	and elastic device
74/20696	Finger lever release	74/2126	and bearings
74/20702	Slidable	74/2127	with electrical or magnetic damping
74/20708	Pedal controlled	74/2128	Damping using swinging masses, e.g., pendulum type, etc.
74/20714	Lever carried rack	74/213	Damping by increasing frictional force
74/2072	Pivoted	74/2131	Damping by absorbing vibration force [via rubber, elastomeric material, etc.]
74/20726	Pedal controlled	74/2132	Structural detail, e.g., fiber, held by magnet, etc.
74/20732	Handles	74/2133	Pawls and ratchets
74/20738	Extension	74/2135	Noiseless
74/20744	Hand crank	74/2136	Pivoted pawls
74/2075	Extensible	74/2137	Single tooth
74/20756	Collapsible	74/2138	Flexible single tooth
74/20762	Shaft connections	74/214	Multiple tooth
74/20768	Engine starter type	74/2141	Sliding pawls
74/20774	Holders	74/2142	Pitmans and connecting rods
74/2078	Handle bars	74/2143	Radial
74/20786	Spring biased or supported	74/2144	Yieldable
74/20792	Folding or adjustable	74/2146	Longitudinal springs
74/20798	Sectional	74/2147	Fluid cushion
74/20804	Simultaneously movable	74/2148	Automatic release
74/2081	Continuous	74/2149	toggle link type
74/20816	with handle latch	74/2151	Longitudinally adjustable
74/20822	Attachments and accessories		
74/20828	Handholds and grips		
74/20834	Hand wheels		
74/2084	Knob or dial		
74/20846	Slidable		
74/20852	Pivoted		

74/2152 . . . Hollow rod, lubricated
 74/2153 . . . Sheet metal type
 74/2154 . . . Counterbalanced
 74/2156 Weight type
 74/2157 Rotating
 74/2158 Spring
 74/2159 . . . Section coupled
 74/216 . . . Bearings, adjustable
 74/2162 . . . Engine type
 74/2163 . . . Idler arm
 74/2164 . . Cranks and pedals
 74/2165 . . . with attached gear
 74/2167 . . . Variable
 74/2168 . . . Pedals
 74/2169 Counterbalanced
 74/217 with toe or shoe clips
 74/2172 Adjustable or folding
 74/2173 . . Cranks and wrist pins
 74/2174 . . . Multiple throw
 74/2175 Sectional
 74/2177 . . . Sectional
 74/2178 . . . Yieldable
 74/2179 . . . Adjustable
 74/218 Automatically
 74/2181 . . . Variable
 74/2183 . . . Counterbalanced
 74/2184 Vibration dampers
 74/2185 . . . Lubricated
 74/2186 . . Gear casings
 74/2188 . . . Axle and torque tubes
 74/2189 . . . Cooling
 74/219 . . Guards
 74/2191 . . . for rotary member
 74/2193 . . Guard mechanisms
 74/2194 . . . Automatic
 74/2195 Oscillating member actuator
 74/2196 Reciprocating member actuator
 74/2198 . . . Operator controlled
 74/2199 . . . Set screw
 74/22 . . Miscellaneous

82/154 . . Transversely shifted cutter
 82/156 . . . Templet controlled
 82/158 . . . Gear controlled
 82/16 . . Severing or cut-off
 82/16016 . . Processes
 82/16032 . . Automatic and/or triggered control
 82/16049 . . Combined with means to sharpen tool[s]
 82/16065 . . Combined with means to apply fluid
 82/16081 . . Combined with means to heat tool and/or work
 82/16098 . . with dust or chip handling
 82/16114 . . including scrap cutting means
 82/16131 . . Flying cutter type
 82/16147 . . Cutting couple straddling work
 82/16163 . . . with pattern, guide or cam means [noncircular product]
 82/16181 . . . Plural cutting means [pairs, or pair, plus single]
 82/16196 . . . Rotary shear pair
 82/16213 Tool axes parallel to axis of work rotation
 82/16229 . . Interrelated means for tool infeed and circumrotation
 82/16245 . . . Dependent upon reaction to work
 82/16262 . . . Infeed cam disk rotation geared to tool holder rotation
 82/16278 Axial infeed cam
 82/16295 including centrifugal balancing means
 82/16311 Scroll plate infeed cam
 82/16327 . . . Infeed cam plate braked with respect to tool[s] carrier plate
 82/16344 . . . Orbital cogwheel and fixed detent
 82/16361 . . . Common gear means
 82/16377 including adjustable means to vary gear speed
 82/16393 with manual disconnect lever
 82/16409 . . . with means to feed work
 82/16426 . . Infeed means
 82/16442 . . . with means to circumrotate tool[s] about work
 82/16459 Fluid means for relative tool actuation
 82/16475 Gear means for tool actuation
 82/16491 including axial cam
 82/16508 with indicator
 82/16524 Bell crank linkage for tool[s] holder
 82/16541 Resilient means for tool actuation
 82/16557 with means for manual retraction
 82/16573 . . . Hand crank for tool holder
 82/16591 . . . Power driven eccentric
 82/16606 Fluid motor
 82/16622 Plural tools
 82/16639 . . . Tool within work
 82/16655 . . . with means to rotate tool[s]
 82/16672 including rotatable cutters supporting work
 82/16688 Planetating work mandrels
 82/16704 Pivoted tool carriage
 82/16721 with adjustable work stops
 82/16737 Eccentric periphery rotary tool
 82/16754 Means to feed work axially
 82/16771 Translatable work support carriage
 82/16786 with tool groove in support roll[s]
 82/16803 . . . Rotatable tool[s] driven by contact with work
 82/16819 Axially movable tool support
 82/16836 Freely floating parallel to axis
 82/16852 with supplemental nonrotative tool
 82/16868 including clutch control for work rotation

Former US Class 82 Series

82/00 Turning
 82/10 . Process of turning
 82/11 . Talking machine tablet
 82/12 . Radially moving rotating tool inside bore
 82/122 . . Forming non-circular bore
 82/125 . . Tool simultaneously moving axially
 82/128 . . . Pivoted to tool-carrier
 82/13 . Pattern section
 82/135 . . Cam-controlled cutter
 82/14 . Axial pattern
 82/141 . . having transverse tool and templet guide
 82/142 . . . with workpiece gauge
 82/143 . . . having electrical actuator
 82/145 And hydraulic actuator
 82/147 . . . having hydraulic actuator
 82/148 . . Pivoted tool rest
 82/149 . . Profiled cutter
 82/15 . Tapers
 82/152 . . Offset work axis

82/16885 including resilient means urging work
against rotary support

82/16901 . . . Separate means for plural tools

82/16918 . . . Spring urged

82/16934 For window shade

82/16951 . . . Tool adjustment and/or stop

82/16967 . . . with means to support and/or rotate work

82/16983 . . . with means to feed work

82/17 . Lathe for pulley

82/18 . Lathe for wheel or axle

82/185 . . In situ lathe for railroad wheel

82/19 . Lathe for crank or crank pin

82/192 . . Portable lathe for crank pin

82/195 . . having work oscillator

82/198 . . . having work driver

82/20 . Lathe for screw cutting

82/205 . . having swinging feed nut and tool bar

82/21 . Portable lathe for brake drum, disc, or shoe

82/22 . Portable lathe for pipe turning

82/23 . Portable lathe for piston grooving

82/24 . Bench lathe

82/245 . . Watchmaker's lathe

82/25 . Lathe

82/2502 . . with program control

82/2504 . . . And transmission

82/2506 . . . And tool turret

82/2508 . . with tool turret

82/2511 . . Vertical

82/2512 . . having facing tool fed transverse to work

82/2514 . . with work feeder or remover

82/2516 . . . Magazine type

82/2518 Bar feeder

82/2521 . . . Bar feeder

82/2522 . . Portable

82/2524 . . Multiple

82/2527 . . having hollow cutter head

82/2529 . . Revolvable cutter heads

82/2531 . . Carriage feed

82/2533 . . . Control

82/2535 Electrical type

82/2537 . . . Apron mechanism

82/2539 Feednut control

82/2541 . . . Slide rest

82/2543 Multiple tool support

82/2545 Tool relief

82/2547 . . . Change gears

82/2549 . . . Feedscrews and rods

82/2552 . . Headstock

82/2554 . . . Speed changing gear

82/2556 Speed change gears for maintaining constant
cutting speed

82/2558 . . . Spindle reverser

82/2561 . . . Spindle or work angler

82/2562 . . . Spindle and bearings

82/2564 . . Tailstock

82/2566 . . Bed

82/2568 . . Center

82/2571 . . . Alignment adjuster

82/2572 . . Attachment

82/2574 . . . Stop [e.g., carriage, tool, work, etc.]

82/2577 Tool slide

82/2579 Collet or spindle

82/2581 Indexible [e.g., roll type, etc.]

82/2583 . . Tool and work rest

82/2585 . . Tool rest

82/2587 . . . Turret type holder [e.g., multiple tools, etc.]

82/2589 . . . Quick release tool or holder clamp

82/2591 . . . Tool post

82/2593 . . Work rest

82/2595 . . . with noise or vibration dampener

82/2597 . . . Center rest

82/26 . Work driver

82/262 . . Lathe dog

82/264 . . . Cam grip

82/266 . . Mandrel

82/268 . . . Expansible

82/27 . Centerer

82/28 . Drill press attachment for turning

82/29 . Attachment for cutting a valve

82/30 . Miscellaneous

Former US Class 83 series

83/00 Cutting

83/02 . Other than completely through work thickness

83/0207 . . or through work presented

83/0215 . . . Including use of rotary scoring blade

83/0222 Plural independent rotary scoring blades

83/023 . . . With infeeding of work

83/0237 . . Pricking

83/0244 . . . Including use of orbiting tool carrier

83/0252 . . . With infeeding of tool

83/0259 . . Edge trimming [e.g., chamfering, etc.]

83/0267 . . Splitting

83/0274 . . . By use of endless band or chain knife

83/0281 . . . By use of rotary blade

83/0289 Plural independent rotary blades

83/0296 . . . With infeeding of work

83/0304 . . Grooving

83/0311 . . . By use of plural independent rotary blades

83/0319 Forming common groove

83/0326 Blades turning about perpendicular axes

83/0333 . . Scoring

83/0341 . . . Processes

83/0348 . . . Active means to control depth of score

83/0356 . . . Serially

83/0363 . . . Plural independent scoring blades

83/037 Rotary scoring blades

83/0378 On opposite sides of work

83/0385 . . . Rotary scoring blade

83/0393 With means to rotate blade

83/04 . Processes

83/0405 . . With preparatory or simultaneous ancillary
treatment of work

83/041 . . . By heating or cooling

83/0414 At localized area [e.g., line of separation]

83/0419 . . . By distorting within elastic limit

83/0424 By stretching

83/0429 By compressing

83/0433 By flexing around or by tool

83/0438 To conform to shape of tool

83/0443 . . . By fluid application

83/0448 . . With subsequent handling [i.e., of product]

83/0453	. . . By fluid application	83/141	. With means to monitor and control operation [e.g., self-regulating means]
83/0457	. . . By retaining or reinserting product in workpiece	83/145	. . Including means to monitor product
83/0462	. . . By accelerating travel	83/148	. . Including means to correct the sensed operation
83/0467	. . . By separating products from each other	83/152	. . . And modify another operation
83/0472	. . . By moving work support to which a tacky product is adhered	83/155	. . . Optimizing product from unique workpiece
83/0476	. . Including stacking of plural workpieces	83/159	. . Including means to compensate tool speed for work-feed variations
83/0481	. . Puncturing	83/162	. With control means responsive to replaceable or selectable information program
83/0486	. . With manipulation of tool protective strip [e.g., backing strip]	83/164	. . For cutting component of animal; e.g., hair clipper
83/0491	. . Cutting of interdigitating products	83/166	. . Removable element carries program
83/0495	. . Making and using a registration cut	83/169	. . . Indeterminate length, web or strand
83/05	. . With reorientation of tool between cuts	83/171	. . . . Magnetic
83/0505	. . With reorientation of work between cuts	83/173	. . Arithmetically determined program
83/051	. . . Relative to same tool	83/175	. . . With condition sensor
83/0515	. . During movement of work past flying cutter	83/178	. . . . Responsive to work
83/0519	. . . Cyclically varying rate of tool or work movement	83/18	. . . With operator input means
83/0524	. . Plural cutting steps	83/182	. With means to weigh product
83/0529	. . . Blanking and cutting	83/202	. With product handling means
83/0534	. . . . Cutting to join blanked holes	83/2022	. . Initiated by means responsive to product or work
83/0538	. . . Repetitive transverse severing from leading edge of work	83/2024	. . . Responsive to work
83/0543	. . . . Alternately forming products of less than total width of work	83/2027	. . Initiated by means directly responsive to tool movement
83/0548	. . . . With longitudinal severing	83/2029	. . . In return motion of tool
83/0553	. . . . . Effected by plural steps	83/2031	. . Including means to drape the product
83/0558	. . . . . Along zigzag or undulant line or cut	83/2033	. . Including means to form or hold pile of product pieces
83/0562	. . . . . Prior to transverse severing	83/2035	. . . In nested relation
83/0567	. . . . . Nonrectilinear cutting	83/2037	. . . In stacked or packed relation
83/0572	. . . Plural cutting steps effect progressive cut	83/204	. . . . Stacker sweeps along product support
83/0577	. . . Repetitive blanking	83/2042	. . . . Including cut pieces overlapped on delivery means
83/0581	. . Cutting part way through from opposite sides of work	83/2044	. . . . And means to separate product portions
83/0586	. . Effecting diverse or sequential cuts in same cutting step	83/2046	. . . . Including means to move stack bodily
83/0591	. . Cutting by direct application of fluent pressure to work	83/2048	. . . . . By movement of stack holder
83/0596	. . Cutting wall of hollow work	83/205	. . . . . By timed relocation of holder along path of stack gscheme-change-itemth
83/06	. . Blanking	83/2053	. . . . . Interrelated adjustment of holder movement and work-feeder
83/0605	. . Cut advances across work surface	83/2055	. . . . And means to resist stack movement
83/061	. With manually actuated means to disturb cyclic operation	83/2057	. . . . Including means to deliver individual pieces to a stack holder
83/081	. With randomly actuated stopping means	83/2059	. . . . . With spindle to enter a hole or to make hole in product
83/083	. . With means to permit subsequent hand operation	83/2061	. . . . . By face-engaging means to push product broadside into stacked relation
83/084	. . With stop-signal-responsive means to actuate auxiliary cutter	83/2063	. . . . Upon emergence from hollow cutter
83/086	. . With sensing of product or product handling means	83/2066	. . By fluid current
83/088	. . Responsive to tool detector or work-feed-means detector	83/2068	. . . Plural blasts directed against plural product pieces
83/089	. . . Responsive to tool characteristic	83/207	. . . By suction means
83/091	. . Responsive to work sensing means	83/2072	. . By brush means
83/093	. . . Of buckled work	83/2074	. . Including means to divert one portion of product from another
83/094	. . . . Running loop	83/2077	. . . By kerf entering guide
83/096	. . . Detector supported on or urged against work	83/2079	. . . Remaining or re-inserted product portion from base material
83/098	. . . . Resiliently biased	83/2081	. . . Gravity type
83/099	. . Manually operated	83/2083	. . . Deflecting guide
83/101	. With stopping means effective on completion of predetermined number of tool cycles	83/2085	. . . . Positionable gate in product flow path
83/121	. With means to accomplish delayed stopping after cessation of cyclic operation	83/2087	. . . Diverging product movers

83/209	. . Including means to replace product in base material after cutting	83/22	. . . Means to move product laterally
83/2092	. . Means to move, guide, or permit free fall or flight of product	83/2203	. . . . Oscillating means
83/2094	. . . Means to move product at speed different from work speed	83/2205	. . . . Reciprocating means
83/2096	. . . Means to move product out of contact with tool	83/2207	. . . Means to move product in a nonrectilinear path
83/2098	. . . . With means to effect subsequent conveying or guiding	83/2209	. . . Guide
83/21	. . . . Out of contact with a rotary tool	83/2211	. . . . Abutment in path of product being moved by work feeder
83/2103	. . . . . Mover surrounds axis of tool rotation	83/2213	. . . . Product-diverting conduit in or from hollow tool
83/2105	. . . . . Mover mounted on rotary tool	83/2216	. . . . Inclined conduit, chute or plane
83/2107	. . . . . For radial movement of product	83/2218	. . . . Abutment interposed in path of free fall or flight of product
83/2109	. . . . . Resiliently mounted	83/222	. With receptacle or support for cut product
83/2111	. . . . . Mover is resiliently mounted	83/242	. With means to clean work or tool
83/2113	. . . . . Pivoted mover	83/263	. With means to apply transient nonpropellant fluent material to tool or work
83/2116	. . . . . And plural rotating tools	83/283	. With means to control or modify temperature of apparatus or work
83/2118	. . . . . Stationary mover	83/293	. . Of tool
83/212	. . . . . And plural rotating tools	83/303	. With tool sharpener or smoother
83/2122	. . . . By ejector within a hollow cutter	83/313	. . Spatially fixed tool
83/2124	. . . . . And means to strip the outer surface of a cutter	83/323	. With means to stretch work temporarily
83/2127	. . . . . Ejector operated with return stroke of cutter	83/343	. With means to deform work temporarily
83/2129	. . . . . By means carried by cooperating cutter	83/364	. By fluid blast and/or suction
83/2131	. . . . . By cam-operated ejector	83/384	. By tool inside hollow work
83/2133	. . . . . By resiliently biased ejector	83/385	. . Work pre-packed with internal tool[s]
83/2135	. . . . Moving stripper timed with tool stroke	83/386	. . With expanding mandrel
83/2137	. . . . . And alternatively movable to or from operating position	83/387	. . Interrelated tool feed means and means to actuate work immobilizer
83/214	. . . . . Latched stripper released by tool return	83/388	. . . Actuated clamp element and work holder coact to position work
83/2142	. . . . . Plural strippers operative upon plural tools	83/39	. . Synchronized tool and work feeding means
83/2144	. . . . . Single stripper operative upon plural tools	83/391	. . With means to position tool[s] for cutting
83/2146	. . . . . Spring arm stripper	83/392	. . One tool [either internal or external] having compound motion
83/2148	. . . . . Linkage actuated	83/393	. . . Annulus and disc-type tool pair
83/215	. . . . . Carried by moving tool element or its support	83/394	. . One tool having unidirectional rotary motion
83/2153	. . . . . Fluid pressure actuated stripper	83/395	. . One tool having only rectilinear motion[s]
83/2155	. . . . . Stripper biased against product	83/396	. . . Annulus and disc-type tool pair
83/2157	. . . . . Elastomeric stripper contacting product	83/397	. . . . A tool has a sequence of motion in plural paths
83/2159	. . . . . By spring means	83/398	. . . Internal tool is an active cutter
83/2161	. . . . . By free weight of stripper	83/40	. . . Multiple external active tools
83/2163	. . . . . Stripper biased against product	83/401	. . . . Tools operate in a substantially common transverse plane of cut
83/2166	. . . . . Spring biased stripper	83/402	. . . . . With tool actuating cams on a common support
83/2168	. . . . Manually operated stripper	83/403	. . With manually actuated means to position or facilitate positioning of work
83/217	. . . . Stationary stripper	83/404	. By means to misalign aligned apertured tools
83/2172	. . . . . Stripper encircles moving tool	83/408	. . Combined with another type tool of the class
83/2174	. . . Blockable exit port	83/412	. . Rectilinear relative movement only
83/2177	. . . Tool conforming member interposed between tool and work	83/416	. . Rotary relative movement solely about a single pivot
83/2179	. . . Including means to move, or resist movement of, cut pieces along delivery chute	83/42	. . . With plural apertures in one or both carriers
83/2181	. . . Active delivery means mounted on tool support	83/424	. By increased tensioning of work-enclosing wire
83/2183	. . . Product mover including gripper means	83/444	. Tool engages work during dwell of intermittent workfeed
83/2185	. . . Suction gripper	83/4443	. . Unicyclic
83/2187	. . . Reciprocating product handler	83/4445	. . . Convertible to and from unicyclic
83/219	. . . Rotating or oscillating product handler	83/4448	. . . Controlled by mechanical means
83/2192	. . . Endless conveyor	83/445	. . With work-moving clamp jaw
83/2194	. . . And means to remove product therefrom		
83/2196	. . . Roller[s]		
83/2198	. . . Tilttable or withdrawable support		

- 83/4453 . . Work moved solely by movable abutment
- 83/4455 . . Operation initiated by work-driven detector means to measure work length
- 83/4458 . . Work-sensing means to control work-moving or work-stopping means
- 83/446 . . . With means to initiate tool feed by same control impulse
- 83/4463 . . Work-sensing means to initiate tool feed
- 83/4465 . . . With work-stopping abutment in sensing means
- 83/4468 . . Plural tools at same station, one positioned for continuous engagement with work
- 83/447 . . Plural tools successively actuated at same station
- 83/4473 . . . During one dwell period
- 83/4475 . . Tool has motion additional to cutting stroke during tool cycle
- 83/4478 . . . Tool has additional motion during work dwell
- 83/448 Included in plural cutting cycles
- 83/4483 . . . Tool has work-feeding motion
- 83/4486 . . With variable direction of work-feed from cycle to cycle
- 83/4488 . . . In one of certain selected directions
- 83/4491 . . Interlock between tool actuating and work feed means
- 83/4493 . . Tool motion initiates work feed and vice versa
- 83/4496 . . Stored energy means for moving work or tool, loaded by tool or work
- 83/4498 . . . Work feed means actuates energy storage device for tool
- 83/4501 . . Work feed means controlled by means mounted on tool or tool support
- 83/4503 . . . Such means drives the work feed means
- 83/4506 Work feed means carried by tool or tool support
- 83/4508 With supplemental work feed means
- 83/4511 On return stroke of tool
- 83/4513 . . . Work feed means halted by means on tool or tool support
- 83/4516 . . Work-feed mechanism in nonfeed motion effects or initiates tool actuation
- 83/4518 . . . By striking tool actuator
- 83/4521 Nonfeed motion is reverse to feed motion
- 83/4523 . . With means to vary number of work-feed increments between tool strokes
- 83/4526 . . Dwell caused by imposing reverse motion on portion of flexible moving work
- 83/4529 . . With uninterrupted flow of work from supply source
- 83/4531 . . Work feed increment shorter than longitudinal tool field
- 83/4534 . . Unequal work feed increments in recurring series
- 83/4536 . . . Work carriage carries ratchet means to determine increments
- 83/4539 . . Means to change tool position, or length or datum position of work- or tool-feed increment
- 83/4541 . . . With means to vary magnitude of work-feed increment
- 83/4544 Multi-increment type [e.g., ticket issuing]
- 83/4546 Length selector initiates machine operation
- 83/4549 By change in length of one member of feed-driving linkage
- 83/4551 Rotating member
- 83/4554 By change of effective shape of driving or driven surface of element of work-feed mechanism
- 83/4556 By adjustment of fixed stop
- 83/4559 With means to vary magnitude or base position of tool stroke
- 83/4561 . . With means to facilitate manual repositioning [shift] of work
- 83/4564 . . With means to produce plurality of work-feed increments per tool cycle
- 83/4567 . . . Including supplemental work-feed means
- 83/4569 Manual
- 83/4572 With stop adapted to engage abutment surface on work
- 83/4574 Plurality of work stops successively effective
- 83/4577 . . Work fed successively to plural tools
- 83/4579 . . . With change of direction between tools
- 83/4582 . . Work advance occurs during return stroke of tool
- 83/4584 . . Dwell defined only by "dead-center" of rotating crank
- 83/4587 . . Dwell initiated by disengagement of surface of moving frictional feed means from work
- 83/4589 . . . Feed means has interrupted frictional surface
- 83/4592 . . . Feed means has rotary motion
- 83/4594 . . Dwell caused by clamping or blocking work during continuous operation of feed means
- 83/4597 . . With means to control magnitude of work-feed increment or work acceleration
- 83/4599 . . . Means to prevent random or excessive work feeds
- 83/4602 . . . Full stroke required of feed means
- 83/4604 . . Work feed functions as tool support
- 83/4607 . . With rotary work-carrier
- 83/461 . . With abutment to position work being fed with respect to cutter
- 83/4612 . . . With slip between positioned work and feed means
- 83/4615 . . Work guide and feed means have open side
- 83/4617 . . Work feed means modified to maintain clearance from tool
- 83/462 . . Plurality of work feed means in separate paths
- 83/4622 . . Intermittent drive type of gearing for work-feed means
- 83/4625 . . . Gearing modified to lock the work-feed means
- 83/4627 . . . Mutilated gear in mesh with gear driving work-feed means
- 83/463 . . Work-feed element contacts and moves with work
- 83/4632 . . . Comprises a work-moving gripper
- 83/4635 . . . Comprises element entering aperture in, or engaging abutment surface on, work
- 83/4637 . . With means to guide, position, or present work to work-feed means
- 83/464 . . . Means to transport work to work-feed means
- 83/4642 Including means to pick articles from pack or stack
- 83/4645 . . With means to clamp work during dwell
- 83/4647 . . One-revolution clutch in tool drive
- 83/465 . . Cutting motion of tool has component in direction of moving work
- 83/4653 . . With means to initiate intermittent tool action
- 83/4656 . . . Tool moved in response to work-sensing means

83/4659	. . . . With means to vary "length" of product	83/4807	. . . . . With one-revolution drive
83/4662	. . . . . To vary an end-product "length" [e.g., "crop cut"]	83/4809	. . . . With loop former preceding tool
83/4664	. . . . With photo-electric work-sensing means	83/4812	. . . . Compound movement of tool during tool cycle
83/4667	. . . . With trip-switch work-sensing means	83/4815	. . . . . Axial reciprocation of tool
83/467	. . . . . To initiate feed movement of tool	83/4818	. . . . Interconnected work feeder and tool driver
83/4673	. . . . . And to initiate flying movement of tool	83/4821	. . . . Side cutting helical blade
83/4676	. . . . With work-responsive means to initiate flying movement of tool	83/4824	. . . . With means to cause progressive transverse cutting
83/4679	. . . . . With flying work-gripper means related to tool carrier	83/4827	. . . . . With helical cutter blade
83/4682	. . . . . With means controlling flying speed dependent on work speed	83/483	. . . . With cooperating rotary cutter or backup
83/4685	. . . With means to vary frequency of initiation	83/4833	. . . . . Cooperating tool axes adjustable relative to each other
83/4688	. . . . By orbitally traveling trigger pin[s]	83/4836	. . . . . With radial overlap of the cutting members
83/4691	. . Interrelated control of tool and work-feed drives	83/4838	. . . . . With anvil backup
83/4693	. . With means to concurrently adjust flying frequency and retain flying speed of tool	83/4841	. . . . . With resilient anvil surface
83/4696	. . Plural diverse flying cutters	83/4844	. . . . . Resiliently urged cutter or anvil member
83/4699	. . Combined with other type cutter	83/4847	. . . . With cooperating stationary tool
83/4702	. . . With slitter	83/485	. Cutter with timed stroke relative to moving work
83/4705	. . Plural separately mounted flying cutters	83/487	. . Work swings about progressively cutting tool during tool stroke
83/4708	. . With means to render cutter pass[es] ineffective	83/489	. . Tool actuated by movable work support
83/4711	. . . With means to produce "mis-cut"	83/49	. . Traveling cutter
83/4714	. . Oscillating work shifter adjacent cutter	83/492	. . With means to vary timing of tool feed
83/4717	. . . Work actuated senser initiates shifter	83/494	. . Uniform periodic tool actuation
83/472	. . Wire tool	83/496	. . . With periodic lateral feed of tool or work
83/4722	. . . On tool support having reciprocation parallel to direction of work-feed	83/498	. . . With plural tool stations
83/4725	. . . . And rotation about axis parallel to direction of work-feed	83/50	. . . Reciprocating tool
83/4728	. . Tool flies by engagement with the work	83/501	. . . With plural tools on a single tool support
83/4731	. . . Tool merely flexes with moving work	83/503	. . With plural tool stations
83/4734	. . Flying support or guide for work	83/505	. Operation controlled by means responsive to product
83/4737	. . With tool speed regulator	83/515	. . Actuation of tool controlled
83/474	. . With work feed speed regulator	83/525	. Operation controlled by detector means responsive to work
83/4743	. . . With means to vary cyclically speed of work	83/527	. . With means to control work-responsive signal system
83/4746	. . Spring return of tool in counterfly direction	83/528	. . . To delay response to work-senser
83/4749	. . Tool mounted on oscillating standard	83/53	. . . To change length of product
83/4751	. . . Both tools of couple on single standard	83/531	. . With plural work-sensing means
83/4754	. . . . One tool swings out of work path on return stroke	83/533	. . With photo-electric work-sensing means
83/4757	. . Tool carrier shuttles rectilinearly parallel to direction of work feed	83/535	. . Release of interlock controlled
83/476	. . . Including means to secure work to carrier	83/536	. . Movement of work controlled
83/4763	. . . Both members of cutting pair on same carrier	83/538	. . Positioning of tool controlled
83/4766	. . Orbital motion of cutting blade	83/54	. . Actuation of tool controlled by work-driven means to measure work length
83/4769	. . . Work feeder mounted on tool support	83/541	. . Actuation of tool controlled in response to work-sensing means
83/4772	. . . . Gripper-type feeder	83/543	. . . Sensing means responsive to work indicium or irregularity
83/4775	. . . Tool speed varied within each orbital cycle	83/544	. . . With trip-switch in work-sensing mechanism
83/4778	. . . Work feed gripper carried on endless belt	83/546	. Interrelated tool actuating and work guide moving means
83/478	. . . Endless belt or chain tool carrier	83/566	. Interrelated tool actuating means and means to actuate work immobilizer
83/4783	. . . Constantly oriented tool with arcuate cutting path	83/5669	. . Work clamp
83/4786	. . . . Cutting couple type	83/5678	. . . Tool deflected by guide on tightened clamp
83/4789	. . . Rotatable disc-type tool on orbiting axis	83/5687	. . . . With means to control clamping force
83/4792	. . . . Idling disc	83/5696	. . . Clamp driven by reaction from tool force
83/4795	. . . Rotary tool	83/5705	. . . With means providing for plural steps in clamping stroke
83/4798	. . . . Segmented disc slitting or slotting tool	83/5715	. . . With sequencing means
83/4801	. . . . With undulant cutting edge [e.g., "pinking" tool]		
83/4804	. . . . Single tool action drive		

83/5724	. . . With provision for manual control of clamp	83/6508	. . . . With means to cause movement of work transversely toward plane of cut
83/5733	. . . Tool or tool support on movable clamp jaw	83/651	. . . . . By means to cause movement toward and away from plane of cut
83/5742	. . . Clamp moved by direct impact of tool or tool support	83/6512	. . . . . Actuated by movement of a member on reciprocating means
83/5751	. . . . Clamp retracted by impact of tool or tool support	83/6513	. . . . . Actuated by passive means which is external to reciprocating means
83/576	. . . Clamp actuating means driven by tool or tool support	83/6515	. . . . . By means to define increment of movement toward plane of cut
83/5769	. . . . Clamp yieldably driven by tool or tool support	83/6516	. . . . . Interrelated with movement of reciprocating means
83/5778	. . . . . With resilient drive element	83/6518	. . . . . By pusher mechanism
83/5787	. . . Clamp driven by yieldable means	83/652	. . . . . With additional work holding or positioning means
83/5796	. . . . Drive means is resilient	83/6521	. . . . . Work holding means includes actuator
83/5805	. . . . Fluid pressure yieldable drive means	83/6523	. . . . . Including plural, simultaneously acting pusher elements
83/5815	. . Work-stop abutment	83/6524	. . . . . Independently adjustable
83/5824	. . . Oppositely effective abutments	83/6526	. . . . . With additional means to retract elements
83/5833	. . . With cyclic means to alter work-stopping position	83/6528	. . . . . Power derived from movement of reciprocating means
83/5842	. . . Stop partakes of tool motion	83/6529	. . . . . Power derived from fluid pressure means
83/5851	. . . . Carried by tool or tool support	83/6531	. . . . . Movement by screw means
83/586	. Interrelated tool actuating means and means to actuate work-mover stop	83/6532	. . . . . Movement by rack and pinion or pawl
83/606	. Interrelated tool actuating means and guard means	83/6534	. . . . . With handle
83/613	. . Work guard	83/6536	. . . . . By carriage
83/619	. . Cutter guide slot closer	83/6537	. . . . . By cable or belt drive
83/626	. Operation of member controlled by means responsive to position of element remote from member [e.g., interlock]	83/6539	. . With means for transverse positioning of work on a moving conveyor
83/637	. . With means to initiate operation of member	83/654	. . With work-constraining means on work conveyor [i.e., "work-carrier"]
83/647	. With means to convey work relative to tool station	83/6542	. . . Plural means to constrain plural work pieces
83/6472	. . By fluid current	83/6544	. . . . End of work protrudes through aperture in carrier
83/6473	. . Centrifugal feed to tangential tool [e.g., "Beria" type]	83/6545	. . . With means to guide work-carrier in nonrectilinear path
83/6475	. . With means to regulate work-feed speed	83/6547	. . . . About axis fixed relative to tool station
83/6476	. . Including means to move work from one tool station to another	83/6548	. . . . . Infeed
83/6478	. . . Tool stations angularly related	83/655	. . . . . About vertical axis
83/648	. . . . Work manipulated between tool stations	83/6552	. . . . . Cut normal to axis
83/6481	. . . . With static tool	83/6553	. . . . . Work-guide tube
83/6483	. . . Tool stations staggered relative to one another	83/6555	. . . . . Cut normal to axis
83/6484	. . . Punch or die station	83/6556	. . . . . Oscillating work-carrier
83/6486	. . . Notcher or pinker station	83/6558	. . . . . Multiple cutters
83/6488	. . . Work reciprocated past double-edged knife	83/656	. . . . . Coaxial rotary cutters
83/6489	. . . Slitter station	83/6561	. . . . . Work stationary during cut
83/6491	. . . . And transverse cutter station	83/6563	. . . With means to orient or position work carrier relative to tool station
83/6492	. . Plural passes of diminishing work piece through tool station	83/6564	. . . . By pattern or templet
83/6494	. . . Work alternately, angularly re-oriented relative to tool station	83/6566	. . . . By indexing means
83/6496	. . . . By additional means to engage work and orient it relative to tool station	83/6568	. . . With additional work-locating means on work-carrier
83/6497	. . . . By roller or roll-like element	83/6569	. . With means to stop work conveyor
83/6499	. . . Work rectilinearly reciprocated through tool station	83/6571	. . With means to store work articles
83/65	. . . . With means to cause or permit angular re-orientation of work about axis parallel to plane of cut	83/6572	. . With additional means to engage work and orient it relative to tool station
83/6502	. . . . . By endless member having work-engaging teeth	83/6574	. . . By work-stopping abutment
83/6504	. . . . . By member having work-engaging tooth	83/6576	. . . By opposed lateral guide means
83/6505	. . . . . Including plural work-engaging teeth		
83/6507	. . . . . Fluid operated		

83/6577	. . . With means to adjust additional means	83/6656	. . Rectilinear movement only
83/6579	. . With means to press work to work-carrier	83/6657	. . . Tool opposing pusher
83/658	. . With projections on work-carrier [e.g., pin wheel]	83/6659	. . . . Hydraulically or pneumatically actuated
83/6582	. . Tool between tandem arranged work carrying means	83/666	. . . . Screw actuated
83/6584	. . Cut made parallel to direction of and during work movement	83/6662	. . . . Gear or pulley actuated
83/6585	. . . Including nonconcurrently acting tool	83/6664	. . . . Lever, cam, or link actuated
83/6587	. . . Including plural, laterally spaced tools	83/6665	. . . . Spring or gravity urged
83/6588	. . . . Tools mounted on common tool support	83/6667	. . Work carrier rotates about axis fixed relative to tool station
83/659	. . . . Tools axially shiftable on support	83/6668	. . Interrelated work-feeding means and tool-moving means
83/6592	. . . Interrelated work-conveying and tool-moving means	83/667	. Tool carrier or guide affixed to work during cutting
83/6593	. . . . With reciprocating tool [e.g., "jigsaw" type]	83/674	. . By flexible work-engaging member
83/6595	. . . . With means to move tool laterally of feed direction during cutting	83/68	. . Entirely work supported
83/6596	. . . . With means to effect difference between work speed and tool speed	83/687	. By tool reciprocable along elongated edge
83/6598	. . . . Tool co-axial with work-conveying means	83/6875	. . With means permitting tool to be rotatably adjusted about its cutting edge during cutting
83/66	. . . With means to press work to tool	83/688	. . With dynamic balancing or shock absorbing means
83/6601	. . . Bevel cutting tool	83/6885	. . With tool of another type
83/6603	. . . Tool shiftable relative to work-conveying means	83/689	. . With means to change to other type tool
83/6604	. . . Tool in contact with surface of work-conveying means	83/6895	. . Plural reciprocable tools
83/6606	. . . Tool between laterally spaced work-conveying means	83/69	. . Stored energy furnishes drive in one direction
83/6608	. . . By rectilinearly moving work carriage	83/6905	. . With tool in-feed
83/6609	. . . . Angularly adjustable	83/691	. . . And auxiliary means for promoting or retarding tool in-feed
83/6611	. . . . . Having positive adjustment stop; e.g., link	83/6915	. . . . By yieldable means
83/6612	. . . . . Having position indicating means	83/692	. . . . And means to vary tool in-feed speed
83/6614	. . . . . Pusher engaging rear surface of work	83/6925	. . . . With interrelated tool actuating and in-feed means
83/6616	. . . . . Having means to actuate pusher	83/693	. . . Of rectilinearly reciprocating tool
83/6617	. . . . . Hydraulic or pneumatic means	83/6935	. . . . With in-feed by pivoting carrier
83/6619	. . . . . Gear or pulley actuated pusher	83/694	. . . And means to prevent tool in-feed
83/662	. . . . . Lever, cam, or link actuated pusher	83/6945	. . . With passive means to guide tool directly
83/6622	. . . . . Having means to actuate carriage	83/695	. . . . By plural opposed guide surfaces
83/6624	. . . . . Hydraulic or pneumatic means	83/6955	. . . . . Having relative adjustment between guide surfaces
83/6625	. . . . . Gear or pulley	83/696	. . . . . With relative adjustment between guide and work or work-support
83/6627	. . . . . Adapted to place tension on flacid member	83/6965	. . . . . By or with additional movable work-support portion
83/6628	. . . . . Lever, cam, or link means	83/697	. . . . . By rotation about an axis parallel to the work-support surface
83/663	. . . . On or attached to vehicle	83/6975	. . . . . By rotation about an axis perpendicular to the work-support surface
83/6632	. . . . Supported for movement at one side of tool only	83/698	. . . Including means to cause nonrectilinear tool infeed
83/6633	. . . By work moving flexible chain or conveyor	83/6985	. . . Of arcuately oscillating tool
83/6635	. . . By feed roller	83/699	. . . Of tool carrier on single moving pivot
83/6636	. . . . Pinch rollers	83/6995	. . . . Pivot moves in closed loop
83/6638	. . . Unattached manual work pusher	83/70	. . . . Pivot moves to and fro in arcuate path
83/664	. . Roller	83/7005	. . . . . Axis of arcuate path moves during cutting
83/6641	. . . Plural independent rollers for feed of plural distinct work	83/701	. . . . . Pivot moves to and fro in rectilinear path
83/6643	. . . Shaped to conform to work	83/7015	. . Having uniplanar compound motion
83/6644	. . . With work-supplying reel	83/702	. . . By plural arcuately oscillating carrier
83/6646	. . . . And provision for selecting feed length	83/7025	. . . Constantly oriented tool travelling in orbit
83/6648	. . . Continuous conveying during, cutting; e.g., straw cutting	83/703	. . . Tool rocks cutting reciprocations
83/6649	. . . Supporting work at cutting station	83/7035	. . . . One tool reciprocates along fixed guide element
83/6651	. . . . Comprising part of cutting station	83/704	. . With work-support and means to vary relationship between tool and work support
83/6652	. . . Tool and feed roller actuated by common handle	83/7045	. . Arcuately oscillating tool carried on single pivot
83/6654	. . . Tool and roller on common movable support		

83/705	. . With means to support tool at opposite ends	83/741	. . With movable or yieldable guide element
83/7055	. . . And apply drive force to both ends of tool	83/743	. . . Opposed to work-supporting surface
83/706	. . . . By flexible drive means	83/744	. . Plural guide elements
83/7065	. . . . By reciprocating rigid support	83/745	. . . Opposed
83/707	. By endless band or chain knife	83/747	. . Opposed to work-supporting surface
83/7076	. . With programming means	83/748	. With work immobilizer
83/7083	. . With cutter other than endlessly orbiting type	83/7487	. . Means to clamp work
83/7089	. . Including contiguous oppositely moving knife portions	83/7493	. . . Combined with, peculiarly related to, other element
83/7095	. . With means to change to non-endlessly orbiting cutter	83/75	. . . . With or to tool guide
83/7101	. . With tool in-feed	83/7507	. . . . Guide for traveling cutter
83/7108	. . . Including ground-traversing vehicle	83/7513	. . . . Tool or tool support on movable clamp jaw
83/7114	. . . Including means to permit arcuate in-feed motion	83/752	. . . With means providing for plural steps in clamping stroke
83/712	. . . . Including means to relocate path of in-feed motion	83/7527	. . . With equalizer or self-aligning jaw
83/7126	. . . . . Angular relative previous path	83/7533	. . . With biasing or counterbalancing means
83/7133	. . . By gravity	83/754	. . . Clamp driven by yieldable means
83/7139	. . . . With fluid in-feed regulating means	83/7547	. . . Liquid pressure actuating means
83/7145	. . . By motor-driven mechanism	83/7553	. . . Including means to retain clamp jaw in position
83/7151	. . With scale or indicator	83/756	. . . Self-locking drive means
83/7158	. . Including plural cutting zones	83/7567	. . . Manually actuated drive means
83/7164	. . . With adjustment of separation between zones	83/7573	. . . Including clamping face of specific structure
83/717	. . . . By lever means	83/758	. . . With means to adjust clamp position or stroke
83/7176	. . . . By screw-threaded means	83/7587	. . Gapped work-constrainer
83/7183	. . . Including "figure-8" band	83/7593	. . Work-stop abutment
83/7189	. . . Comprising plural bands	83/76	. . . With scale or indicator
83/7195	. . Including means to adjust relationship between band and work-support surface	83/7607	. . . Normal to plane of cut
83/7201	. . . By varying angle between band and work-support surface	83/7613	. . . . Adjustable
83/7208	. . . . By tilting band carrier	83/762	. . . . . Angularly relative to plane of cut; e.g., miter
83/7214	. . . . . About point of intersection of cutting span and work-support surface	83/7627	. . . . With traversing cutter guide; e.g., cut-off saw
83/722	. . . By varying distance between band and work-support surface	83/7633	. . . Collapsible
83/7226	. . With means to guard the tension	83/764	. . . Retractable
83/7233	. . . Including means to retard undriven pulley or sprocket	83/7647	. . . Adjustable
83/7239	. . . With means to vary distance between pulley or sprocket axes	83/7653	. . . . Having curved cutting edge to make arcuate cut, plural nonaligned intersecting cutting edges, or spaced punches
83/7245	. . . . And angular relationship of axes	83/766	. . . . . Spaced edges
83/7251	. . . . Including means to yieldably bias pulley	83/7667	. . . Having curved cutting edge to make arcuate cut, plural nonaligned intersecting cutting edges, or spaced punches
83/7258	. . . . . By fluid means	83/7673	. . . . . Spaced edges
83/7264	. . With special blade guide means	83/768	. Rotatable disc tool pair or tool and carrier
83/727	. With means to guide moving work	83/7684	. . With means to support work relative to tool[s]
83/728	. . In pivotal or arcuate movement	83/7688	. . . Plural tool elements successively actuated at same station
83/73	. . Guide fixed to or integral with stationary tool element	83/7693	. . . Tool moved relative to work-support during cutting
83/731	. . . Tool element cooperates with a second tool	83/7697	. . . . Tool angularly adjustable relative to work-support
83/732	. . With guard	83/7701	. . . Supporting surface and tool axis angularly related
83/734	. . With attachment or operative connection to tool carrier	83/7705	. . . . Adjustable angular relationship
83/735	. . With attachment or operative connection to passive tool guide	83/7709	. . . Unidirectionally movable work support
83/736	. . Guide cooperates with template or straight edge secured to work	83/7713	. . . . With opposed work-presser
83/738	. . Curved or deflecting guide	83/7718	. . . . . Presser co-axial with tool
83/739	. . Positively confines or otherwise determines path of work	83/7722	. . . Support and tool relatively adjustable
83/74	. . Adapted to permit maneuvering of work at tool zone	83/7726	. . . . By movement of the tool
		83/773	. . . Work-support includes passageway for tool [e.g., slotted table]
		83/7734	. . With guard for tool
		83/7738	. . Optional tool pairs alternatively operative

83/7743	. . . One element of tool pairs common to all pairs	83/856	. . . . To work-engaging member
83/7747	. . With means to permit replacement of tool	83/857	. . . . . Calibrated scale or indicator
83/7751	. . Means to separate elements of tool pair	83/858	. . . . . Indicates dimension of work being cut
83/7755	. . Carrier for rotatable tool movable during cutting	83/859	. . . . . Dynamic indicator
83/7759	. . . Unicyclic movement	83/86	. . . . To another tool assembly
83/7763	. . . Tool carrier reciprocable rectilinearly	83/861	. . . . To cooperating tool
83/7768	. . . . With means to adjust path of reciprocation	83/862	. . . . To another component of tool assembly
83/7772	. . . . . Angular relative to previous path	83/863	. . . . Adjustable guide for traversing tool; e.g., radial saw guide or miter saw guide
83/7776	. . . . With means to reciprocate carrier	83/865	. . Indicates work characteristic
83/778	. . . . . And means to rotate tool	83/866	. . Indicates wear
83/7784	. . . . With means to rotate tool	83/867	. . Bubble level
83/7788	. . . Tool carrier oscillated or rotated	83/868	. . Counter
83/7793	. . Means to rotate or oscillate tool	83/869	. Means to drive or to guide tool
83/7797	. . . Including means to rotate both elements of tool pair	83/8691	. . Unicyclic
83/7801	. . . . Including means to rotate both elements at different speeds	83/8693	. . . With adjustable stopping point or tool
83/7805	. . . . And means to change speed of rotation	83/8694	. . . With brake or blocking means
83/7809	. . Tool pair comprises rotatable tools	83/8696	. . Means to change datum plane of tool or tool presser stroke
83/7813	. . . Tool pair elements angularly related	83/8697	. . . For disabling of continuously actuated cutter
83/7818	. . . . Elements of tool pair angularly adjustable relative to each other	83/8699	. . . With adjustable stop
83/7822	. . . Tool pair axially shiftable	83/87	. . . By varying length of tool stroke
83/7826	. . . . With shifting mechanism for at least one element of tool pair	83/8702	. . Clicker die press
83/783	. . . Tool pair comprises contacting overlapped discs	83/8703	. . . With die handling attachment
83/7834	. . . . With means to effect axial pressure on pair	83/8704	. . . With reciprocating presser
83/7838	. . . . . With means to change axial pressure	83/8706	. . . . Laterally movable to selective operative positions
83/7843	. . . . With means to change overlap of discs	83/8707	. . . . . Pivotal or revolving only
83/7847	. . . Tool element axially shiftable	83/8709	. . . . . With means to impart, limit, or control pivotal motion of presser
83/7851	. . . Tool pair comprises disc and cylindrical anvil	83/871	. . . . . Interrelated with presser reciprocating means
83/7855	. . . . With adjustable means to urge tool elements together	83/8712	. . . . . With means to mount presser for oscillation about column
83/7859	. . . Elements of tool pair adjustably spaced	83/8713	. . . . With adjustable bed block
83/7863	. . Tool pair comprises rotatable tool and nonrotatable tool	83/8714	. . . . Including presser member reinforcing, or flexure compensating, means
83/7868	. . Tool element selectively operative	83/8716	. . . . With manually actuated control apparatus for reciprocation of presser member
83/7872	. . Tool element mounted for adjustment	83/8717	. . By deforming resilient tool or tool support
83/7876	. . . Plural, axially spaced tool elements	83/8719	. . With transmission yieldable on overload
83/788	. Tool pair comprises rotatable anvil and fixed-type tool	83/872	. . With guard means
83/793	. . Anvil has motion in addition to rotation [i.e., traveling anvil]	83/8722	. . . Static
83/798	. . . Additional motion is along fixed arcuate path	83/8723	. . . . Adjustable
83/803	. . . With plural anvils	83/8725	. . Including movable, tool protecting, cushioning sheet
83/808	. Two tool pairs, driver for one pair moves relative to driver for other pair	83/8726	. . Single tool with plural selective driving means
83/811	. . One tool support acts as driver for other	83/8727	. . Plural tools selectively engageable with single drive
83/814	. . . Punch and shear	83/8729	. . . Predetermined sequence of selection
83/817	. . With variable spacing between tool pairs	83/873	. . . . Of paired tools
83/819	. . . With intermediate work support	83/8732	. . . Turret of tools
83/822	. . Punch and shear	83/8733	. . Tool movable to cooperate selectively with one of a plurality of mating tools
83/825	. . Successively acting	83/8735	. . With means providing for plural steps in tool stroke
83/828	. With illuminating or viewing means for work	83/8736	. . Sequential cutting motions
83/839	. . Mirror or lens	83/8737	. . With tool positioning means synchronized with cutting stroke
83/849	. With signal, scale, or indicator	83/8739	. . . Anvil moves into and out of operative position
83/85	. . Signal; e.g., alarm	83/874	. . . Straight line positioning
83/851	. . Indicator comprising work or product	83/8742	. . Tool pair positionable as a unit
83/852	. . Responsive to force		
83/853	. . Indicates tool position		
83/855	. . . Relative to another element		

83/8743	. . . Straight line positioning	83/8812	. . . Cutting edge in radial plane
83/8745	. . Tool and anvil relatively positionable	83/8814	. . . . Adjustable
83/8746	. . . Straight line	83/8815	. . . . With guide means for the cutting member
83/8748	. . Tool displaceable to inactive position [e.g., for work loading]	83/8817	. . . Axially extending cutting edge
83/8749	. . . By pivotal motion	83/8818	. . . . Axially progressing cut
83/875	. . With templet surface following tool	83/882	. . . . Adjustable
83/8752	. . Tool moves work to and against cooperating tool	83/8821	. . With simple rectilinear reciprocating motion only
83/8753	. . . With means to clamp or bind work to moving tool	83/8822	. . . Edge-to-edge of sheet or web [e.g., traveling cutter]
83/8755	. . . One tool resiliently mounted or biased	83/8824	. . . With provision for dynamic balance
83/8756	. . . Work forced through tool aperture or between spaced cooperating tools	83/8825	. . . With lost motion in tool drive
83/8758	. . . Manually actuated work-moving tool	83/8827	. . . Means to vary force on, or speed of, tool during stroke
83/8759	. . With means to connect or disconnect tool and its drive	83/8828	. . . Plural tools with same drive means
83/8761	. . . Continuously moving drive means [e.g., "gag"]	83/883	. . . . Tools positioned by template
83/8762	. . . . Hand actuated connecting means	83/8831	. . . . Plural distinct cutting edges on same support
83/8763	. . Convertible from tool path to another or from implement to machine	83/8832	. . . . . Concentrically mounted
83/8765	. . Magnet- or solenoid-actuated tool	83/8834	. . . . . Successively acting
83/8766	. . . Tool movement modifies actuating circuit	83/8835	. . . And means to move cooperating cutting member
83/8768	. . . Solenoid core is tool or tool support	83/8837	. . . With application of force to opposite ends of tool supporting crosshead
83/8769	. . Cutting tool operative in opposite directions of travel	83/8838	. . . . By relatively movable fixed axis levers
83/8771	. . Motion direction of tool influenced by resistance of work	83/884	. . . . By connecting rod articulated with tool support
83/8772	. . One tool edge of tool pair encompasses work [e.g., wire cutter]	83/8841	. . . Tool driver movable relative to tool support
83/8773	. . Bevel or miter cut	83/8843	. . . . Cam or eccentric revolving about fixed axis
83/8775	. . With tool tensioning means	83/8844	. . . . Gear actuated tool support
83/8776	. . Constantly urged tool or tool support [e.g., spring biased]	83/8845	. . . . Toggle links, one link pivoted to tool support
83/8778	. . . Ledger blade	83/8847	. . . . Screw actuated tool support
83/8779	. . . Oscillating tool urged axially	83/8848	. . . . Connecting rod articulated with tool support
83/8781	. . . . And urged about pivotal axis	83/885	. . . . Fixed axis lever
83/8782	. . . Stored energy furnishes cutting force	83/8851	. . . . . Adjustable mechanical advantage
83/8784	. . . . With reset	83/8853	. . . . Including details of guide for tool or tool support
83/8785	. . . Through return [noncutting] stroke	83/8854	. . . Progressively cutting
83/8786	. . . . Oscillating tool	83/8855	. . . With spaced guide pins [e.g., die set leader pins]
83/8788	. . Tool return mechanism separate from tool advance mechanism	83/8857	. . . With inclined guides
83/8789	. . With simple revolving motion only	83/8858	. . . Fluid pressure actuated
83/8791	. . . Tool mounted on radial face of rotor	83/886	. . . . Utilizing fluid amplifier
83/8792	. . . Variable speed during one revolution [e.g., intermittent]	83/8861	. . . . Diaphragm
83/8794	. . . Revolving tool moves through recess in work holder or cooperating tool	83/8863	. . . . Explosive fluid
83/8795	. . . . Progressively cutting	83/8864	. . . . Plural cylinders
83/8796	. . . Progressively cutting	83/8866	. . . . Offset cutter
83/8798	. . With simple oscillating motion only	83/8867	. . . With means to adjust tool position on tool holder
83/8799	. . . Plural tool pairs	83/8868	. . . . Adjustably mounted cooperating tool
83/8801	. . . . Plural tools on single oscillating arm [i.e., tool holder]	83/887	. . Parallel draw-cut [e.g., translatory]
83/8802	. . . And means to move cooperating cutter member	83/8871	. . . Link suspension
83/8804	. . . Tool driver movable relative to tool support	83/8873	. . Straight line motion combined with tilting in plane of stroke
83/8805	. . . . Cam or eccentric revolving about fixed axis	83/8874	. . Uniplanar compound motion
83/8807	. . . . Gear or ratchet pawl drives toothed tool support	83/8876	. . . Reciprocating plus work approach [e.g., saw type]
83/8808	. . . . Toggle links, one link pivoted to tool support	83/8877	. . . With gyratory drive
83/8809	. . . . Fixed axis lever	83/8878	. . Guide
83/8811	. . . . . Adjustable mechanical advantage	83/888	. . . With nonrigidly positioned member
		83/8881	. . . With anti-friction means
		83/8883	. . . . Roller with peripheral flange or groove
		83/8884	. . . . Disc

83/8886	. . . With means to vary space between opposed members	83/9394	. . . Helical tool
83/8887	. . . . By rectilinear movement of member	83/9396	. . . Shear type
83/8889	. . . With means to adjust position	83/9399	. . . . Cutting edge wholly parallel to axis of rotation
83/889	. Tool with either work holder or means to hold work supply	83/9401	. . . . Cutting edge wholly normal to axis of rotation
83/896	. . Rotatable wound package supply	83/9403	. . . Disc type
83/902	. . . Plural supply sources	83/9406	. . . Radially adjustable tool
83/909	. Cutter assemblage or cutter element therefor [e.g., chain saw chain]	83/9408	. . . Spaced cut forming tool
83/913	. . With means permitting removal of cutter element	83/9411	. . Cutting couple type
83/917	. . Having diverse cutting elements	83/9413	. . . Spiral type cutter
83/921	. . . And noncutting depth gauge	83/9416	. . . To punch and cut punched article
83/925	. . Having noncutting depth gauge	83/9418	. . . Punching plus nonpunching tool
83/929	. Tool or tool with support	83/942	. . . Notching plus nonnotching tool
83/9292	. . Wire tool	83/9423	. . . Punching tool
83/9295	. . Work supported tool [e.g., clicker die]	83/9425	. . . . Tool pair
83/9297	. . . With product ejection facilitator	83/9428	. . . . Shear-type male tool
83/93	. . . With tool manipulating portion	83/943	. . . . Multiple punchings
83/9302	. . . With tool positioning abutment	83/9432	. . . . Plural spaced successively operative shearing portions
83/9304	. . . To sever article from work and cut within article	83/9435	. . . . Progressive cutting
83/9307	. . . With tool contour adjusting means	83/9437	. . . . Shear-type female tool
83/9309	. . Anvil	83/944	. . . . Multiple punchings
83/9312	. . . Rotatable type	83/9442	. . . Notching tool
83/9314	. . Pointed perforators	83/9444	. . . . Shear type
83/9317	. . Endless band or belt type	83/9447	. . . Shear type
83/9319	. . Toothed blade or tooth therefor	83/9449	. . . Spaced cut forming tool
83/9321	. . . With means to vary tooth position	83/9452	. . . With tool contour adjusting means
83/9324	. . . With additional cutting means	83/9454	. . Reciprocable type
83/9326	. . . Plural separable sections	83/9457	. . Joint or connection
83/9329	. . . . Tooth separable from blade	83/9459	. . . Magnetic connection
83/9331	. . . . . By independent connecting element	83/9461	. . . Resiliently biased connection
83/9333	. . . . . Transversely movable	83/9464	. . . For rotary tool
83/9336	. . . . . Arcuately movable	83/9466	. . . . Flexible sleevelike tool
83/9338	. . . . . With additional element to prevent movement of connecting element	83/9469	. . . . Adjustable
83/9341	. . . . . Rectilinearly movable	83/9471	. . . . Rectilinearly
83/9343	. . . . . By deformation	83/9473	. . . For rectilinearly reciprocating tool
83/9346	. . . Uniformly varying teeth or tooth spacing	83/9476	. . . . Tool is single element with continuous cutting edge [e.g., punch, etc.]
83/9348	. . . Undulating tooth arrangement	83/9478	. . . . Tool is single element reciprocable generally perpendicularly to elongate cutting edge [e.g., shear, etc.]
83/935	. . . Plural tooth groups	83/9481	. . . . Tool is single element reciprocable along elongate cutting edge [e.g., saw blade, etc.]
83/9353	. . . . Including raker tooth group	83/9483	. . . . Adjustable
83/9355	. . . . Including intermediate raker tooth	83/9486	. . . . Rectilinearly
83/9358	. . . Series of dissimilar teeth	83/9488	. . . Adjustable
83/936	. . . Series of allochiral teeth	83/949	. . . . Rectilinearly
83/9362	. . . Teeth having transversely curved cutting edge	83/9493	. . Stationary cutter
83/9365	. . . Teeth having cutting edge parallel to blade surface	83/9495	. . . Nonparallel cutting edges
83/9367	. . . Teeth having cutting edge perpendicular to blade surface	83/9498	. . . Parallel cutting edges
83/937	. . Tool mounted by and between spaced arms	83/95	. Machine frame
83/9372	. . Rotatable type	83/96	. . Guard
83/9374	. . . With spacer interposed between shaft-mounted tools	83/97	. Miscellaneous
83/9377	. . . Mounting of tool about rod-type shaft	Former US Class 117 Series	
83/9379	. . . . At end of shaft	117/00	Single-crystal, oriented-crystal, and epitaxy growth processes; non-coating apparatus therefor
83/9382	. . . Punching plus nonpunching tool	117/10	. Apparatus
83/9384	. . . Notching plus nonnotching tool	117/1004	. . with means for measuring, testing, or sensing
83/9387	. . . Punching tool	117/1008	. . . with responsive control means
83/9389	. . . . Shear type		
83/9391	. . . Notching tool		

- 117/1012 . . . with a window or port for visual observation or examination
- 117/1016 . . with means for treating single-crystal [e.g., heat treating]
- 117/102 . . for forming a platelet shape or a small diameter, elongate, generally cylindrical shape [e.g., whisker, fiber, needle, filament]
- 117/1024 . . for crystallization from liquid or supercritical state
- 117/1028 . . . Crucibleless apparatus having means providing movement of discrete droplets or solid particles to thin-film precursor [e.g., Verneuil method]
- 117/1032 . . . Seed pulling
- 117/1036 including solid member shaping means other than seed or product [e.g., EDFG die]
- 117/104 Means for forming a hollow structure [e.g., tube, polygon]
- 117/1044 including means forming a flat shape [e.g., ribbon]
- 117/1048 Pulling includes a horizontal component
- 117/1052 including a sectioned crucible [e.g., double crucible, baffle]
- 117/1056 including details of precursor replenishment
- 117/106 including sealing means details
- 117/1064 including a fully-sealed or vacuum-maintained crystallization chamber [e.g., ampoule]
- 117/1068 including heating or cooling details [e.g., shield configuration]
- 117/1072 including details of means providing product movement [e.g., shaft guides, servo means]
- 117/1076 . . . having means for producing a moving solid-liquid-solid zone
- 117/108 Including a solid member other than seed or product contacting the liquid [e.g., crucible, immersed heating element]
- 117/1084 having details of a stabilizing feature
- 117/1088 including heating or cooling details
- 117/1092 . . . Shape defined by a solid member other than seed or product [e.g., Bridgman-Stockbarger]
- 117/1096 . . . including pressurized crystallization means [e.g., hydrothermal]
- 137/0402 . . . Cleaning, repairing, or assembling
- 137/0407 Repairing or assembling hydrant [e.g., fireplug, etc.]
- 137/0413 Gas or water meter repairing or assembling
- 137/0419 Fluid cleaning or flushing
- 137/0424 Liquid cleaning or flushing
- 137/043 Valve or valve seat cleaning
- 137/0435 Mechanical cleaning [e.g., pig, etc.]
- 137/0441 Repairing, securing, replacing, or servicing pipe joint, valve, or tank
- 137/0447 Including joint or coupling
- 137/0452 Detecting or repairing leak
- 137/0458 Tapping pipe, keg, or tank
- 137/0463 Particular aperture forming means
- 137/0469 Cutter or cutting tool
- 137/0475 Having deformable or inflatable means
- 137/048 With content loading or unloading [e.g., dispensing, discharge assistant, etc.]
- 137/0486 Specific valve or valve element mounting or repairing
- 137/0491 Valve or valve element assembling, disassembling, or replacing
- 137/0497 Fluid actuated or retarded
- 137/0502 Multi way valve
- 137/0508 Ball valve or rotary ball valve
- 137/0514 Gate valve
- 137/0519 Plug valve
- 137/0525 Butterfly valve
- 137/053 Float valve
- 137/0536 . . . Highspeed fluid intake means [e.g., jet engine intake]
- 137/0645 . . . With condition responsive control means
- 137/0753 . . Control by change of position or inertia of system
- 137/0777 . . . With second control
- 137/0801 . . . Position relative body of water [e.g., marine governors]
- 137/0826 Float controlled
- 137/085 Pressure or head controlled
- 137/0874 Vent opening or closing on tipping container
- 137/0898 By shifting of liquid level
- 137/0923 By pendulum or swinging member
- 137/0947 With servo connection to valve
- 137/0971 Speed responsive valve control
- 137/0989 Acceleration responsive valve control
- 137/1007 With manual valve control
- 137/1026 Speed change and excess speed valve control
- 137/1044 With other condition responsive valve control
- 137/1062 Governor drive failure responsive
- 137/108 Centrifugal mass type [exclusive of liquid]
- 137/1098 With multiple valves
- 137/1116 Periodically actuated valve
- 137/1135 Rotating valve and rotating governor
- 137/1153 Excess speed responsive
- 137/1171 With fluid servo-motor
- 137/1189 . . . Freeze condition responsive safety systems
- 137/1244 With freeze waste
- 137/1298 Stop and waste
- 137/1353 Low temperature responsive drains
- 137/1407 . . . Combustion failure responsive fuel safety cut-off for burners
- 137/1516 . . . Thermo-electric
- 137/1624 . . . Destructible or deformable element controlled

Former US Class 137 series**137/00 Fluid handling**

- 137/0318 . . Processes
- 137/0324 . . . With control of flow by a condition or characteristic of a fluid
- 137/0329 Mixing of plural fluids of diverse characteristics or conditions
- 137/0335 Controlled by consistency of mixture
- 137/034 Controlled by conductivity of mixture
- 137/0346 Controlled by heat of combustion of mixture
- 137/0352 Controlled by pressure
- 137/0357 For producing uniform flow
- 137/0363 For producing proportionate flow
- 137/0368 By speed of fluid
- 137/0374 For regulating boiler feed water level
- 137/0379 By fluid pressure
- 137/0385 . . . Carbonated beverage handling processes
- 137/0391 . . . Affecting flow by the addition of material or energy
- 137/0396 . . . Involving pressure control

- 137/1632 . . Destructible element
- 137/1639 . . . Combined destructible and fusible element
- 137/1647 . . . Explosive actuation
- 137/1654 . . . Separable valve coupling or conduit
- 137/1662 Tensile or sheer pin or bolt
- 137/1669 . . . Tensile or sheer pin or bolt
- 137/1677 Pressure causes pin or bolt to destruct
- 137/1684 . . . With alarm or indicator
- 137/1692 . . . Rupture disc
- 137/1699 Means for holding entire disc after rupture
- 137/1707 Disc burst after destruction of additional element
- 137/1714 Direct pressure causes disc to burst
- 137/1722 Two-way rupture disc
- 137/1729 Dome shape
- 137/1737 Reverse buckling
- 137/1744 Specific weakening point
- 137/1752 Integral disc assembly
- 137/1759 Knife or cutter causes disc to break
- 137/1767 Movable knife or cutter
- 137/1774 . . . With counterbalancing element
- 137/1782 . . . Frangible element returns pressure responsive valve
- 137/1789 . . . Having pressure responsive valve
- 137/1797 . . Heat destructible or fusible
- 137/1804 . . . With second sensing means
- 137/1812 . . . In fluid flow path
- 137/1819 . . . Safety cut-off
- 137/1827 With heater for destructible or fusible element
- 137/1834 With external closing means
- 137/1842 . Ambient condition change responsive
- 137/1866 . . For controlling soil irrigation
- 137/189 . . . Soil moisture sensing
- 137/1915 . . Burner gas cutoff
- 137/1939 . . Atmospheric
- 137/1963 . . . Temperature
- 137/1987 With additional diverse control
- 137/2012 . . . Pressure
- 137/2036 . . Underwater
- 137/206 . Flow affected by fluid contact, energy field or coanda effect [e.g., pure fluid device or system]
- 137/2065 . . Responsive to condition external of system
- 137/2071 . . . And causing change or correction of sensed condition
- 137/2076 . . Utilizing diverse fluids
- 137/2082 . . Utilizing particular fluid
- 137/2087 . . Means to cause rotational flow of fluid [e.g., vortex generator]
- 137/2093 . . . Plural vortex generators
- 137/2098 . . . Vortex generator as control for system
- 137/2104 . . . Vortex generator in interaction chamber of device
- 137/2109 . . . By tangential input to axial output [e.g., vortex amplifier]
- 137/2115 With means to vary input or output of device
- 137/212 . . System comprising plural fluidic devices or stages
- 137/2125 . . . Plural power inputs [e.g., parallel inputs]
- 137/2131 Variable or different-value power inputs
- 137/2136 Pulsating power input and continuous-flow power input
- 137/2142 With variable or selectable source of control-input signal
- 137/2147 To cascaded plural devices
- 137/2153 With feedback passage[s] between devices of cascade
- 137/2158 With pulsed control-input signal
- 137/2164 . . Plural power inputs to single device
- 137/2169 . . . Intersecting at interaction region [e.g., comparator]
- 137/2174 Co-linear, oppositely-directed power inputs [e.g., impact modulator]
- 137/218 . . Means to regulate or vary operation of device
- 137/2185 . . . To vary frequency of pulses or oscillations
- 137/2191 . . . By non-fluid energy field affecting input [e.g., transducer]
- 137/2196 Acoustical or thermal energy
- 137/2202 . . . By movable element
- 137/2207 Operating at timed intervals [e.g., to produce pulses]
- 137/2213 Electrically-actuated element [e.g., electro-mechanical transducer]
- 137/2218 Means [e.g., valve] in control input
- 137/2224 . . Structure of body of device
- 137/2229 . . Device including passages having V over T configuration
- 137/2234 . . . And feedback passage[s] or path[s]
- 137/224 . . . With particular characteristics of control input
- 137/2245 Multiple control-input passages
- 137/2251 . . . And multiple or joined power-outlet passages
- 137/2256 . . . And enlarged interaction chamber
- 137/2262 . . . And vent passage[s]
- 137/2267 . . Device including passages having V over gamma configuration
- 137/2273 . . Device including linearly-aligned power stream emitter and power stream collector
- 137/2278 . Pressure modulating relays or followers
- 137/2322 . . Jet control type
- 137/2365 . . Plural series units
- 137/2409 . . With counter-balancing pressure feedback to the modulating device
- 137/2452 . . . With counter-counter balancing pressure feedback
- 137/2496 . Self-proportioning or correlating systems
- 137/2499 . . Mixture condition maintaining or sensing
- 137/2501 . . . Dividing and recombining flow
- 137/2504 . . . By specific gravity
- 137/2506 . . . By viscosity or consistency
- 137/2509 . . . By optical or chemical property
- 137/2511 . . Fuel controlled by boiler or water system condition
- 137/2514 . . Self-proportioning flow systems
- 137/2516 . . . Interconnected flow displacement elements
- 137/2519 Movable trap chamber
- 137/2521 . . . Flow comparison or differential response
- 137/2524 Flow dividers [e.g., reversely acting controls]
- 137/2526 Main line flow displaces or entrains material from reservoir
- 137/2529 With electrical controller
- 137/2531 . . . Flow displacement element actuates electrical controller
- 137/2534 . . . Liquid level response
- 137/2536 Float controlled weir or valve
- 137/2539 Swinging outlet pipe controller

137/2541	. . . With measuring type discharge assistant	137/2665	. . . . . With external control for correlating valve [e.g., manual]
137/2544	. . Supply and exhaust type	137/2668	. . . . Alternately or successively substituted outflow
137/2546	. . . Vacuum or suction pulsator type [e.g., milking machine]	137/267	. . . . Control by filling auxiliary gravitating or float operating tank
137/2549	. . . . With trip linkage or snap action	137/2673	. . . . . Control by filling outlet tank or receiver
137/2552	. . . . With pulsation responsive pilot valve	137/2675	. . . . . Float controlled
137/2554	. . . Reversing or 4-way valve systems	137/2678	. . . . . Four port reversing valve
137/2557	. . . Waste responsive to flow stoppage	137/268	. . . . . Responsive to pressure or flow interruption
137/2559	. . Self-controlled branched flow systems	137/2683	. . . . . Plural outlets control with automatic reset
137/2562	. . . Dividing and recombining	137/2685	. . . . . Manually set to a single outflow position
137/2564	. . . Plural inflows	137/2688	. . . . . Flow rate responsive
137/2567	. . . . Alternate or successive inflows	137/269	. . . . . Flow sensing turbine
137/2569	. . . . Control by depletion of source	137/2693	. . . . . Pressure responsive
137/2572	. . . . One inflow supplements another	137/2695	. . . . . Responsive to outlet pressure
137/2574	. . . Bypass or relief controlled by main line fluid condition	137/2698	. . . . . Electrical control
137/2577	. . . . Liquid level responsive	137/27	. . Liquid level responsive
137/2579	. . . . Flow rate responsive	137/2703	. . Flow rate responsive
137/2582	. . . . . Including controlling main line flow	137/2705	. . . Pressure differential
137/2584	. . . . . Relief or bypass closes as main opens	137/2708	. . Plural sensors
137/2587	. . . . . Bypass or relief valve biased open	137/271	. . . For single valve
137/2589	. . . . . Pilot valve operated	137/2713	. Siphons
137/2592	. . . . . Carried choke	137/272	. . Plural
137/2594	. . . . . Choke	137/2727	. . . Tank truck mounted
137/2597	. . . . . Variable choke resistance	137/2733	. . . Sequentially discharging in parallel
137/2599	. . . . . Venturi	137/274	. . . . From plural tanks
137/2602	. . . . . Flapper	137/2747	. . . Main siphon with auxiliary starting, stopping or resetting siphon
137/2605	. . . . Pressure responsive	137/2754	. . . . Sinking or bucket-type float operated main siphon, float emptying auxiliary siphon
137/2607	. . . . . With pressure reducing inlet valve	137/2761	. . With discharge-controlling receiver
137/261	. . . . . Relief port through common sensing means	137/2768	. . . With float
137/2612	. . . . . Common sensor for both bypass or relief valve and other branch valve	137/2774	. . Periodic or accumulation responsive discharge
137/2615	. . . . . Bypass or relief valve opens as other branch valve closes	137/2781	. . . With manual control
137/2617	. . . . . Bypass or relief valve biased open	137/2788	. . . Control by filling auxiliary tank
137/262	. . . . . Increasing pressure progressively closes then reopens by-pass or relief valve	137/2795	. . . Float-operated inlet to siphon
137/2622	. . . . . Bypass or relief valve responsive to pressure downstream of outlet valve	137/2802	. . . Release of trapped air
137/2625	. . . . . Pilot valve	137/2808	. . . . Through float-operated vent
137/2627	. . . . . Outlet valve carried by bypass or relief valve	137/2815	. . . . Through liquid trap seal
137/263	. . . . . Plural sensors for single bypass or relief valve	137/2822	. . . . . Auxiliary liquid trap seal
137/2632	. . . . . Sensors interconnected by timing or restrictive orifice	137/2829	. . With strainer, filter, separator or sediment trap
137/2635	. . . . . Pilot valve operated	137/2836	. . With recorder, register, signal, indicator or inspection window
137/2637	. . . . . Mechanical movement between sensor and valve	137/2842	. . With flow starting, stopping or maintaining means
137/264	. . . . . Electrical control	137/2849	. . . Siphon venting or breaking
137/2642	. . . . . Sensor rigid with valve	137/2856	. . . With leakage or entrained air removal
137/2645	. . . . . Flexible sensor	137/2863	. . . Pressure applied to liquid in supply chamber
137/2647	. . . . . Pressure responsive outlet valve	137/287	. . . Plunge or immersion starting
137/265	. . . Plural outflows	137/2877	. . . Pump or liquid displacement device for flow passage
137/2652	. . . . Single actuator operates plural outlets simultaneously	137/2883	. . . . Piston
137/2655	. . . . Biased open isolation valve	137/289	. . . . . Co-axial within flow passage
137/2657	. . . . Flow rate responsive	137/2897	. . . . Collapsible bulb
137/266	. . . . . Primer valve	137/2904	. . . Siphon inlet movable to and from seat
137/2663	. . . . Pressure responsive	137/2911	. . . With valve or closure in-flow passage
		137/2917	. . With means for mounting and/or positioning relative to siphon chamber

- 137/2924 . . Elements
- 137/2931 . Diverse fluid containing pressure systems
- 137/2934 . . Gas lift valves for wells
- 137/2937 . . Gas pressure discharge of liquids feed traps [e.g., to boiler]
- 137/294 . . . Gas pressure controlled by amount of liquids in boiler or discharge receiver
- 137/2943 Pressure connection at liquid level in boiler or discharge receiver
- 137/2947 . . . Gas pressure controlled by amount of liquid in trap
- 137/295 Plural trap chambers
- 137/2953 Gravitating
- 137/2956 Gravitating vessel
- 137/2959 Sinking or bucket type float
- 137/2962 Pivoted vessel with fluid passage through pivot
- 137/2965 Float responsive
- 137/2968 Liquid control valve positively actuated
- 137/2971 Gas condensing type
- 137/2975 Gas inlet and outlet valves unitary
- 137/2978 . . . Gas pressure controlled by manual or cyclic means
- 137/2981 Movable trap chamber
- 137/2984 . . Foam control in gas charged liquids
- 137/2987 . . . Level or pressure responsive
- 137/299 . . . Separate handling of foam
- 137/2993 . . . With conditioning trap or chamber
- 137/2996 Recarbonation
- 137/30 With trap or chamber by-pass
- 137/3003 . . Fluid separating traps or vents
- 137/3006 . . . Liquids separated from liquid
- 137/3009 . . . Plural discriminating outlets for diverse fluids
- 137/3012 Common actuator for control valves
- 137/3015 Choke or restricted passage gas bleed
- 137/3018 From above liquid level
- 137/3021 . . . Discriminating outlet for liquid
- 137/3024 With alternately operated inlet and outlet valves
- 137/3028 With non-discriminating gas vent or liquid discharge
- 137/3031 Abnormal pressure responsive liquid blow-off or drain
- 137/3034 Manual control
- 137/3037 With auxiliary inlet or by-pass valve
- 137/304 With fluid responsive valve
- 137/3043 Successively opened valves
- 137/3046 Gas collecting float [e.g., inverted bucket]
- 137/3049 Downstream from valve
- 137/3052 Level responsive
- 137/3056 Weight or pressure
- 137/3059 Gravitating vessel
- 137/3062 Sinking or bucket type float
- 137/3065 Servo-control
- 137/3068 Float
- 137/3071 With main line gas outlet from trap chamber
- 137/3074 With outlet extending above liquid in trap
- 137/3077 Servo-control
- 137/308 With pressure balanced outlet valve
- 137/3084 . . . Discriminating outlet for gas
- 137/3087 With reverse flow stop or pressure regulating valve
- 137/309 Fluid sensing valve
- 137/3093 With vaporized liquid stop
- 137/3096 With separate return for condensate
- 137/3099 Float responsive
- 137/3102 . . . With liquid emptying means
- 137/3105 Self-emptying
- 137/3109 . . Liquid filling by evacuating container
- 137/3112 . . Main line flow displaces additive from shunt reservoir
- 137/3115 . . Gas pressure storage over or displacement of liquid
- 137/3118 . . . Surge suppression
- 137/3121 . . . With return of liquid to supply
- 137/3124 . . . Plural units
- 137/3127 . . . With gas maintenance or application
- 137/313 Gas carried by or evolved from liquid
- 137/3133 Gas injectors
- 137/3137 Gas injected by liquid pressure or flow
- 137/314 Unitary mounting for gas pressure inlet and liquid outlet
- 137/3143 . . . With liquid level responsive gas vent or whistle
- 137/3146 Combined high and low level responsive
- 137/3149 . Back flow prevention by vacuum breaking [e.g., anti-siphon devices]
- 137/3185 . . Air vent in liquid flow line
- 137/3222 . . . With liquid seal in liquid flow line
- 137/3258 Automatic valve in vent line
- 137/3294 . . . Valved
- 137/3331 With co-acting valve in liquid flow path
- 137/3367 . Lerner-Johnson type valves; i.e., telescoping internal valve in expanded flow line section
- 137/3421 . . Line condition change responsive
- 137/3476 . . Internal servo-motor with internal pilot valve
- 137/353 . . . Pilot controlled passage in nose or needle
- 137/3584 . Inflatable article [e.g., tire filling chuck and/or stem]
- 137/36 . . With pressure-responsive pressure-control means
- 137/3615 . . . Pulsating
- 137/3631 . . . Diaphragm, bellows or expansible tube
- 137/3646 . . . Co-axial inflation and relief valves
- 137/3662 . . With gauge or indicator
- 137/3677 . . . With deflating means
- 137/3693 . . . Selectively connected
- 137/3709 . . Stem attached relief valve
- 137/3724 . . With coupling means
- 137/374 . . With cap
- 137/3755 . . . Valve actuating, assembling or locking means on cap
- 137/3771 Valve manually seated
- 137/3786 . . Removable valve head and seat unit [valve insides]
- 137/3802 . With vehicle guide or support, e.g., service station
- 137/402 . Distribution systems involving geographic features
- 137/4238 . With cleaner, lubrication added to fluid or liquid sealing at valve interface
- 137/4245 . . Cleaning or steam sterilizing
- 137/4252 . . . Reverse fluid flow
- 137/4259 . . . With separate material addition
- 137/4266 . . . Steam sterilizing
- 137/4273 . . . Mechanical cleaning
- 137/428 Valve grinding motion of valve on seat

137/4287	. . . . .	Concentric stem	137/474	. .	With housings, supports or stacking arrangements
137/4294	. . . . .	Spring pressed	137/4757	. .	Battery or electrolytic cell replenishment
137/4301	. . . . .	Lost motion permits grinding	137/4774	. . .	Barometric supply
137/4308	. . . . .	With swivel-preventing means	137/479	. .	Flow dividing compartments
137/4315	. . . . .	Nut releasable from body and/or stem	137/4807	. .	Tank type manifold [i.e., one tank supplies or receives from at least two others]
137/4322	. . . . .	With independent grinding actuator	137/4824	. .	Tank within tank
137/4329	. . . . .	Separable	137/4841	. .	With cross connecting passage
137/4336	. . . . .	Cleaning member reciprocates in passage	137/4857	. .	With manifold or grouped outlets
137/4343	. . . . .	By-pass cleaning	137/4874	. . .	Tank truck type
137/4351	. . . . .	Independent actuation	137/4891	. .	With holder for solid, flaky or pulverized material to be dissolved or entrained
137/4358	. .	Liquid supplied at valve interface	137/5109	. .	Convertible
137/4365	. . .	Plural feed	137/5153	. .	Reversible check
137/4372	. . .	Line pressure feed	137/5196	. .	Unit orientable in a single location between plural positions
137/4379	. . .	Feed by or with actuation	137/524	. . .	Reversible stop and vent or waste
137/4386	. . .	Loss control	137/5283	. .	Units interchangeable between alternate locations
137/4393	. . .	Screw feed	137/5327	. .	Hydrant type
137/44	. . . . .	With check valve	137/5333	. .	Water crane type
137/4407	. . . . .	Excess relief	137/5339	. . .	Spout operated valve
137/4414	. . . . .	Jacking	137/5345	. . .	Rotating riser
137/4421	. . . . .	Jacking	137/535	. . . .	Spout articulated to riser
137/4428	. . . . .	Seating	137/5356	. . . .	Vertically movable riser
137/4435	. . .	Spring biased piston feed	137/5362	. . .	Extensible spout
137/4442	. . .	External pressure	137/5368	. . .	Spout articulated to riser
137/4449	. . .	Gravity or capillary feed	137/5374	. .	Plural riser
137/4456	. .	With liquid valves or liquid trap seals	137/538	. .	Expansible chamber operated by valve actuator for draining riser
137/4463	. .	Liquid seal in liquid flow line; flow liquid forms seal	137/5386	. .	With pump or ejector
137/4471	. . .	Valves	137/5392	. .	Removable valve and valve seat
137/4478	. . . . .	Line condition change responsive	137/5397	. . .	With extension to facilitate removal
137/4486	. . . . .	Plural valves or valve seats	137/5403	. .	Removable valve with supplemental check valve
137/4493	. . . . .	Pivoted valve	137/5409	. .	Movable riser actuated valve
137/4501	. . . . .	Ball valve	137/5415	. . .	Reciprocating riser
137/4508	. . . . .	Seats vertically up	137/5421	. . . .	Piston type valve
137/4516	. . .	Seal replenishers	137/5427	. .	Balanced valve
137/4523	. . .	Plural inlet	137/5433	. .	Valve actuator extends laterally from bottom of riser
137/4531	. . .	Divided and recombined passages	137/5438	. .	Valve actuator outside riser
137/4538	. . .	Tangential inlet flow	137/5444	. . .	Lever actuator
137/4546	. . .	Downward partition encircles projecting outlet	137/545	. . .	With casing, flush with ground or pavement surface
137/4553	. . .	Submerged inlet pipe end	137/5456	. .	With casing
137/4561	. . . .	Hinged seal bowl	137/5462	. . .	Flush with ground or pavement surface
137/4568	. . . .	Distinct seal bowl in flow line connected casing	137/5468	. . .	Cap, cover or hood
137/4576	. . .	U-seals	137/5474	. . .	With heater
137/4583	. . . .	Topside access beneath cover plate closed floor opening	137/5479	. .	With actuator lubricating means
137/4591	. . . .	Enlarged upflow leg	137/5485	. .	With valve at outlet
137/4598	. . . .	Topside access opening	137/5491	. .	With supplemental valve
137/4606	. . . .	Even diameter legs	137/5497	. .	Protection against freezing
137/4613	. . . .	Access opening	137/5503	. . .	Stop and waste
137/4621	. .	Seal for relatively movable valving parts	137/5509	. . . .	With disabling means
137/4628	. . .	Horizontally moving valve	137/5515	. . . .	Separate relatively movable valves with single actuator
137/4636	. . . .	Rotary	137/5521	. . . . .	Unidirectional abutting connection between main valve or actuator and waste valve
137/4643	. .	Liquid valves	137/5526	. . . . .	With screw or gear in actuating mechanism
137/4651	. . .	Branched passage for sealing liquid	137/5532	. . . .	Reciprocating relatively fixed valves
137/4658	. . .	With auxiliary means for varying liquid level	137/5538	. . . . .	Waste through lower valve guide
137/4666	. . .	With baffle			
137/4673	. .	Plural tanks or compartments with parallel flow			
137/469	. .	Sequentially filled and emptied [e.g., holding type]			
137/4707	. . .	With relative rotation of tank group and filling head			
137/4723	. . . .	With rotary filling and emptying head			

137/5544	. Reversing valves - regenerative furnace type	137/613	. . . With valved closure or bung
137/5617	. . With cooling	137/6133	. . . . Combined rotary and longitudinal movement of valve
137/5689	. . Rotary reversing valve	137/6137	. . . . Longitudinal movement of valve
137/5762	. With leakage or drip collecting	137/614	. . . . Rotary movement of valve
137/5835	. . Relatively movable receptacle or drain pipe and outlet	137/6144	. . . With core ejectors
137/5907	. . Collector for waste liquid derived from solid, gas or vapor	137/6147	. . . . Impact operated
137/598	. With repair, tapping, assembly, or disassembly means	137/615	. . Foot valve extraction from top of enclosure
137/5983	. . Blow out preventer or choke valve device [e.g., oil well flow controlling device, etc.]	137/6154	. . With disassembly tool engaging feature
137/5987	. . Solenoid or electromagnetically operated valve	137/6157	. . . Wrench engaging lugs
137/599	. . Pressure regulating type valve	137/6161	. . With provision of alternate wear parts
137/5994	. . . Diaphragm type	137/6164	. . . Valve heads and/or seats
137/5997	. . Gas or water meter replacing	137/6167	. . . . Opposite duplicate surfaces of unitary structure
137/60	. . Assembling or disassembling flexible tube or sleeve type valve	137/6171	. . . . . Homogeneous material
137/6004	. . Assembling or disassembling float or float valve	137/6174	. . . . . Valve heads
137/6007	. . Assembling or disassembling multi way valve	137/6178	. . . . Different portions of continuous surfaces
137/6011	. . Assembling, disassembling, or removing cartridge type valve [e.g., insertable and removable as a unit, etc.]	137/6181	. . . . Successively used adjacent independent elements
137/6014	. . . Faucet type [e.g., domestic water use, etc.]	137/6184	. . Removable valve with normally disabled supplemental check valve
137/6017	. . . . Including removable valve head and seat unit	137/6188	. . . Check valve disabled by normally movable main valve part
137/6021	. . . . Including mechanical movement actuator	137/6191	. . . . Ball check
137/6024	. . . . Particular handle or handle fastening means	137/6195	. . . . Spring bias
137/6028	. . Assembling or disassembling pivoted valve	137/6198	. Non-valving motion of the valve or valve seat
137/6031	. . Assembling or disassembling rotary valve	137/6253	. . Rotary motion of a reciprocating valve
137/6035	. . . Rotary ball valve	137/6307	. . . Turbine on valve
137/6038	. . . . Particular valve seat or interface seal	137/6362	. . . Manual rotating means
137/6041	. . . . . Replaceable	137/6416	. With heating or cooling of the system
137/6045	. . . . . With top entry valve	137/6443	. . With burner
137/6048	. . . Butterfly valve	137/647	. . . Flue extending through fluid
137/6052	. . . . Having valve head or seat packing	137/6497	. . Hot and cold water system having a connection from the hot to the cold channel
137/6055	. . . . With head and stem collections	137/6525	. . Air heated or cooled [fan, fins, or channels]
137/6058	. . . Plug valve	137/6552	. . With diversion of part of fluid to heat or cool the device or its contents
137/6062	. . . . Having retainer at actuator end	137/6579	. . Circulating fluid in heat exchange relationship
137/6065	. . Assembling or disassembling reciprocating valve	137/6606	. . With electric heating element
137/6069	. . . Having particularly packed or sealed mechanical movement actuator	137/6633	. With fluid system support for workman or non-system material
137/6072	. . . Gate valve	137/6851	. With casing, support, protector or static constructional installations
137/6075	. . . . Bifaced	137/6855	. . Vehicle
137/6079	. . . . Having particular valve seat	137/6858	. . . Locomotive
137/6082	. . . . . Including seal	137/6862	. . . . Boiler or steam dome
137/6086	. . Assembling or disassembling check valve	137/6866	. . . Railway car
137/6089	. . With mechanical movement between actuator and valve	137/6869	. . . . Car frame
137/6092	. . . Plural motions of valve	137/6873	. . . . End of car
137/6096	. . . Lever type	137/6877	. . . . Roof, wall or floor
137/6099	. . . Gear type	137/6881	. . . Automotive
137/6103	. . . Cam type	137/6884	. . . . Steering post or wheel
137/6106	. . . Screw type	137/6888	. . . . Dash
137/6109	. . Tool for applying or removing valve or valve member	137/6892	. . . . Floor or frame
137/6113	. . . Including sealing feature	137/6895	. . . . Fender or running board
137/6116	. . With holding means functioning only during transportation assembly or disassembly	137/6899	. . . With hose reel storage means
137/612	. . Tapping a pipe, keg, or apertured tank under pressure	137/6903	. . . Guided by means of track or guideway
137/6123	. . . With aperture forming means	137/6906	. . . Aerial or water-supported [e.g., airplane or ship, etc.]
137/6126	. . . Imperforate closure removing and holding tap	137/691	. . . With retractable or nonuse-positionable support wheel

137/6914	. . . Vehicle supports fluid compressor and compressed fluid storage tank	137/7313	. . . Control of outflow from tank
137/6918	. . . With hose storage or retrieval means	137/7316	. . . Self-emptying tanks
137/6921	. . . With means for plural hoses	137/7319	. . . . By float
137/6925	. . . With flow regulation responsive to hose movement	137/7323	. . . By float
137/6929	. . . . Reel type	137/7326	. . . . Low level safety cut-off
137/6932	. . . With retrieval means	137/7329	. . With supplemental or safety closing means or bias
137/6936	. . . . Power stop or brake	137/7332	. . . Sinking or bucket type float
137/694	. . . . . Responsive to position of hose in casing	137/7336	. . . Gravitating tank
137/6943	. . . . Biased to retracted position	137/7339	. . By weight of accumulated fluid
137/6947	. . . . . Boom type	137/7342	. . . In sinking or bucket type float
137/6951	. . . . . Weighted	137/7345	. . . Oil burner fuel overflow preventing safety cut-offs
137/6954	. . . Reel with support therefor	137/7349	. . . In communicating measuring vessel
137/6958	. . . . Ground supported	137/7352	. . . . Top and bottom connections
137/6962	. . . Basket or holder for folded coiled hose	137/7355	. . . In gravitating tank
137/6966	. . Static constructional installations	137/7358	. . By float controlled valve
137/6969	. . . Buildings	137/7361	. . . Valve opened by external means, closing or closing control by float
137/6973	. . . . Outside access to portions of the system	137/7365	. . . Single float controls plural valves
137/6977	. . . . Escutcheon type support	137/7368	. . . Servo relay operation of control
137/698	. . . . Wall	137/7371	. . . . Fluid pressure
137/6984	. . . . . Recessed gas outlet box	137/7374	. . . . . Flexible diaphragm valve
137/6988	. . . . Floor installation	137/7378	. . . . . From tank
137/6991	. . . Ground supporting enclosure	137/7381	. . . Quick acting
137/6995	. . . . Valve and meter wells	137/7384	. . . . Pilot float released
137/6999	. . . . . With means to center well on valve	137/7387	. . . . Over center mechanism
137/7002	. . . . . Detachable base plate	137/7391	. . . . . Shifting weight
137/7006	. . . . . Vertical casing aligned by valve casing	137/7394	. . . . Trip mechanism
137/701	. . . . . Combined with actuator	137/7397	. . . . . Weight or spring bias
137/7014	. . . . . Telescopic well casing	137/74	. . . . Lost motion mechanism
137/7017	. . . . . Telescopic well casing	137/7404	. . . Plural floats
137/7021	. . . . . Covers	137/7407	. . . With counter-balance
137/7025	. . . . Pipe line transport	137/741	. . . . Within tank
137/7028	. . . Tapering or tower type	137/7413	. . . Level adjustment or selection means
137/7032	. . Furniture and housing furnishings	137/7417	. . . With float leakage disposal
137/7036	. . Jacketed	137/742	. . . In separate communicating float chamber
137/7039	. . Tank supports	137/7423	. . . Rectilinearly traveling float
137/7043	. . Guards and shields	137/7426	. . . . Float co-axial with valve or port
137/7047	. . . Resilient abutment for preventing breakage	137/743	. . . . . Float is spreader or anti-splash means
137/7051	. . . Nozzle abutment for scratch or damage prevention	137/7433	. . . . . Float surrounds inlet pipe
137/7054	. . . Cover for beer cooler aperture for faucet	137/7436	. . . . . Float rigid with valve
137/7058	. . . Sanitary covers or shields	137/7439	. . . Float arm operated valve
137/7062	. . . Valve guards	137/7442	. . . . With valve retarder or cushion means
137/7065	. . . . With means for accommodating a detachable actuator	137/7446	. . . . With flow guide or restrictor
137/7069	. With lock or seal	137/7449	. . . . . External hood or deflector or annular outlet surrounding the inlet pipe
137/71	. . With seal	137/7452	. . . . . Movable nozzle or inlet terminal
137/7131	. . Common lock and valve actuator	137/7455	. . . . Valve removable from outside container
137/7162	. . . Combination lock	137/7459	. . . . With U-shaped inlet pipe having terminal valve
137/7194	. . . Biased valve	137/7462	. . . . With refill pipe
137/7225	. . . Mechanical movement between lock and valve	137/7465	. . . . Assembly mounted on and having reciprocating valve element coaxial with inlet pipe
137/7256	. . Locks against rotary motion	137/7468	. . . . . Horizontal or side entering pipe
137/7287	. Liquid level responsive or maintaining systems	137/7472	. . . . . Vertical inlet riser
137/729	. . Washing machine cycle control	137/7475	. . . . With toggle or second lever connected to valve
137/7293	. . Liquid excluding devices for gas inlet or outlets	137/7478	. . . . With interposed cam, gear or threaded connection
137/7297	. . With second diverse control	137/7481	. . . . Rotary valve element
137/73	. . . Manual control		
137/7303	. . Control of both inflow and outflow of tank		
137/7306	. . Electrical characteristic sensing		
137/731	. . With control fluid connection at desired liquid level		

137/7485	. . . . Pivoted valve	137/7771	. . Bi-directional flow valves
137/7488	. . . . Ball valves	137/7772	. . . One head and seat carried by head of another
137/7491	. . . . Balanced valves	137/7773	. . . . Supporting valve only spring biased
137/7494	. . . . Flexible valve	137/7774	. . . . Supporting valve spring carried by supporting valve
137/7498	. . Barometric	137/7775	. . . . . Spring stop on supported valve stem
137/7501	. . . With shut-off between supply tank and receiver	137/7776	. . . . . Spring abuts guide for supported valve stem
137/7504	. Removable valve head and seat unit	137/7777	. . . . . Both valves spring biased
137/7559	. . Pump type	137/7778	. . . Axes of ports perpendicular
137/7613	. . Threaded into valve casing	137/7779	. . . Axes of ports parallel
137/7668	. . Retained by bonnet or closure	137/778	. . . Axes of ports co-axial
137/7722	. Line condition change responsive valves	137/7781	. . With separate connected fluid reactor surface
137/7723	. . Safety cut-off requiring reset	137/7782	. . . With manual or external control for line valve
137/7724	. . . Thermal	137/7783	. . . Valve closes in responses to reverse flow
137/7725	. . . Responsive to both high and low pressure or velocity	137/7784	. . . Responsive to change in rate of fluid flow
137/7726	. . . Responsive to change in rate of flow	137/7785	. . . . Valve closes in response to excessive flow
137/7727	. . . . Excessive flow cut-off	137/7786	. . . . Turbine or swinging vane type reactor
137/7728	. . . High pressure cut-off	137/7787	. . . . Expansible chamber subject to differential pressures
137/7729	. . . Reset by pressure equalization valve or by-pass	137/7788	. . . . . Pressures across fixed choke
137/773	. . . Fluid released trip	137/7789	. . . . . With Venturi tube having a connection to throat
137/7731	. . . Fluid counter-biased or unseated valve	137/7791	. . . . . Pressures across flow line valve
137/7732	. . . . With mechanical stop against reopening	137/7792	. . . . . Movable deflector or choke
137/7733	. . . . With fluid pressure seating of valve	137/7793	. . . With opening bias [e.g., pressure regulator]
137/7734	. . Fluid opened valve requiring reset	137/7794	. . . . With relief valve
137/7736	. . Consistency responsive	137/7795	. . . . Multi-stage
137/7737	. . Thermal responsive	137/7796	. . . . Senses inlet pressure
137/7738	. . Pop valves	137/7797	. . . . Bias variable during operation
137/7739	. . . Pop closing valves	137/7798	. . . . . Ancillary reactor surface responds to inlet pressure
137/774	. . . Pop pressure reactor in inflow to valve	137/7799	. . . . . Liquid transfer
137/7741	. . . Pop pressure reactor in branched released path	137/78	. . . . . Weight
137/7742	. . . . Separate relief valves or valves for each branch	137/7801	. . . . Balanced valve
137/7743	. . . Lost motion between pop pressure reactor and valve	137/7802	. . . . Liquid level responsive gas flow control
137/7744	. . . Adjustable choke	137/7803	. . . . With protective separator
137/7745	. . . . Annular lip or baffle	137/7804	. . . . Main flow through isolated reactor chamber
137/7746	. . . . . On movable valve part	137/7805	. . . . Through external pipe
137/7747	. . . . . Screw threaded	137/7806	. . . . . Modified valve casing
137/7748	. . Combustion engine induction type	137/7807	. . . . . Adjustable external lever
137/7749	. . . Valve in auxiliary inlet to induction line	137/7808	. . . . Apertured reactor surface surrounds flow line
137/775	. . . With manual modifier	137/7809	. . . . Reactor surface separated by apertured partition
137/7751	. . . With suction compensator	137/781	. . . . . In valve stem
137/7752	. . . With separate reactor surface	137/7811	. . . . . Also through reactor surface
137/7753	. . . Unbalanced pivoted valve [e.g., unbalanced butterfly type]	137/7812	. . . . . Valve stem passes through the aperture
137/7754	. . Line flow effect assisted	137/7813	. . . . . Plural reactor surfaces
137/7755	. . . Reactor surface normal to flow	137/7814	. . . . . Reactor is an inverted cup having liquid seal
137/7756	. . . Reactor surface separated from flow by apertured partition	137/7815	. . . . . With movement dampener
137/7757	. . . . Through separate aperture	137/7816	. . . . . Valve head in inlet chamber
137/7758	. . Pilot or servo controlled	137/7818	. . . . . Valve head in inlet chamber
137/7759	. . . Responsive to change in rate of fluid flow	137/7819	. . . . . Rectilinear valve stem rigid with reactor surface
137/776	. . . . Control by pressures across flow line valve	137/782	. . . . . Reactor surface is diaphragm
137/7761	. . . Electrically actuated valve	137/7821	. . . . . With valve closing bias
137/7762	. . . Fluid pressure type	137/7822	. . . . Reactor surface closes chamber
137/7764	. . . . Choked or throttled pressure type	137/7823	. . . . . Valve head in inlet chamber
137/7765	. . . . . Pilot valve within main valve head	137/7824	. . . . . Reactor surface is inverted cup [float]
137/7766	. . . . . Choked passage through main valve head	137/7825	. . . . . Rectilinear valve stem rigid with reactor surface
137/7767	. . . . . Loose fitting piston		
137/7768	. . . . . Pilot controls supply to pressure chamber		
137/7769	. . . . Single acting fluid servo		
137/777	. . . . . Spring biased		

137/7826	. . . . .	With valve closing bias	137/7879	. . .	Resilient material valve
137/7827	. . . . .	In reactor chamber	137/788	. . . .	Having expansible port
137/7828	. . . . .	Valve head on yoke	137/7881	. . . . .	Apertured plate
137/7829	. . . . .	Yoke has valve closing bias	137/7882	. . . . .	Having exit lip
137/783	. . . . .	Reactor operatively connected to valve by mechanical movement	137/7883	. . . . .	With biasing means
137/7831	. . . .	With mechanical movement between actuator and valve	137/7884	. . . . .	Side vent
137/7832	. . .	Plural valves biased closed	137/7885	. . . . .	Multiple slit
137/7833	. . .	With means for mounting or connecting to system	137/7886	. . . . .	Internally extending mount
137/7834	. . .	Valve seat or external sleeve moves to open valve	137/7887	. . . .	Center flexing strip
137/7835	. . .	Valve seating in direction of flow	137/7888	. . . .	With valve member flexing about securement
137/7836	. . . .	Flexible diaphragm or bellows reactor	137/7889	. . . . .	Sleeve
137/7837	. .	Direct response valves [i.e., check valve type]	137/789	. . . . .	Central mount
137/7838	. . .	Plural	137/7891	. . . . .	Flap or reed
137/7839	. . . .	Dividing and recombining in a single flow path	137/7892	. . . . .	With stop
137/784	. . . . .	Integral resilient member forms plural valves	137/7893	. . . . .	With spring
137/7841	. . . .	One valve carries head and seat for second valve	137/7894	. . . . .	With weight
137/7842	. . . .	Diverse types	137/7895	. . . . .	Peripherally secured diaphragm
137/7843	. . . .	Integral resilient member forms plural valves	137/7896	. . . .	Annulus
137/7845	. . . .	With common biasing means	137/7897	. . .	Vacuum relief type
137/7846	. . . .	Mechanically interconnected	137/7898	. . .	Pivoted valves
137/7847	. . .	With leak passage	137/79	. . . .	Head retained by removable closure
137/7848	. . . .	Permits flow at valve interface	137/7901	. . . .	Valve head movably connected for accommodation to seat
137/7849	. . . .	Bypass in valve casing	137/7902	. . . .	Valve mounted on end of pipe
137/785	. . .	With retarder or dashpot	137/7903	. . . .	Weight biased
137/7851	. . . .	End of valve forms dashpot chamber	137/7904	. . .	Reciprocating valves
137/7852	. . . .	End of valve moves inside dashpot chamber	137/7905	. . . .	Plural biasing means
137/7853	. . . . .	Enlarged piston on end of valve stem	137/7906	. . . .	Cam means for adjusting and fixing bias
137/7854	. . .	In couplings for coaxial conduits, e.g., drill pipe check valves	137/7907	. . . .	Varying effective lever arm
137/7855	. . . .	Valve seat threaded into a coupling element	137/7908	. . . .	Weight biased
137/7856	. . . .	Valve seat formed on or carried by a coupling element	137/7909	. . . . .	Valve body is the weight
137/7857	. . . .	Valve seat clamped between coupling elements	137/791	. . . . .	Ball valves
137/7858	. . .	With means for selecting area of valve or seat	137/7911	. . . . .	Removable cage
137/7859	. . .	Single head, plural ports in parallel	137/7912	. . . . .	Separable seat
137/786	. . . .	Concentric ports	137/7913	. . . . .	Guided head
137/7861	. . . .	Annular head	137/7914	. . . . .	Cage
137/7862	. . . . .	Central post on seat	137/7915	. . . . .	Guide stem
137/7863	. . . . .	Stop	137/7916	. . . . .	With closing stop
137/7864	. . . . .	With guide	137/7917	. . . . .	Oppositely disposed
137/7865	. . . . .	Guide	137/7918	. . . . .	Head slidable on guide rod
137/7866	. . .	Plural seating	137/7919	. . . . .	Guide and seat integral unit
137/7867	. . . .	Sequential	137/792	. . . . .	Guide and closure integral unit
137/7868	. . . . .	Resilient gasket	137/7921	. . . . .	Weight coaxial with valve
137/7869	. . .	Biased open	137/7922	. . . .	Spring biased
137/787	. . . .	Oppositely swinging vanes	137/7923	. . . . .	With means to protect spring from fluid
137/7871	. . . .	Weight biased	137/7924	. . . . .	Spring under tension
137/7873	. . . . .	Ball valves	137/7925	. . . . .	Piston-type valves
137/7874	. . . . .	Edge pivoted valve	137/7927	. . . . .	Ball valves
137/7875	. . . .	Pivoted valves	137/7928	. . . . .	With follower
137/7876	. . .	With external means for opposing bias	137/7929	. . . . .	Spring coaxial with valve
137/7877	. . . .	With means for retaining external means in bias opposing position	137/793	. . . . .	Broken valve parts retainer
137/7878	. . .	With bias adjustment indicator	137/7931	. . . . .	Spring in inlet
			137/7932	. . . . .	Valve stem extends through fixed spring abutment
			137/7933	. . . . .	Yoke or cage-type support for valve stem
			137/7934	. . . . .	Spring abuts removable valve stem guide
			137/7935	. . . . .	Head slides on guide-rod concentric with spring
			137/7936	. . . . .	Spring guides valve head

137/7937	. . . . .	Cage-type guide for stemless valves	137/86163	. . . .	Parallel
137/7938	. . . . .	Guide means integral and coplanar with valve disk	137/86171	. . .	With pump bypass
137/7939	. . . . .	Head between spring and guide	137/86179	. . .	Drain valve actuator mounted on pump
137/794	.	With means for separating solid material from the fluid	137/86187	. .	Plural tanks or compartments connected for serial flow
137/7976	. .	Plural separating elements	137/86196	. . .	Separable with valved-connecting passage
137/8013	. .	Sediment chamber	137/86204	. . .	Fluid progresses by zigzag flow
137/8049	. .	Movable strainer	137/86212	. . .	Plural compartments formed by baffles
137/8085	. .	Hollow strainer, fluid inlet and outlet perpendicular to each other	137/8622	. . .	Plural top-to-bottom connected tanks
137/8122	. .	Planar strainer normal to flow path	137/86228	. . .	With communicating opening in common walls of tanks or compartments
137/8158	.	With indicator, register, recorder, alarm or inspection means	137/86236	. .	Tank with movable or adjustable outlet or overflow pipe
137/8175	. .	Plural	137/86244	. . .	Horizontally traversing outlet
137/8192	. . .	Unobvious - "combination lock" type	137/86252	. . .	Float-supported outlet
137/8208	. .	Time	137/8626	. . .	Swinging outlet pipe or spout
137/8225	. .	Position or extent of motion indicator	137/86268	. .	With running joint between movable parts of system
137/8242	. . .	Electrical	137/86276	. .	Movable tank
137/8259	. . .	Selection from plural branches	137/86284	. .	With antisplash means not in flow passage
137/8275	. . .	Indicator element rigidly carried by the movable element whose position is indicated	137/86292	. .	System with plural openings, one a gas vent or access opening
137/8292	. . . .	Movable indicator element is a pointer	137/863	. . .	Access and outlet
137/8309	. . . . .	Pointer integral with handle	137/86308	. . . .	Tank access opening and bottom outlet
137/8326	. .	Fluid pressure responsive indicator, recorder or alarm	137/86316	. . . . .	Access opening interlock or telltale on outlet valve actuator
137/8342	. .	Liquid level responsive indicator, recorder or alarm	137/86324	. . .	Tank with gas vent and inlet or outlet
137/8359	. .	Inspection means	137/86332	. . . .	Vent and inlet or outlet in unitary mounting
137/8376	.	Combined	137/8634	. . .	With vented outlet
137/8593	.	Systems	137/86348	. .	Tank with internally extending flow guide, pipe or conduit
137/85938	. .	Non-valved flow dividers	137/86356	. . .	Nondraining overflow type
137/85946	. .	Faucet connected, sink drained	137/86364	. . .	Inverted "U" passage
137/85954	. .	Closed circulating system	137/86372	. . .	Inlet internally extending
137/85962	. . .	With thermal circulating means [thermo-siphons]	137/86381	. .	Head-establishing standpipe or expansion chamber [e.g., surge tanks]
137/8597	. .	Main line as motive fluid for follower-type feeder	137/86389	. .	Programmer or timer
137/85978	. .	With pump	137/86397	. . .	With independent valve controller
137/85986	. . .	Pumped fluid control	137/86405	. . .	Repeating cycle
137/85994	. . . .	Manual	137/86413	. . . .	Self-cycling
137/86002	. . . .	Fluid pressure responsive	137/86421	. . . .	Variable
137/8601	. . . . .	And pilot valve	137/86429	. . . . .	Attachable and removable element
137/86019	. . . . .	Direct response valve	137/86437	. . . . .	Adjustable cam
137/86027	. . . .	Electric	137/86445	. . .	Plural, sequential, valve actuations
137/86035	. . .	Combined with fluid receiver	137/86453	. . . .	Plural trips or trip actuations
137/86043	. . . .	Reserve or surge receiver	137/86461	. . . .	Variable cycle
137/86051	. . . .	Compressed air supply unit	137/86469	. . .	Clock alarm mechanism controlled
137/86059	. . . .	Hydraulic power unit	137/86477	. . .	Biased latch, cam operated
137/86067	. . . .	Fluid sump	137/86485	. .	Line condition change responsive release of valve
137/86075	. . .	And jet-aspiration type pump	137/86493	. .	Multi-way valve unit
137/86083	. . .	Vacuum pump	137/86501	. . .	Sequential distributor or collector type
137/86091	. . .	Resiliently mounted pump	137/86509	. . .	Sequentially progressive opening or closing of plural ports
137/86099	. . .	Hand pump	137/86517	. . . .	With subsequent closing of first port
137/86107	. . .	Multiple inlet with multiple outlet	137/86525	. . . . .	Flow combining with flow dividing
137/86115	. . .	Downstream cyclic distributor	137/86533	. . . . .	Rotary
137/86123	. . . .	Distributor part unitary with movable pump part	137/86541	. . . . .	Plug
137/86131	. . .	Plural	137/86549	. . .	Selective reciprocation or rotation
137/86139	. . . .	Serial	137/86558	. . .	Plural noncommunicating flow paths
137/86147	. . . . .	With single motive input	137/86566	. . . .	Rotary plug
137/86155	. . . . .	One pump driven by motive fluid from the other	137/86574	. . .	Supply and exhaust
			137/86582	. . . .	Pilot-actuated

137/8659	. . . . .	Variable orifice-type modulator	137/87048	. .	With preselecting means for plural valve actuator
137/86598	. . . . .	Opposed orifices; interposed modulator	137/87056	. .	With selective motion for plural valve actuator
137/86606	. . . . .	Common to plural valve motor chambers	137/87064	. . .	Oppositely movable cam surfaces
137/86614	. . . . .	Electric	137/87072	. . .	Rotation about either of two pivotal axes
137/86622	. . . . .	Motor-operated	137/8708	. . .	Rotation of actuator arm about its pivot and its axis
137/8663	. . . . .	Fluid motor	137/87088	. . .	Reciprocation along and rotation about same axis
137/86638	. . . . .	Rotary valve	137/87096	. .	Valves with separate, correlated, actuators
137/86646	. . . . .	Plug type	137/87105	. . .	Correlated across separable flow path joint
137/86654	. . . . .	For plural lines	137/87113	. . .	Interlocked
137/86662	. . . . .	Axial and radial flow	137/87121	. . .	Coaxial stems
137/8667	. . . . .	Reciprocating valve	137/87129	. . . .	Rotary
137/86678	. . . . .	Combined disk or plug and gate or piston	137/87137	. . . . .	And reciprocating
137/86686	. . . . .	Plural disk or plug	137/87145	. . . . .	Concentric, central valve removable
137/86694	. . . . .	Piston valve	137/87153	. .	Plural noncommunicating flow paths
137/86702	. . . . .	With internal flow passage	137/87161	. . .	With common valve operator
137/8671	. . . . .	With annular passage [e.g., spool]	137/87169	. .	Supply and exhaust
137/86718	. . .	Dividing into parallel flow paths with recombining	137/87177	. . .	With bypass
137/86726	. . . .	Valve with bypass connections	137/87185	. . . .	Controlled by supply or exhaust valve
137/86734	. . . .	With metering feature	137/87193	. . .	Pilot-actuated
137/86743	. . . .	Rotary	137/87201	. . . .	Common to plural valve motor chambers
137/86751	. . . . .	Plug	137/87209	. . . .	Electric
137/86759	. . . .	Reciprocating	137/87217	. . .	Motor
137/86767	. . . . .	Spool	137/87225	. . . .	Fluid motor
137/86775	. . . . .	With internal passage	137/87233	. . .	Biased exhaust valve
137/86783	. . . . .	Unequal heads	137/87241	. . . .	Biased closed
137/86791	. . . . .	Piston	137/87249	. .	Multiple inlet with multiple outlet
137/86799	. . . . .	With internal flow passage	137/87257	. .	Hydraulic brake line [e.g., hill holders]
137/86807	. . . . .	Sequential opening or closing of serial ports in single flow line	137/87265	. .	Dividing into parallel flow paths with recombining
137/86815	. . .	Multiple inlet with single outlet	137/87273	. . .	With fluid coupling [e.g., railway car hose coupling, truck-trailer oil system coupling, etc.]
137/86823	. . . .	Rotary valve	137/87281	. . .	System having plural inlets
137/86831	. . .	Selective opening of plural ports	137/8729	. . . .	Having digital flow controller
137/86839	. . .	Four port reversing valves	137/87298	. . .	Having digital flow controller
137/86847	. . .	Pivoted valve unit	137/87306	. . . .	Having plural branches under common control for separate valve actuators
137/86855	. . . .	Gate	137/87314	. . . . .	Electromagnetic or electric control [e.g., digital control, bistable electro control, etc.]
137/86863	. . .	Rotary valve unit	137/87322	. . .	With multi way valve having serial valve in at least one branch
137/86871	. . . .	Plug	137/8733	. . .	Fluid pressure regulator in at least one branch
137/86879	. . .	Reciprocating valve unit	137/87338	. . .	Flow passage with bypass
137/86887	. . . .	Combined disk or plug and gate or piston	137/87346	. . . .	Including mixing feature
137/86895	. . . .	Plural petcocks	137/87354	. . . .	Including flowmeter
137/86903	. .	Plural distributor or collector type	137/87362	. . . .	Including cleaning, treating, or heat transfer feature
137/86911	. .	Sequentially closing and opening alternately seating flow controllers	137/8737	. . . . .	Water treatment feature
137/86919	. .	Sequentially progressive opening or closing of plural valves	137/87378	. . .	Second valve assembly carried by first valve head
137/86928	. .	Sequentially progressive opening or closing of plural valves	137/87386	. . . .	With rotary plug having variable restrictor
137/86936	. . .	Pressure equalizing or auxiliary shunt flow	137/87394	. . . .	Carried valve is direct response valve [e.g., check valve, etc.]
137/86944	. . . .	One valve seats against other valve [e.g., concentric valves]	137/87402	. . .	With foam controlling means [e.g., beer, soda faucets]
137/86952	. . . . .	Locomotive throttle	137/8741	. . .	With common operator
137/8696	. . . . .	Gate	137/87418	. . . .	Balanced valve
137/86968	. . . . .	With balancing chamber	137/87426	. . . .	Single resilient member actuates or forms plural passages
137/86976	. . . . .	First valve moves second valve	137/87434	. . . .	Valves deform to close passage
137/86984	. . . . .	Actuator moves both valves			
137/86992	. . .	With subsequent closing of first opened port			
137/87	. . . .	Simultaneously moved port controllers			
137/87008	. . .	Screw-actuated differential valves			
137/87016	. . .	Lost motion			
137/87024	. . . .	Cam determines sequence			
137/87032	. . . .	Rotary concentric valves			
137/8704	. . . .	First valve actuates second valve			

137/87442 Rotary valve	137/87837 Spring bias
137/8745 Including rigid plate with flexible or resilient seal	137/87845 For valve having a ball head
137/87458 Axes of rotation of valves intersect at point	137/87853 With threaded actuator
137/87467 Axes of rotation parallel	137/87861 Spring coaxial with valve
137/87475 Adjacent plate valves always parallel	137/87869 Biased open
137/87483 Adjacent plate valves counter rotate	137/87877 . . . Single inlet with multiple distinctly valved outlets
137/87491 Mechanical movement between actuator and non-rotary valve	137/87885 . . . Sectional block structure
137/87499 . . . Fluid actuated or retarded	137/87893 . . . With fluid actuator
137/87507 . . . Electrical actuator	137/87901 . . . With threaded actuator
137/87515 . . . Mechanical movement between actuator and valve	137/87909 . . . Containing rotary valve
137/87523 . . . Rotary valve	137/87917 . . Flow path with serial valves and/or closures
137/87531 . . . Butterfly valve	137/87925 . . . Separable flow path section, valve or closure in each
137/87539 . . . Having guide or restrictor	137/87933 . . . Common joint and valve seat faces, or sections joined by closing members
137/87547 . . . Manually variable	137/87941 . . . Each valve and/or closure operated by coupling motion
137/87555 . . . Having direct response valve [e.g., check valve, etc.]	137/87949 Linear motion of flow path sections operates both
137/87563 With reverse flow direction	137/87957 Valves actuate each other
137/87571 . . Multiple inlet with single outlet	137/87965 Valve- or closure-operated by coupling motion
137/87579 . . . Faucet attachment	137/87973 Coupling interlocked with valve, or closure or actuator
137/87587 . . . Combining by aspiration	137/87981 . . . Common actuator
137/87595 Combining of three or more diverse fluids	137/87989 Delivery cock with terminal valve
137/87603 Plural motivating fluid jets	137/87997 Alternately seating
137/87611 Flow control by varying position of a fluid inlet relative to entrainment chamber	137/88005 Biased valve
137/87619 With selectively operated flow control means in inlet	137/88014 Opposed screw
137/87627 Flow control means is located in aspirated fluid inlet	137/88022 . . . One valve head provides seat for other head
137/87635 Single actuator operates flow control means located in both motivating fluid and aspirated fluid inlets	137/8803 Also carries head of other valve
137/87643 With condition responsive valve	137/88038 . . . One valve head carries other valve head
137/87652 . . . With means to promote mixing or combining of plural fluids	137/88046 . . . Biased valve with external operator
137/8766 With selectively operated flow control means	137/88054 . . . Direct response normally closed valve limits direction of flow
137/87668 Single actuator operates plural flow control means	137/88062 . . . Coaxial oppositely directed seats
137/87676 . . . With flow control	137/8807 . . Articulated or swinging flow conduit
137/87684 Valve in each inlet	137/88078 . . . Actuates valve
137/87692 With common valve operator	137/88086 Plural motions of valve
137/877 . . With flow control means for branched passages	137/88094 Reciprocating valve
137/87708 . . . With common valve operator	137/88102 Rotary valve
137/87716 For valve having a flexible diaphragm valving member	137/8811 . Frangible
137/87724 For valve having a ball head	137/9029 . With coupling
137/87732 With gearing	137/9138 . . Flexible
137/8774 Threaded actuator	137/9247 . With closure
137/87748 Pivoted or rotary motion converted to reciprocating valve head motion	137/9464 . Faucets and spouts
137/87756 Spring biased	137/9682 . Miscellaneous
137/87764 Having fluid actuator	
137/87772 With electrical actuation	
137/8778 Spring biased	
137/87788 . . . With valve or movable deflector at junction	
137/87796 Movable deflector spout in lateral port	
137/87804 Valve or deflector is tubular passageway	
137/87812 Pivoted valve or deflector	
137/8782 Rotary valve or deflector	
137/87829 . . . Biased valve	

Former US Class 152 Series**152/00 Resilient tires and wheels**

152/10 . Tires, resilient
152/10009 . . Emergency
152/10018 . . with splash guards
152/10027 . . with wear indicating feature
152/10036 . . Cushion and pneumatic combined
152/10045 . . . Metallic spring cushion
152/10054 . . . Enclosed cushion
152/10063 . . . Superimposed
152/10072 Plungers
152/10081 Edge-secured cushion
152/1009 Guide flanges

152/10099 Radial stops
 152/10108 Bolts or studs
 152/10117 . . . Integral
 152/10126 with removable inner tube
 152/10135 . . Armored
 152/10144 . . . Single tube tires internal
 152/10153 Metal
 152/10162 Plates
 152/10171 . . . Casing construction
 152/1018 Embedded
 152/10189 Metal
 152/10198 Plates
 152/10207 Annular
 152/10216 Linked mat
 152/10225 Woven
 152/10234 . . . Interliners
 152/10243 Cotton, fabric, or rubber
 152/10252 Metal
 152/10261 Scale armor
 152/1027 Annular
 152/10279 . . Cushion
 152/10288 . . . Sectional
 152/10297 Annular
 152/10306 Superimposed
 152/10315 Superimposed
 152/10324 with apertured external binders
 152/10333 Radial bolt secured
 152/10342 Abutting sections
 152/10351 with annular internal binders
 152/1036 Interfitting
 152/10369 Indented at joints
 152/10378 . . . Casing enclosed core
 152/10387 Separate core
 152/10396 Removable
 152/10405 Sponge rubber
 152/10414 with core compression
 152/10423 Superimposed rings
 152/10432 Sectional transversely
 152/10441 Balls
 152/1045 Integral structure
 152/10459 Recessed
 152/10468 Chambered
 152/10477 Perforated
 152/10486 Chambered
 152/10495 . . Pneumatic tire or inner tube
 152/10504 . . . Asymmetric tire
 152/10513 . . . Tire reinforcement material characterized by short length fibers or the like
 152/10522 . . . Multiple chamber
 152/10531 Cylinder and piston
 152/1054 Mutually free walls
 152/10549 Interfitting
 152/10558 Balls
 152/10567 with simultaneous inflating means
 152/10576 Annular chambers
 152/10585 with simultaneous inflating means
 152/10594 Mutually free walls
 152/10603 with simultaneous inflating means
 152/10612 with simultaneous inflating means
 152/10621 . . . Sectional casings
 152/1063 Circumferential

152/10639 Rigid inner sections
 152/10648 . . . with means restricting relative movement between tire and inner tube [e.g., anti-creep feature, etc.]
 152/10657 . . . with means to protect inner tube from rim
 152/10666 . . . Automatic sealing of punctures [e.g., self-healing, etc.]
 152/10675 Using flowable coating or composition
 152/10684 On inner surface of tubeless tire
 152/10693 Sealant in plural layers or plural pockets
 152/10702 within or part of construction of inflating inner tube
 152/10711 Sealant in plural layers or plural pockets
 152/1072 by compression
 152/10729 with reinflating means
 152/10738 . . . with means to protect tire from rim
 152/10747 . . . Means other than rim closing the tire opening
 152/10756 Positive casing closure
 152/10765 . . . Characterized by belt or breaker structure
 152/10774 Consisting of only one ply
 152/10783 Reinforcing plies made up from wound narrow ribbons
 152/10792 Structure where each bias angle reinforcing cord ply has no opposingly angled ply
 152/10801 Structure made up of two or more sets of plies wherein the reinforcing cords in one set lie in a different angular position relative to those in other sets
 152/1081 Breaker or belt characterized by the chemical composition or physical properties of elastomer or the like
 152/10819 . . . Characterized by the structure of the bead portion of the tire
 152/10828 Chafer or sealing strips
 152/10837 Bead characterized by the radial extent of apex, flipper or chafer into tire sidewall
 152/10846 Bead characterized by the chemical composition and or physical properties of elastomers or the like
 152/10855 . . . Characterized by the carcass, carcass material, or physical arrangement of the carcass materials
 152/10864 Sidewall stiffening or reinforcing means other than main carcass plies or foldups thereof about beads
 152/10873 with two or more differing cord materials
 152/10882 . . Patches
 152/10891 . . . Mechanically secured
 152/109 Inside and outside, bolt connected
 152/10909 . . . with plugs
 152/10918 . . . Bandages
 152/10927 Mechanically secured
 152/10936 to felly or rim

Former US Class 156 Series

156/00 Adhesive bonding and miscellaneous chemical manufacture
 156/10 . Methods of surface bonding and/or assembly therefor
 156/1002 . . with permanent bending or reshaping or surface deformation of self sustaining lamina
 156/1003 . . . by separating laminae between spaced secured areas [e.g., honeycomb expanding]

156/1005	. . . by inward collapsing of portion of hollow body	156/1077	. . . . . Applying plural cut laminae to single face of additional lamina
156/1007	. . . Running or continuous length work	156/1079	. . . . . Joining of cut laminae end-to-end
156/1008	. . . . Longitudinal bending	156/108	. . . Flash, trim or excess removal
156/101	. . . . . Prior to or during assembly with additional lamina	156/1082	. . . Partial cutting bonded sandwich [e.g., grooving or incising]
156/1011	. . . . . Overedge bending or overedge folding	156/1084	. . . of continuous or running length bonded web
156/1013	. . . . . and edge-joining of one piece blank to form tube	156/1085	. . . . One web only
156/1015	. . . . Folding	156/1087	. . . . Continuous longitudinal slitting
156/1016	. . . . Transverse corrugating	156/1089	. . of discrete laminae to single face of additional lamina
156/1018	. . . . . Subsequent to assembly of laminae	156/109	. . . Embedding of laminae within face of additional laminae
156/102	. . . . . with deformation or cutting of corrugated lamina	156/1092	. . . All laminae planar and face to face
156/1021	. . . . . Treating material of corrugated lamina or dry adhesive thereon to render tacky	156/1093	. . . . with covering of discrete laminae with additional lamina
156/1023	. . . . Surface deformation only [e.g., embossing]	156/1095	. . . . . Opposed laminae are running length webs
156/1025	. . . to form undulated to corrugated sheet and securing to base with parts of shaped areas out of contact	156/1097	. . . . Lamina is running length web
156/1026	. . . with slitting or removal of material at reshaping area prior to reshaping	156/1098	. . . . . Feeding of discrete laminae from separate sources
156/1028	. . . by bending, drawing or stretch forming sheet to assume shape of configured lamina while in contact therewith	156/11	. Methods of delaminating, <u>per se</u> ; i.e. , separating at bonding face
156/103	. . . . Encasing or enveloping the configured lamina	156/1105	. . Delaminating process responsive to feed or shape at delamination
156/1031	. . . . with preshaping of lamina	156/1111	. . Using solvent during delaminating [e.g., water dissolving adhesive at bonding face during delamination, etc.]
156/1033	. . . . Flexible sheet to cylinder lamina	156/1116	. . . Using specified organic delamination solvent
156/1034	. . . Overedge bending of lamina about edges of sheetlike base	156/1121	. . Using vibration during delaminating
156/1036	. . . Bending of one piece blank and joining edges to form article	156/1126	. . Using direct fluid current against work during delaminating
156/1038	. . . . Hollow cylinder article	156/1132	. . . Using vacuum directly against work during delaminating
156/1039	. . . Surface deformation only of sandwich or lamina [e.g., embossed panels]	156/1137	. . . Using air blast directly against work during delaminating
156/1041	. . . . Subsequent to lamination	156/1142	. . Changing dimension during delaminating [e.g., crushing, expanding, warping, etc.]
156/1043	. . . Subsequent to assembly	156/1147	. . . Using shrinking or swelling agent during delaminating
156/1044	. . . . of parallel stacked sheets only	156/1153	. . Temperature change for delamination [e.g., heating during delaminating, etc.]
156/1046	. . . . . Bending of one lamina only	156/1158	. . . Electromagnetic radiation applied to work for delamination [e.g., microwave, uv, ir, etc.]
156/1048	. . . . . to form dished or receptacle-like product	156/1163	. . . Sintering for delamination
156/1049	. . . . Folding only	156/1168	. . Gripping and pulling work apart during delaminating
156/1051	. . . by folding	156/1174	. . . Using roller for delamination [e.g., roller pairs operating at differing speeds or directions, etc.]
156/1052	. . with cutting, punching, tearing or severing	156/1179	. . . with poking during delaminating [e.g., jabbing, etc.]
156/1054	. . . and simultaneously bonding [e.g., cut-seaming]	156/1184	. . . . Piercing layer during delaminating [e.g., cutting, etc.]
156/1056	. . . Perforating lamina	156/1189	. . . with shearing during delaminating
156/1057	. . . . Subsequent to assembly of laminae	156/1195	. . . Delaminating from release surface
156/1059	. . . Splitting sheet lamina in plane intermediate of faces	156/12	. Surface bonding means and/or assembly means with cutting, punching, piercing, severing or tearing
156/1061	. . . Spiral peeling	156/125	. . Plural severing means each acting on a different work piece
156/1062	. . . Prior to assembly	156/13	. . Severing followed by associating with part from same source
156/1064	. . . . Partial cutting [e.g., grooving or incising]	156/1304	. . Means making hole or aperture in part to be laminated
156/1066	. . . . Cutting to shape joining edge surfaces only	156/1309	. . . and securing separate part over hole or aperture
156/1067	. . . . Continuous longitudinal slitting		
156/1069	. . . . . Bonding face to face of laminae cut from single sheet		
156/107	. . . . . Punching and bonding pressure application by punch		
156/1072	. . . . . Closure cap liner applying type		
156/1074	. . . . Separate cutting of separate sheets or webs		
156/1075	. . . . of plural laminae from single stock and assembling to each other or to additional lamina		

156/1313	. . Cutting element simultaneously bonds [e.g., cut seaming]	156/1741	. . . . Progressive continuous bonding press [e.g., roll couples]
156/1317	. . Means feeding plural workpieces to be joined	156/1744	. . . Means bringing discrete articles into assembled relationship
156/1322	. . . Severing before bonding or assembling of parts	156/1746	. . . . Plural lines and/or separate means assembling separate sandwiches
156/1326	. . . . Severing means or member secured thereto also bonds	156/1749	. . . . All articles from single source only
156/133	. . . . Delivering cut part to indefinite or running length web	156/1751	. . . . At least three articles
156/1335	. . . . . Cutter also delivers cut piece	156/1754	. . . . . At least two applied side by side to common base
156/1339	. . . . Delivering cut part in sequence to serially conveyed articles	156/1756	. . . . . Plural ranks
156/1343	. . . Cutting indefinite length web after assembly with discrete article	156/1759	. . . . . Sheet form common base
156/1348	. . Work traversing type	156/1761	. . . . . Stacked serially
156/1352	. . . with liquid applying means	156/1763	. . . . Magazine stack directly contacting separate work
156/1357	. . . . Slitting and severing	156/1766	. . . . . Magazine movable to work
156/1361	. . . . Cutting after bonding	156/1768	. . . . Means simultaneously conveying plural articles from a single source and serially presenting them to an assembly station
156/1365	. . . Fixed cutter	156/1771	. . . . . Turret or rotary drum-type conveyor
156/137	. . Stamp from multiple row sheet type	156/1773	. . . . . For flexible sheets
156/1374	. . with means projecting fluid against work	156/1776	. . . . Means separating articles from bulk source
156/1378	. . Cutter actuated by or secured to bonding element	156/1778	. . . . . Stacked sheet source
156/1383	. . . with liquid applicator	156/178	. . . . . Rotary or pivoted picker
156/1387	. . . . Common actuator for bonding and liquid applying means	156/1783	. . . . . Translating picker
156/1391	. . . . . Liquid applied to web before cutting	156/1785	. . Magazine stack directly contacting work
156/1396	. . . . . Roller applicator	156/1788	. . Work traversing type and/or means applying work to wall or static structure
156/14	. Surface bonding means and/or assembly means with shaping, scarifying, or cleaning joining surface only	156/179	. . . with liquid applying means
156/15	. Combined or convertible surface bonding means and/or assembly means	156/1793	. . . Grip or clamp for web end
156/16	. Surface bonding means and/or assembly means with bond interfering means [slip sheet, etc.]	156/1795	. . . Implement carried web supply
156/17	. Surface bonding means and/or assembly means with work feeding or handling means	156/1798	. . with liquid adhesive or adhesive activator applying means
156/1702	. . For plural parts or plural areas of single part	156/18	. Surface bonding means and/or assembly means with handle or handgrip
156/1705	. . . Lamina transferred to base from adhered flexible web or sheet type carrier	156/19	. Delaminating means
156/1707	. . . . Discrete spaced laminae on adhered carrier	156/1906	. . Delaminating means responsive to feed or shape at delamination
156/171	. . . . . Means serially presenting discrete base articles or separate portions of a single article	156/1911	. . Heating or cooling delaminating means [e.g., melting means, freezing means, etc.]
156/1712	. . . Indefinite or running length work	156/1917	. . . Electromagnetic radiation delaminating means [e.g., microwave, uv, ir, etc.]
156/1715	. . . . Means joining indefinite length work edge to edge	156/1922	. . Vibrating delaminating means
156/1717	. . . . . Means applying adhesively secured tape to seam	156/1928	. . Differential fluid pressure delaminating means
156/172	. . . . . Means applying fluid adhesive to work edge	156/1933	. . . Spraying delaminating means [e.g., atomizer, etc.]
156/1722	. . . . Means applying fluent adhesive or adhesive activator material between layers	156/1939	. . . . Air blasting delaminating means]
156/1724	. . . . . At spaced areas	156/1944	. . . Vacuum delaminating means [e.g., vacuum chamber, etc.]
156/1727	. . . . . Plural indefinite length or running length workpieces	156/195	. . Delaminating roller means
156/1729	. . . . . Fluid applied to nip between indefinite length webs	156/1956	. . . Roller pair delaminating means
156/1732	. . . . . Fluid applied to plural workpieces	156/1961	. . Severing delaminating means [e.g., chisel, etc.]
156/1734	. . . . Means bringing articles into association with web	156/1967	. . . Cutting delaminating means
156/1737	. . . . Discontinuous, spaced area, and/or patterned pressing	156/1972	. . . . Shearing delaminating means
156/1739	. . . . Webs of different width, longitudinally aligned	156/1978	. . Delaminating bending means
		156/1983	. . . Poking delaminating means
		156/1989	. . . Corner edge bending delaminating means
		156/1994	. . Means for delaminating from release surface

Former US Class 225 series

225/00 **Severing by tearing or breaking**
225/10 . Methods

225/12	. . With preliminary weakening	225/251	. . . . With closure fastener
225/14	. . Longitudinally of direction of feed	225/252	. . . With brake or tensioner
225/16	. . Transversely of continuously fed work	225/253	. . . . Restricted or restrictable work outlet
225/18	. . . Progressively to or from one side edge	225/254	. . . With finger-access opening to facilitate work feed-out
225/20	. Severing by manually forcing against fixed edge	225/255	. . . With internal guide
225/201	. . With other type severing means	225/256	. . Blade carrier bodily and slidably supported on running length work
225/202	. . With timer-released means for preventing work feed-out	225/257	. . Blade mounted on hand-held wound package
225/203	. . Including means to effect bias cut	225/259	. . . With lead-end stripper for tacky adhesive work
225/205	. . With feed-out of predetermined length from work supply	225/26	. . . By resiliently embracing outer circumference of package
225/206	. . . Including means to select or adjust feed-out length	225/261	. . . Work supply nonrotatably wound on flanged spool
225/207	. . . Including feed-out stop for manually pulled work	225/262	. . . . Circumferentially movable blade radially retained by beaded or grooved flanges
225/208	. . . . Stop abuts work edge or work-mounted article	225/263	. . . . Blade carrier supports hollow spool for rotation
225/209	. . . . With feed-out of lead-end to aid initial grasping	225/264	. . . . Flange edge notched to provide or coax with cutter
225/21	. . . Merely to provide lead-end for manual grasping	225/266	. . . . With clamp for lead-end of strand-type work
225/211	. . . Manually operated feed-out mechanism	225/267	. . . . . Strand clamped against flange
225/213	. . With indicator	225/268	. . . By resiliently engaging package ends or interior of core
225/214	. . . Indicates length to be severed from supply	225/269	. . . Blade carrier supports package for rotation
225/215	. . With blade-edge guard	225/27	. . Movable blade continually biased toward wound web supply package
225/216	. . . Movable	225/271	. . . Including temporary bias-disabling means
225/217	. . Work stripped from blade by relatively movable means	225/272	. . . Including stripper to separate lead-end from package
225/218	. . . Including movable blade	225/274	. . . Weight of bodily movable package contributes to blade-biasing force
225/22	. . With means to move work toward or into severing position	225/275	. . . Blade slidably guided
225/221	. . . With means to strip adhering work therefrom	225/276	. . Blade movable to severing position by moving work
225/222	. . With work-immobilizing paster surface	225/277	. . . With simultaneous application of brake or clamp
225/223	. . . With finger-access opening	225/278	. . . . Applied to running length work
225/224	. . With means to hold pad or stack of individual sheets	225/279	. . . . . Opposed movable jaws
225/225	. . . With means to separate severed end of stub from supply package	225/28	. . Wound package bodily biased toward fixed blade
225/226	. . . With changeable blade-edge contour	225/282	. . With fixed blade and support for wound package
225/228	. . . . Slidable notcher	225/283	. . . Body- or belt-attached
225/229	. . . Blade slidable along plane of work surface	225/284	. . . With brake applied to supply package
225/23	. . Zigzag-folded supply package	225/285	. . . With guide spaced from blade edge to provide lead-end therebetween
225/231	. . Separate blades usable alternatively or sequentially on same work supply	225/286	. . With work-abutment stop
225/232	. . Plural supply sources	225/287	. . With brake or clamp
225/233	. . . On turret-type support with single blade	225/289	. . . Thread cutter and clamp attachment for sewing machine presser foot
225/234	. . . With movable blade registrable selectively with each source	225/29	. . . Applied to running length work
225/236	. . . With plural blades	225/291	. . . . Spaced from blade edge to provide lead-end therebetween
225/237	. . . . With individual blade for each source	225/292	. . . . . Blade manually movable to expose lead-end
225/238	. . With housing for work supply	225/293	. . . Manually applied, spring returned
225/239	. . . Liquid-, gas-, or light-tight work passage	225/294	. . With guide for running length work
225/24	. . . With inspection window or transparent panel	225/295	. . Blade manually movable to or from severing position
225/241	. . . With mounting means for housing	225/297	. . With means to facilitate lead-end grasping
225/243	. . . Blade on pivoted closure for housing	225/298	. . Blades or severing devices
225/244	. . . Sectional telescoping housing	225/299	. . . Adjustable blade-edge contour
225/245	. . . . Including removable cap or sleeve enclosure for spooled work supply	225/30	. . Breaking or tearing apparatus
225/246	. . . Including special support for wound supply package	225/304	. . Including means to apply thermal shock to work
225/247	. . . . Bearing or trunnions to engage package core		
225/248	. . . Single blank container		
225/249	. . . . Blade unitary with container		

225/307 . . Combined with preliminary weakener or with nonbreaking cutter
 225/314 . . . Successively actuated sharp and dull tools
 225/321 . . . Preliminary weakener
 225/325 With means to apply moment of force to weakened work
 225/329 . . Plural breakers
 225/336 . . Conveyor diverter for moving work
 225/343 . . . Plural divergent work paths
 225/35 . . Work-parting pullers [bursters]
 225/357 . . . Relatively movable clamps
 225/364 . . Axial twisters
 225/371 . . Movable breaking tool
 225/379 . . . Breaking tool intermediate spaced work supports
 225/386 Clamping supports
 225/393 . . Web restrainer

Former US Class 279 Series**279/00 Chucks or sockets**

279/10 . . Expanding
 279/1004 . . Collet type
 279/1008 . . . Fixed jaws and moving cam
 279/1012 . . . Fixed cam and moving jaws
 279/1016 . . Jaws mounted on flexible member; i.e., diaphragm
 279/1021 . . Fluid-pressure actuator
 279/1024 . . . Directly expanding jaws
 279/1029 Jaw is expansible chamber; i.e., bladder type
 279/1033 . . . Expanding jaws via mechanical connection
 279/1037 . . Axially moving actuator
 279/1041 . . . Wedge
 279/1045 Internal cone
 279/1049 with jaw positively interlocked with wedge; e.g., dovetail or T-slot
 279/1054 with resilient means contacting nonresilient jaw
 279/1058 Constricting band, annulus, or clip
 279/1062 . . . Toggle
 279/1066 . . . Axially compressible element expands radially
 279/1071 . . . Lever
 279/1074 . . Rotary actuator
 279/1079 . . . Clutch or self-actuating type
 279/1083 . . Jaw structure
 279/1087 . . . Resilient
 279/1091 . . . Ball or roller
 279/1095 . . . Pivoted
 279/11 . . Vacuum
 279/12 . . with fluid-pressure actuator
 279/1208 . . with measuring, indicating or control means
 279/1216 . . Jaw is expansible chamber; i.e., bladder type
 279/1224 . . Pneumatic type
 279/1233 . . Jaws mounted on flexible member; i.e., diaphragm
 279/1241 . . Socket type
 279/1249 . . . Collet
 279/1258 Fixed cam and moving jaws
 279/1266 Moving cam and fixed jaws
 279/1274 . . Radially reciprocating jaws
 279/1283 . . . Fluid pressure directly moves jaws
 279/1291 . . . Fluid pressure moves jaws via mechanical connection

279/13 . . Angularly adjustable or indexing
 279/14 . . Eccentric
 279/15 . . Threaded grip
 279/16 . . Longitudinal screw clamp
 279/17 . . Socket type
 279/17008 . . Multiple alternative
 279/17017 . . Self-centering of floating
 279/17025 . . . Radially reciprocating jaws
 279/17034 . . . Transverse holder and setscrew
 279/17042 . . Lost motion
 279/17051 . . . Swinging external yoke or detent
 279/17059 Rotary socket
 279/17068 . . . Rotary socket
 279/17076 . . . Spreading elements
 279/17085 . . . Key retainer
 279/17094 . . . Sleeve type retainer
 279/17102 Sleeve in socket
 279/17111 . . Fluid-conduit drill holding
 279/17119 . . Feed type
 279/17128 . . Self-grasping
 279/17136 . . . Yielding grasping jaws
 279/17145 Ball or roller
 279/17153 Spring jaws
 279/17162 . . . Yielding detent
 279/17171 . . . One-way-clutch type
 279/17179 Wedge
 279/17188 Side detent
 279/17196 Ball or roller
 279/17205 . . Conical clamp threaded in socket
 279/17213 . . Transversely oscillating jaws
 279/17222 . . . Screw actuated
 279/17231 . . Pivoted jaws
 279/17239 . . . Moving-cam actuator
 279/17247 Threaded cam sleeve
 279/17256 Reciprocating cam sleeve
 279/17264 . . . Fixed cam and moving jaws
 279/17273 Axial screw actuator
 279/17282 Threaded-sleeve actuator
 279/17291 . . Resilient split socket
 279/17299 . . . Threaded cam sleeve
 279/17307 . . . Reciprocating cam sleeve
 279/17316 . . . Unitary
 279/17324 Split at one end only
 279/17333 Transverse screw actuator
 279/17341 Cam actuator
 279/17351 Split end to end
 279/17358 with jaw pads or insert
 279/17367 . . . Nonresilient member biased by a resilient member
 279/17376 . . . Resilient member reinforced by another resilient member
 279/17384 . . with means to exclude contaminants; e.g., seal, shield
 279/17393 . . One movable side
 279/17401 . . . Sleeved
 279/17411 . . Spring biased jaws
 279/17418 . . . Unitary
 279/17427 Split at one end only
 279/17435 Split at both ends
 279/17444 Split end to end
 279/17452 with jaw pads or insert

279/17461	. . . Nonresilient member biased by a resilient member	279/17957	. . Friction grip
279/17471	. . . Resilient member reinforced by another resilient member	279/17965	. . . Drill type
279/17478	. . . with means to exclude contaminants; e.g., seal, shield	279/17974	. . Barbed or pronged tang
279/17487	. . . Moving-cam actuator	279/17982	. . Molded or cast-in tang
279/17495	. . . . Threaded sleeve and wedge	279/17991	. . Adjustable length or size
279/17504	. . . . Threaded cam sleeve	279/18	. Pivoted jaw
279/17512	. . . . . Loose jaws	279/182	. . Cam-sleeve actuated
279/17521	. . . . Reciprocating cam sleeve	279/185	. . Internal-cone actuated
279/17529	. . . Fixed cam and moving jaws	279/188	. . Toggle actuated
279/17538	. . . . Threaded-sleeve actuator	279/19	. Radially reciprocating jaws
279/17547	. . . . Axial screw actuator	279/1906	. . with indicator
279/17555	. . . Loose jaws	279/1913	. . Transverse-screw actuated
279/17564	. . Loose jaws	279/1921	. . . Annular rack
279/17572	. . . Moving-cam actuator	279/1926	. . Spiral cam or scroll actuated
279/17581	. . . . Threaded cam sleeve	279/1933	. . . Worm
279/17589	. . . . Reciprocating cam sleeve	279/1941	. . . Bevel pinion
279/17598	. . . Fixed cam and moving jaws	279/1946	. . Rack-and-pinion actuated
279/17606	. . . . Threaded sleeve and body	279/1953	. . Toggle actuated
279/17615	. . Obliquely guided reciprocating jaws	279/1961	. . Lever actuated
279/17623	. . . Threaded sleeve and jaw	279/1966	. . . Internal cone
279/17632	. . . . Conical sleeve	279/1973	. . Wedge actuated
279/17641	. . . Threaded central cone and jaw	279/1981	. . External-cone actuated
279/17649	. . . Threaded sleeve and body	279/1986	. . Jaws
279/17658	. . . Reciprocating jaw advancing sleeve	279/1993	. . . with means to facilitate jaw removal
279/17666	. . Radially reciprocating jaws	279/20	. with safety feature
279/17675	. . . Transverse-screw actuated	279/21	. with measuring, indicating or control means
279/17683	. . . . Interlaced jaws	279/22	. Double acting
279/17692	. . . Moving-cam actuator	279/23	. with magnetic or electrostatic means
279/17701	. . . . Threaded cam sleeve	279/24	. by centrifugal force
279/17709	. . . . Threaded sleeve and wedge	279/243	. . to counterbalance jaws
279/17717	. . . . Rotary eccentric-cam sleeve	279/247	. . to grip tool or workpiece
279/17726	. . . . . Roller and rocking jaw	279/25	. Compensation for eccentricity
279/17735	. . . . . Worm actuated	279/26	. with centering means
279/17743	. . . . Reciprocating cam sleeve	279/27	. Separate chuck-actuating power source
279/17752	. . . . . Ball or roller jaws	279/275	. . Self-contained
279/17761	. . Side detent	279/28	. for gear or spline molding
279/17769	. . . Pivoted or rotary	279/29	. More than one set of gripping means
279/17777	. . . . Sleeved	279/30	. Torsion mandrel
279/17786	. . . Spring	279/31	. Jaws mounted on flexible member; i.e. , diaphragm
279/17794	. . . . Sleeved	279/32	. Means to prevent jaw loosening
279/17803	. . . Rotary cam sleeve	279/33	. Member applies axial force component
279/17811	. . . Reciprocating sleeve	279/34	. Accessory or component
279/17821	. . . Set screw	279/3406	. . Adapter
279/17829	. . . U-clamp	279/3412	. . . Drive conversion
279/17837	. . . Plural bolt	279/3418	. . . for particular tool or workpiece
279/17846	. . . Single transverse bolt	279/3425	. . Sliding cam chuck actuator
279/17854	. . . Longitudinal clamping wedge	279/3431	. . Chuck key
279/17863	. . Shouldered-tang holding	279/3437	. . . Safety feature; e.g., ejector, interlock
279/17871	. . . Cap	279/3443	. . . Key holding or attaching means
279/17881	. . . . Screw	279/3451	. . . Nonseparable or built-in
279/17888	. . Tang offset within socket	279/3456	. . Padded or cushioned jaw
279/17897	. . Tang offset without socket	279/3462	. . Jaw insert
279/17905	. . Bottomless	279/3468	. . . Machinable jaw
279/17914	. . . Friction grip	279/3475	. . . . Locking or positioning means
279/17923	. . Transverse pin	279/3481	. . Tool or workpiece ejector
279/17931	. . Screw threaded	279/3487	. . Tool or work stop or locator
279/17941	. . . Nut lock	279/3493	. . Protection means; e.g., cover, seal, overstress prevention, air blast
279/17948	. . . . Threaded sleeve	279/35	. Miscellaneous

Former US Class 292 series**292/00 Closure fasteners**

292/03	. Miscellaneous	292/0866	. . . Multiple head
292/06	. Adjustable backset	292/0867	. . . Spring projected
292/08	. Bolts	292/0868	. . . . Combined motion
292/0801	. . Multiple	292/0869	. . . Spring retracted
292/0802	. . . Sliding and rotary	292/087	. . Loops
292/0803	. . . Sliding and swinging	292/0871	. . . Sliding and swinging, lever-operating means
292/0805	. . . . Combined motion	292/0872	. . . Sliding catch
292/0806	. . . . . Lever-operating means	292/0874	. . . Spring-arm catch
292/0807	. . . Sliding and hooked end	292/0875	. . . Swinging catch
292/0808	. . . Sliding and roller	292/0876	. . Double acting
292/0809	. . . Sliding and spring arm	292/0877	. . . Sliding and swinging
292/081	. . . Swinging and hooked end	292/0878	. . . Sliding
292/0811	. . . Swinging and roller	292/0879	. . . . Roller
292/0813	. . . Swinging and spring arm	292/088	. . . Spring arm
292/0814	. . . Double acting	292/0882	. . . . Roller
292/0815	. . . . Roller	292/0883	. . . Swinging
292/0816	. . . . Sliding	292/0884	. . . . Roller
292/0817	. . . . Spring arm	292/0885	. . . Roller
292/0818	. . . . Swinging	292/0886	. . Sliding and swinging
292/082	. . . Spring arm	292/0887	. . . Operating means
292/0821	. . . . Combined motion	292/0889	. . . . Cam
292/0822	. . . Emergency operating means	292/089	. . . . Lever
292/0823	. . . Gear	292/0891	. . . . Rigid
292/0824	. . . Roller	292/0892	. . . Multiple head
292/0825	. . . Hooked end	292/0893	. . . Spring retracted
292/0826	. . . . Operating means	292/0894	. . Spring arm
292/0828	. . . . . Link and lever	292/0895	. . . Operating means
292/0829	. . . . . Cam	292/0897	. . . . Link and lever
292/083	. . . . . Flexible	292/0898	. . . . Cam
292/0831	. . . . . Lever	292/0899	. . . . Flexible
292/0832	. . . . . Push or pull rod	292/09	. . . . Lever
292/0833	. . . . . Rigid	292/0901	. . . . Push or pull rod
292/0834	. . . Sliding	292/0902	. . . . Rigid
292/0836	. . . . Operating means	292/0903	. . . . . Seal catch
292/0837	. . . . . Cam and lever	292/0905	. . . . . Swinging catch
292/0838	. . . . . Lever and push or pull rod	292/0906	. . . . Screw
292/0839	. . . . . Link and lever	292/0907	. . . Multiple head
292/084	. . . . . Cam	292/0908	. . Emergency operating means
292/0841	. . . . . Flexible	292/0909	. . . Panel
292/0843	. . . . . Gear	292/091	. . . Platform
292/0844	. . . . . Lever	292/0911	. . Hooked end
292/0845	. . . . . Push or pull rod	292/0913	. . . Sliding and swinging
292/0846	. . . . . Rigid	292/0914	. . . . Operating means
292/0847	. . . . . Screw	292/0915	. . . . . Cam
292/0848	. . . Swinging	292/0916	. . . . . Gear
292/0849	. . . . Operating means	292/0917	. . . . . Lever
292/0851	. . . . . Cam and lever	292/0918	. . . . . Rigid
292/0852	. . . . . Link and cam	292/092	. . . . . Screw
292/0853	. . . . . Link and lever	292/0921	. . . Multiple head
292/0854	. . . . . Cam	292/0922	. . . . Operating means
292/0855	. . . . . Flexible	292/0923	. . . . . Lever
292/0856	. . . . . Gear	292/0924	. . . . . Push or pull rod
292/0857	. . . . . Lever	292/0925	. . . . . Rigid
292/0859	. . . . . Push or pull rod	292/0926	. . . Spring projected
292/086	. . . . . Rigid	292/0928	. . . . Operating means
292/0861	. . . . . Screw	292/0929	. . . . . Link and lever
292/0862	. . Swinging and hooked end, multiple head	292/093	. . . . . Cam
292/0863	. . Sliding and rotary	292/0931	. . . . . Flexible
292/0864	. . . Combined motion	292/0932	. . . . . Lever
		292/0933	. . . . . Push or pull rod
		292/0934	. . . . . Rigid

292/0936	. . . Spring retracted	292/1002	. . . . Spring-arm catch
292/0937	. . . Gravity actuated	292/1003	. . . . Swinging catch
292/0938	. . . . Operating means	292/1005	. . . . Cam-operating means
292/0939	. . . . . Cam	292/1006	. . . Gravity actuated
292/094	. . . . . Flexible	292/1007	. . . . Operating means
292/0941	. . . . . Lever	292/1008	. . . . . Cam and lever
292/0943	. . . . . Push or pull rod	292/1009	. . . . . Link and lever
292/0944	. . . . . Rigid	292/101	. . . . . Cam
292/0945	. . . Operating means	292/1011	. . . . . Lever
292/0946	. . . . Link and lever	292/1013	. . . . . Rigid
292/0947	. . . . Cam	292/1014	. . . Operating means
292/0948	. . . . Closure	292/1015	. . . . Link and lever
292/0949	. . . . Lever	292/1016	. . . . Cam
292/0951	. . . . Rigid	292/1017	. . . . Flexible
292/0952	. . . . . Closure catch	292/1018	. . . . Gear
292/0953	. . . . . Friction catch	292/102	. . . . Lever
292/0954	. . . . . Padlock or seal catch	292/1021	. . . . Motor
292/0955	. . . . . Screw catch	292/1022	. . . . Rigid
292/0956	. . . . . Sliding catch	292/1023	. . . . . Closure catch
292/0957	. . . . . Spring-arm catch	292/1024	. . . . . Friction catch
292/0959	. . . . . Swinging catch	292/1025	. . . . . Padlock or seal catch
292/096	. . Sliding	292/1026	. . . . . Screw catch
292/0961	. . . Multiple head	292/1028	. . . . . Sliding catch
292/0962	. . . . Operating means	292/1029	. . . . . Seal
292/0963	. . . . . Link and lever	292/103	. . . . . Spring-arm catch
292/0964	. . . . . Cam	292/1031	. . . . . Swinging catch
292/0966	. . . . . Gear	292/1032	. . . . . Seal
292/0967	. . . . . Lever	292/1033	. . . . Screw
292/0968	. . . . . Rigid	292/1034	. . . Curved
292/0969	. . . Spring projected	292/1036	. . . End lever
292/097	. . . . Operating means	292/1037	. . . Pivoted end
292/0971	. . . . . Cam and lever	292/1038	. . . Roller
292/0972	. . . . . Lever and push or pull rod	292/1039	. . Swinging and camming
292/0974	. . . . . Link and lever	292/10395	. . . Spring projected
292/0975	. . . . . Link and push or pull rod	292/104	. . . . Rigid operating means
292/0976	. . . . . Sliding cam	292/1041	. . . Rigid operating means
292/0977	. . . . . Cam	292/1043	. . Swinging
292/0978	. . . . . Specifically related to vehicle closure	292/1044	. . . Multiple head
292/0979	. . . . . . Bolt disabled by contraretractive movement of inside handle	292/1045	. . . . Operating means
292/098	. . . . . . Auxiliary bolt	292/1046	. . . . . Cam
292/0982	. . . . . . Bolt blocking or disabling means	292/1047	. . . . . Closure
292/0983	. . . . . . Involves rollback	292/1048	. . . . . Lever
292/0984	. . . . . . . Rollback members located on separate spindles	292/1049	. . . . . Rigid
292/0985	. . . . . . . Discrete pivotable or rotatable actuator	292/1051	. . . Spring projected
292/0986	. . . . . . . Discrete push or pull actuator	292/1052	. . . . Operating means
292/0987	. . . . . . . Bolt has ancillary projection spring	292/1053	. . . . . Lever and push or pull rod
292/0989	. . . . . . . Plural rollback elements directionally selectively effective	292/1054	. . . . . Link and cam
292/099	. . . . . . . On separate spindles	292/1055	. . . . . Link and lever
292/0991	. . . . . . . On a tubular member	292/1056	. . . . . Cam
292/0992	. . . . . Flexible	292/1057	. . . . . Flexible
292/0993	. . . . . Gear	292/1059	. . . . . Lever
292/0994	. . . . . Lever	292/106	. . . . . Push or pull rod
292/0995	. . . . . Push or pull rod	292/1061	. . . . . Rigid
292/0997	. . . . . Rigid	292/1062	. . . Spring retracted
292/0998	. . . . . Screw	292/1063	. . . Gravity actuated
292/0999	. . . Spring retracted	292/1064	. . . . Operating means
292/10	. . . . Friction catch	292/1066	. . . . . Cam and lever
292/1001	. . . . Sliding catch	292/1067	. . . . . Link and lever
		292/1068	. . . . . Cam
		292/1069	. . . . . Flexible
		292/107	. . . . . Lever

292/1071	. . . . . Push or pull rod	292/299	. . Slotted keeper
292/1072	. . . . . Rigid	292/301	. . Friction catch
292/1074	. . . . . Roller	292/302	. . Screw catch
292/1075	. . . Operating means	292/304	. . Sliding catch
292/1076	. . . . . Link and lever	292/305	. . Swinging catch
292/1077	. . . . . Cam	292/306	. Gear
292/1078	. . . . . Closure	292/307	. . Sliding catch
292/1079	. . . . . Gear	292/308	. . Swinging catch
292/108	. . . . . Lever	292/31	. Hasps
292/1082	. . . . . Motor	292/314	. . Sliding catch
292/1083	. . . . . Rigid	292/319	. . . Seal
292/1084	. . . . . Closure catch	292/323	. . Swinging catch
292/1085	. . . . . Friction catch	292/327	. . . Seal
292/1086	. . . . . Padlock or seal catch	292/331	. . Seal catch
292/1087	. . . . . Screw catch	292/336	. . Seal-rupturing devices
292/1089	. . . . . Sliding catch	292/34	. Portable
292/109	. . . . . . Seal	292/37	. Portable securer plate or bar
292/1091	. . . . . Spring-arm catch	292/373	. . Sliding and swinging holding member
292/1092	. . . . . Swinging catch	292/376	. . Screw-holding member
292/1093	. . . . . . Seal	292/379	. . Sliding holding member
292/1094	. . . . . Screw	292/382	. . . Screw-operating means
292/1095	. . Seal-rupturing devices	292/385	. . . Screw catch
292/1097	. . Reversible	292/388	. . . Sliding catch
292/1098	. . . Cam and lever operating means	292/391	. . . Swinging catch
292/1099	. . Screw	292/394	. . Swinging holding member
292/11	. Magnetic	292/397	. . . Catch devices
292/14	. Ball	292/40	. Rings
292/17	. Bendable securers	292/42	. Rigid engaging means
292/175	. Bolt releasers	292/426	. . Screw catch
292/18	. . Free-end-engaging means	292/432	. . Sliding catch
292/19	. . Foot operated	292/438	. . Spring-arm catch
292/20	. Clamps	292/444	. . Swinging catch
292/202	. . Hatch fastener	292/45	. Rod clamps
292/205	. . Ring	292/47	. . Friction-plate catch
292/207	. . . Permanently deformed	292/48	. Seals
292/209	. . . Resilient wedge	292/481	. . Compressible disk
292/212	. . . With expanding or contracting means	292/483	. . . Reinforced
292/214	. . . . . Screw	292/484	. . . Multiple
292/216	. . . . . Toggle lever	292/485	. . . . Sheet metal
292/218	. . Screw against closure	292/487	. . . . Hard and soft metal
292/221	. . Screw and nut	292/488	. . . Sheet metal
292/223	. . . Swingable	292/49	. . Compressible rivets and eyelets
292/225	. . Cam-operating means	292/491	. . Distorted shackle
292/228	. . Portable	292/492	. . Driving
292/23	. Cross bars	292/494	. . Interengaging shackle ends, inclosing housing
292/237	. . Screw-operating means	292/4945	. . Rigid shackle ends
292/243	. . Vehicle door latches	292/495	. . . Resilient and rigid engaging means
292/25	. Cylinder	292/496	. . . Resilient engaging means
292/28	. Extension link	292/497	. . Resilient shackle ends
292/282	. . Multiple	292/498	. . . Rigid engaging means
292/283	. . Chain	292/499	. . . Resilient engaging means
292/285	. . Notched bar	292/50	. . Single piece, spring catch
292/286	. . . Sliding catch	292/502	. . Shiftable catch shackle operated
292/288	. . . Swinging catch	292/503	. . Split-ring catch, shackle operated
292/289	. . Slotted bar	292/505	. . Strap-end fasteners
292/291	. . . Sliding catch	292/506	. . Rigid disk, distorted shackle
292/293	. . . Swinging catch	292/507	. . Tag type
292/2935	. . Slotted or notched keeper	292/509	. . Encasing
292/294	. . . Sliding catch	292/51	. Seal bolts
292/296	. . . Swinging catch	292/513	. Shackles
292/297	. . Notched keeper	292/516	. . Sliding catch, seal

292/522	. . Swinging catch, seal	307/375	. . . . Different frequencies
292/528	. . Seal catch	307/383	. . . . Different voltages
292/534	. . Seal-rupturing devices	307/391	. . . Selectively connected loads and/or sources
292/54	. Trippers	307/398	. . Anticoupling of load circuits through same source
292/546	. . Sliding detent	307/406	. . Control of current or power
292/552	. . Spring-arm detent	307/414	. . . Load current proportioning or dividing
292/558	. . Sliding bolt, swinging detent	307/422	. . . Constant magnitude control
292/564	. . Swinging bolt, swinging detent	307/43	. . . . By control of one or more load circuits
292/57	. Operators with knobs or handles	307/438	. . . Limit control
292/59	. Rollback and spindle connection	307/445	. . Serially connected load circuits
292/62	. Bolt casings	307/453	. . . Selective series-parallel connections
292/65	. Braces	307/461	. . Selectively connected or controlled load circuits
292/67	. . Portable	307/469	. . . Condition responsive
292/68	. Keepers	307/477	. . . Code-controlled
292/683	. . Segment	307/484	. . . Sequential or alternating
292/685	. . With anti-friction means	307/492	. . Circuit arrangements or layouts
292/688	. . With silencing or anti-rattle means	307/50	. Plural supply circuits or sources
292/691	. . . Take-up	307/505	. . One source floats across or compensates for other source
292/694	. . Covers	307/511	. . . With intervening converter
292/696	. . With movable dog, catch or striker	307/516	. . . . Storage battery or accumulator-type source
292/699	. . . Motor controlled	307/522	. . . Dynamoelectric-type source
292/702	. . . Pivoted or swinging	307/527	. . . Storage battery or accumulator-type source
292/705	. . Adjustable	307/533	. . . . With series-connected auxiliary source
292/707	. . . Vertically	307/538	. . . . Tap-changing or variable number of cells
292/71	. Wedges	307/544	. . Circulating- or inter-current control or prevention
292/73	. . Portable	307/549	. . Load current control
292/74	. Weights	307/555	. . . Load current division
292/76	. Blind-slat holders	307/56	. . . . Serially connected sources
292/79	. Bolt guards	307/565	. . . . Fixed or predetermined ratio
292/82	. Knobs	307/571	. . . . . Diverse-or unlike-type sources
292/85	. Knob-attaching devices	307/576	. . . . . Plural generators
292/854	. . Friction	307/582	. . . . . Plural converters
292/858	. . Screw	307/587	. . . . . Peak or excess load
292/861	. . . Guards	307/593	. . . Constant load or current
292/865	. . Sliding	307/598	. . . . Serially connected sources
292/869	. . Spring arm	307/604	. . . Load-limiting
292/873	. . Swinging	307/609	. . . Serially connected sources
292/876	. . Wedge	307/615	. . Substitute or emergency source
292/88	. Knob bearings	307/62	. . . Plural substitute sources
292/91	. Knob rose plates	307/625	. . . Storage battery or accumulator
292/93	. Latch spindles	307/631	. . . . With intervening dynamoelectric machine
292/96	. Latch-spindle catches	307/636	. . . Dynamoelectric

Former US Class 307 series

307/00	Electrical transmission or interconnection systems
307/25	. Plural load circuit systems
307/258	. . Common conductor or return type
307/266	. . . Polyphase
307/273	. . . . Phase balancing
307/281	. . . Voltage divider type
307/289	. . . Plural output generators
307/297	. . Transformer connections
307/305	. . Plural sources of supply
307/313	. . . Interconnected for energy transfer
307/32	. . . . With control of magnitude of energy transfer
307/328	. . . . Diverse sources
307/336	. . . . . AC and DC
307/344	. . . Substitute or alternate source
307/352	. . . With control of magnitude of current or power
307/359	. . . Diverse sources
307/367	. . . . AC and DC

307/642	. . Sources distributed along load circuit
307/647	. . Load transfer without paralleling sources
307/653	. . Series-parallel connection of sources
307/658	. . Diverse or unlike electrical characteristics
307/664	. . . Differing frequencies
307/669	. . . Differing capacities
307/675	. . . Differing voltages
307/68	. . . . Generator sources
307/685	. . Series-connected sources
307/691	. . . Generator sources
307/696	. . Selective or optional sources
307/702	. . . Predetermined sequence
307/707	. . Plural converters
307/713	. . Plural transformers
307/718	. . Plural generators
307/724	. . Connecting or disconnecting
307/729	. . . Condition responsive

307/735	. . . . Attainment of voltage, frequency or phase relationship	403/1633	. . Utilizing fluid pressure
307/74	. Switching systems	403/1641	. . Back-off means, e.g., separator, etc.
307/747	. . Plural switches	403/1649	. . Handle or handwheel
307/753	. . . Lazy-man switch type	403/1658	. . . Actuates retainer or blocker
307/76	. . . Selectively actuated	403/1666	. . tool-engaging or accommodating means or with tool
307/766	. . Condition responsive	403/1674	. . . for latch or retainer
307/773	. . . Light, heat, vibratory or radiant energy	403/1683	. . Releasably captive nut or bolt
307/779	. . . Fluid pressure, density, level, velocity or humidity	403/1691	. . Means to lock bolt or nut when other is turned
307/786	. . . Mechanical force	403/17	. with adjunctive shield
307/793	. . . . Speed, centrifugal or kinetic force	403/18	. Structurally installed in diverse art device
307/799	. . . . . Inertia or acceleration	403/185	. . Head or base
307/806	. . . . . Direction of rotation	403/19	. Coupling supported by independent bearing
307/812	. . . . . Differential speed between two bodies	403/20	. with indicator or inspection means
307/819	. . . . . Torque	403/21	. Utilizing thermal characteristic, e.g. , expansion or contraction, etc.
307/826	. . . Electrical	403/213	. . Interposed material of intermediate coefficient of expansion
307/832	. . . . Power or energy	403/217	. . Members having different coefficients of expansion
307/839	. . . . Polarity, phase sequence or reverse flow	403/22	. with fluid pressure responsive component
307/845	. . . . AC or DC discriminating	403/23	. with ambient condition responsive control means
307/852	. . . . Frequency	403/24	. with independent handle or operator
307/858	. . . . Voltage	403/25	. with distinct fluid or article handling or directing feature
307/865	. . . . Current	403/251	. . External reservoir
307/872	. . Repetitive make and break	403/253	. . Pressure fitting
307/878	. . . Electronically controlled relay	403/255	. . including port or reservoir communicating with joint
307/885	. . . . Responsive to physical condition	403/257	. . . Articulated member
307/891	. . . Thermal relay	403/259	. . . . At joint interface
307/898	. . . Vibrating relay	403/26	. Non-adhering fluent material at joint
307/904	. . . Miscellaneous	403/27	. with strain-limiting means
307/911	. . With operation facilitating feature	403/28	. Combined
307/918	. . . Preliminary reduction in current or voltage of system	403/29	. Rotarily connected, differentially translatable members, e.g. , turn-buckle, etc.
307/924	. . . Switch contact conditioning	403/291	. . having tool-engaging means or operating handle
307/931	. . . . Polarity reversing	403/293	. . having operating mechanism
307/937	. . Switch actuation	403/295	. . having locking means
307/944	. . . Power circuit controlled	403/297	. . Differential pitch, similar hand
307/951	. . . With time delay or retardation means	403/299	. . Externally threaded actuator
307/957	. . . . Electrically initiated	403/30	. Laterally related members connected by latch means, e.g. , scaffold connectors
307/964	. . . . Series connected switches	403/31	. Flexible diaphragm or bellows
307/97	. . . With locking, holding or braking means	403/315	. . with additional connection or packing
307/977	. . . Electrical actuator	403/32	. Articulated members
307/983	. . . Fluid-pressure actuator	403/32008	. . Plural distinct articulation axes

Former US Class 403 Series

403/00	Joints and connections	403/32016	. . . Three or more parallel axes
403/10	. Selectively engageable hub to shaft connection	403/32024	. . . Single adjustment for plural axes
403/11	. including frangible component	403/32032	. . . Plural ball and socket
403/12	. Selectively assembled, e.g. , convertible, etc.	403/32041	. . . Universal
403/125	. . Selective orientation	403/32049	. . . . Non-coplanar axes
403/13	. Inflatable connector	403/32057	. . . Angular and linear
403/14	. with opening for access to connector or operator	403/32065	. . . . Screw and swivel
403/142	. . to threaded component	403/32073	. . . . Pivot stud slidable in elongated opening
403/145	. . . Transverse to thread axis	403/32081	. . . Parallel rotary
403/148	. . to biased component	403/32091	. . . Plural translating connections
403/15	. Closure or plug spaced from joint	403/32098	. . Branched
403/16	. with adjunctive protector, broken parts retainer, repair, assembly or disassembly feature	403/32106	. . Member pivoted at rigid corner
403/1608	. . Holding means or protector functioning only during transportation, assembly or disassembly	403/32114	. . including static joint
403/1616	. . Position or guide means	403/32122	. . . Trunnion assembly to side of rod
403/1624	. . . Related to joint component	403/32131	. . . One member is plate or side

403/32139	Secant, i.e., rod extending through plate	403/32565	Ball and socket with restricted movement about one axis
403/32147	Plate or side forms bearing surface	403/32573	Ball stud passes through confining opening
403/32155	Bearing component clamped to plate or side, e.g., bolted, etc.	403/32581	Pin and slot
403/32163	Articulate joint intermediate end joints	403/32591	Opposed stops on one member
403/32172	Variable angle	403/32598	Threaded interface
403/32181	Universal	403/32606	Pivoted
403/32188	Angled or offset members	403/32614	including circumferential biasing or damping means
403/32196	Articulate joint is ball and socket	403/32622	Rocking or rolling contact
403/32204	with threaded joint	403/32631	Universal ball and socket
403/32213	Articulate joint is a swivel	403/32639	including internal tie means
403/32221	Articulate joint comprises pivoted clevis or channel bar	403/32647	Plural concave surfaces with diverse curvature
403/32229	Articulate joint is a slide	403/32655	Interposed concavo-convex component
403/32237	including operator	403/32663	Outer surfaces
403/32245	Arcuate shank moves in complementary guide	403/32672	Swiveled ball parts or seat
403/32254	Lockable at fixed position	403/32681	Composite ball
403/32262	At selected angle	403/32688	Spring biased segments
403/32271	Movable brace between members	403/32696	Nonmetallic part
403/32278	Members rotatable about oblique axes	403/32704	Stud extends into ball
403/32286	Clamping screw traverses sliding complementary arcuate bearing surfaces	403/32713	Elastomerically biased or backed components
403/32295	Securing yoke or ring spaced radially from locking means	403/32721	Elastomeric seat
403/32303	Eyebolt	403/32729	Externally packed
403/32311	Ball and socket	403/32737	including liner, shim, or discrete seat
403/32319	including pivot stud	403/32745	Spring acts through wedging surfaces
403/32327	including radially spaced detent or latch component	403/32754	Variably preloaded
403/32336	Engaging notch or recess in outer periphery of component	403/32762	Spring-biased seat opposite ball stud
403/32344	Side of rod engages recess in radial face	403/32771	Porous
403/32352	Pivoted detent	403/32778	Completely spacing the members
403/32361	Engaging recess in radial face	403/32786	Divided socket-type coupling
403/32368	including radial interengaging tongue and slot or serrations	403/32795	Bifurcated socket
403/32377	Radially spaced arcuate slot engages fastener	403/32803	Separable socket sections
403/32385	Locked by plural motions of one member	403/32811	Spring-biased
403/32393	including bridging keeper	403/32819	including tension or take-up means
403/32401	Locked by nesting parts	403/32827	Interposed spring means coaxial with pivot
403/32409	Members locked in axial alignment	403/32836	Acting through tapered surface on bearing component
403/32418	Plural distinct positions	403/32844	Manually variable
403/32426	Plural distinct positions	403/32852	External of bearing assembly, e.g., antirattler, etc.
403/32434	Unidirectional movement, e.g., ratchet, etc.	403/32861	T-pivot, e.g., wrist pin, etc.
403/32442	At least one discrete position	403/32868	Floating pin
403/32451	Step-by-step adjustment	403/32877	Pin is integral with or secured to inner member
403/32459	Retainer extends through aligned recesses	403/32885	Expanded pin or end
403/32467	Telescoping members	403/32893	including distinct pin retainer
403/32475	having detent	403/32901	Unitary clip or plug
403/32483	Spring biased	403/32909	Threaded pin end
403/32491	Threaded	403/32918	fork and tongue
403/32501	Cam or wedge	403/32926	with interposed antifriction means
403/32508	having transverse pin	403/32934	Oppositely laterally movable tines
403/32516	Remotely actuated	403/32942	On oblique interface
403/32524	Self-locking	403/32951	Transverse pin or stud
403/32532	Clamped members	403/32959	Traverses interposed facing component
403/32541	Rotatable members resiliently biased to one position	403/32967	Attached to or integral with one member
403/32549	including limit means	403/32975	Rotatable
403/32557	for pivotal motion	403/32983	Rod in socket
		403/32991	Axially spring-biased coaxial members
		403/33	Transverse rod to spaced plate surfaces
		403/335	Retainer utilizes or abuts plural plates

- 403/34 . Branched
 - 403/341 . . Three or more radiating members
 - 403/342 . . . Polyhedral
 - 403/343 Unilateral of plane
 - 403/344 . . . Plural pairs of axially aligned members
 - 403/345 . . . Coplanar
 - 403/346 Additional rod held by encompassing means
 - 403/347 . . Polyhedral
 - 403/348 . . Parallel rods
 - 403/349 . . Coplanar
 - 403/35 . Diverse material coupling member
 - 403/36 . Three or more serial joints, at least one diverse
 - 403/362 . . Nonaligned axes
 - 403/364 . . Separable intermediate joint
 - 403/366 . . . Axially acting connector
 - 403/368 . . . Screw or cam
 - 403/37 . Joint involving plural layers of single rod
 - 403/38 . Laterally related rods independently joined to transverse surface
 - 403/39 . Rod to member to side, e.g. , plate, rod side, etc.
(Frozen)
- WARNING**
- Groups [Y10T 403/39](#) - [Y10T 403/3993](#) are no longer used for the classification of documents as of August 1, 2018.
- The content of these groups is being reclassified into groups [F16B 7/00](#), [F16B 9/00](#), [F16B 17/00](#), [F16B 2200/00](#), other [F16B](#) groups as appropriate and [Y10T 403/46](#).
- All groups listed in this Warning should be considered in order to perform a complete search.
- 403/3906 . . Rod side to member to side
(Frozen)
 - 403/3913 . . Unilateral of side
(Frozen)
 - 403/3921 . . Arcuate or multiplanar side
(Frozen)
 - 403/3926 . . . Encompassed side
(Frozen)
 - 403/3933 . . Intermediate member includes tubular part
(Frozen)
 - 403/3941 . . . Side or tubular part deformed in situ
(Frozen)
 - 403/3946 . . . Intermediate member extends through side
(Frozen)
 - 403/3953 Split or divided tubular part and coacting compressor
(Frozen)
 - 403/3961 Transverse clamp secures rod and tubular part
(Frozen)
 - 403/3966 Rod also extends through side
(Frozen)
 - 403/3981 . . . Intermediate member secured to side by radial flange
(Frozen)
 - 403/3986 . . . Internally threaded tubular part
(Frozen)
 - 403/3993 . . Intermediate member extends completely through side
(Frozen)
 - 403/40 . Radially spaced members joined by independent coupling
 - 403/405 . . Flexible intermediate member
 - 403/41 . Coacting connection between inner member and plural parts of outer member

- 403/42 . Rigid angle coupling, e.g. , elbow or u, etc.
 - 403/43 . Axially curved or bent portion of rod is joint component
 - 403/4309 . . Intertwisted crossing rods
 - 403/4318 . . Joined to laterally related transverse surface at axially spaced points
 - 403/4327 . . Reversely bent portion
 - 403/4336 . . . Around eye-forming thimble
 - 403/4345 . . . with wedge clamp
 - 403/4354 . . . Held by crimped collar
 - 403/4363 . . . Open U
 - 403/4372 . . Intertwisted ends
 - 403/4381 . . End of rod is deflected laterally within connector
 - 403/4391 . . Plural rods distorted by single component
 - 403/44 . Three or more members connected at single locus
 - 403/443 . . All encompassed
 - 403/447 . . Mutually contacting
 - 403/45 . Flexibly connected rigid members
 - 403/451 . . Rigid sleeve encompasses flexible bushing
 - 403/452 . . . Longitudinally divided sleeve
 - 403/453 . . Flexible sleeve-type coupling
 - 403/454 . . Connecting pin traverses radially interposed elastomer
 - 403/455 . . Elastomer interposed between radially spaced members
 - 403/456 . . . Elastomer encompasses shoulder on inner member
 - 403/457 . . . including axially acting compressing means
 - 403/458 . . . Composite bushing with elastomeric component
 - 403/459 . . Helical spring type coupling
 - 403/46 . Rod end to transverse side of member
 - 403/4602 . . Corner joint
 - 403/4605 . . Stirrup
(Frozen)
- WARNING**
- Groups [Y10T 403/4605](#) - [Y10T 403/4648](#) are no longer used for the classification of documents as of August 1, 2018.
- The content of these groups is being reclassified into groups [F16B 7/00](#), [F16B 9/00](#), [F16B 17/00](#), [F16B 2200/00](#), other [F16B](#) groups as appropriate and [Y10T 403/46](#).
- All groups listed in this Warning should be considered in order to perform a complete search.
- 403/4608 . . Structure attached to rod end encompasses side
(Frozen)
 - 403/4611 . . . Clamped saddle
(Frozen)
 - 403/4614 . . . Yoke or ring
(Frozen)
 - 403/4617 having radial screw at bight
(Frozen)
 - 403/4621 . . including saddle
(Frozen)
 - 403/4634 . . Rod and side deformingly interlocked
(Frozen)
 - 403/4637 . . Radially interposed, side-engaging shim or bushing
(Frozen)
 - 403/4641 . . Socket formed by shaping or deforming side
(Frozen)

- 403/4642 . . Integral transverse projection on side, e.g.,
(Frozen) necked, etc.
- 403/4645 . . . From rod side
(Frozen)
- 403/4648 . . Utilizing opposite sides of member
(Frozen)
- 403/47 . Molded joint
- 403/471 . . And independent connection
- 403/472 . . including mechanical interlock
- 403/473 . . Socket or open cup for bonding material
- 403/475 . . Member cast in situ
- 403/477 . . Fusion bond, e.g., weld, etc.
- 403/478 . . . Metallic fusion material
- 403/479 Added bonding material, e.g., solder, braze,
etc.
- 403/48 . Shrunk fit
- 403/49 . Member deformed in situ
- 403/4908 . . Separating element between strands of member
- 403/4916 . . Interposed deforming element contacts socket
bottom
- 403/4924 . . Inner member is expanded by longitudinally
inserted element
- 403/4933 . . by separate, deformable element
- 403/4941 . . Deformation occurs simultaneously with action of
separate, diverse function, joint component
- 403/4949 . . Deforming component is inserted section
- 403/4958 . . Separate deforming means remains with joint
assembly
- 403/4966 . . Deformation occurs simultaneously with
assembly
- 403/4974 . . by piercing
- 403/4983 . . Diverse resistance to lateral deforming force
- 403/4991 . . Both members deformed
- 403/50 . Bridged by diverse connector
- 403/51 . including spaced, diverse connections
- 403/52 . including distinct packing
- 403/53 . Split end with laterally movable opposed portions
- 403/535 . . with separate force-applying means
- 403/54 . Flexible member is joint component
- 403/55 . Member ends joined by inserted section
- 403/551 . . Externally bridged
- 403/553 . . Laterally inserted section
- 403/555 . . Angle section
- 403/556 . . Section threaded to member
- 403/557 . . Expansible section
- 403/559 . . Fluted or splined section
- 403/56 . Thread adaptor
- 403/57 . Distinct end coupler
- 403/5706 . . Diverse serial connections
- 403/5713 . . . Axially cleft coupler
- 403/5721 . . Single actuator for plural connections
- 403/5726 . . . Axially biased end portions
- 403/5733 . . Plural opposed sockets
- 403/5741 . . Separate screw or pin-type connections
- 403/5746 . . Continuous thread
- 403/5753 . . having separable end caps or plugs
- 403/5761 . . Interrupted periphery, e.g., split or segmental, etc.
- 403/5766 . . . Axially divided segments
- 403/5773 Interfitting
- 403/5781 Bolted
- 403/5786 Split
- 403/5793 . . including member wedging or camming means
- 403/58 . including ancillary means blocking disconnection of
joint
- 403/581 . . Blocker for assembled joint retainer
- 403/583 . . . Blocker keeper
- 403/585 . . . Blocked key
- 403/587 . . Blocker is catch or key
- 403/589 . . Cam or thread lock
- 403/59 . Manually releaseable latch type
- 403/591 . . having operating mechanism
- 403/592 . . . Ball detent
- 403/593 Remotely actuated
- 403/595 Lever
- 403/597 . . Swiveled bolt
- 403/598 . . Transversely sliding pin
- 403/599 . . Spring biased manipulator
- 403/60 . Biased catch or latch
- 403/602 . . by separate spring
- 403/604 . . . Radially sliding catch
- 403/606 . . Leaf spring
- 403/608 . . Pivoted
- 403/61 . Side slide: elongated co-linear members
- 403/62 . Annular recess is joint component
- 403/63 . Convergent interface
- 403/635 . . Tapered
- 403/65 . Scarf
- 403/655 . . Mirror images
- 403/66 . Interfitted members with external bridging piece
- 403/67 . Thimble: screw or cam
- 403/68 . Screw or cam
- 403/69 . Axially split or separable member
- 403/70 . Interfitted members
- 403/7001 . . Crossed rods
- 403/7003 . . . One rod is encompassed by the other
- 403/7005 . . Lugged member, rotary engagement
- 403/7007 . . . Bayonet joint
- 403/7009 . . Rotary binding cam or wedge
- 403/7011 . . . Radially interposed shim or bushing
- 403/7013 Arcuate slip
- 403/7015 . . Assembled by plural manipulations of member
- 403/7016 . . Diametric end slot is joint component
- 403/7018 . . including separably interposed key
- 403/7021 . . . Axially extending
- 403/7022 Resilient
- 403/7024 Longitudinally stepped or tapered
- 403/7026 . . Longitudinally splined or fluted rod
- 403/7028 . . . Splayed or having a cam surface for anti-
backlash
- 403/7031 . . . Rod designed to be manipulable, e.g., twistable,
within coupling for quick disconnect
- 403/7032 . . . including a means, e.g., spring biased portion,
for misalignment correction
- 403/7033 . . . including a lock or retainer
- 403/7035 . . . Specific angle or shape of rib, key, groove, or
shoulder
- 403/7037 . . Externally shouldered or headed rod
- 403/7041 . . including set screw
- 403/7043 . . Interfitted angle or channel bars
- 403/7045 . . Interdigitated ends
- 403/7047 . . Radially interposed shim or bushing
- 403/7049 . . . Biased by distinct radially acting means
- 403/7051 . . . Wedging or camming
- 403/7052 Engaged by axial movement

403/7054	. . . . . Plural, circumferentially related shims between members	407/118	. . Chip breaker
403/7056	. . . . . Threaded actuator	407/12	. Freely movable cutting edge
403/7058	. . . . . Split or slotted bushing	407/13	. Yieldable tool
403/7061	. . . Resilient	407/134	. . Resiliently mounted tool
403/7062	. . Clamped members	407/137	. . . including yield stress or flexure limit adjusting means
403/7064	. . . by wedge or cam	407/14	. with means to apply fluid to cutting tool
403/7066	. . . . . having actuator	407/15	. Rotary broach
403/7067	. . . . . Threaded actuator	407/16	. Rectilinear broach
403/7069	. . . . . Axially oriented	407/1614	. . Hollow tool for surrounding workpiece
403/7071	. . . . . Lever actuator	407/1628	. . including holder having seat for inserted tool
403/7073	. . Peripheral enlargement, depression, or slot on one member is joint component	407/1642	. . . Annular tool
403/7075	. . including discrete retainer	407/1657	. . . including single tooth
403/7077	. . . for telescoping members	407/1671	. . Plural tooth groups
403/7079	. . . . . Transverse pin	407/1685	. . including sequentially acting teeth of stepped cutting width
403/7081	. . . . . Multiple retainers	407/17	. Gear cutting tool
403/7083	. . . . . having means to prevent removal of retainer	407/1705	. . Face mill gear cutting tool
403/7084	. . . . . Bolt, rivet, or screw	407/171	. . . Adjustable teeth
403/7086	. . . . . Wedge pin	407/1715	. . Hob
403/7088	. . . . . Sliding pin	407/172	. . . Thread cutting
403/7091	. . . . . Expansible retainer	407/1725	. . . including holder having seat for inserted tool
403/7092	. . . for interfitted side faces	407/173	. . . for cutting involute gear tooth
403/7096	. . Rigid angle	407/1735	. . Rotary, gear shaving cutting tool
403/7098	. . Non-circular rod section is joint component	407/174	. . Gear generating, revolving shaper cutting tool
403/71	. Rod side to plate or side	407/1745	. . Rotary, tooth form cutting tool
403/7105	. . Connected by double clamp	407/18	. File or rasp
403/7111	. . Shackle is integral with or independently attached to proximate side of plate or other side	407/1805	. . Flexible blade or carrier therefor
403/7117	. . Flanged or grooved rod	407/181	. . Tire rasp
403/7123	. . Traversed by connector	407/1815	. . Rotary file or round disc
403/7129	. . Laterally spaced rods	407/182	. . Composite, diverse sector, or assembled
403/7135	. . . by separable shim or bushing in connector	407/1825	. . Handle or holder, <u>per se</u>
403/7141	. . . Plural channels in connector	407/19	. Rotary cutting tool
403/7147	. . Connected by flexible tie	407/1902	. . Gang
403/7152	. . Lapped rod ends	407/1904	. . Composite body of diverse material
403/7158	. . Diagonal connector	407/1906	. . including holder [i.e., head] having seat for inserted tool
403/7164	. . One rod held between bight and other rod extending through aperture in leg of connector	407/1908	. . . Face or end mill
403/7171	. . Two rods encompassed by single connector	407/191	. . . . Plural simultaneously usable separable tools in common seat or common clamp actuator for plural simultaneously usable tools
403/7176	. . Resilient clip	407/1912	. . . . Tool adjustable relative to holder
403/7182	. . Yoke or ring-type connector	407/1914	. . . . . Radially
403/7188	. . . Rod received in open channel	407/1916	. . . . . And axially
403/7194	. . Crossed rods	407/1918	. . . . . Selectively
403/72	. Miter joint	407/192	. . . . with separate means to fasten tool to holder
403/725	. . Connector bridges inner or outer periphery	407/1922	. . . . . Wedge clamp element
403/73	. Rigid angle	407/1924	. . . . Specified tool shape
403/74	. Particular configuration or material of member	407/1926	. . . Plural simultaneously usable separable tools in common seat or common clamp actuator for plural simultaneously usable tools
403/75	. having a joining piece extending through aligned openings in plural members	407/1928	. . . Tool adjustable relative to holder
403/76	. having a cam, wedge, or tapered portion	407/193	. . . . Radially
403/77	. Miscellaneous	407/1932	. . . with means to fasten tool seat to holder
		407/1934	. . . with separate means to fasten tool to holder
		407/1936	. . . . Apertured tool
		407/1938	. . . . Wedge clamp element
		407/194	. . . . . Resilient clamp jaw
		407/1942	. . . Peripherally spaced tools
		407/1944	. . . . Sectional support
		407/1946	. . Face or end mill

Former US Class 407 Series

407/00	Cutters, for shaping
407/10	. including noncutting work modifying means
407/11	. including chip breaker, guide or deflector detachable from tool and tool holder
407/112	. . Adjustable relative to cutting edge
407/114	. . . including adjusting means
407/116	. . Attached to or integral with tool clamping jaw

407/1948 . . . with cutting edge entirely across end of tool
[e.g., router bit, end mill, etc.]

407/195 . . Compound tooth arrangement

407/1952 . . Having peripherally spaced teeth

407/1954 . . . Axially tapering tool

407/1956 . . . Circumferentially staggered

407/1958 Plural teeth spaced about a helix

407/196 . . . Varying in cutting edge profile

407/1962 . . . Specified tooth shape or spacing

407/1964 Arcuate cutting edge

407/1966 Helical tooth

407/20 . . Profiled circular tool

407/21 . . Arc segment tool

407/22 . . including holder having seat for inserted tool

407/2202 . . Plural spaced seats and common holder

407/2204 . . . Relatively adjustable seats

407/2206 . . . Simultaneously usable

407/2208 . . Plural simultaneously usable separable tools
in common seat or common clamp actuator for
plural simultaneously usable tools

407/221 . . . Adjustable tool

407/2212 . . with tool ejector

407/2214 . . with separate means to adjust tool to and fro
relative to holder

407/2216 . . . with indicator

407/2218 . . . Plural provisions for adjustment

407/222 . . . by moving tool seat

407/2222 . . Tool adjustable relative to holder

407/2224 . . . with indicator

407/2226 . . . Plural provisions for adjustment

407/2228 Plural interfering seats

407/223 including pivotable seat or tool

407/2232 with detent

407/2234 Pivoted seat

407/2236 And pivotable tool

407/2238 . . . by adjustable or replaceable stop

407/224 Adjustable

407/2242 Screw

407/2244 . . . by movement of seat relative to holder

407/2246 Pivoted seat

407/2248 . . . Pivoted tool

407/225 . . . Resiliently biased tool clamping jaw

407/2252 . . . Rectilinearly

407/2254 including rotatable cam clamp element

407/2256 including wedge clamp element

407/2258 And guide or detent

407/226 including detent

407/2262 Tool gripped directly by set screw

407/2264 Slidable jaw

407/2266 . . Holder adapted for tools of different shape

407/2268 . . with chip breaker, guide or deflector

407/227 . . with separate means to fasten tool seat to holder

407/2272 . . with separate means to fasten tool to holder

407/2274 . . . Apertured tool

407/2276 with means projecting through aperture to
force tool laterally against reaction surface

407/2278 Tilting clamp element and separate means
to tilt same

407/228 . . . Rotatable cam clamp element

407/2282 . . . including tool holding clamp and clamp
actuator

407/2284 Wedge clamp element

407/2286 Resiliently biased clamp jaw

407/2288 Integral with holder

407/229 Pivoted jaw

407/2292 Slidable jaw

407/23 . . including tool having plural alternatively usable
cutting edges

407/235 . . with integral chip breaker, guide or deflector

407/24 . . with chip breaker, guide or deflector

407/245 . . comprising concave surface in cutting face of tool

407/25 . . including cut off tool

407/26 . . comprising cutting edge bonded to tool shank

407/27 . . comprising tool of specific chemical composition

407/28 . . Miscellaneous

Former US Class 408 Series

408/00 Cutting by use of rotating axially moving tool

408/03 . . Processes

408/04 . . Bit detachable

408/05 . . with means to weigh or test work or product

408/08 . . with means to regulate operation by use of templet,
tape, card, or other replaceable information supply

408/10 . . with interlock between machine elements

408/13 . . with randomly-actuated stopping means

408/14 . . Responsive to condition of Tool or tool-drive

408/15 . . Responsive to condition of work or product

408/16 . . with control means energized in response to
activator stimulated by condition sensor

408/165 . . to control Tool rotation

408/17 . . to control infeed

408/172 . . . Responsive to Tool

408/173 . . . Responsive to work

408/175 . . to control relative positioning of Tool and work

408/18 . . with stopping upon completion of prescribed
operation

408/20 . . Responsive to condition of work or product

408/21 . . with signal, indicator, illuminator or optical means

408/23 . . including means to cause Tool to progressively
vibrate toward work

408/26 . . with means to condition tool

408/29 . . with means to deForm work temporarily

408/31 . . Convertible cutting means

408/33 . . Utilizing common cutting Tool

408/34 . . Combined cutting means

408/344 . . including Tool operating on rotating work

408/348 . . Plural other type cutting means

408/35 . . . including plural rotating tools

408/352 . . including rotating cutter other than rotating,
axially moving Tool

408/353 . . . Crystalline cutter

408/355 . . . Utilized in cutting work or product to length

408/3555 Adapted to cut entire thickness of work at
one pass

408/356 . . including plunging [single stroke] cutter

408/36 . . Machine including plural tools

408/365 . . Axes of tools moving with work during operation

408/367 . . . including means to infeed Tool and means to
infeed work or including coaxial tools

408/368 . . . Plural work stations

408/37 . . Turret of tools

408/375 . . Coaxial tools

408/378 . . . Coaxial, opposed tools

408/3784 with additional, converging Tool

- 408/3788 Plural pairs of coaxial, opposed tools
- 408/3792 with means to sequentially feed tools toward work
- 408/3796 with interconnected means to simultaneously feed tools
- 408/38 . . Plural, simultaneously operational tools
- 408/3806 . . . with plural simultaneously operational work stations
- 408/3809 Successively acting on workpiece
- 408/381 Pivotaly mounted, work-advancing, work-supporting means, pivot-axis parallel to tool-axis
- 408/3811 . . . with provision for adjustment of relationship of axes
- 408/3817 . . . at least one Tool driven by orbiting wrist plate
- 408/3822 . . . at least one Tool including flexible drive connection
- 408/3828 . . . with work-infeed
- 408/3833 . . . with means to advance work relative to Tool
- 408/3839 . . . with presser-foot
- 408/3844 . . . with tool-opposing, work-engaging surface
- 408/385 . . Rotatable about parallel axes
- 408/39 . . with radially outer limit of cutting edge moving to define cylinder partially, but not entirely encircled by work
- 408/42 . . Axis of Tool moving with work during operation
- 408/44 . . with means to apply transient, fluent medium to work or product
- 408/45 . . including Tool with duct
- 408/453 . . . and means to move gaseous fluid by application of vacuum
- 408/455 . . . Conducting channel extending to end of Tool
- 408/458 . . . including nozzle
- 408/46 . . including nozzle
- 408/47 . . with work-infeed means
- 408/476 . . Driven by fluid motor
- 408/482 . . Driven by means having sliding engagement therewith
- 408/488 . . Driven by lever or connecting link
- 408/494 . . and gear to drive infeed means
- 408/50 . . with product handling or receiving means
- 408/51 . . Ejector
- 408/52 . . with work advancing or guiding means
- 408/54 . . Means to intermittently advance work
- 408/545 . . . Rotary, work-supporting means
- 408/55 . . with work-engaging structure other than Tool or tool-support
- 408/551 . . with means actuated by work to release Tool from fixed position in Tool support
- 408/552 . . . Adapted to engage work at tool-axis
- 408/553 . . Centering means adapted to be replaced by Tool
- 408/554 . . Magnetic or suction means
- 408/556 . . Tool supporting wheel
- 408/5565 . . . Wheel-axis parallel to tool-axis
- 408/557 . . Frictionally engaging sides of opening in work
- 408/558 . . . Opening coaxial with Tool
- 408/5583 Engaging sides of opening being enlarged by Tool
- 408/5584 Engaging surface axially advanced of tool-action
- 408/5586 Engaging surface subsequent to tool-action on that surface
- 408/5587 Valve fitting
- 408/559 . . Funnel like work-engaging surface cooperating with protuberance on work
- 408/56 . . Adapted to "form" recession in work
- 408/5605 . . . Recession at tool-axis
- 408/561 . . Having tool-opposing, work-engaging surface
- 408/5612 . . . Tool having shiftable tool-axis
- 408/5614 . . . Angularly adjustable surface
- 408/5616 Adjustable about axis that is parallel to tool-axis
- 408/5617 . . . Laterally adjustable surface
- 408/5619 . . . Flexible or concatenated member
- 408/5621 . . . Connected to Tool through opening being enlarged by Tool
- 408/5622 Plural, coaxially opposing, work-engaging means
- 408/5623 . . . with presser foot
- 408/56238 Encompassed by Tool during cut
- 408/56245 including tool-guide [or bushing]
- 408/56253 Base supported machine
- 408/5626 . . . with means to move Tool relative to other work-engaging structure along tool-axis
- 408/5627 Having sliding engagement therewith
- 408/56275 Screw coaxial with Tool
- 408/5628 . . . Tool having screw-thread engaging frame to cause infeed
- 408/563 . . Work-gripping clamp
- 408/5633 . . . Adapted to coaxially grip round work
- 408/56337 Oppositely moving lateral clamps
- 408/5634 Three or more moving clamps
- 408/56343 Base supported clamp
- 408/5635 . . . Oppositely moving lateral clamps
- 408/5638 . . . Adjustable relative to tool-axis
- 408/564 . . Movable relative to Tool along tool-axis
- 408/5647 . . . including means to move Tool
- 408/5653 . . . with means to bias Tool away from work
- 408/566 . . Axially fixed to Tool
- 408/5665 . . . Work-engaging surface parallel to tool-axis
- 408/567 . . Adjustable, tool-guiding jig
- 408/568 . . . Guide bushing
- 408/569 . . Bushing
- 408/57 . . Tool-support with means to receive tool-position indicator
- 408/60 . . Plural tool-assemblages
- 408/62 . . Coaxial
- 408/625 . . . Spring biased
- 408/63 . . Tool or tool-support with torque-applying ratchet
- 408/637 . . with thrust applying means
- 408/639 . . . Reversible ratchet
- 408/641 . . . Double-acting ratchet
- 408/643 . . Reversible ratchet
- 408/65 . . Means to drive tool
- 408/655 . . with specific Tool structure
- 408/66 . . Friction gearing
- 408/665 . . Universal or flexible drive connection to rotate Tool
- 408/67 . . Belt and pulley
- 408/675 . . including means to move Tool along tool-axis
- 408/6757 . . . Fluid means
- 408/6764 . . . Laterally adjustable Tool
- 408/6771 . . . with clutch means
- 408/6774 including plural speed drive
- 408/6776 Actuated by Tool movement

- 408/6779 . . . Rack and pinion
- 408/6786 . . . Manually moved lever
- 408/6793 . . . Screw coaxial with Tool
- 408/68 . . Tool or tool-support with thrust-applying machine-engaging screw
- 408/70 . . Tool or tool-support with torque-applying clutch
- 408/72 . . Friction clutch
- 408/73 . . Tool or tool-support with torque-applying spline
- 408/75 . . Relative motion of splined shaft and tool-support causing release of Tool from operating position
- 408/76 . . Tool-carrier with vibration-damping means
- 408/78 . . Tool of specific diverse material
- 408/81 . . Tool having crystalline cutting edge
- 408/83 . . Tool-support with means to move Tool relative to tool-support
- 408/85 . . to move radially
- 408/852 . . . with Tool releasing trigger
- 408/853 and separate Tool setting means
- 408/854 . . . to move eccentrically mounted Tool
- 408/855 Tool-support including plural, adjustable sections
- 408/856 . . . Moving means including pinion engaging rack-like surface of Tool
- 408/858 . . . Moving means including wedge, screw or cam
- 408/8583 with resiliently urged Tool
- 408/85837 with spring retainer
- 408/85843 Resilient Tool or tool-support
- 408/8585 including oppositely moving, diverging tools
- 408/8588 Axially slidable moving-means
- 408/85884 Tool pivotally mounted on support
- 408/85888 Having axially spaced shoulders
- 408/85892 Screw driven wedge or cam
- 408/85893 Screw with axis radially spaced from tool-axis
- 408/85894 Annular wedge-collar
- 408/858945 Axially spaced tool-retaining collars
- 408/858946 with travelling wedge
- 408/858948 Tool having axially facing, collar-receiving groove
- 408/858949 including two-piece collar
- 408/85895 Traveling wedge
- 408/858953 Interfitting, tool-retaining wedge
- 408/858955 including separable interfitting element
- 408/858957 Having externally threaded shank connected to tool-support
- 408/85896 Annular wedge-collar
- 408/859 Rotary cam
- 408/8591 Scroll plate
- 408/85913 Volute scroll
- 408/85915 with means to rotate scroll
- 408/85918 with adjustable means to limit scroll movement
- 408/8592 Coaxial with tool-axis
- 408/8593 Wedge moving perpendicular to tool-axis
- 408/8595 Pivotal tool-support
- 408/8598 Screw extending perpendicular to tool-axis
- 408/85985 Plural tools moved by diametrically opposed screws
- 408/85988 Screws mounted on common shaft
- 408/8599 Tool having pitch-stabilizing ridge
- 408/85995 with tool-holding clamp and clamp actuator
- 408/86 . . Tool-support with means to permit positioning of the Tool relative to support
- 408/865 . . Pivotal Tool
- 408/868 . . . with multiple cutting positions
- 408/87 . . Tool having stepped cutting edges
- 408/8713 . . . including means to permit both radial and axial positioning of edge
- 408/8725 . . . including means to permit relative axial positioning of edges
- 408/8729 with work-engaging structure other than cutting edge
- 408/8734 including central Tool axially movable relative to support
- 408/8738 . . . including inverse cutting edge
- 408/875 . . including means to "form" depression in work
- 408/88 . . including central-lead
- 408/885 . . including tool-holding clamp and clamp actuator
- 408/888 . . . Movable along tool-axis
- 408/89 . . Tool or Tool with support
- 408/892 . . with work-engaging structure detachable from cutting edge
- 408/8923 . . . Removable central lead
- 408/8925 . . . Depth-limiting member
- 408/8928 . . . Adjustable
- 408/893 . . Hollow milling Tool
- 408/895 . . Having axial, core-receiving central portion
- 408/8953 . . . with lateral outlet
- 408/8957 . . . and having stepped cutting edges
- 408/896 . . Having product-receiving chamber
- 408/8967 . . . and central lead-screw
- 408/8973 . . . and central lead
- 408/898 . . Helical ribbon Tool
- 408/899 . . Having inversely angled cutting edge
- 408/90 . . . and axially extending peripheral cutting spur
- 408/901 . . Having axially extending peripheral cutting spur
- 408/902 . . Having central lead-screw
- 408/904 . . with pitch-stabilizing ridge
- 408/9042 . . . and radially spaced cutting edge
- 408/9044 . . . including cutting teeth of different width
- 408/9045 and different root circles
- 408/9046 . . . including tapered section
- 408/90467 and relieved cutting edge
- 408/90473 including work-embracing cutting edges
- 408/9048 . . . Extending outwardly from tool-axis
- 408/905 . . Having stepped cutting edges
- 408/906 . . . Axially spaced
- 408/9065 with central lead
- 408/907 . . including detailed shank
- 408/909 . . Having peripherally spaced cutting edges
- 408/9093 . . . Each formed by a pair of axially facing facets
- 408/9095 . . . with axially extending relief channel
- 408/9097 Spiral channel
- 408/9098 . . . with means to retain Tool to support
- 408/90987 Wedge means
- 408/90993 Screw driven means
- 408/91 . . Machine frame
- 408/92 . . with counterweight mechanism
- 408/93 . . including pivotally mounted tool-carrier
- 408/935 . . . including laterally movable tool-carrier
- 408/94 . . Tool-support

408/95 . . with tool-retaining means
 408/953 . . . Clamping jaws
 408/957 . . . Tool adapter
 408/96 . Miscellaneous
 408/97 . . Drill bushings
 408/98 . . Drill guide
 408/99 . . Adjustable stop

Former US Class 409 Series**409/00 Gear cutting, milling, or planing**

409/10 . Gear cutting
 409/100159 . . with regulation of operation by use of templet, card, or other replaceable information supply
 409/100318 . . . including follower for templet
 409/100477 . . and burnishing simultaneously
 409/100636 . . with compensation for backlash in drive means
 409/100795 . . with work or product advancing
 409/100954 . . . Utilizing transfer arm
 409/101113 . . Gear chamfering or deburring
 409/101272 . . . Using relatively reciprocating or oscillating cutter
 409/101431 . . Gear tooth shape generating
 409/10159 . . . Hobbing
 409/101749 Process
 409/101908 Generating tooth for bevel gear
 409/102067 including means to shift hob between cutting passes
 409/102226 with control means energized in response to activator stimulated by condition sensor
 409/102385 Plural hobs
 409/102544 including infeed means
 409/102703 to infeed along axis of work rotation
 409/102862 Infeed of cutter
 409/103021 and infeed radially of axis of work rotation
 409/10318 Vertically
 409/103339 to infeed radially of axis of work rotation
 409/103498 Infeed of cutter
 409/103657 and infeed tangentially of work axis
 409/103816 . . . Milling with radial faced tool
 409/103975 Process
 409/104134 Adapted to cut bevel gear
 409/104293 with means to continuously rotate work and means to co-form all teeth of gear
 409/104452 Bevel gear having nonparallel opposing tooth flanks
 409/104611 including rotary cutter cradle
 409/10477 . . . by relative axial movement between synchronously indexing or rotating work and cutter
 409/104929 Crowning
 409/105088 Displacing cutter axially relative to work [e.g., gear shaving, etc.]
 409/105247 Using gear shaper-cutter
 409/105406 Plural distinct cutting edges
 409/105565 Cutting rotating work, the axis of which lies in a plane intersecting the cutter axis
 409/105724 . . . Gear shaving
 409/105883 . . . Using rotary cutter
 409/106042 having axially directed cutting edge
 409/106201 Plural rotary cutters
 409/10636 On reciprocating carriage

409/106519 Using reciprocating or oscillating cutter
 409/106678 Bevel gear cutting
 409/106837 Dual cutters
 409/106996 Double acting cutter
 409/107155 Rectilinearly reciprocating cutter
 409/107314 Cutter comprising a rack
 409/107473 . . . Making a noncircular gear, worm, rotor, or a planar-faced gear
 409/107632 . . Gear shaving
 409/107791 . . Using rotary cutter
 409/10795 . . . Process
 409/108109 . . . End mill
 409/108268 Radially faced
 409/108427 Using plural, selectively usable tools
 409/108586 . . . Plural rotary cutters
 409/108745 . . . Cutting action along work axis
 409/108904 Cutting action intersecting work axis
 409/109063 . . Using reciprocating or oscillating cutter
 409/109222 . . . Broach
 409/109381 . . . including circumferentially disposed cutting edges
 409/10954 . . Work dividing or checking of work position or division
 409/109699 . . with work clamping
 409/20 . with refurbishing of cutter
 409/30 . Milling
 409/300056 . . Thread or helix generating
 409/300112 . . . Process
 409/300168 . . . with means to regulate operation by use of templet, card, or other replaceable information supply
 409/300224 Complete cycle
 409/30028 to regulate cutting depth [e.g., relief, taper, etc.]
 409/300336 to regulate rate of motion [e.g., stopping, etc.]
 409/300392 . . . with nonthread or nonhelix generating, milling cutter
 409/300448 . . . with means to advance work or product
 409/300504 . . . Plural cutters or work holders
 409/30056 . . . with planetary cutter
 409/300616 . . . Work means to move work axially and means to interrelate work movement with cutter rotation
 409/300672 . . . with means to rotate work and means to interrelatedly infeed the work relative to the cutter
 409/300728 Means to infeed the cutter
 409/300784 . . . with means to circumferentially adjust the position of the cutter with respect to the work
 409/30084 . . with regulation of operation by templet, card, or other replaceable information supply
 409/300896 . . . with sensing of numerical information and regulation without mechanical connection between sensing means and regulated means [i.e., numerical control]
 409/300952 . . . to cut lock key
 409/301008 Using templet other than a key
 409/301064 Complete cycle
 409/30112 . . . Process
 409/301176 . . . Reproducing means
 409/301232 including pantograph cutter-carrier
 409/301288 and means to move work at work station

409/301344	About work axis	409/303528	Adapted to trigger electrical energy
409/3014	Pivotally supported for vertical movement	409/303584	Photocell
409/301456	and means to counterbalance carrier	409/30364	Adapted to trigger fluid energy
409/301512	including plural cutters	409/303696	Templet
409/301568	by use of pivotally supported tracer	409/303752	Process
409/301624	Duplicating means	409/303808	including infeeding
409/30168	with means for operation without manual intervention	409/303864	with means to weigh or test work or product
409/301736	to make a double curvature foil	409/30392	with means to protect operative or machine [e.g., guard, safety device, etc.]
409/301792	including means to sense optical or magnetic image	409/303976	with means to control temperature or lubricate
409/301848	with means to support templet above or under work	409/304032	Cutter or work
409/301904	including tracer adapted to trigger electrical energy	409/304088	with means to remove chip
409/30196	to actuate electrically driven work or tool moving means	409/304144	Means to trim edge
409/302016	to actuate fluid driven work or tool moving means	409/3042	Means to remove scale or raised surface imperfection
409/302072	including tracer adapted to trigger fluid energy	409/304256	Means to remove flash or burr
409/302128	to actuate fluid driven work or tool moving means	409/304312	with means to dampen vibration
409/302184	including cutter and tracer fixed to move laterally together	409/304368	Means to mill epitrochoidal shape
409/30224	and provision for circumferential relative movement of cutter and work	409/304424	Means for internal milling
409/302296	including plural cutters	409/30448	with detachable or auxiliary cutter support to convert cutting action
409/302352	including plural cutters	409/304536	including means to infeed work to cutter
409/302408	including cross-slide tool carrier	409/304592	with compensation for backlash in drive means
409/302464	including plural cutters	409/304648	with control means energized in response to activator stimulated by condition sensor
409/30252	including cross-slide tool carrier	409/304704	In response to cutter or cutter carriage
409/302576	with means to support templet above or under work	409/30476	In response to work or work carriage
409/302632	with provision for circumferential relative movement of cutter and work	409/304816	to control rate of infeed or return
409/302688	with provision for circumferential relative movement of cutter and work	409/304872	to control limit of infeed
409/302744	and means for operation without manual intervention	409/304928	Adapted to hydraulically or pneumatically stimulate control
409/3028	including tracer adapted to trigger electrical or fluid energy	409/304984	Adapted to electrically stimulate control
409/302856	For using planar templet in cutting profile [e.g., contour map from planar map, etc.]	409/30504	to control rate of infeed or return
409/302912	including means for operation without manual intervention	409/305096	to effect stopping of infeed
409/302968	including means for operation without manual intervention	409/305152	with means to change rate of infeed
409/303024	including simultaneously usable plural tracers or including tracer adapted to simultaneously use plural templets	409/305208	Means to mill indeterminate length work
409/30308	to make a double curvature foil	409/305264	Multiple work stations
409/303136	to make a double curvature foil	409/30532	with means to advance work or product
409/303192	including cutter and tracer fixed to move together	409/305376	Vertically
409/303248	with provision for circumferential relative movement of cutter and work	409/305432	Endless or orbital work or product advancing means
409/303304	and provision for circumferential relative movement of cutter and work	409/305488	to reciprocate or oscillate work
409/30336	including cutter and tracer fixed to move together	409/305544	with work holder
409/303416	Templet, tracer, or cutter	409/3056	and means to selectively position work
409/303472	Tracer	409/305656	including means to support work for rotation during operation
		409/305712	and including means to infeed cutter toward work axis
		409/305768	with linear movement of work
		409/305824	with angular movement of work
		409/30588	including friction gearing drive
		409/305936	including fluid drive
		409/305992	with means to effect stopping upon completion of operation
		409/306048	with means to advance work or product
		409/306104	Endless or orbital work or product advancing means
		409/30616	with means to precisely reposition work
		409/306216	Randomly manipulated, work supported, or work following device
		409/306272	For machining commutator

- 409/306328 . . . For cutting longitudinal groove in shaft [e.g., keyway, etc.]
- 409/306384 . . . with work supported guide means
- 409/30644 to guide tool to move in arcuate path
- 409/306496 . . . with work follower
- 409/306552 . . . Randomly manipulated
- 409/306608 End mill [e.g., router, etc.]
- 409/306664 . . including means to infeed rotary cutter toward work
- 409/30672 . . . with means to limit penetration into work
- 409/306776 . . . Axially
- 409/306832 with infeed control means energized in response to activator stimulated by condition sensor
- 409/306888 In response to cutter condition
- 409/306944 In response to work condition
- 409/307 with work holder
- 409/307056 and laterally
- 409/307112 Simultaneously
- 409/307168 Plural cutters
- 409/307224 . . . with infeed control means energized in response to activator stimulated by condition sensor
- 409/30728 In response to cutter condition
- 409/307336 In response to work condition
- 409/307392 . . . with means to change rate of infeed
- 409/307448 . . . with work holder
- 409/307504 Indexable
- 409/30756 . . . Machining arcuate surface
- 409/307616 with means to move cutter eccentrically
- 409/307672 . . . Angularly adjustable cutter head
- 409/307728 . . . including gantry-type cutter-carrier
- 409/307784 . . . Plural cutters
- 409/30784 . . including means to adjustably position cutter
- 409/307896 . . . with work holder or guide
- 409/307952 . . . Linear adjustment
- 409/308008 with control for adjustment means responsive to activator stimulated by condition sensor
- 409/308064 Responsive to position of cutter
- 409/30812 and means to clamp cutter support in adjusted position
- 409/308176 with position indicator or limit means
- 409/308232 and angular adjustment
- 409/308288 including gantry-type cutter-carrier
- 409/308344 Plural cutters
- 409/3084 . . . with position indicator or limit means
- 409/308456 . . . with right angle cutter drive
- 409/308512 . . . Compound angular adjustment
- 409/308568 . . . Plural cutters
- 409/308624 . . with limit means to aid in positioning of cutter bit or work [e.g., gauge, stop, etc.]
- 409/30868 . . Work support
- 409/308736 . . . with position indicator or stop
- 409/308792 . . . Indexable
- 409/308848 including dividing head
- 409/308904 Multiple row dividing head
- 409/30896 . . . with angular adjustment
- 409/309016 . . . with work holder or guide
- 409/309072 including cutter limited to rotary motion
- 409/309128 . . . with means to adjust work support vertically
- 409/309184 . . including cutter limited to rotary motion
- 409/30924 . . . Cutter turning about vertical axis
- 409/309296 . . Detachable or repositionable tool head
- 409/309352 . . Cutter spindle or spindle support
- 409/309408 . . . with cutter holder
- 409/309464 and draw bar
- 409/30952 . . . with cutter holder
- 409/309576 . . Machine frame
- 409/309632 . . . Overarm harness structure
- 409/309688 . . . including counterbalancing means
- 409/309744 . . . including means to compensate for deformation
- 409/3098 Deflection of cutter spindle
- 409/309856 . . . Convertible from lathe
- 409/309912 . . . including relatively movable components and means to relatively immobilize these components
- 409/309968 . . Tailstock
- 409/40 . Broaching
- 409/400175 . . Process
- 409/40035 . . with control means energized in response to activator stimulated by condition sensor
- 409/400525 . . . Responsive to condition of work or product
- 409/4007 . . with means to distribute cutter infeed force
- 409/400875 . . with means to select cutter or to select or modify cutter drive
- 409/40105 . . with means to clean, lubricate, or modify temperature of work or cutter
- 409/401225 . . with product handling means
- 409/4014 . . . Between plural broaching stations
- 409/401575 . . . Means to eject broached product
- 409/40175 . . . Chip removal means
- 409/401925 . . with means to protect operative or machine [e.g., guard, safety device, etc.]
- 409/4021 . . . with safety means for overload or safety interlock
- 409/402275 . . with work immobilizer and means to activate work immobilizer interrelated with cutter infeed, work infeed, or work advance
- 409/40245 . . with work infeed or advancing means and means to clamp the work thereto, which clamping means is interrelated with work or cutter infeed
- 409/402625 . . Means to remove flash or burr
- 409/4028 . . Means for cutting groove
- 409/402975 . . . Arcuate groove in cylindrical surface
- 409/40315 Rifling
- 409/403325 . . Orbital carrier for cutter
- 409/4035 . . Orbital carrier for work
- 409/403675 . . with means to cyclically manipulate cutter or cutter support
- 409/40385 . . . to reorient, introduce, or remove cutter
- 409/404025 . . . Cutter released to interim support at termination of cutting stroke
- 409/4042 . . . to remove and return cutter to cutter support
- 409/404375 . . with plural cutters
- 409/40455 . . with means to advance, infeed, or manipulate work
- 409/404725 . . . Interrelated with cutter infeed
- 409/4049 including means supporting work and additional means opposing infeed force
- 409/405075 including work indexing means for sequential cutting of different surfaces of a single workpiece
- 409/40525 including work indexing means for sequential cutting of surfaces of different workpieces

- 409/405425 with means to retract work from path of tool's idle return stroke
- 409/4056 to infeed work past cutter
- 409/405775 . . . with means to hold work during cutting
- 409/40595 including work clamping means
- 409/406125 with means to adjust or facilitate adjustment of work or work holder
- 409/4063 with means on work or work holder to guide cutter during infeed
- 409/406475 . . . Cutter infeed means
- 409/40665 Imparting rectilinear motion to cutter
- 409/406825 and rotary motion to cutter
- 409/407 Fluid powered means
- 409/407175 Rack means
- 409/40735 Screw means
- 409/407525 . . . Machine frame
- 409/4077 . . . Cutter support or guide
- 409/50 . . . Planing
- 409/500164 . . . with regulation of operation by templet, card, or other replaceable information supply
- 409/500328 including use of tracer adapted to trigger electrical or fluid energy
- 409/500492 including provision for circumferential relative movement of cutter and work
- 409/500656 including provision for circumferential relative movement of cutter and work
- 409/50082 . . . Process
- 409/500984 . . . with means to lubricate
- 409/501148 . . . with product handling means
- 409/501312 . . . Randomly manipulated, work supported, or work following device
- 409/501476 . . . Means to remove flash or burr
- 409/50164 Elongated work
- 409/501804 Flash or burr inside hollow work
- 409/501968 Transverse burr
- 409/502132 Flat work
- 409/502296 . . . of commutator
- 409/50246 . . . Means for trimming edge [e.g., chamfering, scarfing, etc.]
- 409/502624 . . . Means for cutting groove
- 409/502788 Arcuate groove
- 409/502952 For rifling
- 409/503116 Inside hollow work
- 409/50328 . . . Means for shaving by blade spanning work surface
- 409/503444 Concave work surface [e.g., bearing, stereotype printing plate, etc.]
- 409/503608 Circumferential surface
- 409/503772 including rack driven infeed means
- 409/503936 including roller infeed means
- 409/5041 . . . Means for cutting arcuate surface
- 409/504264 Cycloidal surface
- 409/504428 with work infeed and means to arcuately reposition the cutter
- 409/504592 with work infeed and means to arcuately reposition the work
- 409/504756 . . . with means to relatively infeed cutter and work
- 409/50492 and means to rotate work and cutter at same rate about converging axes
- 409/505084 with plural sequentially acting cutters or with double acting cutter
- 409/505248 and means to vary rate of infeed
- 409/505412 Reciprocating work infeed means
- 409/505576 with fluid-driven bed
- 409/50574 with rack-driven bed
- 409/505904 with screw-driven bed
- 409/506068 and means to permit repositioning of cutter laterally
- 409/506232 Reciprocating cutter infeed means
- 409/506396 Reciprocating cutter horizontally
- 409/50656 with work support and lead screw to reposition work support
- 409/506724 with fluid-powered means to drive cutter
- 409/506888 with pivoting link to drive cutter
- 409/507052 Link driven by crank
- 409/507216 with rack to drive cutter
- 409/50738 with screw to drive cutter
- 409/507544 with link or cam to drive cutter
- 409/507708 with rack to drive cutter
- 409/507872 including means causing return stroke
- 409/508036 . . . Machine frame
- 409/5082 . . . Means to permit repositioning of cutter
- 409/508364 Laterally
- 409/508528 Plural independently positioned cutters
- 409/508692 including clutch
- 409/508856 including repositioning means and means to effect stopping thereof
- 409/50902 including relatively movable components and means to relatively immobilize these components
- 409/509184 Work table
- 409/509348 . . . Tool head
- 409/509512 with selectively usable cutting edges
- 409/509676 with means to permit repositioning of cutting for idle return stroke
- 409/50984 comprising pivotable cutter or cutter support

Former US Class 428 Series

- 428/00 Stock material or miscellaneous articles**
- 428/10 . . . Liquid crystal optical display having layer of specified composition
- 428/1005 . . . Alignment layer of specified composition
- 428/1009 Alignment layer is inorganic
- 428/1014 Silicon compound [i.e., organosilicon]
- 428/1018 Polyamide
- 428/1023 Polyimide
- 428/1027 Polyimidefluoride
- 428/1032 Polyimide-metallo
- 428/1036 . . . with viewing layer of specified composition
- 428/1041 Polarizer or dye containing viewing layer
- 428/1045 Silicon compound [e.g., glass, organosilicon, etc.]
- 428/105 Ester [e.g., polycarbonate, polyacrylate, etc.]
- 428/1055 . . . with charge transferring layer of specified composition
- 428/1059 . . . with bonding or intermediate layer of specified composition [e.g., sealant, space, etc.]
- 428/1064 Inorganic layer
- 428/1068 Silicon compound [i.e., organosilicon]
- 428/1073 Epoxy
- 428/1077 Ester
- 428/1082 Unsaturated aliphatic polymer [e.g., vinyl, etc.]
- 428/1086 . . . with substrate layer of specified composition
- 428/1091 Releasable substrate layer to expose adhesive

- 428/1095 . . . Inorganic substrate layer [e.g., ceramic, metallic, glass, etc.]
- 428/11 . . Magnetic recording head
- 428/1107 . . Magnetoresistive
- 428/1114 . . . having tunnel junction effect
- 428/1121 . . . Multilayer
- 428/1129 Super lattice [e.g., giant magneto resistance [GMR] or colossal magneto resistance [CMR], etc.]
- 428/1136 . . . Single film
- 428/1143 . . . with defined structural feature
- 428/115 . . Magnetic layer composition
- 428/1157 . . Substrate composition
- 428/1164 . . with protective film
- 428/1171 . . with defined laminate structural detail
- 428/1179 . . . Head with slider structure
- 428/1186 . . . with head pole component
- 428/1193 . . with interlaminar component [e.g., adhesion layer, etc.]
- 428/12 . . All metal or with adjacent metals
- 428/12007 . . Component of composite having metal continuous phase interengaged with nonmetal continuous phase
- 428/12014 . . having metal particles
- 428/12021 . . . having composition or density gradient or differential porosity
- 428/12028 . . . Composite; i.e., plural, adjacent, spatially distinct metal components [e.g., layers, etc.]
- 428/12035 Fiber, asbestos, or cellulose in or next to particulate component
- 428/12042 Porous component
- 428/12049 Nonmetal component
- 428/12056 Entirely inorganic
- 428/12063 Nonparticulate metal component
- 428/12069 Plural nonparticulate metal components
- 428/12076 Next to each other
- 428/12083 Nonmetal in particulate component
- 428/1209 Plural particulate metal components
- 428/12097 Nonparticulate component encloses particles
- 428/12104 Particles discontinuous
- 428/12111 Separated by nonmetal matrix or binder [e.g., welding electrode, etc.]
- 428/12118 Nonparticulate component has Ni-, Cu-, or Zn-base
- 428/12125 Nonparticulate component has Fe-base
- 428/12132 Next to Fe-containing particles
- 428/12139 Nonmetal particles in particulate component
- 428/12146 Nonmetal particles in a component
- 428/12153 . . . Interconnected void structure [e.g., permeable, etc.]
- 428/1216 . . . Continuous interengaged phases of plural metals, or oriented fiber containing
- 428/12167 Nonmetal containing
- 428/12174 Mo or W containing
- 428/12181 . . Composite powder [e.g., coated, etc.]
- 428/12188 . . having marginal feature for indexing or weakened portion for severing
- 428/12194 . . . For severing perpendicular to longitudinal dimension
- 428/12201 . . Width or thickness variation or marginal cuts repeating longitudinally
- 428/12208 . . . Variation in both width and thickness
- 428/12215 . . . Marginal slots [i.e., deeper than wide]
- 428/12222 . . Shaped configuration for melting [e.g., package, etc.]
- 428/12229 . . Intermediate article [e.g., blank, etc.]
- 428/12236 . . . Panel having nonrectangular perimeter
- 428/12243 Disk
- 428/1225 Symmetrical
- 428/12257 Only one plane of symmetry
- 428/12264 . . . having outward flange, gripping means or interlocking feature
- 428/12271 . . . having discrete fastener, marginal fastening, taper, or end structure
- 428/12278 Same structure at both ends of plural taper
- 428/12285 Single taper [e.g., ingot, etc.]
- 428/12292 . . Workpiece with longitudinal passageway or stopweld material [e.g., for tubular stock, etc.]
- 428/12299 . . Workpiece mimicking finished stock having nonrectangular or noncircular cross section
- 428/12306 . . Workpiece of parallel, nonfastened components [e.g., fagot, pile, etc.]
- 428/12313 . . . Arranged to avoid lateral displacement
- 428/12319 . . . Composite
- 428/12326 . . with provision for limited relative movement between components
- 428/12333 . . Helical or with helical component
- 428/1234 . . Honeycomb, or with grain orientation or elongated elements in defined angular relationship in respective components [e.g., parallel, inter- secting, etc.]
- 428/12347 . . Plural layers discontinuously bonded [e.g., spot-weld, mechanical fastener, etc.]
- 428/12354 . . Nonplanar, uniform-thickness material having symmetrical channel shape or reverse fold [e.g., making acute angle, etc.]
- 428/12361 . . having aperture or cut
- 428/12368 . . . Struck-out portion type
- 428/12375 . . having member which crosses the plane of another member [e.g., T or X cross section, etc.]
- 428/12382 . . Defined configuration of both thickness and nonthickness surface or angle therebetween [e.g., rounded corners, etc.]
- 428/12389 . . having variation in thickness
- 428/12396 . . . Discontinuous surface component
- 428/12403 . . . Longitudinally smooth and symmetrical
- 428/1241 . . Nonplanar uniform thickness or nonlinear uniform diameter [e.g., L-shape]
- 428/12417 . . . Intersecting corrugating or dimples not in a single line [e.g., waffle form, etc.]
- 428/12424 . . Mass of only fibers
- 428/12431 . . Foil or filament smaller than 6 mils
- 428/12438 . . . Composite
- 428/12444 . . Embodying fibers interengaged or between layers [e.g., paper, etc.]
- 428/12451 . . Macroscopically anomalous interface between layers
- 428/12458 . . having composition, density, or hardness gradient
- 428/12465 . . having magnetic properties, or preformed fiber orientation coordinate with shape
- 428/12472 . . Microscopic interfacial wave or roughness
- 428/12479 . . Porous [e.g., foamed, spongy, cracked, etc.]

428/12486	. . Laterally noncoextensive components [e.g., embedded, etc.]	428/12812	. . . . . Diverse refractory group metal-base components: alternative to or next to each other
428/12493	. . Composite; i.e., plural, adjacent, spatially distinct metal components [e.g., layers, joint, etc.]	428/12819	. . . . . Group VB metal-base component
428/125	. . . Deflectable by temperature change [e.g., thermostat element]	428/12826	. . . . . Group VIB metal-base component
428/12507	. . . . More than two components	428/12833	. . . . . Alternative to or next to each other
428/12514	. . . . One component Cu-based	428/1284	. . . . . W-base component
428/12521	. . . . Both components Fe-based with more than 10% Ni	428/12847	. . . . . Cr-base component
428/12528	. . . Semiconductor component	428/12854	. . . . . Next to Co-, Fe-, or Ni-base component
428/12535	. . . with additional, spatially distinct nonmetal component	428/12861	. . . . . Group VIII or IB metal-base component
428/12542	. . . . More than one such component	428/12868	. . . . . Group IB metal-base component alternative to platinum group metal-base component [e.g., precious metal, etc.]
428/12549	. . . . . Adjacent to each other	428/12875	. . . . . Platinum group metal-base component
428/12556	. . . . Organic component	428/12882	. . . . . Cu-base component alternative to Ag-, Au-, or Ni-base component
428/12562	. . . . . Elastomer	428/12889	. . . . . Au-base component
428/12569	. . . . . Synthetic resin	428/12896	. . . . . Ag-base component
428/12576	. . . . Boride, carbide or nitride component	428/12903	. . . . . Cu-base component
428/12583	. . . . Component contains compound of adjacent metal	428/1291	. . . . . Next to Co-, Cu-, or Ni-base component
428/1259	. . . . . Oxide	428/12917	. . . . . Next to Fe-base component
428/12597	. . . . Noncrystalline silica or noncrystalline plural-oxide component [e.g., glass, etc.]	428/12924	. . . . . Fe-base has 0.01-1.7% carbon [i.e., steel]
428/12604	. . . . . Film [e.g., glaze, etc.]	428/12931	. . . . . Co-, Fe-, or Ni-base components, alternative to each other
428/12611	. . . . Oxide-containing component	428/12937	. . . . . Co- or Ni-base component next to Fe-base component
428/12618	. . . . . Plural oxides	428/12944	. . . . . Ni-base component
428/12625	. . . . Free carbon containing component	428/12951	. . . . . Fe-base component
428/12632	. . . Four or more distinct components with alternate recurrence of each type component	428/12958	. . . . . Next to Fe-base component
428/12639	. . . Adjacent, identical composition, components	428/12965	. . . . . Both containing 0.01-1.7% carbon [i.e., steel]
428/12646	. . . . Group VIII or IB metal-base	428/12972	. . . . . Containing 0.01-1.7% carbon [i.e., steel]
428/12653	. . . . . Fe, containing 0.01-1.7% carbon [i.e., steel]	428/12979	. . . . . Containing more than 10% nonferrous elements [e.g., high alloy, stainless]
428/1266	. . . O, S, or organic compound in metal component	428/12986	. . . Adjacent functionally defined components
428/12667	. . . . Oxide of transition metal or Al	428/12993	. . Surface feature [e.g., rough, mirror]
428/12674	. . . Ge- or Si-base component	428/13	. Hollow or container type article [e.g., tube, vase, etc.]
428/12681	. . . Ga-, In-, Tl- or Group VA metal-base component	428/1303	. . Paper containing [e.g., paperboard, cardboard, fiberboard, etc.]
428/12687	. . . Pb- and Sn-base components: alternative to or next to each other	428/1307	. . . Bag or tubular film [e.g., pouch, flexible food casing, envelope, etc.]
428/12694	. . . . and next to Cu- or Fe-base component	428/131	. . Glass, ceramic, or sintered, fused, fired, or calcined metal oxide or metal carbide containing [e.g., porcelain, brick, cement, etc.]
428/12701	. . . Pb-base component	428/1314	. . . Contains fabric, fiber particle, or filament made of glass, ceramic, or sintered, fused, fired, or calcined metal oxide, or metal carbide or other inorganic compound [e.g., fiber glass, mineral fiber, sand, etc.]
428/12708	. . . Sn-base component	428/1317	. . . Multilayer [continuous layer]
428/12715	. . . . Next to Group IB metal-base component	428/1321	. . . . Polymer or resin containing [i.e., natural or synthetic]
428/12722	. . . . Next to Group VIII metal-base component	428/1324	. . Flexible food casing [e.g., sausage type, etc.]
428/12729	. . . Group IIA metal-base component	428/1328	. . Shrinkable or shrunk [e.g., due to heat, solvent, volatile agent, restraint removal, etc.]
428/12736	. . . Al-base component	428/1331	. . . Single layer [continuous layer]
428/12743	. . . . Next to refractory [Group IVB, VB, or VIB] metal-base component	428/1334	. . Nonself-supporting tubular film or bag [e.g., pouch, envelope, packet, etc.]
428/1275	. . . . Next to Group VIII or IB metal-base component	428/1338	. . . Elemental metal containing
428/12757	. . . . . Fe		
428/12764	. . . . Next to Al-base component		
428/12771	. . . Transition metal-base component		
428/12778	. . . . Alternative base metals from diverse categories		
428/12785	. . . . Group IIB metal-base component		
428/12792	. . . . . Zn-base component		
428/12799	. . . . . Next to Fe-base component [e.g., galvanized]		
428/12806	. . . . Refractory [Group IVB, VB, or VIB] metal-base component		

- 428/1341 . . . Contains vapor or gas barrier, polymer derived from vinyl chloride or vinylidene chloride, or polymer containing a vinyl alcohol unit
- 428/1345 . . . Single layer [continuous layer]
- 428/1348 . . Cellular material derived from plant or animal source [e.g., wood, cotton, wool, leather, etc.]
- 428/1352 . . Polymer or resin containing [i.e., natural or synthetic]
- 428/1355 . . . Elemental metal containing [e.g., substrate, foil, film, coating, etc.]
- 428/1359 Three or more layers [continuous layer]
- 428/1362 . . . Textile, fabric, cloth, or pile containing [e.g., web, net, woven, knitted, mesh, nonwoven, matted, etc.]
- 428/1366 Textile, fabric, cloth, or pile is sandwiched between two distinct layers of material unlike the textile, fabric, cloth, or pile layer
- 428/1369 . . . Fiber or fibers wound around each other or into a self-sustaining shape [e.g., yarn, braid, fibers shaped around a core, etc.]
- 428/1372 . . . Randomly noninterengaged or randomly contacting fibers, filaments, particles, or flakes
- 428/1376 . . . Foam or porous material containing
- 428/1379 . . . Contains vapor or gas barrier, polymer derived from vinyl chloride or vinylidene chloride, or polymer containing a vinyl alcohol unit
- 428/1383 Vapor or gas barrier, polymer derived from vinyl chloride or vinylidene chloride, or polymer containing a vinyl alcohol unit is sandwiched between layers [continuous layer]
- 428/1386 . . . Natural or synthetic rubber or rubber-like compound containing
- 428/139 . . . Open-ended, self-supporting conduit, cylinder, or tube-type article
- 428/1393 Multilayer [continuous layer]
- 428/1397 . . . Single layer [continuous layer]
- 428/14 . . Layer or component removable to expose adhesive
- 428/1405 . . Capsule or particulate matter containing [e.g., sphere, flake, microballoon, etc.]
- 428/141 . . Bituminous
- 428/1414 . . Ceramic, glass, glasslike, vitreous
- 428/1419 . . Wax containing
- 428/1424 . . Halogen containing compound
- 428/1429 . . . Fluorine
- 428/1433 . . . Coloring agent containing
- 428/1438 . . Metal containing
- 428/1443 . . . Aluminum
- 428/1448 . . . Coloring agent containing
- 428/1452 . . Polymer derived only from ethylenically unsaturated monomer
- 428/1457 . . . Silicon
- 428/1462 . . Polymer derived from material having at least one acrylic or alkacrylic group or the nitrile or amide derivative thereof [e.g., acrylamide, acrylate ester, etc.]
- 428/1467 . . Coloring agent
- 428/1471 . . Protective layer
- 428/1476 . . Release layer
- 428/1481 . . Dissimilar adhesives
- 428/1486 . . Ornamental, decorative, pattern, or indicia
- 428/149 . . Sectional layer removable
- 428/1495 . . . Adhesive is on removable layer
- 428/15 . . Sheet, web, or layer weakened to permit separation through thickness
- 428/16 . . Two dimensionally sectional layer
- 428/161 . . with frame, casing, or perimeter structure
- 428/162 . . Transparent or translucent layer or section
- 428/163 . . Next to unitary web or sheet of equal or greater extent
- 428/164 . . . Continuous two dimensionally sectional layer
- 428/166 Glass, ceramic, or metal sections [e.g., floor or wall tile, etc.]
- 428/167 Cellulosic sections [e.g., parquet floor, etc.]
- 428/168 . . . Nonrectangular
- 428/169 . . Sections connected flexibly with external fastener
- 428/17 . . Three or more coplanar interfitted sections with securing means
- 428/18 . . Longitudinally sectional layer of three or more sections
- 428/183 . . Next to unitary sheet of equal or greater extent
- 428/187 . . . Continuous sectional layer
- 428/19 . . Sheets or webs edge spliced or joined
- 428/192 . . Sheets or webs coplanar
- 428/193 . . . Double faced corrugated sheets or webs connected
- 428/195 . . . Beveled, stepped, or skived in thickness
- 428/197 . . . with noncoplanar reinforcement
- 428/198 Pile or nap surface sheets connected
- 428/20 . . Patched hole or depression
- 428/21 . . Circular sheet or circular blank
- 428/211 . . Gear
- 428/213 . . Frictional
- 428/214 . . End closure
- 428/215 . . Seal, gasket, or packing
- 428/216 . . Ornamental, decorative, pattern, or indicia
- 428/218 . . Aperture containing
- 428/219 . . Edge structure
- 428/22 . . Nonparticulate element embedded or inlaid in substrate and visible
- 428/23 . . Sheet including cover or casing
- 428/231 . . Filled with gas other than air; or under vacuum
- 428/232 . . Encased layer derived from inorganic settable ingredient
- 428/233 . . Foamed or expanded material encased
- 428/234 . . including elements cooperating to form cells
- 428/236 . . . Honeycomb type cells extend perpendicularly to nonthickness layer
- 428/237 . . Noninterengaged fibered material encased [e.g., mat, batt, etc.]
- 428/238 . . . Metal cover or casing
- 428/239 . . Complete cover or casing
- 428/23907 . . Pile or nap type surface or component
- 428/23914 . . Interlaminar
- 428/23921 . . With particles
- 428/23929 . . Edge feature or configured or discontinuous surface
- 428/23936 . . . Differential pile length or surface
- 428/23943 . . Flock surface
- 428/2395 . . Nap type surface
- 428/23957 . . Particular shape or structure of pile
- 428/23964 . . . U-, V-, or W-shaped or continuous strand, filamentary material
- 428/23971 Continuous strand with adhesive bond to backing

- 428/23979 . . Particular backing structure or composition
- 428/23986 . . With coating, impregnation, or bond
- 428/23993 . . Composition of pile or adhesive
- 428/24 . Structurally defined web or sheet [e.g., overall dimension, etc.]
- 428/24008 . . including fastener for attaching to external surface
- 428/24017 . . . Hook or barb
- 428/24025 . . Superposed movable attached layers or components
- 428/24033 . . including stitching and discrete fastener[s], coating or bond
- 428/24041 . . . Discontinuous or differential coating, impregnation, or bond
- 428/2405 Coating, impregnation, or bond in stitching zone only
- 428/24058 . . including grain, strips, or filamentary elements in respective layers or components in angular relation
- 428/24066 . . . Wood grain
- 428/24074 . . . Strand or strand-portions
- 428/24083 Nonlinear strands or strand-portions
- 428/24091 with additional layer[s]
- 428/24099 On each side of strands or strand-portions
- 428/24107 including mechanically interengaged strands, strand-portions or strand-like strips
- 428/24116 Oblique to direction of web
- 428/24124 . . . Fibers
- 428/24132 . . including grain, strips, or filamentary elements in different layers or components parallel
- 428/2414 . . including fringe
- 428/24149 . . Honeycomb-like
- 428/24157 . . . Filled honeycomb cells [e.g., solid substance in cavities, etc.]
- 428/24165 . . . Hexagonally shaped cavities
- 428/24174 . . including sheet or component perpendicular to plane of web or sheet
- 428/24182 . . . Inward from edge of web or sheet
- 428/2419 . . Fold at edge
- 428/24198 . . . Channel-shaped edge component [e.g., binding, etc.]
- 428/24207 . . . with strand[s] or strand-portion[s] between layers [e.g., upholstery trim, etc.]
- 428/24215 . . . Acute or reverse fold of exterior component
- 428/24223 Embedded in body of web
- 428/24231 At opposed marginal edges
- 428/2424 Annular cover
- 428/24248 One piece
- 428/24256 Abutted or lapped seam
- 428/24264 . . . Particular fold structure [e.g., beveled, etc.]
- 428/24273 . . including aperture
- 428/24281 . . . Struck out portion type
- 428/24289 Embedded or interlocked
- 428/24298 . . . Noncircular aperture [e.g., slit, diamond, rectangular, etc.]
- 428/24306 Diamond or hexagonal
- 428/24314 Slit or elongated
- 428/24322 . . . Composite web or sheet
- 428/24331 including nonapertured component
- 428/24339 Keyed
- 428/24347 From both sides
- 428/24355 . . Continuous and nonuniform or irregular surface on layer or component [e.g., roofing, etc.]
- 428/24364 . . . with transparent or protective coating
- 428/24372 Particulate matter
- 428/2438 Coated
- 428/24388 Silicon containing coating
- 428/24397 Carbohydrate
- 428/24405 Polymer or resin [e.g., natural or synthetic rubber, etc.]
- 428/24413 Metal or metal compound
- 428/24421 Silicon containing
- 428/2443 Sand, clay, or crushed rock or slate
- 428/24438 . . . Artificial wood or leather grain surface
- 428/24446 . . . Wrinkled, creased, crinkled or creped
- 428/24455 Paper
- 428/24463 Plural paper components
- 428/24471 . . . Crackled, crazed or slit
- 428/24479 . . including variation in thickness
- 428/24488 . . . Differential nonuniformity at margin
- 428/24496 . . . Foamed or cellular component
- 428/24504 Component comprises a polymer [e.g., rubber, etc.]
- 428/24512 Polyurethane
- 428/24521 . . . with component conforming to contour of nonplanar surface
- 428/24529 and conforming component on an opposite nonplanar surface
- 428/24537 Parallel ribs and/or grooves
- 428/24545 Containing metal or metal compound
- 428/24554 including cellulosic or natural rubber component
- 428/24562 . . . Interlaminar spaces
- 428/2457 . . . Parallel ribs and/or grooves
- 428/24579 with particulate matter
- 428/24587 Oblique to longitudinal axis of web or sheet
- 428/24595 . . . and varying density
- 428/24603 Fiber containing component
- 428/24612 . . . Composite web or sheet
- 428/2462 with partial filling of valleys on outer surface
- 428/24628 . . Nonplanar uniform thickness material
- 428/24636 . . . Embodiment mechanically interengaged strand[s], strand-portion[s] or strand-like strip[s] [e.g., weave, knit, etc.]
- 428/24645 with folds in parallel planes
- 428/24653 . . . Differential nonplanarity at margin
- 428/24661 . . . Forming, or cooperating to form cells
- 428/24669 . . . Aligned or parallel nonplanarities
- 428/24678 Waffle-form
- 428/24686 Pleats or otherwise parallel adjacent folds
- 428/24694 Parallel corrugations
- 428/24702 with locally deformed crests or intersecting series of corrugations
- 428/24711 Plural corrugated components
- 428/24719 with corrugations of respective components intersecting in plane projection
- 428/24727 with planar component
- 428/24736 . . . Ornamental design or indicia
- 428/24744 . . Longitudinal or transverse tubular cavity or cell
- 428/24752 . . Laterally noncoextensive components
- 428/2476 . . . Fabric, cloth or textile component
- 428/24769 . . . Cellulosic

- 428/24777 . . . Edge feature
- 428/24785 . . . including layer embodying mechanically interengaged strands, strand portions or strand-like strips [e.g., weave, knit, etc.]
- 428/24793 . . . Comprising discontinuous or differential impregnation or bond
- 428/24802 . . . Discontinuous or differential coating, impregnation or bond [e.g., artwork, printing, retouched photograph, etc.]
- 428/2481 . . . including layer of mechanically interengaged strands, strand-portions or strand-like strips
- 428/24818 Knitted, with particular or differential bond sites or intersections
- 428/24826 . . . Spot bonds connect components
- 428/24835 . . . including developable image or soluble portion in coating or impregnation [e.g., safety paper, etc.]
- 428/24843 . . . with heat sealable or heat releasable adhesive layer
- 428/24851 . . . Intermediate layer is discontinuous or differential
- 428/2486 with outer strippable or release layer
- 428/24868 Translucent outer layer
- 428/24876 Intermediate layer contains particulate material [e.g., pigment, etc.]
- 428/24884 Translucent layer comprises natural oil, wax, resin, gum, glue, gelatin
- 428/24893 . . . including particulate material
- 428/24901 including coloring matter
- 428/24909 Free metal or mineral containing
- 428/24917 . . . including metal layer
- 428/24926 . . . including ceramic, glass, porcelain or quartz layer
- 428/24934 . . . including paper layer
- 428/24942 . . including components having same physical characteristic in differing degree
- 428/2495 . . . Thickness [relative or absolute]
- 428/24959 of adhesive layers
- 428/24967 Absolute thicknesses specified
- 428/24975 No layer or component greater than 5 mils thick
- 428/24983 . . . Hardness
- 428/24992 . . . Density or compression of components
- 428/249921 . Web or sheet containing structurally defined element or component
- 428/249922 . . . Embodying intertwined or helical component[s]
- 428/249923 . . . Including interlaminar mechanical fastener
- 428/249924 . . . Noninterengaged fiber-containing paper-free web or sheet which is not of specified porosity
- 428/249925 . . . Fiber-containing wood product [e.g., hardboard, lumber, or wood board, etc.]
- 428/249926 . . . Including paper layer
- 428/249927 . . . Fiber embedded in a metal matrix
- 428/249928 . . . Fiber embedded in a ceramic, glass, or carbon matrix
- 428/249929 Fibers are aligned substantially parallel
- 428/24993 Fiber is precoated
- 428/249931 Free metal or alloy fiber
- 428/249932 . . . Fiber embedded in a layer derived from a water-settable material [e.g., cement, gypsum, etc.]
- 428/249933 . . . Fiber embedded in or on the surface of a natural or synthetic rubber matrix
- 428/249934 Fibers are aligned substantially parallel
- 428/249935 Fiber is nonlinear [e.g., crimped, sinusoidal, etc.]
- 428/249936 Fiber is precoated
- 428/249937 Fiber is precoated
- 428/249938 Composite or conjugate fiber [e.g., fiber contains more than one chemically different material in monofilament or multifilament form, etc.]
- 428/249939 Two or more layers
- 428/24994 Fiber embedded in or on the surface of a polymeric matrix
- 428/249941 Fiber is on the surface of a polymeric matrix having no embedded portion
- 428/249942 Fibers are aligned substantially parallel
- 428/249943 Fiber is nonlinear [e.g., crimped, sinusoidal, etc.]
- 428/249944 Fiber is precoated
- 428/249945 Carbon or carbonaceous fiber
- 428/249946 Glass fiber
- 428/249947 Polymeric fiber
- 428/249948 Fiber is precoated
- 428/249949 Two or more chemically different fibers
- 428/24995 Two or more layers
- 428/249951 Including a free metal or alloy constituent
- 428/249952 At least one thermosetting synthetic polymeric material layer
- 428/249953 . . . Composite having voids in a component [e.g., porous, cellular, etc.]
- 428/249954 With chemically effective material or specified gas other than air, N, or carbon dioxide in void-containing component
- 428/249955 Void-containing component partially impregnated with adjacent component
- 428/249956 Void-containing component is inorganic
- 428/249957 Inorganic impregnant
- 428/249958 Void-containing component is synthetic resin or natural rubbers
- 428/249959 Void-containing component is wood or paper
- 428/24996 With internal element bridging layers, nonplanar interface between layers, or intermediate layer of commingled adjacent foam layers
- 428/249961 With gradual property change within a component
- 428/249962 Void-containing component has a continuous matrix of fibers only [e.g., porous paper, etc.]
- 428/249963 And a force disintegratable component [e.g., stencil sheet, etc.]
- 428/249964 Fibers of defined composition
- 428/249965 Cellulosic
- 428/249966 Plural cellulosic components
- 428/249967 Inorganic matrix in void-containing component
- 428/249968 Of hydraulic-setting material
- 428/249969 Of silicon-containing material [e.g., glass, etc.]
- 428/24997 Of metal-containing material
- 428/249971 Preformed hollow element-containing
- 428/249972 Resin or rubber element
- 428/249973 Mineral element
- 428/249974 Metal- or silicon-containing element
- 428/249975 Void shape specified [e.g., crushed, flat, round, etc.]

- 428/249976 . . . Voids specified as closed
- 428/249977 Specified thickness of void-containing component [absolute or relative], numerical cell dimension or density
- 428/249978 . . . Voids specified as micro
- 428/249979 Specified thickness of void-containing component [absolute or relative] or numerical cell dimension
- 428/24998 Composite has more than two layers
- 428/249981 . . . Plural void-containing components
- 428/249982 . . . With component specified as adhesive or bonding agent
- 428/249983 As outermost component
- 428/249984 Adhesive or bonding component contains voids
- 428/249985 Composition of adhesive or bonding component specified
- 428/249986 . . . Void-containing component contains also a solid fiber or solid particle
- 428/249987 . . . With nonvoid component of specified composition
- 428/249988 Of about the same composition as, and adjacent to, the void-containing component
- 428/249989 Integrally formed skin
- 428/24999 Inorganic
- 428/249991 Synthetic resin or natural rubbers
- 428/249992 Linear or thermoplastic
- 428/249993 Hydrocarbon polymer
- 428/249994 . . Composite having a component wherein a constituent is liquid or is contained within preformed walls [e.g., impregnated-filled, previously void containing component, etc.]
- 428/249995 . . . Constituent is in liquid form
- 428/249996 Ink in pores
- 428/249997 Encapsulated liquid
- 428/249998 . . . Indefinite plurality of similar impregnated thin sheets [e.g., "decorative laminate" type, etc.]
- 428/249999 . . . Differentially filled foam, filled plural layers, or filled layer with coat of filling material
- 428/25 . . Web or sheet containing structurally defined element or component and including a second component containing structurally defined particles
- 428/251 . . Mica
- 428/252 . . Glass or ceramic [i.e., fired or glazed clay, cement, etc.] [porcelain, quartz, etc.]
- 428/253 . . Cellulosic [e.g., wood, paper, cork, rayon, etc.]
- 428/254 . . Polymeric or resinous material
- 428/256 . . Heavy metal or aluminum or compound thereof
- 428/257 . . . Iron oxide or aluminum oxide
- 428/258 . . Alkali metal or alkaline earth metal or compound thereof
- 428/259 . . Silicic material
- 428/26 . . Web or sheet containing structurally defined element or component, the element or component having a specified physical dimension
- 428/261 . . In terms of molecular thickness or light wave length
- 428/263 . . Coating layer not in excess of 5 mils thick or equivalent
- 428/264 . . . Up to 3 mils
- 428/265 1 mil or less
- 428/266 . . of base or substrate
- 428/268 . . Monolayer with structurally defined element
- 428/269 . . including synthetic resin or polymer layer or component
- 428/27 . . Web or sheet containing structurally defined element or component, the element or component having a specified weight per unit area [e.g., gms/sq cm, lbs/sq ft, etc.]
- 428/273 . . of coating
- 428/277 . . . Cellulosic substrate
- 428/28 . . Web or sheet containing structurally defined element or component and having an adhesive outermost layer
- 428/2804 . . Next to metal
- 428/2809 . . including irradiated or wave energy treated component
- 428/2813 . . Heat or solvent activated or sealable
- 428/2817 . . . Heat sealable
- 428/2822 Wax containing
- 428/2826 Synthetic resin or polymer
- 428/283 . . . Water activated
- 428/2835 . . including moisture or waterproof component
- 428/2839 . . with release or antistick coating
- 428/2843 . . including a primer layer
- 428/2848 . . Three or more layers
- 428/2852 . . Adhesive compositions
- 428/2857 . . . including metal or compound thereof or natural rubber
- 428/2861 . . . having readily strippable combined with readily readhearable properties [e.g., stick-ons, etc.]
- 428/2865 . . . including monomer or polymer of carbohydrate [e.g., starch, dextrin, etc.] Or protein [e.g., casein, animal protein, etc.] Or derivative thereof
- 428/287 . . . including epoxy group or epoxy polymer
- 428/2874 . . . including aldehyde or ketone condensation polymer [e.g., urea formaldehyde polymer, melamine formaldehyde polymer, etc.]
- 428/2878 . . . including addition polymer from unsaturated monomer
- 428/2883 including addition polymer of diene monomer [e.g., SBR, SIS, etc.]
- 428/2887 including nitrogen containing polymer [e.g., polyacrylonitrile, polymethacrylonitrile, etc.]
- 428/2891 including addition polymer from alpha-beta unsaturated carboxylic acid [e.g., acrylic acid, methacrylic acid, etc.] Or derivative thereof
- 428/2896 . . . including nitrogen containing condensation polymer [e.g., polyurethane, polyisocyanate, etc.]
- 428/29 . . Coated or structurally defined flake, particle, cell, strand, strand portion, rod, filament, macroscopic fiber or mass thereof
- 428/2902 . . Channel shape
- 428/2904 . . Staple length fiber
- 428/2905 . . . Plural and with bonded intersections only
- 428/2907 . . . with coating or impregnation
- 428/2909 . . . Nonlinear [e.g., crimped, coiled, etc.]
- 428/2911 . . Mica flake
- 428/2913 . . Rod, strand, filament or fiber
- 428/2915 . . . including textile, cloth or fabric
- 428/2916 . . . including boron or compound thereof [not as steel]

428/2918	. . . including free carbon or carbide or therewith [not as steel]	428/31	. Surface property or characteristic of web, sheet or block
428/292	. . . . In coating or impregnation	428/315	. . Surface modified glass [e.g., tempered, strengthened, etc.]
428/2922	. . . . Nonlinear [e.g., crimped, coiled, etc.]	428/31504	. Composite [nonstructural laminate]
428/2924	. . . . Composite	428/31507	. . Of polycarbonate
428/2925	. . . . Helical or coiled	428/31511	. . Of epoxy ether
428/2927	. . . including structurally defined particulate matter	428/31515	. . . As intermediate layer
428/2929	. . . Bicomponent, conjugate, composite or collateral fibers or filaments [i.e., coextruded sheath-core or side-by-side type]	428/31518	. . . . Next to glass or quartz
428/2931	. . . . Fibers or filaments nonconcentric [e.g., side-by-side or eccentric, etc.]	428/31522	. . . . Next to metal
428/2933	. . . Coated or with bond, impregnation or core	428/31525	. . . Next to glass or quartz
428/2935	. . . . Discontinuous or tubular or cellular core	428/31529	. . . Next to metal
428/2936	. . . . Wound or wrapped core or coating [i.e., spiral or helical]	428/31533	. . Of polythioether
428/2938	. . . . Coating on discrete and individual rods, strands or filaments	428/31536	. . Including interfacial reaction product of adjacent layers
428/294	. . . . including metal or compound thereof [excluding glass, ceramic and asbestos]	428/3154	. . Of fluorinated addition polymer from unsaturated monomers
428/2942	. . . . . Plural coatings	428/31544	. . . Addition polymer is perhalogenated
428/2944	. . . . . Free metal in coating	428/31547	. . Of polyisocyanurate
428/2945	. . . . . Natural rubber in coating	428/31551	. . Of polyamidoester [polyurethane, polyisocyanate, polycarbamate, etc.]
428/2947	. . . . . Synthetic resin or polymer in plural coatings, each of different type	428/31554	. . . Next to second layer of polyamidoester
428/2949	. . . . . Glass, ceramic or metal oxide in coating	428/31558	. . . Next to animal skin or membrane
428/2951	. . . . . Metal with weld modifying or stabilizing coating [e.g., flux, slag, producer, etc.]	428/31562	. . . Next to polyamide [nylon, etc.]
428/2953	. . . . . Titanium compound in coating	428/31565	. . . Next to polyester [polyethylene terephthalate, etc.]
428/2955	. . . . . Silicic material in coating	428/31569	. . . Next to natural rubber
428/2956	. . . . . Glass or silicic fiber or filament with metal coating	428/31573	. . . Next to addition polymer of ethylenically unsaturated monomer
428/2958	. . . . . Metal or metal compound in coating	428/31576	. . . . Ester monomer type [polyvinylacetate, etc.]
428/296	. . . . . Rubber, cellulosic or silicic material in coating	428/3158	. . . . Halide monomer type [polyvinyl chloride, etc.]
428/2962	. . . . Silane, silicone or siloxane in coating	428/31583	. . . . Nitrile monomer type [polyacrylonitrile, etc.]
428/2964	. . . . Artificial fiber or filament	428/31587	. . . . Hydrocarbon polymer [polyethylene, polybutadiene, etc.]
428/2965	. . . . Cellulosic	428/31591	. . . Next to cellulosic
428/2967	. . . . Synthetic resin or polymer	428/31594	. . . Next to aldehyde or ketone condensation product [phenol-aldehyde, etc.]
428/2969	. . . . . Polyamide, polyimide or polyester	428/31598	. . . Next to silicon-containing [silicone, cement, etc.] layer
428/2971	. . . . Impregnation	428/31601	. . . . Quartz or glass
428/2973	. . . Particular cross section	428/31605	. . . Next to free metal
428/2975	. . . . Tubular or cellular	428/31609	. . . Particulate metal or metal compound-containing
428/2976	. . . . Longitudinally varying	428/31612	. . . . As silicone, silane or siloxane
428/2978	. . . . Surface characteristic	428/31616	. . . Next to polyester [e.g., alkyd]
428/298	. . . Physical dimension	428/3162	. . . . Cross-linked polyester [e.g., glycerol maleate-styrene, etc.]
428/2982	. . Particulate matter [e.g., sphere, flake, etc.]	428/31623	. . . Next to polyamide or polyimide
428/2984	. . . Microcapsule with fluid core [includes liposome]	428/31627	. . . Next to aldehyde or ketone condensation product
428/2985	. . . . Solid-walled microcapsule from synthetic polymer	428/3163	. . . . Next to acetal of polymerized unsaturated alcohol [e.g., formal butyral, etc.]
428/2987	. . . . . Addition polymer from unsaturated monomers only	428/31634	. . . Next to cellulosic
428/2989	. . . Microcapsule with solid core [includes liposome]	428/31638	. . . . Cellulosic ester
428/2991	. . . Coated	428/31641	. . . Next to natural rubber, gum, oil, rosin, wax, bituminous or tarry residue
428/2993	. . . . Silicic or refractory material containing [e.g., tungsten oxide, glass, cement, etc.]	428/31645	. . . Next to addition polymer from unsaturated monomers
428/2995	. . . . . Silane, siloxane or silicone coating	428/31649	. . . . Ester, halide or nitrile of addition polymer
428/2996	. . . . . Glass particles or spheres	428/31652	. . Of asbestos
428/2998	. . . . including synthetic resin or polymer	428/31656	. . . With metal layer
428/30	. Self-sustaining carbon mass or layer with impregnant or other layer	428/31659	. . . With cellulosic layer

428/31663 . . .	As siloxane, silicone or silane	428/31826 . . .	Of natural rubber
428/31667 . . .	Next to addition polymer from unsaturated monomers, or aldehyde or ketone condensation product	428/3183 . . .	Next to second layer of natural rubber
428/3167 . . .	Of cork	428/31833 . . .	Next to aldehyde or ketone condensation product or addition polymer from unsaturated monomers
428/31674 . . .	Including natural oil or gum or rosin [e.g., linoleum, etc.]	428/31837	Including polyene monomers
428/31678 . . .	Of metal	428/31841 . . .	Next to cellulosic
428/31681 . . .	Next to polyester, polyamide or polyimide [e.g., alkyd, glue, or nylon, etc.]	428/31844 . . .	Of natural gum, rosin, natural oil or lac
428/31685	Natural source polyamide [e.g., casein, gelatin, etc.]	428/31848 . . .	Next to cellulosic
428/31688 . . .	Next to aldehyde or ketone condensation product	428/31851	Natural oil
428/31692 . . .	Next to addition polymer from unsaturated monomers	428/31855 . . .	Of addition polymer from unsaturated monomers
428/31696	Including polyene monomers [e.g., butadiene, etc.]	428/31859 . . .	Next to an aldehyde or ketone condensation product
428/31699	Ester, halide or nitrile of addition polymer	428/31862	Melamine-aldehyde
428/31703 . . .	Next to cellulosic	428/31866	Impregnated or coated cellulosic material
428/31707 . . .	Next to natural rubber	428/3187	Amide-aldehyde
428/3171	With natural rubber next to second layer of natural rubber	428/31873	Urea or modified urea-aldehyde
428/31714 . . .	Next to natural gum, natural oil, rosin, lac or wax	428/31877	Phenol-aldehyde
428/31717 . . .	Next to bituminous or tarry residue	428/3188 . . .	Next to cellulosic
428/31721 . . .	Of polyimide	428/31884	Regenerated or modified cellulose
428/31725 . . .	Of polyamide	428/31888	Addition polymer of hydrocarbon[s] only
428/31728 . . .	Next to second layer of polyamide	428/31891	Where addition polymer is an ester or halide
428/31732	At least one layer is nylon type	428/31895	Paper or wood
428/31736 . . .	Next to polyester	428/31899	Addition polymer of hydrocarbon[s] only
428/31739 . . .	Nylon type	428/31902	Monoethylenically unsaturated
428/31743	Next to addition polymer from unsaturated monomer[s]	428/31906	Ester, halide or nitrile of addition polymer
428/31746	Polymer of monoethylenically unsaturated hydrocarbon	428/31909 . . .	Next to second addition polymer from unsaturated monomers
428/3175 . . .	Next to addition polymer from unsaturated monomer[s]	428/31913	Monoolefin polymer
428/31754	Natural source-type polyamide	428/31917	Next to polyene polymer
428/31757	Polymer of monoethylenically unsaturated hydrocarbon	428/3192	Next to vinyl or vinylidene chloride polymer
428/31761 . . .	Next to aldehyde or ketone condensation product	428/31924	Including polyene monomers
428/31765 . . .	Inorganic-containing or next to inorganic-containing	428/31928	Ester, halide or nitrile of addition polymer
428/31768 . . .	Natural source-type polyamide [e.g., casein, gelatin, etc.]	428/31931 . . .	Polyene monomer-containing
428/31772	Next to cellulosic	428/31935 . . .	Ester, halide or nitrile of addition polymer
428/31775	Paper	428/31938 . . .	Polymer of monoethylenically unsaturated hydrocarbon
428/31779 . . .	Next to cellulosic	428/31942 . . .	Of aldehyde or ketone condensation product
428/31783	Paper or wood	428/31946 . . .	Next to second aldehyde or ketone condensation product
428/31786 . . .	Of polyester [e.g., alkyd, etc.]	428/31949 . . .	Next to cellulosic
428/3179 . . .	Next to cellulosic	428/31953	Modified or regenerated cellulose
428/31794 . . .	Of cross-linked polyester	428/31957	Wood
428/31797 . . .	Next to addition polymer from unsaturated monomers	428/3196	Phenoplast
428/31801 . . .	Of wax or waxy material	428/31964	Paper
428/31804 . . .	Next to cellulosic	428/31967	Phenoplast
428/31808	Cellulosic is paper	428/31971 . . .	Of carbohydrate
428/31812	Glassine paper	428/31975 . . .	Of cellulosic next to another carbohydrate
428/31815 . . .	Of bituminous or tarry residue	428/31978	Cellulosic next to another cellulosic
428/31819 . . .	Next to cellulosic	428/31982	Wood or paper
428/31823	Paper	428/31986	Regenerated or modified
		428/31989 . . .	Of wood
		428/31993 . . .	Of paper
		428/31996	Next to layer of metal salt [e.g., plasterboard, etc.]
		428/32 . . .	Composite [nonstructural laminate] of inorganic material having metal-compound-containing layer and having defined magnetic layer
		428/325 . . .	Magnetic layer next to second metal compound-containing layer

- 428/4935 . Impregnated naturally solid product [e.g., leather, stone, etc.]
- 428/662 . . Wood timber product [e.g., piling, post, veneer, etc.]
- 428/8305 . Miscellaneous [e.g., treated surfaces, etc.]

Former US Class 436 Series**436/00 Chemistry: analytical and immunological testing**

- 436/10 . Composition for standardization, calibration, simulation, stabilization, preparation or preservation; processes of use in preparation for chemical testing
- 436/100833 . . Simulative of a gaseous composition
- 436/101666 . . Particle count or volume standard or control [e.g., platelet count standards, etc.]
- 436/102499 . . Blood gas standard or control
- 436/103332 . . Bilirubin or uric acid standard or control
- 436/104165 . . Lipid, cholesterol, or triglyceride standard or control
- 436/104998 . . Glucose, ketone, nitrate standard or control
- 436/105831 . . Protein or peptide standard or control [e.g., hemoglobin, etc.]
- 436/106664 . . Blood serum or blood plasma standard or control
- 436/107497 . . Preparation composition [e.g., lysing or precipitation, etc.]
- 436/108331 . . Preservative, buffer, anticoagulant or diluent
- 436/109163 . . Inorganic standards or controls
- 436/11 . Automated chemical analysis
- 436/110833 . . Utilizing a moving indicator strip or tape
- 436/111666 . . Utilizing a centrifuge or compartmented rotor
- 436/112499 . . with sample on test slide
- 436/113332 . . with conveyance of sample along a test line in a container or rack
- 436/114165 . . . with step of insertion or removal from test line
- 436/114998 . . . with treatment or replacement of aspirator element [e.g., cleaning, etc.]
- 436/115831 . . Condition or time responsive
- 436/116664 . . . with automated titrator
- 436/117497 . . with a continuously flowing sample or carrier stream
- 436/118339 . . . with formation of a segmented stream
- 436/119163 . . with aspirator of claimed structure
- 436/12 . Condition responsive control
- 436/13 . Tracers or tags
- 436/14 . Heterocyclic carbon compound [i.e. , O, S, N, Se, Te, as only ring hetero atom]
- 436/141111 . . Diverse hetero atoms in same or different rings [e.g., alkaloids, opiates, etc.]
- 436/142222 . . Hetero-O [e.g., ascorbic acid, etc.]
- 436/143333 . . . Saccharide [e.g., DNA, etc.]
- 436/144444 Glucose
- 436/145555 . . Hetero-N
- 436/146666 . . . Bile pigment
- 436/147777 . . . Plural nitrogen in the same ring [e.g., barbituates, creatinine, etc.]
- 436/148888 Uric acid
- 436/15 . Inorganic acid or base [e.g. , hcl, sulfuric acid, etc.]
- 436/153333 . . Halogen containing
- 436/156666 . . Sulfur containing
- 436/16 . Phosphorus containing
- 436/163333 . . Organic [e.g., chemical warfare agents, insecticides, etc.]

- 436/166666 . . of inorganic phosphorus compound in body fluid
- 436/17 . Nitrogen containing
- 436/170769 . . N-Nitroso containing [e.g., nitrosamine, etc.]
- 436/171538 . . Urea or blood urea nitrogen
- 436/172307 . . Cyanide or isocyanide
- 436/173076 . . Nitrite or nitrate
- 436/173845 . . Amine and quaternary ammonium
- 436/174614 . . . Tertiary amine
- 436/175383 . . . Ammonia
- 436/176152 . . Total nitrogen determined
- 436/176921 . . . As part of an elemental analysis
- 436/177692 . . Oxides of nitrogen
- 436/178459 . . . Only nitrogen dioxide
- 436/179228 . . . Both nitrogen oxide and dioxide
- 436/18 . Sulfur containing
- 436/182 . . Organic or sulphydryl containing [e.g., mercaptan, hydrogen, sulfide, etc.]
- 436/184 . . . Only hydrogen sulfide
- 436/186 . . Sulfur dioxide
- 436/188 . . Total or elemental sulfur
- 436/19 . Halogen containing
- 436/193333 . . In aqueous solution
- 436/196666 . . Carbon containing compound [e.g., vinylchloride, etc.]
- 436/20 . Oxygen containing
- 436/200833 . . Carbonyl, ether, aldehyde or ketone containing
- 436/201666 . . . Carboxylic acid
- 436/202499 . . . Formaldehyde or acetone
- 436/203332 . . Hydroxyl containing
- 436/204165 . . . Ethanol
- 436/204998 . . Inorganic carbon compounds
- 436/205831 . . . Carbon monoxide only
- 436/206664 . . Ozone or peroxide
- 436/207497 . . Molecular oxygen
- 436/208339 . . . Fuel/air mixture or exhaust gas analysis
- 436/209163 . . . Dissolved or trace oxygen or oxygen content of a sealed environment
- 436/21 . Hydrocarbon
- 436/212 . . Aromatic
- 436/214 . . Acyclic [e.g., methane, octane, isoparaffin, etc.]
- 436/216 . . . Unsaturated [e.g., ethylene, diene, etc.]
- 436/218 . . Total hydrocarbon, flammability, combustibility [e.g., air-fuel mixture, etc.]
- 436/22 . Hydrogen, per se
- 436/23 . Carbon containing
- 436/235 . . In an aqueous solution [e.g., TOC, etc.]
- 436/24 . Nuclear magnetic resonance, electron spin resonance or other spin effects or mass spectrometry
- 436/25 . including sample preparation
- 436/25125 . . Digestion or removing interfering materials
- 436/2525 . . Stabilizing or preserving
- 436/25375 . . Liberation or purification of sample or separation of material from a sample [e.g., filtering, centrifuging, etc.]
- 436/255 . . . including use of a solid sorbent, semipermeable membrane, or liquid extraction
- 436/25625 . . Dilution
- 436/2575 . . Volumetric liquid transfer
- 436/25875 . . Gaseous sample or with change of physical state

Former US Class 442 series**442/00 Fabric [woven, knitted, or nonwoven textile or cloth, etc.]**

- 442/10 . Scrim [e.g., open net or mesh, gauze, loose or open weave or knit, etc.]
- 442/102 . . Woven scrim
- 442/103 . . . Including a multifilament fiber precoated with other than free metal or alloy prior to weaving
- 442/105 . . . Comprising a composite fiber
- 442/107 . . . Comprising at least two chemically different fibers
- 442/109 . . . Metal or metal-coated fiber-containing scrim
- 442/11 Including an additional free metal or alloy constituent
- 442/112 Particulate free metal or alloy constituent
- 442/114 Including a foam layer
- 442/116 Including a woven fabric which is not a scrim
- 442/117 Including a nonwoven fabric which is not a scrim
- 442/119 Including a paper layer
- 442/121 Including a nonwoven fabric which is not a scrim
- 442/122 Two or more nonwoven fabric layers
- 442/124 Including a natural or synthetic rubber layer
- 442/126 Including a preformed film, foil, or sheet
- 442/128 Including a layer derived from a water-settable material [e.g., cement, gypsum, etc.]
- 442/129 Including a ceramic or glass layer
- 442/131 Including a coating or impregnation of synthetic polymeric material
- 442/133 . . . Inorganic fiber-containing scrim
- 442/134 Including a carbon or carbonized fiber
- 442/136 Including a foam layer
- 442/138 Including a metal layer
- 442/14 Including an additional scrim layer
- 442/141 Including a woven fabric which is not a scrim
- 442/143 Including a nonwoven fabric which is not a scrim
- 442/145 Including a preformed film, foil, or sheet
- 442/147 Including a mica layer
- 442/148 Including a coating or impregnation containing particulate material other than fiber
- 442/15 . . . Including a foam layer
- 442/152 . . . Including a free metal or alloy constituent
- 442/153 . . . Including an additional scrim layer
- 442/155 . . . Including a paper layer
- 442/157 Two or more paper layers
- 442/159 . . . Including a nonwoven fabric which is not a scrim
- 442/16 Two or more nonwoven layers
- 442/162 . . . Including a natural or synthetic rubber layer
- 442/164 . . . Including a preformed film, foil, or sheet
- 442/166 Cellulose acetate film or sheet
- 442/167 Fluorinated polyolefin film or sheet
- 442/169 Polyolefin film or sheet
- 442/171 . . . Including a layer derived from a water-settable material [e.g., cement, gypsum, etc.]
- 442/172 . . . Coated or impregnated

- 442/174 Including particulate material other than fiber in coating or impregnation
- 442/176 Three or more layers
- 442/178 Synthetic polymeric fiber
- 442/179 Nylon fiber
- 442/181 Bitumen coating or impregnation
- 442/183 . . . Synthetic polymeric fiber
- 442/184 . . Nonwoven scrim
- 442/186 . . . Comprising a composite fiber
- 442/188 . . . Metal or metal-coated fiber-containing scrim
- 442/19 Including a paper layer
- 442/191 . . . Inorganic fiber-containing scrim
- 442/193 Including a foam layer
- 442/195 . . . Including a foam layer
- 442/197 . . . Including a nonwoven fabric which is not a scrim
- 442/198 . . . Coated or impregnated
- 442/20 . Coated or impregnated woven, knit, or nonwoven fabric which is not [a] associated with another preformed layer or fiber layer or, [b] with respect to woven and knit, characterized, respectively, by a particular or differential weave or knit, wherein the coating or impregnation is neither a foamed material nor a free metal or alloy layer
- 442/2008 . . Fabric composed of a fiber or strand which is of specific structural definition
- 442/2016 . . Impregnation is confined to a plane disposed between both major fabric surfaces which are essentially free of impregnating material
- 442/2025 . . Coating produced by extrusion
- 442/2033 . . Coating or impregnation formed *in situ* [e.g., by interfacial condensation, coagulation, precipitation, etc.]
- 442/2041 . . Two or more non-extruded coatings or impregnations
- 442/2049 . . . Each major face of the fabric has at least one coating or impregnation
- 442/2057 At least two coatings or impregnations of different chemical composition
- 442/2066 Different coatings or impregnations on opposite faces of the fabric
- 442/2074 At least one coating or impregnation contains particulate material
- 442/2082 At least one coating or impregnation functions to fix pigments or particles on the surface of a coating or impregnation
- 442/209 At least one coating or impregnation contains particulate material
- 442/2098 . . . At least two coatings or impregnations of different chemical composition
- 442/2107 At least one coating or impregnation contains particulate material
- 442/2115 At least one coating or impregnation functions to fix pigments or particles on the surface of a coating or impregnation
- 442/2123 . . . At least one coating or impregnation contains particulate material
- 442/2131 At least one coating or impregnation functions to fix pigments or particles on the surface of a coating or impregnation
- 442/2139 . . Coating or impregnation specified as porous or permeable to a specific substance [e.g., water vapor, air, etc.]

- 442/2148 . . . Coating or impregnation is specified as microporous but is not a foam
- 442/2156 . . Coating or impregnation collects radionuclide or heavy metal
- 442/2164 . . Coating or impregnation specified as water repellent
- 442/2172 . . . Also specified as oil repellent
- 442/218 . . . Organosilicon containing
- 442/2189 . . . Fluorocarbon containing
- 442/2197 . . . Nitrogen containing
- 442/2205 . . . Natural oil or wax containing
- 442/2213 . . Coating or impregnation is specified as weather proof, water vapor resistant, or moisture resistant
- 442/2221 . . Coating or impregnation is specified as water proof
- 442/223 . . . Organosilicon containing
- 442/2238 . . . Fluorocarbon containing
- 442/2246 . . . Nitrogen containing
- 442/2254 . . . Natural oil or wax containing
- 442/2262 . . Coating or impregnation is oil repellent but not oil or stain release
- 442/227 . . . Fluorocarbon containing
- 442/2279 . . Coating or impregnation improves soil repellency, soil release, or anti- soil redeposition qualities of fabric
- 442/2287 . . . Fluorocarbon containing
- 442/2295 . . . Linear polyether group chain containing
- 442/2303 . . Coating or impregnation provides a fragrance or releases an odor intended to be perceptible to humans
- 442/2311 . . Coating or impregnation is a lubricant or a surface friction reducing agent other than specified as improving the "hand" of the fabric or increasing the softness thereof
- 442/232 . . . Fluorocarbon containing
- 442/2328 . . . Organosilicon containing
- 442/2336 . . . Natural oil or wax containing
- 442/2344 . . Coating or impregnation is anti-slip or friction-increasing other than specified as an abrasive
- 442/2352 . . Coating or impregnation functions to soften the feel of or improve the "hand" of the fabric
- 442/2361 . . Coating or impregnation improves stiffness of the fabric other than specified as a size
- 442/2369 . . Coating or impregnation improves elasticity, bendability, resiliency, flexibility, or shape retention of the fabric
- 442/2377 . . . Improves elasticity
- 442/2385 . . . Improves shrink resistance
- 442/2393 . . . Coating or impregnation provides crease-resistance or wash and wear characteristics
- 442/2402 . . Coating or impregnation specified as a size
- 442/241 . . Coating or impregnation improves snag or pull resistance of the fabric
- 442/2418 . . Coating or impregnation increases electrical conductivity or anti-static quality
- 442/2426 . . . Elemental carbon containing
- 442/2434 . . . Linear polyether group chain containing
- 442/2443 . . . Nitrogen and phosphorus containing
- 442/2451 . . . Phosphorus containing
- 442/2459 . . . Nitrogen containing
- 442/2467 . . . Sulphur containing
- 442/2475 . . Coating or impregnation is electrical insulation-providing, -improving, or -increasing, or conductivity-reducing
- 442/2484 . . Coating or impregnation is water absorbency-increasing or hydrophilicity-increasing or hydrophilicity-imparting
- 442/2492 . . . Polyether group containing
- 442/25 . . Coating or impregnation absorbs sound
- 442/2508 . . Coating or impregnation absorbs chemical material other than water
- 442/2516 . . . Chemical material is one used in biological or chemical warfare
- 442/2525 . . Coating or impregnation functions biologically [e.g., insect repellent, antiseptic, insecticide, bactericide, etc.]
- 442/2533 . . . Inhibits mildew
- 442/2541 . . . Insect repellent
- 442/2549 . . Coating or impregnation is chemically inert or of stated nonreactance
- 442/2557 . . . Oxygen or ozone resistant
- 442/2566 . . . Organic solvent resistant [e.g., dry cleaning fluid, etc.]
- 442/2574 . . . Acid or alkali resistant
- 442/2582 . . Coating or impregnation contains an optical bleach or brightener or functions as an optical bleach or brightener [e.g., it masks fabric yellowing, etc.]
- 442/259 . . Coating or impregnation provides protection from radiation [e.g., U.V., visible light, I.R., micscheme-change-itemave, high energy particle, etc.] or heat retention thru radiation absorption
- 442/2598 . . . Radiation reflective
- 442/2607 . . . Radiation absorptive
- 442/2615 . . Coating or impregnation is resistant to penetration by solid implements
- 442/2623 . . . Ballistic resistant
- 442/2631 . . Coating or impregnation provides heat or fire protection
- 442/2639 . . . Coated or impregnated asbestos fabric
- 442/2648 . . . Coating or impregnation is specified as an intumescent material
- 442/2656 . . . Antimony containing
- 442/2664 . . . Boron containing
- 442/2672 . . . Phosphorus containing
- 442/268 Phosphorus and nitrogen containing compound
- 442/2689 A phosphorus containing compound and a nitrogen containing compound
- 442/2697 Phosphorus and halogen containing compound
- 442/2705 A phosphorus containing compound and a halogen containing compound
- 442/2713 . . . Halogen containing
- 442/2721 . . . Nitrogen containing
- 442/273 . . Coating or impregnation provides wear or abrasion resistance
- 442/2738 . . Coating or impregnation intended to function as an adhesive to solid surfaces subsequently associated therewith
- 442/2746 . . . Heat-activatable adhesive
- 442/2754 . . . Pressure-sensitive adhesive
- 442/2762 . . Coated or impregnated natural fiber fabric [e.g., cotton, wool, silk, linen, etc.]
- 442/277 . . . Coated or impregnated cellulosic fiber fabric

- 442/2779 Coating or impregnation contains an acrylic polymer or copolymer [e.g., polyacrylonitrile, polyacrylic acid, etc.]
- 442/2787 Coating or impregnation contains a vinyl polymer or copolymer
- 442/2795 Coating or impregnation contains an epoxy polymer or copolymer or polyether
- 442/2803 Polymeric coating or impregnation from a silane or siloxane not specified as lubricant or water repellent
- 442/2811 Coating or impregnation contains polyimide or polyamide
- 442/282 Coating or impregnation contains natural gum, rosin, natural oil, or wax
- 442/2828 Coating or impregnation contains aldehyde or ketone condensation product
- 442/2836 Phenol-aldehyde condensate
- 442/2844 Melamine-aldehyde condensate
- 442/2852 Amide-aldehyde condensate [e.g., modified urea-aldehyde condensate, etc.]
- 442/2861 . . Coated or impregnated synthetic organic fiber fabric
- 442/2869 . . . Coated or impregnated regenerated cellulose fiber fabric
- 442/2877 . . . Coated or impregnated polyvinyl alcohol fiber fabric
- 442/2885 . . . Coated or impregnated acrylic fiber fabric
- 442/2893 . . . Coated or impregnated polyamide fiber fabric
- 442/2902 Aromatic polyamide fiber fabric
- 442/291 . . . Coated or impregnated polyolefin fiber fabric
- 442/2918 Polypropylene fiber fabric
- 442/2926 . . Coated or impregnated inorganic fiber fabric
- 442/2934 . . . Coating or impregnation contains vinyl polymer or copolymer
- 442/2943 Vinyl acetate polymer or copolymer
- 442/2951 . . . Coating or impregnation contains epoxy polymer or copolymer or polyether
- 442/2959 . . . Coating or impregnation contains aldehyde or ketone condensation product
- 442/2967 Amide-aldehyde condensate
- 442/2975 . . . Coated or impregnated ceramic fiber fabric
- 442/2984 . . . Coated or impregnated carbon or carbonaceous fiber fabric
- 442/2992 . . . Coated or impregnated glass fiber fabric
- 442/30 . . Woven fabric [i.e., woven strand or strip material]
- 442/3008 . . Woven fabric has an elastic quality
- 442/3016 . . . Including a preformed layer other than the elastic woven fabric [e.g., fabric or film or foil or sheet layer, etc.]
- 442/3024 . . . Including elastic strand or strip
- 442/3033 . . Including a strip or ribbon
- 442/3041 . . . Woven fabric comprises strips or ribbons only
- 442/3049 . . Including strand precoated with other than free metal or alloy
- 442/3057 . . . Multiple coatings
- 442/3065 . . Including strand which is of specific structural definition
- 442/3073 . . . Strand material is core-spun [not sheath-core bicomponent strand]
- 442/3081 Core is synthetic polymeric material
- 442/3089 . . . Cross-sectional configuration of strand material is specified
- 442/3098 Cross-sectional configuration varies longitudinally along the strand
- 442/3106 Hollow strand material
- 442/3114 Cross-sectional configuration of the strand material is other than circular
- 442/3122 Cross-sectional configuration is multi-lobal
- 442/313 . . . Strand material formed of individual filaments having different chemical compositions
- 442/3138 Including inorganic filament
- 442/3146 . . Strand material is composed of two or more polymeric materials in physically distinct relationship [e.g., sheath-core, side-by-side, islands-in-sea, fibrils-in-matrix, etc.] or composed of physical blend of chemically different polymeric materials or a physical blend of a polymeric material and a filler material
- 442/3154 . . . Sheath-core multicomponent strand material
- 442/3163 . . . Islands-in-sea multicomponent strand material
- 442/3171 . . . Strand material is a blend of polymeric material and a filler material
- 442/3179 . . Woven fabric is characterized by a particular or differential weave other than fabric in which the strand denier or warp/weft pick count is specified
- 442/3187 . . . Triaxially woven fabric
- 442/3195 . . . Three-dimensional weave [e.g., x-y-z planes, multi-planar warps and/or wefts, etc.]
- 442/3203 Multi-planar warp layers
- 442/3211 Multi-planar weft layers
- 442/322 . . . Warp differs from weft
- 442/3228 Materials differ
- 442/3236 Including inorganic strand material
- 442/3244 Including natural strand material [e.g., cotton, wool, etc.]
- 442/3252 Including synthetic polymeric strand material
- 442/326 Including synthetic polymeric strand material
- 442/3268 Including natural strand material
- 442/3276 Including polyamide strand material
- 442/3285 Including polyester strand material
- 442/3293 . . . Warp and weft are identical and contain at least two chemically different strand materials
- 442/3301 . . . Coated, impregnated, or autogenous bonded
- 442/3309 Woven fabric contains inorganic strand material
- 442/3317 Woven fabric contains synthetic polymeric strand material
- 442/3325 . . Including a foamed layer or component
- 442/3333 . . . Including a free metal or alloy constituent
- 442/3341 . . . Plural foam layers
- 442/335 . . . Plural fabric layers
- 442/3358 Including a nonwoven fabric layer
- 442/3366 . . . Woven fabric is coated, impregnated, or autogenously bonded
- 442/3374 Coating or impregnation includes particulate material other than fiber
- 442/3382 . . Including a free metal or alloy constituent
- 442/339 . . . Metal or metal-coated strand
- 442/3398 . . . Vapor or sputter deposited metal layer
- 442/3407 . . . Chemically deposited metal layer [e.g., chemical precipitation or electrochemical deposition or plating, etc.]

442/3415	. . .	Preformed metallic film or foil or sheet [film or foil or sheet had structural integrity prior to association with the woven fabric]	442/3715	. . .	Nonwoven fabric layer comprises parallel arrays of strand material
442/3423	. . . .	Plural metallic films or foils or sheets	442/3724	. . .	Needled
442/3431	. . . .	Plural fabric layers	442/3732	. . . .	Including an additional nonwoven fabric
442/3439	. . . .	Including a nonwoven fabric layer	442/374	. . . .	Additional nonwoven fabric comprises chemically different strand material than the first nonwoven fabric
442/3447	. . . .	Including a preformed synthetic polymeric film or sheet [i.e., film or sheet having structural integrity prior to association with the woven fabric]	442/3748	. . . .	Including inorganic strand material
442/3455	. . . .	Including particulate material other than fiber	442/3756	. . . .	Nonwoven fabric layer comprises at least two chemically different fibers
442/3463	. . .	Plural fabric layers	442/3764	. . . .	Coated, impregnated, or autogenously bonded
442/3472	. .	Woven fabric including an additional woven fabric layer	442/3772	. . .	Hydroentangled
442/348	. . .	Mechanically needled or hydroentangled	442/378	. . .	Coated, impregnated, or autogenously bonded
442/3488	. . . .	Four or more layers	442/3789	. . . .	Plural nonwoven fabric layers
442/3496	. . . .	Coated, impregnated, or autogenously bonded	442/3797	. . . .	Coating or impregnation is derived from a water-settable material [e.g., cement, gypsum, etc.]
442/3504	. . .	Woven fabric layers comprise chemically different strand material	442/3805	. . . .	Coating or impregnation contains natural or synthetic rubber
442/3512	. . . .	Three or more fabric layers	442/3813	. . . .	Coating or impregnation contains synthetic polymeric material
442/352	. . . .	One of which is a nonwoven fabric layer	442/3821	. . . .	Coating or impregnation contains bituminous material
442/3528	. . .	Three or more fabric layers	442/3829	. . . .	Four or more layers
442/3537	. . . .	One of which is a nonwoven fabric layer	442/3837	. . . .	Including particulate material other than fiber
442/3545	. . . .	Woven fabric layers impregnated with a blend of thermosetting and thermoplastic resins	442/3846	. . . .	Including particulate material other than fiber
442/3553	. . . .	Woven fabric layers impregnated with an organosilicon resin	442/3854	. .	Woven fabric with a preformed polymeric film or sheet
442/3561	. . . .	Woven fabric layers impregnated with a natural or synthetic rubber	442/3862	. . .	Ester condensation polymer sheet or film [e.g., polyethylene terephthalate, etc.]
442/3569	. . . .	Woven fabric layers impregnated with a thermosetting resin	442/387	. . .	Vinyl polymer or copolymer sheet or film [e.g., polyvinyl chloride, polyvinylidene chloride, polyvinyl acetate, etc.]
442/3577	. . . .	Phenolic resin	442/3878	. . .	Fluorinated olefin polymer or copolymer sheet or film [e.g., Teflon®, etc.]
442/3585	. . . .	Epoxy resin	442/3886	. . .	Olefin polymer or copolymer sheet or film [e.g., polypropylene, polyethylene, ethylene-butylene copolymer, etc.]
442/3594	. . . .	Woven fabric layers impregnated with a thermoplastic resin [e.g., vinyl polymer, etc.]	442/3894	. . .	Amide condensation polymer sheet or film [e.g., nylon 6, etc.]
442/3602	. . .	Three or more distinct layers	442/3902	. . .	Polyimide sheet or film
442/361	. . . .	At least one layer is derived from water-settable material [e.g., cement, gypsum, etc.]	442/3911	. . .	Natural or synthetic rubber sheet or film
442/3618	. . . .	At least one layer contains wood or cork	442/3919	. . .	Including particulate material other than fiber
442/3626	. . . .	At least one layer contains bituminous material [e.g., tar, pitch, asphalt, etc.]	442/3927	. .	Including a paper or wood pulp layer
442/3634	. . . .	At least one layer comprises paper	442/3935	. . .	Mica paper layer
442/3642	. . . .	At least one layer contains natural or synthetic rubber	442/3943	. . .	Plural paper or wood pulp layers
442/365	. . . .	At least one layer is a preformed synthetic polymeric film or sheet	442/3951	. . .	Including a bituminous layer
442/3659	. . . .	At least one layer comprises ceramic or glass material in other than particulate form	442/3959	. . .	Including an outermost adhesive layer
442/3667	. . . .	Composite consisting of at least two woven fabrics bonded by an interposed adhesive layer [but not two woven fabrics bonded together by an impregnation which penetrates through the thickness of at least one of the woven fabric layers]	442/3967	. . .	Including a natural or synthetic rubber layer
442/3675	. . . .	Fabric layer contains natural strand material	442/3976	. .	Including strand which is stated to have specific attributes [e.g., heat or fire resistance, chemical or solvent resistance, high absorption for aqueous composition, water solubility, heat shrinkability, etc.]
442/3683	. . . .	Fabric layer contains carbon or carbonaceous strand material	442/3984	. . .	Strand is other than glass and is heat or fire resistant
442/3691	. . . .	Fabric layer contains glass strand material	442/3992	. . .	Strand is heat shrinkable
442/3699	. . . .	Including particulate material other than fiber	442/40	. .	Knit fabric [i.e., knit strand or strip material]
442/3707	. .	Woven fabric including a nonwoven fabric layer other than paper	442/406	. .	Including parallel strips
			442/413	. .	Including an elastic strand

442/419	. . Including strand precoated with other than free metal or alloy	442/618	. . . . Blend of chemically different inorganic microfibers
442/425	. . Including strand which is of specific structural definition	442/619	. . . . Including other strand or fiber material in the same layer not specified as having microdimensions
442/431	. . . Cross-sectional configuration of strand material is specified	442/62	. . . . Including another chemically different microfiber in a separate layer
442/438	. . . Strand material formed of individual filaments having different chemical compositions	442/621	. . . . Including other strand or fiber material in a different layer not specified as having microdimensions
442/444	. . Strand is a monofilament composed of two or more polymeric materials in physically distinct relationship [e.g., sheath-core, side-by-side, islands-in-sea, fibrils-in-matrix, etc.] or composed of physical blend of chemically different polymeric materials or a physical blend of a polymeric material and a filler material	442/622	. . . . Microfiber is a composite fiber
442/45	. . Knit fabric is characterized by a particular or differential knit pattern other than open knit fabric or a fabric in which the strand denier is specified	442/623	. . . . Microfiber is glass
442/456	. . . Including additional strand inserted within knit fabric	442/624	. . . . Microfiber is carbon or carbonaceous
442/463	. . . . Warp knit insert strand	442/625	. . . . Autogenously bonded
442/469	. . Including a foamed layer or component	442/626	. . . . Microfiber is synthetic polymer
442/475	. . Including a free metal or alloy constituent	442/627	. . . Strand or fiber material is specified as non-linear [e.g., crimped, coiled, etc.]
442/481	. . . Chemically deposited metal layer [e.g., chemical precipitation or electrochemical deposition or plating, etc.]	442/629	. . . . Composite strand or fiber material
442/488	. . Including an additional knit fabric layer	442/63	. . . . Carbon or carbonaceous strand or fiber material
442/494	. . Including a nonwoven fabric layer other than paper	442/631	. . . . Glass strand or fiber material
442/50	. FELT FABRIC	442/632	. . . . A single nonwoven layer comprising non-linear synthetic polymeric strand or fiber material and strand or fiber material not specified as non-linear
442/51	. . From natural organic fiber [e.g., wool, etc.]	442/633	. . . . Synthetic polymeric strand or fiber material is of staple length
442/53	. . . Including particulate material other than fiber	442/634	. . . . A nonwoven fabric having a layer comprising non-linear synthetic polymeric strand or fiber material and a separate and distinct layer comprising strand or fiber material which is not specified as non-linear
442/54	. . . At least three layers	442/635	. . . . Synthetic polymeric strand or fiber material
442/56	. . From synthetic organic fiber	442/636	. . . . Synthetic polymeric strand or fiber material is of staple length
442/57	. . Including particulate material other than fiber	442/637	. . Including strand or fiber material which is a monofilament composed of two or more polymeric materials in physically distinct relationship [e.g., sheath-core, side-by-side, islands-in-sea, fibrils-in-matrix, etc.] or composed of physical blend of chemically different polymeric materials or a physical blend of a polymeric material and a filler material
442/59	. . At least three layers	442/638	. . . Side-by-side multicomponent strand or fiber material
442/60	. Nonwoven fabric [i.e., nonwoven strand or fiber material]	442/64	. . . Islands-in-sea multicomponent strand or fiber material
442/601	. . Nonwoven fabric has an elastic quality	442/641	. . . Sheath-core multicomponent strand or fiber material
442/602	. . . Nonwoven fabric comprises an elastic strand or fiber material	442/642	. . . Strand or fiber material is a blend of polymeric material and a filler material
442/603	. . Including strand or fiber material precoated with other than free metal or alloy	442/643	. . Including parallel strand or fiber material within the nonwoven fabric
442/604	. . . Strand or fiber material is glass	442/644	. . . Parallel strand or fiber material is glass
442/605	. . . Strand or fiber material is inorganic	442/645	. . . Parallel strand or fiber material is inorganic [e.g., rock wool, mineral wool, etc.]
442/607	. . . Strand or fiber material is synthetic polymer	442/646	. . . Parallel strand or fiber material is naturally occurring [e.g., cotton, wool, etc.]
442/608	. . Including strand or fiber material which is of specific structural definition	442/647	. . Including a foamed layer or component
442/609	. . . Cross-sectional configuration of strand or fiber material is specified	442/648	. . . Including a free metal or alloy constituent
442/61	. . . . Cross-sectional configuration varies longitudinally along strand or fiber material	442/649	. . . Plural foamed layers
442/611	. . . . Cross-sectional configuration of strand or fiber material is other than circular	442/651	. . . Plural fabric layers
442/612	. . . . Hollow strand or fiber material	442/652	. . . Nonwoven fabric is coated, impregnated, or autogenously bonded
442/613	. . . . Microcellular strand or fiber material		
442/614	. . . Strand or fiber material specified as having microdimensions [i.e., microfiber]		
442/615	. . . . Strand or fiber material is blended with another chemically different microfiber in the same layer		
442/616	. . . . Blend of synthetic polymeric and inorganic microfibers		

- 442/653 . . . Including particulate material other than fiber
- 442/654 . . Including a free metal or alloy constituent
- 442/655 . . . Metal or metal-coated strand or fiber material
- 442/656 . . . Preformed metallic film or foil or sheet [film or foil or sheet had structural integrity prior to association with the nonwoven fabric]
- 442/657 . . . Vapor, chemical, or spray deposited metal layer
- 442/658 . . . Particulate free metal or alloy constituent
- 442/659 . . Including an additional nonwoven fabric
- 442/66 . . . Additional nonwoven fabric is a spun-bonded fabric
- 442/662 Needled
- 442/663 Hydroentangled
- 442/664 . . . Including a wood fiber containing layer
- 442/665 . . . Including a layer derived from a water-settable material [e.g., cement, gypsum, etc.]
- 442/666 . . . Mechanically interengaged by needling or impingement of fluid [e.g., gas or liquid stream, etc.]
- 442/667 Needled
- 442/668 . . . Separate nonwoven fabric layers comprise chemically different strand or fiber material
- 442/669 At least one layer of inorganic strand or fiber material and at least one layer of synthetic polymeric strand or fiber material
- 442/67 . . . Multiple nonwoven fabric layers composed of the same inorganic strand or fiber material
- 442/671 . . . Multiple nonwoven fabric layers composed of the same polymeric strand or fiber material
- 442/673 . . . Including particulate material other than fiber
- 442/674 . . Nonwoven fabric with a preformed polymeric film or sheet
- 442/675 . . . Ester condensation polymer sheet or film [e.g., polyethylene terephthalate, etc.]
- 442/676 . . . Vinyl polymer or copolymer sheet or film [e.g., polyvinyl chloride, polyvinylidene chloride, polyvinyl acetate, etc.]
- 442/677 . . . Fluorinated olefin polymer or copolymer sheet or film [e.g., TeflonR, etc.]
- 442/678 . . . Olefin polymer or copolymer sheet or film [e.g., polypropylene, polyethylene, ethylene-butylene copolymer, etc.]
- 442/679 . . . Natural or synthetic rubber sheet or film
- 442/68 . . Melt-blown nonwoven fabric
- 442/681 . . Spun-bonded nonwoven fabric
- 442/682 . . Needled nonwoven fabric
- 442/684 . . . Containing at least two chemically different strand or fiber materials
- 442/685 Containing inorganic and polymeric strand or fiber materials
- 442/686 Containing polymeric and natural strand or fiber materials
- 442/687 Containing inorganic strand or fiber material
- 442/688 Containing polymeric strand or fiber material
- 442/689 . . Hydroentangled nonwoven fabric
- 442/69 . . Autogenously bonded nonwoven fabric
- 442/691 . . . Inorganic strand or fiber material only
- 442/692 . . . Containing at least two chemically different strand or fiber materials
- 442/693 . . Including a paper layer
- 442/695 . . Including a wood containing layer

- 442/696 . . Including strand or fiber material which is stated to have specific attributes [e.g., heat or fire resistance, chemical or solvent resistance, high absorption for aqueous compositions, water solubility, heat shrinkability, etc.]
- 442/697 . . Containing at least two chemically different strand or fiber materials
- 442/698 . . . Containing polymeric and natural strand or fiber materials
- 442/699 . . Including particulate material other than strand or fiber material

Former US Class 464 Series

- 464/00 Rotary shafts, gudgeons, housings, and flexible couplings for rotary shafts**
- 464/10 . having heating or cooling means
- 464/20 . with auxilliary indicator or alarm
- 464/30 . Electrical or magnetic coupling
- 464/40 . Coupling accommodates drive between members having misaligned or angularly related axes, transmits torque via radially directed pin, and has particular balancing means
- 464/50 . Shafting having particular vibration dampening or balancing structure

Former US Class 477 Series

- 477/00 Interrelated power delivery controls, including engine control**
- 477/10 . Steering by driving
- 477/20 . Plural engines
- 477/23 . . Electric engine
- 477/24 . . . with brake control
- 477/26 . . . with clutch control
- 477/27 . . with clutch control
- 477/30 . Electric engine
- 477/32 . . with clutch control
- 477/322 . . . with brake control
- 477/3225 Stopped at end of cycle
- 477/323 . . . Engine stopped at end of cycle
- 477/325 . . . Common controller
- 477/327 . . . Electric clutch
- 477/328 . . . Speed responsive
- 477/33 . . with transmission control
- 477/333 . . . Load motion limit control
- 477/337 . . . Transmission change by moving engine
- 477/34 . . . Reversible engine
- 477/343 . . . Engine starting interlock
- 477/347 . . . Condition responsive engine control
- 477/35 . . Brake engaged when engine energy deactivated, brake disengaged when engine energy activated
- 477/357 . . . Cam actuated brake
- 477/363 . . . Electrically actuated brake
- 477/37 . . Brake actuation opens switch to engine
- 477/373 . . . Electrically actuated brake
- 477/377 . . . Fluid actuated brake
- 477/38 . . Control means selectively operates engine energy input and brake
- 477/387 . . . Fluid actuated brake
- 477/393 . . . Electrically actuated brake
- 477/40 . Gas turbine engine
- 477/45 . . Continuously variable transmission
- 477/50 . with supercharger

477/55	. .	Manifold pressure control	477/646	. . .	Anti-creep
477/60	. .	Transmission control	477/647	. . .	Brake controls transmission
477/606	. .	Differential transmission	477/648	. . . .	Pressure controlled
477/613	. .	Plural outputs	477/649	. . .	One control blocks another
477/619	. .	Continuously variable friction transmission	477/65	. .	Control by sensed ambient condition, pattern indicia, external signal, or temperature
477/6197	. . .	with fluid drive	477/653	. . .	Temperature control
477/6203	. . .	with clutch control	477/656	. .	Engine starting interlock
477/621	. . .	with brake control	477/663	. .	Exhaust emission control
477/6217	. . .	Interrelated control of diverse transmissions	477/669	. .	Engine ignition control for transmission change
477/6223	. . .	Constant speed output	477/67	. . .	Ignition advanced or retarded
477/623	. . .	Controlled by engine map	477/671	. . .	Ignition intermitting and safety means limiting duration of intermission
477/6237	. . .	Belt-type	477/673	. . .	Ignition intermitting controlled by manifold pressure
477/624	. . . .	Fluid pressure control	477/674	. . .	Ignition intermitting initiated by positioning accelerator
477/6242	. . . . .	Ratio change controlled	477/6745	. . . .	Initiation inhibited by sensed condition
477/62423	. . . . .	Engine coast braking	477/675	. .	Engine controlled by transmission
477/62427	. . . . .	with electric valve control	477/676	. . .	Constant output shaft speed
477/62429	. . . . .	Duty ratio control	477/677	. . .	Diminution during transmission change
477/6243	. . .	Fluid pressure control	477/679	. . .	Responsive to transmission output condition
477/625	. .	Fluid resistance inhibits rotation of planetary transmission element	477/68	. . .	Transmission setting contingent
477/631	. .	including fluid drive	477/6805	. . . .	Change to neutral idles engine
477/633	. . .	Impeller-turbine-type	477/6808	. . . . .	Engine input variable in neutral
477/6333	. . . .	Engine controlled	477/681	. .	Anticreep
477/6337	. . . .	with countershaft gearing	477/688	. .	Transmission controlled by engine
477/63378	. . . . .	and turbine shaft brake	477/689	. . .	Shift from neutral shock control
477/63385	. . . . .	and clutch control	477/6895	. . . .	Pressure controlled
477/63393	. . . . .	Control of or by fluid drive	477/69	. . .	Engine [coast] braking
477/634	. . . .	with hydrodynamic braking	477/691	. . . .	Electric valve control
477/6343	. . . .	with nonratio brake	477/692	. . .	by acceleration
477/6347	. . . .	Control responsive to fluid drive	477/693	. . .	by input manifold pressure or engine fuel control
477/635	. . . .	with clutch control	477/6931	. . . .	Selector-type
477/6351	. . . . .	Disengaged during shift	477/6933	. . . .	with positive shift means
477/6352	. . . . .	Speed responsive	477/69335	. . . . .	with synchronization
477/63525	. . . . .	Electrical	477/6934	. . . .	Prevents unsafe or unintentional shift
477/6353	. . . .	with fluid unit vane control	477/6935	. . . . .	Reverse inhibitor
477/6357	. . . .	Fill and empty-type fluid units	477/6936	. . . .	Shift valve control
477/636	. . .	Ratio control	477/69362	. . . . .	Hysteresis
477/637	. . . .	with planetary transmission control	477/693625	. . . . .	Electric control
477/638	. .	with clutch control	477/69363	. . . . .	Plural shift valves
477/6388	. . .	and brake control	477/693635	. . . . .	Electric control
477/6389	. . . .	Temperature responsive control	477/693636	. . . . .	Downshift control
477/639	. . . .	Engine controlled	477/693637	. . . . .	Kickdown
477/6392	. . . .	Clutch controlled	477/693638	. . . . .	Selector valve overrule
477/6394	. . . .	Gearing controlled	477/69364	. . . . .	Downshift control
477/6395	. . .	Temperature responsive control	477/693643	. . . . .	Kickdown
477/6403	. . .	Clutch, engine, and transmission controlled	477/693645	. . . . .	Selector valve overrule
477/6407	. . . .	Electronic digital control	477/69365	. . . . .	Electric control
477/641	. . .	Clutch and transmission controlled	477/69366	. . . . .	Downshift control
477/6414	. . . .	Speed responsive control	477/69367	. . . . .	Downshift control
477/6415	. . . . .	with manual override	477/693675	. . . . .	Kickdown
477/6417	. . . . .	Vacuum actuated clutch	477/69368	. . . . .	Selector valve overrule
477/6418	. . .	Clutch and engine controlled	477/6937	. . . .	Servo motor timing
477/6422	. . . .	Speed responsive control	477/69373	. . . . .	Downshift
477/6424	. . . . .	Plural speed signals	477/693738	. . . . .	with fluid accumulator
477/6425	. . .	Clutch controlled	477/693742	. . . . .	Electric valve control
477/6428	. . . .	Electric clutch	477/693746	. . . . .	Double acting servo
477/643	. . . .	Vacuum actuated clutch	477/693754	. . . . .	Speed responsive control
477/6432	. . . . .	Electric control	477/693762	. . . . .	Electric valve control
477/6433	. . .	Engine controlled			
477/6437	. . . .	Speed responsive			
477/644	. .	with brake control			

477/69377 with fluid accumulator
 477/69378 Engine parameter controls back pressure
 477/69379 Electric valve control
 477/6938 Double acting servo
 477/69383 Speed responsive control
 477/69387 Electric valve control
 477/6939 Transmission pressure controlled
 477/69393 Variable capacity pump
 477/69395 Line pressure controlled
 477/693958 Responsive to speed
 477/693962 Electric valve control
 477/693964 Duty ratio control
 477/693965 Transmission setting contingent
 477/693973 Electric valve control
 477/69398 Electric valve control
 477/694 . . . Engine control linkage mounted on manual
 gearshift lever
 477/70 . . Clutch control
 477/71 . . with starter
 477/73 . . with fluid drive
 477/735 . . . Speed responsive control
 477/74 . . with brake control
 477/743 . . . Clutch controlled
 477/745 . . . and brake controlled
 477/747 . . . Engine controlled
 477/75 . . Condition responsive control
 477/753 . . . Speed responsive
 477/755 . . . Slip rate control
 477/757 . . . Overload release
 477/759 . . . Engine shut off
 477/76 . . Electric clutch
 477/78 . . Regulated clutch engagement
 477/79 . . Engine controlled by clutch control
 477/80 . . Brake control
 477/81 . . Sensed condition responsive control of engine of
 brake
 477/813 . . . Brake
 477/814 . . . and engine
 477/816 . . . Speed or acceleration responsive
 477/817 . . . Speed or acceleration responsive
 477/82 . . Plural diverse brake means
 477/83 . . Engine energy control having adjusting and
 holding device, with means on brake control to
 override holding device
 477/833 . . . Holding device engaged by electric means
 477/835 . . . Magnetic holding device
 477/837 . . . Mechanical holding device engaged by
 mechanical means
 477/839 . . . Device or means including a threaded shaft,
 rack or ratchet
 477/84 . . Brake control having holding device, with means
 on engine control to override holding device
 477/847 . . . Holding device responsive to motion, speed or
 acceleration
 477/85 . . . Holding device comprising brake valve
 operated by solenoid
 477/853 . . . Holding device engaged by electric means
 477/857 . . . Holding device comprising brake valve
 operated by solenoid
 477/86 . . Brake engaged when engine energy deactivated,
 brake disengaged when engine energy is activated
 477/865 . . . Internal combustion engine

477/868 Controls brake valve
 477/869 Vacuum actuated brake
 477/87 . . Brake condition change modifies engine
 condition
 477/873 . . . Brake actuation interrupts ignition circuit of
 fluid engine
 477/877 . . . Brake actuation decreases or eliminates fluid
 energy input to engine
 477/878 by closing throttle valve
 477/879 by preventing increasing operation of engine
 energy control
 477/88 . . Decreasing fluid energy input to engine actuates
 brake
 477/89 . . Control means selectively operates engine energy
 input and brake
 477/893 . . . Foot operated control means
 477/8936 Engine and brake control including
 interconnected elements
 477/8941 Pivots and translates
 477/8944 Pivots about intermediate fulcrum
 477/8947 Pivots about two fulcrums
 477/8953 Pivots about intermediate fulcrum
 477/8959 Lever reciprocates on moveable supports at
 both ends
 477/8964 Pivots for sequential operation
 477/897 . . . Control means including fluid passage

Former US Class 483 Series

483/00 Tool changing
 483/10 . . Process
 483/11 . . with safety means
 483/115 . . Guard
 483/12 . . with means to regulate operation by means of
 replaceable information supply [e.g. , templet, tape,
 card, etc.]
 483/123 . . Replaceable information comprising tool location
 483/127 . . . including determining optimum tool access
 path
 483/13 . . with control means energized in response to
 activator stimulated by condition sensor
 483/132 . . Responsive to tool identifying information
 483/134 . . . Identifying information on tool or tool holder
 483/136 . . Responsive to tool
 483/138 . . . including means to monitor and control, i.e.,
 adaptive machining
 483/14 . . with signal or indicator
 483/15 . . with means to condition or adjust tool or tool
 support
 483/16 . . with means to transfer work
 483/165 . . Plural machine tools, e.g., flexible manufacturing
 483/17 . . including machine tool or component
 483/1702 . . Rotating work machine tool [e.g., screw machine,
 lathe, etc.]
 483/1705 . . . Tool support comprises rotary spindle
 483/1707 . . . Tool having specific mounting or work treating
 feature
 483/171 Workpiece holder [e.g., chuck or chuck jaw,
 collet, etc.]
 483/1712 Turning tool insert changer
 483/1714 . . . Tool changer between tool support and matrix
 483/1717 Plural matrices
 483/1719 Tool support comprises turret

- 483/1721 Linearly moveable tool changer
- 483/1724 Linearly moveable tool changer
- 483/1726 . . . Direct tool exchange between tool support and matrix
- 483/1729 . . Reciprocating tool machine tool [e.g., broaching machine, shaping machine, etc.]
- 483/1731 . . . including matrix
- 483/1733 . . Rotary spindle machine tool [e.g., milling machine, boring, machine, grinding machine, etc.]
- 483/1736 . . . Tool having specific mounting or work treating feature
- 483/1738 Tool head
- 483/174 Abrading wheel
- 483/1743 including means for angularly orienting tool and spindle
- 483/1745 Spindle angularly oriented to align with tool
- 483/1748 . . . Tool changer between spindle and matrix
- 483/175 Plural matrices
- 483/1752 including tool holder pivotable about axis
- 483/1755 Plural tool holders pivotable about common axis
- 483/1757 including intermediate tool changer
- 483/176 Intermediate tool changer includes tool holder pivotable about axis
- 483/1762 Tool holders pivotable with respect to each other
- 483/1764 Tool holders pivotable about plural nonparallel axes
- 483/1767 Linearly movable tool holders
- 483/1769 Extensible tool holders
- 483/1771 Translatable axis
- 483/1774 Distinct tool changer for each tool
- 483/1776 including intermediate tool changer
- 483/1779 Linearly movable tool holder
- 483/1781 Tool holder pivotable about plural nonparallel axes
- 483/1783 including linearly translatable tool changer [e.g., shuttle, ram, etc.]
- 483/1786 Plural tool holders
- 483/1788 Orthogonally translatable
- 483/179 . . . Direct tool exchange between spindle and matrix
- 483/1793 Spindle comprises tool changer
- 483/1795 Matrix indexes selected tool to transfer position
- 483/1798 including means to project tool from matrix
- 483/18 . . Tool transfer to or from matrix
- 483/1809 . . Matrix including means to latch tool
- 483/1818 . . Matrix including means to project tool for transfer
- 483/1827 . . . Rectilinear
- 483/1836 . . . Pivoting
- 483/1845 . . Plural matrices
- 483/1855 . . . including tool replenishing
- 483/1864 . . including tool pot or adapter
- 483/1873 . . Indexing matrix
- 483/1882 . . . Rotary disc
- 483/1891 . . . Chain or belt
- 483/19 . . Miscellaneous