

# CPC COOPERATIVE PATENT CLASSIFICATION

**B21J FORGING; HAMMERING; PRESSING METAL; RIVETING; FORGE FURNACES** (rolling of metal [B21B](#); making particular products by forging or pressing [B21K](#); cladding or plating [B23K](#); finishing surfaces by hammering [B23P 9/04](#); compacting surfaces by blasting with particulate material [B24C 1/10](#); general features of presses, presses for consolidating scrap [B30B](#); furnaces in general [F27](#))

<b>1/00</b>	<b>Preparing metal stock {or similar ancillary operations prior, during or post forging, e.g. heating or cooling (pretreatment for rolling <a href="#">B21B 1/02</a>, <a href="#">B21B 15/0035</a>)}</b>	<b>7/10</b>	. . with both drive and hammer connected to a fulcrumed lever, e.g. tail hammers
<b>1/003</b>	. {Selecting material}	<b>7/12</b>	. . . the lever being a spring, i.e. spring hammers
<b>1/006</b>	. . {Amorphous metal}	<b>7/14</b>	. . Forging machines working with several hammers
<b>1/02</b>	. Preliminary treatment of metal stock without particular shaping, e.g. salvaging segregated zones, forging or pressing in the rough (modifying the physical properties by deformation <a href="#">C21D 7/00</a> , <a href="#">C22F 1/00</a> )	<b>7/145</b>	. . . {the hammers being driven by a rotating annular driving member}
<b>1/025</b>	. . {affecting grain orientation}	<b>7/16</b>	. . . in rotary arrangements
<b>1/04</b>	. Shaping in the rough solely by forging or pressing	<b>7/18</b>	. . Forging machines working with die jaws, e.g. pivoted, movable laterally of the forging or pressing direction, e.g. for swaging
<b>1/06</b>	. Heating or cooling methods or arrangements specially adapted for performing forging or pressing operations {( <a href="#">B21J 5/063</a> takes precedence)}	<b>7/20</b>	. Drives for hammers; Transmission means therefor
<b>3/00</b>	<b>Lubricating during forging or pressing (lubricating in general <a href="#">F16N</a>)</b>	<b>7/22</b>	. . for power hammers
<b>5/00</b>	<b>Methods for forging, hammering, or pressing (for working sheet-metal or metal tubes, rods, or profiles <a href="#">B21D</a>; for working wire <a href="#">B21F</a>); Special equipment or accessories therefor</b>	<b>7/24</b>	. . . operated by steam, air, or other gaseous pressure
<b>5/002</b>	. {Hybrid process, e.g. forging following casting}	<b>7/26</b>	. . . . operated by internal combustion
<b>5/004</b>	. {Thixotropic process, i.e. forging at semi-solid state}	<b>7/28</b>	. . . operated by hydraulic or liquid pressure
<b>5/006</b>	. {using ultrasonic waves}	<b>7/30</b>	. . . operated by electro-magnets
<b>5/008</b>	. {Incremental forging}	<b>7/32</b>	. . . operated by rotary drive, e.g. by electric motor
<b>5/02</b>	. Die forging; Trimming by making use of special dies; {Punching during forging}	<b>7/34</b>	. . . operating both the hammer and the anvil, so-called counter-tup
<b>5/022</b>	. . {Open die forging}	<b>7/36</b>	. . for drop hammers
<b>5/025</b>	. . {Closed die forging}	<b>7/38</b>	. . . driven by steam, air, or other gaseous pressure
<b>5/027</b>	. . {Trimming}	<b>7/40</b>	. . . driven by hydraulic or liquid pressure
<b>5/04</b>	. by directly applied fluid pressure or explosive action	<b>7/42</b>	. . . operated by rotary drive, e.g. electric motors
<b>5/06</b>	. for performing particular operations	<b>7/44</b>	. . . . equipped with belts, ropes, cables, chains
<b>5/063</b>	. . {Friction heat forging (friction heat riveting <a href="#">B21J 15/027</a> )}	<b>7/46</b>	. . Control devices specially adapted to forging hammers, not restricted to one of the preceding sub-groups
<b>5/066</b>	. . . {Flow drilling}	<b>9/00</b>	<b>Forging presses</b>
<b>5/08</b>	. . Upsetting	<b>9/02</b>	. Special design or construction
<b>5/10</b>	. . Piercing billets (in combination with extrusion <a href="#">B21C 23/00</a> )	<b>9/022</b>	. . {multi-stage forging presses (handling devices <a href="#">B21K 27/00</a> )}
<b>5/12</b>	. . Forming profiles on internal or external surfaces (making screw-thread by forging, pressing, or hammering <a href="#">B21K</a> )	<b>9/025</b>	. . {with rolling or wobbling dies}
<b>7/00</b>	<b>Hammers; Forging machines with hammers or die jaws acting by impact (hand hammers <a href="#">B25D</a>; electrical features in section <a href="#">H</a>)</b>	<b>9/027</b>	. . {with punches moving along auxiliary lateral directions ( <a href="#">B21J 13/025</a> takes precedence)}
<b>7/02</b>	. Special design or construction	<b>9/04</b>	. . Piercing presses
<b>7/04</b>	. . Power hammers	<b>9/06</b>	. . Swaging presses; Upsetting presses
<b>7/06</b>	. . Drop hammers	<b>9/08</b>	. . . equipped with devices for heating the work-piece (electric heating elements <a href="#">H05B</a> )
<b>7/08</b>	. . . with rigidly-guided hammer	<b>9/10</b>	. Drives for forging presses
		<b>9/12</b>	. . operated by hydraulic or liquid pressure
		<b>9/14</b>	. . . in conjunction with electric power
		<b>9/16</b>	. . . in conjunction with steam or gas power
		<b>9/18</b>	. . operated by making use of gearing mechanisms, e.g. levers, spindles, crankshafts, eccentrics, toggle-levers, rack bars
		<b>9/20</b>	. . Control devices specially adapted to forging presses not restricted to one of the preceding sub-groups



<b>11/00</b>	<b>Forging hammers combined with forging presses; Forging machines with provision for hammering and pressing</b>	15/30	. . Particular elements, e.g. supports; Suspension equipment specially adapted for portable riveters
<b>13/00</b>	<b>Details of machines for forging, pressing, or hammering</b>	15/32	. . . Devices for inserting or holding rivets in position with or without feeding arrangements
13/02	. Dies or mountings therefor	15/323	. . . . {using a carrier strip}
13/025	. . {Dies with parts moving along auxiliary lateral directions}	15/326	. . . . {Broken-off mandrel collection}
13/03	. . Die mountings	15/34	. . . . for installing {multiple-type} tubular rivets
13/04	. Frames; Guides	15/36	. . Rivet sets, i.e. tools for forming heads; Mandrels for expanding parts of hollow rivets
13/06	. Hammers tups; Anvils; Anvil blocks	15/365	. . . {Mandrels for expanding parts of hollow rivets}
13/08	. Accessories for handling work or tools	15/38	. Accessories for use in connection with riveting, e.g. pliers for upsetting; Hand tools for riveting
13/085	. . {handling of tools}	15/383	. . {Hand tools for riveting}
13/10	. . Manipulators (in general <a href="#">B25J</a> )	15/386	. . {Pliers for riveting}
13/12	. . . Turning means	15/40	. . for forming rivet heads
13/14	. . Ejecting devices	15/42	. . Special clamping devices for workpieces to be riveted together, e.g. operating through the rivet holes
<b>15/00</b>	<b>Riveting</b>	15/44	. . Rivet hole positioners
15/02	. Riveting procedures	15/46	. . Positioners for rivets for making tube joints
15/022	. . {Setting rivets by means of swaged-on locking collars, e.g. lockbolts}	15/48	. . Devices for caulking rivets
15/025	. . {Setting self-piercing rivets}	15/50	. . Removing or cutting devices for rivets
15/027	. . {Setting rivets by friction heating}	<b>17/00</b>	<b>Forge furnaces (furnaces for heat treatment <a href="#">C21D 9/00</a>; furnaces in general <a href="#">F27</a>)</b>
15/04	. . Riveting hollow rivets mechanically	17/02	. electrically heated (electric heating elements <a href="#">H05B</a> )
15/041	. . . {by pushing a drive-pin}	<b>19/00</b>	<b>Blacksmiths requisites not otherwise provided for</b>
15/043	. . . {by pulling a mandrel}	19/02	. Hearths; Air supply arrangements specially adapted therefor
15/045	. . . . {and swaging locking means, i.e. locking the broken off mandrel head to the hollow rivet}	19/025	. . {Tyre heaters}
15/046	. . . {by edge-curling}	19/04	. Anvils; Associated items
15/048	. . . {Setting self-drilling hollow rivets}		
15/06	. . Riveting hollow rivets by means of hydraulic, liquid, or gas pressure ({portable riveters <a href="#">B21J 15/105</a> })		
15/08	. . riveting by applying heat {, e.g.} to the end parts of the rivets to enable heads to be formed ({ <a href="#">B21J 15/027</a> takes precedence})		
15/10	. Riveting machines (electric heating elements <a href="#">H05B</a> )		
15/105	. . {Portable riveters (pliers for riveting <a href="#">B21J 15/386</a> )}		
15/12	. . with tools or tool parts having a movement additional to the feed movement, e.g. spin ({ <a href="#">B21J 15/027</a> takes precedence})		
15/14	. . specially adapted for riveting specific articles, e.g. brake lining machines		
15/142	. . . {Aerospace structures}		
15/145	. . . {Turbines}		
15/147	. . . {Composite articles}		
15/16	. . Drives for riveting machines; Transmission means therefor		
15/18	. . . operated by air pressure or other gas pressure, e.g. explosion pressure		
15/185	. . . . {by explosion pressure}		
15/20	. . . operated by hydraulic or liquid pressure		
15/205	. . . . {Riveting tools having hand operated pumps for building up the hydraulic pressure}		
15/22	. . . operated by both hydraulic or liquid pressure and gas pressure		
15/24	. . . operated by electro-magnets		
15/26	. . . operated by rotary drive, e.g. by electric motor		
15/28	. . Control devices specially adapted to riveting machines not restricted to one of the preceding sub-groups		
15/285	. . . {for controlling the rivet upset cycle}		