

CPC COOPERATIVE PATENT CLASSIFICATION

F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

LIGHTING; HEATING

F25 REFRIGERATION OR COOLING; COMBINED HEATING AND REFRIGERATION SYSTEMS; HEAT PUMP SYSTEMS; MANUFACTURE OR STORAGE OF ICE; LIQUEFACTION SOLIDIFICATION OF GASES

F25D REFRIGERATORS; COLD ROOMS; ICE-BOXES; COOLING OR FREEZING APPARATUS NOT COVERED BY ANY OTHER SUBCLASS ([refrigerated show cases A47F 3/04](#); [thermally-insulated vessels for domestic use A47J 41/00](#); [refrigerated vehicles](#), [see the appropriate subclasses of classes B60 - B64](#); [containers with thermal insulation in general B65D 81/38](#); [heat-transfer, heat-exchange or heat-storage materials, e.g. refrigerants, or materials for the production of heat or cold by chemical reactions other than by combustion C09K 5/00](#); [thermally-insulated vessels for liquefied or solidified gases F17C](#); [air-conditioning or air-humidification F24F](#); [refrigeration machines, plants or systems F25B](#); [cooling of instruments and comparable apparatus without refrigeration G12B](#); [cooling of engines or pumps](#), [see the relevant classes](#))

NOTES

1. In this subclass, the following term is used with the meaning indicated:
 - "device" means an enclosed space to be cooled; such devices being associated either with refrigerating machinery, e.g. in a refrigerator, or with other cold sources, e.g. in an ice-box.
2. Attention is drawn to Note (2) following the title of subclass [F24F](#).

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Devices not associated with refrigerating machinery

- 1/00 Devices using naturally cold air or cold water**
- 1/02 . using naturally cold water, e.g. household tap water
- 3/00 Devices using other cold materials; Devices using cold-storage bodies**
- 3/005 . {combined with heat exchangers}
- 3/02 . using ice, e.g. ice-boxes
- 3/04 . . Stationary cabinets
- 3/045 . . . {Details}
- 3/06 . . Movable containers
- 3/08 . . . portable, i.e. adapted to be carried personally
- 3/10 . using liquefied gases, e.g. liquid air {(for cooling semiconductor devices [H01L 23/445](#))}
- 3/102 . . {Stationary cabinets}
- 3/105 . . {Movable containers}
- 3/107 . . {portable, i.e. adapted to be carried personally}
- 3/11 . . with conveyors carrying articles to be cooled through the cooling space
- 3/12 . using solidified gases, e.g. carbon-dioxide snow
- 3/122 . . {Stationary cabinets}
- 3/125 . . {Movable containers}
- 3/127 . . {Stationary devices with conveyors carrying articles to be cooled through the cooling space}

- 3/14 . . portable, i.e. adapted to be carried personally
- 5/00 Devices using endothermic chemical reactions, e.g. using frigorific mixtures**
- 5/02 . portable, i.e. adapted to be carried personally
- 7/00 Devices using evaporation effects without recovery of the vapour** ([butter or cheese dishes with cooling devices A47G 19/26](#))
- 9/00 Devices not covered by groups [F25D 1/00 - F25D 7/00](#); Combinations of devices covered by two or more of the groups [F25D 1/00 - F25D 7/00](#)**
- 9/005 . {using fluorinated halogenous hydrocarbons}

Devices associated with refrigerating machinery

- 11/00 Self-contained movable devices, e.g. domestic refrigerators**
- 11/003 . {Transport containers}
- 11/006 . {with cold storage accumulators}
- 11/02 . with cooling compartments at different temperatures
- 11/022 . . {with two or more evaporators}
- 11/025 . . {using primary and secondary refrigeration systems}
- 11/027 . . {of the sorption cycle type}

11/04	<ul style="list-style-type: none"> • specially adapted for storing deep-frozen articles (F25D 11/02 takes precedence) 	21/10	<ul style="list-style-type: none"> • by spraying with fluid
13/00	Stationary devices, e.g. cold-rooms	21/12	<ul style="list-style-type: none"> • by hot-fluid circulating system separate from the refrigerant system
13/02	<ul style="list-style-type: none"> • with several cooling compartments, e.g. refrigerated locker systems 	21/125	<ul style="list-style-type: none"> • . . . {the hot fluid being ambient air}
13/04	<ul style="list-style-type: none"> • . the compartments being at different temperatures 	21/14	<ul style="list-style-type: none"> • Collecting or removing condensed and defrost water; Drip trays
13/06	<ul style="list-style-type: none"> • with conveyors carrying articles to be cooled through the cooling space 	23/00	General constructional features (F25D 21/00 takes precedence)
13/062	<ul style="list-style-type: none"> • . {with refrigerated conveyors} 	23/003	<ul style="list-style-type: none"> • {for cooling refrigerating machinery}
13/065	<ul style="list-style-type: none"> • . {Articles being submerged in liquid coolant} 	23/006	<ul style="list-style-type: none"> • {for mounting refrigerating machinery components}
13/067	<ul style="list-style-type: none"> • . {with circulation of gaseous cooling fluid} 	23/02	<ul style="list-style-type: none"> • Doors; Covers (F25D 23/08 takes precedence {locks or fastenings E05B 65/0042})
15/00	Devices not covered by group F25D 11/00 or F25D 13/00, e.g. non-self-contained movable devices	23/021	<ul style="list-style-type: none"> • . {Sliding doors}
16/00	Devices using a combination of a cooling mode associated with refrigerating machinery with a cooling mode not associated with refrigerating machinery	23/023	<ul style="list-style-type: none"> • . {Air curtain closures}
Details or features of the devices covered by groups F25D 1/00 - F25D 16/00		23/025	<ul style="list-style-type: none"> • . {Secondary closures}
17/00	Arrangements for circulating cooling fluids; Arrangements for circulating gas, e.g. air, within refrigerated spaces	23/026	<ul style="list-style-type: none"> • . {for open-top cabinets}
17/005	<ul style="list-style-type: none"> • {in cold rooms} 	23/028	<ul style="list-style-type: none"> • . {Details}
17/02	<ul style="list-style-type: none"> • for circulating liquids, e.g. brine 	23/04	<ul style="list-style-type: none"> • . with special compartments, e.g. butter conditioners
17/04	<ul style="list-style-type: none"> • for circulating air, e.g. by convection 	23/06	<ul style="list-style-type: none"> • Walls (F25D 23/08 takes precedence; containers with thermal insulation B65D 81/38)
17/042	<ul style="list-style-type: none"> • . {Air treating means within refrigerated spaces (air conditioning in general F24F)} 	23/061	<ul style="list-style-type: none"> • . {with conduit means}
17/045	<ul style="list-style-type: none"> • . . . {Air flow control arrangements} 	23/062	<ul style="list-style-type: none"> • . {defining a cabinet}
17/047	<ul style="list-style-type: none"> • . . . {Pressure equalising devices} 	23/063	<ul style="list-style-type: none"> • . . . {formed by an assembly of panels}
17/06	<ul style="list-style-type: none"> • . by forced circulation 	23/064	<ul style="list-style-type: none"> • . . . {formed by moulding, e.g. moulding <i>in situ</i>}
17/062	<ul style="list-style-type: none"> • . . . {in household refrigerators} 	23/065	<ul style="list-style-type: none"> • . {Details}
17/065	<ul style="list-style-type: none"> • {with compartments at different temperatures} 	23/066	<ul style="list-style-type: none"> • . . . {Liners}
17/067	<ul style="list-style-type: none"> • . . . {Evaporator fan units} 	23/067	<ul style="list-style-type: none"> • . . . {Supporting elements}
17/08	<ul style="list-style-type: none"> • . . . using ducts 	23/068	<ul style="list-style-type: none"> • . . . {Arrangements for circulating fluids through the insulating material}
19/00	Arrangement or mounting of refrigeration units with respect to devices {or objects to be refrigerated, e.g. infra-red detectors}	23/069	<ul style="list-style-type: none"> • . {Cooling space dividing partitions}
19/003	<ul style="list-style-type: none"> • {with respect to movable containers} 	23/08	<ul style="list-style-type: none"> • Parts formed wholly or mainly of plastics materials
19/006	<ul style="list-style-type: none"> • {Thermal coupling structure or interface} 	23/082	<ul style="list-style-type: none"> • . {Strips}
19/02	<ul style="list-style-type: none"> • plug-in type 	NOTE	
19/04	<ul style="list-style-type: none"> • with more than one refrigeration unit 	When a document describes both breaking and sealing strips it is classified in group F25D 23/082 only.	
21/00	Defrosting; Preventing frosting; Removing condensed or defrost water (removing ice or water from heat-exchange apparatus in general F28F 17/00; heating arrangements specially adapted for transparent or reflecting areas H05B 3/84)	23/085	<ul style="list-style-type: none"> • . . . {Breaking strips}
21/002	<ul style="list-style-type: none"> • {Defroster control} 	23/087	<ul style="list-style-type: none"> • . . . {Sealing strips}
21/004	<ul style="list-style-type: none"> • . {Control mechanisms (F25D 21/006 takes precedence)} 	23/10	<ul style="list-style-type: none"> • Arrangements for mounting in particular locations, e.g. for built-in type, for corner type
21/006	<ul style="list-style-type: none"> • . {with electronic control circuits} 	23/12	<ul style="list-style-type: none"> • Arrangements of compartments additional to cooling compartments; Combinations of refrigerators with other equipment, e.g. stove
21/008	<ul style="list-style-type: none"> • . {by timer} 	23/123	<ul style="list-style-type: none"> • . {Butter compartment}
21/02	<ul style="list-style-type: none"> • Detecting the presence of frost or condensate 	23/126	<ul style="list-style-type: none"> • . {Water cooler}
21/025	<ul style="list-style-type: none"> • . {using air pressure differential detectors} 	25/00	Charging, supporting, and discharging the articles to be cooled
21/04	<ul style="list-style-type: none"> • Preventing the formation of frost or condensate 	25/005	<ul style="list-style-type: none"> • {using containers}
21/06	<ul style="list-style-type: none"> • Removing frost (defrosting cycles F25B 47/02) 	25/02	<ul style="list-style-type: none"> • by shelves
21/065	<ul style="list-style-type: none"> • . {by mechanical means} 	25/021	<ul style="list-style-type: none"> • . {combined with trays}
21/08	<ul style="list-style-type: none"> • . by electric heating 	25/022	<ul style="list-style-type: none"> • . {Baskets}
		25/024	<ul style="list-style-type: none"> • . {Slidable shelves}
		25/025	<ul style="list-style-type: none"> • . . . {Drawers}
		25/027	<ul style="list-style-type: none"> • . {Rotatable shelves}
		25/028	<ul style="list-style-type: none"> • . {Cooled supporting means}
		25/04	<ul style="list-style-type: none"> • by conveyors (in general B65G)
		27/00	Lighting arrangements (in general F21)
		27/005	<ul style="list-style-type: none"> • {combined with control means}

29/00	Arrangement or mounting of control or safety devices	2303/0842	. . . inside the beverage contained in a bottle, can, drinking glass, pitcher or dispenser
29/001	. {for cryogenic fluid systems}	2303/0843	. . . on the side of the product
29/003	. {for movable devices}	2303/0844	. . . above the product
29/005	. {Mounting of control devices}	2303/0845	. . . below the product
29/006	. {Safety devices}	2303/0846	. . . around the neck of a bottle
29/008	. {Alarm devices}	2303/085	. . Compositions of cold storage materials
31/00	Other cooling or freezing apparatus	2317/00	Details or arrangements for circulating cooling fluids; Details or arrangements for circulating gas, e.g. air, within refrigerated spaces, not provided for in other groups of this subclass
31/001	. {Plate freezers}	2317/04	. Treating air flowing to refrigeration compartments
31/002	. {Liquid coolers, e.g. beverage cooler (receptacle coolers F25D 31/006)}	2317/041	. . by purification
31/003	. . {with immersed cooling element}	2317/0411	. . . by dehumidification
31/005	. {Combined cooling and heating devices}	2317/04111	. . . . Control means therefor
31/006	. {specially adapted for cooling receptacles, e.g. tanks}	2317/0413	. . . by humidification
31/007	. . {Bottles or cans}	2317/04131	. . . . Control means therefor
31/008	. . {Drinking glasses}	2317/0415	. . . by deodorizing
<hr/>		2317/0416	. . . using an ozone generator
2201/00	Insulation	2317/0417	. . . using an UV-lamp
2201/10	. with respect to heat	2317/043	. . by creating a vacuum in a storage compartment
2201/12	. . using an insulating packing material	2317/06	. with forced air circulation
2201/122	. . . of loose fill type	2317/061	. . through special compartments
2201/124	. . . of fibrous type	2317/062	. . along the inside of doors
2201/126	. . . of cellular type	2317/063	. . with air guides
2201/1262	. . . . with open cells	2317/065	. . characterised by the air return
2201/128	. . . of foil type	2317/0651	. . . through the bottom
2201/1282	. . . . with reflective foils	2317/0652	. . . through the corner
2201/14	. . using subatmospheric pressure	2317/0653	. . . through the mullion
2201/30	. with respect to sound	2317/0654	. . . through the side
2300/00	Special arrangements or features for refrigerators; cold rooms; ice-boxes; Cooling or freezing apparatus not covered by any other subclass	2317/0655	. . . through the top
2303/00	Details of devices using other cold materials; Details of devices using cold-storage bodies	2317/066	. . characterised by the air supply
2303/08	. Devices using cold storage material, i.e. ice or other freezable liquid	2317/0661	. . . from the bottom
2303/081	. . using ice cubes or crushed ice	2317/0662	. . . from the corner
2303/082	. . disposed in a cold storage element not forming part of a container for products to be cooled, e.g. ice pack or gel accumulator	2317/0663	. . . from the mullion
2303/0821	. . . the element placed in a compartment which can be opened without the need of opening the container itself	2317/0664	. . . from the side
2303/0822	. . . Details of the element	2317/0665	. . . from the top
2303/08221	. . . . Fasteners or fixing means for the element	2317/0666	. . . from the freezer
2303/08222	. . . . Shape of the element	2317/0667	. . . from the refrigerator
2303/08223	. . . . . having the shape of an ice cube	2317/067	. . characterised by air ducts
2303/083	. . using cold storage material disposed in closed wall forming part of a container for products to be cooled	2317/0671	. . . Inlet ducts
2303/0831	. . . the liquid is disposed in the space between the walls of the container	2317/0672	. . . Outlet ducts
2303/0832	. . . the liquid is disposed in an accumulator pack locked in a closable wall forming part of the container	2317/068	. . characterised by the fans
2303/084	. . Position of the cold storage material in relationship to a product to be cooled	2317/0681	. . . Details thereof
2303/0841	. . . external to the container for a beverage, e.g. a bottle, can, drinking glass or pitcher	2317/0682	. . . Two or more fans
		2317/0683	. . . the fans not of the axial type
		2317/0684	. . . the fans allowing rotation in reverse direction
		2321/00	Details or arrangements for defrosting; Preventing frosting; Removing condensed or defrost water, not provided for in other groups of this subclass
		2321/14	. Collecting condense or defrost water; Removing condense or defrost water
		2321/141	. . Removal by evaporation
		2321/1411	. . . using compressor heat
		2321/1412	. . . using condenser heat or heat of desuperheaters
		2321/1413	. . . using heat from electric elements or using an electric field for enhancing removal
		2321/142	. . characterised by droplet guides
		2321/143	. . characterised by means to fix, clamp, or connect water pipes or evaporation trays

2321/144	. . characterised by the construction of drip water collection pans	2327/00	Lighting arrangements not provided for in other groups of this subclass
2321/1441	. . . inside a refrigerator	2327/001	. Lighting arrangements on the external side of the refrigerator, freezer or cooling box
2321/1442	. . . outside a refrigerator		
2321/145	. . characterised by multiple collecting pans	2331/00	Details or arrangements of other cooling or freezing apparatus not provided for in other groups of this subclass
2321/146	. . characterised by the pipes or pipe connections	2331/80	. Type of cooled receptacles
2321/147	. . characterised by capillary, wick, adsorbent, or evaporation elements	2331/801	. . Bags
2323/00	General constructional features not provided for in other groups of this subclass	2331/8011	. . . to be carried on the back of a person
2323/0011	. Means for leveling refrigerators	2331/8012	. . . for cosmetics
2323/002	. Details for cooling refrigerating machinery	2331/8013	. . . for playing golf
2323/0021	. . using air guides	2331/8014	. . . for medical use
2323/0022	. . using multiple air flows	2331/8015	. . . Pouches
2323/0023	. . Control of the air flow cooling refrigerating machinery	2331/802	. . Barrels
2323/0024	. . Filters in the air flow cooling refrigerating machinery	2331/803	. . Bottles
2323/0026	. . characterised by the incoming air flow	2331/804	. . Boxes
2323/00261	. . . through the back bottom side	2331/8041	. . . for drinking
2323/00262	. . . through the back top side	2331/805	. . Cans
2323/00263	. . . through the back corner side	2331/8051	. . . for holding milk
2323/00264	. . . through the front bottom part	2331/806	. . Dispensers
2323/00265	. . . through the front top part	2331/807	. . Eggs
2323/00266	. . . through the bottom	2331/808	. . Glasses
2323/00267	. . . through the side	2331/809	. . Holders
2323/00268	. . . through the top	2331/81	. . Pitchers
2323/0027	. . characterised by the out-flowing air	2331/811	. . Pour-throughs
2323/00271	. . . from the back bottom	2331/812	. . Trays
2323/00272	. . . from the back top	2400/00	General features of, or devices for refrigerators, cold rooms, ice-boxes, or for cooling or freezing apparatus not covered by any other subclass
2323/00273	. . . from the back corner	2400/02	. Refrigerators including a heater
2323/00274	. . . from the front bottom	2400/04	. Refrigerators with a horizontal mullion
2323/00275	. . . from the front top	2400/06	. Refrigerators with a vertical mullion
2323/00276	. . . from the bottom	2400/08	. Refrigerator tables
2323/00277	. . . from the side	2400/10	. Refrigerator top-coolers
2323/00278	. . . from the top	2400/12	. Portable refrigerators
2323/0028	. . characterised by the fans	2400/14	. Refrigerator multi units
2323/00281	. . . Two or more fans	2400/16	. Convertible refrigerators
2323/00282	. . . the fans not of the axial type	2400/18	. Aesthetic features
2323/00283	. . . the fans allowing rotation in reverse direction	2400/20	. Carts specially adapted for transporting objects to be cooled
2323/00284	. . . Details thereof	2400/22	. Cleaning means for refrigerating devices
2323/02	. Details of doors or covers not otherwise covered	2400/24	. Protection against refrigerant explosions
2323/021	. . French doors	2400/26	. Refrigerating devices for cooling wearing apparel, e.g. garments, hats, shoes or gloves
2323/022	. . Doors that can be pivoted either left-handed or right-handed	2400/28	. Quick cooling
2323/023	. . Door in door constructions	2400/30	. Quick freezing
2323/024	. . Door hinges	2400/32	. Removal, transportation or shipping of refrigerating devices from one location to another
2323/06	. Details of walls not otherwise covered	2400/34	. Temperature balancing devices
2323/061	. . Collapsible walls	2400/36	. Visual displays
2323/062	. . Inflatable walls	2400/361	. . Interactive visual displays
2323/121	. the refrigerator is characterised by a water filter for the water/ice dispenser	2400/38	. Refrigerating devices characterised by wheels
2323/122	. the refrigerator is characterised by a water tank for the water/ice dispenser	2400/40	. Refrigerating devices characterised by electrical wiring
2325/00	Charging, supporting or discharging the articles to be cooled, not provided for in other groups of this subclass	2500/00	Problems to be solved
2325/021	. Shelves with several possible configurations	2500/02	. Geometry problems
2325/022	. Shelves made of glass or ceramic	2500/04	. Calculation of parameters
2325/023	. Shelves made of wires	2500/06	. Stock management
		2600/00	Control issues

F25D

- 2600/02 . Timing
- 2600/04 . Controlling heat transfer
- 2600/06 . Controlling according to a predetermined profile
- 2700/00 Means for sensing or measuring; Sensors therefor**
- 2700/02 . Sensors detecting door opening
- 2700/04 . Sensors detecting the presence of a person
- 2700/06 . Sensors detecting the presence of a product
- 2700/08 . Sensors using Radio Frequency Identification [RFID]
- 2700/10 . Sensors measuring the temperature of the evaporator
- 2700/12 . Sensors measuring the inside temperature
- 2700/121 . . of particular compartments
- 2700/122 . . of freezer compartments
- 2700/123 . . more than one sensor measuring the inside temperature in a compartment
- 2700/14 . Sensors measuring the temperature outside the refrigerator or freezer
- 2700/16 . Sensors measuring the temperature of products