

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 OTHERWISE PROVIDED FOR ([refrigerated showcases 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 or comparable apparatus without refrigeration G12B](#))

NOTES

- 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.
- 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 {[\(for cooling semiconductor devices H10W 40/305\)](#)}
- 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 associated with refrigerating machinery and 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	. specially adapted for storing deep-frozen articles (F25D 11/02 takes precedence)	21/10	. . by spraying with fluid
13/00	Stationary devices, e.g. cold-rooms	21/12	. . by hot-fluid circulating system separate from the refrigerant system
13/02	. with several cooling compartments, e.g. refrigerated locker systems	21/125	. . . {the hot fluid being ambient air}
13/04	. . the compartments being at different temperatures	21/14	. Collecting or removing condensed and defrost water; Drip trays
13/06	. with conveyors carrying articles to be cooled through the cooling space	23/00	General constructional features (F25D 21/00 takes precedence)
13/062	. . {with refrigerated conveyors}	23/003	. {for cooling refrigerating machinery}
13/065	. . {Articles being submerged in liquid coolant}	23/006	. {for mounting refrigerating machinery components}
13/067	. . {with circulation of gaseous cooling fluid}	23/02	. 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	. . {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	. . {Air curtain closures}
		23/025	. . {Secondary closures}
		23/026	. . {for open-top cabinets}
		23/028	. . {Details}
		23/04	. . with special compartments, e.g. butter conditioners
		23/06	. Walls (F25D 23/08 takes precedence; containers with thermal insulation B65D 81/38)
		23/061	. . {with conduit means}
		23/062	. . {defining a cabinet}
		23/063	. . . {formed by an assembly of panels}
		23/064	. . . {formed by moulding, e.g. moulding <i>in situ</i> }
		23/065	. . {Details}
		23/066	. . . {Liners}
		23/067	. . . {Supporting elements}
		23/068	. . . {Arrangements for circulating fluids through the insulating material}
		23/069	. . {Cooling space dividing partitions}
		23/08	. Parts formed wholly or mainly of plastics materials
		23/082	. . {Strips}
			NOTE
			When a document describes both breaking and sealing strips it is classified in group F25D 23/082 only.
		23/085	. . . {Breaking strips}
		23/087	. . . {Sealing strips}
		23/10	. Arrangements for mounting in particular locations, e.g. for built-in type, for corner type
		23/12	. Arrangements of compartments additional to cooling compartments; Combinations of refrigerators with other equipment, e.g. stove
		23/123	. . {Butter compartment}
		23/126	. . {Water cooler}
		25/00	Charging, supporting, and discharging the articles to be cooled
		25/005	. {using containers}
		25/02	. by shelves
		25/021	. . {combined with trays}
		25/022	. . {Baskets}
		25/024	. . {Slidable shelves}
		25/025	. . . {Drawers}
		25/027	. . {Rotatable shelves}
		25/028	. . {Cooled supporting means}
		25/04	. by conveyors (in general B65G)
		27/00	Lighting arrangements (in general F21)
		27/005	. {combined with control means}
17/00	Arrangements for circulating cooling fluids; Arrangements for circulating gas, e.g. air, within refrigerated spaces		
17/005	. {in cold rooms}		
17/02	. for circulating liquids, e.g. brine		
17/04	. for circulating air, e.g. by convection		
17/042	. . {Air treating means within refrigerated spaces (air conditioning in general F24F)}		
17/045	. . . {Air flow control arrangements}		
17/047	. . . {Pressure equalising devices}		
17/06	. . by forced circulation		
17/062	. . . {in household refrigerators}		
17/065 {with compartments at different temperatures}		
17/067	. . . {Evaporator fan units}		
17/08	. . . using ducts		
19/00	Arrangement or mounting of refrigeration units with respect to devices (or objects to be refrigerated, e.g. infrared detectors)		
19/003	. {with respect to movable containers}		
19/006	. {Thermal coupling structure or interface}		
19/02	. plug-in type		
19/04	. with more than one refrigeration unit		
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)		
21/002	. {Defroster control}		
21/004	. . {Control mechanisms (F25D 21/006 takes precedence)}		
21/006	. . {with electronic control circuits}		
21/008	. . {by timer}		
21/02	. Detecting the presence of frost or condensate		
21/025	. . {using air pressure differential detectors}		
21/04	. Preventing the formation of frost or condensate		
21/06	. Removing frost (defrosting cycles F25B 47/02)		
21/065	. . {by mechanical means}		
21/08	. . by electric heating		

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
		2317/0416	. . . using an ozone generator
		2317/0417	. . . using an UV-lamp
		2317/043	. . by creating a vacuum in a storage compartment
		2317/06	. with forced air circulation
		2317/061	. . through special compartments
		2317/062	. . along the inside of doors
		2317/063	. . with air guides
		2317/065	. . characterised by the air return
		2317/0651	. . . through the bottom
		2317/0652	. . . through the corner
		2317/0653	. . . through the mullion
		2317/0654	. . . through the side
		2317/0655	. . . through the top
		2317/066	. . characterised by the air supply
		2317/0661	. . . from the bottom
		2317/0662	. . . from the corner
		2317/0663	. . . from the mullion
		2317/0664	. . . from the side
		2317/0665	. . . from the top
		2317/0666	. . . from the freezer
		2317/0667	. . . from the refrigerator
		2317/067	. . characterised by air ducts
		2317/0671	. . . Inlet ducts
		2317/0672	. . . Outlet ducts
		2317/068	. . characterised by the fans
		2317/0681	. . . Details thereof
		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
2201/00	Insulation		
2201/10	. with respect to heat		
2201/12	. . using an insulating packing material		
2201/122	. . . of loose fill type		
2201/124	. . . of fibrous type		
2201/126	. . . of cellular type		
2201/1262 with open cells		
2201/128	. . . of foil type		
2201/1282 with reflective foils		
2201/14	. . using subatmospheric pressure		
2201/30	. with respect to sound		
2300/00	Special arrangements or features for refrigerators; cold rooms; ice-boxes; Cooling or freezing apparatus not covered by any other subclass		
2303/00	Details of devices using other cold materials; Details of devices using cold-storage bodies		
2303/08	. Devices using cold storage material, i.e. ice or other freezable liquid		
2303/081	. . using ice cubes or crushed ice		
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		
2303/0821	. . . the element placed in a compartment which can be opened without the need of opening the container itself		
2303/0822	. . . Details of the element		
2303/08221 Fasteners or fixing means for the element		
2303/08222 Shape of the element		
2303/08223 having the shape of an ice cube		
2303/083	. . using cold storage material disposed in closed wall forming part of a container for products to be cooled		
2303/0831	. . . the liquid is disposed in the space between the walls of the container		
2303/0832	. . . the liquid is disposed in an accumulator pack locked in a closable wall forming part of the container		
2303/084	. . Position of the cold storage material in relationship to a product to be cooled		
2303/0841	. . . external to the container for a beverage, e.g. a bottle, can, drinking glass or pitcher		

- 2321/144 . . characterised by the construction of drip water collection pans
- 2321/1441 . . . inside a refrigerator
- 2321/1442 . . . outside a refrigerator
- 2321/145 . . characterised by multiple collecting pans
- 2321/146 . . characterised by the pipes or pipe connections
- 2321/147 . . characterised by capillary, wick, adsorbent, or evaporation elements

- 2323/00** **General constructional features not provided for in other groups of this subclass**
- 2323/0011 . Means for leveling refrigerators
- 2323/002 . Details for cooling refrigerating machinery
- 2323/0021 . . using air guides
- 2323/0022 . . using multiple air flows
- 2323/0023 . . Control of the air flow cooling refrigerating machinery
- 2323/0024 . . Filters in the air flow cooling refrigerating machinery
- 2323/0026 . . characterised by the incoming air flow
- 2323/00261 . . . through the back bottom side
- 2323/00262 . . . through the back top side
- 2323/00263 . . . through the back corner side
- 2323/00264 . . . through the front bottom part
- 2323/00265 . . . through the front top part
- 2323/00266 . . . through the bottom
- 2323/00267 . . . through the side
- 2323/00268 . . . through the top
- 2323/0027 . . characterised by the out-flowing air
- 2323/00271 . . . from the back bottom
- 2323/00272 . . . from the back top
- 2323/00273 . . . from the back corner
- 2323/00274 . . . from the front bottom
- 2323/00275 . . . from the front top
- 2323/00276 . . . from the bottom
- 2323/00277 . . . from the side
- 2323/00278 . . . from the top
- 2323/0028 . . characterised by the fans
- 2323/00281 . . . Two or more fans
- 2323/00282 . . . the fans not of the axial type
- 2323/00283 . . . the fans allowing rotation in reverse direction
- 2323/00284 . . . Details thereof
- 2323/02 . Details of doors or covers not otherwise covered
- 2323/021 . . French doors
- 2323/022 . . Doors that can be pivoted either left-handed or right-handed
- 2323/023 . . Door in door constructions
- 2323/024 . . Door hinges
- 2323/06 . Details of walls not otherwise covered
- 2323/061 . . Collapsible walls
- 2323/062 . . Inflatable walls
- 2323/121 . the refrigerator is characterised by a water filter for the water/ice dispenser
- 2323/122 . the refrigerator is characterised by a water tank for the water/ice dispenser

- 2325/00** **Charging, supporting or discharging the articles to be cooled, not provided for in other groups of this subclass**
- 2325/021 . Shelves with several possible configurations
- 2325/022 . Shelves made of glass or ceramic
- 2325/023 . Shelves made of wires

- 2327/00** **Lighting arrangements not provided for in other groups of this subclass**
- 2327/001 . Lighting arrangements on the external side of the refrigerator, freezer or cooling box

- 2331/00** **Details or arrangements of other cooling or freezing apparatus not provided for in other groups of this subclass**
- 2331/80 . Type of cooled receptacles
- 2331/801 . . Bags
- 2331/8011 . . . to be carried on the back of a person
- 2331/8012 . . . for cosmetics
- 2331/8013 . . . for playing golf
- 2331/8014 . . . for medical use
- 2331/8015 . . . Pouches
- 2331/802 . . Barrels
- 2331/803 . . Bottles
- 2331/804 . . Boxes
- 2331/8041 . . . for drinking
- 2331/805 . . Cans
- 2331/8051 . . . for holding milk
- 2331/806 . . Dispensers
- 2331/807 . . Eggs
- 2331/808 . . Glasses
- 2331/809 . . Holders
- 2331/81 . . Pitchers
- 2331/811 . . Pour-throughs
- 2331/812 . . Trays

- 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**
- 2400/02 . Refrigerators including a heater
- 2400/04 . Refrigerators with a horizontal mullion
- 2400/06 . Refrigerators with a vertical mullion
- 2400/08 . Refrigerator tables
- 2400/10 . Refrigerator top-coolers
- 2400/12 . Portable refrigerators
- 2400/14 . Refrigerator multi units
- 2400/16 . Convertible refrigerators
- 2400/18 . Aesthetic features
- 2400/20 . Carts specially adapted for transporting objects to be cooled
- 2400/22 . Cleaning means for refrigerating devices
- 2400/24 . Protection against refrigerant explosions
- 2400/26 . Refrigerating devices for cooling wearing apparel, e.g. garments, hats, shoes or gloves
- 2400/28 . Quick cooling
- 2400/30 . Quick freezing
- 2400/32 . Removal, transportation or shipping of refrigerating devices from one location to another
- 2400/34 . Temperature balancing devices
- 2400/36 . Visual displays
- 2400/361 . . Interactive visual displays
- 2400/38 . Refrigerating devices characterised by wheels
- 2400/40 . Refrigerating devices characterised by electrical wiring

- 2500/00** **Problems to be solved**
- 2500/02 . Geometry problems
- 2500/04 . Calculation of parameters
- 2500/06 . Stock management

- 2600/00** **Control issues**

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- 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