

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](#); [cooling of engines or pumps](#), see the relevant classes)

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 [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 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}

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| 11/027 | . . {of the sorption cycle type} | 21/08 | . . by electric heating |
| 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} |
| Details or features of the devices covered by groups F25D 1/00 - F25D 16/00 | | 23/025 | . . {Secondary closures} |
| 17/00 | Arrangements for circulating cooling fluids; Arrangements for circulating gas, e.g. air, within refrigerated spaces | 23/026 | . . {for open-top cabinets} |
| 17/005 | . {in cold rooms} | 23/028 | . . {Details} |
| 17/02 | . for circulating liquids, e.g. brine | 23/04 | . . with special compartments, e.g. butter conditioners |
| 17/04 | . for circulating air, e.g. by convection | 23/06 | . Walls (F25D 23/08 takes precedence; containers with thermal insulation B65D 81/38) |
| 17/042 | . . {Air treating means within refrigerated spaces (air conditioning in general F24F)} | 23/061 | . . {with conduit means} |
| 17/045 | . . . {Air flow control arrangements} | 23/062 | . . {defining a cabinet} |
| 17/047 | . . . {Pressure equalising devices} | 23/063 | . . . {formed by an assembly of panels} |
| 17/06 | . . by forced circulation | 23/064 | . . . {formed by moulding, e.g. moulding <i>in situ</i> } |
| 17/062 | . . . {in household refrigerators} | 23/065 | . . {Details} |
| 17/065 | {with compartments at different temperatures} | 23/066 | . . . {Liners} |
| 17/067 | . . . {Evaporator fan units} | 23/067 | . . . {Supporting elements} |
| 17/08 | . . . using ducts | 23/068 | . . . {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 | . . {Cooling space dividing partitions} |
| 19/003 | . {with respect to movable containers} | 23/08 | . Parts formed wholly or mainly of plastics materials |
| 19/006 | . {Thermal coupling structure or interface} | 23/082 | . . {Strips} |
| 19/02 | . plug-in type | NOTE | |
| 19/04 | . 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 | . . . {Breaking strips} |
| 21/002 | . {Defroster control} | 23/087 | . . . {Sealing strips} |
| 21/004 | . . {Control mechanisms (F25D 21/006 takes precedence)} | 23/10 | . Arrangements for mounting in particular locations, e.g. for built-in type, for corner type |
| 21/006 | . . {with electronic control circuits} | 23/12 | . Arrangements of compartments additional to cooling compartments; Combinations of refrigerators with other equipment, e.g. stove |
| 21/008 | . . {by timer} | 23/123 | . . {Butter compartment} |
| 21/02 | . Detecting the presence of frost or condensate | 23/126 | . . {Water cooler} |
| 21/025 | . . {using air pressure differential detectors} | 25/00 | Charging, supporting, and discharging the articles to be cooled |
| 21/04 | . Preventing the formation of frost or condensate | 25/005 | . {using containers} |
| 21/06 | . Removing frost (defrosting cycles F25B 47/02) | 25/02 | . by shelves |
| 21/065 | . . {by mechanical means} | 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) |

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| 27/005 | . {combined with control means} | 2303/0841 | . . . external to the container for a beverage, e.g. a bottle, can, drinking glass or pitcher |
| 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 |
| | | 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 |

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| 2321/143 | . . characterised by means to fix, clamp, or connect water pipes or evaporation trays | 2325/023 | . Shelves made of wires |
| 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 | 2331/00 | Details or arrangements of other cooling or freezing apparatus not provided for in other groups of this subclass |
| 2321/145 | . . characterised by multiple collecting pans | 2331/80 | . Type of cooled receptacles |
| 2321/146 | . . characterised by the pipes or pipe connections | 2331/801 | . . Bags |
| 2321/147 | . . characterised by capillary, wick, adsorbent, or evaporation elements | 2331/8011 | . . . to be carried on the back of a person |
| 2323/00 | General constructional features not provided for in other groups of this subclass | 2331/8012 | . . . for cosmetics |
| 2323/0011 | . Means for leveling refrigerators | 2331/8013 | . . . for playing golf |
| 2323/002 | . Details for cooling refrigerating machinery | 2331/8014 | . . . for medical use |
| 2323/0021 | . . using air guides | 2331/8015 | . . . Pouches |
| 2323/0022 | . . using multiple air flows | 2331/802 | . . Barrels |
| 2323/0023 | . . Control of the air flow cooling refrigerating machinery | 2331/803 | . . Bottles |
| 2323/0024 | . . Filters in the air flow cooling refrigerating machinery | 2331/804 | . . Boxes |
| 2323/0026 | . . characterised by the incoming air flow | 2331/8041 | . . . for drinking |
| 2323/00261 | . . . through the back bottom side | 2331/805 | . . Cans |
| 2323/00262 | . . . through the back top side | 2331/8051 | . . . for holding milk |
| 2323/00263 | . . . through the back corner side | 2331/806 | . . Dispensers |
| 2323/00264 | . . . through the front bottom part | 2331/807 | . . Eggs |
| 2323/00265 | . . . through the front top part | 2331/808 | . . Glasses |
| 2323/00266 | . . . through the bottom | 2331/809 | . . Holders |
| 2323/00267 | . . . through the side | 2331/81 | . . Pitchers |
| 2323/00268 | . . . through the top | 2331/811 | . . Pour-throughs |
| 2323/0027 | . . characterised by the out-flowing air | 2331/812 | . . Trays |
| 2323/00271 | . . . from the back bottom | 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 |
| 2323/00272 | . . . from the back top | 2400/02 | . Refrigerators including a heater |
| 2323/00273 | . . . from the back corner | 2400/04 | . Refrigerators with a horizontal mullion |
| 2323/00274 | . . . from the front bottom | 2400/06 | . Refrigerators with a vertical mullion |
| 2323/00275 | . . . from the front top | 2400/08 | . Refrigerator tables |
| 2323/00276 | . . . from the bottom | 2400/10 | . Refrigerator top-coolers |
| 2323/00277 | . . . from the side | 2400/12 | . Portable refrigerators |
| 2323/00278 | . . . from the top | 2400/14 | . Refrigerator multi units |
| 2323/0028 | . . characterised by the fans | 2400/16 | . Convertible refrigerators |
| 2323/00281 | . . . Two or more fans | 2400/18 | . Aesthetic features |
| 2323/00282 | . . . the fans not of the axial type | 2400/20 | . Carts specially adapted for transporting objects to be cooled |
| 2323/00283 | . . . the fans allowing rotation in reverse direction | 2400/22 | . Cleaning means for refrigerating devices |
| 2323/00284 | . . . Details thereof | 2400/24 | . Protection against refrigerant explosions |
| 2323/02 | . Details of doors or covers not otherwise covered | 2400/26 | . Refrigerating devices for cooling wearing apparel, e.g. garments, hats, shoes or gloves |
| 2323/021 | . . French doors | 2400/28 | . Quick cooling |
| 2323/022 | . . Doors that can be pivoted either left-handed or right-handed | 2400/30 | . Quick freezing |
| 2323/023 | . . Door in door constructions | 2400/32 | . Removal, transportation or shipping of refrigerating devices from one location to another |
| 2323/024 | . . Door hinges | 2400/34 | . Temperature balancing devices |
| 2323/06 | . Details of walls not otherwise covered | 2400/36 | . Visual displays |
| 2323/061 | . . Collapsible walls | 2400/361 | . . Interactive visual displays |
| 2323/062 | . . Inflatable walls | 2400/38 | . Refrigerating devices characterised by wheels |
| 2323/121 | . the refrigerator is characterised by a water filter for the water/ice dispenser | 2400/40 | . Refrigerating devices characterised by electrical wiring |
| 2323/122 | . the refrigerator is characterised by a water tank for the water/ice dispenser | 2500/00 | Problems to be solved |
| 2325/00 | Charging, supporting or discharging the articles to be cooled, not provided for in other groups of this subclass | 2500/02 | . Geometry problems |
| 2325/021 | . Shelves with several possible configurations | 2500/04 | . Calculation of parameters |
| 2325/022 | . Shelves made of glass or ceramic | 2500/06 | . Stock management |

2600/00 Control issues

- 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