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

<table>
<thead>
<tr>
<th>1/00</th>
<th>Devices using naturally cold air or cold water</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/02</td>
<td>using naturally cold water, e.g. household tap water</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3/00</th>
<th>Devices using other cold materials; Devices using cold-storage bodies</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/005</td>
<td>{combined with heat exchangers}</td>
</tr>
<tr>
<td>3/02</td>
<td>using ice, e.g. ice-boxes</td>
</tr>
<tr>
<td>3/04</td>
<td>. . Stationary cabinets</td>
</tr>
<tr>
<td>3/045</td>
<td>. . {Details}</td>
</tr>
<tr>
<td>3/06</td>
<td>. . Movable containers</td>
</tr>
<tr>
<td>3/08</td>
<td>. . portable, i.e. adapted to be carried personally</td>
</tr>
<tr>
<td>3/10</td>
<td>using liquefied gases, e.g. liquid air (for cooling semiconductor devices H01L 23/445)</td>
</tr>
</tbody>
</table>

| 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 |
| 9/005 | . . {using fluorinated halogenous hydrocarbons} |

Devices associated with refrigerating machinery

<table>
<thead>
<tr>
<th>11/00</th>
<th>Self-contained movable devices, e.g. domestic refrigerators</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/003</td>
<td>. {Transport containers}</td>
</tr>
<tr>
<td>11/006</td>
<td>. {with cold storage accumulators}</td>
</tr>
<tr>
<td>11/02</td>
<td>with cooling compartments at different temperatures</td>
</tr>
<tr>
<td>11/022</td>
<td>. . {with two or more evaporators}</td>
</tr>
<tr>
<td>11/025</td>
<td>. . {using primary and secondary refrigeration systems}</td>
</tr>
<tr>
<td>11/027</td>
<td>. . {of the sorption cycle type}</td>
</tr>
</tbody>
</table>
Devices associated with refrigerating machinery

11/04 Devices associated with refrigerating machinery or parts of refrigerating machinery - specially adapted for storing deep-frozen articles (F25D 11/02 takes precedence)
12/04 Stationary devices, e.g. cold-rooms
12/04 . . . with several cooling compartments, e.g. refrigerated locker systems
13/04 . . . the compartments being at different temperatures
13/06 . . . with conveyors carrying articles to be cooled through the cooling space
13/06 . . . [with refrigerated conveyors]
13/06 . . . {Articles being submerged in liquid coolant}
13/06 . . . {with circulation of gaseous cooling fluid}
15/00 Devices not covered by group F25D 11/00 or F25D 13/00, e.g. non-self-contained movable devices
15/00 Devices using a combination of a cooling mode associated with refrigerating machinery with a cooling mode not associated with refrigerating machinery

Details or features of the devices covered by groups F25D 1/00 - F25D 16/00

17/00 Arrangements for circulating cooling fluids;
Arrangements for circulating gas, e.g. air, within refrigerated spaces
17/0005 . . . [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 for objects to be refrigerated, e.g. infra-red 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
21/10 . . . by spraying with fluid
21/12 . . . by hot-fluid circulating system separate from the refrigerant system
21/125 . . . . . . . {the hot fluid being ambient air}
21/14 . . . Collecting or removing condensed and defrost water; Drip trays
23/00 General constructional features (F25D 21/00 takes precedence)
23/003 . . . [for cooling refrigerating machinery]
23/006 . . . [for mounting refrigerating machinery components]
23/007 . . . [Doors; Covers (F25D 23/08 takes precedence (locks or fastenings E05B 65/0042))
23/021 . . . [Sliding doors]
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 in situ]
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]
Details or features of the devices covered by groups F25D1/00 - F25D16/00

29/00 Arrangement or mounting of control or safety devices
29/001 . [for cryogenic fluid systems]
29/003 . [for movable devices]
29/005 . [Mounting of control devices]
29/006 . [Safety devices]
29/008 . [Alarm devices]

31/00 Other cooling or freezing apparatus
31/001 . [Plate freezers]
31/002 . [Liquid coolers, e.g. beverage cooler (receptacle coolers F25D 31/006)]
31/003 . [with immersed cooling element]
31/005 . [Combined cooling and heating devices]
31/006 . [specially adapted for cooling receptacles, e.g. tanks]
31/007 . [Bottles or cans]
31/008 . [Drinking glasses]

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 freezeable 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
2303/0842 . . . inside the beverage contained in a bottle, can, drinking glass, pitcher or dispenser
2303/0843 . . . on the side of the product
2303/0844 . . . above the product
2303/0845 . . . below the product
2303/0846 . . . around the neck of a bottle
2303/0845 . . . Compositions of cold storage materials

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
2317/004 . Treating air flowing to refrigeration compartments
2317/0041 . . . by purification
2317/00411 . . . by dehumidification
2317/004111 . . . Control means therefor
2317/00413 . . . by humidification
2317/004131 . . . Control means therefor
2317/00415 . . . by deodorizing
2317/00416 . . . using an ozone generator
2317/00417 . . . using an UV-lamp
2317/0043 . . . by creating a vacuum in a storage compartment
2317/006 . . . with forced air circulation
2317/0061 . . . through special compartments
2317/0062 . . . along the inside of doors
2317/0063 . . . with air guides
2317/0065 . . . characterised by the air return
2317/00651 . . . through the bottom
2317/00652 . . . through the corner
2317/00653 . . . through the mullion
2317/00654 . . . through the side
2317/00655 . . . through the top
2317/0066 . . . characterised by the air supply
2317/00661 . . . from the bottom
2317/00662 . . . from the corner
2317/00663 . . . from the mullion
2317/00664 . . . from the side
2317/00665 . . . from the top
2317/00666 . . . from the freezer
2317/00667 . . . from the refrigerator
2317/0067 . . . characterised by air ducts
2317/00671 . . . Inlet ducts
2317/00672 . . . Outlet ducts
2317/0068 . . . characterised by the fans
2317/00681 . . . Details thereof
2317/00682 . . . Two or more fans
2317/00683 . . . the fans not of the axial type
2317/00684 . . . 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
2323/00 General constructional features not provided for in other groups of this subclass

2323/0001 . Means for leveling refrigerators
2323/0002 . 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
2323/0025 . characterised by the incoming air flow
2323/0026 . through the back bottom side
2323/0027 . through the back top side
2323/0028 . through the back corner side
2323/0029 . through the front bottom part
2323/0030 . through the front top part
2323/0031 . through the top
2323/0032 . through the side
2323/0033 . through the top
2323/0034 . characterised by the out-flowing air
2323/0035 . from the back bottom
2323/0036 . from the back top
2323/0037 . from the back corner
2323/0038 . from the front bottom
2323/0039 . from the front top
2323/0040 . from the bottom
2323/0041 . from the side
2323/0042 . from the top
2323/0043 . Two or more fans
2323/0044 . the fans not of the axial type
2323/0045 . the fans allowing rotation in reverse direction
2323/0046 . Details thereof
2323/0047 . Details of doors or covers not otherwise covered
2323/0048 . French doors
2323/0049 . Doors that can be pivoted either left-handed or right-handed
2323/0050 . Door in door constructions
2323/0051 . Door hinges
2323/0052 . Details of walls not otherwise covered
2323/0053 . Collapsible walls
2323/0054 . Inflatable walls
2323/0055 . the refrigerator is characterised by a water filter for the water/ice dispenser
2323/0056 . 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

2325/0021 . Shelves with several possible configurations
2325/0022 . Shelves made of glass or ceramic
2325/0023 . Shelves made of wires

2327/00 Lighting arrangements not provided for in other groups of this subclass

2327/0001 . 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

2331/0001 . Type of cooled receptacles
2331/0002 . Bags
2331/0003 . to be carried on the back of a person
2331/0004 . for cosmetics
2331/0005 . for playing golf
2331/0006 . for medical use
2331/0007 . Pouches
2331/0008 . Barrels
2331/0009 . Bottles
2331/0010 . Boxes
2331/0011 . for drinking
2331/0012 . Cans
2331/0013 . for holding milk
2331/0014 . Dispensers
2331/0015 . Eggs
2331/0016 . Glasses
2331/0017 . Holders
2331/0018 . Pitchers
2331/0019 . Pour-throughs
2331/0020 . 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

2400/0021 . Refrigerators including a heater
2400/0022 . Refrigerators with a horizontal mullion
2400/0023 . Refrigerators with a vertical mullion
2400/0024 . Refrigerator tables
2400/0025 . Refrigerator top coolers
2400/0026 . Portable refrigerators
2400/0027 . Refrigerator multi units
2400/0028 . Convertible refrigerators
2400/0029 . Aesthetic features
2400/0030 . Carts specially adapted for transporting objects to be cooled
2400/0031 . Cleaning means for refrigerating devices
2400/0032 . Protection against refrigerant explosions
2400/0033 . Refrigerating devices for cooling wearing apparel, e.g. garments, hats, shoes or gloves
2400/0034 . Quick cooling
2400/0035 . Quick freezing
2400/0036 . Removal, transportation or shipping of refrigerating devices from one location to another
2400/0037 . Temperature balancing devices
2400/0038 . Visual displays
2400/0039 . Interactive visual displays
2400/0040 . Refrigerating devices characterised by wheels

2500/00 Problems to be solved

2500/0001 . Geometry problems
2500/0002 . Calculation of parameters
2500/0003 . Stock management

2600/00 Control issues
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>2600/02</td>
<td>Timing</td>
</tr>
<tr>
<td>2600/04</td>
<td>Controlling heat transfer</td>
</tr>
<tr>
<td>2600/06</td>
<td>Controlling according to a predetermined profile</td>
</tr>
<tr>
<td>2700/00</td>
<td><strong>Means for sensing or measuring; Sensors therefor</strong></td>
</tr>
<tr>
<td>2700/02</td>
<td>Sensors detecting door opening</td>
</tr>
<tr>
<td>2700/04</td>
<td>Sensors detecting the presence of a person</td>
</tr>
<tr>
<td>2700/06</td>
<td>Sensors detecting the presence of a product</td>
</tr>
<tr>
<td>2700/08</td>
<td>Sensors using Radio Frequency Identification (RFID)</td>
</tr>
<tr>
<td>2700/10</td>
<td>Sensors measuring the temperature of the evaporator</td>
</tr>
<tr>
<td>2700/12</td>
<td>Sensors measuring the inside temperature</td>
</tr>
<tr>
<td>2700/121</td>
<td>of particular compartments</td>
</tr>
<tr>
<td>2700/122</td>
<td>of freezer compartments</td>
</tr>
<tr>
<td>2700/123</td>
<td>more than one sensor measuring the inside temperature in a compartment</td>
</tr>
<tr>
<td>2700/14</td>
<td>Sensors measuring the temperature outside the refrigerator or freezer</td>
</tr>
<tr>
<td>2700/16</td>
<td>Sensors measuring the temperature of products</td>
</tr>
</tbody>
</table>