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 |
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
17/005 . . . [in cold rooms]
17/006 . . . for circulating liquids, e.g. brine
17/007 . . . for circulating air, e.g. by convection
17/008 . . . [Air treating means within refrigerated spaces (air conditioning in general F24F)]
17/009 . . . [Air flow control arrangements]
17/010 . . . [Pressure equalising devices]
17/011 . . . by forced circulation
17/012 . . . [in household refrigerators]
17/013 . . . [with compartments at different temperatures]
17/014 . . . [Evaporator fan units]
17/015 . . . using ducts

19/00 Arrangement or mounting of refrigeration units with respect to devices (or objects to be refrigerated, e.g. infra-red detectors)
19/001 . . . [with respect to movable containers]
19/002 . . . [Thermal coupling structure or interface]
19/003 . . . [plug-in type]
19/004 . . . 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)
21/001 . . . [Defroster control]
21/002 . . . [Control mechanisms (F25D 21/006 takes precedence)]
21/003 . . . [with electronic control circuits]
21/004 . . . [by timer]
21/005 . . . Detecting the presence of frost or condensate
21/006 . . . [using air pressure differential detectors]
21/007 . . . Preventing the formation of frost or condensate
21/008 . . . Removing frost (defrosting cycles F25B 47/02)
21/009 . . . [by mechanical means]
21/010 . . . by electric heating
21/011 . . . by spraying with fluid
21/012 . . . by hot-fluid circulating system separate from the refrigerant system
21/013 . . . [the hot fluid being ambient air]
21/014 . . . Collecting or removing condensed and defrost water; Drip trays

23/00 General constructional features (F25D 21/00 takes precedence)
23/001 . . . [for cooling refrigerating machinery]
23/002 . . . [for mounting refrigerating machinery components]
23/003 . . . [Doors; Covers (F25D 23/08 takes precedence (locks or fastenings E05B 65/0042))]
23/004 . . . [Sliding doors]
23/005 . . . [Air curtain closures]
23/006 . . . [Secondary closures]
23/007 . . . [for open-top cabinets]
23/008 . . . [Details]
23/009 . . . with special compartments, e.g. butter conditioners
23/010 . . . Walls (F25D 23/08 takes precedence; containers with thermal insulation B65D 81/38)
23/011 . . . [with conduit means]
23/012 . . . [defining a cabinet]
23/013 . . . [formed by an assembly of panels]
23/014 . . . [formed by moulding, e.g. moulding in situ]
23/015 . . . [Details]
23/016 . . . [Liners]
23/017 . . . [Supporting elements]
23/018 . . . [Arrangements for circulating fluids through the insulating material]
23/019 . . . [Cooling space dividing partitions]
23/020 . . . Parts formed wholly or mainly of plastics materials
23/021 . . . [Strips]

NOTE
When a document describes both breaking and sealing strips it is classified in group F25D 23/082 only.
23/022 . . . [Breaking strips]
23/023 . . . [Sealing strips]
23/024 . . . Arrangements for mounting in particular locations, e.g. for built-in type, for corner type
23/025 . . . Arrangements of compartments additional to cooling compartments; Combinations of refrigerators with other equipment, e.g. stove
23/026 . . . [Butter compartment]
23/027 . . . [Water cooler]

25/00 Charging, supporting, and discharging the articles to be cooled
25/001 . . . [using containers]
25/002 . . . by shelves
25/003 . . . [combined with trays]
25/004 . . . [Baskets]
25/005 . . . [Slidable shelves]
25/006 . . . [Drawers]
25/007 . . . [Rotatable shelves]
25/008 . . . [Cooled supporting means]
25/009 . . . by conveyors (in general B65G)

27/00 Lighting arrangements (in general F21)
27/001 . . . [combined with control means]
### 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 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
- [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
- [2317/04] Treating air flowing to refrigeration compartments
- [2317/041] by purification
- [2317/0411] by dehumidification
- [2317/04111] Control means therefor
- [2317/04113] by humidification
- [2317/04131] Control means therefor
- [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
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 Details for using air guides
2323/0022 Details for using multiple air flows
2323/0023 Details of the air flow cooling refrigerating machinery
2323/0024 Details of filters in the air flow cooling refrigerating machinery
2323/0026 Details of the back side
2323/0027 Details of the out-flowing air
2323/0028 Details of the fans
2323/0029 Details of the fans not of the axial type
2323/003 Details of fans allowing rotation in reverse direction
2323/0032 Details of two or more fans
2323/0033 Details of the fans of the axial type

2323/0020 General features of, or devices for refrigerators, cold rooms, ice-boxes, or for cooling or freezing apparatus not provided for in 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

2600/00 Control issues
Timing
Controlling heat transfer
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