SECTION F — MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING

F24 HEATING; RANGES; VENTILATING

Note(s)

In this class, the following terms are used with the meanings indicated:

- "stove" includes apparatus which may have an open fire, e.g. fireplace;
- "range" means an apparatus for cooking having elements that perform different cooking operations or cooking and heating operations.

F24B DOMESTIC STOVES OR RANGES FOR SOLID FUELS; IMPLEMENTS FOR USE IN CONNECTION WITH STOVES OR RANGES [6]

1/00 Stoves or ranges [1, 2006.01]
1/02 • Closed stoves **[1, 2006.01]**
1/04 • • built-up from glazed tiles (F24B 1/08, F24B 1/16 take precedence) **[1, 2006.01]**
1/06 • • • Construction of tiles or bracing means therefor, e.g. shim liner (forming of tiles B28B; glazing of tiles C04B) **[1, 2006.01]**
1/08 • • with fuel storage in a single undivided hopper within stove or range **[1, 2006.01]**
1/10 • • • with combustion in horizontal direction (F24B 1/14 takes precedence) **[1, 2006.01]**
1/14 • • • with predistillation in the hopper **[1, 2006.01]**
1/16 • • with fuel storage in multiple or divided hoppers within the stove or range **[1, 2006.01]**
1/18 • Stoves with open fires, e.g. fireplaces **[1, 2006.01]**
1/181 • • Free-standing fireplaces, e.g. for mobile homes **[4, 2006.01]**
1/182 • • with additional provisions for cooking (other stoves with additional provisions for cooking F24B 1/26) **[4, 2006.01]**
1/183 • • with additional provisions for heating water **[4, 2006.01]**
1/185 • • with air-handling means, heat exchange means, or additional provisions for convection heating (F24B 1/183 takes precedence; component parts or accessories having air-handling means, heat exchange means, or additional provisions for convection heating F24B 1/191); Regulating combustion; Controls therefor **[4, 2006.01]**
1/187 • • • Condition responsive controls for regulating combustion (valves or dampers for air supply F23L) **[4, 2006.01]**
1/188 • • • characterised by use of heat exchange means (F24B 1/187 takes precedence) **[4, 2006.01]**
1/189 • • • characterised by air-handling means, i.e. of combustion-air, heated-air, or flue-gases, e.g. draught control dampers (F24B 1/187, F24B 1/188 take precedence) **[4, 2006.01]**
1/19 • • • • Supplying combustion-air **[4, 2006.01]**
1/191 • • Component parts; Accessories **[4, 2006.01]**
1/192 • • • Doors; Screens; Fuel guards **[4, 2006.01]**
1/193 • • • Grates; Irons **[4, 2006.01]**
1/195 • • • Fireboxes; Frames; Hoods; Heat reflectors **[4, 2006.01]**
1/197 • • • Hearths **[4, 2006.01]**
1/198 • • • Surrounds-fronts **[4, 2006.01]**
1/199 • • • Fuel-handling equipment **[4, 2006.01]**
1/20 • Ranges **[1, 2006.01]**
1/22 • • in which the baking oven is arranged above the fire-box **[1, 2006.01]**
1/24 • • with built-in masses for heat storage or heat insulation **[1, 2006.01]**
1/26 • Stoves with additional provisions for cooking (stoves with open-fires with additional provisions for cooking F24B 1/182) **[1, 4, 2006.01]**
1/28 • Combined installations of stoves or ranges, e.g. back-to-back stoves with a common fire-box **[1, 2006.01]**

3/00 Heaters not covered by group F24B 1/00, e.g. charcoal brazier (for cooking A47J 27/00-A47J 37/00) **[1, 2006.01]**

5/00 Combustion-air or flue-gas circulation in or around stoves or ranges (stoves with open fires with air-handling means F24B 1/185) **[1, 4, 2006.01]**
5/02 • in or around stoves **[1, 2006.01]**
5/04 • • the air or gas passing downwards through the bottom of the stove or fire grate **[1, 2006.01]**
5/06 • in or around ranges **[1, 2006.01]**
5/08 • • around the baking oven **[1, 2006.01]**

7/00 Stoves, ranges, or flue-gas ducts, with additional provisions for convection heating (stoves with open fires characterised by use of heat exchange means F24B 1/185; air heaters having heat generating means F24H 3/00) **[1, 4, 2006.01]**
7/02 • with external air ducts **[1, 2006.01]**
7/04 • with internal air ducts **[1, 2006.01]**
7/06 • without air ducts **[1, 2006.01]**

9/00 Stoves, ranges, or flue-gas ducts, with additional provisions for heating water (F24B 1/182, F24B 1/183 take precedence) **[1, 3, 4, 2006.01]**
9/02 • in open containers, e.g. bain-marie **[1, 2006.01]**
9/04 • in closed containers **[1, 4, 2006.01]**

13/00 **Details solely applicable to stoves or ranges burning solid fuels** (component parts or accessories for stoves with open-fires F24B 1/191; removing ash, clinker or slag from combustion chambers F23J 1/00; removing solid residues from passages or chambers beyond the fire F23J 3/00; joints or connections for chimneys or flues F23J 13/04; mouths or inlet holes for chimneys or flues F23J 13/06; means for supervising combustion F23M 11/04) **[1, 4, 2006.01]**

13/02 • Arrangement or mounting of fire-grate assemblies (grates F23H); Arrangement or mounting of linings for fire-boxes, e.g. fire-back (ceramic materials C04B 33/00, C04B 35/00; casings, linings, walls for combustion chambers F23M) **[1, 2006.01]**

13/04 • Arrangements for feeding solid fuel, e.g. hoppers (feeding solid fuel to combustion apparatus in general F23K) **[1, 2006.01]**

15/00 **Implements for use in connection with stoves or ranges** (ash sieves B07B; firelighters C10L 11/00; removal of ashes F23J; other devices for igniting F23Q) **[6, 2006.01]**

15/02 • for breaking coal **[6, 2006.01]**

15/04 • Coal hods; Coal boxes **[6, 2006.01]**

15/06 • Shovels with ejectors **[6, 2006.01]**

15/08 • Shovels with sifters **[6, 2006.01]**

15/10 • Coal tongs **[6, 2006.01]**

F24C **OTHER DOMESTIC STOVES OR RANGES; DETAILS OF DOMESTIC STOVES OR RANGES, OF GENERAL APPLICATION** (radiator stoves of the fluid-circulating type F24H)

Subclass index

1/00 **Stoves or ranges in which the fuel or energy supply is not restricted to solid fuel or to a type covered by a single one of groups F24C 3/00-F24C 9/00; Stoves or ranges in which the type of fuel or energy supply is not specified [1, 2006.01]**

1/02 • adapted for the use of two or more kinds of fuel or energy supply (F24C 1/16 takes precedence; combinations of two or more stoves or ranges each having a different kind of fuel or energy supply F24C 11/00) **[1, 2006.01]**

1/04 • • simultaneously **[1, 2006.01]**

1/06 • • by replacing parts, e.g. replacing burner by electric heater **[1, 2006.01]**

1/08 • solely adapted for radiation heating (F24C 1/16 takes precedence) **[1, 2006.01]**

1/10 • • with reflectors **[1, 2006.01]**

1/12 • • • of circular shape **[1, 2006.01]**

1/14 • Radiation heating stoves or ranges, with additional provision for convection heating (F24C 1/02, F24C 1/16 take precedence; solely adapted for convection heating F24H) **[1, 2006.01]**

1/16 • with special adaptation for travelling, e.g. collapsible **[1, 2006.01]**

3/00 **Stoves or ranges for gaseous fuels [1, 2006.01]**

3/02 • with heat produced solely by flame (F24C 3/14 takes precedence) **[1, 2006.01]**

3/04 • with heat produced wholly or partly by a radiant body, e.g. by a perforated plate (F24C 3/14 takes precedence) **[1, 2006.01]**

3/06 • • without any visible flame **[1, 2006.01]**

3/08 • Arrangement or mounting of burners (burners per se F23D) **[1, 2006.01]**

3/10 • Arrangement or mounting of ignition devices (ignition devices per se F23Q) **[1, 2006.01]**

3/12 • Arrangement or mounting of control or safety devices (control valves F16K; safety devices for burners F23D 14/72; regulating or controlling combustion F23N) **[1, 2006.01]**

3/14 • with special adaptation for travelling, e.g. collapsible **[1, 2006.01]**

5/00 **Stoves or ranges for liquid fuels [1, 2006.01]**

5/02 • with evaporation burners, e.g. dish type (F24C 5/20 takes precedence) **[1, 2006.01]**

5/04 • • wick type **[1, 2006.01]**

5/06 • • • adjustable **[1, 2006.01]**

5/08 • • with heat produced wholly or partly by a radiant body **[1, 2006.01]**

5/10 • with atomising burners (F24C 5/20 takes precedence) **[1, 2006.01]**

5/12 • Arrangement or mounting of burners (burners per se F23D) **[1, 2006.01]**

5/14 • Arrangement or mounting of ignition devices (ignition devices per se F23Q) **[1, 2006.01]**

5/16 • Arrangement or mounting of control or safety devices (control valves F16K; safety devices for burners F23D; regulating or controlling combustion F23N) **[1, 2006.01]**

5/18 • Liquid-fuel supply arrangements forming parts of stoves or ranges (feeding liquid fuel to combustion apparatus in general F23K) **[1, 2006.01]**

5/20 • with special adaptation for travelling, e.g. collapsible **[1, 2006.01]**

7/00 **Stoves or ranges heated by electric energy** (electric heating elements or arrangements H05B) **[1, 2006.01]**

7/02 • using microwaves (heating using microwaves in general H05B 6/64) **[1, 2006.01]**

7/04 • with heat radiated directly from the heating element (F24C 7/10 takes precedence) **[1, 2006.01]**

7/06 • Arrangement or mounting of electric heating elements **[1, 2006.01]**

7/08 • Arrangement or mounting of control or safety devices (switches H01H; circuit arrangements for electric heating H05B) **[1, 2006.01]**

7/10 • with special adaptation for travelling, e.g. collapsible **[1, 2006.01]**

9/00 **Stoves or ranges heated by a single type of energy supply not covered by groups F24C 3/00-F24C 7/00 or subclass F24B** (using the heat from an exothermal reaction not involving a supply of free oxygen gas, using solar energy F24J) **[1, 2006.01]**

11/00 **Combinations of two or more stoves or ranges, e.g. each having a different kind of energy supply [1, 2006.01]**

13/00 **Stoves or ranges with additional provisions for heating water [1, 3, 2006.01]**

14/00 **Stoves or ranges having self-cleaning provisions, e.g. continuous or catalytic cleaning, electrostatic cleaning [3, 2006.01]**

14/02 • pyrolytic type **[3, 2006.01]**

15/00 **Details** (electric heating elements or arrangements H05B) **[1, 2006.01]**

15/02 • Doors specially adapted for stoves or ranges (in general E06B; for combustion chambers F23M) **[1, 2006.01]**

15/04 • • with transparent panels **[1, 2006.01]**

15/06 • Ornamental features, e.g. grate front, surround **[1, 2006.01]**

15/08 • Foundations or support plates; Legs or pillars; Casings; Wheels (F24C 15/10 takes precedence) **[1, 2006.01]**

15/10 • Tops, e.g. hot plate; Rings (F24C 15/12, F24C 15/14 take precedence) **[1, 2006.01]**

15/12 • Side rests; Side plates; Cover lids; Splash guards; Racks outside ovens, e.g. for drying plates **[1, 2006.01]**

15/14 • Spillage trays or grooves **[1, 2006.01]**

15/16 • Shelves, racks, or trays inside ovens; Supports therefor **[1, 2006.01]**

15/18 • Arrangement of compartments additional to cooking compartments, e.g. for warming, for storing utensils or fuel containers; Arrangement of additional heating or cooking apparatus, e.g. grills (grills per se A47J) **[1, 2006.01]**

15/20 • Removing cooking fumes (parts, details or accessories of cooking-vessels for withdrawing or condensing cooking vapours from such vessels A47J 36/38) **[1, 5, 2006.01]**

15/22 • Reflectors for radiation heaters **[1, 2006.01]**

15/24 • Radiant bodies or panels for radiation heaters (radiant gas burners F23D 14/12) **[1, 2006.01]**

15/26 • Handles for carrying **[1, 2006.01]**

15/28 • Draught shields **[1, 2006.01]**

15/30 • Arrangements for mounting stoves or ranges in particular locations **[1, 2006.01]**

15/32 • Arrangements of ducts for hot gases, e.g. in or around baking ovens **[1, 2006.01]**

15/34 • Elements or arrangements for heat storage or insulation **[1, 2006.01]**

15/36 • Protective guards, e.g. for preventing access to heated parts **[1, 2006.01]**

F24D **DOMESTIC- OR SPACE-HEATING SYSTEMS, e.g. CENTRAL HEATING SYSTEMS; DOMESTIC HOT-WATER SUPPLY SYSTEMS; ELEMENTS OR COMPONENTS THEREFOR** (preventing corrosion C23F; water supply in general E03; using steam or condensate extracted or exhausted from steam engine plants for heating purposes F01K 17/02; steam traps F16T; domestic stoves or ranges F24B, F24C; water or air heaters having heat generating means F24H; combined heating and refrigeration systems F25B; heat exchange apparatus or elements F28; removing furring F28G; electric heating elements or arrangements H05B)

Note(s) [5]

In this subclass, the following expression is used with the meaning indicated:

- "central heating system" means a system in which heat is generated or stored at central sources and is distributed by means of a transfer fluid to the spaces or areas to be heated.

Subclass index

Central heating systems

1/00 **Steam central heating systems** (F24D 10/00, F24D 11/00 take precedence) **[1, 2006.01]**

1/02 • operating with live steam **[1, 2006.01]**

1/04 • operating with exhaust steam **[1, 2006.01]**

1/06 • operating with superheated steam **[1, 2006.01]**

1/08 • Feed-line arrangements, e.g. providing for one-pipe system **[1, 2006.01]**

3/00 **Hot-water central heating systems** (F24D 10/00, F24D 11/00 take precedence) **[1, 2006.01]**
3/02 • with forced circulation, e.g. by pumps **[1, 2006.01]**
3/04 • with the water under high pressure **[1, 2006.01]**
3/06 • • Arrangements or devices for maintaining high pressure **[1, 2006.01]**
3/08 • in combination with systems for domestic hot-water supply **[1, 2006.01]**
3/10 • Feed-line arrangements, e.g. providing for heat-accumulator tanks, expansion tanks **[1, 2006.01]**
3/12 • Tube and panel arrangements for ceiling, wall, or underfloor heating (electric underfloor heating F24D 13/02; special adaptations of floors for incorporating ducts, e.g. for heating or ventilating, E04B 5/48; building elements of block or other shape for the construction of parts of buildings characterised by special adaptations, e.g. serving for locating conduits, E04C 1/39; building elements of relatively thin form for the construction of parts of buildings with special adaptations for auxiliary purposes, e.g. serving for locating conduits, E04C 2/52) **[4, 2006.01]**
3/14 • • incorporated in a ceiling, wall or floor **[4, 2006.01]**
3/16 • • mounted on, or adjacent to, a ceiling, wall or floor **[4, 2006.01]**
3/18 • using heat pumps **[5, 2006.01]**

5/00 **Hot-air central heating systems** (F24D 10/00, F24D 11/00 take precedence; air conditioning F24F)**; Exhaust-gas central heating systems [1, 2006.01]**
5/02 • operating with discharge of hot air into the space or area to be heated **[1, 2006.01]**
5/04 • • with return of the air to the air heater **[1, 2006.01]**
5/06 • operating without discharge of hot air into the space or area to be heated **[1, 2006.01]**
5/08 • • with hot air led through radiators **[1, 2006.01]**
5/10 • • with hot air led through heat-exchange ducts in the walls, floor, or ceiling **[1, 2006.01]**
5/12 • using heat pumps **[5, 2006.01]**

7/00 **Central heating systems employing heat-transfer fluids not covered by groups F24D 1/00-F24D 5/00, e.g. oil, salt, gas** (F24D 10/00, F24D 11/00 take precedence) **[1, 2006.01]**

9/00 **Central heating systems employing combinations of heat-transfer fluids covered by two or more of groups F24D 1/00-F24D 7/00** (F24D 10/00, F24D 11/00 take precedence) **[1, 2006.01]**
9/02 • Hot water and steam systems **[1, 2006.01]**

10/00 **District heating systems [5, 2006.01]**

11/00 **Central heating systems using heat accumulated in storage masses** (self-contained storage heating units F24D 15/02; storage masses, see the relevant subclasses) **[1, 2006.01]**
11/02 • using heat pumps **[1, 2006.01]**

12/00 **Other central heating systems [1, 2006.01]**
12/02 • having more than one heat source (F24D 3/18, F24D 5/12, F24D 11/02 take precedence) **[5, 2006.01]**

Other domestic- or space-heating systems

13/00 **Electric heating systems** (electric water or air heaters F24H) **[1, 2006.01]**
13/02 • solely using resistance heating, e.g. underfloor heating **[1, 2006.01]**
13/04 • using electric heating of heat-transfer fluid in separate units of the system **[1, 2006.01]**

15/00 **Other domestic- or space-heating systems [1, 2006.01]**
15/02 • consisting of self-contained heating units, e.g. storage heaters **[3, 2006.01]**
15/04 • using heat pumps **[5, 2006.01]**

17/00 **Domestic hot-water supply systems** (combined with domestic- or space-heating systems F24D 1/00-F24D 15/00) **[1, 2006.01]**
17/02 • using heat pumps **[5, 2006.01]**

19/00 **Details** (of water or air heaters F24H 9/00; of heat-exchange or heat-transfer apparatus, of general application F28F) **[3, 2006.01]**
19/02 • Arrangement of mountings or supports for radiators **[3, 2006.01]**
19/04 • • in skirtings **[3, 2006.01]**
19/06 • Casings, cover lids or ornamental panels, for radiators **[3, 2006.01]**
19/08 • Arrangements for drainage, venting or aerating (valves for drainage F16K, e.g. F16K 21/00, for venting or aerating F16K 24/00) **[3, 2006.01]**
19/10 • Arrangement or mounting of control or safety devices (control valves F16K; only the heater being controlled F24H 9/20) **[3, 2006.01]**

F24F **AIR-CONDITIONING; AIR-HUMIDIFICATION; VENTILATION; USE OF AIR CURRENTS FOR SCREENING** (removing dirt or fumes from areas where they are produced B08B 15/00; vertical ducts for carrying away waste gases from buildings E04F 17/02; tops for chimneys or ventilating shafts, terminals for flues F23L 17/02)

Note(s) [3]

1. In this subclass:
   - air-humidification as auxiliary treatment in air-conditioning, i.e. in units wherein the air is also either cooled or heated, is covered by groups F24F 1/00 or F24F 3/14;
   - air-humidification per se, e.g. "room humidifiers", is covered by group F24F 6/00.
2. In this subclass, the following terms or expressions are used with the meanings indicated:
   - "air-conditioning" means the supply of air to rooms or spaces by means which provide for the treatment of the air in at least two of the following ways:
     heating — cooling — any other kind of treatment, e.g. humidification;
   - "ventilation" means the supply of air to, or its extraction from, rooms or spaces, and systems for circulating air within rooms or spaces, but does not cover the mere treatment of air being supplied to, extracted from, or circulated within, rooms or spaces.

Subclass index

Air-conditioning

1/00 Room units, e.g. separate or self-contained units or units receiving primary air from a central station [1, 2006.01, 2011.01]

1/01 • in which secondary air is induced by injector action of the primary air **[3, 2006.01, 2011.01]**

1/02 • self-contained, i.e. with all apparatus for treatment installed in a common casing **[1, 2006.01, 2011.01]**

1/04 • • Arrangements for portability **[1, 2006.01, 2011.01]**

1/06 • Separate outdoor units, e.g. outdoor unit to be linked to a separate room unit comprising a compressor and a heat exchanger **[2011.01]**

Note(s) [2011.01]

In this group, the first place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.

1/08 • • Compressors specially adapted for separate outdoor units **[2011.01]**

1/10 • • • Arrangement or mounting thereof **[2011.01]**

1/12 • • • Vibration or noise prevention therefor **[2011.01]**

1/14 • • Heat exchangers specially adapted for separate outdoor units **[2011.01]**

1/16 • • • Arrangement or mounting thereof **[2011.01]**

1/18 • • • characterised by their shape **[2011.01]**

1/20 • • Electric components for separate outdoor units **[2011.01]**

1/22 • • • Arrangement or mounting thereof **[2011.01]**

1/24 • • • Cooling of electric components **[2011.01]**

1/26 • • Refrigerant piping **[2011.01]**

1/28 • • • for connecting several separate outdoor units **[2011.01]**

1/30 • • • for use inside the separate outdoor units **[2011.01]**

1/32 • • • for connecting the separate outdoor unit to indoor units **[2011.01]**

1/34 • • • Protection means therefor, e.g. covers for refrigerant pipes **[2011.01]**

1/36 • • Drip trays for outdoor units **[2011.01]**

1/38 • • Fan details of outdoor units, e.g. bell-mouth shaped inlets or fan mountings **[2011.01]**

1/40 • • Vibration or noise prevention at outdoor units (for outdoor unit compressors F24F 1/12) **[2011.01]**

1/42 • • characterised by the use of the condensate, e.g. for enhanced cooling **[2011.01]**

1/44 • • characterised by the use of internal combustion engines **[2011.01]**

1/46 • • Component arrangements in separate outdoor units **[2011.01]**

1/48 • • • characterised by airflow, e.g. inlet or outlet airflow **[2011.01]**

1/50 • • • • with outlet air in upward direction **[2011.01]**

1/52 • • • • Inlet and outlet arranged on the same side, e.g. for mounting in a wall opening **[2011.01]**

1/54 • • • • Inlet and outlet arranged on opposite sides **[2011.01]**

1/56 • • Casing or covers of separate outdoor units, e.g. fan guards **[2011.01]**

1/58 • • • Separate protective covers for outdoor units, e.g. solar guards, snow shields or camouflage **[2011.01]**

1/60 • • Arrangement or mounting of the outdoor unit **[2011.01]**

1/62 • • • Wall-mounted **[2011.01]**

1/64 • • • Ceiling-mounted, e.g. below a balcony **[2011.01]**

1/66 • • • under the floor level **[2011.01]**

1/68 • • • Arrangement of multiple separate outdoor units **[2011.01]**

3/00 Air-conditioning systems in which conditioned primary air is supplied from one or more central stations to distributing units in the rooms or spaces where it may receive secondary treatment; Apparatus specially designed for such systems (room units F24F 1/00) **[1, 2006.01]**

3/02 • characterised by the pressure or velocity of the primary air **[1, 3, 2006.01]**

3/04 • • operating with high pressure or high velocity **[1, 2006.01]**

3/044 • Systems in which all treatment is given in the central station, i.e. all-air systems **[3, 2006.01]**

3/048 • • with temperature control at constant rate of air-flow **[3, 2006.01]**

3/052 • • • Multiple duct systems, e.g. systems in which hot and cold air are supplied by separate circuits from the central station to mixing chambers in the spaces to be conditioned **[3, 2006.01]**

3/056 • • the air at least partially flowing over lighting fixtures, the heat of which is dissipated or used (outlets for directing or distributing air into rooms or spaces combined with lighting fixtures F24F 13/078) **[3, 2006.01]**

3/06 • characterised by the arrangements for the supply of heat-exchange fluid for the subsequent treatment of primary air in the room units **[1, 2006.01]**

3/08 • • with separate supply and return lines for hot and cold heat-exchange fluids **[1, 2006.01]**

3/10 • • with separate supply lines and common return line for hot and cold heat-exchange fluids **[1, 2006.01]**

3/12 • characterised by the treatment of the air otherwise than by heating and cooling **[1, 2006.01]**
3/14 • • by humidification; by dehumidification **[1, 2006.01]**
3/147 • • • with both heat and humidity transfer between supplied and exhausted air **[3, 2006.01]**
3/153 • • • with subsequent heating, i.e. with the air, given the required humidity in the central station, passing a heating element to achieve the required temperature **[3, 2006.01]**
3/16 • • by purification, e.g. by filtering; by sterilisation; by ozonisation **[1, 2006.01]**

5/00 Air-conditioning systems or apparatus not covered by group F24F 1/00 or F24F 3/00 [1, 2006.01]

6/00 Air-humidification [3, 2006.01]
6/02 • by evaporation of water in the air **[3, 2006.01]**
6/04 • • using stationary unheated wet elements **[3, 2006.01]**
6/06 • • using moving unheated wet elements **[3, 2006.01]**
6/08 • • using heated wet elements **[3, 2006.01]**
6/10 • • • heated electrically **[3, 2006.01]**
6/12 • by forming water dispersions in the air **[3, 2006.01]**
6/14 • • using nozzles **[3, 2006.01]**
6/16 • • using rotating elements **[3, 2006.01]**
6/18 • by injection of steam into the air **[3, 2006.01]**

7/00 Ventilation [1, 2006.01]
7/007 • with forced flow (using ducting systems F24F 7/06) **[3, 2006.01]**
7/013 • • using wall or window fans, displacing air through the wall or window **[3, 2006.01]**
7/02 • Roof ventilation (ventilation of roof coverings E04D) **[1, 3, 6, 2006.01]**
7/04 • with ducting systems **[1, 2006.01]**
7/06 • • with forced air circulation, e.g. by fan **[1, 2006.01]**
7/08 • • • with separate ducts for supplied and exhausted air **[3, 2006.01]**
7/10 • • • with air supply, or exhaust, through perforated wall, floor or ceiling (outlet members for directing or distributing air F24F 13/06) **[3, 2006.01]**

9/00 Use of air currents for screening, e.g. air curtain [1, 2006.01]

Common features or details

11/00 Control or safety systems or apparatus [1, 3, 2006.01]
11/02 • Arrangement or mounting of control or safety devices **[1, 2006.01]**
11/04 • • solely for controlling the rate of air-flow **[1, 2006.01]**
11/047 • • • to constant value **[3, 2006.01]**
11/053 • • • by means responsive to temperature **[3, 2006.01]**
11/06 • • solely for controlling the supply of heating or cooling fluids for secondary treatment (F24F 11/08 takes precedence) **[1, 2006.01]**
11/08 • • for controlling the primary treatment of air **[1, 2006.01]**

12/00 Use of energy recovery systems in air conditioning, ventilation or screening (with both heat and humidity transfer between supplied and exhausted air F24F 3/147) **[4, 2006.01]**

13/00 Details common to, or for air-conditioning, air-humidification, ventilation or use of air currents for screening [1, 2006.01]
13/02 • Ducting arrangements **[1, 2006.01]**
13/04 • • Air-mixing units (F24F 13/06 takes precedence) **[1, 2006.01]**
13/06 • • Outlets for directing or distributing air into rooms or spaces, e.g. ceiling air diffuser **[1, 2006.01]**
13/062 • • • having one or more bowls or cones diverging in the flow direction **[3, 2006.01]**
13/065 • • • formed as cylindrical or spherical bodies which are rotatable **[3, 2006.01]**
13/068 • • • formed as perforated walls, ceilings or floors (F24F 13/078 takes precedence) **[3, 2006.01]**
13/072 • • • of elongated shape, e.g. between ceiling panels **[3, 2006.01]**
13/075 • • • having parallel rods or lamellae directing the outflow, e.g. the rods or lamellae being individually adjustable (F24F 13/072 takes precedence) **[3, 2006.01]**
13/078 • • • combined with lighting fixtures **[3, 2006.01]**
13/08 • Air-flow control members, e.g. louvres, grilles, flaps or guide plates (F24F 7/013, F24F 13/06 take precedence) **[1, 3, 2006.01]**
13/10 • • movable, e.g. dampers **[1, 2006.01]**
13/12 • • • built-up of sliding members **[1, 2006.01]**
13/14 • • • built-up of tilting members, e.g. louvre **[1, 2006.01]**
13/15 • • • • with parallel simultaneously tiltable lamellae **[3, 2006.01]**
13/16 • • • built-up of parallelly-movable plates **[1, 2006.01]**
13/18 • • specially adapted for insertion in flat panels, e.g. in door or window-pane **[1, 2006.01]**
13/20 • Casings or covers **[5, 2006.01]**
13/22 • Means for preventing condensation or evacuating condensate **[5, 2006.01]**
13/24 • Means for preventing or suppressing noise **[5, 2006.01]**
13/26 • Arrangements for air-circulation by means of induction, e.g. by fluid coupling or thermal effect **[6, 2006.01]**
13/28 • Arrangement or mounting of filters **[6, 2006.01]**
13/30 • Arrangement or mounting of heat-exchangers **[6, 2006.01]**
13/32 • Supports for air-conditioning, air-humidification or ventilation units **[6, 2006.01]**

F24H **FLUID HEATERS, e.g. WATER OR AIR HEATERS, HAVING HEAT-GENERATING MEANS, IN GENERAL** (heat-transfer, heat-exchange or heat-storage materials C09K 5/00; tube furnaces for thermal non-catalytic cracking C10G 9/20; devices, e.g. valves, for venting and aerating enclosures F16K 24/00; steam traps or like apparatus F16T; steam generation F22; combustion apparatus F23; domestic stoves or ranges F24B, F24C; domestic- or space-heating systems F24D; furnaces, kilns, ovens, retorts F27; heat-exchangers F28; electric heating elements or arrangements H05B)

Note(s) [3]

1. The distinguishing feature of the air heaters covered by this subclass is that the heat is predominantly released to the air by convection, mostly by forced circulation of the air. The domestic stoves or ranges covered by subclass F24B, F24C may also be fired or electric air heaters but they release their heat to a considerable extent by radiation and only to some extent by natural convention.
2. In this subclass, the following terms or expressions are used with the meanings indicated:
   - "water" includes other liquids and means always the liquid to be heated;
   - "air" includes other gases or gas mixtures and means always the gas to be heated;
   - "furnace tubes" means tubes inside the heater wherein combustion is performed;
   - "fire tubes" means tubes inside the heater through which flue-gases flow from a combustion chamber located outside the tubes;
   - "heater" means apparatus including both heat generating means and means for transferring the generated heat to water or air.
3. All storage heaters are classified in group F24H 7/00.

Subclass index

1/00 **Water heaters having heat generating means, e.g. boiler, flow-heater, water-storage heater** (F24H 7/00, F24H 8/00 take precedence; details F24H 9/00; steam boilers F22B; domestic stoves or ranges with additional provisions for heating water F24B 9/00, F24C 13/00) **[1, 5, 2006.01]**

1/06 • Portable or mobile, e.g. collapsible **[1, 2006.01]**

1/08 • Packaged or self-contained boilers, i.e. water heaters with control devices and pump in a single unit **[1, 2006.01]**

1/10 • Continuous-flow heaters, i.e. heaters in which heat is generated only while the water is flowing, e.g. with direct contact of the water with the heating medium (F24H 1/50 takes precedence) **[1, 5, 2006.01]**

1/12 • • in which the water is kept separate from the heating medium **[1, 2006.01]**

1/14 • • • by tubes, e.g. bent in serpentine form **[1, 2006.01]**

1/16 • • • • helically or spirally coiled **[1, 2006.01]**

1/18 • Water-storage heaters (F24H 1/50 takes precedence; combined with water-heating stoves for central heating F24H 1/22) **[1, 5, 2006.01]**

1/20 • • with immersed heating elements, e.g. electric elements or furnace tubes **[1, 2006.01]**

1/22 • Water heaters other than continuous-flow or water-storage heaters, e.g. water heaters for central heating (F24H 1/50 takes precedence) **[1, 5, 2006.01]**

1/24 • • with water mantle surrounding the combustion chamber or chambers (F24H 1/40, F24H 1/44 take precedence) **[1, 3, 2006.01]**

1/26 • • • the water mantle forming an integral body **[1, 2006.01]**

1/28 • • • • including one or more furnace or fire tubes **[1, 2006.01]**

1/30 • • • the water mantle being built-up from sections **[1, 2006.01]**

1/32 • • • • with vertical sections arranged side by side **[1, 2006.01]**

1/34 • • with water chamber arranged adjacent to the combustion chamber or chambers, e.g. above or at side (F24H 1/24, F24H 1/44 take precedence) **[1, 2006.01]**

1/36 • • • the water chamber including one or more fire tubes **[1, 2006.01]**

1/38 • • with water contained in separate elements, e.g. radiator-type element (F24H 1/40, F24H 1/44 take precedence) **[1, 2006.01]**

1/40 • • with water tube or tubes (F24H 1/44 takes precedence) **[1, 2006.01]**

1/41 • • • in serpentine form **[3, 2006.01]**

1/43 • • • helically or spirally coiled **[3, 2006.01]**

1/44 • • with combinations of two or more of the types covered by groups F24H 1/24-F24H 1/40 **[1, 2006.01]**

1/46 • Water heaters having plural combustion chambers **[1, 2, 5, 2006.01]**

1/48 • Water heaters for central heating incorporating heaters for domestic water **[5, 2006.01]**

1/50 • • incorporating domestic water tanks **[5, 2006.01]**

1/52 • • incorporating heat exchangers for domestic water (F24H 1/50 takes precedence) **[5, 2006.01]**

3/00 **Air heaters having heat generating means** (F24H 7/00, F24H 8/00 take precedence; details F24H 9/00; domestic stoves or ranges with additional provisions for convection heating of air F24B, F24C) **[1, 5, 2006.01]**

3/02 • with forced circulation (F24H 3/12 takes precedence) **[1, 2006.01]**

3/04 • • the air being in direct contact with the heating medium, e.g. electric heating element **[1, 2006.01]**

3/06 • • the air being kept separate from the heating medium, e.g. using forced circulation of air over radiators **[1, 2006.01]**
3/08 • • • by tubes **[1, 2006.01]**
3/10 • • • by plates **[1, 2006.01]**
3/12 • with additional heating arrangements **[1, 2006.01]**

4/00 Fluid heaters using heat pumps [5, 2006.01]
4/02 • Liquid heaters **[5, 2006.01]**
4/04 • • Storage heaters **[5, 2006.01]**
4/06 • Gas heaters **[5, 2006.01]**

6/00 Combined water and air heaters (F24H 8/00 takes precedence) **[1, 5, 2006.01]**

7/00 Storage heaters, i.e. heaters in which the energy is stored as heat in masses for subsequent release (domestic stoves or ranges with additional heat storage masses F24B 1/24, F24C 15/34) **[1, 2006.01]**
7/02 • the released heat being conveyed to a transfer fluid, e.g. air, water **[1, 2006.01]**
7/04 • • with forced circulation of the transfer fluid **[1, 2006.01]**
7/06 • the released heat being radiated **[1, 2006.01]**

8/00 Fluid heaters having heat-generating means specially adapted for extracting latent heat from flue gases by means of condensation [5, 2006.01]

9/00 Details [1, 2006.01]
9/02 • Casings; Cover lids; Ornamental panels **[1, 2006.01]**
9/06 • Arrangement of mountings or supports **[1, 2006.01]**
9/12 • Connecting heaters to circulation pipes (pipe joints in general F16L) **[1, 2006.01]**
9/14 • Connecting different sections, e.g. in water heaters (in radiators F28F 9/26) **[1, 2006.01]**
9/16 • Arrangements for water drainage (valves for drainage F16K, e.g. F16K 21/00; in pipes or pipe systems in general F16L 55/00; in domestic-or space-heating systems F24D 19/08) **[1, 2006.01]**
9/18 • Arrangement or mounting of grates, burners, or heating elements (burners F23D; grates F23H; electric heating elements H05B) **[1, 2006.01]**
9/20 • Arrangement or mounting of control or safety devices (control valves F16K; safety devices for burners F23D; combustion control devices F23N; of systems comprising a heater, see the relevant subclasses, e.g. of control heating systems F24D 19/10; automatic switching for electric heating apparatus H05B 1/02) **[1, 2006.01]**

F24J PRODUCTION OR USE OF HEAT NOT OTHERWISE PROVIDED FOR (materials therefor C09K 5/00; engines or other mechanisms for producing mechanical power from heat, see the relevant classes, e.g. F03G for using natural heat)

1/00 Apparatus or devices using heat produced by exothermal chemical reactions other than by combustion (for cooking-vessels A47J 36/28; self-heating compresses A61F 7/03; materials for the production of heat or cold undergoing non-reversible chemical reactions, other than by combustion, when used C09K 5/18) **[1, 2006.01]**

2/00 Use of solar heat, e.g. solar heat collectors (distillation or evaporation of water using solar energy C02F 1/14; roof covering aspects of energy collecting devices E04D 13/18; devices for producing mechanical power from solar energy F03G 6/00; semiconductor devices specially adapted for converting solar energy into electrical energy H01L 31/00; photovoltaic [PV] cells including means directly associated with the PV cell to utilise heat energy H01L 31/0525; PV modules including means associated with the PV module to utilise heat energy H02S 40/44) **[4, 5, 2006.01, 2014.01]**

Note(s) [2014.01]

Supporting structures also intended for use with photovoltaic modules should further be classified in the relevant groups of subclass H02S.

2/02 • Solar heat collectors with support for article heated, e.g. stoves, ranges, crucibles, furnaces or ovens using solar heat **[4, 2006.01]**
2/04 • Solar heat collectors having working fluid conveyed through collector **[4, 2006.01]**
2/05 • • surrounded by a transparent enclosure, e.g. evacuated solar collectors **[6, 2006.01]**
2/06 • • having concentrating elements (optical elements or systems per se G02B) **[4, 2006.01]**
2/07 • • • Receivers working at high temperature, e.g. for solar power plants **[6, 2006.01]**
2/08 • • • having lenses as concentrating elements **[4, 2006.01]**
2/10 • • • having reflectors as concentrating elements **[4, 2006.01]**
2/12 • • • • parabolic **[4, 2006.01]**
2/13 • • • • hemispherical **[6, 2006.01]**
2/14 • • • • semi-cylindrical or cylindro-parabolic **[4, 2006.01]**
2/15 • • • • conical **[6, 2006.01]**
2/16 • • • • having flat plates **[4, 2006.01]**
2/18 • • • • spaced, opposed interacting reflecting surfaces **[4, 2006.01]**
2/20 • • the working fluid being conveyed between plates **[4, 2006.01]**
2/22 • • • having extended surfaces, e.g. protrusions, corrugations (F24J 2/28 takes precedence) **[4, 2006.01]**
2/23 • • the working fluid trickling freely over collector elements **[6, 2006.01]**
2/24 • • the working fluid being conveyed through tubular heat absorbing conduits **[4, 2006.01]**
2/26 • • • having extended surfaces, e.g. protrusions (F24J 2/28 takes precedence) **[4, 2006.01]**
2/28 • • having permeable mass, foraminous or porous materials **[4, 2006.01]**
2/30 • • with means to exchange heat between plural fluids **[4, 2006.01]**
2/32 • • having evaporator and condenser section, e.g. heat pipe **[4, 2006.01]**
2/34 • • having heat storage mass **[4, 2006.01]**
2/36 • Rollable or foldable collector units **[4, 2006.01]**
2/38 • employing tracking means (F24J 2/02, F24J 2/06 take precedence; rotary supports or mountings therefor F24J 2/54; supporting structures of photovoltaic modules for generation of electric power specially adapted for solar tracking systems H02S 20/32) **[4, 2006.01, 2014.01]**
2/40 • Control arrangements **[4, 2006.01]**

2/42 • Solar heat systems not otherwise provided for **[4, 2006.01]**

2/44 • • having thermosiphonic circulation **[4, 2006.01]**

2/46 • Component parts, details or accessories of solar heat collectors **[4, 2006.01]**

2/48 • • characterised by the absorber material **[4, 2006.01]**

2/50 • • Transparent coverings **[4, 2006.01]**

2/51 • • Thermal insulation (F24J 2/50 takes precedence) **[6, 2006.01]**

2/52 • • Arrangement of mountings or supports **[4, 2006.01]**

2/54 • • • specially adapted for rotary movement **[6, 2006.01]**

3/00 Other production or use of heat, not derived from combustion (use of solar heat F24J 2/00) **[1, 2006.01]**

3/06 • using natural heat **[4, 2006.01]**

3/08 • • using geothermal heat (devices for producing mechanical power from geothermal energy F03G 4/00) **[4, 5, 2006.01]**