

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](#))

Definition statement

This place covers:

Methods and apparatus for air-conditioning, i.e. the supply of air to or the treatment of air in rooms or spaces by means which provide for the treatment of the air in the following ways:

- Cooling;
- Cooling and Heating;
- Cooling and any other kind of treatment, e.g. humidification.

Methods and apparatus for humidification of air for rooms or spaces.

Methods and apparatus for supplying air or extracting air from rooms or spaces, either by forced movement (for example by fans) or by natural effects (for example convection).

Methods and apparatus for circulating air within rooms or spaces, either by forced movement (for example by fans) or by natural effects (for example convection).

Methods and apparatus for use of air currents for screening, for example of entrances of buildings or of areas where particular operations are performed.

Use of energy recovery systems in air conditioning, ventilation or screening.

Details, for example control arrangements, safety arrangements, ducting arrangements or air flow control members, which are specially adapted for the methods or apparatus specified above.

Treatment, e.g. purification, of air supplied to human living or working spaces in air conditioning systems or in room units otherwise than by heating, cooling, humidifying or drying.

Self-contained air purifiers.

Relationships with other classification places

As regards air-conditioning, air-humidification, ventilation and treatment of air this subclass is an application-oriented place that covers methods or apparatus for these processes when specially adapted for rooms or spaces that are primarily intended as dwelling or working-spaces for human beings.

Air-treatment or ventilation that is specially adapted for particular processes or for other particular environments, for example for industrial processes or for housing of animals, is covered in the places for those processes or environments. For examples of such places see the section "Examples of places where the subject matter of this subclass is covered when specially adapted, used for a particular purpose, or incorporated in a larger system" below.

With the exception of humidification, this subclass does not cover the mere treatment of air being supplied to, extracted from, or circulated within, rooms or spaces. Such treatment of air in general, for example heating, cooling, heat-exchange or filtering, is covered in several different places of the CPC, see for example the entries under "Informative References" below.

Related arrangements for merely heating are covered by subclasses [F24D](#) or [F24H](#). This subclass does not cover elements or apparatus in general for transporting air or for regulating air flow, for

Relationships with other classification places

example fans, ducts or valves. Such elements and apparatus are covered in several different places in the IPC, see for example the entries under "Informative References" below.

This subclass does not cover ventilation of garments or furniture or other devices, which is covered by the places for those devices, for example classes [A41](#) - [A47](#) for garments and furniture and class [H01](#) for electrical devices.

References

Limiting references

This place does not cover:

| | |
|---|----------------------------|
| 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 ventilating shafts; Terminals for flues | F23L 17/02 |

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

| | |
|---|---|
| Ventilating arrangements for forage silos | A01F 25/22 |
| Devices for ventilating greenhouses | A01G 9/24 |
| Ventilation in animal husbandry | A01K |
| Controlling humidity in incubators for poultry | A01K 41/04 |
| Treatment rooms with artificial climate for medical purposes | A61G 10/02 , A61G 13/00 |
| Devices for reconditioning breathing air in sealed rooms | A62B 11/00 |
| Devices for ventilating gas-proof shelters | A62B 13/00 |
| Containers or portable cabins for affording breathing protection with devices for reconditioning the breathing air or for ventilating | A62B 31/00 |
| Dust-free rooms or enclosures for laboratories | B01L 1/04 |
| Ventilation, air-conditioning, or cooling, specially adapted for passenger or goods spaces of vehicles | B60H |
| Air curtains at doors or windows of vehicles | B60J 9/04 |
| Ventilation of driving cabins or engine rooms of locomotives or motor railcars | B61C 17/04 |
| Heating, cooling, ventilating, or air-conditioning, specially adapted for rail vehicles | B61D 27/00 |
| Adaptations of ventilation, cooling, heating, or air-conditioning for submarines or other underwater vessels | B63G 8/36 |
| Arrangements of ventilation, heating, cooling, or air-conditioning specially adapted for ships or other waterborne vessels | B63J 2/00 |
| Arrangements or adaptations of air-treatment apparatus for crew, passenger or freight spaces in aircraft | B64D 13/00 |
| Arrangements or adaptations of devices for treatment of the atmosphere in cosmonautic vehicles | B64G 1/46 |
| Drying cabinets or drying chambers having heating or ventilating means | D06F 58/10 |
| Special arrangement or operation of ventilating devices in lavatories | E03D 9/04 |

| | |
|--|----------------------------|
| Drying building constructions in general or keeping them dry, e.g. by air vents | E04B 1/70 |
| Special adaptations of floors for incorporating ventilation ducts | E04B 5/48 |
| Ceilings having means for ventilation | E04B 9/02 |
| Ventilation of roof coverings | E04D 13/17 |
| Ventilation of tents | E04H 15/10 |
| Ventilation in doors or windows | E06B 7/02 |
| Ventilation of mines or tunnels | E21F 1/00 |
| Cooling or drying of air in mines or tunnels | E21F 3/00 |
| Removing cooking fumes | F24C 15/20 |
| Arrangements for supplying or controlling air or other gases for drying solid materials or objects | F26B 21/00 |
| Cooling, ventilating or heating of electric apparatus | H05K 7/20 |

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|---|
| Disinfecting or sterilising of air | A61L |
| Filtering, washing or drying of gases | B01D |
| Mixing gases with vapours or liquids in general | B01F 23/10 |
| Transportable units for separating dispersed particles from air by electrostatic effect | B03C 3/32 |
| Spraying | B05B , B05D |
| Production of ozone | C01B 13/10 |
| Heat, sound or noise insulation, absorption, or reflection | E04B 1/74 |
| Air-ducts or air channels in buildings | E04F 17/04 |
| Chimney stacks or similar ducts | E04H 12/28 |
| Fans in general, details of fans | F04D |
| Pumping installations for air | F04D 25/08 , F04D 29/00 |
| Valves in general | F16K |
| Devices for venting or aerating enclosures in general | F16K 24/00 |
| Pipes in general, joints, fittings or supports therefor | F16L |
| Noise absorbers for ducting | F16L 55/02 |
| Thermal insulation for ducting | F16L 59/00 |
| Devices for conducting smoke or fumes, e.g. flues | F23J 11/00 |
| Domestic stoves | F24B , F24C |
| Hot air central heating systems | F24D 5/00 |
| Fluid heaters, water or air-heaters | F24H |
| Air heaters having heat generating means | F24H 3/00 |
| Refrigeration in general, details of refrigeration systems | F25B |
| Combined heating and refrigeration systems | F25B 29/00 |

| | |
|--|--|
| Production, working, storing or distribution of ice | F25C |
| Refrigerators, cold rooms, e.g. for food storage | F25D |
| Heat exchange apparatus in general, details of heat exchangers | F28C , F28D , F28F |
| Measuring temperature or quantity of heat in general | G01K |
| Testing apparatus not otherwise provided for | G01M |
| Control of flow in general | G05D 7/00 |
| Control of humidity in general | G05D 22/00 |
| Control of temperature in general | G05D 23/00 |
| Ion sources | H01J 27/02 , H01J 37/08 |
| Generating ions to be introduced into non-enclosed gases | H01T 23/00 |
| Arrangements in telecontrol or telemetry systems in general | H04Q 9/00 |
| Arrangements for cooling, heating or ventilation of semiconductor or other solid state devices | H10W 40/00 , H10F 77/60 |

Special rules of classification

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](#), while air-humidification per se, e.g. "room humidifiers", is covered by group [F24F 6/00](#).

Looping references between [B08B 15/00](#) and [F24F](#) have been identified. Until this inconsistency is resolved, the current classification practice in CPC is as follows: [B08B 15/00](#) is a limiting reference for subclass [F24F](#). [F24F](#) is an informative reference for main group [B08B 15/00](#).

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

| | |
|------------------|--|
| Air-conditioning | Supply of air to or the treatment of air in rooms or spaces by means of cooling or a combination of cooling and a further kind of air treatment, e.g. humidification, heating or air purification. |
| Ventilation | Supply of air to rooms or spaces, extraction of air from rooms or spaces, or circulation of air within rooms or spaces. |

F24F 1/00

Room units for air-conditioning, e.g. separate or self-contained units or units receiving primary air from a central station

Definition statement

This place covers:

- Air-conditioning units placed within a room for cooling the room, i.e. fan coil unit of a split unit. These indoor units can thereby receive primary air from a central station and/or recirculate the air within the room and/or supply outside air.
- Split unit comprising an indoor unit and an outdoor unit.
- Outdoor unit of split unit.
- Self-contained units.

Usually, these room units comprise a refrigerant cycle.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|---|
| Central station centrally producing cool air for distributing cool air in a plurality of rooms | F24F 3/00 |
| Systems comprising multiple indoor units | F24F 3/065 |
| Dehumidification | F24F 3/14 |
| Air-conditioning systems or apparatus not covered by F24F 1/00 or F24F 3/00 . | F24F 5/00 |
| Humidification | F24F 6/00 |
| Filter units per se | F24F 8/10 |
| Control of room units | F24F 11/30 |
| Vanes or dampers of room units | F24F 13/14 , F24F 13/15 |
| Casing of indoor units and self-contained units | F24F 13/20 |
| Condensate evacuation | F24F 13/222 |

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

| | |
|---------------------|---|
| Split unit | Air conditioning unit in split configuration, often with the compressor and condenser located in a separate external outdoor unit and the evaporator located in an indoor unit, the two units being connected via refrigerant pipes |
| Self-contained unit | Air conditioning unit with all apparatus for air treatment installed in a common casing, e.g. compressor, condenser and evaporator |

F24F 1/01

in which secondary air is induced by injector action of the primary air

Definition statement

This place covers:

Room units in which secondary air is induced by injector action of the primary air.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|----------------------------|
| Self-contained room units for air-conditioning | F24F 1/02 |
| Control systems for controlling the temperature of the supplied air by controlling the air supply to heat-exchangers or bypass channels | F24F 11/81 |
| Arrangements for air-circulation by means of induction | F24F 13/26 |

F24F 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](#))

Definition statement

This place covers:

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.

References

Limiting references

This place does not cover:

| | |
|------------|---------------------------|
| Room units | F24F 1/00 |
|------------|---------------------------|

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|------------------------------|
| Room humidifier | F24F 6/00 |
| Mounting arrangement of air filters | F24F 13/28 |
| Disinfection, sterilisation or deodorisation or air | A61L 9/00 |
| Filter unit per se | B01D |
| Drying of gases | B01D 53/26 |
| Electric filter | B03C |
| Cogeneration of electricity and heat or cold | F25B |
| Computer rooms | H05K 7/20 |
| Clean room for semiconductor production | H10P 72/0402 |

F24F 3/001

{in which the air treatment in the central station takes place by means of a heat-pump or by means of a reversible cycle (reversible cycle for humidifying and drying air [F24F 3/147](#))}

References

Limiting references

This place does not cover:

| | |
|---|----------------------------|
| Reversible cycle for humidifying and drying air | F24F 3/147 |
|---|----------------------------|

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|------------|----------------------------|
| Heat pumps | F25B 30/00 |
|------------|----------------------------|

F24F 3/0444

{in which two airstreams are conducted from the central station via independent conduits to the space to be treated, of which one has a constant volume and a season-adapted temperature, while the other one is always cold and varies in volume}

Definition statement

This place covers:

Systems in which two airstreams are conducted from the central station via independent conduits to the space to be treated, of which one has a constant volume and a season adapted temperature to compensate for the fluctuating heat transfer losses of the building, while the other varies in volume and is always cold in order to compensate for the interior fluctuations and variable solar heating effects. These so-called "Dual Conduit Systems" are similar to high-pressure air-water systems.

F24F 3/0525

{in which the air treated in the central station is reheated}

Definition statement

This place covers:

Reheating may take place near the central station upon arrival, in the space to be treated, in a branch pipe to zone in a multi-zone system or in the warm pipe in a system having separate supply conduits for warm and cold air.

F24F 3/06

characterised by the arrangements for the supply of heat-exchange fluid for the subsequent treatment of primary air in the room units

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|----------------------------|
| Arrangement or assembly of components for the regulation of the supply of heating or cooling media for the secondary treatment of air | F24F 11/83 |
|---|----------------------------|

F24F 3/16

by purification, e.g. by filtering; by sterilisation; by ozonisation

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|---|
| Treatment rooms or enclosures for medical purposes | A61G 10/00 |
| Ion sources | H01J 27/02 , H01J 37/08 |

F24F 3/163

Clean air work stations, i.e. selected areas within a space which filtered air is passed

References**Application-oriented references**

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

| | |
|---|-----------------------------|
| Means providing sterile air at a surgical operation table or area | A61G 13/108 |
|---|-----------------------------|

F24F 5/00

Air-conditioning systems or apparatus not covered by [F24F 1/00](#) or [F24F 3/00](#) {, e.g. using solar heat or combined with household units such as an oven or water heater}

Definition statement

This place covers:

- Exclusively-fluid system, e.g. using water as cooling fluid ([F24F 5/0003](#)),
- Cooling apparatus specially adapted for use in air-conditioning, e.g. using absorption or desorption ([F24F 5/0014](#)), or using cold storage body ([F24F 5/0017](#)) (e.g. PCM material for storage), or using evaporation ([F24F 5/0035](#)).
- Cooling apparatus using the Peltier effect ([F24F 5/0042](#)).
- Cooling apparatus using natural energy ([F24F 5/0046](#)), e.g. solar energy or air from the ground.
- Cooling apparatus using thermal walls ([F24F 5/0075](#)),
- Cooling apparatus using radiation from walls or ceiling ([F24F 5/0089](#)).
- Cooling apparatus combined with domestic apparatus, e.g. boiler, heating system ([F24F 5/0096](#)).

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|---|
| Absorption or desorption for humidification or dehumidification purposes | F24F 3/1411 |
| Air conditioning in containers | B65D 88/74 |
| Apparatus using radiation from walls or ceiling for heating purposes only | F24D 3/14 , F24D 3/16 |

| | |
|--|----------------------------|
| Hot-water central heating system | F24D 3/18 |
| Solar heat collector | F24S |
| Production of heat using geothermal energy | F24T |
| Cooling towers | F28C 1/00 |
| Phase Change Material (PCM) in general | F28D 20/02 |

F24F 5/0042

{characterised by the application of thermo-electric units or the Peltier effect}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|----------------------------|
| Refrigerators and cooling systems using thermo-electric units or the Peltier effect | F25B 21/02 |
| Thermobatteries or thermogenerators | H10N 10/00 |
| Cooling arrangements for semi-conductors using the Peltier effect | H10W 40/28 |

F24F 5/0075

{Systems using thermal walls, e.g. double window}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|-----------------------|----------------------|
| Double windows per se | E06B |
|-----------------------|----------------------|

F24F 5/0085

{Systems using a compressed air circuit}

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

| | |
|--|----------------------------|
| Arrangements or adaptations of heating, cooling, ventilating or other air-treating devices specially for passengers or goods in spaces of vehicles | B60H |
| Arrangements or adaptations of air-treatment apparatus for aircraft crew or passenger, or freight space | B64D 13/00 |

F24F 6/00**Air-humidification {, e.g. cooling by humidification}****Definition statement***This place covers:*

Local unit for room humidification by evaporation of water in the air, or by water dispersion or by injection of steam in the air.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

| | |
|---|------------------------------|
| Humidification systems | F24F 3/14 |
| Cooling using evaporation | F24F 5/0035 |
| Device to humidify the respiration air of patients | A61M 16/16 |
| Spraying or sprinkling apparatus with rotating elements discharging liquid, e.g. water, over substantially the whole periphery of each rotating element by centrifugal forces | B05B 3/10 |
| Ultrasonic oscillator | B05B 17/06 |
| Steam generation in boilers | F22B 1/28 |
| Humidifying within a fuel cell | H01M 8/04126 |

F24F 6/02**by evaporation of water in the air****References****Application-oriented references**

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

| | |
|---|-----------------------------|
| Humidifiers specially adapted for radiators | F24D 19/008 |
|---|-----------------------------|

F24F 6/043**{with self-sucking action, e.g. wicks}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

| | |
|---------------------------|-----------------------------|
| Humidifiers for radiators | F24D 19/008 |
|---------------------------|-----------------------------|

F24F 6/14**using nozzles****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|-------------------------------------|----------------------|
| Nozzles per se, spraying in general | B05B |
|-------------------------------------|----------------------|

F24F 7/00**Ventilation****Definition statement**

This place covers:

Systems or apparatus for supplying air to rooms or exhausting air from rooms or circulating air within the rooms, e.g. by means of wall-ducts or systems using window or roof apertures.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|------------------------------|
| Ventilation control | F24F 11/0001 |
| Ventilation of animal housings | A01K 1/0047 |
| Hoods preventing escape of fumes from the area where they are produced | B08B 15/02 |
| Ventilation systems of lifts | B66B 11/024 |
| Roof-covering elements | E04D 1/30 |
| Ventilation of roof coverings | E04D 13/17 |
| Ventilation through double windows | E06B 7/02 |
| Ventilation of mines or tunnels | E21F 1/00 |
| Ventilators or fans per se | F04D |
| Removing cooking fumes | F24C 15/20 |

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

| | |
|---------------------|--|
| Natural circulation | Air circulation without active fan, e.g. chimney effect, using solar energy or using wind energy |
|---------------------|--|

F24F 7/013

using wall or window fans, displacing air through the wall or window

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|---|
| With heating elements | F24F 3/00 - F24F 3/14 |
| Room ventilators, portable ventilators | F04D 25/08 |

F24F 7/06

with forced air circulation, e.g. by fan {positioning of a ventilator in or against a conduit}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|--------------------|----------------------------|
| Ventilators per se | F04D 25/08 |
|--------------------|----------------------------|

F24F 7/065

{fan combined with single duct; mounting arrangements of a fan in a duct}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|----------------------|----------------------|
| Construction of fans | F04D |
|----------------------|----------------------|

F24F 8/00

Treatment, e.g. purification, of air supplied to human living or working spaces otherwise than by heating, cooling, humidifying or drying

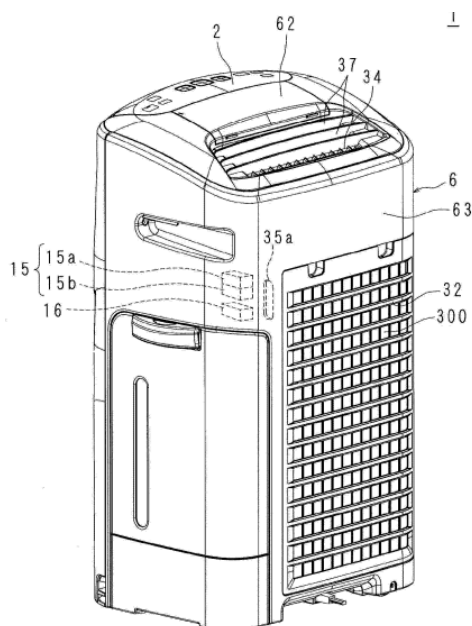
Definition statement

This place covers:

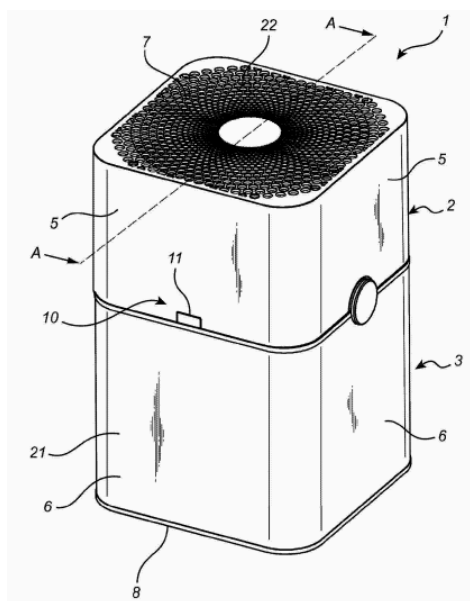
- Treatment, e.g. purification, of air supplied to human living or working spaces in air conditioning systems or in room units otherwise than by heating, cooling, humidifying or drying
- Self-contained air purifiers
- Details of air treatment apparatus

Illustrative examples of subject matter classified in this place:

Air purifier



Air purifier device with coupling mechanism



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|---------------------------|
| Disinfection, sterilisation or deodorisation of air in general | A61L 9/00 |
| Filter unit per se | B01D |
| Electric filter | B03C |

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

| | |
|-----------------------------|---|
| Self-contained air purifier | Apparatus with all its air purifying elements, e.g. filters or fans, arranged in a common casing. |
|-----------------------------|---|

F24F 8/10

by separation, e.g. by filtering

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|-------------------------------------|----------------------------|
| Arrangements or mounting of filters | F24F 13/28 |
|-------------------------------------|----------------------------|

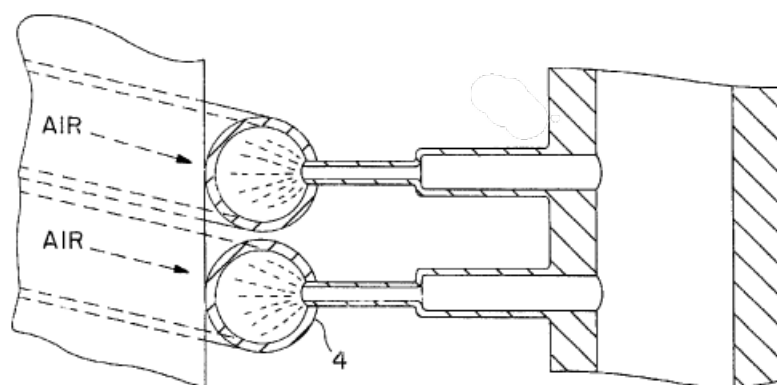
F24F 8/133

by direct contact with liquid, e.g. with sprayed liquid

Definition statement

This place covers:

Removal of particles from the treated air by direct contact with a liquid, e.g. by spraying liquid into a stream of air or bubbling gas through a liquid.



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|----------------------------|
| Removal of particles through use of a filter element or structure that is wetted | F24F 8/125 |
|--|----------------------------|

F24F 8/192**by electrical means, e.g. by applying electrostatic fields or high voltages****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

| | |
|---|-----------------------------|
| Air-conditioning systems or apparatus characterised by using thermoelectric means | F24F 5/0042 |
|---|-----------------------------|

F24F 8/70**by removing radon****Definition statement***This place covers:*

Reducing of radon concentration in living or working space for humans or spaces associated therewith, e.g. sub-basements.

F24F 9/00**Use of air currents for screening, e.g. air curtains****Definition statement***This place covers:*

- Air curtain delimiting two different spaces.
- Air curtain in a wall opening delimiting a room from the outside
- The air curtain can be obtained by using more than one jet or band.

References**Application-oriented references**

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

| | |
|--------------------------|---------------------------|
| Air curtain for vehicles | B60J 9/04 |
|--------------------------|---------------------------|

Informative references*Attention is drawn to the following places, which may be of interest for search:*

| | |
|--|-----------------------------|
| Clean air workstation | F24F 3/163 |
| Means providing sterile air to operating tables in surgery | A61G 13/108 |
| Removing cooking fumes | F24C 15/20 |
| Air curtain in cold rooms | F25D 23/023 |

F24F 11/00

Control or safety arrangements

Definition statement

This place covers:

Control of HVAC devices or systems ([F24F 11/00](#)).

Elements or components of control device, e.g. flap or damper control, ([F24F 11/89](#)).

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|------------------------------|
| Air flow control members | F24F 13/08 |
| Tilting members, e.g. louver | F24F 13/14 |
| Fire prevention or containment | A62C 2/00 |
| Extinguishing or preventing fire | A62C 3/14 |
| Controlling the speed of ventilators by varying driving speed | F04D 27/0261 |
| Control valve per se | F16K |
| Compressor control | F25B 49/022 |
| Refrigerant flow control | F25B 49/025 |
| Humidity control | G05D 22/00 |
| Humidity control using electrical means | G05D 22/02 |
| Temperature control using electrical means (thermostat) | G05D 23/19 |

Special rules of classification

Damper control controlling the rate of air-flow:

- If increasing air pressure opens the damper, then classify in [F24F 11/745](#)
- If increasing air pressure closes the damper, then classify in [F24F 11/75](#)

F24F 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](#))

Definition statement

This place covers:

Apparatus and systems with heat-exchange between supplied and exhausted air, e.g. using an air-to-air heat exchanger or using an intermediate fluid, e.g. heat pump.

References

Limiting references

This place does not cover:

| | |
|--|----------------------------|
| Both heat and humidity transfer between supplied and exhausted air | F24F 3/147 |
|--|----------------------------|

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|----------------------------|
| Heat-exchange in general | F28 |
| Heat-exchange apparatus, not provided for in another subclass, in which the heat-exchange media do not come into direct contact | F28D |
| Heat-exchange apparatus having plate-like conduit | F28D 9/00 |
| Heat pipes | F28D 15/00 |

F24F 13/00

Details common to, or for air-conditioning, air-humidification, ventilation or use of air currents for screening

Definition statement

This place covers:

Details concerning ducting arrangements ([F24F 13/02](#)); Air outlets ([F24F 13/06](#)); Air-flow control members ([F24F 13/08](#)); Casing or covers ([F24F 13/20](#)).

Means for preventing or evacuating condensate ([F24F 13/22](#)).

Means for preventing or suppressing noise ([F24F 13/24](#)).

Arrangement for air-circulation by means of air-induction ([F24F 13/26](#)).

Arrangement for mounting of filter ([F24F 13/28](#)), of heat exchanger ([F24F 13/30](#)).

Mounting means for HVAC devices ([F24F 13/32](#)).

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|------------------------------|
| Room units in which secondary air is induced by injection action of the primary air | F24F 1/01 |
| Mounting of filtering elements within a casing | B01D 46/0005 |
| Ventilating nozzles for vehicles | B60H 1/34 |
| Ventilation combined with door or window frames | E06B 7/02 |
| Butterfly valves | F16K 1/22 |
| Support for pipes | F16L 3/00 |
| Flange joints of pipes | F16L 23/00 |
| Noise absorbers in pipes | F16L 55/033 |
| Lighting devices combined with ventilating systems | F21V 33/0088 |
| Method or devices for protecting against noise | G10K 11/16 |

F24F 13/0227

{using parts of the building, e.g. air ducts inside the floor, walls or ceiling of a building}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|------------------------------------|----------------------------|
| Air ducts or channels of buildings | E04F 17/04 |
|------------------------------------|----------------------------|

F24F 13/04

Air-mixing units ([F24F 13/06](#) takes precedence)

References**Limiting references**

This place does not cover:

| | |
|---|----------------------------|
| Outlets for directing or distributing air into rooms or spaces, e.g. ceiling air diffuser | F24F 13/06 |
|---|----------------------------|

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|-----------------------------|
| Indoor units for air-conditioning characterised by introduction of outside air to the room | F24F 1/0035 |
| Mixing gases in general | B01F 23/10 |

F24F 13/078

combined with lighting fixtures

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|--|----------------------------|
| Air-treatment systems with air-flow over lighting fixtures | F24F 3/056 |
|--|----------------------------|

F24F 13/08

Air-flow control members, e.g. louvres, grilles, flaps or guide plates
([F24F 7/013](#), [F24F 13/06](#) take precedence)

References**Limiting references**

This place does not cover:

| | |
|---|----------------------------|
| Ventilation with forced flow using wall or window fans, displacing air through the wall or window | F24F 7/013 |
| Outlets for directing or distributing air into rooms or spaces, e.g. ceiling air diffuser | F24F 13/06 |

Informative references

Attention is drawn to the following places, which may be of interest for search:

| | |
|------------------|---------------------------|
| Roof ventilation | F24F 7/02 |
|------------------|---------------------------|

F24F 13/10

movable, e.g. dampers

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|-------------------|----------------------|
| Valves in general | F16K |
|-------------------|----------------------|

F24F 13/22

Means for preventing condensation or evacuating condensate

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|---------------------------------|----------------------------|
| For refrigerators or cold rooms | F25D 21/14 |
|---------------------------------|----------------------------|

F24F 13/24

Means for preventing or suppressing noise

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| | |
|---|---------------------------|
| Air supply, or exhaust, through perforated wall, floor or ceiling | F24F 7/10 |
|---|---------------------------|