

CPC COOPERATIVE PATENT CLASSIFICATION

F24F AIR-CONDITIONING, AIR-HUMIDIFICATION, VENTILATION, USE OF AIR CURRENTS FOR SCREENING (devices for ventilating greenhouses [A01G](#) {air-conditioning systems for greenhouses [A01G 9/246](#)}; animal husbandry [A01K](#), e.g. controlling humidity in incubators [A01K 41/04](#); disinfecting or sterilising of air [A61L](#); devices for reconditioning breathing air in sealed rooms or for ventilating gas-proof shelters [A62B](#); filtering, washing or drying of gases [B01D](#); mixing gases with vapours or liquids in general [B01F 3/00](#); spraying [B05B](#), [B05D](#); removing dirt or fumes from areas where they are produced [B08B 15/00](#); ventilation, air-conditioning or cooling, specially adapted for vehicles, [see the relevant vehicle places](#), e.g. [B60H](#), [B61D 27/00](#), {[B64D 13/00](#)}; production of ozone [C01B 13/10](#); chimneys or flues [E04F 17/02](#), [E04H 12/28](#), [F23J 11/00](#), [F23L 17/02](#); air ducts or conduits [E04F 17/04](#), [F16L](#); ventilation in doors or windows [E06B 7/02](#); fans, blowers [F04](#); noise-absorbing in pipes or pipe systems [F16L](#); tops for chimneys and ventilating shafts [F23L](#); cooling [F25](#); details of heat-exchange or heat-transfer apparatus, of general application [F28F](#); apparatus for generating ions to be introduced into non-enclosed gases, e.g. the atmosphere [H01T 23/00](#))

NOTES

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.

Air-conditioning

1/00	Rooms units, e.g. receiving primary air from a central station {or with supply of heating or cooling agents from a central station, such as those applied to air-treatment systems included in F24F 3/00 and F24F 5/00 (arrangement or assembly of components for the primary treatment of air F24F 11/08; mixing chambers for air F24F 13/04)}	2001/0074	. {receiving heat exchange fluid}
		2001/0077	. . {the fluid entering and leaving the room unit as a liquid}
		2001/0081	. . {the fluid entering the room unit as a liquid and leaving it as a gas}
		2001/0085	. {using the cooling effect of evaporating fluid either evaporating directly in the room air, in the air supplied to the room or in the outside air}
1/0003	. {Split units}	2001/0088	. . {evaporating directly in the room air or the air supplied to the room}
1/0007	. {Fan coil units, e.g. using an evaporating refrigerant}	2001/0092	. . {evaporating in the outside air, e.g. evaporation heat being extracted from the room air by indirect heat exchange}
1/0011	. . {characterised by the air outlet}	2001/0096	. {Units supplying highly filtered air to a room or to a limited area within a room}
1/0014	. . . {with two or more blow out openings}	1/01	. in which secondary air is induced by injector action of the primary air (F24F 1/02 takes precedence; {arrangement or assembly of or components for the regulation of the air supply through a heat exchanger and the associated bypass for the secondary treatment of the air F24F 11/027 ; nozzle for induction unit F24F 13/26)}
1/0018	. . {characterised by the fan}		
1/0022	. . . {Centrifugal or radial fan}	1/02	. self-contained, i.e. with all apparatus for treatment installed in a common casing {(arrangement or assembly of components for the primary treatment of air in independent units F24F 11/085)}
1/0025	. . . {Cross flow or tangential fan}	1/022	. . {Comprising a compressor cycle}
1/0029	. . . {Axial fan}	1/025	. . . {Portable}
1/0033	. . . {comprising two or more fans}	1/027	. . . {mounted in wall openings, e.g. in windows}
2001/0037	. . {mounted in or under the ceiling}	1/04	. . Arrangements for portability
2001/004	. . {mounted or standing on the floor}		
2001/0044	. . {mounted at least partially under the floor or the outlet air is being distributed under the floor (HVAC with raised floors F24F 2221/40)}		
2001/0048	. . {mounted in or on the wall}		
2001/0051	. . {Introducing outside air to rooms}		
2001/0055	. . {Exhausting internal air from rooms}		
1/0059	. {characterised by the heat exchanger}		
2001/0062	. {receiving air from a central station}		
2001/0066	. . {with air treatment in the central station and in the room unit}		
2001/007	. . {with air treatment in the room unit}		

- 1/06 . Separate outdoor units, e.g. outdoor unit to be linked to a separate room comprising a compressor and a heat exchanger
- NOTE**
- In this group, 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
- 1/10 . . . Arrangement or mounting thereof
- 1/12 . . . Vibration or noise prevention thereof
- 1/14 . . Heat exchangers specially adapted for separate outdoor units
- 1/16 . . . Arrangement or mounting thereof
- 1/18 . . . characterized by their shape
- 1/20 . . Electric components for separate outdoor units
- 1/22 . . . Arrangement or mounting thereof
- 1/24 . . . Cooling of electric components
- 1/26 . . Refrigerant piping
- 1/28 . . . for connecting several separate outdoor units
- 1/30 . . . for use inside the separate outdoor units
- 1/32 . . . for connecting the separate outdoor units to indoor units
- 1/34 . . . Protection means thereof, e.g. covers for refrigerant pipes
- 1/36 . . Drip trays for outdoor units
- 1/38 . . Fan details of outdoor units, e.g. bell-mouth shaped inlets of fan mountings
- 1/40 . . Vibration or noise prevention at outdoor units (for outdoor units compressors [F24F 1/12](#))
- 1/42 . . characterized by the use of the condensate, e.g. for enhanced cooling
- 1/44 . . characterized by the use of internal combustion engines
- 1/46 . . Component arrangements in separate outdoor units
- 1/48 . . . characterized by air airflow, e.g. inlet or outlet airflow
- 1/50 with outlet air in upward direction
- 1/52 with inlet and outlet arranged on the same side, e.g. for mounting in a wall opening
- 1/54 Inlet and outlet arranged on opposite sides
- 1/56 . . Casing or covers of separate outdoor units, e.g. fan guards
- 1/58 . . . Separate protective covers for outdoor units, e.g. solar guards, snow shields or camouflage
- 1/60 . . Arrangement or mounting of the outdoor unit
- 1/62 . . . Wall-mounted
- 1/64 . . . Ceiling-mounted, e.g. below a balcony
- 1/66 . . . under the floor level
- 1/68 . . . Arrangement of multiple separate outdoor units
- 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](#); construction of heat-exchangers [F28](#) {[F24F 3/044](#) takes precedence; arrangement or assembly of components for the primary treatment of air [F24F 11/08](#)})**
- 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 ([regulation of heat-pump circuit in air treatment systems \[F25B 29/00\]\(#\); heat pumps \[F25B 13/00\]\(#\), \[F25B 29/00\]\(#\); reversible cycle for humidifying and drying air \[F24F 3/147\]\(#\)](#))}
- 2003/003 . {with primary air treatment in the central station and subsequent secondary air treatment in air treatment units located in or near the rooms}
- 2003/005 . . {with a single air duct for transporting treated primary air from the central station to air treatment units located in or near the rooms}
- 2003/006 . . {with two air ducts for separately transporting treated hot and cold primary air from the central station to air treatment units located in or near the rooms}
- 2003/008 . {Supplying highly filtered air to a room or to a limited area within a room}
- 3/02 . characterised by the pressure or velocity of the primary air ([F24F 3/044 takes precedence](#))
- 3/04 . . operating with high pressure or high velocity
- 3/044 . Systems in which all treatment is given in the central station, i.e. all-air systems
- 3/0442 . . {with volume control at a constant temperature}
- 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 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, i.e. so-called "Dual Conduit System"; this system is similar to a high-pressure air-water system}
- 2003/0446 . . {with a single air duct for transporting treated air from the central station to the rooms}
- 2003/0448 . . {with two air ducts for separately transporting treated hot and cold air from the central station to the rooms}
- 3/048 . . with temperature control at constant rate of air-flow ([F24F 3/056 takes precedence](#))
- 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
- 3/0522 {in which warm or cold air from the central station is delivered via individual pipes to mixing chambers in the space to be treated, the cold air/warm air ratio being controlled by a thermostat in the space concerned, i.e. so-called Dual-duct System}
- 3/0525 {in which the air treated in the central station is reheated; this 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}
- 3/0527 {in which treated air having differing temperatures is conducted through independent conduits from the central station to various spaces to be treated, i.e. so-called "multi-Zone" system; ([F24F 3/0525 takes precedence](#))}

- 3/056 . . the air at least partially flowing over lighting fixtures, the heat of which is dissipated or used
- 3/06 . characterised by the arrangements for the supply of heat-exchange fluid for the subsequent treatment of primary air in the room units ([F24F 3/02](#) takes precedence {Arrangement or assembly of components for the regulation of the supply of heating or cooling media for the secondary treatment of air [F24F 11/06](#)})
- 3/065 . . {with a plurality of evaporators or condensers}
- 3/08 . . with separate supply and return lines for hot and cold heat-exchange fluids {i.e. so-called "4-conduit" system}
- 3/10 . . with separate supply lines and common return line for hot and cold heat-exchange fluids {i.e. so-called "3-conduit" system}
- 3/12 . characterised by the treatment of the air otherwise than by heating and cooling ([F24F 3/02](#), [F24F 3/06](#) take precedence, apparatus for the individual treatment, [see the appropriate subclasses for the treatments](#))
- 3/14 . . by humidification; by dehumidification
- 3/1405 . . . {in which the humidity of the air is exclusively affected by contact with the evaporator of a closed-circuit cooling system or heat pump circuit}
- 3/1411 . . . {by absorbing or adsorbing water, e.g. using an hygroscopic desiccant}
- 3/1417 {with liquid hygroscopic desiccants}
- 3/1423 {with a moving bed of solid desiccants, e.g. a rotary wheel supporting solid desiccants}
- 3/1429 {alternatively operating a heat exchanger in an absorbing/adsorbing mode and a heat exchanger in a regeneration mode}
- 2003/1435 . . . {comprising semi-permeable membrane}
- 2003/144 . . . {by dehumidification only}
- 2003/1446 {by condensing}
- 2003/1452 {heat extracted from the humid air for condensing is returned to the dried air}
- 2003/1458 . . . {using regenerators}
- 2003/1464 {using rotating regenerators}
- 3/147 . . . with both heat and humidity transfer between supplied and exhausted air
- 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
- 3/16 . . by purification, e.g. by filtering; by sterilisation; by ozonisation {([ion sources H01J 27/02](#), [H01J 37/08](#); treatment rooms or enclosures for medical purposes [A61G 10/00](#))}
- 3/1603 . . . {by filtering (arrangements or mounting of filters [F24F 13/28](#))}
- 3/1607 {Clean air work stations, i.e. selected areas within a space to which filtered air is passed (means providing sterile air at a surgical operation table or area [A61G 13/108](#))}
- 3/161 {Clean rooms, i.e. enclosed spaces in which a uniform flow of filtered air is distributed (air distribution by perforated walls [F24F 7/10](#); dust-free rooms or enclosures applicable solely to laboratory purposes [B01L 1/04](#))}
- 2003/1614 {using a dry filtering element}
- 2003/1617 {using wet filtering methods}
- 2003/1621 {using chemical filtering methods}
- 2003/1625 {using active carbon}
- 2003/1628 {using catalytic reaction}
- 2003/1632 {using vortex}
- 2003/1635 {using high voltage}
- 2003/1639 {with filter cleaning}
- 2003/1642 {of pollen, to avoid allergies}
- 2003/1646 {of tobacco smoke}
- 2003/165 {of ozone}
- 2003/1653 {using biofilters, plants or microorganisms}
- 2003/1657 {the air pollution of a street or a city}
- 3/166 . . . {using electric means, e.g. applying electrostatic field ([using thermo-electric means F24F 5/0042](#))}
- 2003/1664 . . . {by sterilisation}
- 2003/1667 {using UV light}
- 2003/1671 {using ozone}
- 2003/1675 {using a sterilising medium}
- 2003/1678 {to avoid the Legionella bacteria}
- 2003/1682 . . . {by ionisation}
- 2003/1685 . . . {by ozonisation}
- 2003/1689 . . . {by odourising}
- 2003/1692 . . . {by adding oxygen}
- 2003/1696 . . . {by removing radon}
- 5/00 Air-conditioning systems or apparatus not covered by [F24F 1/00](#) or [F24F 3/00](#) {, e.g. using solar heat; combined with household units such as an oven or water heater}**
- 5/0003 . {Exclusively-fluid systems}
- 5/0007 . {cooling apparatus specially adapted for use in air-conditioning ([self-contained room units F24F 1/02](#); [F24F 5/0046](#) takes precedence; air-humidification [F24F 6/00](#))}
- 5/001 . . {Compression cycle type}
- 5/0014 . . {using absorption or desorption}
- 5/0017 . . {using cold storage bodies, e.g. ice}
- 5/0021 . . . {using phase change material [PCM] for storage}
- 2005/0025 . . . {using heat exchange fluid storage tanks}
- 2005/0028 . . . {using hydridable metals as energy storage media}
- 2005/0032 . . . {Systems storing energy during the night}
- 5/0035 . . {using evaporation}
- 2005/0039 . . {using a cryogen, e.g. CO₂ liquid or N₂ liquid}
- 5/0042 . {characterised by the application of thermo-electric units or the Peltier effect ([refrigerators and cooling systems using magnetic or electrical effects in general F25B 21/02](#); for semi-conductors [H01L 23/38](#); thermobatteries or thermogenerators [H01L 35/00](#))}
- 5/0046 . {using natural energy, e.g. solar energy, energy from the ground}
- 5/005 . . {using energy from the ground by air circulation, e.g. "Canadian well"}
- 2005/0053 . . {receiving heat-exchange fluid from a well}
- 2005/0057 . . {receiving heat-exchange fluid from a closed circuit in the ground}
- 2005/006 . . {receiving heat-exchange fluid from the drinking or sanitary water supply circuit}
- 2005/0064 . . {using solar energy}
- 2005/0067 . . . {with photovoltaic panels}
- 5/0071 . {adapted for use in covered swimming pools}

- 5/0075 . {Systems using thermal walls, e.g. double window (double windows [per se E06B](#))}
- 2005/0078 . . {Double windows}
- 2005/0082 . . {Facades}
- 5/0085 . {Systems using a compressed air circuit (B64D 13/00, B60H take precedence)}
- 5/0089 . {Systems using radiation from walls or panels}
- 5/0092 . . {ceilings, e.g. cool ceilings}
- 5/0096 . {combined with domestic apparatus}
- 6/00 Air-humidification, e.g. for increasing comfort in living spaces by "room humidifiers" {cooling by humidification}**
 - 2006/001 . {using a water curtain}
 - 2006/003 . {using a decorative fountain}
 - 2006/005 . {using plants}
 - 2006/006 . {with water treatment}
 - 2006/008 . {Air-humidifier with water reservoir}
 - 6/02 . by evaporation of water in the air {(humidifiers specially adapted for radiators [see F24D 19/008](#))}
 - 6/025 . . {using electrical heating means (F24F 6/105 takes precedence)}
 - 6/04 . . using stationary unheated wet elements
 - 6/043 . . . {with self-sucking action, e.g. wicks (humidifiers for radiators [F24D 19/008](#))}
 - 2006/046 . . . {with a water pump}
 - 6/06 . . using moving unheated wet elements
 - 2006/065 . . . {using slowly rotating discs for evaporation}
 - 6/08 . . using heated wet elements
 - 6/10 . . . heated electrically
 - 6/105 {using the heat of lamps}
 - 6/12 . by forming water dispersions in the air
 - 6/14 . . using nozzles (nozzles [per se](#), spraying in general [B05B](#))
 - 2006/143 . . . {using pressurised air for spraying}
 - 2006/146 . . . {using pressurised water for spraying}
 - 6/16 . . using rotating elements
 - 6/18 . by injection of steam into the air
- 7/00 Ventilation, {e.g. by means of wall-ducts; systems using window or roof apertures}**
 - 2007/001 . {with exhausting air ducts}
 - 2007/002 . . {Junction box, e.g. for ducts from kitchen, toilet or bathroom}
 - 2007/003 . {using vent ports in a wall}
 - 2007/004 . {Natural ventilation using convection}
 - 2007/005 . {Cyclic ventilation, e.g. alternating air supply volume or reversing flow direction (F24F 2012/008 takes precedence when there is heat exchange between exhaust and supply air)}
 - 7/007 . with forced flow (using ducting systems [F24F 7/06](#))
 - 7/013 . . using wall or window fans, displacing air through the wall or window {possibly through a grill or through a shutter or flap (with heating elements [F24F 3/00](#) - [F24F 3/14](#); ventilators with provision for recirculating air or piping it away [F24F 7/06](#); room ventilators, portable ventilators [F04D 25/08](#))}
 - 7/02 . Roof ventilation ([F24F 7/007](#) takes precedence; ventilation of roof coverings [E04D](#))
 - 7/025 . . {with forced air circulation by means of a built-in ventilator}
 - 7/04 . with ducting systems {also by double walls; with natural circulation ([F24F 7/02](#) takes precedence)}
- 7/06 . . with forced air circulation, e.g. by fan {positioning of a ventilator in or against a conduit (ventilators [per se F04D 25/08](#))}
- 7/065 . . . {fan combined with single duct; mounting arrangements of a fan in a duct (construction of fans [F04D](#))}
- 7/08 . . . with separate ducts for supplied and exhausted air {with provisions for reversal of the input and output systems}
- 7/10 . . . with air supply, or exhaust, through perforated wall, floor or ceiling, (outlet members for directing or distributing air {into rooms or spaces, e.g. ceiling air-diffusers} [F24F 13/06](#))
- 9/00 Use of air currents for screening, e.g. air curtain (air curtains for vehicles [B60J 9/04](#))**
 - 2009/002 . {Room dividers}
 - 2009/005 . {combined with a door}
 - 2009/007 . {using more than one jet or band in the air curtain}

Common features or details

- 11/00 Control or safety systems or apparatus ({extinguishing or preventing fire [A62C 3/14](#); control valves [per se F16K](#); humidity control [G05D 22/00](#))}**
 - 11/0001 . {for ventilation ([F24F 11/0009](#) takes precedence)}
 - 2011/0002 . . {for admittance of outside air}
 - 2011/0004 . . . {to create overpressure in a room}
 - 2011/0005 . . . {to create underpressure in a room, keeping contamination inside}
 - 2011/0006 . . {using low temperature external supply air to assist cooling}
 - 11/0008 . {for air-humidification ([F24F 11/0009](#) takes precedence)}
 - 11/0009 . {Electrical control or safety systems or apparatus}
 - 11/001 . . {Control systems or circuits characterised by their inputs, e.g. using sensors}
 - 11/0012 . . . {Air temperature}
 - 2011/0013 {of the outside air}
 - 11/0015 . . . {Air humidity}
 - 2011/0016 {of the outside air}
 - 11/0017 . . . {Air quality properties}
 - 2011/0019 {of the outside air}
 - 2011/002 {Odor concentration}
 - 2011/0021 {Ozone concentration}
 - 2011/0023 {Concentration of air-borne particles}
 - 2011/0024 {Tobacco smoke}
 - 2011/0026 {Carbon dioxide concentration}
 - 2011/0027 {Carbon monoxide concentration}
 - 2011/0028 {Oxygen concentration}
 - 2011/003 {Radon concentration}
 - 2011/0031 {Electric charge}
 - 2011/0032 {Volatile organic compound [VOC]}
 - 11/0034 . . . {Occupancy}
 - 2011/0035 {Position of occupants}
 - 2011/0036 {Activity of occupants}
 - 2011/0038 . . . {Air velocity}
 - 2011/0039 {of the outside air}
 - 2011/0041 . . . {Pressure}
 - 2011/0042 {Air pressure}
 - 2011/0043 {Heat exchange fluid pressure}
 - 2011/0045 . . . {Heat exchange fluid temperature}
 - 2011/0046 . . . {Load}

2011/0047	. . . {Energy consumption}	11/06	. . solely for controlling the supply of heating or cooling fluids for secondary treatment (F24F 11/08 takes precedence)
2011/0049	. . . {Sunlight}	11/08	. . for controlling the primary treatment of air
2011/005	. . . {Artificial light}	11/085	. . . {in independent units}
2011/0052	. . . {Malfunction}	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; heat-exchange in general F28)
2011/0053	. . . {Sound}	12/001	. {with heat-exchange between supplied and exhausted air}
2011/0054	. . . {Condensate}	12/002	. . {using an intermediate heat-transfer fluid}
2011/0056	. . . {Damper state, e.g. open or closed}	12/003	. . . {using a heat pump}
2011/0057	. . . {using feedback from user}	2012/005	. . . {using heat pipes}
2011/0058	. . . {using weather information or forecast}	12/006	. . {using an air-to-air heat exchanger (F24F 12/002 takes precedence)}
11/006	. . {Control systems or circuits characterised by type of control, internal processing or calculations, e.g. using fuzzy logic adaptative control or estimating values}	2012/007	. . {using a by-pass for bypassing the heat-exchanger}
2011/0061	. . . {using electronic processing}	2012/008	. . {cyclic routing supply and exhaust air (F24F 2007/005 takes precedence when there is no heat exchange)}
2011/0063	. . . . {using pre-stored data}	13/00	Details common to, or for air-conditioning, air-humidification, ventilation or use of air currents for screening
2011/0064	. . . . {for selecting an operative mode}	13/02	. Ducting arrangements
2011/0065	. . . . . {Sleeping mode}	13/0209	. . {characterised by their connecting means, e.g. flanges}
2011/0067	. . . {using one central controller connected to several sub-controllers}	13/0218	. . {Flexible soft ducts, e.g. ducts made of permeable textiles}
2011/0068	. . . {using remote control device}	13/0227	. . {using parts of the building, e.g. air ducts inside the floor, walls or ceiling of a building (air ducts or channels of buildings E04F 17/04)}
2011/0069	. . . . {using a telephone line}	13/0236	. . {with ducts including air distributors, e.g. air collecting boxes with at least three openings}
2011/0071	. . . . {using internet communication}	13/0245	. . {Manufacturing or assembly of air ducts; Methods therefor}
2011/0072	. . . . {for programming}	13/0254	. . {characterised by their mounting means, e.g. supports}
2011/0073	. . . {using timers}	13/0263	. . {Insulation for air ducts}
2011/0075	. . . {for electric energy efficiency or saving}	13/0272	. . {Modules for easy installation or transport}
11/0076	. . {Control systems or circuits characterised by their outputs, e.g. using a variable flow fan}	13/0281	. . {Multilayer duct}
11/0078	. . . {controlling the angle of the air stream}	13/029	. . {Duct comprising an opening for inspection, e.g. manhole}
11/0079	. . . {controlling the speed of ventilators}	13/04	. . Air mixing units (F24F 13/06 takes precedence ; mixing gases in general B01F 3/02 {room units for the mixing of pre-treated primary air with recirculated or room air F24F 1/00 })
11/008	. . . {controlling the supply of heat-exchange fluid}	13/06	. . Outlets for directing or distributing air into rooms or spaces, e.g. ceiling air diffuser
2011/0082	. . . . {using a valve}	13/0604	. . . {integrated in or forming part of furniture}
2011/0083	. . . . {using a variable flow pump}	2013/0608	. . . {Perforated ducts}
2011/0084	. . . . {monitoring refrigerant leakage}	2013/0612	. . . {Induction nozzles without swirl means}
11/0086	. . {Control systems or circuits characterised by other control features, e.g. display or monitoring devices}	2013/0616	. . . {Outlets that have intake openings}
2011/0087	. . . {for defrosting}	13/062	. . . having one or more bowls or cones diverging in the flow direction (F24F 13/072 takes precedence)
2011/0089	. . . . {an outdoor unit}	13/065	. . . formed as cylindrical or spherical bodies which are rotatable (F24F 13/072 takes precedence)
2011/009	. . . . {an indoor unit}	13/068	. . . formed as perforated walls, ceilings or floors (F24F 13/078 takes precedence)
2011/0091	. . . {Display or monitoring devices}	13/072	. . . of elongated shape, e.g. between ceiling panels
2011/0093	. . . . {Devices monitoring filter performance}		
2011/0094	. . . . {for computing energy costs}		
2011/0095	. . . {Devices triggered by fire, excessive heat or smoke}		
2011/0097	. . . . {opening air passage in case of fire, excessive heat or smoke}		
2011/0098	. . . . {closing air passage in case of fire, excessive heat or smoke}		
11/02	. Arrangements or mounting of control or safety devices		
11/022	. . {for the control of flow conditions, e.g. pressure, velocity}		
11/025	. . . {characterised by velocity control}		
11/027	. . {exclusively for controlling the air supply to a heat-exchanger or the ancillary bypass (F24F 11/08 takes precedence)}		
11/04	. . solely for controlling the rate of air-flow (F24F 11/08 takes precedence)		
11/043	. . . {dependent on air-current or wind pressure (F24F 11/04 takes precedence)}		
11/047	. . . to constant value		
11/053	. . . by means responsive to temperature		

13/075	. . . having parallel rods or lamellae directing the outflow, e.g. the rods or lamellae being individually adjustable (F24F 13/072 takes precedence)
13/078	. . . combined with lighting fixtures (air-treatment systems with air-flow over lighting fixtures F24F 3/056)
13/08	. Air-flow control members, e.g. louvres, grilles, flaps, guide plates (F24F 13/06 takes precedence; roof ventilators F24F 7/02)
13/081	. . {for guiding air around a curve}
13/082	. . {Grilles, registers or guards}
13/084	. . . {with mounting arrangements, e.g. snap fasteners for mounting to the wall or duct}
13/085	. . . {including an air filter}
2013/087	. . . {using inflatable bellows}
2013/088	. . . {Air-flow straightener}
13/10	. . movable, e.g. damper (F24F 13/18 takes precedence; valves in general F16K)
13/105	. . . {composed of diaphragms or segments}
13/12	. . . built up of sliding members
13/14	. . . built up of tilting members, e.g. louver
13/1406	. . . . {characterised by sealing means}
13/1413	. . . . {using more than one tilting member, e.g. with several pivoting blades (F24F 13/15 takes precedence)}
13/142	. . . . {using pivoting blades with intersecting axles}
13/1426	. . . . {characterised by actuating means}
2013/1433	. . . . . {with electric motors}
2013/144	. . . . . {with thermoactuators}
2013/1446	. . . . . {with gearings}
2013/1453	. . . . . {with cables, e.g. bowden cables}
2013/146	. . . . . {with springs}
2013/1466	. . . . . {with pneumatic means}
2013/1473	. . . . . {with cams or levers}
2013/148	. . . . . {with magnets}
13/1486	. . . . {characterised by bearings, pivots or hinges}
2013/1493	. . . . {using an elastic membrane}
13/15	. . . . with parallel simultaneously tiltable lamellae
13/16	. . . built up of parallelly-movable plates
13/18	. . specially adapted for insertion in flat panels, e.g. in door or window-pane
13/20	. Casings or covers
2013/202	. . {Mounting a compressor unit therein}
2013/205	. . {Mounting a ventilator fan therein}
2013/207	. . {with control knobs; Mounting controlling members or control units therein}
13/22	. Means for preventing condensation or evacuating condensate {(for refrigerating devices in general F25D 21/14)}
2013/221	. . {to avoid the formation of condensate, e.g. dew}
13/222	. . {for evacuating condensate}
13/224	. . . {in a window-type room air conditioner}
2013/225	. . . {by evaporating the condensate in the cooling medium, e.g. in air flow from the condenser}
2013/227	. . . {Condensate pipe for drainage of condensate from the evaporator}
2013/228	. . {Treatment of condensate, e.g. sterilising}
13/24	. Means for preventing or suppressing noise {(in perforated ceilings F24F 7/10)}
2013/242	. . {Sound-absorbing material}
2013/245	. . {using resonance}

2013/247	. . {Active noise-suppression}
13/26	. Arrangements for air-circulation by means of induction, e.g. by fluid coupling or thermal effect
13/28	. Arrangement or mounting of filters
13/30	. Arrangement or mounting of heat-exchangers
13/32	. Supports for air-conditioning, air-humidification or ventilation units

2203/00 Devices or apparatus used for air treatment

2203/02	. System or Device comprising a heat pump as a subsystem, e.g. combined with humidification/dehumidification, heating, natural energy or with hybrid system
2203/021	. . Compression cycle
2203/023	. . . with turbine used for expansion
2203/025	. . . with turbine for compression
2203/026	. . Absorption - desorption cycle
2203/028	. . . using a solid absorbing medium
2203/10	. Rotary wheel
2203/1004	. . Bearings or driving means
2203/1008	. . comprising a by-pass channel
2203/1012	. . Details of the casing or cover
2203/1016	. . combined with another type of cooling principle, e.g. compression cycle
2203/102	. . combined with a heat pipe
2203/1024	. . combined with a humidifier
2203/1028	. . combined with a spraying device
2203/1032	. . Desiccant wheel
2203/1036	. . . Details
2203/104	. . Heat exchanger wheel
2203/1044	. . performing other movements, e.g. sliding
2203/1048	. . Geometric details
2203/1052	. . comprising a non-axial air flow
2203/1056	. . comprising a reheater
2203/106	. . . Electrical reheater
2203/1064	. . . Gas fired reheater
2203/1068	. . comprising one rotor
2203/1072	. . comprising two rotors
2203/1076	. . comprising three rotors
2203/108	. . comprising rotor parts shaped in sector form
2203/1084	. . comprising two flow rotor segments
2203/1088	. . comprising three flow rotor segments
2203/1092	. . comprising four flow rotor segments
2203/1096	. . comprising sealing means
2203/12	. Dehumidifying or humidifying belt type

Air-conditioning

2221/00 Details or features not otherwise provided for

2221/02	. combined with lighting fixtures
2221/08	. Installation or apparatus for use in sport halls, e.g. swimming pools, ice rings
2221/10	. combined with, or integrated in, furniture
2221/12	. transportable
2221/125	. . mounted on wheels
2221/14	. . mounted on the ceiling
2221/16	. . mounted on the roof
2221/17	. . mounted in a wall
2221/18	. . combined with domestic apparatus
2221/183	. . combined with a hot-water boiler
2221/186	. . combined with a fireplace

- 2221/20 . mounted in or close to a window
- 2221/22 . Cleaning ducts or apparatus
- 2221/225 . . using a liquid
- 2221/26 . improving the aesthetic appearance
- 2221/28 . using the Coanda effect
- 2221/30 . comprising fireproof material
- 2221/32 . preventing human errors during the installation, use or maintenance, e.g. goofy proof
- 2221/34 . Heater, e.g. gas burner, electric air heater
- 2221/36 . Modules, e.g. for an easy mounting or transport
- 2221/38 . Personalised air distribution
- 2221/40 . HVAC with raised floors
- 2221/42 . Mobile autonomous air conditioner, e.g. robots
- 2221/44 . Protection from terrorism or theft
- 2221/46 . Air flow forming a vortex
- 2221/48 . HVAC for a wine cellar
- 2221/50 . HVAC for high buildings, e.g. thermal or pressure differences
- 2221/52 . Weather protecting means, e.g. against wind, rain or snow
- 2221/54 . Heating and cooling, simultaneously or alternatively
- 2221/56 . Cooling being a secondary aspect