

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

TRANSPORTING

B60 VEHICLES IN GENERAL

(NOTE omitted)

B60H ARRANGEMENTS OF HEATING, COOLING, VENTILATING OR OTHER AIR-TREATING DEVICES SPECIALLY ADAPTED FOR PASSENGER OR GOODS SPACES OF VEHICLES

NOTE

Attention is drawn to the Note following the title of class [B60](#)

WARNING

{In this subclass, non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

1/00 Heating, cooling or ventilating devices

NOTE

In this group and its subgroups, as well as in patent documents, the following abbreviation is used:

- HVAC Heating, Ventilating and Air Conditioning

1/00007	. {Combined heating, ventilating, or cooling devices (control systems or mechanisms B60H 1/00642)}	2001/00157	. . . . {without by-pass}
1/00014	. . {for load cargos on load transporting vehicles}	2001/00164	. . . . {with more than one by-pass}
1/00021	. . {Air flow details of HVAC devices}	2001/00171	. . . . {Valves on heaters for modulated liquid flow}
1/00028	. . . {Constructional lay-out of the devices in the vehicle}	2001/00178	. . . . {comprising an air passage from the HVAC box to the exterior of the cabin}
1/00035	. . . {for sending an air stream of uniform temperature into the passenger compartment}	2001/00185	. . . {Distribution of conditioned air}
1/00042	. . . . {the air passing only one heat exchanger}	2001/00192	. . . . {to left and right part of passenger compartment}
1/0005	. . . . {the air being firstly cooled and subsequently heated or <i>vice versa</i> }	2001/002	. . . . {to front and rear part of passenger compartment}
1/00057	. . . . {the air being heated and cooled simultaneously, e.g. using parallel heat exchangers}	1/00207	. . {characterised by the position of the HVAC devices with respect to the passenger compartment (B60H 1/00021 takes precedence)}
1/00064	. . . {for sending air streams of different temperatures into the passenger compartment}	2001/00214	. . . {Devices in front of the passenger compartment}
1/00071	. . . . {the air passing only one heat exchanger}	2001/00221	. . . {Devices in the floor or side wall area of the passenger compartment}
2001/00078	. . . {Assembling, manufacturing or layout details}	2001/00228	. . . {Devices in the interior of the passenger compartment}
2001/00085	. . . . {of air intake}	2001/00235	. . . {Devices in the roof area of the passenger compartment}
2001/00092	. . . . {of air deflecting or air directing means inside the device}	2001/00242	. . . {Devices in the rear area of the passenger compartment}
2001/00099	. . . . {comprising additional ventilating means}	1/0025	. {the devices being independent of the vehicle}
2001/00107	. . . . {characterised by the relative position of the heat exchangers, e.g. arrangements leading to a curved airflow}	1/00257	. . {Non-transportable devices, disposed outside the vehicle, e.g. on a parking}
2001/00114	. . . {Heating or cooling details}	1/00264	. . {Transportable devices}
2001/00121	. . . . {More than one heat exchanger in parallel}	1/00271	. {HVAC devices specially adapted for particular vehicle parts or components and being connected to the vehicle HVAC unit}
2001/00128	. . . . {Electric heaters}	1/00278	. . {for the battery}
2001/00135	. . . . {Deviding walls for separate air flows}	1/00285	. . {for vehicle seats}
2001/00142	. . . . {first heating and then cooling}	1/00292	. . {for steering wheels}
2001/0015	. . . {Temperature regulation}	1/00295	. . {for trim components, e.g. panels, dashboards, liners}
		2001/003	. . {Component temperature regulation using an air flow}

- 2001/00307 . . {Component temperature regulation using a liquid flow}
- 1/00314 . {Arrangements permitting a rapid heating of the heating liquid ([B60H 1/00492](#), [B60H 1/03](#) take precedence)}
- 1/00321 . {Heat exchangers for air-conditioning devices ([B60H 1/3227](#) takes precedence)}
- 1/00328 . . {of the liquid-air type}
- 1/00335 . . {of the gas-air type ([B60H 1/18](#) takes precedence)}
- 1/00342 . . {of the liquid-liquid type}
- 2001/0035 . . {movable in and out of the air stream}
- 1/00357 . {Air-conditioning arrangements specially adapted for particular vehicles}
- 1/00364 . . {for caravans or trailers}
- 1/00371 . . {for vehicles carrying large numbers of passengers, e.g. buses}
- 1/00378 . . {for tractor or load vehicle cabins}
- 1/00385 . . {for vehicles having an electrical drive, e.g. hybrid or fuel cell}
- 1/00392 . . . {for electric vehicles having only electric drive means}
- 1/004 . . . {for vehicles having a combustion engine and electric drive means, e.g. hybrid electric vehicles}
- 1/00407 . . {for open or convertible vehicles}
- 1/00414 . . {for military, emergency, safety or security vehicles}
- 1/00421 . {Driving arrangements for parts of a vehicle air-conditioning ([B60H 1/3222](#) takes precedence)}
- 1/00428 . . {electric}
- 1/00435 . . {fluid or pneumatic}
- 1/00442 . . . {using a vacuum}
- 1/00445 . . {mechanical power take-offs from the vehicle propulsion unit}
- 1/00457 . {Ventilation unit, e.g. combined with a radiator ([control systems for ventilators B60H 1/00828](#))}
- 1/00464 . . {The ventilator being of the axial type}
- 1/00471 . . {The ventilator being of the radial type, i.e. with radial expulsion of the air}
- 1/00478 . {Air-conditioning devices using the Peltier effect}
- 1/00485 . {Valves for air-conditioning devices, e.g. thermostatic valves}
- 1/00492 . {comprising regenerative heating or cooling means, e.g. heat accumulators}
- 1/00499 . . {Heat or cold storage without phase change including solid bodies, e.g. batteries}
- 1/005 . . {Regenerative cooling means, e.g. cold accumulators}
- 1/00507 . {Details, e.g. mounting arrangements, desaeration devices ([B60H 1/32](#) takes precedence)}
- 1/00514 . . {Details of air conditioning housings}
- 1/00521 . . . {Mounting or fastening of components in housings, e.g. heat exchangers, fans, electronic regulators}
- 1/00528 . . . {Connections between housing parts}
- 1/00535 . . . {Mounting or fastening of the housing to the vehicle}
- 1/00542 . . . {Modular assemblies}
- 1/0055 . . . {the housing or parts thereof being integrated in other devices, e.g. dashboard}
- 1/00557 . . {Details of ducts or cables}
- 1/00564 . . . {of air ducts}
- 1/00571 . . . {of liquid ducts, e.g. for coolant liquids or refrigerants}
- 1/00578 . . . {of bowden wires}
- 1/00585 . . {Means for monitoring, testing or servicing the air-conditioning}
- 1/00592 . . {Add-on devices, e.g. heat/cooling boxes, compartment dividers, upgrade sets}
- 2001/006 . . {Noise reduction}
- 2001/00607 . . {Recycling}
- 2001/00614 . . {Cooling of electronic units in air stream}
- 2001/00621 . . {Fastening lids on air-conditioning housings}
- 2001/00628 . . {Adaption for left or right hand drive}
- 2001/00635 . . {Air-tight sealing devices}
- 1/00642 . {Control systems or circuits; Control members or indication devices for heating, cooling or ventilating devices ([B60H 1/3201](#) - [B60H 1/3208](#), [B60H 1/3225](#) take precedence)}
- 1/0065 . . {Control members, e.g. levers or knobs ([B60H 1/00985](#) takes precedence)}
- 1/00657 . . . {Remote control devices}
- 1/00664 . . {Construction or arrangement of damper doors ([control systems or circuits for damper doors B60H 1/00835](#))}
- 1/00671 . . . {Damper doors moved by rotation; Grilles}
- 1/00678 {the axis of rotation being in the door plane, e.g. butterfly doors}
- 1/00685 {the door being a rotating disc or cylinder or part thereof ([B60H 1/00678](#) takes precedence)}
- 1/00692 . . . {Damper doors moved by translation, e.g. curtain doors}
- 2001/007 . . . {Manufacturing or assembling}
- 2001/00707 . . . {Details of pivots of damper doors}
- 2001/00714 . . . {Details of seals of damper doors}
- 2001/00721 . . . {Air deflecting or air directing means}
- 2001/00728 . . . {Film doors}
- 1/0073 . . {Control systems or circuits characterised by particular algorithms or computational models, e.g. fuzzy logic or dynamic models}
- 2001/00733 . . . {Computational models modifying user-set values}
- 1/00735 . . {Control systems or circuits characterised by their input, i.e. by the detection, measurement or calculation of particular conditions, e.g. signal treatment, dynamic models}
- 1/00742 . . . {by detection of the vehicle occupants' presence; by detection of conditions relating to the body of occupants, e.g. using radiant heat detectors}
- 1/0075 . . . {the input being solar radiation}
- 1/00757 . . . {by the input of sound, e.g. by using a voice synthesizer}
- 1/00764 . . . {the input being a vehicle driving condition, e.g. speed ([B60H 1/00828](#), [B60H 1/00864](#) take precedence)}
- 1/00771 {the input being a vehicle position or surrounding, e.g. GPS-based position or tunnel}
- 1/00778 {the input being a stationary vehicle position, e.g. parking or stopping}
- 1/00785 . . . {by the detection of humidity or frost}
- 1/00792 . . . {Arrangement of detectors ([B60H 1/00742](#), [B60H 1/0075](#), [B60H 1/00785](#) take precedence)}

1/008	. . . {the input being air quality}	1/00964	. . {Control systems or circuits characterised by including features for automatic and non-automatic control, e.g. for changing from automatic to manual control}
1/00807	. . . {the input being a specific way of measuring or calculating an air or coolant temperature}	1/00971	. . {Control systems or circuits characterised by including features for locking or memorising of control modes}
1/00814	. . {Control systems or circuits characterised by their output, for controlling particular components of the heating, cooling or ventilating installation}	1/00978	. . {Control systems or circuits characterised by failure of detection or safety means; Diagnostic methods}
1/00821	. . . {the components being ventilating, air admitting or air distributing devices}	1/00985	. . {Control systems or circuits characterised by display or indicating devices, e.g. voice simulators (characterised by the input of sound using a voice synthesizer B60H 1/00757 ; B60H 1/00978 takes precedence)}
1/00828	. . . . {Ventilators, e.g. speed control (B60H 1/00864 takes precedence)}	1/02	. the heat being derived from the propulsion plant
1/00835	. . . . {Damper doors, e.g. position control (construction or arrangement of damper doors B60H 1/00664 ; B60H 1/00864 takes precedence)}	1/025	. . {from both the cooling liquid and the exhaust gases of the propulsion plant}
1/00842	. . . . . {the system comprising a plurality of damper doors; Air distribution between several outlets}	1/03	. . and from a source other than the propulsion plant
1/00849	. . . . . {for selectively commanding the induction of outside or inside air (B60H 1/00842 takes precedence)}	1/032	. . . {from the cooling liquid of the propulsion plant and from a burner}
1/00857	. . . . . {characterised by the means connecting the initiating means, e.g. control lever, to the damper door}	1/034	. . . {from the cooling liquid of the propulsion plant and from an electric heating device}
1/00864	. . . . . {Ventilators and damper doors}	1/036	. . . {from the plant exhaust gases and from a burner}
1/00871	. . . . . {Air directing means, e.g. blades in an air outlet (construction of nozzles or air diffusers B60H 1/34)}	1/038	. . . {from the cooling liquid of the propulsion plant and from a viscous fluid heater}
1/00878	. . . {the components being temperature regulating devices}	1/039	. . . {from air leaving the interior of the vehicle, i.e. heat recovery}
1/00885	. . . . {Controlling the flow of heating or cooling liquid, e.g. valves or pumps (B60H 1/00899 takes precedence; constructions of valves B60H 1/00485)}	1/04	. . from cooling liquid of the plant {(B60H 1/025 , B60H 1/03 take precedence)}
1/00892	. . . . {Devices specially adapted for avoiding uncomfortable feeling, e.g. sudden temperature changes (B60H 1/00885 takes precedence)}	1/06	. . . directly from main radiator
1/00899	. . . . {Controlling the flow of liquid in a heat pump system (controlling the properties of the refrigerant liquid, e.g. pressure or temperature, B60H 1/3204)}	1/08	. . . from other radiator than main radiator
1/00907	. . . . . {where the flow direction of the refrigerant changes and an evaporator becomes condenser}	1/10	. . . . the other radiator being situated in a duct capable of being connected to atmosphere outside vehicle
1/00914	. . . . . {where the flow direction of the refrigerant does not change and there is a bypass of the condenser}	1/12	. . . . . using an air blower
1/00921	. . . . . {where the flow direction of the refrigerant does not change and there is an extra subcondenser, e.g. in an air duct}	1/14	. . other than from cooling liquid of the plant
2001/00928	. . . . . {comprising a secondary circuit}	1/143	. . . {the heat being derived from cooling an electric component, e.g. electric motors, electric circuits, fuel cells or batteries}
2001/00935	. . . . . {comprising four way valves for controlling the fluid direction}	2001/146	. . . {from a viscous fluid heater}
2001/00942	. . . . . {comprising a plurality of heat exchangers, e.g. for multi zone heating or cooling}	1/16	. . . the air being heated by direct contact with the plant, e.g. air-cooled motor
2001/00949	. . . . . {comprising additional heating/cooling sources, e.g. second evaporator}	1/18	. . . the air being heated from the plant exhaust gases {(B60H 1/025 takes precedence)}
2001/00957	. . . . . {comprising locations with heat exchange within the refrigerant circuit itself, e.g. cross-, counter-, or parallel heat exchange}	1/20	. . . . using an intermediate heat-transferring medium
2001/00961	. . . . . {comprising means for defrosting outside heat exchangers}	1/22	. the heat source being other than the propulsion plant {(B60H 1/00492 takes precedence)}
		1/2203	. . {the heat being derived from burners}
		1/2206	. . . {controlling the operation of burners}
		1/2209	. . . {arrangements of burners for heating an intermediate liquid (B60H 1/032 takes precedence)}
		1/2212	. . . {arrangements of burners for heating air}
		1/2215	. . {the heat being derived from electric heaters}
		1/2218	. . . {controlling the operation of electric heaters}
		1/2221	. . . {arrangements of electric heaters for heating an intermediate liquid (B60H 1/034 takes precedence)}
		1/2225	. . . {arrangements of electric heaters for heating air}
		1/2226	. . . {Electric heaters using radiation}

1/2227	. . . {Electric heaters incorporated in vehicle trim components, e.g. panels or linings}	1/32	. Cooling devices (B60H 1/00478 , B60H 1/005 take precedence)
2001/2228	. . {controlling the operation of heaters}	1/3201	. . {using absorption or adsorption}
2001/2231	. . . {for proper or safe operation of the heater}	1/32011	. . . {using absorption, e.g. using Li-Br and water}
2001/2234	. . . {when vehicle is parked, preheating}	1/32014	. . . {using adsorption, e.g. using Zeolite and water}
2001/2237	. . . {supplementary heating, e.g. during stop and go of a vehicle}	1/3202	. . {using evaporation, i.e. not including a compressor, e.g. involving fuel or water evaporation}
2001/224	. . . {automatic operation, e.g. control circuits or methods}	1/3204	. . {using compression (B60H 1/3233 takes precedence)}
2001/2243	. . . {manual operation, e.g. remote control or timer}	1/3205	. . . {Control means therefore}
2001/2246	. . {obtaining information from a variable, e.g. by means of a sensor}	1/3207	. . . . {for minimizing the humidity of the air}
2001/225	. . . {related to an operational state of another HVAC device}	1/3208	. . . . {Vehicle drive related control of the compressor drive means, e.g. for fuel saving purposes}
2001/2253	. . . {related to an operational state of the vehicle or a vehicle component}	1/321	. . . . {for preventing the freezing of a heat exchanger}
2001/2256	. . . {related to the operation of the heater itself, e.g. flame detection or overheating}	1/3211	. . . . {for increasing the efficiency of a vehicle refrigeration cycle}
2001/2259	. . {output of a control signal}	1/3213	. . . . {for increasing the efficiency in a vehicle heat pump}
2001/2262	. . . {related to the period of on/off time of the heater}	1/3214	. . . . {for improving the lubrication of a refrigerant compressor in a vehicle}
2001/2265	. . . {related to the quantity of heat produced by the heater}	1/3216	. . . . {for improving a change in operation duty of a compressor in a vehicle}
2001/2268	. . {Constructional features}	1/3217	. . . . {for high pressure, inflammable or poisonous refrigerants causing danger in case of accidents}
2001/2271	. . . {Heat exchangers, burners, ignition devices}	1/3219	. . . . {for improving the response time of a vehicle refrigeration cycle}
2001/2275	. . . {Thermoelectric converters for generating electrical energy}	1/322	. . . . {for improving the stop or idling operation of the engine}
2001/2278	. . . {Connectors, water supply, housing, mounting brackets}	1/3222	. . . {characterised by the compressor driving arrangements, e.g. clutches, transmissions or multiple drives (B60H 1/3208 , B60H 1/3226 take precedence)}
2001/2281	. . . {Air supply, exhaust systems}	1/3223	. . . {characterised by the arrangement or type of the compressor (B60H 1/3222 takes precedence)}
2001/2284	. . . {Fuel supply}	1/3225	. . . {characterised by safety arrangements, e.g. compressor anti-seizure means or by signalling devices}
2001/2287	. . . {Integration into a vehicle HVAC system or vehicle dashboard (B60H 2001/00128 takes precedence)}	1/3226	. . . {Self-contained devices, i.e. including own drive motor}
2001/229	. . . {Integration into an air outlet}	1/3227	. . . {characterised by the arrangement or the type of heat exchanger, e.g. condenser, evaporator (condensed liquid drainage means B60H 1/3233)}
2001/2293	. . . {Integration into other parts of a vehicle}	1/3228	. . . {characterised by refrigerant circuit configurations}
2001/2296	. . . {integration into fluid/air heat exchangers}	1/32281	. . . . {comprising a single secondary circuit, e.g. at evaporator or condenser side}
1/24	. Ventilating devices where the heating or cooling is irrelevant (nozzles or air-diffusers B60H 1/34)	1/32284	. . . . {comprising two or more secondary circuits, e.g. at evaporator and condenser side}
1/241	. . {characterised by the location of ventilation devices in the vehicle}	1/3229	. . . {characterised by constructional features, e.g. housings, mountings, conversion systems (B60H 1/3227 , B60H 1/3233 take precedence)}
1/242	. . . {located in the front area}	1/323	. . . {characterised by comprising auxiliary or multiple systems, e.g. plurality of evaporators, or by involving auxiliary cooling devices}
1/243	. . . {located in the lateral area (e.g. doors, pillars)}	1/3232	. . . {particularly adapted for load transporting vehicles (B60H 1/3226 takes precedence)}
1/244	. . . {located in the rear area}	1/3233	. . {characterised by condensed liquid drainage means}
1/245	. . . {located in the roof}		
1/246	. . . {located in the interior of the vehicle or in or below the floor}		
1/247	. . {Disposition of several air-diffusers in a vehicle for ventilation-air circulation in a vehicle cabin}		
1/248	. . {Air-extractors, air-evacuation from the vehicle interior}		
1/249	. . . {using one-way valves}		
1/26	. . Ventilating openings in vehicle exterior; Ducts for conveying ventilating air		
1/262	. . . {Openings in or on the vehicle roof}		
1/265	. . . {Openings in window or door posts or pillars (B60H 1/248 takes precedence)}		
1/267	. . . {Openings in or near to vehicle windows}		
1/28	. . . the openings being situated directly in front of vehicle front window		
1/30	. . . Air scoops		

- 1/32331 . . . {comprising means for the use of condensed liquid, e.g. for humidification or for improving condenser performance}
- 1/3235 . . {using sublimation, e.g. dry ice cooling or melting ice}
- 2001/3236 . . {information from a variable is obtained}
- 2001/3238 . . . {related to the operation of the compressor}
- 2001/3239 . . . {related to flow}
- 2001/3241 {of air}
- 2001/3242 {of a refrigerant}
- 2001/3244 . . . {related to humidity}
- 2001/3245 {of air}
- 2001/3247 {of a refrigerant}
- 2001/3248 . . . {related to pressure}
- 2001/325 {of the refrigerant at a compressing unit}
- 2001/3251 {of the refrigerant at a condensing unit}
- 2001/3252 {of the refrigerant at an evaporating unit}
- 2001/3254 {of the refrigerant at an expansion unit}
- 2001/3255 . . . {related to temperature}
- 2001/3257 {of the refrigerant at a compressing unit}
- 2001/3258 {of the air at a condensing unit}
- 2001/326 {of the refrigerant at a condensing unit}
- 2001/3261 {of the air at an evaporating unit}
- 2001/3263 {of the refrigerant at an evaporating unit}
- 2001/3264 {of the refrigerant at an expansion unit}
- 2001/3266 . . . {related to the operation of the vehicle}
- 2001/3267 . . . {related to the operation of an expansion valve}
- 2001/3269 . . {output of a control signal}
- 2001/327 . . . {related to a compressing unit}
- 2001/3272 {to control the revolving speed of a compressor}
- 2001/3273 {related to the operation of the vehicle, e.g. the compressor driving torque}
- 2001/3275 {to control the volume of a compressor}
- 2001/3276 . . . {related to a condensing unit}
- 2001/3277 {to control the air flow}
- 2001/3279 {to control the refrigerant flow}
- 2001/328 . . . {related to an evaporating unit}
- 2001/3282 {to control the air flow}
- 2001/3283 {to control the refrigerant flow}
- 2001/3285 . . . {related to an expansion unit}
- 2001/3286 . . {Constructional features}
- 2001/3288 . . . {Additional heat source}
- 2001/3289 . . . {Additional cooling source}
- 2001/3291 . . . {Locations with heat exchange within the refrigerant circuit itself}
- 2001/3292 . . . {Compressor drive is electric only}
- 2001/3294 . . . {Compressor drive is hybrid}
- 2001/3295 . . . {Compressing means other than compressor}
- 2001/3297 . . . {Expansion means other than expansion valve}
- 2001/3298 . . . {Ejector-type refrigerant circuits}
- 1/34 . . . Nozzles; Air-diffusers
- 1/3407 . . {providing an air stream in a fixed direction, e.g. using a grid or porous panel}
- 1/3414 . . {with means for adjusting the air stream direction [\(B60H 1/345 takes precedence\)](#)}
- 1/3421 . . . {using only pivoting shutters}
- 1/3428 . . . {using a set of pivoting shutters and a pivoting frame}
- 1/3435 . . . {using only a pivoting frame}
- 1/3442 {the frame being spherical}
- 1/345 . . {with means for adjusting divergence, convergence or oscillation of air stream}
- 1/3457 . . {Outlets providing a vortex, i.e. a spirally wound air flow}
- 2001/3464 . . . {Details of hinges}
- 2001/3471 . . . {Details of actuators}
- 2001/3478 {acting on additional damper doors}
- 2001/3485 . . . {Air temperature regulation}
- 2001/3492 . . . {Manufacturing; Assembling}
- 3/00 Other air-treating devices**
- 3/0007 . . {Adding substances other than water to the air, e.g. perfume, oxygen}
- 3/0014 . . {characterised by the location of the substance adding device}
- 3/0021 . . . {in the air-conditioning housing}
- 3/0028 . . . {on or near an air outlet}
- 3/0035 . . {characterised by the control methods for adding the substance}
- 2003/0042 . . . {with ventilating means for adding the substances}
- 2003/005 . . . {with heating means for adding the substances}
- 2003/0057 . . . {Servicing means therefor, e.g. for renewal of substances}
- 2003/0064 . . . {adding more than one substance}
- 3/0071 . . {Electrically conditioning the air, e.g. by ionizing}
- 3/0078 . . . {comprising electric purifying means}
- 3/0085 . . {Smell or pollution preventing arrangements [\(B60H 3/0007, B60H 3/0071, B60H 3/02, B60H 3/06 take precedence\)](#)}
- 3/0092 . . . {in the interior of the HVAC unit, e.g. by spraying substances inside the unit}
- 3/02 . . . Moistening ; Humidity control}
- 3/022 . . . {for only humidifying the air}
- 3/024 . . . {for only dehumidifying the air}
- 2003/026 . . . {the devices being located in the passenger compartment}
- 2003/028 . . . {the devices comprising regeneration means}
- 3/06 . . . Filtering
- 3/0608 . . . {Filter arrangements in the air stream}
- 3/0616 {with provisions for replacing the filter element}
- 3/0625 {with provisions for by-passing the filter element}
- 3/0633 {with provisions for regenerating or cleaning the filter element}
- 3/0641 {near ventilating openings in the vehicle exterior}
- 2003/065 {Details for holding filter elements in position}
- 3/0658 . . . {Filter elements specially adapted for their arrangement in vehicles [\(B60H 3/0608 takes precedence\)](#)}
- 2003/0666 {the filter element having non-rectangular shape}
- 2003/0675 . . . {Photocatalytic filters}
- 2003/0683 . . . {the quality of the filter or the air being checked}
- 2003/0691 . . . {Adsorption filters, e.g. activated carbon}