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(54) Heat pump laundry treatment apparatus

(57) The present invention relates to a heat pump laundry treatment apparatus, in particular a heat pump laundry dryer or a heat pump washing machine having drying function.

A heat pump laundry treatment apparatus (1) according to the invention comprises a cabinet (2) that houses a rotatable laundry drum (3) for treating laundry using process air, the drum (3) being accessible by a user through a door (4) of the apparatus (1), wherein the laundry treatment apparatus (1) comprises: a basement (9) which constitutes a bottom portion of said cabinet (2) for supporting operational components for carrying out a drying process on laundry, a process air circuit (12) for circulating the process air through the drum (3), a heat pump assembly (14) having a refrigerant loop, in which the refrigerant fluid is circulated through a first and a second heat exchanger (15,16), the heat pump assembly (14) comprising a compressing device (17) that is received in a seat (8) formed in the basement (9) and that is removably fixed thereon. The apparatus of the invention is characterized in that the compressing device (17) is fixed to a bottom wall (31) of said basement (9) by at least one pin (20) which is integrally formed with the basement (9) bottom wall (31).

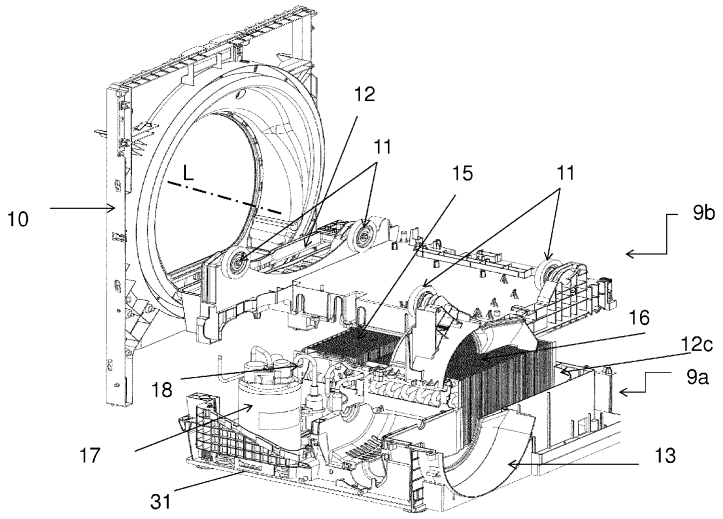

Figure 3

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Description

[0001] The present invention relates to a heat pump laundry treatment apparatus, in particular a heat pump laundry dryer or a heat pump washing machine having drying function.

[0002] As it is known, a heat pump type laundry dryer generally comprises a casing enclosing a rotatable drum whose inner region defines a laundry treating chamber where a drying process is carried out. The machine casing is closed at the bottom thereof by a basement having a lower surface facing the floor where the machine is to be placed and an upper surface provided with seats for receiving operational components provided for carrying out a drying process on laundry. A heat pump system, an electric motor, a fan, a drying air circuit (process air circuit) and other devices provided for operating the laundry apparatus are operational components of the machine. A heat pump system includes a closed refrigerant loop, a first heat exchanger acting as evaporator for evaporating the refrigerant and cooling process air, a compressing device, a second heat exchanger acting as condenser for cooling the refrigerant and heating the process air, and an expansion device from where the refrigerant is returned to the first heat exchanger.

[0003] Today's heat pump type laundry dryers are notable for their high drying capability and effective energy saving. Typically, when drying laundry, the compressing device of the heat pump is activated while the drum is rotated by a drive unit, the refrigerant is compressed and drying air (process air) is re-circulated through the drum by means of a process air circuit and a blower installed in such circuit. Thus, the process air exhausted from the drum is cooled and dehumidified by heat exchange carried out by the evaporator of the heat pump system. The dehumidified air is heated by heat exchange carried out by the condenser of the heat pump system and, subsequently, the heated and dried air is supplied into the drum for performing the laundry drying process. As a result, dry warm air is repeatedly supplied into the drum, whereby laundry is dried.

[0004] One of the basic components of heat pump tumble dryer is the compressing device. There are various types of compressing devices used in tumble dryer, including different shapes. The compressing device is usually placed in the dryer basement near the heat exchangers.

[0005] In a known embodiment, the compressing device is fixed onto a basement through a special plate, generally made in metal sheet, which acts as an interface between the compressing device and the basement, allowing a solid fixation. In other words, the compressing device is fixed onto the plate which, in turn, is fixed onto the basement. The special plate interface is specifically designed for each compressing device model. However, this solution is not convenient for the fact that the interface represents an additional device which is counterproductive in terms of weight, cost, complexity, and assembling time. Such plate is often the cause of undesired noise due to vibrations generated by the compressing device operation. Rubber vibration absorbers are generally provided between the plate interface and the compressing device but their noise reduction effect is not completely satisfying.

[0006] In another known embodiment, a heat-pump system is provided in which the compressing device is mounted, through first fastening means, on a bottom base element and a reinforcing plate made of metal that remains interposed between the compressing device and the bottom base element. Such bottom base element is in turn attached to the machine casing bottom portion with further second fastening means. A noise reduction cover is further placed onto the bottom base element for covering the compressing device. This arrangement is particularly complex because requires first to install and fix the heat pump components on the bottom base element and then to fix the bottom base element onto the basement of the dryer casing. In addition, when needed, the removal of the bottom base element from the bottom portion of the tumble dryer outer casing and/or the removal of the heat pump components from the bottom base element are particularly difficult and laborious. Therefore, there is the need for a less complicated solution.

[0007] Thus, there is further the need to have a reliable coupling between the compressing device and the basement, while reducing the number of components involved and the number of possible noise sources, such as the metal sheet interface support between the compressing device and the basement.

SUMMARY OF THE INVENTION

[0008] In compliance with the above aims, according to the present invention there is provided a heat pump laundry treatment apparatus, in particular a heat pump laundry dryer or a heat pump washing machine having drying function, comprising a cabinet that houses a rotatable laundry drum for treating laundry using process air, the drum being accessible by a user through a door of the apparatus. The laundry treatment apparatus of the present invention further comprises: - a basement which constitutes a bottom portion of said cabinet for supporting operational components for carrying out a drying process on laundry, - a process air circuit for circulating the process air through the drum, and - a heat pump assembly having a refrigerant loop, in which the refrigerant fluid is circulated through a first and a second heat exchanger, the heat pump comprising a compressing device that is received in a seat formed in the basement and is removably fixed thereon. The laundry treatment apparatus of the present invention is further characterized by the fact that the compressing device is fixed to a bottom wall of said basement by at least one pin which integrally formed with the basement bottom wall.

[0009] In the present invention, the term "bottom wall"

of said basement refers to the basement wall which rests on the floor where the heat pump laundry treatment apparatus is to be placed, wherein said bottom wall has a lower surface facing the floor and an upper surface being in the inner part of the cabinet.

[0010] In the present invention, the sentence term "at least one pin integrally formed with the basement bottom wall" refers to the fact that the at least one pin and said bottom wall of said basement are a single unitary piece. That means that the compressing device of the laundry treatment apparatus of the present invention is fixed to the bottom wall of said basement by at least one pin which is part of the basement bottom wall itself.

[0011] By the present invention the coupling between the compressing device and the basement is reliable and at the same time allows the reduction of the number of components involved and the number of possible noise sources, such as the metal sheet interface support between the compressing device and the basement. In addition, the number of components involved in the laundry treatment apparatus of the present invention is further reduced by the fact that the at least one pin is integrally formed with the basement bottom wall.

[0012] Furthermore, in the present invention, the term "operational components" refer to components which contribute to the good operation of the heat pump laundry treatment apparatus of the present invention and that are supported by the bottom portion of said cabinet. The operational components may include, for example, a process air fan; a portion of the process air circuit; a portion of the heat pump assembly; electric motors for rotating a laundry treatment chamber and/or a process air fan; a rotatable drum constituting the laundry treatment chamber, one or more control units or any other device, or portions thereof, operated for carrying out a drying treatment on laundry.

[0013] Furthermore and preferably, though not necessarily, the heat pump laundry treatment apparatus is **characterized in that** said basement bottom wall comprises an upper surface and a lower surface, said at least one pin protruding from one or both the upper and lower surface.

[0014] By this way, a proper mechanical resistance is further ensured against the vibrations generated by the compressing device when the apparatus of the present invention is working.

[0015] Furthermore and preferably, though not necessarily, said at least one pin is made of the same material in which said basement is made.

[0016] Furthermore and preferably, though not necessarily, said at least one pin and said basement are made by means of an injection molding process.

[0017] Furthermore and preferably, though not necessarily, said at least one pin comprises a housing for receiving a fastening device, the housing extending along the longitudinal axis of the pin.

[0018] Furthermore and preferably, though not necessarily, said fastening device is a screw threadly engaged or engageable in said housing.

[0019] Furthermore and preferably, though not necessarily, said housing contains an internally threaded portion engaging with said threadly engaged fastening device.

[0020] Furthermore and preferably, though not necessarily, said at least one pin acts as a support for a vibration damping element extending around the pin and interposed between the pin itself and the compressing device, preferably between the pin itself and a base portion of the compressing device.

[0021] Furthermore and preferably, though not necessarily, said vibration damping element comprise a first end in contact with the base of the compressing device and a second end in contact with an upper surface of the basement bottom wall carrying the at least one pin.

[0022] Furthermore and preferably, though not necessarily, said basement bottom wall comprises a lower surface that separates the cabinet from the ambient where the apparatus is placed.

[0023] Furthermore and preferably, though not necessarily, an air gap is formed between a lower surface of the basement bottom wall and the surface on which the apparatus stands.

[0024] Furthermore and preferably, though not necessarily, in said compressing device seat, said basement comprises reinforcement ribs that are shaped to retain the base of said compressing device in a stable position.

[0025] Furthermore and preferably, though not necessarily, said basement comprises seats for receiving a portion of the cabinet front wall.

[0026] Furthermore and preferably, though not necessarily, said basement comprises a lower shell and an upper shell associated on each other, wherein said upper shell comprises housings for receiving drum supporting means. Useful drum supporting means are, for example, supporting rollers which are located in pairs substantially at the two axial ends of the revolving drum, and are fixed in free revolving manner to the casing so as to allow the revolving drum to freely rotate about a reference axis inside the boxlike cabinet.

[0027] A non-limiting embodiment of the present invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows in a perspective view a heat pump laundry treatment apparatus realized in accordance with the teachings of the present invention, with parts removed for clarity;

Figure 2 shows an enlarged view of a lower internal part of the heat pump laundry treatment apparatus of Figure 1;

Figure 3 shows in a perspective view an internal part of the front panel and the upper half-shell and the lower half-shell of the supporting basement of the heat pump laundry treatment of Figure 1, with parts

removed for clarity;

Figure 4 is an enlarged view of one of the fixing elements for fixing the compressing device of Figure 3 to the basement, with some parts removed for clarity.

Figure 5 shows a sectional view of one of the fixing elements formed on the basement.

Figures 6 shows in perspective view the lower supporting base of the heat pump laundry treatment of Figure 1;

Figures 7 shows a plan view of the lower supporting base of the heat pump laundry treatment of Figure 1.

[0028] With reference to Figures 1 and 2, number 1 indicates as a whole a preferably household, heat pump laundry treatment apparatus which comprises:

a preferably, though not necessarily, parallelepiped-shaped outer boxlike casing 2 structured for resting on the floor;

a substantially cylindrical, revolving drum 3 structured for housing the laundry to be dried, and which is fixed in axially rotating manner inside the boxlike casing 2, directly facing a laundry loading/unloading through opening formed in the front wall of casing 2; and

a porthole door 4 hinged to the front wall of casing 2 to rotate about a preferably, though not necessarily, vertically-oriented reference axis, to and from a closing position in which the door 4 rests completely against the front wall to close the laundry loading/unloading opening and substantially airtight seal the revolving drum 3.

[0029] Inside the boxlike casing 2, the rotary-drum laundry dryer 1 additionally comprises an electric motor 5 which is mechanically connected to the revolving drum 3 for driving into rotation the drum 3 about its longitudinal axis; a closed-circuit, hot-air generator 6 which is structured to circulate through the revolving drum 3 a stream of hot air having a low moisture level, and which flows over and rapidly dries the laundry located inside drum 3; and finally an electronic central control unit which controls both the electric motor 5 and the hot-air generator 6 to perform one of the user-selectable drying cycles preferably, though not necessarily, stored in the same central control unit.

[0030] With reference to Figures 1 and 2, the boxlike casing 2 preferably comprises a substantially parallelepiped-shaped lower supporting basement 9 which is structured for resting on the floor and for housing at least part of the hot-air generator 6; and a substantially parallelepiped-shaped upper boxlike cabinet 10 which is rigidly fixed to the top of the lower supporting basement 9 and it is structured so as to house the revolving drum 3.

[0031] In particular, the basement 9 has a bottom wall 31 which rests on the floor where the heat pump laundry treatment apparatus 1 of the present invention is to be placed; the bottom wall 31 has a lower surface facing the floor and an upper surface being in the inner part of the cabinet.

[0032] In addition, the lower surface of the bottom wall 31 of the basement 9 separates the casing 2 from the ambient where the heat pump laundry treatment apparatus 1 of the present invention is placed. Furthermore, an air gap is formed between the lower surface of the bottom wall 31 of the basement 9 and the surface on which the heat pump laundry treatment apparatus 1 stands. The basement 9 is preferably realized in polymeric material.

[0033] In the example shown, in particular, the revolving drum 3 preferably extends inside the boxlike cabinet 10 coaxial to a substantially horizontally-oriented longitudinal reference axis L, and rests on a number of substantially horizontally-oriented, front and rear idle supporting rollers 11 which are located in pairs substantially at the two axial ends of the revolving drum 3, and are fixed in free revolving manner to the casing 2 so as to allow the revolving drum 3 to freely rotate about its reference axis L inside the boxlike cabinet 10.

[0034] With reference to Figures 2 and 3, the front and rear idle supporting rollers 11 are preferably fixed in free revolving manner directly on top of the lower supporting basement 9.

[0035] The laundry loading/unloading opening of casing 2 is therefore realized in the front wall of the upper boxlike cabinet 10, and the porthole door 4 is hinged to the front wall of the aforesaid upper boxlike cabinet 10.

[0036] With reference to Figures 2 and 3, the hot-air generator 6 is a heat-pump type, wherein the heat-pump assembly 14 comprises:

- a first air/refrigerant heat exchanger 15 which is located along the air recirculating conduit 12 and is structured for cooling down the airflow arriving from revolving drum 3 to condense and restrain the surplus moisture in the airflow;

- a second air/refrigerant heat exchanger 16 which is located along the air recirculating conduit 12, downstream of heat exchanger 15, and which is structured for heating the airflow arriving from heat exchanger 15 and directed back to revolving drum 3, so that the airflow re-entering into revolving drum 3 is heated to a temperature higher than or equal to that of the air flowing out of revolving drum 3;

- an electrically-powered refrigerant compressing device 17 which is interposed between the refrigerant-outlet of heat exchanger 15 and the refrigerant-inlet

of heat exchanger 16, and which is structured for compressing the gaseous-state refrigerant directed towards heat exchanger 16 so that refrigerant pressure and temperature are much higher at the refrigerant-inlet of heat exchanger 16 than at the refrigerant-outlet of heat exchanger 15; and

- an expansion valve or similar passive/operated refrigerant expansion device 18 (for example a capillary tube, a thermostatic valve or an electrically-controlled expansion valve) which is interposed between the refrigerant-outlet of heat exchanger 16 and the refrigerant-inlet of heat exchanger 15, and it is structured so as to cause an expansion of the refrigerant directed towards the first air/refrigerant heat exchanger 15, so that refrigerant pressure and temperature are much higher at the refrigerant-outlet of heat exchanger 16 than at the refrigerant-inlet of heat exchanger 15.

[0037] The heat-pump assembly 14 is further provided with a number of connecting pipes 28 which connect the two heat exchangers 15 and 16, the refrigerant compressing device 17 and the refrigerant expansion device 18 to one another, so as to allow the refrigerant to continuously flow in closed loop from the refrigerant compressing device 17 in sequence to the second air/refrigerant heat exchanger 16, to the refrigerant expansion device 18, to the first air/refrigerant heat exchanger 15, and finally return back to the refrigerant compressing device 17.

[0038] The air/refrigerant heat exchanger 15 is conventionally referred to as the "evaporator" or "gas-heater" of the heat-pump assembly 14, and it is structured so that the airflow arriving from revolving drum 3 and the low-pressure and low temperature refrigerant directed to the suction of the refrigerant compressing device 17 can flow through it simultaneously, allowing the refrigerant having a temperature lower than that of the airflow, to absorb heat from the airflow, thus causing condensation of the surplus moisture in the airflow arriving from revolving drum 3.

[0039] The air/refrigerant heat exchanger 16, in turn, is conventionally referred to as the "condenser" or "gas-cooler" of the heat-pump assembly 14, and it is structured so that the airflow directed back into revolving drum 3 and the high-pressure and high-temperature refrigerant arriving from the delivery of the refrigerant compressing device 17 can flow through it simultaneously, allowing the refrigerant having a temperature greater than that of the airflow to release heat to the airflow, thus heating the airflow directed back into the revolving drum 3.

[0040] With reference to Figure 3, in the example shown, in particular, a central/intermediate segment 12c of the air recirculating conduit 12 extends in passthrough manner across the lower supporting basement 9, and the evaporator 15 and condenser 16 of the heat-pump assembly 14 are fitted/recessed, one downstream the other along the flowing direction of the airflow, into the central/intermediate segment 12c of the air recirculating conduit 12. The central/intermediate segment 12c is therefore shaped/dimensioned so as to house both the evaporator 15 and the condenser 16 of the heat-pump assembly 14.

[0041] In the example shown, the central/ intermediate segment 12c of the air recirculating conduit 12 preferably extends inside the lower supporting basement 9 substantially horizontally.

[0042] Instead, the refrigerant compressing device 17 and the refrigerant expansion device 18 of the heat-pump assembly 14 are preferably fixed/recessed on the lower supporting basement, beside the central/intermediate segment 12c of the air recirculating conduit 12.

[0043] With reference to Figures 1, 2 and 3, a centrifugal fan 13 of hot-air generator 6, in turn, is preferably located outside of the lower supporting basement 9, preferably at one of the two end-openings of the central/ intermediate segment 12c of air recirculating conduit 12, so to directly communicate with, i.e. be flowingly/fluidly connected to, both the central segment 12c of the air recirculating conduit 12 and the inside of revolving drum 3.

[0044] In the example shown, the centrifugal fan 13 is preferably located on the back of the lower supporting basement 9, at the exit end-opening or outlet of the central/intermediate segment 12c of the air recirculating conduit 12, i.e. downstream of both evaporator 15 and condenser 16 of the heat-pump assembly 14.

[0045] In addition to the above, with reference to Figure 3, the lower supporting basement 9 of outer casing 2 is preferably formed/composed by a lower half-shell 9a which is structured for resting on the floor, and by an upper half-shell 9b which in turn is structured for being stacked up on top of, and rigidly coupled to, the lower half-shell 9a, so to preferably directly support the upper boxlike cabinet 10 and preferably also the front and rear idle rollers 11 that support in free revolving manner the revolving drum 3.

[0046] The lower half-shell 9a and the upper half-shell 9b are furthermore shaped so as to form, when coupled to one another, substantially the whole central/intermediate segment 12c of the air recirculating conduit 12 which houses, one downstream the other along the flowing direction of the airflow, both the evaporator 15 and the condenser 16 of the heat-pump assembly 14.

[0047] In the example shown, the lower half-shell 9a and the upper half-shell 9b are preferably structured/shaped so as to firmly and unremovably jam/block in between themselves the evaporator 15 and the condenser 16 of the heat-pump assembly 14 when coupled to one another to form/compose the lower supporting basement 9 of outer casing 2.

[0048] In other words, the lower half-shell 9a and upper half-shell 9b are shaped so as to form the two halves of the central segment 12c of the air recirculating conduit 12, and are structured for being substantially airtight cou-

pled to one another, so as to compose/form the whole central segment 12c of the air recirculating conduit 12, and contemporaneously directly lock/trap in between themselves the evaporator 15 and the condenser 16.

[0049] In the example shown, the lower half-shell 9a and the upper half-shell 9b are both preferably, though not necessarily, made of plastic material preferably by means of an injection molding process.

[0050] In addition to the above, the lower supporting basement 9 is also preferably structured so to directly support the electric motor 5.

[0051] In addition, with reference to Figures 4 to 7, the refrigerant compressing device 17 is received in a proper seat 8 formed in the basement 9 and is removably fixed thereon. In particular, the compressing device 17 is fixed to the bottom wall 31 of said basement 9 by interposing only vibration damping elements 23 to reduce vibrations due to operation of the compression device 17. The assembly comprising the vibration damping elements 23, pins 20, and fastening devices 22 forms a 'direct' connection between the compressing device 17 and the bottom wall 31 of said basement 9. There are no special devices interposed between the compressing device 17 and the basement 9 which act as an interface as in the prior art. Thus, the number of components constituting the heat pump laundry treatment apparatus 1 is reduced.

[0052] Furthermore, with reference to Figures 4 and 5, the refrigerant compressing device 17 is fixed to the bottom wall 31 of the basement 9 by at least one pin 20; in the example of Figures 4 and 5, three pins 20 are shown for a better fixation of the compressing device 17 to the basement 9. In Figure 4, in order to better view the bottom wall 31, some parts provided thereon have been removed. The pins 20 are integrally formed with the basement 9 bottom wall 31 forming a single unitary piece with the basement 9. That means that the compressing device 17 of the laundry treatment apparatus 1 is fixed to the bottom wall 31 of the basement 9 by pins 20 being part of the basement 9 bottom wall 31 itself.

[0053] The bottom wall 31 of the basement 9 comprises an upper surface 21 and a lower surface 30; for a better fixation of the compressing device 17 to the bottom wall 31 of the basement 9 through the pins 20, each of the pins 20 protrudes upwards from the upper surface 21 of the basement 9 bottom wall 31. By this way, a proper mechanical resistance of pins 20 is further ensured against the vibrations generated by the compressing device 17 when the apparatus of the present invention is working.

[0054] In order to further improve mechanical resistance of the pins 20, the latter may also protrude downwards from the lower surface 30 of the basement.

[0055] Each of the pins 20 is preferably made of the same material in which the basement 9 is made. Further preferably, the pins 20 and the basement 9 are made by means of an injection molding process.

[0056] Each of the pins 20 comprises a housing 32 for receiving a fastening device 22, the housing 32 extending along the longitudinal axis of the pin 20. In the embodiment shown in Figures 4 and 5, the fastening device 22 comprises a screw threadly engaged or engageable in said housing 32. The fastening device 22 may also comprise a washer. The housing 32 contains an internally threaded portion threadly engaging with the fastening device 22.

[0057] Each of the pins 20 acts as a support for a vibration damping element 23 extending around the pin 20 and being interposed between the pin 20 itself and a base portion 24 of the compressing device 17.

[0058] Such a vibration damping element 23 comprise a first end 25 in contact with the base portion 24 of the compressing device 17 and a second end 26 in contact with an upper surface 21 of the basement 9 bottom wall 31 carrying the pin 20. In the embodiment shown in Figure 5, such a vibration damping element 23 is a made of rubber.

[0059] The bottom wall 31 of the basement 9 comprises a lower surface 30 that separates the cabinet 2 from the ambient where the apparatus 1 is placed; an air gap is thus formed between such a lower surface 30 of the bottom wall 31 of the basement 9 and the surface of the floor on which the apparatus 1 stands.

[0060] With reference to Figures 6 and 7, in the seat 8 for the compressing device 17, the basement 9 comprises reinforcement ribs 27 that are shaped to retain the base of the compressing device 17 in a stable position.

[0061] In addition, the basement 9 comprises seats 34 for receiving a portion of the front wall of the cabinet 2.

[0062] General operation of the rotary-drum home laundry drier 1 is clearly inferable from the above description, with no further explanation required.

[0063] Clearly, changes may be made to the rotary-drum laundry drier 1 as described herein without, however, departing from the scope of the present invention.

Claims

1. Heat pump laundry treatment apparatus (1), in particular a heat pump laundry dryer or a heat pump washing machine having drying function, comprising a cabinet (2) that houses a rotatable laundry drum (3) for treating laundry using process air, the drum (3) being accessible by a user through a door (4) of the apparatus (1), wherein the laundry treatment apparatus (1) comprises:

   a basement (9) which constitutes a bottom portion of said cabinet (2) for supporting operational components for carrying out a drying process on laundry,
   a process air circuit (12) for circulating the process air through the drum (3),
   a heat pump assembly (14) having a refrigerant loop, in which the refrigerant fluid is circulated through a first and a second heat exchanger

(15,16), the heat pump assembly (14) comprising a compressing device (17) that is received in a seat (8) formed in the basement (9) and that is removably fixed thereon,
characterized in that the compressing device (17) is fixed to a bottom wall (31) of said basement (9) by at least one pin (20) which is integrally formed with the basement (9) bottom wall (31).

2. Heat pump laundry treatment apparatus according to claim 1 wherein said basement (9) bottom wall (31) comprises an upper surface (21) and a lower surface (30), said at least one pin (20) protruding from one or both the upper (21) surface and the lower surface (30).

3. Heat pump laundry treatment apparatus according to claim 1 or 2, wherein said at least one pin (20) is made of the same material in which said basement (9) is made.

4. Heat pump laundry treatment apparatus according to one or more of the previous claims, wherein said at least one pin (20) comprises a housing (32) for receiving a fastening device (22), the housing (32) extending along the longitudinal axis of the pin (20).

5. Heat pump laundry treatment apparatus according to claim 4, wherein said fastening device (22) is a screw thready engaged or engageable in said housing (32).

6. Heat pump laundry treatment apparatus according to any preceding claim, wherein said at least one pin (20) acts as a support for a vibration damping element (23) extending around the pin (20) and interposed between the pin (20) itself and a base portion (24) of the compressing device (17).

7. Heat pump laundry treatment apparatus according to claim 6 wherein said vibration damping element (23) comprise a first end (25) in contact with the base portion (24) of the compressing device (17) and a second end (26) in contact with an upper surface of the basement (9) bottom wall (31) carrying the at least one pin (20).

8. Heat pump laundry treatment apparatus according to one or more of the previous claims, wherein said basement (9) bottom wall (31) comprises a lower surface (30) that separates the cabinet (2) from the ambient where the apparatus (1) is placed.

9. Heat pump laundry treatment apparatus according to one or more of the previous claims, wherein an air gap is formed between a lower surface (30) of the basement (9) bottom wall (31) and the surface on which the apparatus (1) stands.

10. Heat pump laundry treatment apparatus according to one or more of the previous claims, wherein in said compressing device seat (8), said basement (9) comprises reinforcement ribs (27) that are shaped to retain the base portion (24) of said compressing device (17) in a stable position.

11. Heat pump laundry treatment apparatus according to one or more of the previous claims, wherein said basement (9) comprises seats (34) for receiving a portion of the cabinet (2) front wall.

12. Heat pump laundry treatment apparatus according to one or more of the previous claims, wherein said basement (9) comprises a lower shell (9a) and an upper shell (9b) associated on each other, wherein said upper shell (9b) comprises housings for receiving drum (3) supporting means (11).

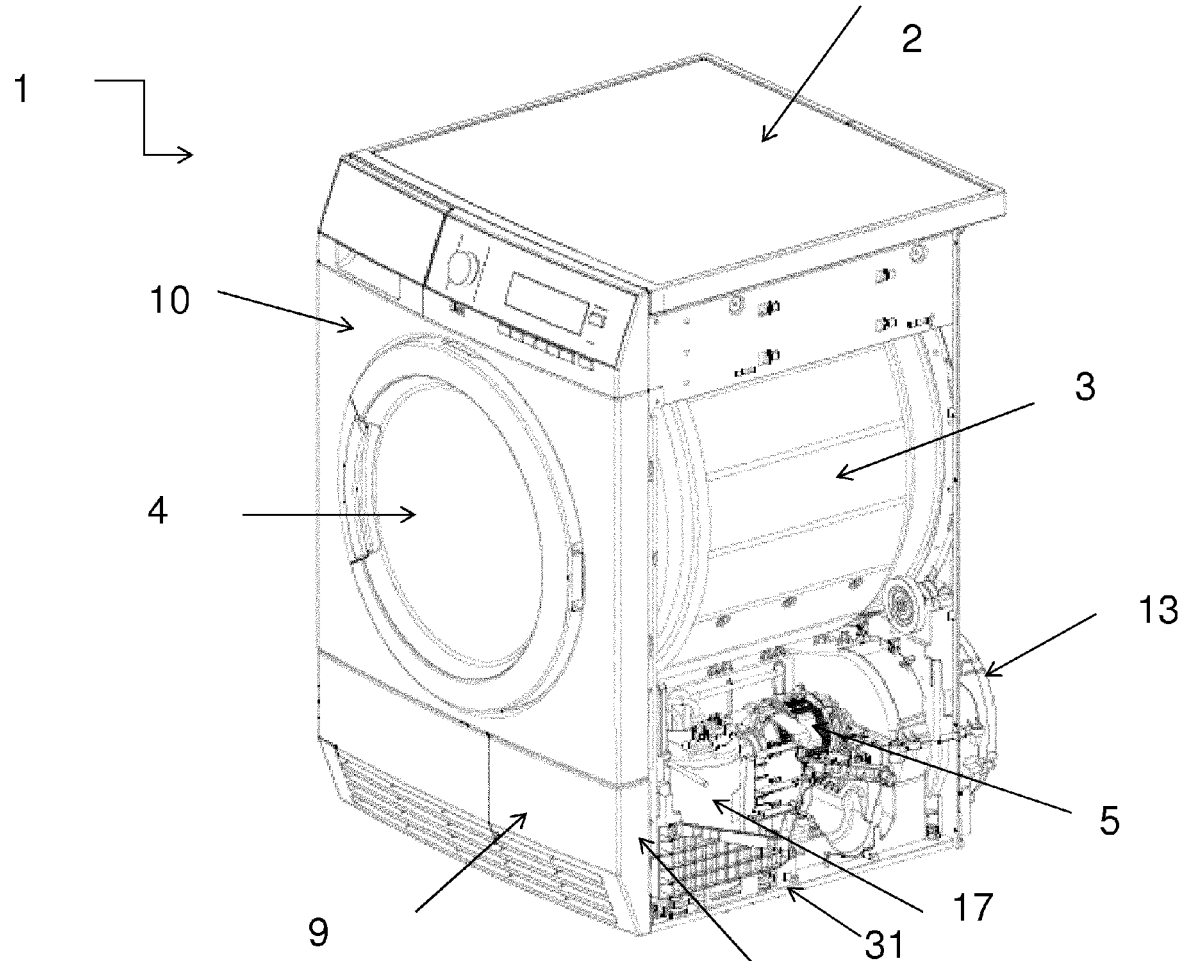

Figure 1

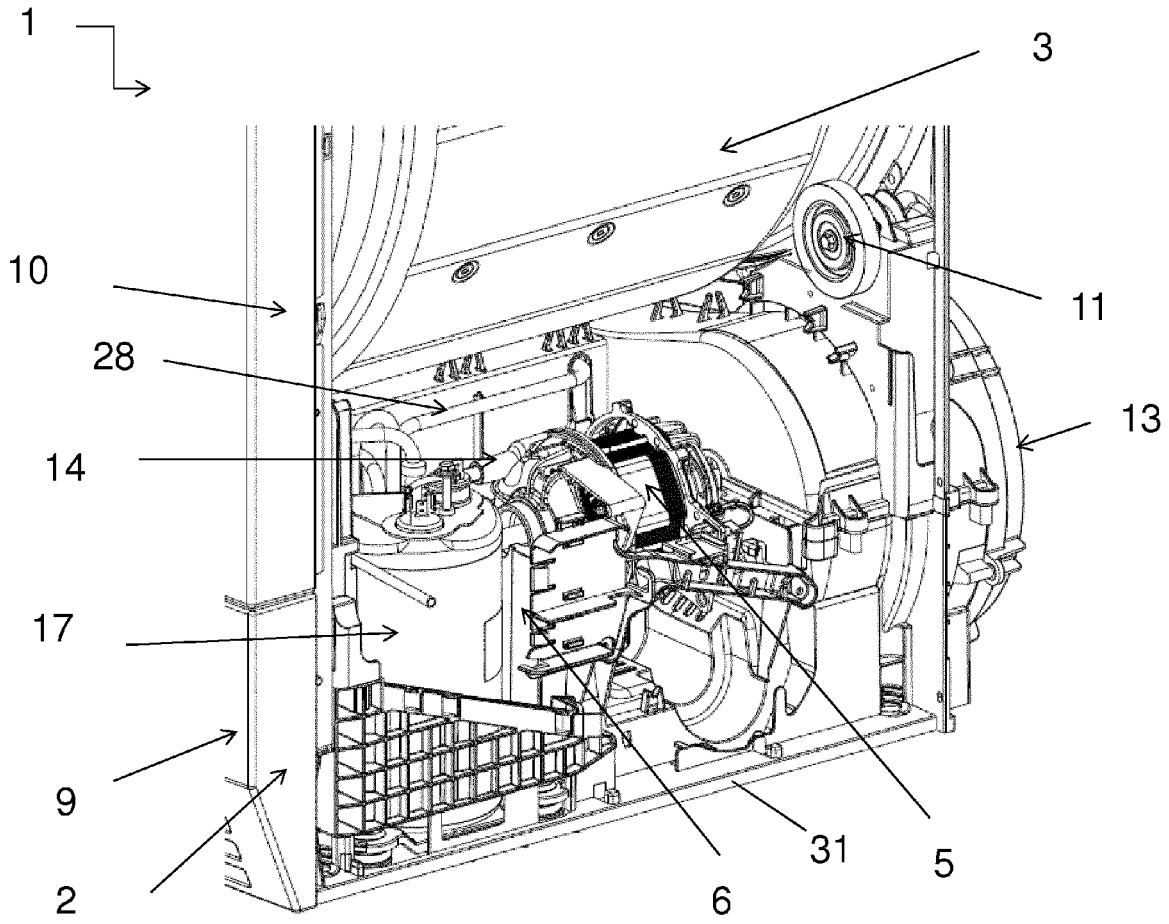

Figure 2

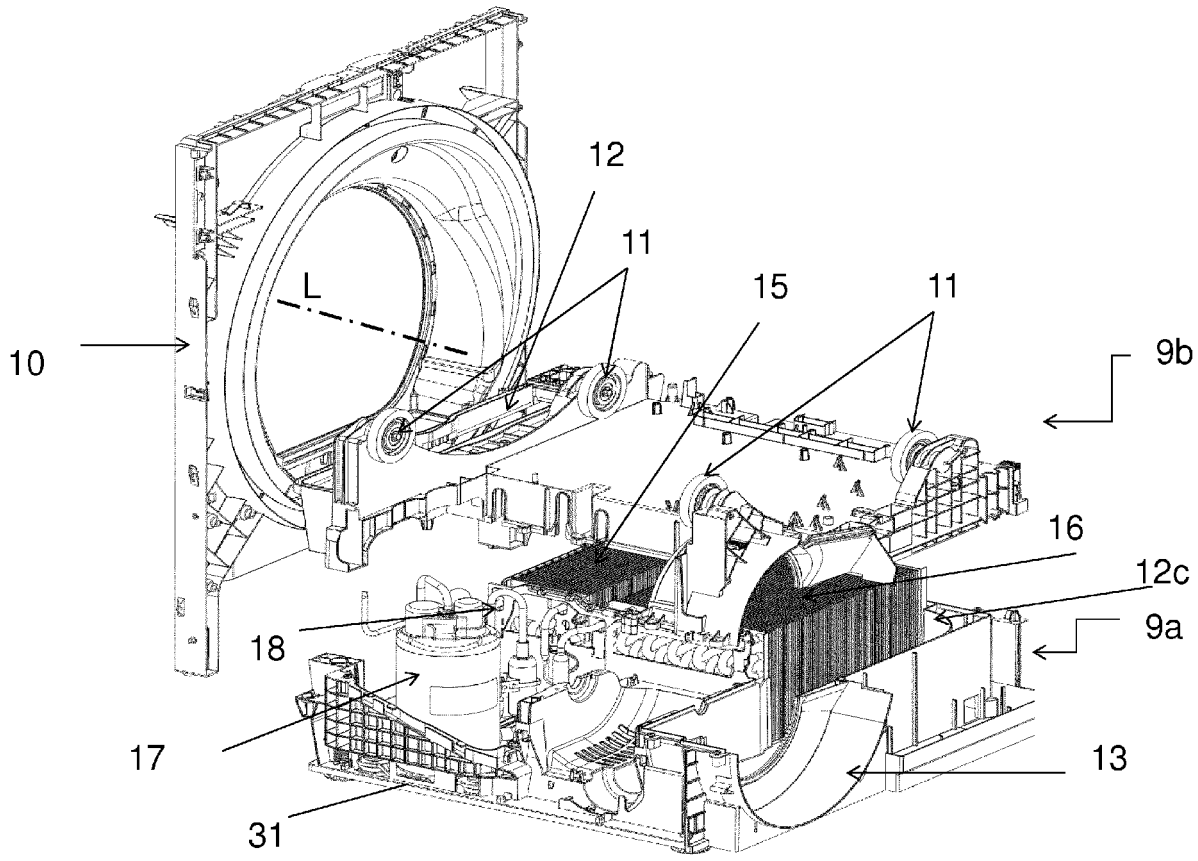

Figure 3

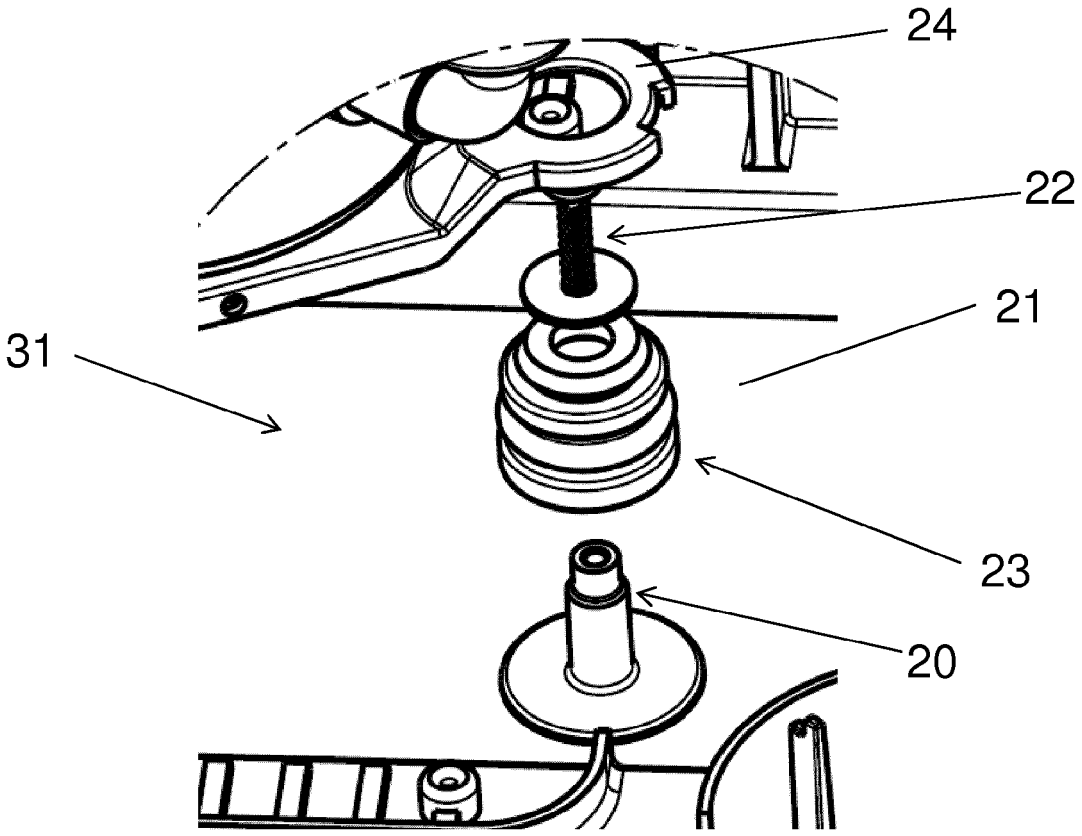

Figure 4

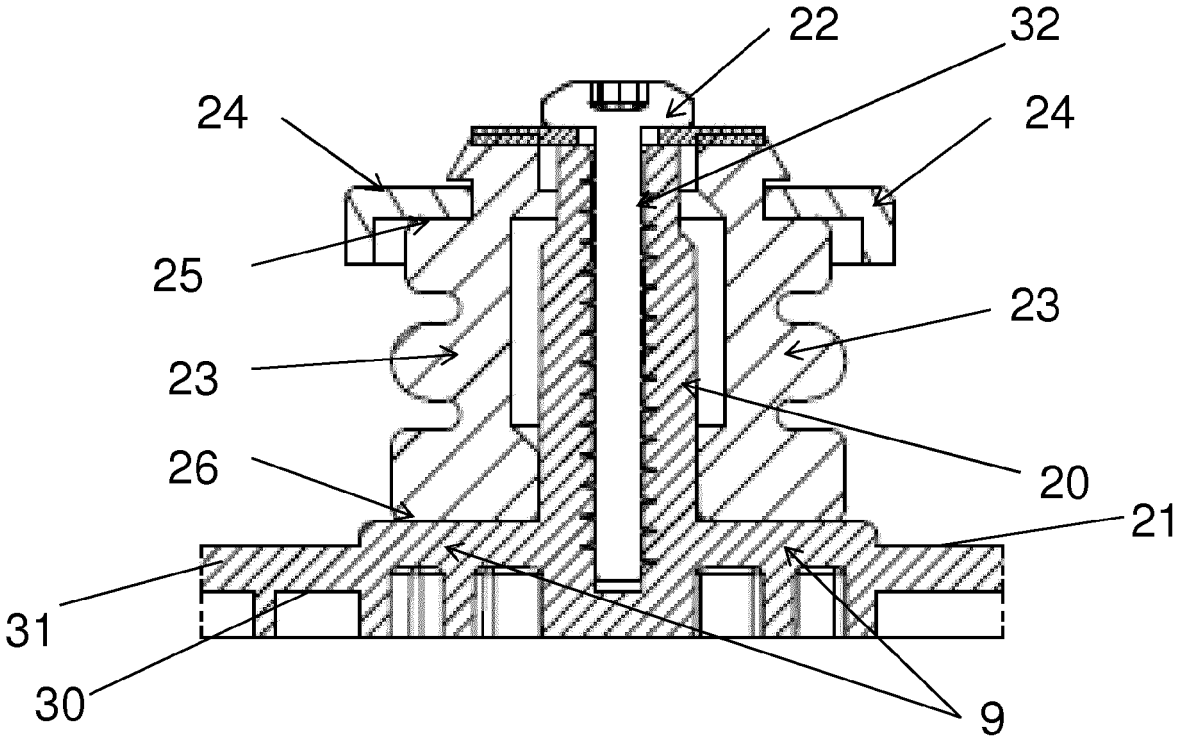

Figure 5

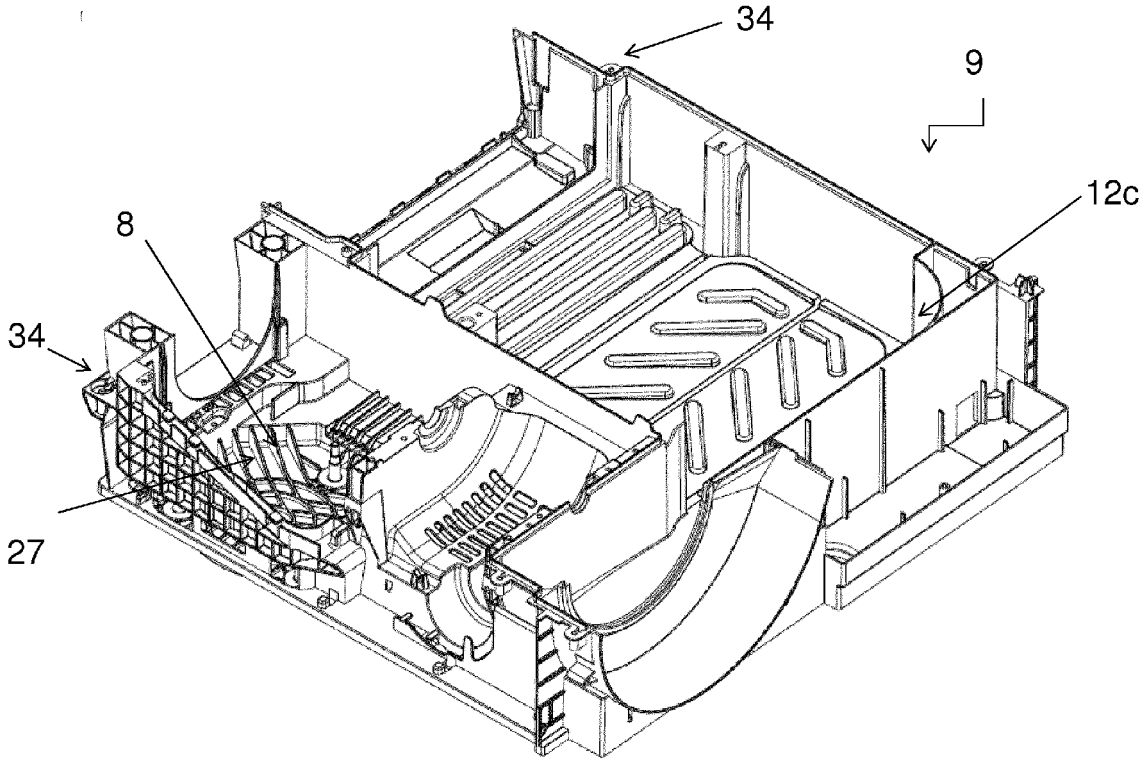

Figure 6

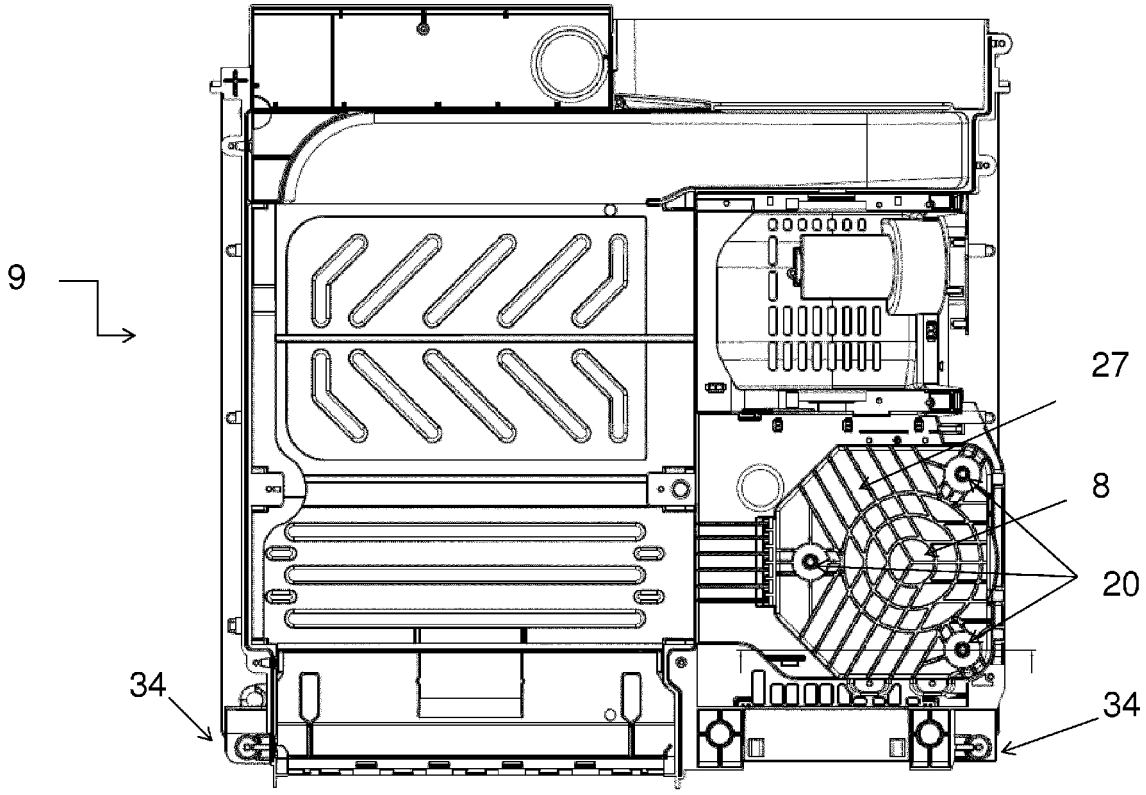

Figure 7

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 May 2013	Weinberg, Ekkehard

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