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(54) **WASHING-DRYING MACHINE**

(57) The present disclosure provides a washing-drying machine including: a cabinet (10); an inner drum (20) rotatably disposed in the cabinet (10) and defining an accommodating cavity therein, in which the inner drum (20) has an air outlet (21) communicated with the accommodating cavity; a condenser (30) disposed in the cabinet (10) and defining a condensation channel together with the cabinet (10), in which the condensation channel is communicated with the air outlet (21); and a filter (40) detachably disposed in the cabinet (10) and located between the air outlet (21) and the condensation channel, in which the filter (40) has an inlet (401) communicated with the air outlet (21) and an outlet (402) communicated with the condensation channel and is provided with multiple layers of detachable filtering pieces (41).

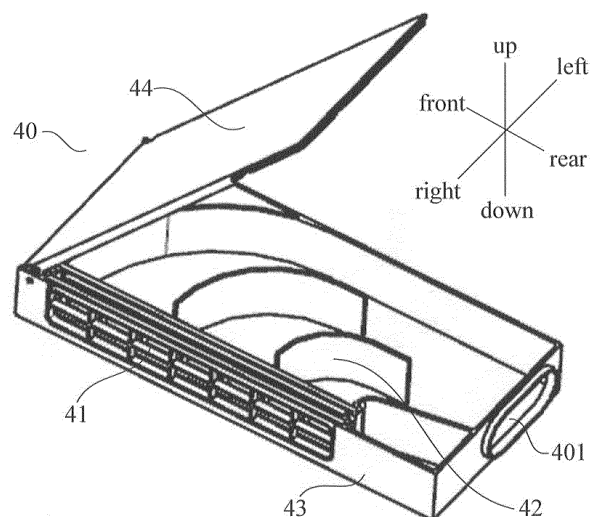


Fig. 3

Description

FIELD

[0001] The present disclosure relates to a technical field of laundry machine, especially to a washing-drying machine.

BACKGROUND

[0002] In the heat-pump front-loading washing-drying machine in the related art, a filtering device for soft flocks is needed as the clothes bring in the soft flocks in the drying process thereof. The filtering device for soft flocks of the washing-drying machine in the market is not detachable and disposed in a top portion of the washing-drying machine, and thus needs to be taken out from the top portion for cleaning. This kind of structure is not favorable for the space usage of the washing-drying machine, and a user cannot place the washing-drying machine in a cupboard. Moreover, a filter of an European heat-pump washing-drying machine is disposed at the front portion of the machine, but needs to be operated twice for being taken out, which is complicated in operation.

SUMMARY

[0003] The present disclosure aims to solve one of the technical problems in the related art to at least some extent. Accordingly, the present disclosure provides a washing-drying machine which has a simple and compact structure, facilitates assembling and disassembling, and improves usage convenience for a user.

[0004] The washing-drying machine according to embodiments of the present disclosure includes: a cabinet; an inner drum rotatable disposed in the cabinet and defining an accommodating cavity therein, in which the inner drum has an air outlet communicated with the accommodating cavity; a condenser disposed in the cabinet and defining a condensation channel together with the cabinet, in which the condensation channel is communicated with the air outlet; and a filter detachably disposed in the cabinet and located between the air outlet and the condensation channel, in which the filter has an inlet communicated with the air outlet and an outlet communicated with the condensation channel, and is provided with multiple layers of detachable filtering pieces.

[0005] In the washing-drying machine according to embodiments of the present disclosure, by disposing the detachable filter in the cabinet and the detachable filtering pieces in the filter, air can be filtered before entering the condensation channel so as to prevent the soft flocks from entering the condensation channel and influencing an operating efficiency of the condenser, and also, a user can detach the filter and further clean the filter rapidly and conveniently, thus improving the usage convenience for the user. The filter of the washing-drying machine has

a simple and compact structure and is convenient to assemble and disassemble with a high efficiency.

[0006] In addition, the washing-drying machine according to embodiments of the present disclosure may further have the additional technical features as followed.

[0007] According to an embodiment of the present disclosure, the filtering pieces are detachably disposed between the inlet and the outlet or at one of the inlet and the outlet.

[0008] According to an embodiment of the present disclosure, the filtering pieces are disposed at the outlet.

[0009] According to an embodiment of the present disclosure, a plurality of air guiding plates are disposed between the inlet and the outlet, an air channel is defined between two adjacent air guiding plates and is communicated with the inlet and the outlet respectively.

[0010] According to an embodiment of the present disclosure, each air guiding plate is configured as an arc-shaped plate extending from the inlet to the outlet in an arc transition manner.

[0011] According to an embodiment of the present disclosure, the filter includes: a filter box defining an air guiding cavity therein and having the inlet and the outlet communicated with the air guiding cavity; and a filter cover detachably connected with the filter box.

[0012] According to an embodiment of the present disclosure, the filter box has a rectangle shape, and the inlet and the outlet are provided in two adjacent side walls of the filter box respectively.

[0013] According to an embodiment of the present disclosure, the filter cover is pivotably connected with the filter box.

[0014] According to an embodiment of the present disclosure, the filtering pieces include a filtering mesh, and a plurality of the filtering meshes is disposed while overlapping one another.

[0015] According to an embodiment of the present disclosure, the plurality of the filtering meshes is disposed at the outlet while overlapping one another.

[0016] Additional aspects and advantages of the present disclosure will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

Fig. 1 is a perspective view of a washing-drying machine according to embodiments of the present disclosure;

Fig. 2 is a top view of the washing-drying machine shown in Fig. 1;

Fig. 3 is a schematic view of a filter of a washing-drying machine according to embodiments of the present disclosure; and

Fig. 4 is an exploded view of the filter of the washing-

drying machine shown in Fig. 3.

[0018] Reference numerals:

washing-drying machine 100;
cabinet 10; access port A;
inner drum 20; air outlet 21; pipe 22;
condenser 30;
filter 40; inlet 401; outlet 402; air channel 403; filtering
piece 41; air guiding plate 42; filter box 43; filter cover
44.

DETAILED DESCRIPTION

[0019] Embodiments of the present disclosure will be described in detail. Examples of the embodiments are shown in the drawings. The embodiments described herein with reference to drawings are explanatory, and used to generally understand the present disclosure, and shall not be construed to limit the present disclosure.

[0020] In the following, a washing-drying machine 100 according to embodiments of the present disclosure will be described with reference to Fig. 1 to Fig. 4.

[0021] As shown in Fig. 1 and Fig. 2, the washing-drying machine 100 according to embodiments of the present disclosure includes: a cabinet 10, an inner drum 20, a condenser 30 and a filter 40. Specifically, the inner drum 20 is rotatably disposed in the cabinet 10, the inner drum 20 defines an accommodating cavity therein and has an air outlet 21 communicated with the accommodating cavity. The condenser 30 is disposed in the cabinet 10 and defines a condensation channel (not shown) together with the cabinet 10, and the condensation channel is communicated with the air outlet 21. The filter 40 is detachably disposed in the cabinet 10 and located between the air outlet 21 and the condensation channel, and the filter 40 has an inlet 401 communicated with the air outlet 21 and an outlet 402 communicated with the condensation channel, and is further provided with multiple layers of detachable filtering pieces 41.

[0022] In other words, the washing-drying machine 100 mainly includes the cabinet 10, an outer tub (not shown), the inner drum 20, the condenser 30 and the filter 40. The cabinet 10 extends along a vertical direction (i.e. an up and down direction as shown in Fig. 1), the outer tub is fixed within the cabinet 10, and the inner drum 20 is rotatably disposed in the outer tub. An external circumferential wall of the inner drum 20 and an internal circumferential wall of the outer tub are spaced apart from each other. The inner drum 20 defines the accommodating cavity therein to accommodate clothes, the inner drum 20 has an air inlet (not shown) and the air outlet 21 communicated with the accommodating cavity respectively. Optionally, axes of the outer tub and the inner drum 20 extend along a front and rear direction respectively, i.e. an opening of the inner drum 20 faces forwards.

[0023] Further, the filter 40 and the condenser 30 are both disposed in the cabinet 10. The condensation chan-

nel is defined between the condenser 30 and the cabinet 10, and the filter 40 is detachably disposed between the air outlet 21 of the inner drum 20 and the condensation channel to filter air before the air enters the condensation channel, so as to prevent the soft flocks of the clothes from entering the condensation channel and influencing the operating efficiency of the condenser 30. When the washing-drying machine 100 enters a drying program, wet air in the inner drum 20 enters the filter 40, and the filter 40 filters out the soft flocks in the air. Cleaned air is condensed and heated through heat exchangers (such as an evaporator and the condenser 30), and then enters the inner drum 20 to dry clothes, and so on.

[0024] As shown in Fig. 1, a side wall of the cabinet 10 is disposed with an access port A, and the filter 40 is disposed adjacent to the side wall of the cabinet 10, so that a user can take out the filter 40 through the access port A to clean the filter 40 and then mount the filter 40 back into the cabinet 10 through the access port A after cleaning the filter 40, without disassembling a machine body of the washing-drying machine, thus resulting in convenient assembling and disassembling, as well as easy operations, regardless of a placing position of the washing-drying machine 100. The filter 40 has the inlet 401 and the outlet 402, in which the inlet 401 of the filter 40 is communicated with the air outlet 21 of the inner drum 20, for example the filter 40 may be in communication with the air outlet 21 of the inner drum 20 through a pipe 22, and the outlet 402 of the filter 40 is communicated with the condensation channel. The filter 40 is further provided with the detachable filtering pieces 41 therein, which are convenient to assemble, disassemble, replace and repair.

[0025] In the washing-drying machine 100 according to embodiments of the present disclosure, by disposing the detachable filter 40 in the cabinet 10 and the detachable filtering pieces 41 in the filter 40, the air can be filtered before entering the condensation channel so as to prevent the soft flocks from entering the condensation channel and influencing the operating efficiency of the condenser 30, and also, a user can also detach the filter 40 and clean the filter 40 rapidly and conveniently, thus improving the usage convenience for the user. The filter 40 of the washing-drying machine 100 has a simple and compact structure and is convenient to assemble and disassemble with a high efficiency.

[0026] Optionally, according to an embodiment of the present disclosure, the filtering pieces 41 may be detachably disposed between the inlet 401 and the outlet 402 or at one of the inlet 401 and the outlet 402. Thus, the air can be filtered before entering the condensation channel and the soft flocks of the clothes are prevented from entering the condensation channel and influencing the operating efficiency of the condenser 30.

[0027] In some specific embodiments of the present disclosure, the filtering pieces 41 are disposed at the outlet 402. Specifically, as shown in Fig. 2 and Fig. 3, a casing of the filter 40 is provided with the inlet 401 com-

municated with the air outlet 21 and the outlet 402 communicated with the condensation channel, i.e. the inlet 401 of the filter 40 is communicated with the air outlet 21 of the inner drum 20 and the outlet 402 of the filter 40 is communicated with the condensation channel, and the filtering pieces 41 are disposed at the outlet 402 of the filter 40 so as to filter the air at the outlet 402. Thus, by disposing the filtering pieces 41 at the outlet 402, it is convenient to assemble and disassemble the filtering pieces 41, and due to a large size of the outlet 402, a filtering air amount in unit time can be increased and thus the operating efficiency of the filter 40 can be improved.

[0028] According to an embodiment of the present disclosure, a plurality of air guiding plates 42 is disposed between the inlet 401 and the outlet 402, and an air channel 403 is defined between two adjacent air guiding plates 42 and is communicated with the inlet 401 and the outlet 402 respectively. Specifically, as shown in Fig. 3, the plurality of air guiding plates 42 is arranged in the filter 40 and spaced apart from one another, the air channel 403 is defined between the two adjacent air guiding plates 42, and two ends of the air guiding plate 42 extend towards the inlet 401 and the outlet 402 respectively, i.e. one end of the air channel 403 is communicated with the inlet 401 and the other end of the air channel 403 is communicated with the outlet 402. Thus, by disposing the air guiding plates 42 in the filter 40, the air can be guided to disperse uniformly, so as to make the air condensed and heated by the heat exchanger (such as the condenser 30 and the evaporator) more sufficiently.

[0029] Preferably, according to an embodiment of the present disclosure, each air guiding plate 42 is configured as an arc-shaped plate extending from the inlet 401 to the outlet 402 in an arc transition manner. Specifically, as shown in Fig. 4, the plurality of air guiding plates 42 extending from the inlet 401 to the outlet 402 in the arc transition manner are provided between the inlet 401 and the outlet 402 of the filter 40, and the plurality of air guiding plates 42 is spaced apart from one another to define a plurality of the air channels 403, so that the air can be guided to disperse uniformly, and thus the air can be condensed and heated by the heat exchanger (such as the condenser 30 and the evaporator) more sufficiently, and also, an air flowing direction can be changed on the basis of decreasing an energy loss of the air.

[0030] According to an embodiment of the present disclosure, the filter 40 includes a filter box 43 and a filter cover 44. Specifically, the filter box 43 defines an air guiding cavity therein, the filter box 43 has the inlet 401 and the outlet 402 communicated with the air guiding cavity respectively, and the filter cover 44 is detachably connected with the filter box 43.

[0031] In other words, the filter 40 mainly includes the filter box 43, the filter cover 44, and the filtering pieces 41. The filter box 43 defines the air guiding cavity having an open top end, and side walls of the filter box 43 have the inlet 401 and the outlet 402 communicated with the air guiding cavity respectively. The filter cover 44 is de-

tachably disposed to the filter box 43 to enclose the open top end of the air guiding cavity. The filtering pieces 41 are detachably disposed in the filter box 43 and located at one of the inlet 401 and the outlet 402 or between the inlet 401 and the outlet 402, and the air guiding cavity is configured to have an arc shape extending from the inlet 401 to the outlet 402 in the arc transition manner.

[0032] Thus, the filter 40 has a simple and compact structure, is convenient to assemble, disassemble and repair, and can filter the soft flocks in the air and also have a function of air guiding.

[0033] Optionally, according to an embodiment of the present disclosure, the filter box 43 is configured to have a rectangle shape, and the inlet 401 and the outlet 402 are provided in two adjacent side walls of the filter box 43 respectively. Specifically, as shown in Fig. 3 and Fig. 4, the filter box 43 is configured to be a rectangular box extending along a horizontal direction (i.e. a front and rear direction as shown in Fig. 3), the inlet 401 is provided in a short side wall of the filter box 43 (i.e. a rear side wall as shown in Fig. 3), and the outlet 402 is provided in a long side wall (i.e. a right side wall as shown in Fig. 3) adjacent to the short side wall. The filtering pieces 41 are detachably disposed at the outlet 402 to filter the air before the air enters the condensation channel.

[0034] Due to the large size of the outlet 402, the filtering air amount in unit time is increased, and the operating efficiency of the filter 40 is improved. Furthermore, the air disperses uniformly, thus making the air condensed and heated by the heat exchanger (such as the condenser 30 and the evaporator) more sufficiently.

[0035] The filter box 43 and the filter cover 44 may be detachably connected with each other by a bolt or a snap structure. Certainly, the present disclosure is not limited to this. For example, as shown in Fig. 3, the filter cover 44 is pivotally connected with the filter box 43. When the soft flocks on the filtering pieces 41 need to be removed, it is only needed to take out the filter 40 through the access port A, then open the filter cover 44 and further take off the filtering pieces 41 to clean the same. After the soft flocks are removed, it is only needed to mount the filtering pieces 41 back, close the filter cover 44, and finally mount the filter 40 back through the access port A. In these above processes, the filter cover 44 does not need to be taken down completely, which improves the usage convenience for the user and provides a high assembling and disassembling efficiency.

[0036] In some specific embodiments of the present disclosure, the filtering pieces 41 may include a filtering mesh, and a single layer of the filtering mesh may be provided. Certainly, the present disclosure is not limited to this. For example, the filtering pieces 41 may also include a plurality of filtering meshes, and the plurality of filtering meshes is disposed while overlapping one other. Optionally, the plurality of filtering meshes is disposed at the outlet 402 while overlapping one another. A shape of each filtering mesh may be same with a shape of the outlet 402 of the filter 40. For example, the outlet 402 of

the filter 40 and the filtering mesh each have a rectangle shape. The plurality of filtering meshes is arranged in respective layers and disposed at the outlet 402, which can perform a multi-layer filtering, improve the filtering function and effect of the filter 40, and further effectively prevent the soft flocks of clothes from entering into the condenser 30 or other components and blocking channels. In addition, the plurality of filtering meshes is detachable from the side wall of the filter box 43, which facilitates assembling and disassembling of the filtering meshes and is convenient for repair and replacement.

[0037] Other configurations and operations of the washing-drying machine 100 according to embodiments of the present disclosure are known for those skilled in the art, and thus will not be described in detail herein.

[0038] In the specification, it is to be understood that terms such as "central," "longitudinal," "lateral," "length," "width," "thickness," "upper," "lower," "front," "rear," "left," "right," "vertical," "horizontal," "top," "bottom," "inner," "outer," "clockwise," "counterclockwise," "an axial direction," "a radical direction," and "a circumferential direction," should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not require that the present disclosure be constructed or operated in a particular orientation.

[0039] In addition, terms such as "first" and "second" are used herein for purposes of description and are not intended to indicate or imply relative importance or significance or to imply the number of indicated technical features. Thus, the feature defined with "first" and "second" may comprise one or more of this feature. In the description of the present disclosure, "a plurality of" means two or more than two, unless specified otherwise.

[0040] In the present disclosure, unless specified or limited otherwise, the terms "mounted," "connected," "coupled," "fixed" and the like are used broadly, and may be, for example, fixed connections, detachable connections, or integral connections; may also be mechanical or electrical connections or be communicated with each other; may also be direct connections or indirect connections via intervening structures; may also be inner communications or interaction of two elements, which can be understood by those skilled in the art according to specific situations.

[0041] In the present disclosure, unless specified or limited otherwise, a structure in which a first feature is "on" or "below" a second feature may include an embodiment in which the first feature is in direct contact with the second feature, and may also include an embodiment in which the first feature and the second feature are not in direct contact with each other, but are contacted via an intervening structures. Furthermore, a first feature "on," "above," or "on top of" a second feature may include an embodiment in which the first feature is right or obliquely "on," "above," or "on top of" the second feature, or just means that the first feature is at a height higher than that of the second feature; while a first feature "be-

low," "under," or "on bottom of" a second feature may include an embodiment in which the first feature is right or obliquely "below," "under," or "on bottom of" the second feature, or just means that the first feature is at a height lower than that of the second feature.

[0042] Reference throughout this specification to "an embodiment," "some embodiments," "an example," "a specific example," or "some examples," means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present disclosure. Thus, the appearances of the phrases in various places throughout this specification are not necessarily referring to the same embodiment or example of the present disclosure. Furthermore, the particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples. Furthermore, different embodiments or examples in this specification can be jointed and combined by those skilled in the art without mutual contradiction.

[0043] Although embodiments have been shown and described, it would be appreciated that the embodiments above are explanatory and cannot be construed to limit the present disclosure, and changes, alternatives, transformation and modifications to the embodiments above can be made by those skilled in the art in the scope of the present disclosure.

Claims

1. A washing-drying machine (100), comprising:

a cabinet (10);
an inner drum (20) rotatably disposed in the cabinet (10) and defining an accommodating cavity therein, wherein the inner drum (20) has an air outlet (21) communicated with the accommodating cavity;
a condenser (30) disposed in the cabinet (10) and defining a condensation channel together with the cabinet (10), wherein the condensation channel is communicated with the air outlet (21); and
a filter (40) detachable disposed in the cabinet (10) and located between the air outlet (21) and the condensation channel, wherein the filter (40) has an inlet (401) communicated with the air outlet (21) and an outlet (402) communicated with the condensation channel, and is provided with multiple layers of detachable filtering pieces (41).

2. The washing-drying machine (100) according to claim 1, wherein the filtering pieces (41) are detachably disposed between the inlet (401) and the outlet (402) or at one of the inlet (401) and the outlet (402).

3. The washing-drying machine (100) according to claim 2, wherein the filtering pieces (41) are disposed at the outlet (402).
4. The washing-drying machine (100) according to claim 1, wherein a plurality of air guiding plates (42) is disposed between the inlet (401) and the outlet (402), an air channel (403) is defined between two adjacent air guiding plates (42) and is communicated with the inlet (401) and the outlet (402) respectively.
5. The washing-drying machine (100) according to claim 4, wherein each air guiding plate (42) is configured as an arc-shaped plate extending from the inlet (401) to the outlet (402) in an arc transition manner.
6. The washing-drying machine (100) according to claim 1, wherein the filter (40) comprises:
- a filter box (43) defining an air guiding cavity therein and having the inlet (401) and the outlet (402) communicated with the air guiding cavity; and
- a filter cover (44) detachably connected with the filter box (43).
7. The washing-drying machine (100) according to claim 6, wherein the filter box (43) has a rectangle shape, and the inlet (401) and the outlet (402) are provided in two adjacent side walls of the filter box (43) respectively.
8. The washing-drying machine (100) according to claim 6, wherein the filter cover (44) is pivotably connected with the filter box (43).
9. The washing-drying machine (100) according to any one of claims 1-8, wherein the filtering pieces (41) comprises a filtering mesh, and a plurality of the filtering meshes is provided while overlapping one another.
10. The washing-drying machine (100) according to claim 9, wherein the plurality of the filtering meshes is disposed at the outlet (402) while overlapping one another.

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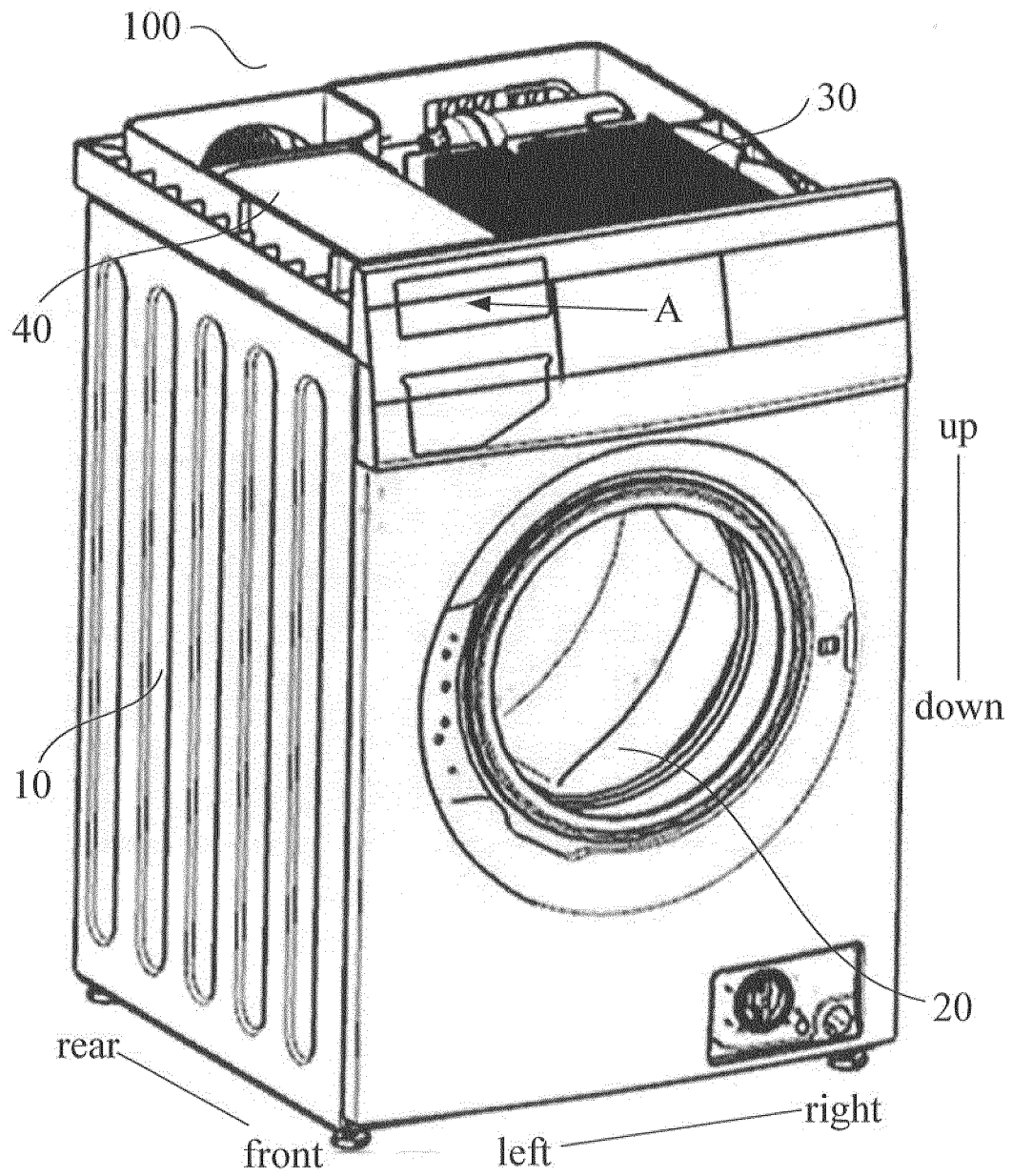


Fig. 1

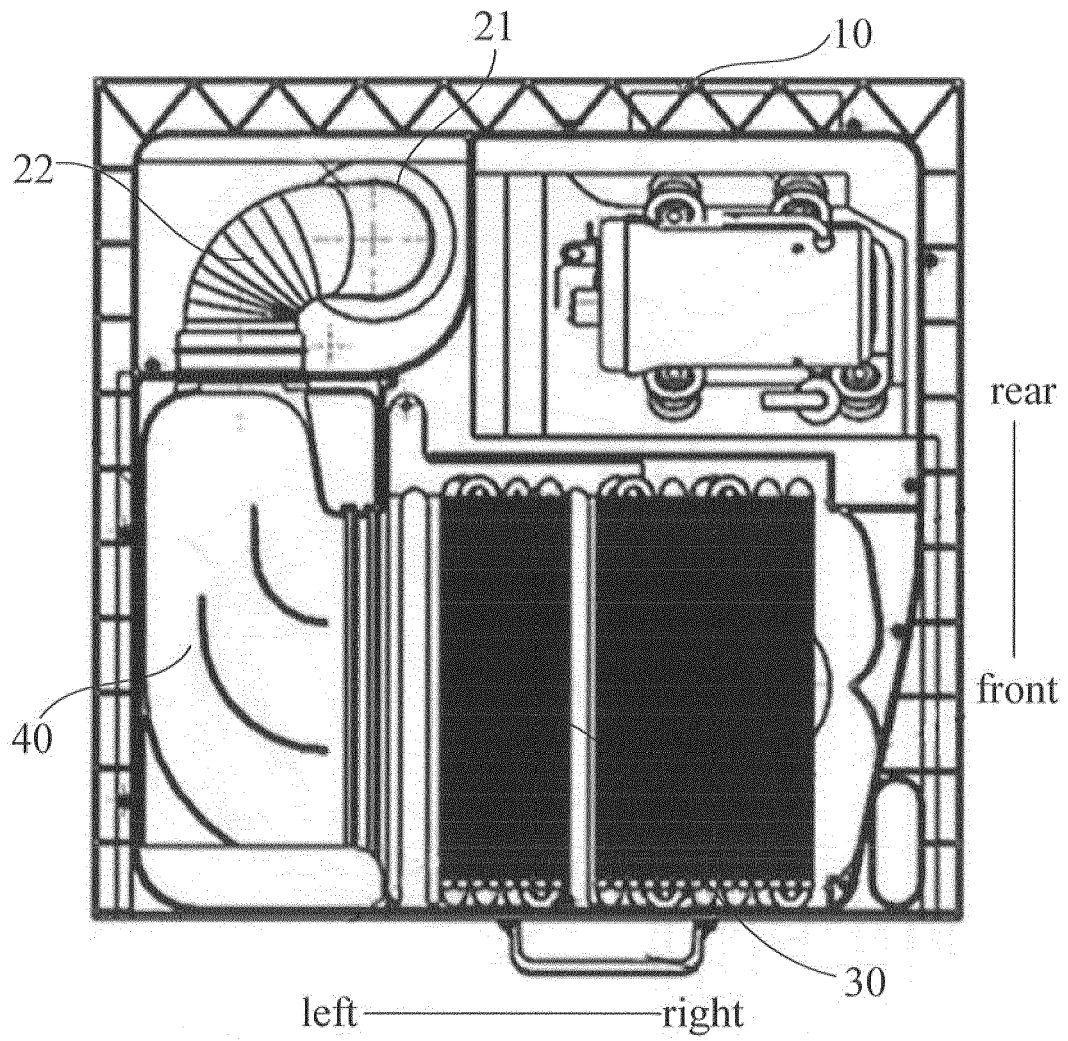


Fig. 2

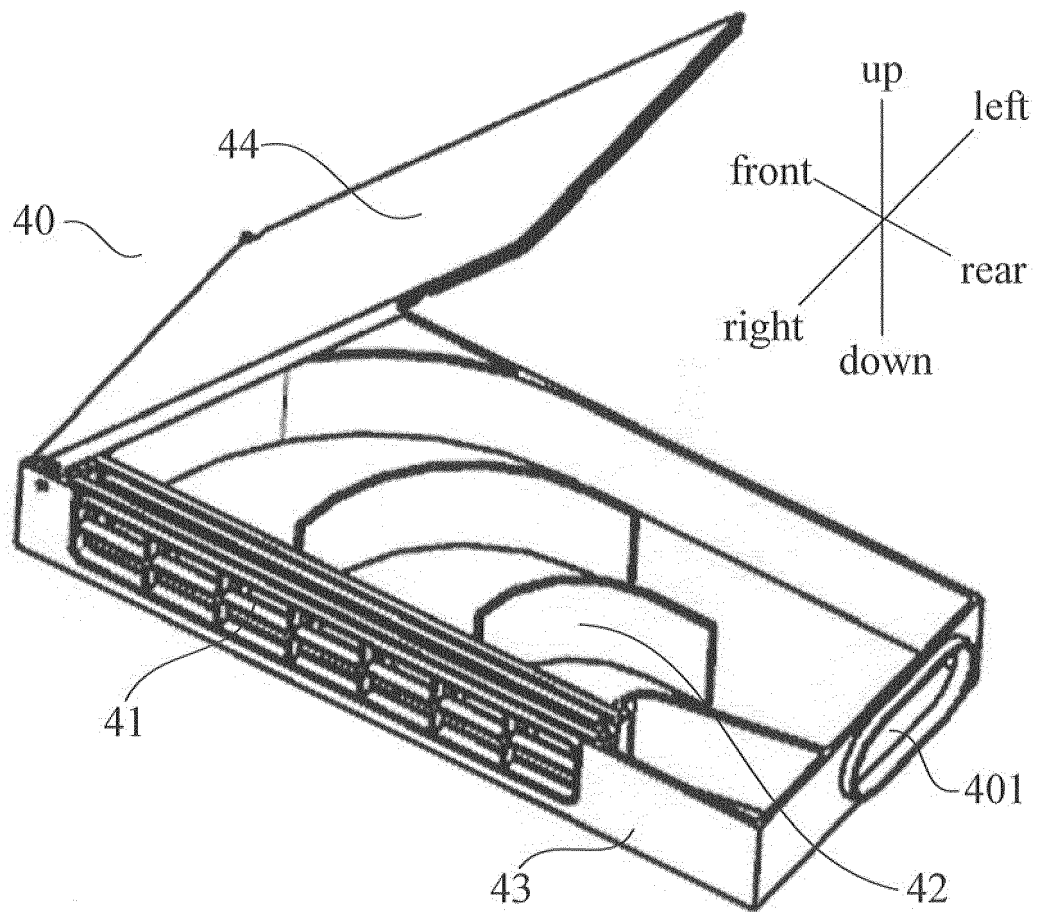


Fig. 3

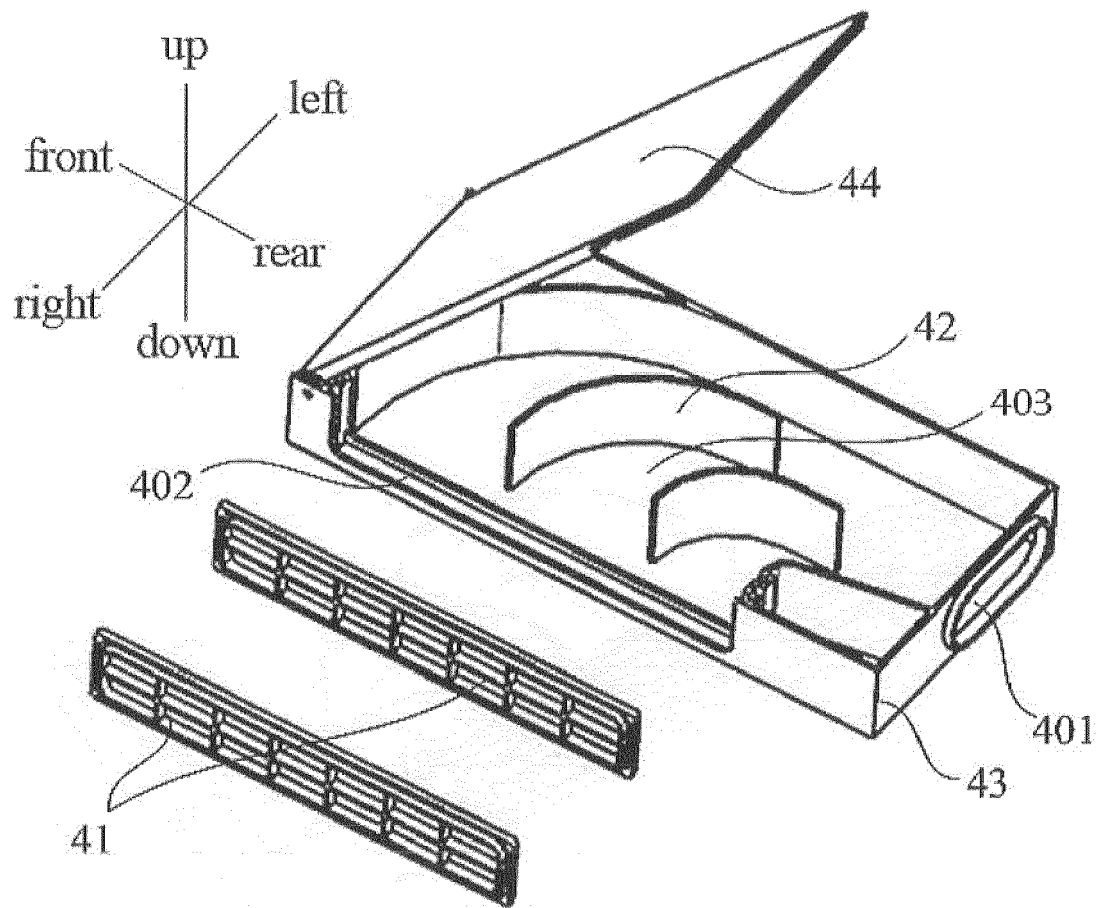


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 16 20 0436

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 843 123 A1 (ELECTROLUX APPLIANCES AB [SE]) 4 March 2015 (2015-03-04) * paragraph [0004] - paragraph [0024] * * paragraph [0028] - paragraph [0031] * * paragraph [0042] - paragraph [0053] * * paragraph [0083] - paragraph [0085] * * figures 1-5C * -----	1-10	INV. D06F58/22 ADD. D06F25/00
			TECHNICAL FIELDS SEARCHED (IPC)
			D06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 January 2017	Examiner Bermejo, Marco
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