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(54) **MULTI PURPOSE AIR PURIFIER**

(57) The invention relates to an air purifier (1). The air purifier comprises a housing (2) and an air inlet. A fan is provided inside the housing drawing air from the air inlet towards an air outlet. Further, a filter is provided inside the housing in an air path from the air inlet to the air outlet for filtering the air drawn from the air inlet such that air at the air outlet is filtered air. The air purifier comprises a hood (3) at the air outlet. The hood is configured to be positioned in at least a first position and a second position, where in the first position the hood is in a retracted position configured to let the filtered air exit the outlet without interfering with the direction of air exiting via the air outlet, and where in the second position the hood is in an expanded position configured to direct at least a fraction or all of the filtered outlet air in a predetermined direction. Hereby the air purifier can be made to operate in at least two different modes of operation. Advantageously, in the first mode a diffuse stream of filtered air is provided and in the second mode a focused air stream of filtered air is provided.

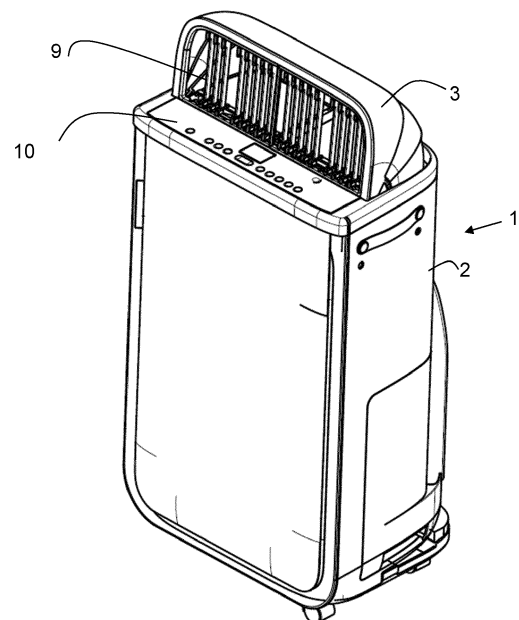


Fig. 4

Description

TECHNICAL FIELD

[0001] The invention relates to an air purifier.

BACKGROUND

[0002] Air purifiers are used to remove, in particular, unwanted particles from air. When used in a home environment, the aim of an air purifier is typically to improve the air quality in a home or a room in a home. The particles removed can be small health hazardous particles, tobacco smoke particles or even viruses and bacteria. Thus, the air purifier can be described as a device which removes contaminants from the air in a room to improve indoor air quality. These air purifiers can be particularly helpful for allergy sufferers and asthmatics, but also in other scenarios where the indoor air quality needs to be improved.

[0003] The air purifiers are provided with different filters for filtering different types of particles and contaminants and the purified air is expelled via an outlet in a diffuse manner to be spread all around the space where the air purifier is located.

[0004] Air purifiers for home use are typically designed as stand-alone units that can be moved around and hence form portable air purifiers.

[0005] There is a constant desire to improve air purifiers and the use thereof. Hence, there exists a need for an improved air purifier.

SUMMARY

[0006] It is an object of the present invention to provide an improved air purifier and in particular a portable air purifier.

[0007] This object is obtained by a device as set out in the appended claims.

[0008] As has been realized by the inventors, it can be desirable to let the air purifier, in particular a portable air purifier, direct purified air in a focused stream to some part of the space where the air purifier is located. This can be achieved by providing a hood on top of the air purifier that can be positioned in different positions depending on the function that the user wants to have. In particular, the hood can be retracted to let the air purifier operate in a normal operational state where diffuse air is let out from the air purifier and also be folded out to direct the purified air in a focused air stream towards some part of the space where the air purifier is located.

[0009] Thus, in accordance with the invention, an air purifier is provided. The air purifier comprises a housing and an air inlet. A fan is provided inside the housing drawing air from the air inlet towards an air outlet. Further, a filter is provided inside the housing in an air path from the air inlet to the air outlet for filtering the air drawn from the air inlet such that air at the air outlet is filtered air.

The air purifier comprises a hood at the air outlet. The hood is configured to be positioned in at least a first position and a second position, where in the first position the hood is in a retracted position configured to let the filtered air exit the outlet without interfering with the direction of air exiting via the air outlet, and where in the second position the hood is in an expanded position configured to direct at least a fraction or all of the filtered outlet air in a predetermined direction. Hereby the air purifier can be made to operate in at least two different modes of operation. Advantageously, in the first mode a diffuse stream of filtered air is provided and in the second mode a focused air stream of filtered air is provided.

[0010] In accordance with one embodiment, the hood is configured to be positioned in at least one additional, third, position where in the third position the hood is in a partly expanded position. Hereby additional modes of operation can be achieved.

[0011] In accordance with one embodiment, in the second position, the hood is configured to divert outlet air 90 degrees. Hereby air can be directed horizontally for an air purifier that lets out air vertically or vice versa.

[0012] In accordance with one embodiment, the hood is configured to be completely retracted inside the housing of the air purifier in the first position. Hereby the hood can be put away when not in use and not hinder operation or movement of the air purifier.

[0013] In accordance with one embodiment, the hood has a curved backside. Hereby a more efficient direction of purified air can be achieved.

[0014] In accordance with one embodiment, the hood comprises at least two telescopic segments. Hereby the folding of the hood can be made easier and the hood will take less space when folded into a retracted position.

[0015] In accordance with one embodiment, the hood comprises a set of louvers. By providing louvers in the hood, louvers can be used to create a diffuse air stream in an easy manner when the hood is retracted. Also, the louvers can be used efficiently when the hood is used in its expanded (folded up) position.

[0016] In accordance with one embodiment, the air purifier comprises a motor configured to drive the louvers back and forth. Hereby the louvers can be made to oscillate to create a more comfortable air stream.

[0017] The air purifier as described herein can also provide additional functions such as having a heater and or an air humidifier.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The invention will now be described in more detail, by way of example, and with reference to the accompanying drawings, in which:

Fig. 1 illustrates a side view of a portable air purifier with a hood in a first position,

Fig. 2 illustrates a side view of a portable air purifier with a hood in a second position,

Fig. 3 is a cross sectional view of a portable air purifier, and

Fig. 4 is a view in perspective of a portable air purifier.

DETAILED DESCRIPTION

[0019] The invention will now be described more fully hereinafter with reference to the accompanying drawings, in which certain embodiments of the invention are shown. The invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided by way of example so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. For example, like or similar components of different embodiments can be exchanged between different embodiments. Some components can be omitted from different embodiments. Like numbers refer to like elements throughout the description.

[0020] In Fig. 1 an air purifier 1 in accordance with an embodiment of the invention is seen in a side view. The air purifier 1 is provided inside a housing 2. The air purifier 1 can advantageously be portable so as to be possible to move around inside a room or some other space where the air purifier is located.

[0021] In order to provide air purifying without causing any wind in the space where the air purifier is operated the air purifier 1 can be provided to have an air outlet in an indirect diffuse direction. Hereby purified air can be distributed in the space. This is typically how a conventional portable air purifier operates. The outlet can for example be provided to let out purified air at the top of the air purifier 1 in a diffuse manner in a non-specified direction as indicated by the arrows in Fig. 1.

[0022] However, as has been realized, in some instances it can be desired to have a more focused stream of purified air. To achieve such a focused stream of purified air, a hood can be provided at the air outlet as is depicted in Fig. 2.

[0023] In Fig. 2, the air purifier 1 is provided with a hood 3. The hood 3 directs the purified air or in some modes of operation a fraction thereof, in a direction that is selectable by the user. Hereby, a focused stream of purified air can be directed to a specific part or area in the space where the air purifier is located. Because all air exiting the air outlet of the air purifier is filtered in the air purifier 1, a focused stream of air can in this manner be directed by the user to a specific area.

[0024] In accordance with some embodiments the hood 3 is configured to be folded out from the air purifier 1 to an expanded position as is seen in Fig. 2. In particular, the hood 3 can be provided to rest inside the housing 2 of the air purifier when not in use, and the be folded

out when used. The hood 3 can be formed by multiple sections 31, 32 linked to each other such that the hood 3 has multiple sections and does not need to be in one single piece. The multiple sections can in one embodiment be linked in a telescopic manner.

[0025] In Fig. 3, a cross sectional view from the side of the air purifier 1 is shown. The air purifier has a fan 4 provided inside the housing 2. The fan 4 draws air from an air inlet 5 towards an air outlet 6. The air drawn from the air inlet 5 is made to pass a filter 7 inside the housing 2 in an air path from the air inlet 5 to the air outlet 6. The air path can for example include an air duct 8 directing air from the air filter 7 to the air outlet 6. The filter 7 is designed to filter the air from particles or bacteria or some other undesired contaminants of the air. The hood 3 is provided at the air outlet 6. The hood is configured to be positioned in two (or more) positions as explained above, such that the hood 3 can be in a retracted position configured to let the filtered air exit the outlet without interfering with the direction of air exiting via the air outlet 6, and also in an expanded position configured to direct at least a fraction of the filtered outlet air in a predetermined direction. The air purifier 1 can also be provided with louver(s) 9. In accordance with some embodiments the louver(s) can be provided in the hood 3.

[0026] The air purifier 1, can also operate as an air humidifier. In such an embodiment the air purifier 1 can comprise a water tank 11 and a humidification filter 12. A heater (not shown) can also be provided in the air purifier 1.

[0027] In Fig. 4, a view in perspective of the air purifier 1 is shown. In Fig. 4 the hood is in a fully expanded position where air is deflected in a 90-degree angle from an upright direction. As is understood, the hood 3 can in accordance with some embodiments be placed in different angular positions. For example, the hood can be configured to be positioned in a position where in the hood is in a partly expanded position in addition to be fully expanded and being folded into the air purifier and also in positions there-in-between.

[0028] Thus, in Fig. 4 the hood is in a fully expanded position and divert the outlet air 90 degrees. However, it is also envisaged that the fully expanded position corresponds to some other direction of diverting air.

[0029] Also, in Fig. 4 the retracted position corresponds to a position where the outlet of the air purifier is configured to let air exit in a generally vertical direction upwards. However, it is also envisaged that the air is let out in some other general direction when the hood is in a retracted position.

[0030] As can be seen in Fig. 4, the hood 3 can advantageously have a curved backside. Hereby air that is led via the hood can be diverted to and focused in a particular direction without unnecessarily hinder the air flow. The result is that air can travel longer in the direction in which the hood 3 directs the air.

[0031] Further, as mentioned above, the hood 3 can be made up of several segments. In particular, the hood

3 can comprises at least two telescopic segments. By forming the hood by several segments in this way, the hood can easily be folded into the housing 2 of the air purifier 1.

[0032] As set out above, the hood 3 can comprise a set of louvers 9. Louvers are elements, typically movable elements, provided to displace air blown by a fan. One or more such (movable) elements or louvers can be provided at the air outlet. In particular the louvers 9 can be mounted in the hood 3. The louvers 9 can be motor driven by a motor (not shown). In accordance with one embodiment the motor is configured to drive the louvers 9 back and forth. Hereby an oscillating movement of the louvers can be obtained whereby a diffuse air stream can be achieved.

[0033] Also, the hood 3 can be motor driven by a motor (not shown). The operation of the air purifier, including the operation of different motors when provided can be controlled by a user via a user interface 10. The hood can then be placed in any suitable position. For example, the hood can have different positions corresponding to diverting the purified air 0, 30, 60 and 90 degrees.

Claims

1. An air purifier (1) comprising:

a housing (2)
an air inlet (5),
a fan inside (4) the housing drawing air from the air inlet (5) towards an air outlet (6),
a filter (7) inside the housing in an air path from the air inlet to the air outlet for filtering the air drawn from the air inlet such that air at the air outlet is filtered air, the air purifier further comprising a hood (3) at the air outlet (6), wherein the hood is configured to be positioned in at least a first position and a second position, where in the first position the hood is in a retracted position configured to let the filtered air exit the outlet without interfering with the direction of air exiting via the air outlet, and where in the second position the hood is in an expanded position configured to direct at least a fraction of the filtered outlet air in a predetermined direction.

2. The air purifier (1) according to claim 1, wherein the hood (3) is configured to be positioned in at least one additional, third, position where in the third position the hood is in a partly expanded position.

3. The air purifier (1) according to claim 1 or 2, wherein in the second position the hood is configured to divert outlet air 90 degrees.

4. The air purifier (1) according to any one of claims 1 - 3, wherein in the first position the outlet of the air

purifier is configured to let air exit in a generally vertical direction upwards.

5. The air purifier (1) according to any one of claims 1 - 4, wherein in the first position the hood (3) is configured to be completely retracted inside the housing (2) of the air purifier.

6. The air purifier (1) according to any one of claims 1 - 5, wherein the hood has a curved backside.

7. The air purifier (1) according to any one of claims 1 - 6, wherein the hood comprises at least two telescopic segments (31, 32).

8. The air purifier (1) according to any one of claims 1 - 7, wherein the hood comprises a set of louvers (9).

9. The air purifier (1) according to claim 8, wherein the air purifier comprises a motor configured to drive the louvers back and forth.

10. The air purifier (1) according to any one of claims 1-9, wherein the air purifier further comprises a heater and or an air humidifier.

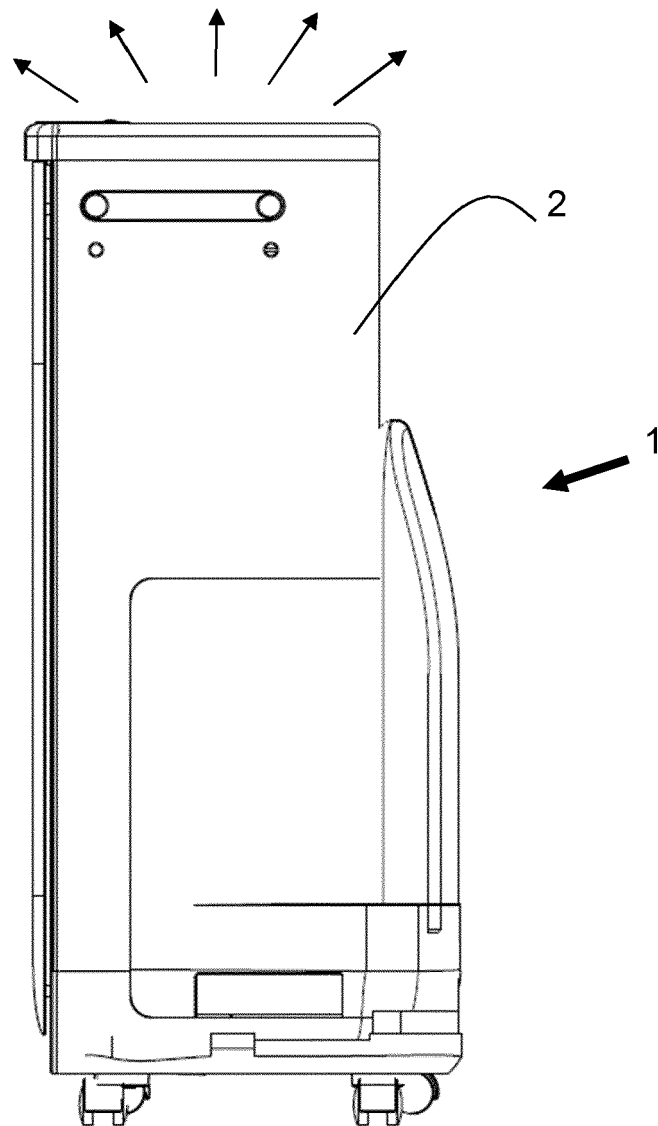


Fig. 1

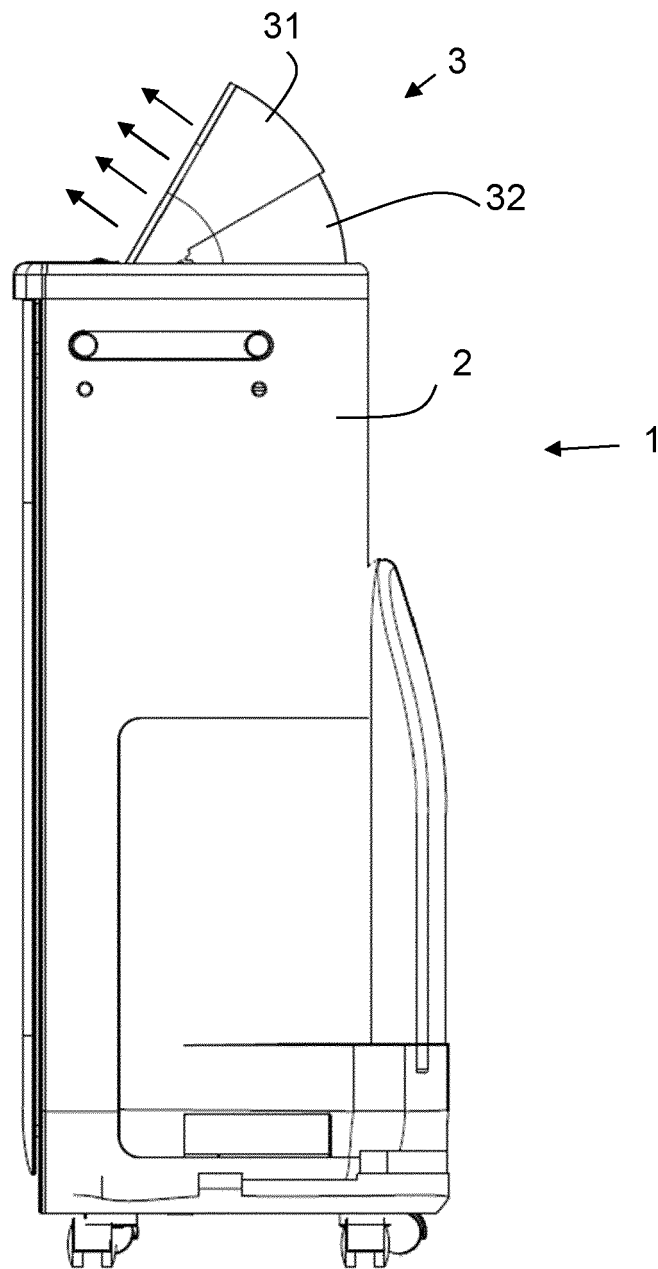


Fig. 2

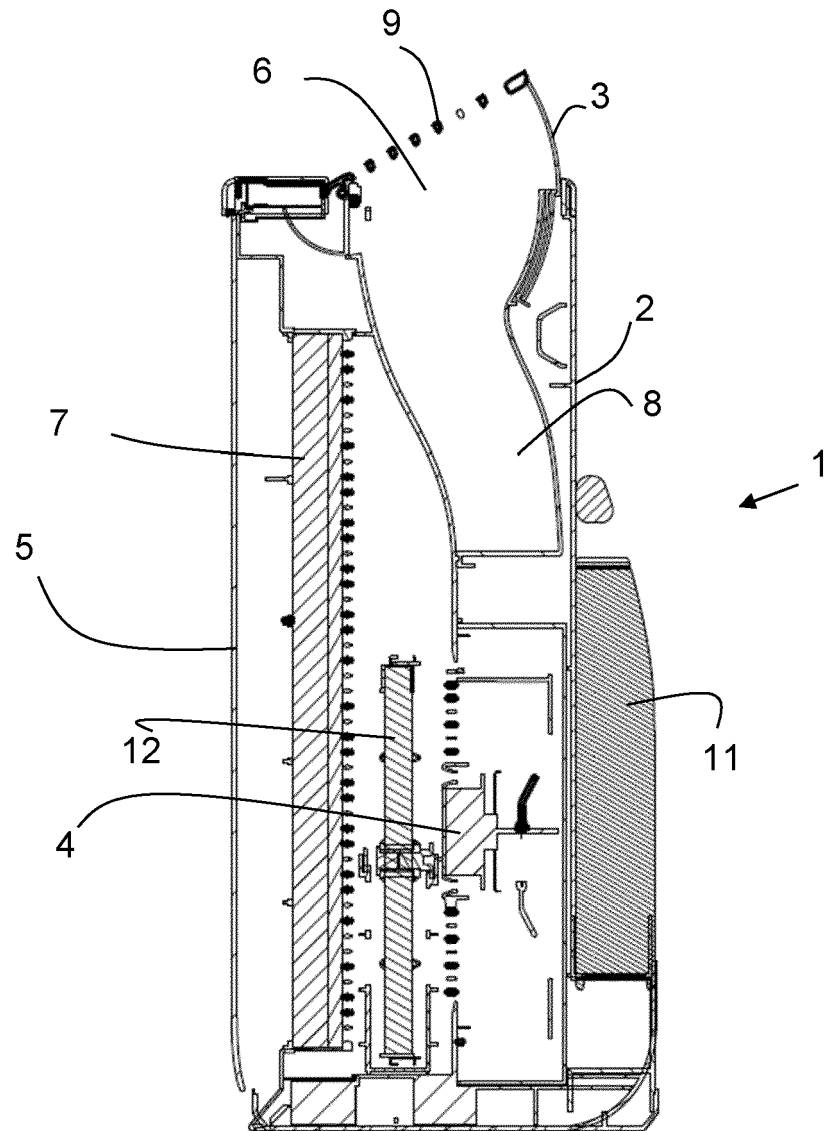


Fig. 3

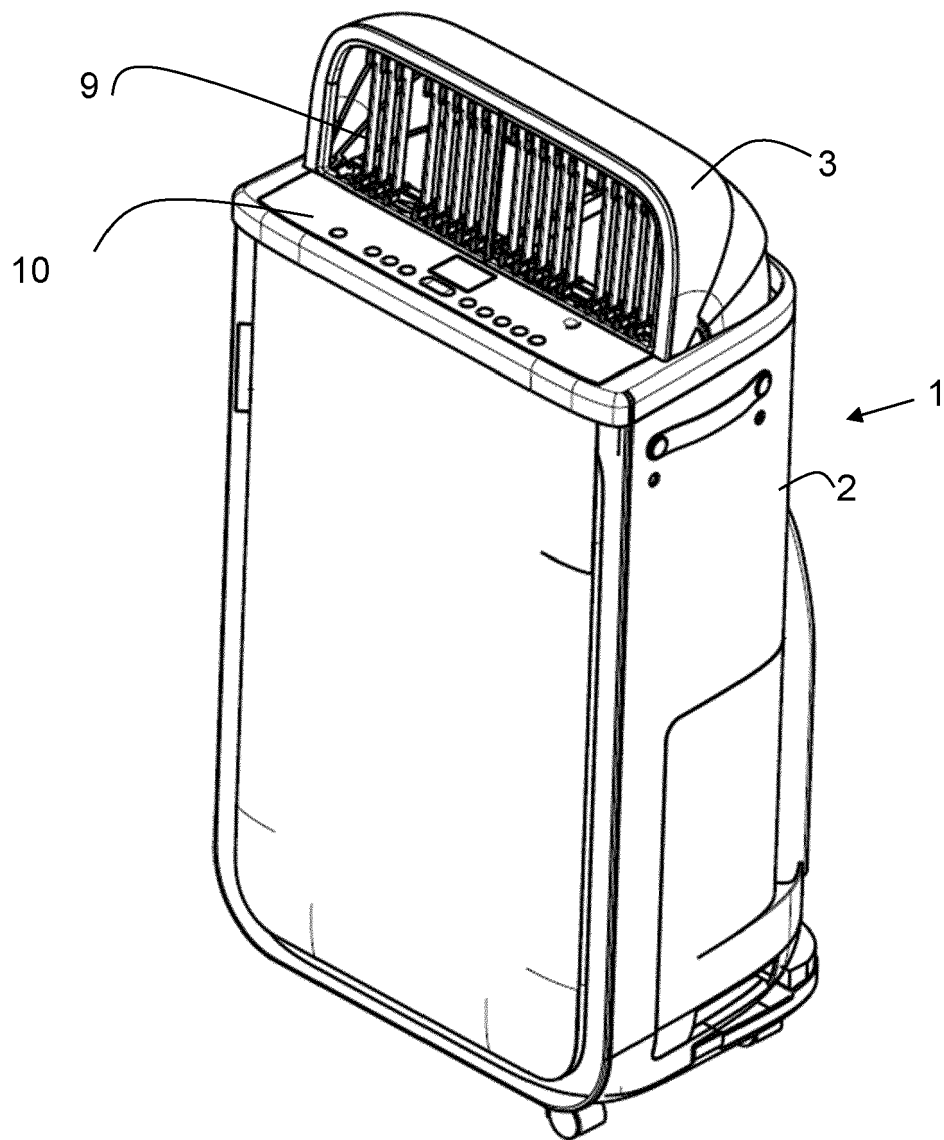


Fig. 4



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Application Number
EP 21 15 9348

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EPO FORM 1503 03.82 (P04C01)

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 19 July 2021	Examiner Blot, Pierre-Edouard
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 15 9348

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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