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(54) **A hand dryer**

(57) A hand dryer of the type having installed inside its body (1) a motor-blower-resistance assembly (5) suctioning ambient air from an inlet (6, 11') being provided in said body and expelling said air once heated to the outside through an outlet (11'', 7) also being provided in said body. With respect to the known dryers of the same type this dryer is characterized in that said motor-blower-resistance assembly (5) is arranged in a slanted arrangement inside the body (1), and the air outlet duct (8) has a tapered configuration and is provided with fences (22) thus bringing about an improved air suction and discharge by minimizing the air pressure losses and aerodynamically and fluidly optimizing the air flow path. The slanted arrangement of the motor-blower-resistance assembly (5) does as well facilitate its placement inside the body (1) thereby allowing to make the most of the physical dimensions of said assembly and to selectively install in it two different types of electric motor (12).

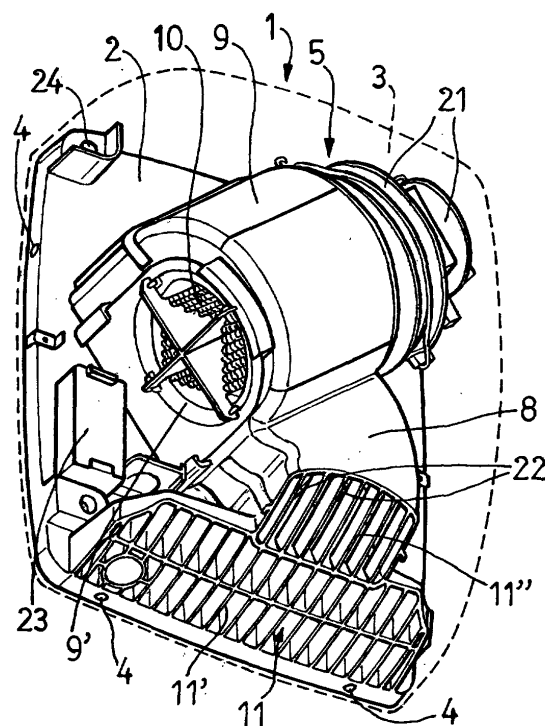


Fig. 1

Description

[0001] The hand dryer to which the present invention refers is of the type having installed inside its body a motor-blower-resistance assembly suctioning ambient air from an inlet being provided in said body and expelling said air once heated to the outside through an outlet also being provided in said body.

[0002] The aforementioned body is made up of a flat base being provided to be secured to the wall and having fitted to it the above-mentioned motor-blower-resistance assembly, and a cover being provided to be secured onto said base and comprising the air inlet and outlet.

[0003] The instant dryer to a substantial degree differs from the known dryers of the aforesaid type in that its motor-blower-resistance assembly is arranged in a slanted arrangement inside the dryer's body, this bringing about an improved air suction and discharge, a minimization of the air pressure losses, and an aerodynamically and fluidly optimized air flow path.

[0004] This slanted arrangement of the motor-blower-resistance assembly facilitates its placement inside the dryer's body thereby allowing to make the most of the physical dimensions of said assembly and to selectively install in it an electric induction motor or a universal one with brushes thus allowing to provide two versions of the dryer.

[0005] The slanted arrangement of the motor-blower-resistance assembly does as well allow to obtain a dryer of reduced dimensions and an optimum suction by the blower, all this resulting in a higher flow rate of expelled air and in a less noisy dryer as compared with the existing ones of the same type.

[0006] The instant dryer has the resistance of the motor-blower-resistance assembly advantageously installed in the suction inlet of said assembly, this minimizing the pressure head loss of the system and thus allowing to make a better use of the fluidic performance at the air outflow end.

[0007] This dryer is also provided with a specially designed volute allowing to reduce the diameter and hence the height of the dryer, and with an asymmetric impeller allowing to cool the motor and to uniformly distribute the air temperature at the outflow end.

[0008] A special, tapered outlet duct with fences does in its turn allow to direct the flow from the blower outlet towards the centre of the dryer with minimum losses and with a possibly lowest level of turbulence to thus reduce the noise level being generated.

[0009] The dryer does also incorporate a silent block arrangement allowing to adequately position the motor and to dampen the vibrations being generated by the motor-blower system, and another one being arranged on the back surface of the apparatus and in contact with the wall.

[0010] These and other characteristics will be best made apparent by the following detailed description

whose understanding will be made easier by the accompanying sheet of drawings showing a practical embodiment cited only by way of example not limiting the scope of the present invention.

[0011] In the drawings:

Fig. 1 is a perspective view of the hand dryer in question with the cover being shown as per a dash line illustration;

Fig. 2 shows a frontal elevation of said dryer without the cover;

Fig. 3 illustrates a plan-view from the bottom of the dryer with the cover sectioned; and

Fig. 4 is a lateral elevation from the right-hand side showing the dryer with the also sectioned cover and secured to a wall.

[0012] According to these figures, the hand dryer being shown in them comprises a body 1 being made up of a vertical, quadrangular, flat base 2 being at its back surface secured to the pertinent wall P, and a cover 3 being fitted through its opening onto said plate and secured at predetermined locations 4 of its contour thus covering the members being innerly comprised by the dryer, said members being fitted and/or secured to the front surface of base 2.

[0013] Of note from among said members is the motor-blower-resistance assembly 5 being arranged in a slanted arrangement on the front surface of base 2, the resistance 10 and the blower 26 being formed by an asymmetric, double-suction impeller being installed in the inside of a volute 9 being also arranged in a slanted arrangement and situated between the central and upper portions of base 2.

[0014] The motor 12 is in its turn fitted between silent blocks 21 on said upper portion of base 2 towards a corner of this latter (see Fig. 2) whose ample space 27 allows to install different types of motor as might be necessary.

[0015] The resistance 10 is installed inside the volute 9 between the air suction inlet 9' being arranged in a downwardly oriented arrangement (Figs. 1 and 2) and the blower 26, the motor 12 being fitted as has been said above and being located behind said blower and outside said volute 9.

[0016] The volute 9 forms a body having a rectangular base and a semicylindrical upper portion, and at the side being arranged in a downwardly oriented arrangement is connected to one of the ends of a hot air outlet duct 8, this connection being located at approximately the central portion of the dryer, said duct 8 extending along a sinuous path in a downward direction and as per a tapered configuration up to its other end where it is fitted to a grating 11 being provided on the lower edge of the base 2 and frontally projecting from it.

[0017] This grating 11 is divided in two sections namely being one section 11' being provided for the inflow of the outside air and being adjacent to the lower edge of

the base 2 forming part of the opening, said section 11' besides encompassing almost the whole length of said lower edge, and another one 11" being of smaller width and being formed by way of a forwardly directed, upwardly arcuated extension of the former one, this latter section 11" being provided for the outflow of the hot air and being more or less centred with respect to the other one, the duct 8 being fitted to it and innerly comprising fences 22 being provided to bring about a perfect guidance of the air flow.

[0018] Cover 3 comprises properly arranged openings 6, 7 (Fig. 4) in correspondence with said sections 11', 11" of the grating 11, whereas the base 2 comprises a box 23 housing the electrical connections, and holes 24 being provided to allow to secure said base to the wall P (Figs. 1 and 2), as well as a set of silent blocks 25 being arranged on its back surface for the purpose of reducing as much as possible the vibrations and noises being generated by the dryer.

Claims

1. A hand dryer comprising a body (1) being made up of a base (2) and a cover (3) and having installed in its inside a motor-blower-resistance assembly (5) suctioning ambient air from an inlet (6, 11') being provided in said body and expelling said air once heated to the outside through an outlet (11", 7) also being provided in said body; **characterized in that** the motor-blower-resistance assembly (5) is arranged in a slanted arrangement inside the dryer's body (1) thus allowing to make the most both of its physical dimensions and of its fluidodynamic performance.
2. A hand dryer as per claim 1, **characterized in that** the duct (8) being innerly comprised by it in order to allow to direct the air flow to the outlet (11", 7) being located at the centre of said dryer, said duct being provided by way of a direct extension of the volute (9) of said dryer, is innerly provided with fences (22) and has a tapered configuration being adapted to minimize the losses of said air flow and the levels of turbulence being generated.
3. A hand dryer as per claim 1, **characterized by** the geometric arrangement of its inner members in such a way as to allow to selectively install in the drive unit (26, 12) two different types of electric motor (12), one of them being of the induction, capacitor-start type, and the other one being of the type of a universal motor with brushes.

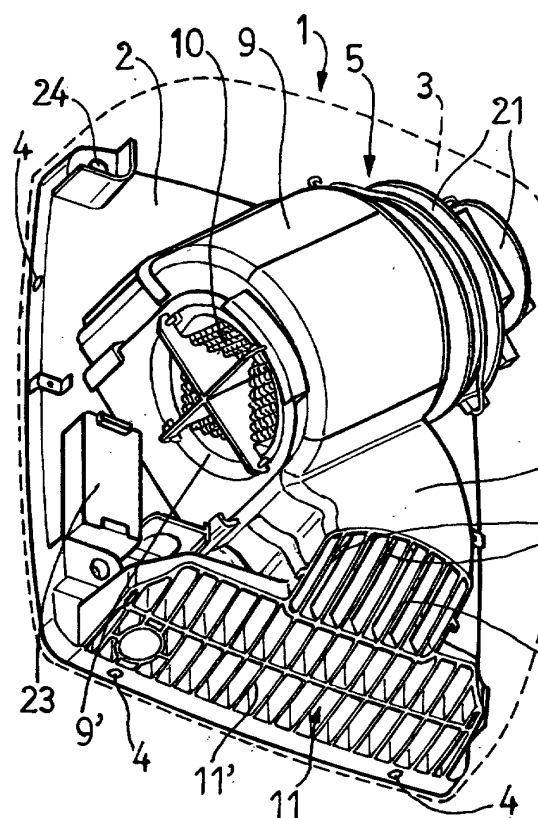


Fig. 1

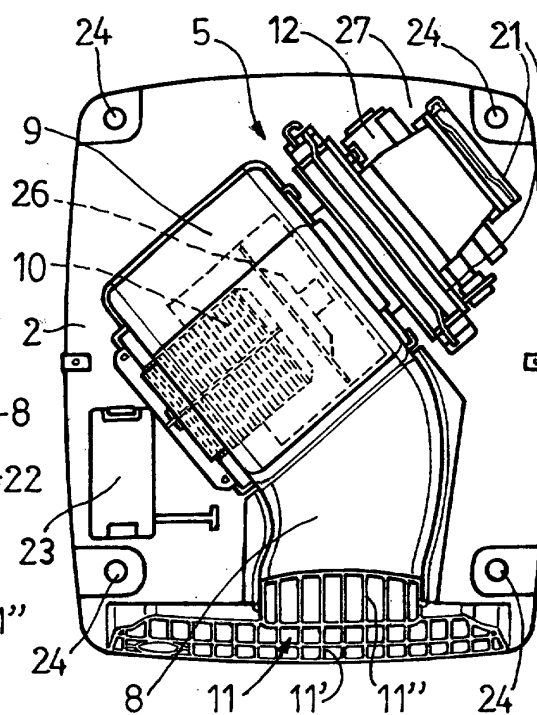


Fig. 2

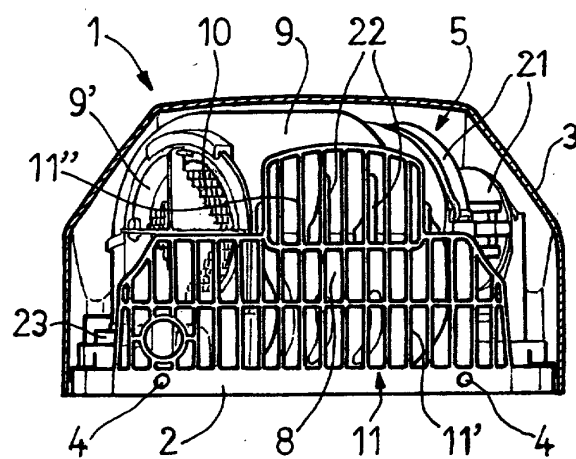


Fig. 3

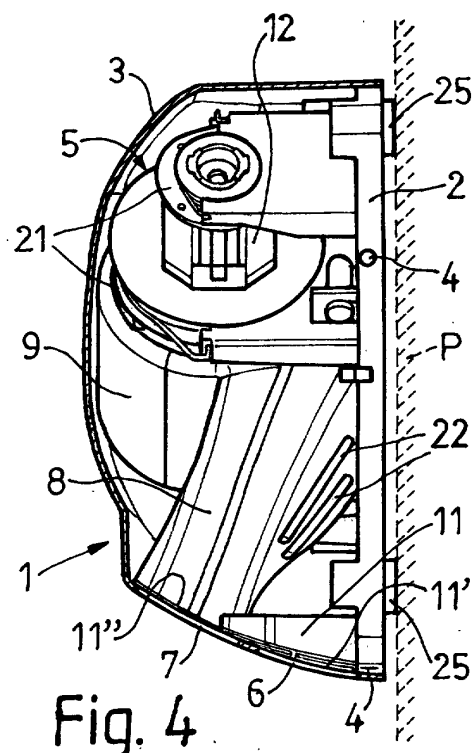


Fig. 4