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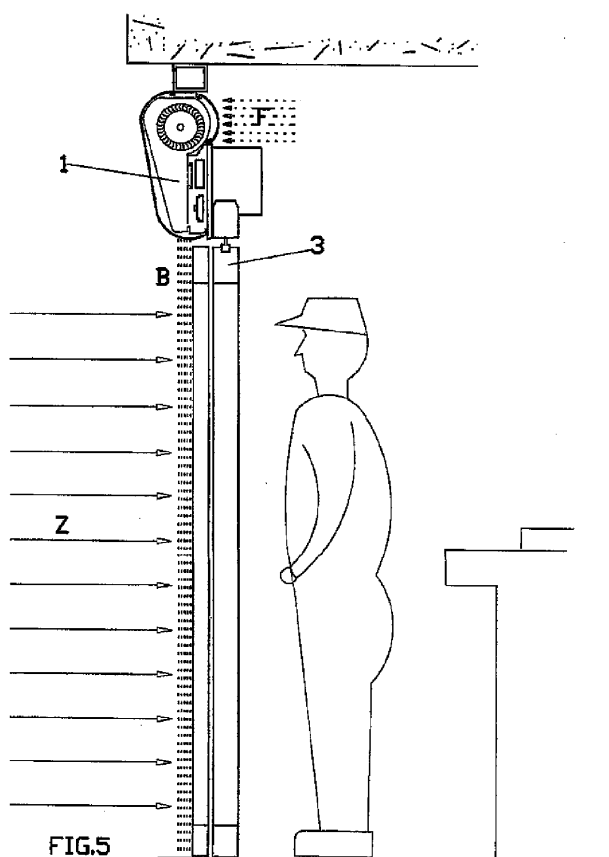
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(54) **Automatic lateral sliding door**

(57) The invention regards an automatic lateral sliding door, of the type provided with an "air blade barrier", obtained with suitable airflow, configured according to a vertical slat configuration, which form a vertical barrier, which withholds the airflow in horizontal direction.

Such automatic door is characterized in that the ven-

tilation group (1), which provides for the air barrier (B), is applied on the upright of the door (3), so as to have the port for suctioning the airflow arranged on one side of the door and the slit for blowing the air, that forms the barrier (B), positioned on the other side of the door itself. (Fig 5).



Description

[0001] The present finding regards an automatic lateral sliding door, according to the general part of claim 1.

[0002] As it is well known, even in rooms well thermally insulated from the external environment, where all design precautionary measures are taken as regards the efficiency of the doors and windows, there often arises the need to resolve some heating drawbacks caused by the so-called "air masses", which move within the environments upon opening the doors.

[0003] If at domestic level the impact of these air currents is not particularly important, in that the period of time the door remains open is extremely short, on the contrary, in business buildings the issue becomes much more important.

[0004] Business buildings are subject to a continuous flow of clients coming in and out, hence implying continuously opening and closing the doors, thus leading to the occurrence of airflows from outside and heat efficiency loss from inside, this being caused by the difference between the internal temperature and the external temperature (even in absence of wind).

[0005] This phenomenon causes a series of more or less significant problems, such as:

- the formation of unpleasant air currents at the door;
- heat-hygrometric unbalance of the internal environment with ensuing head loss of the air condition system;
- entry of dust and pollutant agents from the outside to a point that, in case of a busy traffic area or industrial area, the pollution and external dust level jeopardise any air cleaning effort by the air purification system.

[0006] The problem is solved by introducing the so-called "air-blade barriers" constituted by an appropriate airflow, configured according to a vertical slat configuration, which form a vertical barrier, which withholds the airflow in horizontal direction.

[0007] In the current state of the art, the air jet or "air blade" is provided by an apparatus operating on the principle of the fan, which is arranged in a raised position, from the internal part of the door.

[0008] More specifically, such apparatus, which will be identified hereinafter by the general term of "ventilation group", is a substantially parallelepiped-shaped casing, provided with a port for suctioning air and a lower slit for the exit of the airflow, which provides for the "heat curtain", invisible and descendent, which serves as a barrier against the air masses, which would naturally enter from outside the door itself. Such apparatus - being positioned on the internal part of the door, where means for controlling the door are also provided, should, for this reason, necessarily be sufficiently spaced from the door itself, hence generating an interspace between the door and the "heat curtain"; however, this jeopardizes the action

of countering the air barrier, as described more in detail hereinafter.

[0009] A second drawback which arises with the use of the ventilator groups of the known type regards the aesthetic aspect, in that these apparatuses, constituting a separate block from the door structure, are "cumbersome containers" hanging on the ceiling and unpleasant to sight.

[0010] As the most relevant documents of the state of the art EP 1801341 A1, US 2007/298703 A1, DE 4404733 A1 are cited.

[0011] An object of the present finding is to provide an automatic lateral sliding door provided with an air blade barrier, without the drawbacks revealed by the similar products of the known type.

[0012] This object is attained by means of an automatic lateral sliding door, which is characterized by the fact that the ventilator group is applied on the upright of the door, so as to have the air suctioning port arranged on one side of the door, usually the one facing inwards, while the slit for blowing the air blade is positioned on the other side of the door, usually the one facing outwards.

[0013] Specifically, the ventilator group is configured so that the air suctioning port is substantially in line, or at least minimally projecting, with respect to the frame of the door, while the slit for discharging the air is positioned so that the air barrier that is formed is the closest possible to the external face of the door and, specifically, with lateral extension at least equivalent to the opening of the same door.

[0014] The finding will be further defined through the description of a possible embodiment thereof, provided by way of non-limiting example, with reference to the attached drawings, wherein:

- fig 1 (table I) represents an elevational and sectional view of the ventilation group applied on a sliding door;
- figs 2, 3 (table II) represent views, respectively, from inside and outside, of a sliding door, provided with the apparatus according to fig 1;
- figs 4, 5 (table III) represent the installation and operation of a ventilation group, respectively, of the known type and innovative type according the invention.

[0015] As observable in figs 1-3, the ventilation group, indicated in its entirety with reference 1, is mounted on the upper crosspiece 2 of the door 3, so as to be able to suction an airflow "F2" from inside and transform it into an air blade barrier "B", which is positioned immediately before the external part of said door.

[0016] From a construction point of view, the ventilation group 1 comprises a blowing apparatus 10, enclosed within a protection casing 20.

[0017] Specifically, the blowing apparatus 10 consists of a metal structure 11, applied, through connectors 12, to the upright 2 of the door 3, containing a fan 13, which suctions air from the port 14 and conveys it into the ta-

pered conduit 15 where the air barrier "B" flow is formed.

[0018] Still specifically, the protection casing 20, suitably shaped and removable, is made up of a rear part 21, provided with a grid 22, which allows suctioning the airflow and by a front part 23, provided with slits 24, for the exit of the air barrier "B". There are considerable advantages obtained from the application of the finding. Actually, practically, as observable in fig 4, the common ventilation group 100 is positioned in proximity of the internal part of the door, where the automation members "K" of the aforementioned door are also present hence said group should necessarily remain sufficiently spaced from the door itself.

[0019] Such current arrangement results in the air barrier "B1" being necessarily spaced from the door and specifically from the passage opening of the door, hence due to such distance, the horizontal entry airflow "Z", meant to be countered, travels the space of the interspace "H", present between the open door and the "heat curtain" and it is discharged laterally on the two sides of said barrier, thus being able to freely enter into the environment to be protected against external air and almost entirely jeopardizing the countering action of the "air blade".

[0020] On the contrary, as observable in fig 5, by applying the ventilation group 1 according to the invention, the air barrier "B", being positioned outside the door, in an almost flushed manner and extending well beyond the passage opening "C", entirely prevents the horizontal entry airflow "Z" from exceeding beyond the door itself.

[0021] In addition, figures 4, 5, clearly reveal another advantage of the finding, i.e. that the ventilation group 1 can also be mounted on previously installed sliding doors 3, exploiting the space present between the upper cross-piece of the door and the ceiling for introducing a suctioning grid.

[0022] Lastly, as clearly observable in fig. 5, it is possible to observe the advantage of the smaller overall dimension required by the ventilation group 1, in that it is positioned substantially in line with the structure of the sliding door; furthermore, given that it is provided with an interchangeable protection casing, the external aspect of the apparatus can be configured variously, adapting it to the technical needs of the door on which it is applied and thus minimising the presence of said apparatus to the minimum.

[0023] The finding thus conceived can be subjected to modifications and variants and the construction details thereof can be replaced by other technically equivalent elements as long as they fall within the inventive concept defined by the claims that follow.

Claims

1. AUTOMATIC LATERAL SLIDING DOOR, of the type provided with an "air blade barrier", obtained with an appropriate airflow, configured according to a vertical slats configuration, which form a vertical

barrier, which withholds the air flow in horizontal direction, said automatic door **characterised in that** the ventilation group (1) which provides for the air barrier (B), is applied on the upright (2) of the door (3), so as to have the port (21) for suctioning the airflow (F) arranged on one side of the door and the slit (24), for blowing the air that forms the barrier (B), positioned on the other side of the door itself.

2. AUTOMATIC LATERAL SLIDING DOOR, according to claim 1, **characterised in that** the ventilation group (1) is configured so that the port (21) for suctioning the airflow (F) is substantially in line, or minimally projecting, with respect to the door frame (3) while the slit (24) for discharging the air is positioned so that the air barrier (B) that is formed is the closest possible to the external face of the door, at the opening (C) of the same door.

3. AUTOMATIC LATERAL SLIDING DOOR, according to claim 2, **characterised in that** the ventilation group (1) comprises a blowing apparatus (10) enclosed within a protection casing (20).

4. AUTOMATIC LATERAL SLIDING DOOR, according to claim 3, **characterised in that** the blowing apparatus (10) is constituted by a metal structure (11), applied through connectors (12) to the upright (2) of the door (3) and containing a fan (13), which suctions air from the opening (14) and conveys it into the tapered conduit (15), where the flow of the air barrier (B) is formed.

5. AUTOMATIC LATERAL SLIDING DOOR, according to claim 3, **characterised in that** the crankcase (20), suitably shaped, is made up of a rear part (21), provided with a grid (22) which allows suctioning the airflow and by a front part (23), provided with slits (24) for the exit of the air barrier (B).

6. AUTOMATIC LATERAL SLIDING DOOR, according to claim 5, **characterised in that** the component parts (21, 23) of the crankcase (20) are withheld on the upright (2) in a removable manner, so as to allow substitution thereof with others having different shapes.

7. AUTOMATIC LATERAL SLIDING DOOR, according to one or more of the preceding claims, **characterised in that** the air barrier (B) has a greater lateral extension than the width of the door opening (C).

8. VENTILATION GROUP (1), provided with a blowing apparatus (10), constituted by a metal structure (11), which contains the fan (13), which suctions the air from the opening (14) and conveys it into the tapered conduit (15), where the flow of the air barrier (B) is formed, said apparatus being enclosed in a crank-

case (20), made up of a rear part (21), provided with a grid (22), which allows suctioning the airflow and by a front part (23), provided with slits (24), for the outflow of the airflow, said ventilation group (1) being **characterized in that** it is mounted on automatic lateral sliding doors, according to one or more of the preceding claims.

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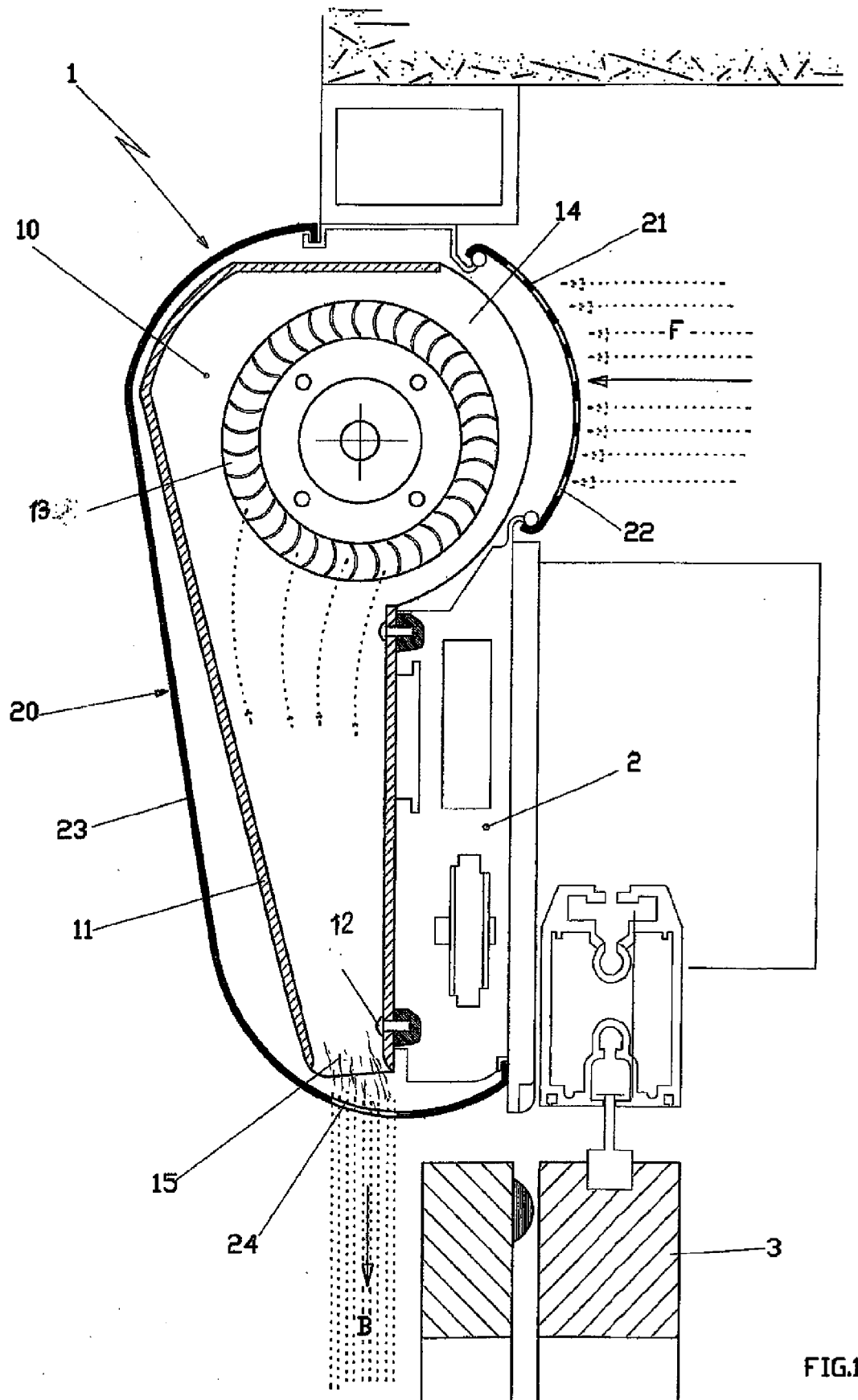
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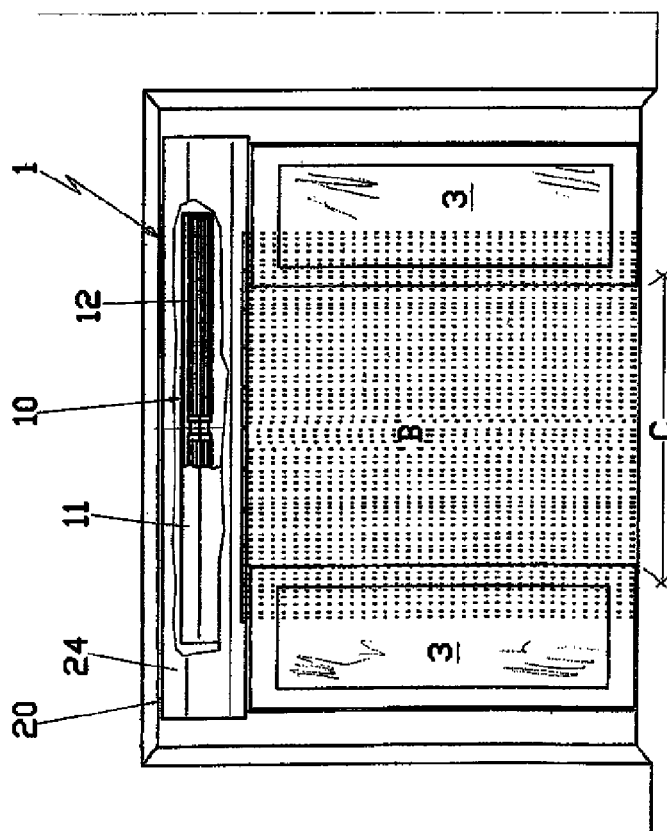


FIG. 2

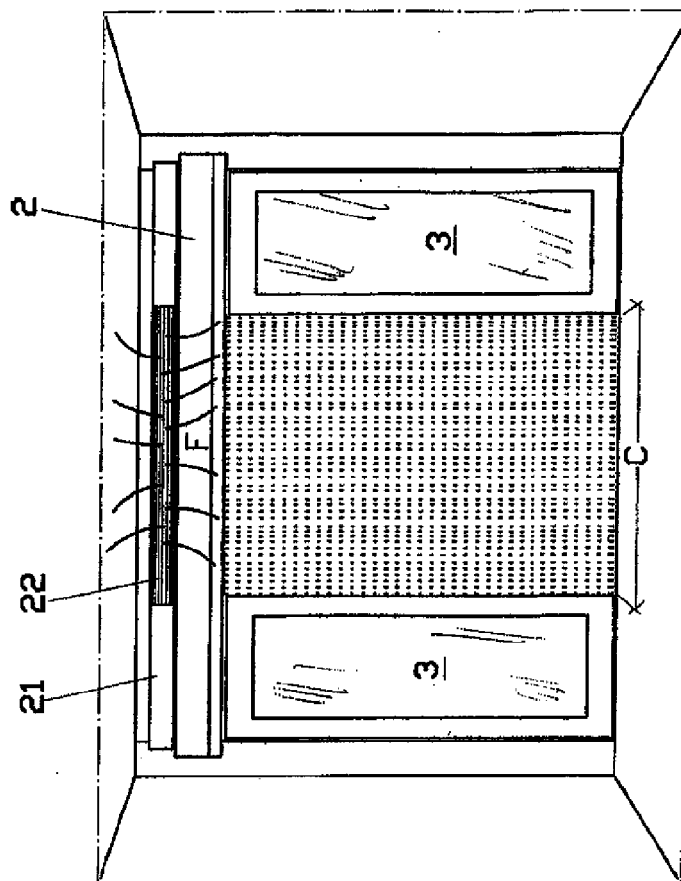
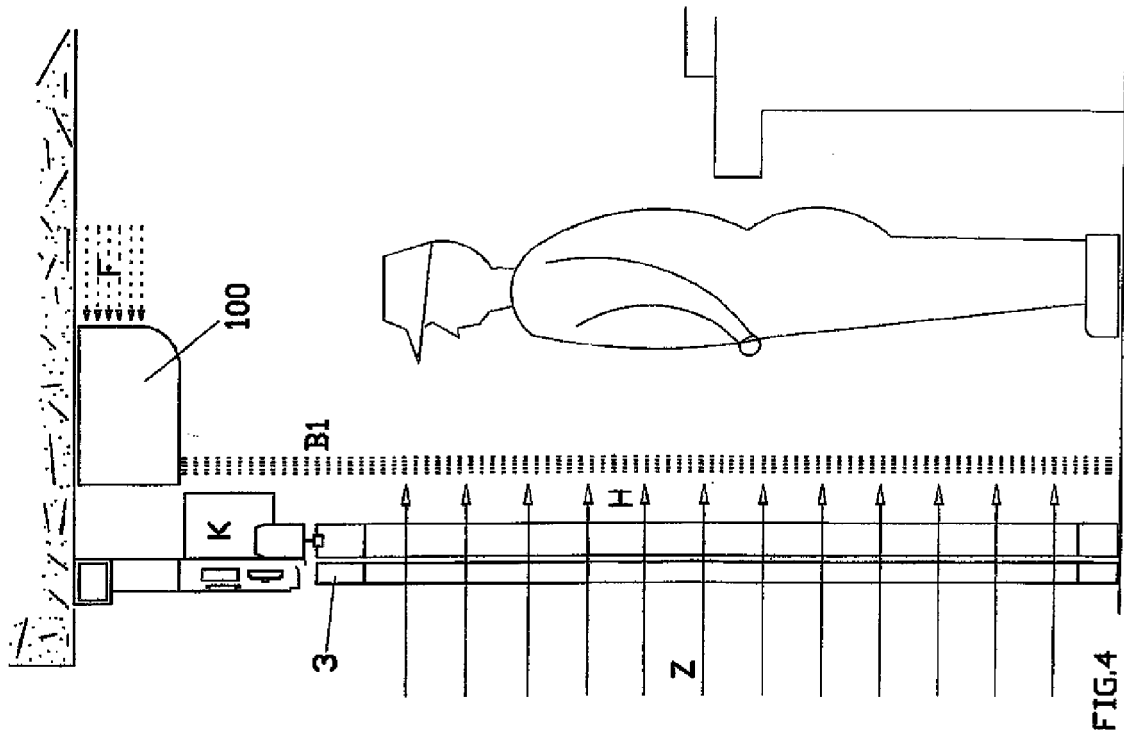
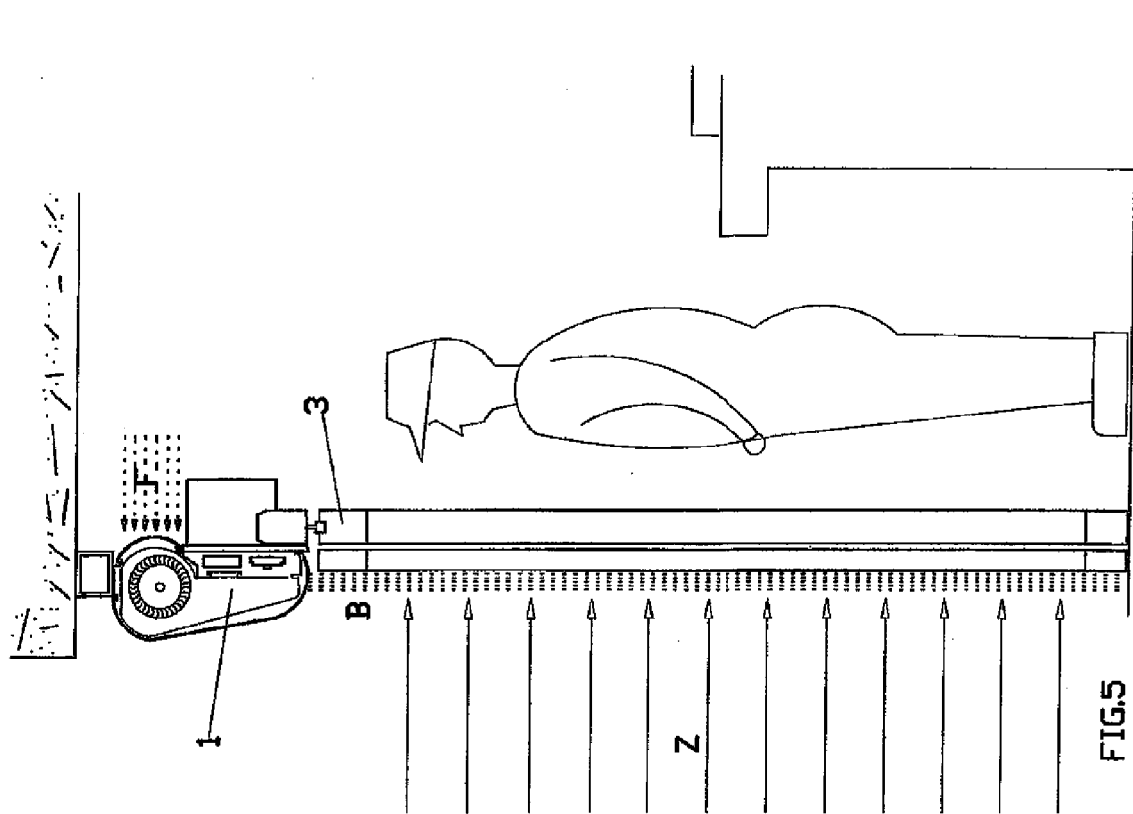


FIG. 3





EUROPEAN SEARCH REPORT

Application Number
EP 12 15 9160

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 801 341 A1 (ASSA ABLOY IP AB [SE]) 27 June 2007 (2007-06-27) * abstract *	1-8	INV. F24F9/00
A	----- US 2007/298703 A1 (CHEN CHIH-FENG [CN]) 27 December 2007 (2007-12-27) * abstract *	1-8	
A	----- DE 44 04 733 A1 (LKS LUFT UND KLIMASERVICE CHRI [DE]) 17 August 1995 (1995-08-17) * abstract *	1-8	
			TECHNICAL FIELDS SEARCHED (IPC)
			F24F E06B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 June 2012	Examiner Valenza, Davide
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			

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EPO FORM 1503 03.82 (P04C01)

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

EP 12 15 9160

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The members are as contained in the European Patent Office EDP file on
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13-06-2012

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EP 1801341	A1	27-06-2007	EP	1801341 A1	27-06-2007

US 2007298703	A1	27-12-2007	NONE		

DE 4404733	A1	17-08-1995	NONE		

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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