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EP 3 458 721 B1

Description

FIELD OF THE INVENTION

[0001] The present invention concerns a fan usable in closed domestic or public places, to create a stream of air for ventilating or conditioning the surrounding environment.

[0002] The term fan as used hereafter is intended to mean, in a broader sense, any apparatus whatsoever able to supply ventilation, conditioning, cooling, heating, thermo-ventilation, dehumidification or purification of the air.

BACKGROUND OF THE INVENTION

[0003] Fans for rooms are known, substantially configured as a column, with a containing structure which houses the mechanical components that generate the stream of ventilation or conditioning air, and a zone from which the stream of air is emitted, comprising one or more exit apertures through which the stream is emitted toward the environment.

[0004] In the most typical and widespread solutions, the exit aperture is generally located in sight on the front part of the structure of the fan, often making the technical components partly visible, for example the ventilation blades and/or the possible heating means.

[0005] This can give the fan an unpleasant esthetic effect, preventing the manufacturer from obtaining a clean profile, without discontinuities and thus lowering the esthetic value of the fan.

[0006] Furthermore, since the technical components face directly toward the space, they are more subject to contact with dust or other dirt that can compromise the functioning thereof.

[0007] Portable fans are also known, which do not have the internal components visible or partly visible, or that do not have ventilation blades, but which have a stream of air confined to a limited portion of space.

[0008] In particular, the stream of air is greatly limited in its distribution in the space, which reduces its applicability and effectiveness.

[0009] Another disadvantage of many of the known solutions is that the air entering the fan is taken in in a lower zone, where there is the motor, substantially in correspondence with or near the base of the fan.

[0010] In this way, as well as taking in the air from the space, the fan also takes in the dust which is present in large quantities on the base surface where the fan is rested.

[0011] Document CN-A-104.863.871 for example describes a fan comprising a support base provided with an air suction chamber, and a body that develops in a vertical direction, communicating with the support base and provided with a plurality of slits made in the longitudinal direction, through which the stream of air generated is emitted outside, in a direction imparted by deflector

elements provided in correspondence with the slits. In the solution described in CN-A-104.863.871, the entrance apertures for the air and the means to generate a stream of air are necessarily provided in the support base, under the slits through which the air exits, because the geometry and configuration of the vertical body do not allow a different disposition of these components.

[0012] Document WO-A-2012/017220 describes a fan comprising a body provided with apertures for the air to enter, inside which body means to generate a stream of air are disposed, and a casing with an annular shape, provided with at least a first aperture to emit a first portion of the stream of air and at least a second aperture to emit a second portion of the stream of air. Due to the disposition of the air entrance apertures and the means to generate the stream of air, constrained by the configuration of the fan, the air sucked in can contain dust or impurities that tend to deposit in correspondence with the ground.

[0013] Document CN-A-105.351.230 describes a fan that exploits the Coanda effect to emit a stream of air toward a user. The fan comprises a chamber provided with holes for the air to enter, inside which chamber the means to generate the stream of air are provided and on which a Coanda-type deflector is disposed with a section comprising an arched portion and a V-shaped portion, and provided with slits for the stream of air to exit in correspondence with the arched portion, which deflect the stream of air toward the tip of the V. The solution described provides that the entrance holes and the means to generate the stream of air are disposed in correspondence with the lower part of the fan, but this causes the same problems as described above.

[0014] The solution described in US-A-2015/0136997 concerns a fan device provided with a housing for the main body with a column shape, provided with an entrance aperture for the air in a rear zone, and with an exit aperture defined by a slit made longitudinally in a front wall of the housing of the main body. The fan device comprises a blowing device disposed in the lower part of the housing of the main body, configured to make the air circulate from the entrance aperture to the exit aperture from the bottom upward.

[0015] One purpose of the present invention is to obtain a fan that overcomes the disadvantages of known fans.

[0016] Another purpose of the present invention is to obtain a fan that returns a distributed stream of air at uniform temperature, able to guarantee maximum comfort to the people in the space where it is positioned.

[0017] Another purpose is to obtain a fan that requires minimum maintenance operations with reduced frequency.

[0018] Another purpose is to obtain a fan that allows to vary the amplitude of the stream of air at exit.

[0019] Another purpose of the present invention is to obtain a fan with great esthetic value, having a front surface without discontinuities and defining a closed profile without apertures to access the internal zone where there

are the functional components of the fan.

[0020] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0021] The present invention is set forth and characterized in the independent claims, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0022] In accordance with the above purposes, the present invention concerns a fan for the emission of a stream of air into a space.

[0023] The fan comprises a main body with a vertical development with respect to a support base on which it is located in a condition of use, said main body defining an internal housing compartment.

[0024] According to one aspect of the present invention, the fan has a longitudinal aperture disposed in its rear zone, for the emission of the stream of air toward the outside, and also comprises an air suction and distribution unit, located, at least for a substantial part thereof, above the beginning of the longitudinal aperture, and a channeling element positioned in proximity to the longitudinal aperture and cooperating with it to determine the exit of the stream of air through the longitudinal aperture, so that the exiting stream of air adheres to the external surface of the main body and is conveyed toward the front of the fan.

[0025] According to another aspect of the invention, the external surface of the main body has a rounded geometry substantially without discontinuities so that the stream of air, exiting from the rear part of the fan, is conveyed adherent toward the front part and then toward the external environment to be ventilated or conditioned.

[0026] According to another aspect, the channeling element has or is associated with means suitable to subdivide the stream of air exiting from the longitudinal aperture into two streams with opposite directions, so that the streams separate substantially in correspondence to the longitudinal aperture and are separately conveyed adhering to the external surface of the main body, toward the front part of the fan, where they are at least partly rejoined and spread into the environment.

[0027] In this way, advantageously, a fan can be obtained that does not need blades, in which the internal components are not visible to the user and whose visible surface is without discontinuities, with a rounded profile that, as well as providing a pleasant esthetic appearance, is functional for the emission and distribution of streams of air into the space.

[0028] The invention also concerns a method to determine a stream of air exiting from the fan.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] These and other characteristics of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a front elevation view of a fan according to one embodiment of the present invention;
- fig. 2 is a view in section of the fan in fig. 1 taken according to the section plan II-II visible in fig. 3;
- fig. 3 is a cross section of the fan in fig. 2;
- fig. 4 is a cross section of a variant of the fan in fig. 2;
- fig. 5 is a cross section of a variant of the fan in fig. 2;
- fig. 6 is a cross section of a variant of the fan in fig. 2;

[0030] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can conveniently be incorporated into other embodiments without further clarifications.

DETAILED DESCRIPTION OF SOME EMBODIMENTS

[0031] Embodiments described here with reference to figs. 1-6 concern a fan 10 usable in particular in closed spaces for ventilating air at room temperature, for cooling, heating, thermo-ventilating, dehumidifying or purifying air.

[0032] The fan 10 comprises a main body 12 with a vertical development with respect to a support base 18 on which it is positioned during use.

[0033] The main body 12 defines inside it a compartment 13 for housing functional components.

[0034] The fan 10 has a longitudinal aperture 16, disposed in the rear part of the main body 12, and comprises a unit 14 to take in and distribute a stream of air W.

[0035] The air suction and distribution unit 14 is located, at least for a substantial part, above the beginning of the longitudinal aperture 16.

[0036] The longitudinal aperture 16 is disposed on the opposite side with respect to the space to be conditioned. In particular, the longitudinal aperture 16 is located in the rear part of the fan 10, and the stream of air W exiting from the longitudinal aperture 16 is deflected so as to reach the front zone located at the front of the fan 10, as indicated by arrows F in figs. 3 and 4.

[0037] In general, the expressions "rear part" and "front zone" are only intended to define a functional relationship between these two parts, which have to be substantially opposite each other with respect to the main body 12 and the user.

[0038] According to some embodiments, the air suction and distribution unit 14 comprises a rotor 15 provided with suitably oriented blades to determine the suction of the air from the outside and its entrance into the main

body 12.

[0039] The rotor 15 can be designed for example to obtain a centrifugal fan, an axial fan or a mixed axial-centrifugal fan.

[0040] The air suction and distribution unit 14 also comprises a drive member 17 connected to the rotor 15 by means of a drive shaft located in correspondence with the center of the rotor 15.

[0041] The fan 10 also comprises a channeling element 20 positioned near the longitudinal aperture 16 and cooperating with it to direct the stream of air W toward the outside.

[0042] The channeling element 20 is configured so as to allow the stream of air W exiting from the longitudinal aperture 16 to adhere to an external surface 22 of the main body 12. In other words, the channeling element 20 is able to deflect the stream of air W exiting from the longitudinal aperture 16.

[0043] The channeling element 20 comprises an active surface 20a which, during use, is struck by the stream of air W exiting from the longitudinal aperture 16. The active surface 20a can have a convex shape.

[0044] The channeling element 20 makes the stream of air W exiting from the longitudinal aperture 16 in its travel toward the front zone of the fan 10 follow the profile of the external surface 22 and be conveyed toward the front of the fan 10, as can be seen better in figs. 3 and 4.

[0045] Furthermore, in cooperation with the external surface 22, the channeling element 20 is configured to determine a minimum passage section of the stream of air W exiting from the compartment 13.

[0046] In one formulation of the invention, the external surface 22 has a rounded geometry, substantially without any discontinuities, so that the stream of air W, exiting from the rear part of the fan 10, is conveyed adherent toward the front part and then toward the space to be ventilated or conditioned.

[0047] Within the field of the present invention, the rounded geometry can be defined by a cross section that is substantially circular, regular oval, drop-shaped, compressed, or such as to obtain a profile of the main body 12 that is substantially drop-shaped or wing-shaped, or any other shape, even different from circular, suitable to convey the stream of air W adherent to the external surface 22 without creating significant variations in the development of the stream, and without creating disturbances, turbulence, discontinuities or any other factor that could disturb the development of the stream.

[0048] The air enters inside the main body 12 through through entrance holes 27 made at least above the longitudinal aperture 16, in the top part and/or on the upper lateral wall of the main body 12.

[0049] The compartment 13 allows to channel inside the fan 10 the stream of air W from the entrance holes 27 toward the longitudinal aperture 16.

[0050] According to a preferred embodiment, the main body 12 can be configured to have a substantially cylindrical shape for the whole of its height.

[0051] In this way, the main body 12 has a circular cross section shape, that is, without sharp edges and advantageously it is possible to make the stream of air W transit adherent to the external surface 22 at exit from the longitudinal aperture 16, exploiting the Coanda effect.

[0052] According to one embodiment shown by way of example in fig. 1, the main body 12 can have a tapered shape in at least part of its vertical development.

[0053] In particular, according to an advantageous formulation, the main body 12 has on its height a narrowing in section substantially in correspondence with the longitudinal aperture 16.

[0054] In this way, thanks to the fact that in correspondence with the longitudinal aperture 16 a regular oval profile is formed, or drop-shaped, compressed, or wing-shaped, the stream of air W is kept adherent to the external surface 22 for a greater segment than it would be if the section were circular and constant for the whole height of the main body 12. Consequently, the stream of air W that strikes the user will be more intense and less turbulent.

[0055] In this variant embodiment, the diameter inside which the cross section of the main body 12 is inscribed can be comprised in a range from 100mm to 230mm and the height of the main body 12 can be comprised in a range between 750mm and 850mm.

[0056] The main body 12 can be configured to have a continuous surface in the front part, while in correspondence with the longitudinal aperture 16 it has a profile folded toward the inside, to define the longitudinal aperture 16 itself.

[0057] In this way, the particular rounded geometry of the main body 12 in correspondence with the longitudinal aperture 16 allows to convey the stream of air W adherent to the external surface 22, so as to form a surface film that is propagated then toward the front of the fan 10.

[0058] According to possible embodiments, described for example with reference to fig. 3, the main body 12 can have a geometric cross section with a profile 40 defined by a polyline, which can be approximated by a plurality of convex arc segments S1, S2, S3,SN located one after the other.

[0059] In particular, the polyline profile 40 is configured to generate a stream of air in the front part of the fan 10 such as to guarantee a high level of comfort for a user.

[0060] According to some embodiments, the profile 40 of the characteristic section has a symmetrical shape with respect to a median plane M of the fan 10 which joins the front part and rear part where there is the longitudinal aperture 16.

[0061] It should be noted that the profile 40 can affect only one zone of the main body 12, in particular that zone where the longitudinal aperture 16 is made.

[0062] In some embodiments, the longitudinal aperture 16 and the profile 40 can affect the whole longitudinal (vertical) development of the main body 12, or only one portion thereof.

[0063] According to some embodiments, in the direc-

tion of the stream of air from the longitudinal aperture 16 to the front part of the fan 10, the successive convex arc segments have a progressively decreasing amplitude and a progressively increasing radius of curvature.

[0064] According to some embodiments, the convex arc segments S1, S2, S3, ..., SN are tangent to each other.

[0065] According to some embodiments, for example shown with reference to fig. 3, the profile 40 can be approximated by at least three convex arc segments S1, S2, S3.

[0066] Even if in the following description we refer by way of example to three arc segments, it is clear that there can be any number N of convex arc segments, for example five, seven, ten, twenty, one hundred or more, provided that the convex arc segments have a progressively decreasing amplitude with respect to each other in the direction of the stream of air, and a progressively increasing radius of curvature.

[0067] According to some embodiments, the first convex arc segment S1 can extend for an amplitude corresponding to a first angle α_1 , comprised for example between 110° and 150° , and can have a first radius of curvature R1 comprised between 5mm and 10mm. In particular, the first radius of curvature R1 can be comprised between 6mm and 8mm. For example the first radius of curvature R1 can be comprised between 6.8mm and 7.2mm.

[0068] According to other embodiments, the first convex arc segment S1 can extend for an amplitude corresponding to a first angle α_1 , comprised between 120° and 140° , and can have a first radius of curvature R1 which can be comprised for example between 6.9mm and 7.1mm.

[0069] According to other embodiments, the second convex arc segment S2 can extend for an amplitude corresponding to a second angle α_2 , comprised for example between 50° and 70° , and can have a second radius of curvature R2 comprised between 25mm and 45mm. In particular, the second radius of curvature R2 can be comprised between 30mm and 40mm.

[0070] According to other embodiments, the second convex arc segment S2 can extend for an amplitude corresponding to a second angle α_2 , comprised between 55° and 65° , and can have a second radius of curvature R2 comprised between 32mm and 37mm.

[0071] According to some embodiments, the third convex arc segment S3 can extend for an amplitude corresponding to a third angle α_3 , comprised for example between 20° and 40° , and can have a third radius of curvature R3 comprised between 80mm and 130mm. In particular, the third radius of curvature R3 can be comprised between 90mm and 120mm.

[0072] According to other embodiments, the third convex arc segment S3 can extend for an amplitude corresponding to a third angle α_3 , comprised between 25° and 35° , and can have a third radius of curvature R3 comprised between 100mm and 110mm, more particularly it

can be comprised for example between 104mm and 106mm.

[0073] According to some embodiments, the second convex arc segment S2 is tangent at one end with the first convex arc segment S1 and at the opposite end with the third convex arc segment S3, so that the profile 40 has a development without discontinuities.

[0074] According to other embodiments, it can be provided that each convex arc segment S1, S2, S3 itself consists of a plurality of arc sub-segments, which in their entirety approximate the respective arc segments S1, S2, S3. Each arc sub-segment has, with respect to the previous segment (in the direction of the stream of air W) a progressively decreasing amplitude and a progressively increasing radius of curvature.

[0075] For example, according to a possible embodiment, not shown, it can be provided that instead of the first convex arc segment S1, two arc sub-segments are disposed one after the other, and extend for respective amplitudes, for example with angles of 67° and 63° , and in which the respective radii of curvature can vary for example from 6.8mm to 7mm and from 7mm to 7.2mm.

[0076] According to some other embodiments, the curvature of the first convex arc segment S1 cooperates with the channeling element 20 to define an exit passage 21 for the stream of air.

[0077] According to other embodiments, the channeling element 20 can have an arched shape, with a radius of curvature suitable to cooperate with the first arc segments to define an exit passage 21 on each side of the median plane M.

[0078] According to some embodiments, the channeling element 20 can have a curvilinear profile, which can be positioned above the portion of the external surface 22 in correspondence with the longitudinal aperture 16.

[0079] In one embodiment, the channeling element 20 has a longitudinal development at least equal to the extension of the longitudinal aperture 16.

[0080] In another embodiment, shown in fig. 2, the channeling element 20 has a vertical development equal to the development of the main body 12.

[0081] In another embodiment, shown by way of example in fig. 4, the channeling element 20 can provide a separator element 24 configured to determine a separation substantially into two halves of the stream of air W exiting from the longitudinal aperture 16.

[0082] According to some embodiments, the separator element 24 can have in section a triangle or arrow shape, with an apex 24a facing toward the longitudinal aperture 16 and the base facing toward the channeling element 20.

[0083] According to other embodiments, the separator element 24 can have concave sides, arched toward the inside.

[0084] In some embodiments, the apex 24a can be rounded or beveled.

[0085] The presence of the separator element 24 allows to obtain a progressive reduction in the transit sec-

tion of the air, which is maximum in correspondence with the longitudinal aperture 16, that is, on the apex 24a of the separator element 24, and is minimum in correspondence with the end of the exit passage 21, that is, in correspondence with the outermost end of the channeling element 20.

[0086] The reduction in section between the apex 24a of the separator element 24 and the passage 21 can therefore determine an increase in the speed of the stream of air W toward the outside and toward the front part of the fan 10.

[0087] In this way two streams of air W are created, with opposite directions, each of which, exiting from a respective passage 21, adheres with a respective portion of the external surface 22 of the main body 12, with the streams substantially combining again on the front of the fan 10.

[0088] According to some embodiments, the passage 21 is conformed as a narrowing in section for the passage of the stream of air W.

[0089] According to some embodiments, each passage 21 has a width comprised between about 0.1mm and 50mm.

[0090] According to some embodiments, the passage 21 has a width comprised between about 1mm and about 20mm.

[0091] According to other embodiments, the passage 21 has a width comprised between about 3mm and about 10mm.

[0092] The width of the passage 21 thus designed allows to supply a stream of air toward the user with a speed suitable to confer on the user a sensation of optimum comfort at the desired distance.

[0093] In particular, the speed of the stream of air at exit is such as to optimize both the effectiveness of the functioning of the fan 10 and the comfort of the user.

[0094] According to other embodiments, the external surface 22 of the main body 12, at least in correspondence with the zone affected by the longitudinal aperture 16, has a surface finish suitable to eliminate, or at least reduce, possible wrinkles and roughness, so as to prevent turbulence in the stream of air, thus guaranteeing a high level of comfort for the user.

[0095] According to some embodiments, the external surface 22 can have a surface roughness comprised between 0.001μ and 100μ measured in terms of Ra, Rz and Rq.

[0096] According to one embodiment, preferably in a substantially front zone, that is, facing toward the space to be conditioned or ventilated, the main body 12 can have interference and diversion means 32, configured to cause a diversion of the stream of air W in order to make its adherence to the external surface 22 at least partly terminate, and/or to determine a jet of air to be modulated in amplitude, according to requirements.

[0097] The interference means 32 can be installed at any point whatsoever on the height of the main body 12, to modulate the amplitude of the stream of air W and/or

the jet of air that hits the space where it is located.

[0098] According to some embodiments, the interference means 32 are the mechanical type.

[0099] According to some embodiments, for example described with reference to fig. 5, the mechanical interference means 32 can comprise mechanical interference members 32a, for example longitudinal fins, adjustable as desired, that is, having a shape similar to that of the flaps of an airplane.

[0100] The mechanical interference members 32a can be configured as flaps, or moving surfaces with a shape similar to the surface that supports them, and configured to deflect the stream of air toward the outside.

[0101] According to some embodiments, the mechanical interference members 32a can be rotated from a position substantially parallel to the external surface 22 of the main body 12 to a position substantially perpendicular thereto.

[0102] According to other embodiments, the interference means 32 are the aerodynamic type.

[0103] According to these embodiments, for example shown by way of example in fig. 6, aerodynamic interference members 32b can be provided, such as nozzles, or shaped holes, which generate jets of air with an angled direction with respect to the external surface 22, for example substantially perpendicular, to deflect or perturb the main stream of air and cause it to be propagated in the space.

[0104] According to one embodiment, shown by way of example in fig. 2, the fan 10 can also comprise a filtering element 26.

[0105] The filtering element 26 can be installed upstream of the air suction and distribution unit 14 and in correspondence with the entrance holes 27, so that the air sucked in can be suitably cleaned and purified of dust or particular allergens present in it.

[0106] The position of the filtering element 26 substantially at the top of the overall structure of the fan 10 facilitates its access for possible maintenance and replacement interventions, also thanks to the particular conformation of the main body 12.

[0107] According to another embodiment, shown by way of example in fig. 2, the fan 10 can comprise a conditioning device 28 installed inside the main body 12 and in substantial correspondence with the longitudinal aperture 16.

[0108] The conditioning device 28 can be any device whatsoever, able to modify the condition of the stream of air W to supply a determinate effect inside the space where it is emitted by the fan 10.

[0109] For example, the conditioning device 28 can supply heating, cooling or dehumidification of the stream of air W, or also a combination of these in the case of a fan 10 designed to perform diverse functions according to requirements.

[0110] The conditioning device 28 is installed, in the case shown here, upstream of the channeling element 20.

[0111] According to one embodiment, shown by way of example in fig. 2, the conditioning device 28 can be installed immediately upstream of the longitudinal aperture 16.

[0112] According to another embodiment, the conditioning device 28 can be installed downstream of the longitudinal aperture 16.

[0113] According to embodiments described here, the fan 10 comprises a deflector device 34 provided with a plurality of deflector elements 35 to convey the stream of air through the longitudinal aperture 16 and toward the channeling element 20.

[0114] According to another embodiment, shown by way of example in figs. 2 and 3, the fan 10 can comprise an adjustment device 36 which cooperates with the deflector device 34 to determine the desired orientation of the deflector elements 35, in order to modulate the direction of the stream of air W.

[0115] In one embodiment, the adjustment device 36 can determine the rotation of the deflector elements 35 from a position substantially parallel to the support base 18 to a position substantially perpendicular to the support base 18.

[0116] According to another embodiment, shown by way of example in fig. 2, the fan 10 also comprises a device 30 to rotate the main body 12.

[0117] The rotation device 30 can be installed in correspondence with two different portions respectively of the main body 12 and the support base 18.

[0118] The rotation device 30 is provided with a kinematics that determines the rotation of the main body 12 with respect to the support base 18 by a desired angle of rotation.

[0119] In this way the rotation device 30, when driven, for example remotely, by a button or by any other known system, determines the movement of the main body 12 around an axis, to determine its position or to drive a continuous rotation movement.

[0120] It is clear that modifications and/or additions of parts may be made to the fan 10 as described heretofore, without departing from the field and scope of the present invention.

[0121] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of fan, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

Claims

1. Fan comprising a main body (12) with a vertical development with respect to a support base (18) on which it is located in a condition of use, said main body (12) defining an internal housing compartment (13), wherein it has a longitudinal aperture (16) disposed in its rear zone, for the emission of a stream

of air (W) toward the outside, and also comprises an air suction and distribution unit (14), located, at least for a substantial part thereof, above the beginning of said longitudinal aperture (16), and a channeling element (20) positioned in proximity to said longitudinal aperture (16) and cooperating with it to determine the exit of the stream of air (W) through said longitudinal aperture (16), so that said exiting stream of air (W) adheres to the external surface (22) of the main body (12) and is conveyed toward the front of the fan.

2. Fan as in claim 1, **characterized in that** said external surface (22) of said main body (12) has a rounded geometry substantially without discontinuities so that the stream of air (W), exiting from the rear part of the fan, is conveyed adherent toward the front part and then toward the external environment to be ventilated or conditioned.

3. Fan as in claim 1 or 2, **characterized in that** said channeling element (20) has or is associated with means suitable to subdivide said stream of air (W) exiting from said longitudinal aperture (16) into two streams with opposite directions, so that said streams separate substantially in correspondence to said longitudinal aperture (16) and are separately conveyed adhering to said external surface (22) of the main body (12), toward the front part of the fan, where they are at least partly rejoined and spread into the external environment.

4. Fan as in any claim hereinbefore, **characterized in that** said channeling element (20) has a curvilinear profile which can overlap the portion of said external surface (22) in correspondence with said longitudinal aperture (16).

5. Fan as in any claim hereinbefore, **characterized in that** said channeling element (20), in cooperation with said external surface (22), is configured to determine a minimum section for the passage of said stream of air (W) exiting from said compartment (13).

6. Fan as in any claim hereinbefore, **characterized in that** said main body (12) has, on said external surface (22), interference and diverting means (32) of the stream of air (W).

7. Fan as in claim 6, **characterized in that** said interference means (32) are the mechanical type.

8. Fan as in claim 6, **characterized in that** said interference means (32) are the aerodynamic type.

9. Fan as in any claim hereinbefore, **characterized in that** it comprises a filtering element (26) located upstream of said suction and distribution unit (14) and

in correspondence with entrance holes (27) of the stream of air (W).

10. Fan as in any claim hereinbefore, **characterized in that** it comprises a conditioning device (28) installed inside said main body (12) and in correspondence with said longitudinal aperture (16). 5
11. Fan as in claim 10, **characterized in that** said conditioning device (28) is selected from a group comprising a heating device, a cooling device or a dehumidifying device. 10
12. Fan as in any claim hereinbefore, **characterized in that** it comprises a deflector device (34) with a plurality of deflector elements (35) and associated with an adjustment device (36) configured to impart a rotation and a variation in inclination to said deflector elements (35). 15
13. Fan as in any claim hereinbefore, **characterized in that** it comprises a rotation device (30) installed at one end inside said main body (12) and at the opposite end to said support base (18). 20
14. Fan as in any claim hereinbefore, **characterized in that** said channeling element (20) comprises a separator element (24) configured to determine a separation substantially into two halves of said stream of air (W) exiting from said longitudinal aperture (16). 25
15. Fan as in claim 2 and any claim hereinbefore, **characterized in that** said rounded geometry can be defined by a substantially circular, regular oval, drop-shaped or compressed section shape, or such as to obtain a substantially drop-shaped or wing-shaped profile (40) of said main body (12), said profile (40) being configured to generate a stream of air in the front part of the fan so as to guarantee a high level of comfort for the user. 30
16. Fan as in claim 15, **characterized in that** said profile (40) comprises a polyline approximated by a plurality of convex arc segments (S1, S2, S3,SN) located one after the other, wherein said convex arc segments (S1, S2, S3,SN) have a progressively increasing radius of curvature, and a progressively decreasing amplitude in the direction of the stream of air, that is, from said longitudinal aperture (16) toward the front part of the fan. 35
17. Method for the circulation of a stream of air (W) by means of a fan (10) comprising a main body (12) with a vertical development with respect to a support base (18) on which it is located in a condition of use, said main body (12) defining an internal housing compartment (13), wherein it provides to: 40

- suck air from the external environment by means of a suction and distribution unit (14) located above a longitudinal aperture (16);
- distribute a stream of air (W) in said compartment (13) from said suction and distribution unit (14) toward said longitudinal aperture (16);
- make said stream of air (W) exit from said longitudinal aperture (16);
- divert said stream of air (W) by means of a channeling element (20) positioned in proximity to said longitudinal aperture (16);
- make said stream of air (W) adhere to an external surface (22) of said main body (12) with a rounded geometry. 45

Patentansprüche

1. Lüfter umfassend ein Hauptgehäuse (12) mit vertikaler Ausdehnung in Bezug auf einen Grundträger (18), auf dem er sich im Gebrauchszustand befindet, wobei das Hauptgehäuse (12) eine innere Gehäussekammer (13) definiert, wobei er eine in seinem hinteren Bereich angeordnete Längsöffnung (16) zur Emission eines Luftstroms (W) in Richtung Außenseite aufweist und außerdem umfasst: eine Luftansaugungs- und -verteilungseinheit (14), die, zumindest in einem wesentlichen Teil, oberhalb des Anfangs der Längsöffnung (16) angeordnet ist, und ein Kanalisierungselement (20), das in der Nähe der Längsöffnung (16) angeordnet ist und mit dieser kooperiert, um den Austritt des Luftstroms (W) durch die Längsöffnung (16) so zu lenken, dass der austretende Luftstrom (W) an der Außenfläche (22) des Hauptgehäuses (12) anhaftet und zur Vorderseite des Lüfters hin befördert wird. 20
2. Lüfter gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Außenfläche (22) des Hauptgehäuses (12) eine gerundete Geometrie im Wesentlichen ohne Diskontinuitäten aufweist, so dass der Luftstrom (W), der von dem hinteren Teil des Lüfters austritt, anhaftend zu dem vorderen Teil hin und anschließend in die zu belüftende oder zu klimatisierende äußere Umgebung befördert wird. 25
3. Lüfter gemäß Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Kanalisierungselement (20) Mittel aufweist oder mit diesen verbunden ist, die geeignet sind, den aus der Längsöffnung (16) austretenden Luftstrom (W) in zwei Ströme mit entgegengesetzten Richtungen zu teilen, so dass sich die Ströme im Wesentlichen in Entsprechung mit der Längsöffnung (16) trennen und anhaftend an die Außenfläche (22) des Hauptgehäuses (12) getrennt zum vorderen Teil des Lüfters hin befördert werden, wo sie zumindest teilweise wieder vereinigt werden und sich in die äußere Umgebung ausbreiten. 30

4. Lüfter gemäß irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** das Kanalisierungselement (20) ein kurvenförmiges Profil aufweist, welches den Teil der Außenfläche (22), der der Längsöffnung (16) entspricht, überlagern kann.
5. Lüfter gemäß irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** das Kanalisierungselement (20) zusammen mit der Außenfläche (22) so konfiguriert ist, dass ein minimaler Abschnitt für den Durchgang des aus der Kammer (13) austretenden Luftstroms (W) bestimmt wird.
6. Lüfter gemäß irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** das Hauptgehäuse (12) auf seiner Außenfläche (22) Beeinflussungs- und Ablenkungsmittel (32) des Luftstroms (W) aufweist.
7. Lüfter gemäß Anspruch 6, **dadurch gekennzeichnet, dass** die Beeinflussungsmittel (32) vom mechanischen Typ sind.
8. Lüfter gemäß Anspruch 6, **dadurch gekennzeichnet, dass** die Beeinflussungsmittel (32) vom aerodynamischen Typ sind.
9. Lüfter gemäß irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** er ein Filterelement (26) umfasst, dass stromaufwärts der Ansaugungs- und Verteilungseinheit (14) und in Entsprechung mit den Eintrittslöchern (27) des Luftstroms (W) angeordnet ist.
10. Lüfter gemäß irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** er eine Klimatisierungsvorrichtung (28) umfasst, die im Inneren des Hauptgehäuses (12) und in Entsprechung mit der Längsöffnung (16) installiert ist.
11. Lüfter gemäß Anspruch 10, **dadurch gekennzeichnet, dass** die Klimatisierungsvorrichtung (28) ausgewählt ist aus der Gruppe umfassend eine Heizvorrichtung, eine Kühlvorrichtung oder eine Entfeuchtungsvorrichtung.
12. Lüfter gemäß irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** er eine Ablenkungsvorrichtung (34) umfasst, die eine Vielzahl an Ablenkungselementen (35) aufweist und mit einer Einstellvorrichtung (36) verbunden ist, die so konfiguriert ist, dass sie an die Ablenkungselemente (35) eine Rotation und eine Veränderung der Neigung weitergibt.
13. Lüfter gemäß irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** er eine Rotationsvorrichtung (30) umfasst, die an einem Ende innerhalb des Hauptgehäuses (12) und an dem Ende, das dem Trägersockel (18) entgegengesetzt ist, installiert ist.
14. Lüfter gemäß irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** das Kanalisierungselement (20) ein Trennelement (24) umfasst, das so konfiguriert ist, dass es eine Trennung des aus der Längsöffnung (16) austretenden Luftstroms (W) im Wesentlichen in zwei Hälften bestimmt.
15. Lüfter gemäß Anspruch 2 und irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die abgerundete Geometrie durch eine im Wesentlichen kreisförmige, gleichmäßig ovale, tropfenförmige oder abschnittskomprimierte Form definiert werden kann, oder so, dass ein im Wesentlichen tropfenförmiges oder flügelartiges Profil (40) des Hauptgehäuses (12) erhalten wird, wobei das Profil (40) so konfiguriert ist, dass es einen Luftstrom in dem vorderen Teil des Lüfters erzeugt, um ein hohes Maß an Komfort für den Nutzer zu gewährleisten.
16. Lüfter gemäß Anspruch 15, **dadurch gekennzeichnet, dass** das Profil (40) eine Polylinie umfasst, die durch eine Vielzahl an hintereinander angeordneten konvexen Bogensegmenten (S1, S2, S3, ...SN) gebildet wird, wobei die konvexen Bogensegmente (S1, S2, S3, ...SN) einen progressiv ansteigenden Krümmungsradius und eine progressiv abnehmende Amplitude in der Richtung des Luftstroms, d.h., von der Längsöffnung (16) zum vorderen Teil des Lüfters, aufweisen.
17. Verfahren zur Zirkulation eines Luftstroms (W) mit Hilfe eines Lüfters (10), welcher ein Hauptgehäuse (12) mit vertikaler Ausdehnung in Bezug auf einen Trägersockel (18), auf dem er sich im Gebrauchszustand befindet, umfasst, wobei das Hauptgehäuse (12) eine innere Gehäusekammer (13) definiert, wobei er bereitstellt:
 - das Ansaugen von Luft aus der äußeren Umgebung mit Hilfe einer oberhalb einer Längsöffnung (16) angeordneten Ansaugungs- und Verteilungsvorrichtung (14);
 - das Verteilen eines Luftstroms (W) in der Kammer (13) von der Ansaugungs- und Verteilungsvorrichtung (14) zu der Längsöffnung (16) hin;
 - das Bewirken des Austritts des Luftstroms (W) aus der Längsöffnung (16);
 - das Umlenken des Luftstroms (W) mit Hilfe eines in der Nähe der Längsöffnung (16) positionierten Kanalisierungselements (20);
 - das Bewirken des Anhaftens des Luftstroms (W) an der Außenfläche (22) des Hauptgehäuses (12) mit abgerundeter Geometrie.

Revendications

1. Ventilateur comprenant un corps principal (12) avec un développement vertical par rapport à une base de support (18) sur laquelle il est situé dans une condition d'utilisation, ledit corps principal (12) définissant un compartiment de logement intérieur (13), où il a une ouverture longitudinale (16) disposée dans sa zone arrière, pour l'émission d'un flux d'air (W) vers l'extérieur, et comprend aussi une unité d'aspiration et de distribution d'air (14), située, au moins pour une partie substantielle de celle-ci, au-dessus du début de ladite ouverture longitudinale (16), et un élément de canalisation (20) positionné à proximité de ladite ouverture longitudinale (16) et coopérant avec celle-ci pour déterminer la sortie du flux d'air (W) à travers ladite ouverture longitudinale (16), de sorte que ledit flux d'air (W) sortant adhère à la surface extérieure (22) du corps principal (12) et soit transporté vers la partie avant du ventilateur.
2. Ventilateur selon la revendication 1, **caractérisé en ce que** ladite surface extérieure (22) dudit corps principal (12) a une géométrie arrondie substantiellement sans discontinuités de sorte que le flux d'air (W), sortant de la partie arrière du ventilateur, soit transporté adhérent vers la partie avant puis vers l'environnement extérieur à ventiler ou à conditionner.
3. Ventilateur selon la revendication 1 ou 2, **caractérisé en ce que** ledit élément de canalisation (20) a ou est associé à des moyens appropriés pour subdiviser ledit flux d'air (W) sortant de ladite ouverture longitudinale (16) en deux flux de directions opposées, de sorte que lesdits flux se séparent substantiellement en correspondance de ladite ouverture longitudinale (16) et soient transportés séparément en adhérent à ladite surface extérieure (22) du corps principal (12), vers la partie avant du ventilateur, où ils sont au moins partiellement réunis et répartis dans l'environnement extérieur.
4. Ventilateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit élément de canalisation (20) a un profil curviligne qui peut se superposer à la portion de ladite surface extérieure (22) en correspondance de ladite ouverture longitudinale (16).
5. Ventilateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit élément de canalisation (20), en coopération avec ladite surface extérieure (22), est configuré pour déterminer une section minimale pour le passage dudit flux d'air (W) sortant dudit compartiment (13).
6. Ventilateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit corps principal (12) présente, sur ladite surface extérieure (22), des moyens d'interférence et de déviation (32) du flux d'air (W).
7. Ventilateur selon la revendication 6, **caractérisé en ce que** lesdits moyens d'interférence (32) sont du type mécanique.
8. Ventilateur selon la revendication 6, **caractérisé en ce que** lesdits moyens d'interférence (32) sont du type aérodynamique.
9. Ventilateur selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend un élément filtrant (26) situé en amont de ladite unité d'aspiration et de distribution (14) et en correspondance des trous d'entrée (27) du flux d'air (W).
10. Ventilateur selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend un dispositif de conditionnement (28) installé à l'intérieur dudit corps principal (12) et en correspondance de ladite ouverture longitudinale (16).
11. Ventilateur selon la revendication 10, **caractérisé en ce que** ledit dispositif de conditionnement (28) est choisi d'un groupe comprenant un dispositif de chauffage, un dispositif de refroidissement ou un dispositif de déshumidification.
12. Ventilateur selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend un dispositif déflecteur (34) avec une pluralité d'éléments déflecteurs (35) et associé à un dispositif de réglage (36) configuré pour conférer une rotation et une variation d'inclinaison auxdits éléments déflecteurs (35).
13. Ventilateur selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend un dispositif de rotation (30) installé à l'intérieur dudit corps principal (12) et en correspondance de l'extrémité opposée de ladite base de support (18).
14. Ventilateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit élément de canalisation (20) comprend un élément séparateur (24) configuré pour déterminer une séparation substantiellement en deux moitiés dudit flux d'air (W) sortant de ladite ouverture longitudinale (16).
15. Ventilateur selon la revendication 2 et l'une quelconque des revendications ci-dessus, **caractérisé en ce que** ladite géométrie arrondie peut être définie par une forme substantiellement circulaire, ovale ré-

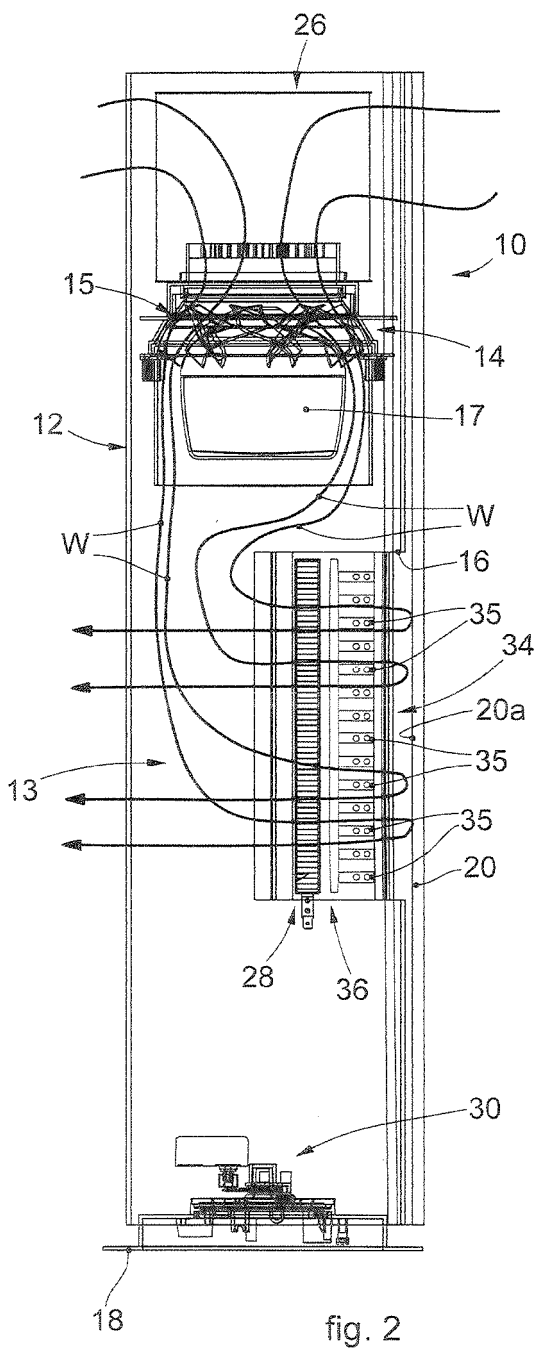
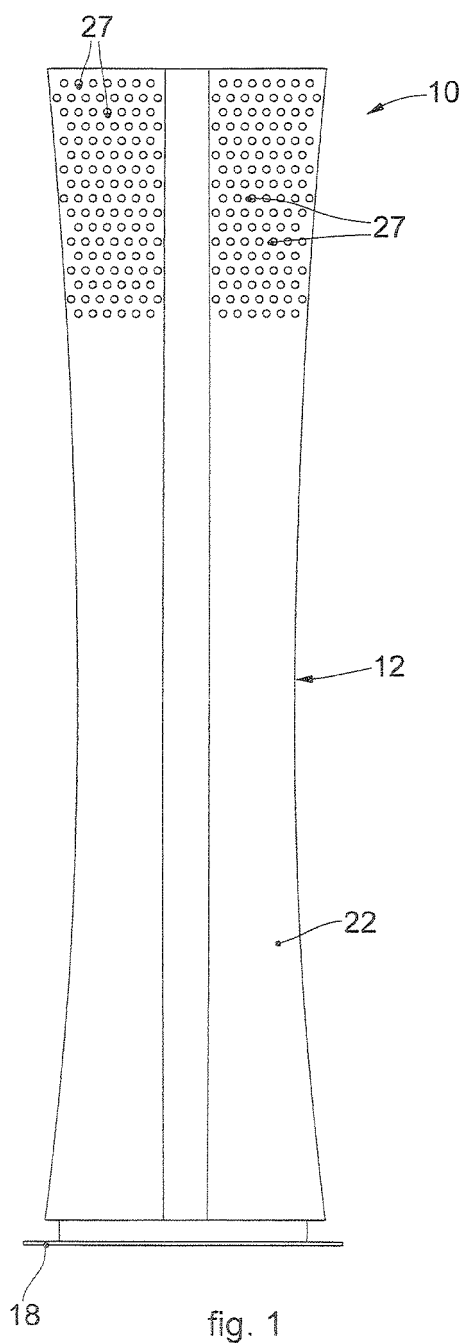
gulière, en forme de goutte ou une forme de section compressée, ou de manière à obtenir un profil substantiellement en forme de goutte ou en forme d'aile (40) dudit corps principal (12), ledit profil (40) étant configuré pour générer un flux d'air dans la partie avant du ventilateur de manière à assurer un haut niveau de confort pour l'utilisateur.

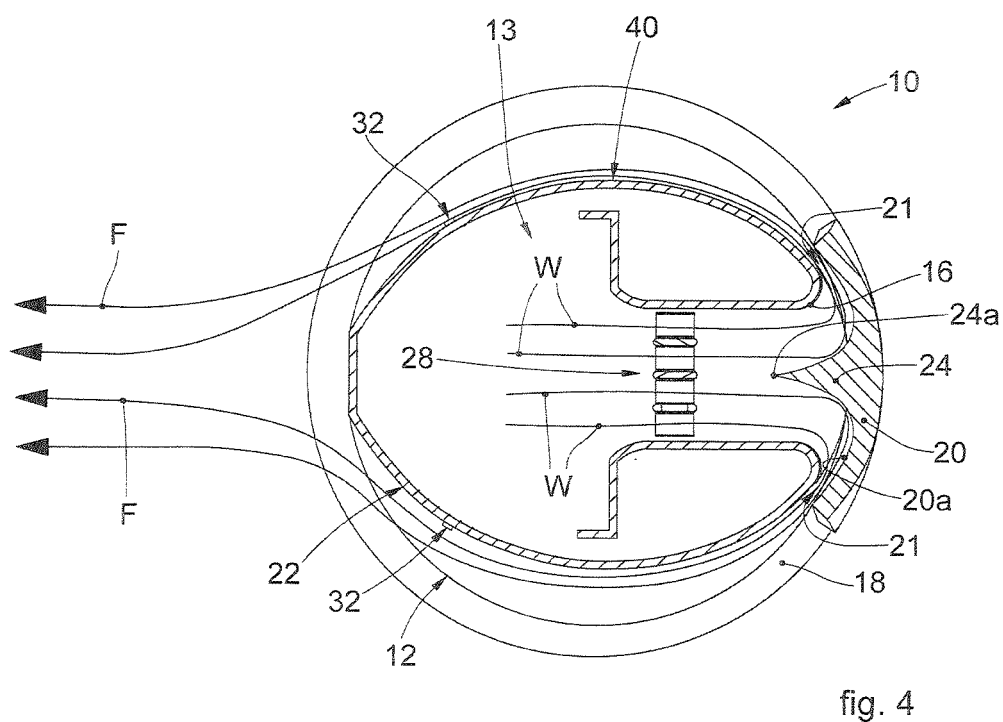
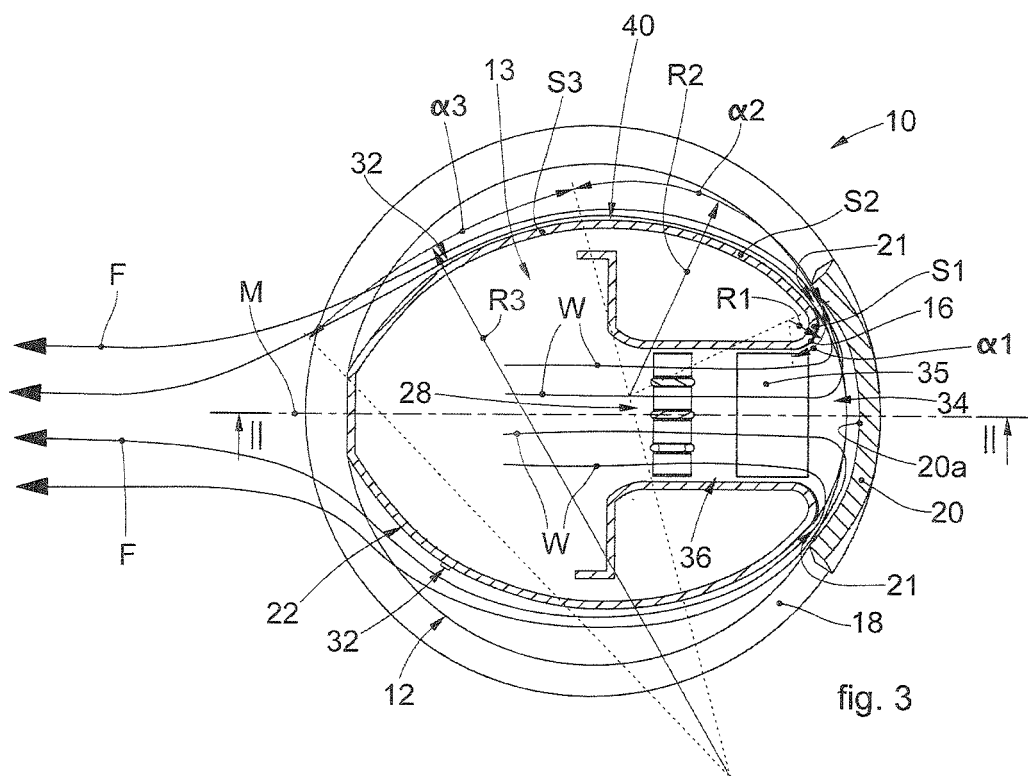
16. Ventilateur selon la revendication 15, **caractérisé en ce que** ledit profil (40) comprend une polyligne approximée par une pluralité de segments d'arc convexe (S1, S2, S3,SN) situés l'un après l'autre, où lesdits segments d'arc convexe (S1, S2, S3,SN) ont un rayon de courbure progressivement croissant, et une amplitude progressivement décroissante dans la direction du flux d'air, c'est-à-dire de ladite ouverture longitudinale (16) vers la partie avant du ventilateur.
17. Méthode pour la circulation d'un flux d'air (W) au moyen d'un ventilateur (10) comprenant un corps principal (12) avec un développement vertical par rapport à une base de support (18) sur laquelle il se trouve dans une condition d'utilisation, ledit corps principal (12) définissant un compartiment de logement intérieur (13), où il fournit :
- l'aspiration de l'air de l'environnement extérieur au moyen d'une unité d'aspiration et de distribution (14) située au-dessus d'une ouverture longitudinale (16) ;
 - la distribution d'un flux d'air (W) dans ledit compartiment (13) depuis ladite unité d'aspiration et de distribution (14) vers ladite ouverture longitudinale (16) ;
 - la sortie dudit flux d'air (W) de ladite ouverture longitudinale (16) ;
 - la déviation dudit flux d'air (W) au moyen d'un élément de canalisation (20) positionné à proximité de ladite ouverture longitudinale (16) ;
 - l'adhésion dudit flux d'air (W) à une surface extérieure (22) dudit corps principal (12) avec une géométrie arrondie.

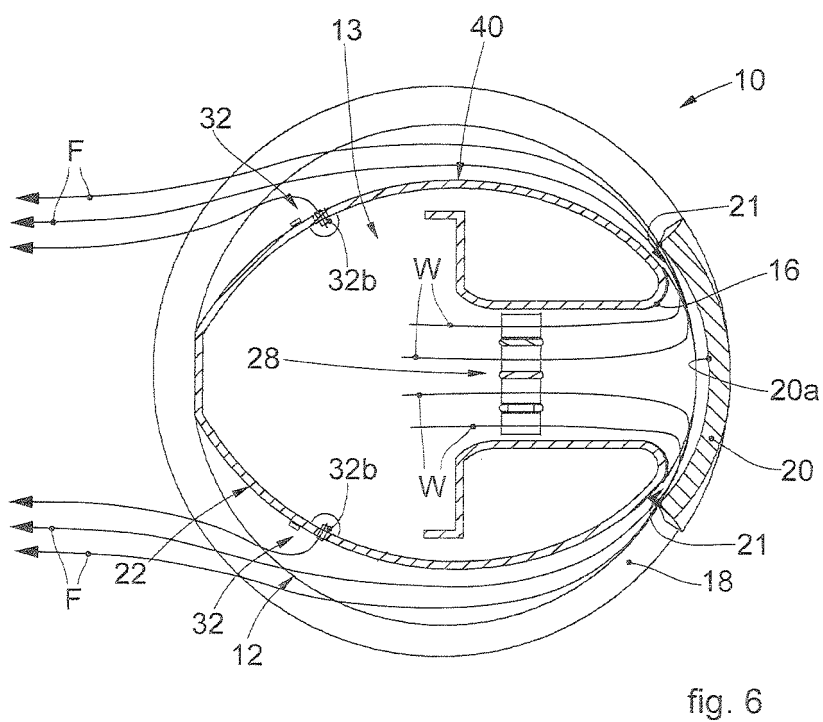
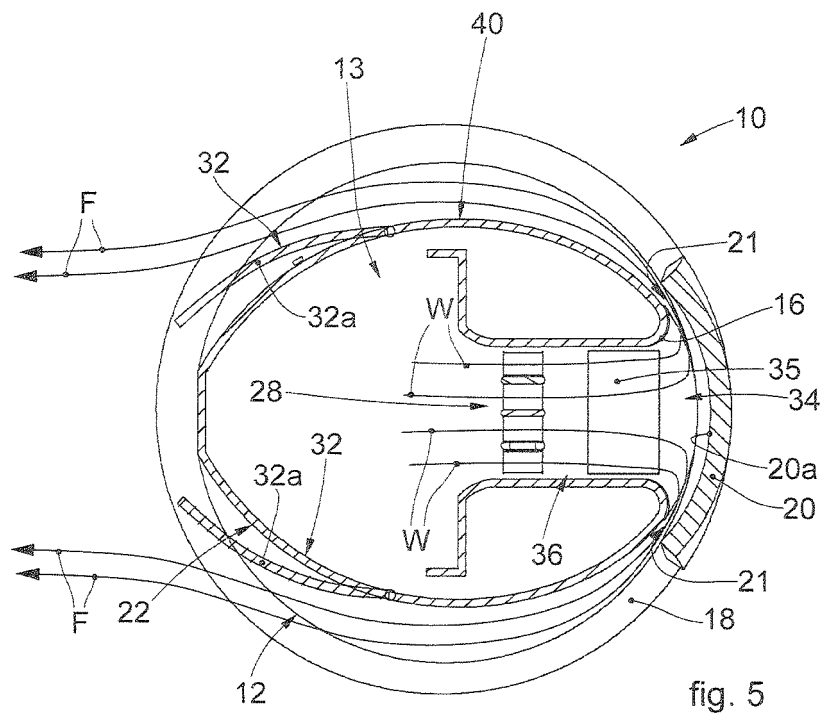
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REFERENCES CITED IN THE DESCRIPTION

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