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(54) **AN AXIAL BLOWER**

AXIALGEBLÄSE

VENTILATEUR AXIAL

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Description

THE FIELD OF THE INVENTION

[0001] The invention relates to an axial blower of the type that comprises an essentially circular-cylindrical blower tube with an internal and an external diameter, wherein a blower rotor is configured with an external diameter that is slightly smaller than the internal diameter of the blower tube, said blower rotor having a rotor shaft that essentially coincides with the central axis in the circular-cylindrical blower tube and is configured such that, at its one end, the blower tube has a suction side and, at its opposite end, a discharge side defined by the configuration and direction of rotation of the blower rotor, and wherein, before the suction side of the blower tube, a funnel is configured with an internal surface that converges towards the internal diameter of the blower tube, and where the funnel, before the suction side of the axial blower, is cut off on one side to the effect that the outermost edge of the funnel, seen from the central axis of the blower tube, is smaller on that side than on other sides.

THE STATE OF THE ART

[0002] Today, several different embodiments of axial blowers of the above type are known, wherein the funnel on the suction side of the blower tube serves the purpose of optimising the efficiency of the axial blower and of minimising generation of noise at the suction side of the axial blower. AT 375 155 B discloses an example of an axial blower having an inlet funnel being cut off at mutually perpendicular positions.

[0003] It is thus a constant challenge in the development of such axial blowers to accomplish that, in given circumstances and at a given motor power for operating the blower rotor, a high pressure increase and/or large throughput of air are/is obtained.

THE OBJECT OF THE INVENTION

[0004] Based on that, it is the object of the present invention to provide an axial blower of the kind set forth in the introductory part and which is suitable in particular for being arranged in areas of limited height, such as garage facilities and tunnels, while simultaneously providing, with simple means and in a cost-efficient manner, an efficient utilisation of the available motor power.

[0005] This is obtained by means of an axial blower of the kind described in the introductory part which is characterized in that a material face is provided, at least on one of the sites where the funnel is cut off, which face delimits the flow area of the axial blower transversally to the flow direction within the axial blower and which extends from the foremost end and rearwards on the inside of the funnel and a distance into the blower tube, said material face on the foremost part reducing the flow area and, on the last part, increases the flow area until the

material face ends, whereby the flow area corresponds to the flow area in the blower tube.

[0006] As it is, it is thereby enabled that the axial blower can be mounted on a surface, such as a ceiling or a wall, to the effect that the outside of the blower tube is arranged close to that surface whereby, where a limited space is available, an axial blower with a blower rotor having a relatively large outer diameter can be arranged.

[0007] By the funnel being cut off on two sides relative to the central axis of the blower tube it is accomplished, that, all other things being equal, the axial blower will take up even less space.

[0008] This is particularly advantageous if the two sites where the funnel is cut off are arranged diametrically opposite each other, the axial blower thereby being mountable directly beneath eg a ceiling without protruding significantly downwards in the space where it is mounted.

[0009] According to a preferred embodiment the smallest possible building height means that, all other things being equal, the funnel is cut off so that the outer periphery thereof, where it is cut off, is at least partially situated in a plane that corresponds essentially to a tangential plane for the outer diameter on the circular-cylindrical blower tube.

[0010] If the axial blower is to be mounted directly on a wall or beneath a ceiling, the outer periphery of the funnel, where it is cut off, is advantageously provided with a mounting fitting that comprises a plate part extending essentially in the tangential plane of the outer diameter on the circular-cylindrical blower tube, and wherein the mounting fitting is provided with a number of holes configured with a view to the introduction of mounting screws. In this manner it is enabled that the fitting can be secured in a very stable manner to the blower tube and the funnel without significant use of reinforcement parts.

[0011] In particular in scenarios where the axial blower is not to be mounted to directly adjoin a ceiling or a wall or some other plane surface, it would be advantageous if a material face were to be configured on both cut-off sites of the funnel, and wherein the two material faces are essentially configured symmetrically about the central axis of the blower tube.

[0012] Advantageously the material face is formed by means of an insert which is constituted essentially by an element which is separate relative to the blower tube and the funnel and secured to the inside of the funnel and the blower tube by welding, gluing, riveting, or by means of any other securing method. Thereby it is accomplished that a major part of the axial blower can be constructed from standardised components, following which it is possible to mount one or two inserts as needed and which may optionally be optimised to specific conditions.

[0013] In this context, the insert is particularly advantageously configured from a moulded material such as moulding plastics. Should there be requirements to the axial blower being able to tolerate elevated temperatures, the insert(s) may be made of metal or the like.

[0014] Moreover, the axial blower may comprise a diffuser at the rearmost end of the axial blower, at the discharge side of the blower tube, and such diffuser may advantageously be configured so as to have an internal surface that diverges from the internal diameter of the blower tube and rearwards, and wherein the diffuser is cut off completely or partially on at least one side of the axial blower to the effect that the diffuser, seen from the central axis of the blower tube, is smaller on that side than on other sides. Hereby it is accomplished, in the same manner as at the suction side of the axial blower, that the diffuser does not take up space where it is cut off.

[0015] In the same manner as was the case with the funnel, the diffuser may advantageously be cut off on two sides relative to the central axis of the blower tube, and it is also possible to obtain similar advantages as were obtained in the context of the funnel in respect of configuration and arrangement of the cut-off sides of the diffuser, configuration and arrangement of the material face/the insert, and configuration and structure of the mounting fittings in accordance with the same principles as were applied in the context of the funnel.

[0016] However, in connection with the diffuser the two material faces are advantageously, and in particular in situations when the axial blower is to be mounted in close proximity to a plane surface, such as a ceiling or a wall, configured differently in such a way as to bring about the effect that the flow of air at the discharge side is deflected in a direction away from the mounting fitting.

[0017] The invention is particularly convenient in the context of arrangement of the axial blower in proximity to a ceiling or a wall, but, of course, the axial blower may also be arranged on a location on a wall where the axial blower is not sitting close to a ceiling or a wall.

LIST OF FIGURES

[0018]

Figure 1: is a perspective view of an axial blower according to the present invention, seen in an inclined view from above.

Figure 2: shows the axial blower shown in figure 1, in a view straight from the front, from the suction side.

Figure 3: shows the axial blower shown in figure 1, seen straight from the rear, from the discharge side.

Figure 4: is a perspective view of the axial blower according to figure 1, seen in an inclined view from above and in a sectional view through the axial blower along the line C-C as shown in figure 2.

Figure 5: is a sectional view of the axial blower according to figure 1, seen from the side of the axial blower, along the section C-C as shown in figure 2.

EMBODIMENT OF THE INVENTION

[0019] Thus, the figures show an axial blower 1 according to the present invention, which axial blower 1 comprises a circular-cylindrical blower tube 2, where a blower rotor 11 with blades 12 is arranged, said blower rotor 11 being caused to rotate about its axis by means of an electromotor 13 which is, in a manner known *per se*, retained within the blower tube 2, eg by means of a number of guide faces 14.

[0020] At the one end of the blower tube 2, which constitutes the suction side of the axial blower 1, a funnel 3 is provided which causes the air which is drawn into the axial blower to flow, to the widest extent possible, into same without significant turbulence and ensuing increased noise level and loss of efficiency. In the same manner, at the other end of the blower tube 2 which constitutes the discharge side of the axial blower 1, a diffuser 4 is configured, serving the same purpose as at the funnel 3. It is not always necessary to use the diffuser 4, but, in the shown embodiment, it is included.

[0021] As will appear from the figures and in particular from figures 2 and 3, both the funnel 3 and the diffuser 4 are, according to the principle of the invention, cut off in two places that are diametrically opposite each other relative to the central axis of the axial blower 1. Thereby, it is possible to integrate the axial blower according to the invention into a compartment with limited space without this presupposing that the entire axial blower 1 and in particular the blower rotor 11 are to be downsized. On the side where the funnel 3 and the diffuser 4 are cut off, mounting fittings 5, 6 are configured that are provided with holes for receiving mounting screws and which thereby enable that the axial blower 1 can be mounted to directly adjoin a plane face such as a wall or a ceiling, and thereby the axial blower will protrude minimally from the wall or the ceiling compared to the space required by the blower rotor 11 for being able to rotate.

[0022] To reduce turbulence on the suction side of the axial blower 1 at the funnel 3, inserts 7, 8 are arranged that, in the flow direction, first narrow the flow area through the axial blower transversally to the central axis thereof and then expand such flow area until the insert ends, whereby the flow area is caused to correspond to the flow area around the blower rotor 11.

[0023] This means that turbulence in the suction side at the funnel 3 and into the blower tube 2 can be reduced significantly without ensuing significant loss efficiency, while simultaneously the noise level is reduced.

[0024] If the axial blower 1 is mounted to be directly adjoining a wall by means of the mounting fittings 5, 6, the insert 7 may be omitted at the side where the mounting fitting 5 is arranged. This is due to the efficiency of the insert not being high in that situation.

[0025] At the discharge side where the diffuser 4 is arranged, inserts 9, 10 are also arranged where the diffuser 4 is cut off. The function of those inserts 9, 10 is primarily to deflect the flow of air blown out of the axial

blower 1, and therefore they are not configured alike, the insert 9 being configured at the mounting fitting 6 having a relatively plane material face forming a ramp relative to the inside of the blower tube 2, and the diametrically oppositely arranged insert 10 having a rounded material face acting like the top face of a wing whereby it creates a relative sub-atmospheric pressure. Thereby the flow of air leaving the axial blower 1 will, as shown in the figures, be directed away from the mounting fitting 6 at the diffuser.

[0026] Besides, the inserts 9, 10 at the diffuser 4 can be used in all kinds of axial blowers with the same purpose in mind, irrespective of whether those blowers are of the known type where funnel and diffuser are not cut off in the manner defined by the present invention.

[0027] Inserts 7, 8, 9, 10 are made of a material that can be moulded, such as plastics, and then they are mounted in a manner known *per se* to the inside of the funnel 3 or the diffuser 4 and the blower tube 2. If there are requirements that the axial blower 1 is to be able to resist elevated temperatures, the inserts 7, 8, 9, 10 may be made of metal or the like.

[0028] According to one embodiment of the axial blower 1, it may be reversible to the effect that the direction of rotation of the blower rotor 11 can be reversed, and the flow of air may be blown in the opposite direction.

Claims

1. An axial blower (1) comprising an essentially circular-cylindrical blower tube (2) with an internal and an external diameter, and wherein, in the blower tube (2), a blower rotor (11) is configured, which blower rotor (11) has a rotor shaft that essentially coincides with the central axis in the circular-cylindrical blower tube (2), and wherein the blower rotor (11) has an external diameter that is slightly smaller than the internal diameter of the blower tube (2) and is configured such that, at a foremost end seen in the flow direction of the air that is, in operation, driven through the axial blower (1), the blower tube (2) has a suction side and, at its opposite rearmost end, has a discharge side for air, and wherein, at the suction side of the blower tube (2), before the circular-cylindrical blower tube (2), a funnel (3) is configured with an internal surface that converges towards the internal diameter of the blower tube (2), and where the funnel (3) is, at the suction side of the axial blower (1), cut off completely or partially on at least one side of the axial blower (1) to the effect that the outermost edge of the funnel (3), seen from the central axis of the blower tube, is smaller on that side than on other sides **characterised in that**, a material face (7,8) is provided, at least on one of the sites where the funnel (3) is cut off, which face delimits the flow area of the axial blower (1) transversally to the flow direction within the axial blower (1) and which extends from the foremost end and rearwards on the inside of the funnel (3) and a distance into the blower tube (2), said material face on the foremost part reducing the flow area and, on the last part, increases the flow area until the material face ends, whereby the flow area corresponds to the flow area in the blower tube (2).
2. An axial blower according to claim 1, **characterised in that** that the funnel (3) is cut off on two sides relative to the central axis of the blower tube (2).
3. An axial blower according to claim 2, **characterised in that** that the two sites where the funnel (3) is cut off are arranged diametrically opposite each other.
4. A axial blower according to claim 1, 2, or 3, **characterised in that** the funnel (3) is cut off such that the outer periphery thereof, where it is cut off, is at least partially situated in plane which corresponds essentially to a tangential plane for the outer diameter of the circular-cylindrical blower tube (2).
5. An axial blower according to claim 4, **characterised in that** to the outer periphery of the funnel (3), where it is cut off, a mounting fitting (5) is secured, which fitting (5) comprises a plate part that extends essentially in the tangential plane of the outer diameter of the circular-cylindrical blower tube (2), and wherein the mounting fitting (5) is provided with a number of holes configured with a view to the introduction of mounting screws.
6. An axial blower according to claim 1 and 2, **characterised in that** a material face is configured on both cut-off sites of the funnel (3), and wherein the two material faces are essentially configured symmetrically about the central axis of the blower tube (2).
7. An axial blower according to claim 6, **characterised in that** the material face ends before it reaches the blower rotor (11) within the blower tube (2).
8. An axial blower according to claim 6 or 7, **characterised in that** the material face is formed by means of an insert (7, 8) which is constituted by an element which is separate relative to the blower tube (2) and the funnel (3) and secured to the inside of the funnel (3) and the blower tube (2) by welding, gluing, riveting, or by means of any other securing method.
9. An axial blower according to claim 8, **characterised in that** the insert (7, 8) is configured from a moulded material, such as moulding plastics.
10. An axial blower according to one or more of the preceding claims, **characterised in that**, at the discharge side of the blower tube, at the rearmost end,

and behind the circular cylindrical blower tube, seen in relation to the flow direction in operation, a funnel is provided that forms a diffuser (4) for the air flowing through the axial blower (1) in operation, which diffuser (4) is provided with an internal surface that diverges from the internal diameter of the blower tube (2) and rearwards, and wherein the diffuser (4) is cut off completely or partially on at least one side of the axial blower (1) to the effect that the diffuser (4), seen from the central axis of the blower tube (2), is smaller on that side than on other sides.

11. An axial blower according to claim 10, **characterised in that** the diffuser (4) is cut off on two sides relative to the central axis of the blower tube (1).
12. An axial blower according to claim 11, **characterised in that** the two sites where the diffuser (4) is cut off are arranged diametrically opposite each other.
13. An axial blower according to claim 10, 11 or 12, **characterised in that** the diffuser (4) is cut off such that the outer periphery thereof, where it is cut off, is at least partially situated in plane that corresponds essentially to a tangential plane for the outer diameter of the circular-cylindrical blower pipe (2).
14. An axial blower according to claim 13, **characterised in that** the outer periphery of the diffuser (4), where it is cut off, is provided with a mounting fitting (6) that comprises a plate part extending essentially in the tangential plane for the outer diameter on the circular-cylindrical blower tube (2), and wherein the mounting fitting (6) is provided with a number of holes configured with a view to the introduction of mounting screws.
15. An axial blower according to one or more of claims 10 through 14, **characterised in that** a material face is provided, at least on one of the sites where the funnel (4) is cut off, which face delimits the flow area of the axial blower (1) transversally to the flow direction within the axial blower (1), and which extends from the rearmost end and forwards on the inside of the funnel (4) and a distance into the blower tube (2), said material face, on the rearmost part, increasing the flow area, and, on the first part, seen in the flow direction, reducing the flow area.
16. An axial blower according to claims 11 and 15, **characterised in that** a material face is configured on both sites, where the funnel (4) is cut off, and wherein the two material faces are configured differently in such a way as to bring about the effect that the flow of air at the discharge side is deflected in a direction away from the mounting fitting (6).

17. An axial blower according to claim 15 or 16, **characterised in that** the material face begins after the blower rotor (11) inside the blower tube.

18. An axial blower according to one or more of claims 15 through 17, **characterised in that** the material face is formed from an insert (9, 10) which is constituted essentially by an element which is separate relative to the blower tube (2) and the funnel (4) and secured to the inside of the funnel (4) and the blower tube (2) by welding, gluing, riveting, or by means of any other securing method.

19. An axial blower according to claim 18, **characterised in that** the insert (9, 10) is made of a moulded material, such as moulding plastics.

Patentansprüche

1. Axiales Gebläse (1), umfassend ein im Wesentlichen rund-zyllindrisches Gebläserohr (2) mit einem Innen- und einem Außendurchmesser, und wobei in dem Gebläserohr (2) ein Gebläserotor (11) eingerichtet ist, wobei dieser Gebläserotor (11) eine Rotorwelle aufweist, die im Wesentlichen mit der Mittelachse in dem rund-zyllindrischen Gebläserohr (2) übereinstimmt, und wobei der Gebläserotor (11) einen Außendurchmesser aufweist, der ein wenig kleiner als der Innendurchmesser des Gebläserohrs (2) ist, und der so eingerichtet ist, dass er, an einem vordersten Ende, gesehen in der Flussrichtung der Luft, im Betrieb durch das axiale Gebläse (1) angetrieben ist, wobei das Gebläserohr (2) eine Ansaugseite aufweist und, an dessen entgegengesetztem hintersten Ende, eine Ausstoßseite für Luft aufweist, und wobei an der Ansaugseite des Gebläserohrs (2) vor dem rund-zyllindrischen Gebläserohr (2) ein Trichter (3) mit einer Innenfläche eingerichtet ist, die in Richtung auf den Innendurchmesser des Gebläserohrs (2) konvergiert, und wo der Trichter (3), an der Ansaugseite des axialen Gebläses (1), vollständig oder teilweise an mindestens einer Seite des axialen Gebläses (1) mit der Folge abgeschnitten ist, dass die äußerste Kante des Trichters (3), gesehen von der Mittelachse des Gebläserohrs, auf dieser Seite kleiner ist als auf anderen Seiten, **dadurch gekennzeichnet, dass** eine Materialfläche (7, 8) an mindestens einer der Seiten bereitgestellt ist, wo der Trichter (3) abgeschnitten ist, wobei diese Fläche den Flussbereich des axialen Gebläses (1) transversal zu der Flussrichtung innerhalb des axialen Gebläses (1) begrenzt und die sich von dem vordersten Ende und rückwärts im Inneren des Trichters (3) und eine Entfernung in das Gebläserohr (2) hinein erstreckt, wobei die Materialfläche an dem vordersten Teil den Flussbereich reduziert und an dem letzten Teil den Flussbereich erhöht bis die Materialfläche

- endet, wobei der Flussbereich dem Flussbereich in dem Gebläserohr (2) entspricht.
2. Axiales Gebläse nach Anspruch 1, **dadurch gekennzeichnet, dass** der Trichter (3) auf zwei Seiten relativ zu der Mittelachse des Gebläserohrs (2) abgeschnitten ist. 5
 3. Axiales Gebläse nach Anspruch 2, **dadurch gekennzeichnet, dass** die zwei Seiten, wo der Trichter (3) abgeschnitten ist, einander diametral gegenüberliegend angeordnet sind. 10
 4. Axiales Gebläse nach Anspruch 1, 2 oder 3, **dadurch gekennzeichnet, dass** der Trichter (3) derartig abgeschnitten ist, dass dessen äußere Peripherie, wo er abgeschnitten ist, mindestens teilweise in einer Ebene gelegen ist, die im Wesentlichen einer tangentialen Ebene für den Außendurchmesser des rund-zylindrischen Gebläserohrs (2) entspricht. 15
 5. Axiales Gebläse nach Anspruch 4, **dadurch gekennzeichnet, dass** an der äußeren Peripherie des Trichters (3), wo er abgeschnitten ist, ein Montagefitting (5) gesichert ist, wobei dieses Fitting (5) ein Plattenteil umfasst, das sich im Wesentlichen in der tangentialen Ebene des Außendurchmessers des rund-zylindrischen Gebläserohrs (2) erstreckt, und wobei das Montagefitting (5) mit einer Anzahl von Löchern ausgestattet ist, die mit einer Aufnahme für die Einführung von Montageschrauben eingerichtet sind. 20
 6. Axiales Gebläse nach Anspruch 1 und 2, **dadurch gekennzeichnet, dass** eine Materialfläche auf beiden abgeschnittenen Seiten des Trichters (3) eingerichtet ist, und wobei die zwei Materialflächen im Wesentlichen symmetrisch um die Mittelachse des Gebläserohrs (2) eingerichtet sind. 25
 7. Axiales Gebläse nach Anspruch 6, **dadurch gekennzeichnet, dass** die Materialfläche endet, bevor sie den Gebläserotor (11) innerhalb des Gebläserohrs (2) erreicht. 30
 8. Axiales Gebläse nach Anspruch 6 oder 7, **dadurch gekennzeichnet, dass** die Materialfläche mittels eines Einsatzes (7, 8) gebildet ist, der mittels einem Element gebildet ist, das separat relativ zu dem Gebläserohr (2) und dem Trichter (3) ist und an der Innenseite des Trichters (3) und des Gebläserohrs (2) gesichert ist mittels Schweißen, Kleben, Nieten oder mittels eines anderen Sicherungsverfahrens. 35
 9. Axiales Gebläse nach Anspruch 8, **dadurch gekennzeichnet, dass** der Einsatz (7, 8) aus einem gegossenen Material, wie gegossenem Kunststoff, gebildet ist. 40
 10. Axiales Gebläse nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** an der Ausstoßseite des Gebläserohrs an dem hintersten Ende, und hinter dem rund-zylindrischen Gebläserohr, gesehen in Bezug auf die Flussrichtung im Betrieb, ein Trichter bereitgestellt ist, der einen Luftverteiler (4) für die Luft bildet, die im Betrieb durch das axiale Gebläse (1) fließt, wobei dieser Luftverteiler (4) mit einer Innenfläche ausgestattet ist, die von dem Innendurchmesser des Gebläserohrs (2) und rückwärts divergiert, und wobei der Luftverteiler (4) vollständig oder teilweise an mindestens einer Seite des axialen Gebläses (1) mit der Folge abgeschnitten ist, dass der Luftverteiler (4), gesehen von der Mittelachse des Gebläserohrs (2), kleiner auf dieser Seite ist als auf anderen Seiten. 45
 11. Axiales Gebläse nach Anspruch 10, **dadurch gekennzeichnet, dass** der Luftverteiler (4) auf zwei Seiten relativ zu der Mittelachse des Gebläserohrs (1) abgeschnitten ist. 50
 12. Axiales Gebläse nach Anspruch 11, **dadurch gekennzeichnet, dass** die zwei Seiten, wo der Luftverteiler (4) abgeschnitten ist, einander diametral gegenüberliegend angeordnet sind. 55
 13. Axiales Gebläse nach Anspruch 10, 11 oder 12, **dadurch gekennzeichnet, dass** der Luftverteiler (4) derartig abgeschnitten ist, dass dessen äußere Peripherie, wo er abgeschnitten ist, mindestens teilweise in einer Ebene gelegen ist, die im Wesentlichen einer tangentialen Ebene für den Außendurchmesser des rund-zylindrischen Gebläserohrs (2) entspricht. 60
 14. Axiales Gebläse nach Anspruch 13, **dadurch gekennzeichnet, dass** an der äußeren Peripherie des Luftverters (4), wo er abgeschnitten ist, ein Montagefitting (6) bereitgestellt ist, das ein Plattenteil umfasst, das sich im Wesentlichen in der tangentialen Ebene für den Außendurchmesser an dem rund-zylindrischen Gebläserohr (2) erstreckt, und wobei das Montagefitting (6) mit einer Anzahl von Löchern ausgestattet ist, die mit einer Aufnahme für die Einführung von Montageschrauben eingerichtet sind. 65
 15. Axiales Gebläse nach einem oder mehreren der Ansprüche 10 bis 14, **dadurch gekennzeichnet, dass** eine Materialfläche mindestens an einer der Seiten, wo der Trichter (4) abgeschnitten ist, bereitgestellt ist, wobei diese Fläche den Flussbereich des axialen Gebläses (1) transversal zu der Flussrichtung innerhalb des axialen Gebläses (1) begrenzt, und die sich von dem hintersten Ende und vorwärts im Inneren des Trichters (4) und eine Entfernung in das Gebläserohr (2) hinein erstreckt, wobei die Materialfläche, auf dem hintersten Teil, den Flussbereich erhöht. 70

und, auf dem ersten Teil, gesehen in der Flussrichtung, den Flussbereich reduziert.

16. Axiales Gebläse nach einem der Ansprüche 11 und 15, **dadurch gekennzeichnet, dass** eine Materialfläche auf beiden Seiten eingerichtet ist, wo der Trichter (4) abgeschnitten ist, und wobei die zwei Materialflächen unterschiedlich auf eine solche Weise eingerichtet sind, dass dies die Folge hat, dass der Fluss von Luft an der Ausstoßseite in eine Richtung weg von dem Montagefitting (6) abgelenkt wird. 5
17. Axiales Gebläse nach Anspruch 15 oder 16, **dadurch gekennzeichnet, dass** die Materialfläche nach dem Gebläserotor (11) innerhalb des Gebläserohrs beginnt. 10
18. Axiales Gebläse nach einem oder mehreren der Ansprüche 15 bis 17, **dadurch gekennzeichnet, dass** die Materialfläche aus einem Einsatz (9, 10) gebildet ist, der im Wesentlichen mittels eines Elements gebildet ist, das separat relativ zu dem Gebläserohr (2) und dem Trichter (4) ist und an der Innenseite des Trichters (4) und des Gebläserohrs (2) gesichert ist mittels Schweißen, Kleben, Nieten oder mittels anderer Sicherungsverfahren. 15
19. Axiales Gebläse nach Anspruch 18, **dadurch gekennzeichnet, dass** der Einsatz (9, 10) aus einem gegossenen Material, wie gegossenem Plastik, hergestellt ist. 20

Revendications

1. Ventilateur axial (1) comprenant un tube de ventilateur essentiellement circulaire-cylindrique (2) avec un diamètre interne et un diamètre externe, et dans lequel, un rotor de ventilateur (11) est configuré dans le tube de ventilateur (2), lequel rotor de ventilateur (11) a un arbre de rotor qui coïncide essentiellement avec l'axe central dans le tube de ventilateur circulaire-cylindrique (2), et dans lequel le rotor de ventilateur (11) a un diamètre externe qui est légèrement inférieur au diamètre interne du tube de ventilateur (2) et est configuré de telle sorte que, à une extrémité la plus en avant vue dans le sens d'écoulement de l'air qui est entraîné, en fonctionnement, à travers le ventilateur axial (1), le tube de ventilateur (2) a un côté aspiration et, à son extrémité opposée la plus en arrière, a un côté évacuation pour l'air, et dans lequel, côté aspiration du tube de ventilateur (2), avant le tube de ventilateur circulaire-cylindrique (2), un entonnoir (3) est configuré avec une surface interne qui converge vers le diamètre interne du tube de ventilateur (2), et où l'entonnoir (3) est, côté aspiration du ventilateur axial (1), coupé entièrement ou partiellement sur au moins un côté du ventilateur 35

axial (1) de sorte que le bord le plus extérieur de l'entonnoir (3), vu depuis l'axe central du tube de ventilateur, soit plus petit sur ce côté que sur les autres côtés, **caractérisé en ce qu'**une face de matériau (7, 8) est prévue, au moins sur un des sites où l'entonnoir (3) est coupé, laquelle face délimite la zone d'écoulement du ventilateur axial (1) transversalement au sens d'écoulement à l'intérieur du ventilateur axial (1) et qui s'étend de l'extrémité la plus en avant et vers l'arrière sur l'intérieur de l'entonnoir (3) et une distance dans le tube de ventilateur (2), ladite face de matériau sur la partie la plus en avant réduisant la zone d'écoulement et, sur la dernière partie, augmente la zone d'écoulement jusqu'à ce que la face de matériau se termine, selon lequel la zone d'écoulement correspond à la zone d'écoulement dans le tube de ventilateur (2).

2. Ventilateur axial selon la revendication 1, **caractérisé en ce que** l'entonnoir (3) est coupé sur deux côtés par rapport à l'axe central du tube de ventilateur (2). 25
3. Ventilateur axial selon la revendication 2, **caractérisé en ce que** les deux sites où l'entonnoir (3) est coupé sont agencés de manière diamétralement opposée l'un à l'autre. 30
4. Ventilateur axial selon la revendication 1, 2 ou 3, **caractérisé en ce que** l'entonnoir (3) est coupé de telle sorte que sa périphérie extérieure, où il est coupé, est située au moins partiellement dans le plan qui correspond essentiellement à un plan tangentiel pour le diamètre extérieur du tube de ventilateur circulaire-cylindrique (2). 35
5. Ventilateur axial selon la revendication 4, **caractérisé en ce qu'**à la périphérie extérieure de l'entonnoir (3), où il est coupé, un raccord de montage (5) est fixé, lequel raccord (5) comprend une partie plaque qui s'étend essentiellement dans le plan tangentiel du diamètre extérieur du tube de ventilateur circulaire-cylindrique (2), et dans lequel le raccord de montage (5) est doté d'un certain nombre de trous configurés en vue de l'introduction de vis de montage. 40
6. Ventilateur axial selon les revendications 1 et 2, **caractérisé en ce qu'**une face de matériau est configurée sur les deux côtés coupés de l'entonnoir (3), et dans lequel les deux faces de matériau sont essentiellement configurées symétriquement autour de l'axe central du tube de ventilateur (2). 45
7. Ventilateur axial selon la revendication 6, **caractérisé en ce que** la face de matériau se termine avant d'atteindre le rotor de ventilateur (11) à l'intérieur du tube de ventilateur (2). 50

8. Ventilateur axial selon la revendication 6 ou 7, **caractérisé en ce que** la face de matériau est formée au moyen d'un insert (7, 8) qui est constitué d'un élément qui est séparé par rapport au tube de ventilateur (2) et à l'entonnoir (3) et fixé à l'intérieur de l'entonnoir (3) et du tube de ventilateur (2) par soudage, collage, rivetage, ou au moyen de tout autre procédé de fixation. 5
9. Ventilateur axial selon la revendication 8, **caractérisé en ce que** l'insert (7, 8) est configuré à partir d'un matériau moulé, tel un moulage de plastique. 10
10. Ventilateur axial selon une ou plusieurs des revendications précédentes, **caractérisé en ce que**, côté évacuation du tube de ventilateur, à l'extrémité la plus en arrière, et derrière le tube de ventilateur circulaire-cylindrique, vu par rapport au sens d'écoulement en fonctionnement, un entonnoir est prévu qui forme un diffuseur (4) pour l'air s'écoulant à travers le ventilateur axial (1) en fonctionnement, lequel diffuseur (4) est doté d'une surface interne qui diverge du diamètre interne du tube de ventilateur (2) et vers l'arrière, et dans lequel le diffuseur (4) est coupé entièrement ou partiellement sur au moins un côté du ventilateur axial (1) de sorte que le diffuseur (4), vu depuis l'axe central du tube de ventilateur (2), soit plus petit sur ce côté que sur les autres côtés. 15 20 25
11. Ventilateur axial selon la revendication 10, **caractérisé en ce que** le diffuseur (4) est coupé sur deux côtés par rapport à l'axe central du tube de ventilateur (1). 30
12. Ventilateur axial selon la revendication 11, **caractérisé en ce que** les deux sites où le diffuseur (4) est coupé sont agencés de manière diamétralement opposée l'un à l'autre. 35
13. Ventilateur axial selon la revendication 10, 11 ou 12, **caractérisé en ce que** le diffuseur (4) est coupé de telle sorte que sa périphérie extérieure, où il est coupé, est située au moins partiellement dans un plan qui correspond essentiellement à un plan tangentiel pour le diamètre extérieur du tube de ventilateur circulaire-cylindrique (2). 40 45
14. Ventilateur axial selon la revendication 13, **caractérisé en ce que** la périphérie extérieure du diffuseur (4), où il est coupé, est dotée d'un raccord de montage (6) qui comprend une partie plaque s'étendant essentiellement dans le plan tangentiel pour le diamètre extérieur sur le tube de ventilateur circulaire-cylindrique (2), et dans lequel le raccord de montage (6) est doté d'un certain nombre de trous configurés en vue de l'introduction de vis de montage. 50 55
15. Ventilateur axial selon une ou plusieurs des revendications 10 à 14, **caractérisé en ce qu'une** face de matériau est prévue, au moins sur un des sites, où l'entonnoir (4) est coupé, laquelle face délimite la zone d'écoulement du ventilateur axial (1) transversalement au sens d'écoulement à l'intérieur du ventilateur axial (1), et qui s'étend de l'extrémité la plus en arrière et vers l'avant sur l'intérieur de l'entonnoir (4) et une distance dans le tube de ventilateur (2), ladite face de matériau, sur la partie la plus en arrière, augmentant la zone d'écoulement et, sur la première partie, vue dans le sens d'écoulement, réduisant la zone d'écoulement.
16. Ventilateur axial selon les revendications 11 et 15, **caractérisé en ce qu'une** face de matériau est configurée sur les deux sites, où l'entonnoir (4) est coupé, et dans lequel les deux faces de matériau sont configurées différemment de manière à avoir pour effet que l'écoulement d'air côté évacuation soit dévié dans une direction s'éloignant du raccord de montage (6).
17. Ventilateur axial selon la revendication 15 ou 16, **caractérisé en ce que** la face de matériau commence après le rotor de ventilateur (11) à l'intérieur du tube de ventilateur.
18. Ventilateur axial selon une ou plusieurs des revendications 15 à 17, **caractérisé en ce que** la face de matériau est formée à partir d'un insert (9, 10) qui est constitué essentiellement d'un élément qui est séparé par rapport au tube de ventilateur (2) et à l'entonnoir (4) et fixé à l'intérieur de l'entonnoir (4) et du tube de ventilateur (2) par soudage, collage, rivetage, ou au moyen de tout autre procédé de fixation.
19. Ventilateur axial selon la revendication 18, **caractérisé en ce que** l'insert (9, 10) est réalisé en un matériau moulé, tel un moulage de plastique.

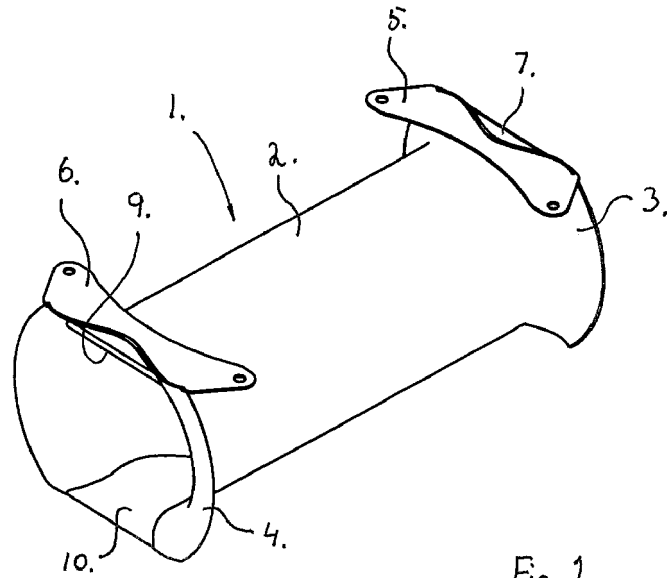


Fig. 1

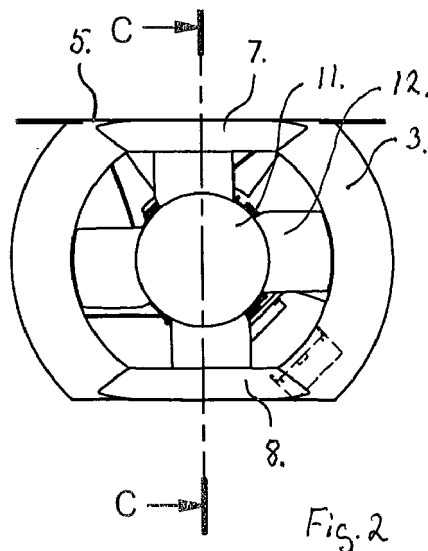


Fig. 2

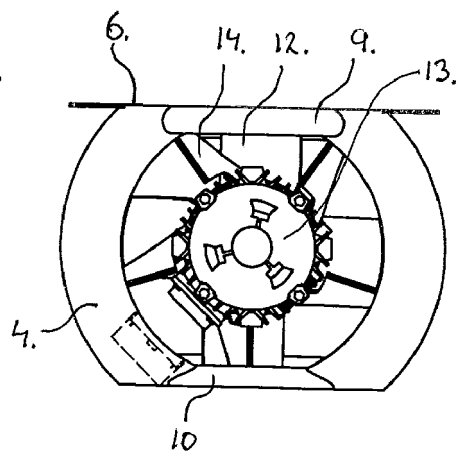
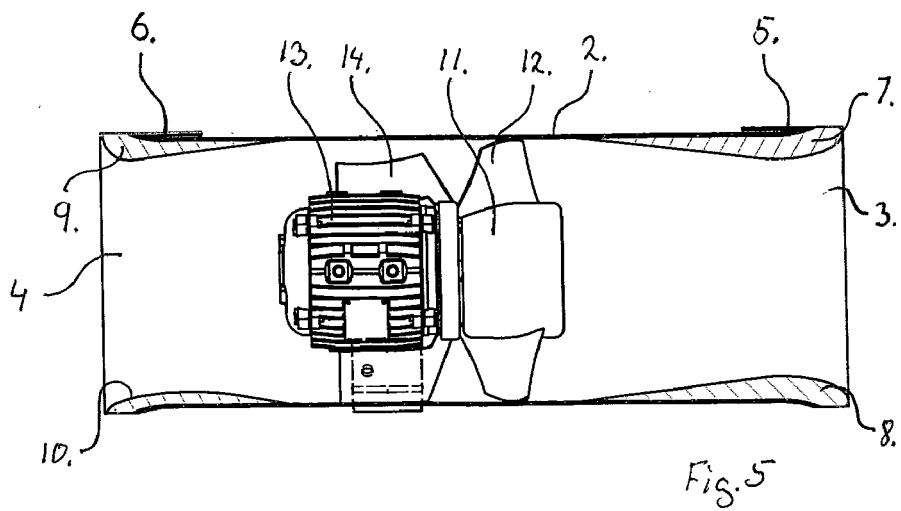
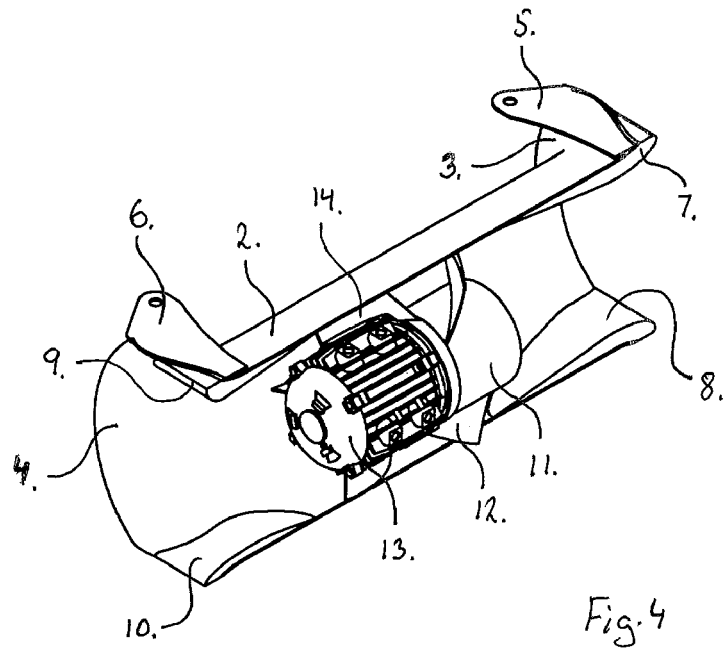


Fig. 3



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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