Claims

1. A fan arrangement (1) comprising a diffuser (3) and ~~for~~a fan (2) of axial, radial or diagonal type of construction, wherein the diffusor (3) is fastened to at least one static part of the fan by fastening means or by means of frictionally locking or positively locking connections, or the static part and the diffusor (3) are formed as a single component, wherein the diffusor (3) comprises ~~having~~ an inlet opening (10) and ~~having~~ an outlet opening (20) for a gaseous medium which flows through a diffuser interior (I), which is enclosed by an outer housing (30), in an axially oriented main flow direction (S) from the inlet opening (10) to the outlet opening (20), wherein the diffusor (3) is located downstream the fan (2) with regard to the main flow direction (S), wherein for conversion of dynamic pressure into static pressure the cross section (21) of the outlet opening (20) is larger than the cross section (11) of the inlet opening (10), and the cross section of the diffuser interior (I) increases from the cross section (11) of the inlet opening to the cross section (21) of the outlet opening (20), wherein the outer housing (30) forms an outer diffuser part (AD) which delimits the diffuser interior (I) to the outside, wherein ~~characterized in that,~~ along the main flow direction (S), the cross section of the outer diffuser part (AD) changes from a circular cross section (31) at the inlet opening (10) to a non-circular cross section (32) at the outlet opening (20),

characterized in that

concentrically with respect to the outer diffuser part (AD), there is arranged an inner diffuser part (ID) which, with an inner housing (40),

delimits the diffuser interior (I) to the inside, wherein

the inner diffuser (ID) has, in at least one section perpendicular to the main flow direction (S), a non-circular cross section (42) about the longitudinal axis (X-X) of the inner diffuser part (ID).

2. A fan arrangement (1) comprising a diffuser (3) and~~for~~ a fan (2) of axial, radial or diagonal type of construction, wherein the diffusor (3) is fastened to at least one static part of the fan by fastening means or by means of frictionally locking or positively locking connections, or the static part and the diffusor (3) are formed as a single component, wherein the diffusor (3) comprises ~~having~~ an inlet opening (10) and ~~having~~ an outlet opening (20) for a gaseous medium which flows through a diffuser interior (I), which is enclosed by an outer housing (30), in an axially oriented main flow direction (S) from the inlet opening (10) to the outlet opening (20), wherein the diffusor (3) is located downstream the fan (2) with regard to the main flow direction (S), wherein for conversion of dynamic pressure into static pressure the cross section (21) of the outlet opening (20) is larger than the cross section (11) of the inlet opening (10), and the cross section of the diffuser interior (I) increases from the cross section (11) of the inlet opening to the cross section (21) of the outlet

opening (20), wherein the outer housing (30) forms an outer diffuser part (AD) which delimits the diffuser interior (I) to the outside,

characterized in that~~wherein~~, concentrically with respect to the outer diffuser part (AD), there is arranged an inner diffuser part (ID) which, with an inner housing (40), delimits the diffuser interior (I) to the inside,wherein

~~characterized in that~~ the outer diffuser part (AD) and/or the inner diffuser part (ID) are/is designed such that the cross section of the diffuser interior (I) is non-rotationally symmetrical at at least one point.

~~3. A diffuser (3) in which, on the one hand, an outer diffuser part (AD) for a fan (2) of axial, radial or diagonal type of construction is provided, which outer diffuser part changes from a circular to a non-circular cross section along a main flow direction (R1) of a fluid, wherein an inner diffuser part (ID) of arbitrary design is provided, or in which, on the other hand, an inner diffuser part (ID) is provided which, in at least one portion, has a non-circular cross section about the axis of rotation (X-X) of the fan (2), wherein an outer diffuser part (AD) of arbitrary design is provided.~~

~~4. A diffuser (3) having at least one cross-sectional region of rotationally asymmetrical form as a result of the design of an outer diffuser part (AD) and/or inner diffuser part (ID), in particular having an inner diffuser part (ID) without an outer diffuser part (AD).~~

~~5. The diffuser (3) as claimed in one of the preceding claims,~~

~~characterized in that, concentrically with respect the outer diffuser part (AD), there is arranged an~~

~~inner diffuser part (ID) which, with an inner housing (40), delimits the diffuser interior (I) to the inside.~~

~~6. The diffuser (3) according to the preamble of claim 1, in particular as claimed in claim 1, wherein an inner diffuser part (ID) is arranged concentrically with respect to the outer diffuser part (AD), wherein the diffuser (3) has a housing which, as an inner housing (40), delimits the diffuser interior (I) to the inside,~~

~~characterized in that the inner diffuser part (ID) has, in at least one section perpendicular to the main flow direction (S), a non-circular cross section (42) about the longitudinal axis (X-X) of the inner diffuser part (ID).~~

3~~7~~. The fan arrangement (1)~~diffuser (3)~~ as claimed in claim 1 or 2~~one of the preceding claims~~,
characterized in that the non-circular cross section (32) of the outer diffuser part (AD) and/or of the inner diffuser part (ID) is of polygonal, in particular square, basic shape.

4~~8~~. The fan arrangement (1)~~diffuser (3)~~ as claimed in one of the preceding claims,
characterized by the diffusor (3) ~~a construction~~ composed of a plurality of individual diffuser parts which are connected to one another by fastening means such as screws, rivets, clamps or the like, or by means of frictionally ~~non-positively~~ locking, positively locking and/or cohesive connections, such as by means of a bayonet lock, by means of a clip connection, by means of a welded connection or the like.

5~~9~~. The fan arrangement (1)~~diffuser (3)~~ as claimed in one of the preceding claims,

characterized in that the diffuser (3), or at least one diffuser part (ID, AD, 30, 40), is composed of originally planar plates which are bent and connected to one another, in particular of punched metal sheets, or of a flexible cover (P), which is/are if appropriate tensed and/or stiffened with the aid of additional add-on parts such as supporting struts (9b) and/or bearing and shaped rings (9a).

6~~10~~. The fan arrangement (1)~~diffuser (3)~~ as claimed in one of the preceding claims,
characterized in that the inner housing (40), the outer housing (30) and/or parts thereof are/is composed of plastic and are/is produced preferably by primary forming or shaping processes such as injection molding, extrusion, rotary molding, foaming, vacuum deep-drawing, blow molding or the like.

7~~11~~. The fan arrangement (1)~~diffuser (3)~~ as claimed in claim 6~~10~~,
characterized in that mechanically highly loaded regions of the inner housing (40), of the outer housing (30) and/or of the parts thereof are reinforced by at least one metal part inlaid during the primary forming process or subsequently attached.

8~~12~~. The fan arrangement (1)~~diffuser (3)~~ as claimed in one of the preceding claims,
characterized in that a load-bearing structure of the diffuser (3) is a framework spanned by a thin material composed in particular of plastic or sheet metal.

9~~13~~. The fan arrangement (1)~~diffuser (3)~~ as claimed in one of the preceding claims,

characterized in that a touch guard, for example in the form of rectangular struts, is arranged on the inner housing (40) and/or on the outer housing (30), which touch guard is formed in one piece with the respective housing (30, 40) or is formed as a separate part fastened to the inner housing (40) and/or to the outer housing (30).

10. The fan arrangement (1) ~~diffuser (3)~~ as claimed in one of the preceding claims,
characterized in that a follow-up guide wheel is arranged on the inner housing (40) and/or on the outer housing (30), which follow-up guide wheel is formed in one piece with the respective housing (30, 40) or as a separate part fastened to the inner housing (40) and/or outer housing (30) and is composed of static guide elements which are designed so as to divert circumferential and/or radial components of the flow speed in the axial direction (X-X).

11. The fan arrangement (1) ~~diffuser (3)~~ as claimed in one of the preceding claims
characterized by a sound-deadening means, wherein in particular the diffuser interior (I) is lined with a sound-deadening material, preferably in such a way that the free surface of the sound-deadening material on that side of the inner housing (40) and/or of the outer housing (30) which faces towards the main flow (S) forms a diffuser wall which is active in terms of flow.

12. The fan arrangement (1) ~~diffuser (3)~~ as claimed in claim 11,
characterized in that a sound-deadening material is applied to the diffuser outer surface, which faces away from the main flow (S), of the outer housing (30).

13~~17~~. The fan arrangement (1)~~diffuser (3)~~ as claimed in claim 11~~15~~,
characterized in that the outer diffuser part (AD) and/or the inner diffuser part (ID) is/are composed partially or in particular integrally of the sound-deadening material.

14~~18~~. The fan arrangement (1)~~diffuser (3)~~ as claimed in one of the preceding claims,
characterized by a system for active noise reduction ("active noise control") for reducing mid- to low-frequency sound radiation.

~~19. An outer diffuser part (AD) or inner diffuser part (ID) for a diffuser (3) as claimed in one of the preceding claims,~~
~~characterized by one or more of the characterizing features of one of claims 1 to 18.~~

~~20. A fan arrangement (1) comprising a diffuser (3) as claimed in one of claims 1 to 19 and a fan (2) of axial, radial or diagonal type of construction~~.

15~~21~~. The fan arrangement (1) as claimed in one of the preceding claims~~claim 20~~,
characterized in that the diffuser (3) is fastened to the at least one static part of the fan, in particular to a wall ring (5) and/or to a protective grille, by ~~fastening means such as~~ screws, rivets, clamps or the like, or ~~by means of non-positively locking or positively locking connections, such as~~ by means of a bayonet lock, by means of a clip connection, or by means of a welded connection~~, etc~~.