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(54) **Fan hub**

(57) The arrangement is formed by the combination of a number of standardised parts such as a sleeve, a back half casing and a front half casing, both being generally equal to one another and having a semicylindrical configuration with no upper base. From the edge thereof a flap is formed provided with a number of openings and flanges located at the side surface thereof. Said half casings may be coupled through clamping means pro-

vided at the base thereof by combining bores, rods and nuts tightly clamping them in such a way that the skirt of said blades is located therein, which blades are manufactured in a conventional way. However, said base is provided with such a skirt which finishes at the only free end thereof in a ringed rim. The skirt and the rim are accommodated in a bracket which is clamped between the above mentioned back and front half casings.

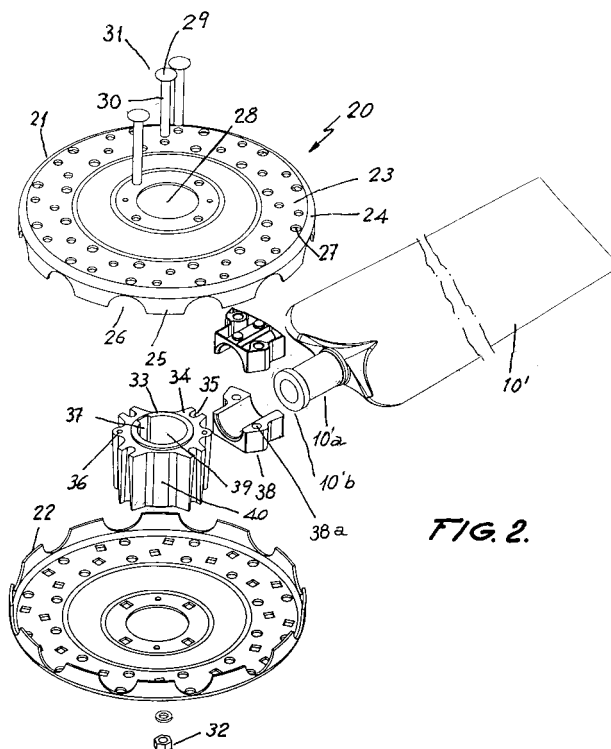


FIG. 2.

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Description

[0001] The present patent application relates, as stated in its title, to "IMPROVEMENTS IN BUILDING CASINGS FOR FANS" which novel manufacturing, conformation and design features fulfil the purpose to which they have been specifically conceived, with a maximum safety and effectiveness.

[0002] More particularly, the present invention refers to a novel arrangement of the parts in the helix of fans.

[0003] Said arrangement has been devised to serve the purpose of manufacturing fans having different diameter and different number of blades, since its configuration allows assembling all of these parts without the need of varying said configuration. This results in that it is possible to standardise fans having different diameter and different features, thus reducing manufacturing costs as well as the costs of provision of spare parts for any fault or damage which it could occur in their useful life.

[0004] Such arrangement is formed by the combination of a number of standardised parts such as a sleeve, a back half casing and a front half casing, both being generally equal to one another and having a semicylindrical configuration with no upper base. From the edge thereof a flap is formed which is provided with a number of openings and flanges located at the side surface thereof. The flap has as many openings as vanes are provided in the helix. Said half casings may be coupled through clamping means provided at the base thereof by combining bores, rods and nuts tightly clamping them in such a way that the skirt of said blades is located therein, which blades are manufactured in a conventional way. However, said base is provided with such a skirt, which finishes at the only free end thereof in a ringed rim. The skirt and the rim are thoroughly accommodated in a bracket comprising two parts. Once said two parts have been clamped between the back and front half casings, they prevent the vane from being rotated around the axis thereof and radially moved relative to the helix centre. Such clamping system is common regardless of the fan diameter, the number of vanes and the vanes tilt.

[0005] The possibility of using the same half casings as well as the same clamping means for different types of blades will produce the above-denoted benefits. Further, assembly will be greatly eased since only having clamping means such as pneumatic screw drivers and the like, a high productivity in this type of fans can be obtained. As these fans are manufactured from a low-volume production, it is not allowed to build and design special machinery for an automatic assembly. Therefore; any decrease in manual operations, which are the basis and foundation of their manufacturing, will immediately have repercussions on their manufacturing costs.

[0006] The prior art related to the present invention is formed by means and parts that enable the assembly of this type of fans; wherein basically two half casings are

provided, the back one being different from the front one. This combined with the sleeve which are coupled to the motor (which is different in each case), involves the absolute inability to carry out a standardisation such as the one described and which is the object of the present invention.

[0007] Further details and features of the present patent application will be apparent from the following description, which refers to the accompanying drawings that schematically represent the preferred details. These details are given by way of example, which refer to a possible case of practical embodiment, but it is not limited to the details disclosed herein; therefore this description must be considered from an illustrating point of view and without any type of limitations.

[0008] A detailed list of the various parts cited in the present patent application is given below: (10) helix, (10'a) skirt, (10'b) rim, (10') blade, (11) back half casing, (12) front half casing, (13) sleeve, (14) motor axis passage, (15) blade, (16) blade body, (17) blade end, (18) base, (19) recess, (20) helix, (21) back half casing, (22) front half casing, (23) base of helix (20), (24) edge, (25) flap, (26) openings, (27) bores, (28) central passage, (29) flat head, (30) rod, (31) screw, (32) nut, (33) sleeve, (34) teeth, (35) spline, (36) bores, (37) spline slot, (38) bracket, (38a) bores, (39) passage, (40) clearance.

[0009] Figure n^o 1 is a cross-section elevational end view of a prior art constructive arrangement for manufacturing this type of fans, where the helix (10) provided with blades (15) mounted between the half casings (12) and (13) is shown.

[0010] Figure n^o 2 is an exploded perspective of the arrangement of the present invention.

[0011] In one of the preferred embodiments of what is the object of the present invention, and as it is diagrammatically depicted in figure n^o 1, manufacturing of fans, and more particularly manufacturing of helices having blades (15), starts from manufacturing, by means of moulding or casting, of a back half casing (11) and a front half casing (12) which are quite complementary and different. The skirt (17) and the base (18) of a conventional blade (15) provided with the body (16) are fitted between and clamped to said half casings (11, 12). The sleeve (13), which is provided with a passage (14) at the middle part thereof, where the axis of an electric motor that drives the helix is to be received, is subsequently fitted.

[0012] This constructive system as shown in figure n^o 1 involves forming of two different half casings (12) and (13), and subsequently fitting the sleeve (13) to enable coupling the helix to the motor.

[0013] All the above have been replaced with the object of the present invention, as it can be seen from figure n^o 2, which shows how the half casings are formed by a cylindrical body having only one base. The base (23) is provided with chamfered or rounded edges (24) and flaps (25) extending downwardly and perpendicular to the base (23). The flaps (25) are provided with as

many regularly distributed openings (26) as vanes are provided in the helix.

[0014] The base (23) is machined through conventional means and it is provided with a number of bores (27) which purpose will be discussed below. In the middle part of the base (23) there exists a central passage (28) where the sleeve (33) is to be fitted. Such sleeve (23) is subsequently coupled to the electric motor axis (not shown in the figures).

[0015] The helix (10), as it can be seen from figure n^o 2, is provided at one of its ends with a skirt (10 a) finishing at the only end thereof in a rim (10 b). This allows that said skirt (10 a) is surrounded by the bracket (38) which comprises two symmetric pieces that are joined forming a single assembly with the corresponding bores (38a) where screws will be fitted thus fastening the helixes (10) as the skirt (10'a) is fitted between the openings (26) once said half casings (21, 22) have been joined. This is helped by the screws (31) provided with rods (30) and flat heads (29).

[0016] As it can be seen from figure n^o 2, the sleeve (33) is fitted, in turn, inside the half casings (21) and (22), which once assembled form an integral assembly as they are clamped to the rods or screws which pass through the bores (36).

[0017] Such sleeve (33) is provided at the middle part thereof with a longitudinal bore (39) where the axis of an electric motor that drives the helix is to be fitted. At the outer side surface, there exist splines (35) extending longitudinally where rods (30) are to be inserted to fix the half casings,

[0018] Each of the blades (10') are therefore clamped to the helix (20) through the following means:

- a) Bracket (38) mounted on the skirt (10'a).
- b) Rim (10'b) fitted in the bracket (38).
- c) Bracket (38) clamped inside the half casings (22,22).
- d) Screws (31) fitted in the longitudinal splines (35) of the sleeve (13).
- e) Screws (31) crossing the bores (27) formed in the half casings and the bores (38a), thus fixing the assembly,

[0019] Design of the back and front semicubes (21, 22) is grossly simple and its construction is very light whereby not only a manufacturing costs saving is obtained but a thickness saving relative to the solution shown in figure n^o 1 is obtained with no structural rigidity decrease.

[0020] Likewise, inclusion of the brackets (38) in conjunction with a standardisation of the skirts (10'a) and the rims (10'b) is an added value to the costs reduction as explained above, in the sense that without changing the geometry of the half casings (21, 22) and that of the openings (26) it is possible to use the same type of helix (20) for different types of blades (10') which, in all cases, they will maintain the same geometry features for the

skirt (10'a) and the rim (10'b) and therefore different types of blades (10') will be able to use the same helix (20) and bracket (38) arrangement.

[0021] Once having been sufficiently described what the present patent application consists in accordance to the enclosed drawings, it is understood that any detail modification can be introduced as appropriate, provided that variations may alter the essence of the invention as summarised in the appended claims.

Claims

1. "IMPROVEMENTS IN BUILDING CASINGS FOR FANS" improving those comprising a helix (10) formed by a back half casing (11) and a front half casing (12) having different configurations, where blades (15) having bodies (16) are clamped between the inner surfaces thereof and one of the bases of the bodies (16) finishing in one end (17) which is provided with a base (18), characterised in that the helix (10) comprises two half pieces, a half casing (21) and a half casing (22), said half casings (21, 22) having a cylindrical configuration provided with only one base, whilst from the circular base (23), which perimeter is determined by a chamfered or rounded edge (24), an extending downwardly flap (25) is provided with a number of substantially semicircular openings (26), said base (23) being provided with a number of bores (27); and a sleeve (33) and brackets (38) being fitted between the half casings (21, 22).
2. "IMPROVEMENTS IN BUILDING CASINGS FOR FANS" as claimed in claim 1, characterised in that clamping of the blades (10') is performed by the brackets (38) which are fitted on the skirt (10'a) and clamped in the half casings (21, 22) by means of screws (31) passing through bores (27) and (38a) as well as through openings (26) existing in the flap (25) of the half casings (21, 22).
3. "IMPROVEMENTS IN BUILDING CASINGS FOR FANS" as claimed in claim 1, characterised in that the sleeve (33) for coupling the skirt (10'a) to the corresponding motor axis comprises a body having longitudinal ribs or teeth (34) at the side surface thereof delimiting both clearances (40) to clamp the rim (10'b) of the skirt (10'a) of the blade (10').

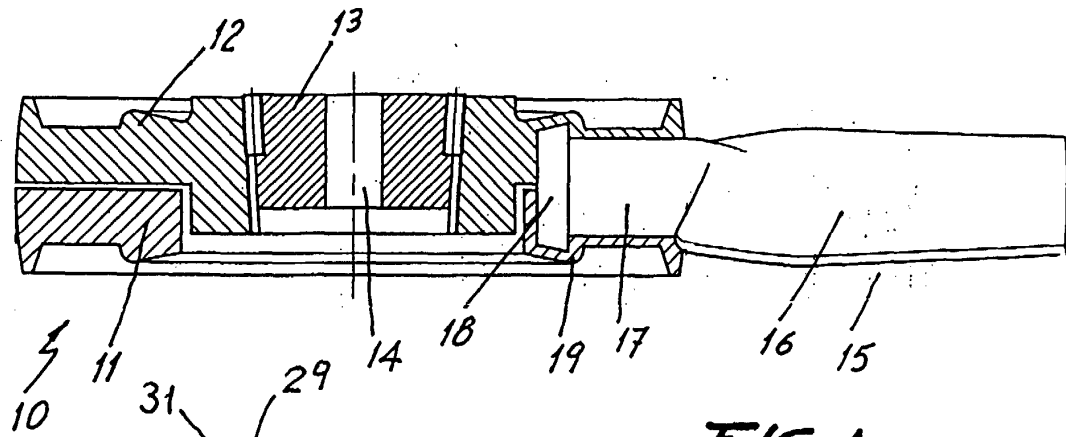


FIG. 1.

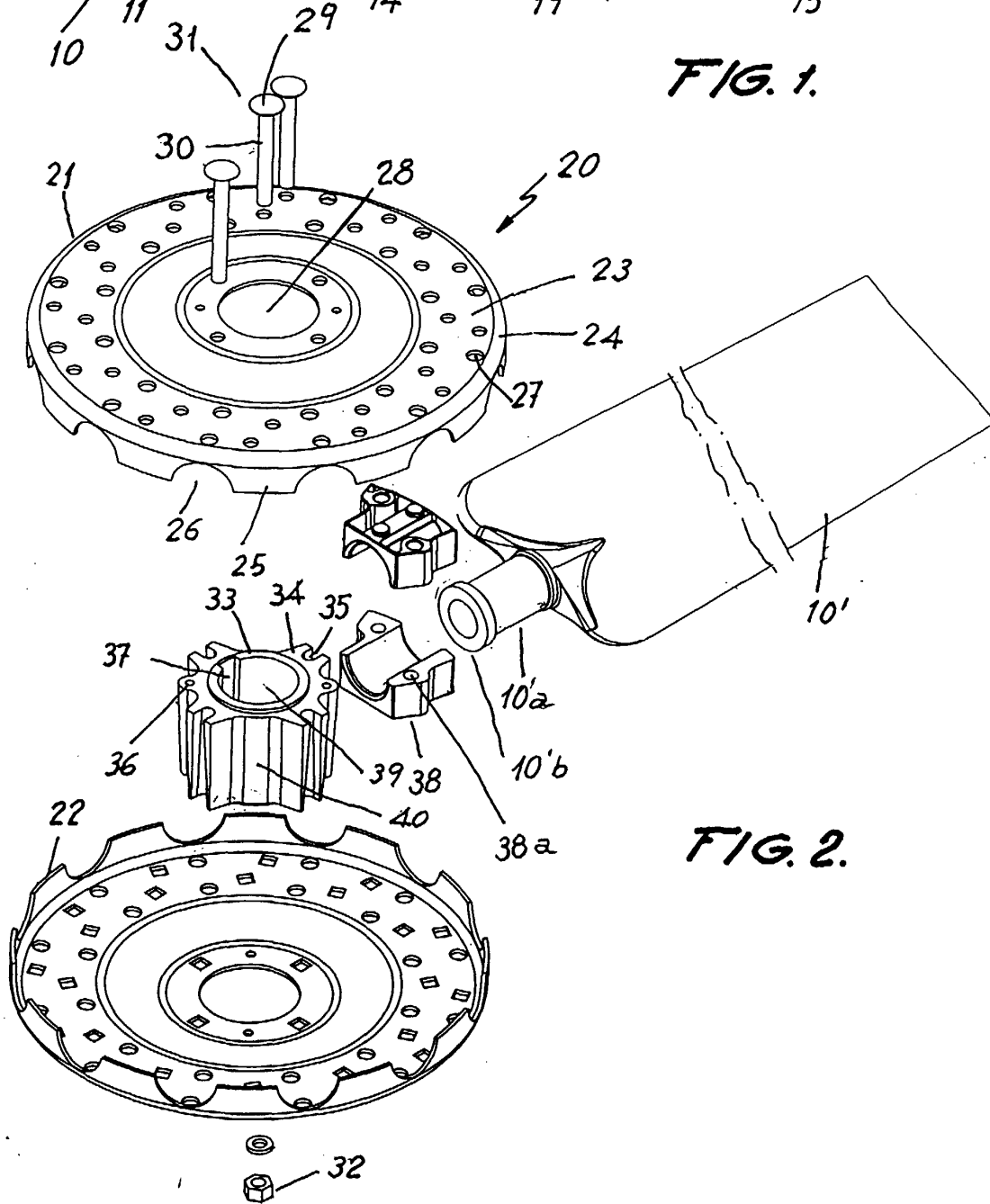


FIG. 2.