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(54) **Tub for washer or washer/dryer machine provided with conduits**

(57) A tub (1) for washer or washer/dryer machine is disclosed, comprising: a tub body composed of a basically cylindrical lateral wall (20) connected by means of a circular connection section (21) to a bottom wall (2) and a cover (3) provided with a circular peripheral section (31) coupled with said bottom wall (2) of the tub body in such a way to form a box-shaped structure. The tub body comprises a first flange (25) that is coupled with a second flange (35) provided in said cover to generate a fluid-tight chamber (40) that can be used for various functions of the machine, such as pressure intake cover (4).

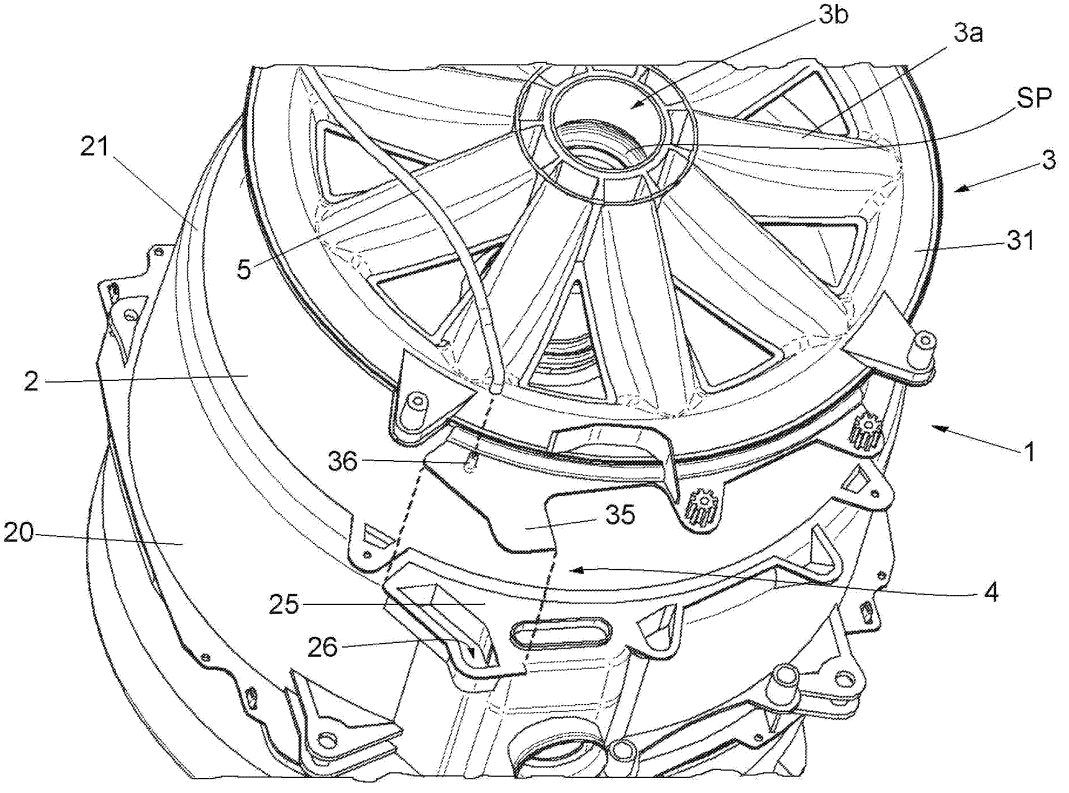


FIG. 2

EP 2 218 816 A1

Description

[0001] The present patent application for industrial invention relates to a tub for washer or washer-dryer machine. The following description makes specific reference to a washer, it being understood that the invention is also extended to a washer/dryer machine.

[0002] Referring to Fig. 1, as it is known, a washer comprises a tub (1) in which a rotary drum (300) is mounted and driven into rotation by an electric motor. A disc-shaped flange (400) is mounted on the front of the tub (1), commonly defined as loading mouth (400), defining an opening used to load laundry into the drum (300).

[0003] The tub comprises a cylindrical wall (20) open on the front that is connected to a bottom wall (2). Generally, the bottom wall (2) is reinforced because it must receive a bearing-holder in which the drive shaft that drives the drum into rotation is rotatably mounted.

[0004] Referring to Fig. 1A, the patent application WO2008/102396 in the name of the same applicant, which is hereby incorporated as reference, discloses a tub (1) comprising a cylindrical lateral wall (20) joined by means of a connection wall (21) to a smooth bottom wall (2) on which a suitably shaped cap (3) acting as reinforcement is engaged and fixed. The cap (3) and the bottom wall (2) are provided with axial holes (32, 22) in which a bearing support (SP) is mounted to rotatably support the shaft of the drum.

In general, washers comprise hoses, conduits and chambers connected to the tub, which are used for several applications, in order to control various functions of the washer.

[0005] For example, the use of a pressure intake cover is known, being a closed volume connected to a pressure switch to measure the water level inside the tub.

[0006] Referring to Fig. 1, according to the known art, the pressure intake cover is obtained in the separation section between the lateral wall (20) of the tub and the loading mouth (400). This solution is limitative whenever it is necessary to position the tub assembly with axis with upward inclination inside the casing. In such a case, the pressure intake cover would be mainly in the front, and not in the lowest point of the casing. Such a condition is not favourable for the good operation of the pressure intake cover.

[0007] Another application is known, in which a recirculation conduit is used to provide communication between the lower part and the upper part of the tub. The function of the recirculation conduit is to recirculate pumped water, bringing back in the drum with the laundry the soapy water that is contained in the lower part of the tub outside the drum. This operation allows for fully using the soap, thus increasing the quality of washing (washing class).

[0008] Said recirculation conduit, which is separated from the tub, represents an additional cost both for the purchasing price of the part and for its assembly.

[0009] The purpose of the present invention is to eliminate the drawbacks of the prior art, by devising a tub for washer that is practical, versatile, inexpensive and simple to make and assemble.

This purpose has been achieved according to the invention with the characteristics described in the enclosed independent claim 1.

Advantageous embodiments are disclosed in the dependent claims.

[0010] The tub for washer or washer/dryer according to the present invention comprises:

- a tub body composed of a basically cylindrical lateral wall connected by means of a circular connection section to a bottom wall, and
- a cover provided with a circular peripheral section coupled with said bottom wall of the tub body, in such a way to form a box-shaped structure.

[0011] The tub body comprises at least a first flange that is coupled with at least a second flange provided in said cover, in such a way to generate a fluid-tight chamber or conduit that can be used for various functions of the appliance, such as pressure intake cover or conduit for passage of fluid.

[0012] The advantages of the tub of the invention appear evident, which makes use of the coupling between the back cover and the tub body to generate chambers and conduits that can be used for various functions of the washing machine, thus saving considerably on space and avoiding the provision and assembly of additional parts.

[0013] Additional characteristics of the invention will appear evident from the following detailed description, which refers to merely illustrative, not limiting embodiments, illustrated in the enclosed drawings, wherein:

Fig. 1 is an exploded perspective view of a washing assembly for washer according to the known art;
Fig. 1A is an exploded perspective view of an improved tub for washer according to the known art;
Fig. 2 is an exploded partially-cut perspective view of a first embodiment of the tub of the invention;
Fig. 3 is a perspective view of the tub of Fig. 2 after assembly;
Fig. 4 is a cross-sectional view of a pressure intake cover of the tub of Fig. 3;
Fig. 5 is the same view as Fig. 2, except for it shows a variant of the pressure intake cover;
Fig. 6 is a back view of the tub of Fig. 5 after assembly;
Fig. 7 is a cross-sectional view along plane VII-VII of Fig. 6;
Fig. 8 is an exploded perspective view of a second embodiment of the tub of the invention;
Fig. 9 is a perspective view of the tub of Fig. 8 after assembly; and
Fig. 10 is a cross-sectional view of a recirculation conduit of the tub of Fig. 9.

[0014] Referring to Figs. 2 and 3, a first embodiment of the tub for washer according to the present invention is disclosed, which is generally referred to with numeral (1).

[0015] The tub (1) comprises a tub body composed of a cylindrical wall (20) open on the front and provided with a circular connection section (21) that is connected to a preferably smooth bottom wall (2).

[0016] A cover (3) is engaged and fixed on the bottom wall (2). The cover (3) is provided with a circular peripheral section (31) that is advantageously fixed on the peripheral section of the tub body by means of ultrasound welding. Obviously, the cover (3) can be fixed to the tub body also by means of thermowelding, gluing or suitable fixing means.

[0017] The cover (3) is provided with cavities facing the bottom wall (2) in such a way to form a box-shaped structure with it. Advantageously, the cover (3) is provided with a plurality of spokes (3a) branching off from a central hub (3b) adapted to house a bearing support (SP) that rotatably supports a shaft of the drum driven into rotation by an electric motor of the washer.

[0018] A pressure intake cover (4) is arranged between the connection section (21) of the tub body and the cover (3).

[0019] A first flange (25) protrudes radially outwards from the connection section (21) of the tub body. The flange (25) is composed of a flat plate provided with a recessed housing (26) that forms a chamber in communication with the inside of the tub.

[0020] A second flange (35) protrudes radially outwards from the peripheral section (31) of the cover in such a way to be coupled with the first flange (25), forming a fluid-tight chamber (40), as shown in Fig. 4, which is the pressure intake cover (4).

[0021] The recessed housing (26) can be obtained only in the flange (35) of the cover or in both flanges (25 and 35).

[0022] Evidently, tightness means, such as gaskets, can be provided between the two flanges (25, 35) to ensure water-tightness of the chamber (40) of the pressure intake cover. Naturally, said gaskets are not necessary if gluing or welding technology is used to assemble the two parts; in fact, water-tightness is equally guaranteed in these two cases.

[0023] It must be noted that the flange (35) of the cover is connected to the peripheral section (31) of the cover by means of a connection section (34) arranged above the connection section (21) of the tub body. Still referring to Fig. 2, the flange (35) of the cover is provided with a shank (36) with through hole. A pipe (5) is connected to the shank (36) and to a pressure switch (not shown) to measure the pressure in the chamber (40) and consequently the water level inside the tub.

[0024] In the following description elements identical or corresponding to the ones described above are indicated with the same numerals, omitting a detailed description.

Figs. 5 - 7 show a variant of the tub (1), in which the recessed housing (226) is obtained in the second flange (35) joined to the cover. A hole (225) in communication with the inside of the tub is obtained in the first flange (25) joined to the tub body, as shown in Fig. 7. The shank (36) for connection of the pipe (5) is obtained in the recessed housing (226) of the cover flange.

[0025] Figs. 8 and 9 illustrate a second embodiment of the tub of the invention, generally indicated with numeral (101), wherein a recirculation conduit (6) is arranged between the connection section (21) of the tub body and the peripheral section (31) of the cover (3).

[0026] A first flange (125) follows the connection section (21) of the tub body for an arc of circle of approximately 80° - 120°. The flange (125) consists in a flat plate with curved profile. The curved flange (125) has a first end (127) that protrudes radially outwards from the connection section (21) of the tub body and a second end with a hole (128) that communicates with a conduit (129) obtained on the cylindrical lateral wall (20) of the tub body.

[0027] A second flange (135) complementary to the first flange (125) follows the peripheral section (31) of the cover for an arc of circle of approximately 80° - 120°. The flange (135) is composed of a curved plate that defines a concave cavity (136) (see Fig. 10). The concave flange (135) has a first end (137) that protrudes radially outwards from the peripheral section (31) of the cover and a second end with a cap (138) that covers the hole (128) of the first flange (125).

[0028] The end (137) of the second flange ends with a shank (7) with inlet opening (70). A pipe is connected to the inlet opening (70), which is connected to a pump that draws in the lower part of the tub.

[0029] When the cover (3) is mounted on the back wall (2) of the tub body, the two flanges (125, 126) are coupled, forming a watertight conduit (60), as shown in Fig. 10, which is the recirculation conduit (6) that draws soapy water in the lower part of the tub and recirculates it in the upper part of the drum.

[0030] The concave cavity (136) can be obtained only in the flange (125) of the tub body or in both flanges (125 and 135).

Evidently, tightness means, such as gaskets, can be provided between the two flanges (125, 135) to ensure water-tightness of the recirculation conduit (60).

[0031] Both the tub body and the cover together with the corresponding flanges are made of moulded plastic material.

[0032] Numerous variations and modifications can be made to the present embodiments of the invention by an expert of the art, while still falling within the scope of the invention as claimed in the enclosed claims.

Claims

1. Tub (1; 101) for washer or washer/dryer **machine** comprising:

- a tub body composed of a basically cylindrical lateral wall (20) connected by means of a circular connection section (21) to a **flat** bottom wall (2), and
- a cover (3) provided with a circular peripheral section (31) coupled with the said bottom wall (2) of the tub body, in such a way to form a box-shaped structure,

characterised in that
the tub body comprises at least a first flange (25; 125) that is coupled with at least a second flange (35; 135) provided in the said cover, in such a way to generate a fluid-tight chamber (40) or conduit (60) that can be used for pressure intake cover (4) or conduit (6) for passage of fluid.

2. Tub (1; 101) according to claim 1, **characterised in that** the first flange (25; 125) is arranged on the said connection section (21) of the tub body and the second flange (35; 135) is arranged on said peripheral section (31) of the cover.

3. Tub (1; 101) according to claim 1 or 2, **characterised in that** at least one between the said first flange (25; 125) and said second flange (35; 135) is provided with a recessed housing (26; 226) or concave cavity (136) to define the said chamber (40) or conduit (60).

4. Tub (1) according to claim 3, **characterised in that** the first flange (25) protrudes radially from the connection section (21) of the tub body and has a recessed housing (26) and the second flange (35) protrudes radially from the said peripheral section (31) of the cover and has a shank (36) with a hole to receive a pipe (5) connected to a pressure switch.

5. Tub (1) according to claim 3, **characterised in that** the first flange (25) protrudes radially from the connection section (21) of the tub body and has a hole (225) that communicates with the inside of the tub and the second flange (35) protrudes radially from the said peripheral section (31) of the cover and has a recessed housing (226) and a shank (36) with a hole to receive a pipe (5) connected to a pressure switch.

6. Tub (101) according to claim 3, **characterised in that**:

- the first flange (125) follows the connection section (21) of the tub body for an arc of a circle of approximately 80°-120° and has a first end (127) that protrudes radially outwards and a second end with a hole (128) that communicates with a conduit (129) obtained on the said cylindrical lateral wall (20) of the tub body, and
- the second flange (135) follows the peripheral section (31) of the cover for an arc of circle of approximately 80°-120° and is provided with a first end (137) that protrudes radially outwards and has a shank (7) with an inlet opening (70) and a second end with a cap (138) that covers the hole (120) of the first flange.

7. Tub (1; 101) according to any of the above claims, **characterised in that** said at least first flange (25; 125) is integral with said tub body obtained by moulding of plastic materials.

8. Tub (1; 101) according to any of the above claims, **characterised in that** said at least first flange (35; 135) is integral with said tub body obtained by moulding of plastic materials.

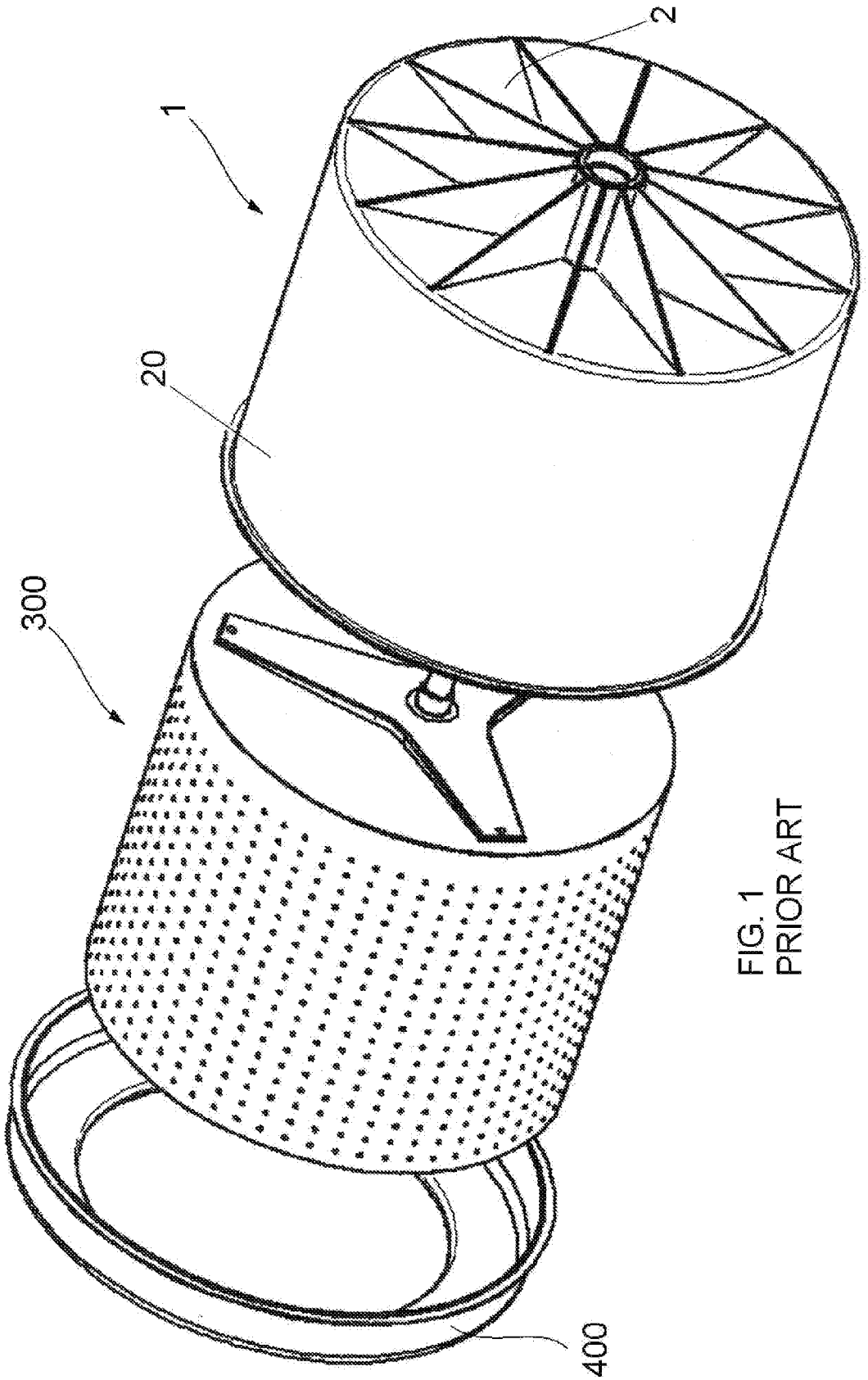


FIG. 1
PRIOR ART

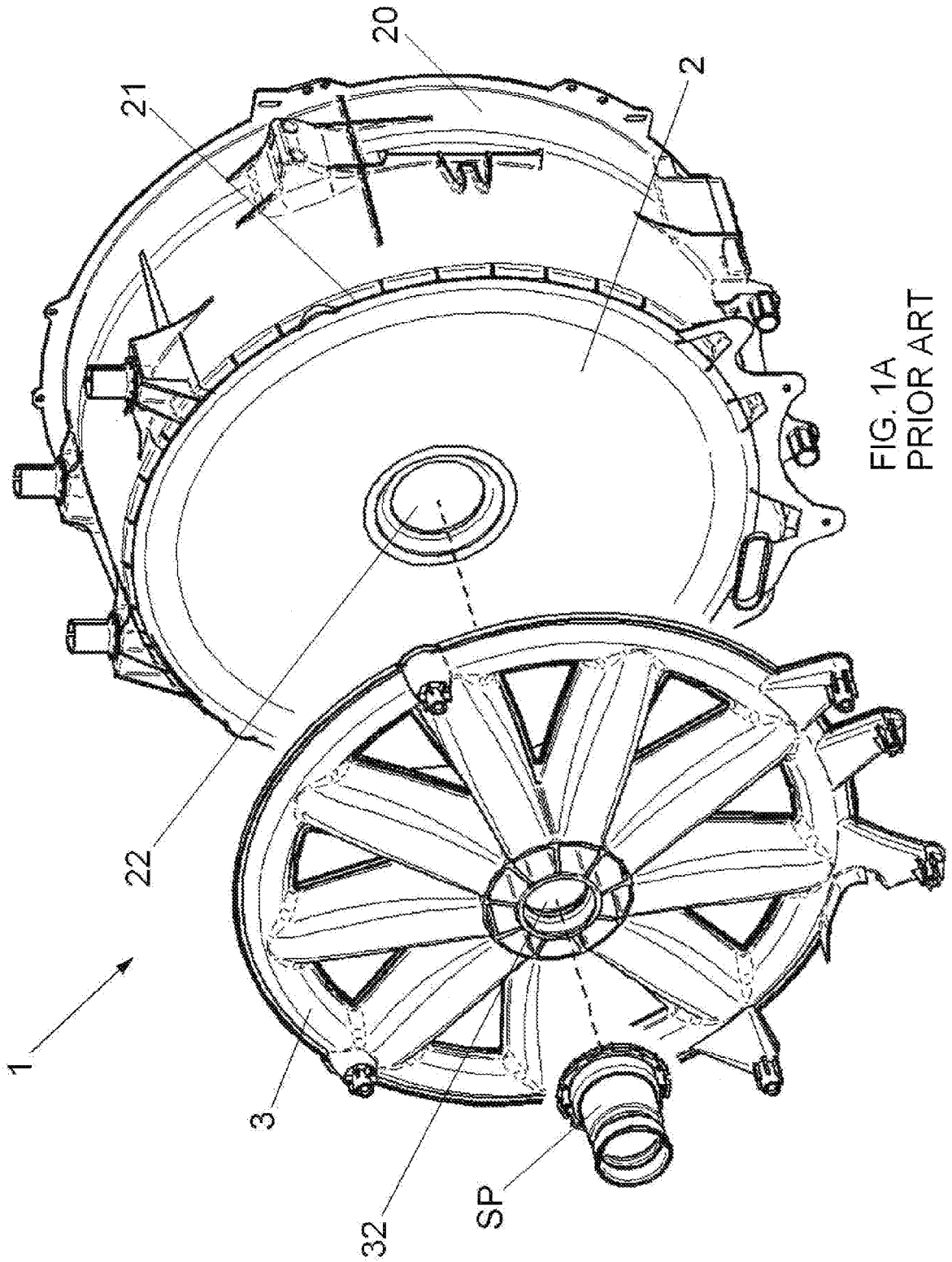


FIG. 1A
PRIOR ART

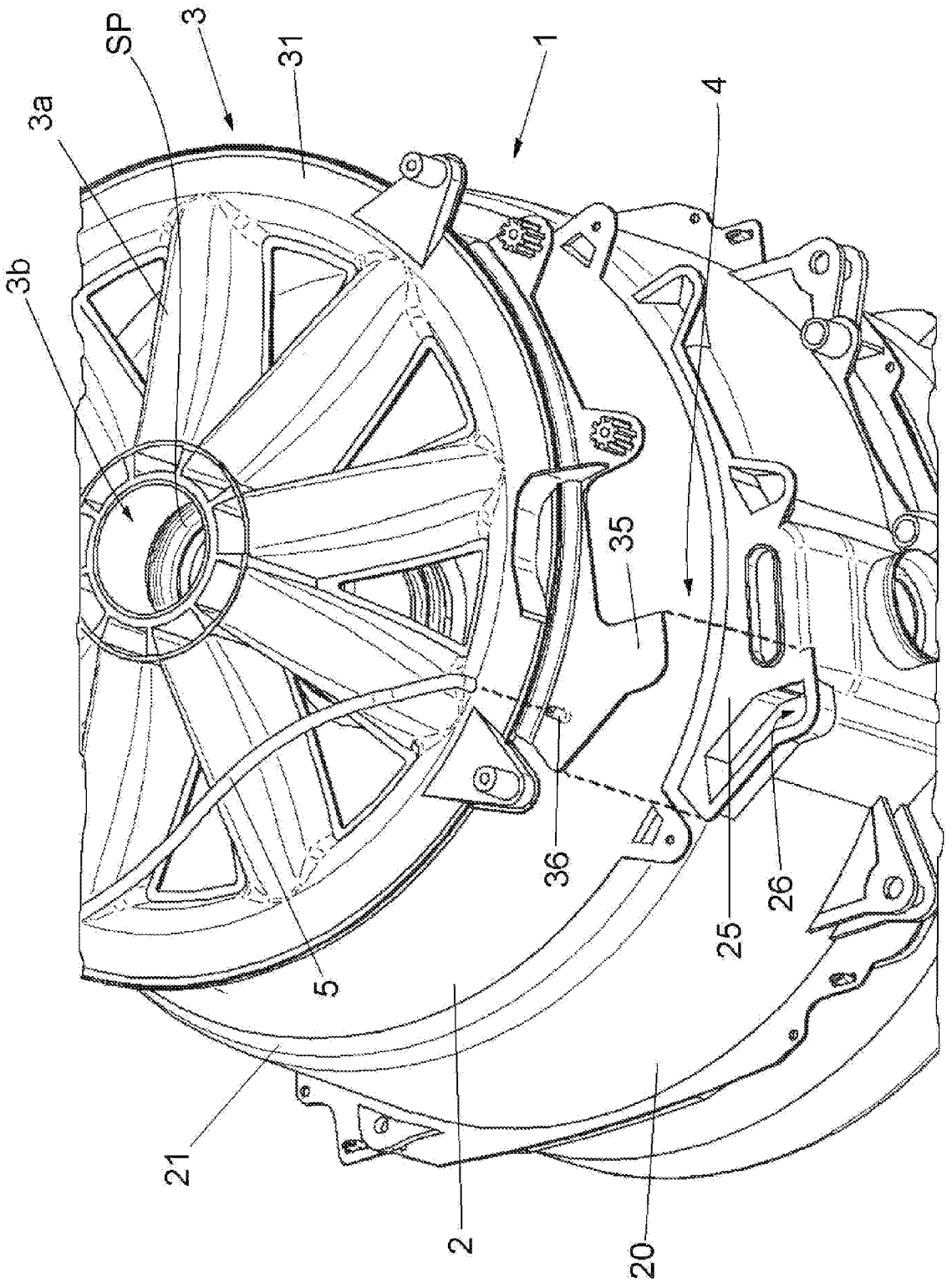


FIG. 2

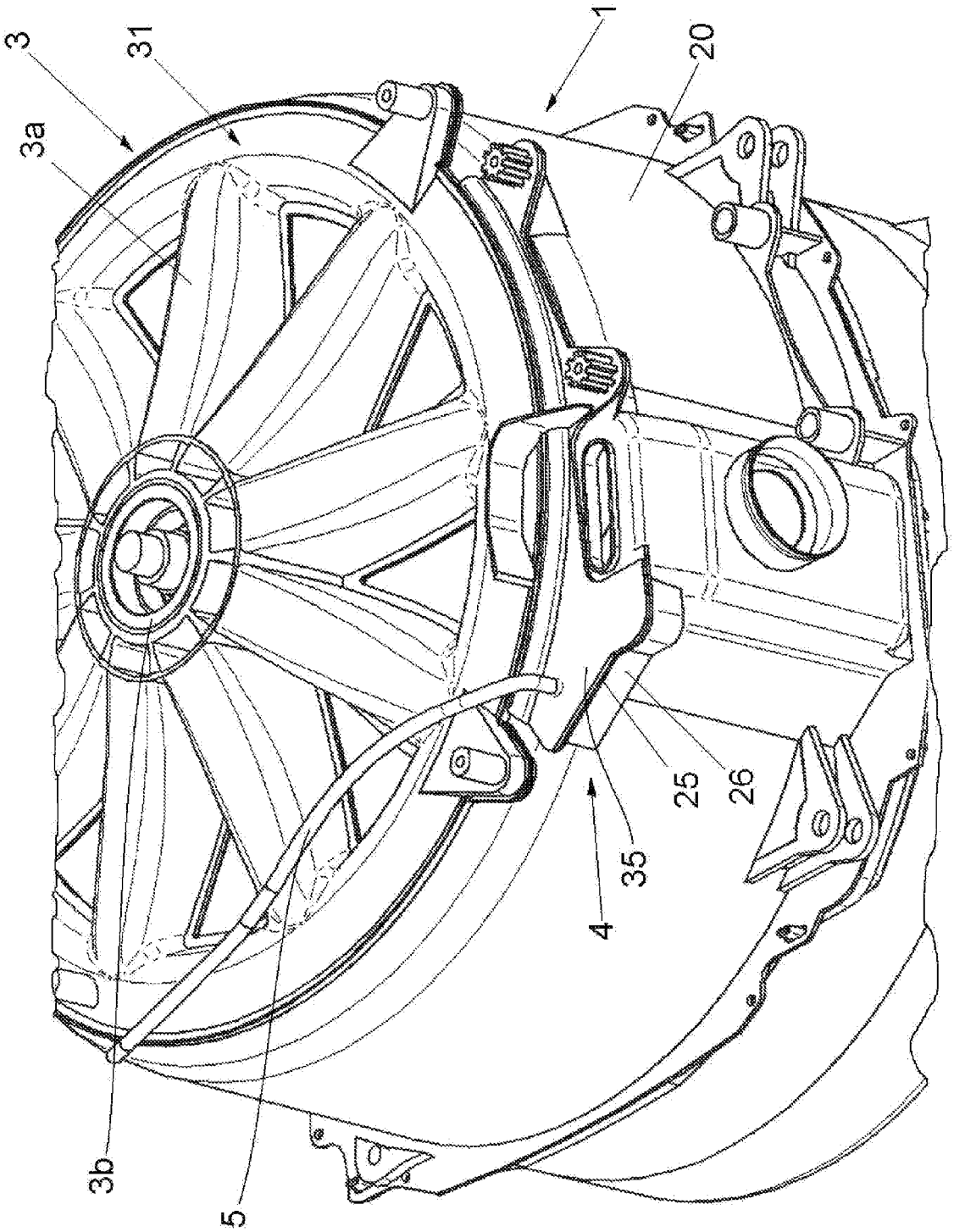


FIG. 3

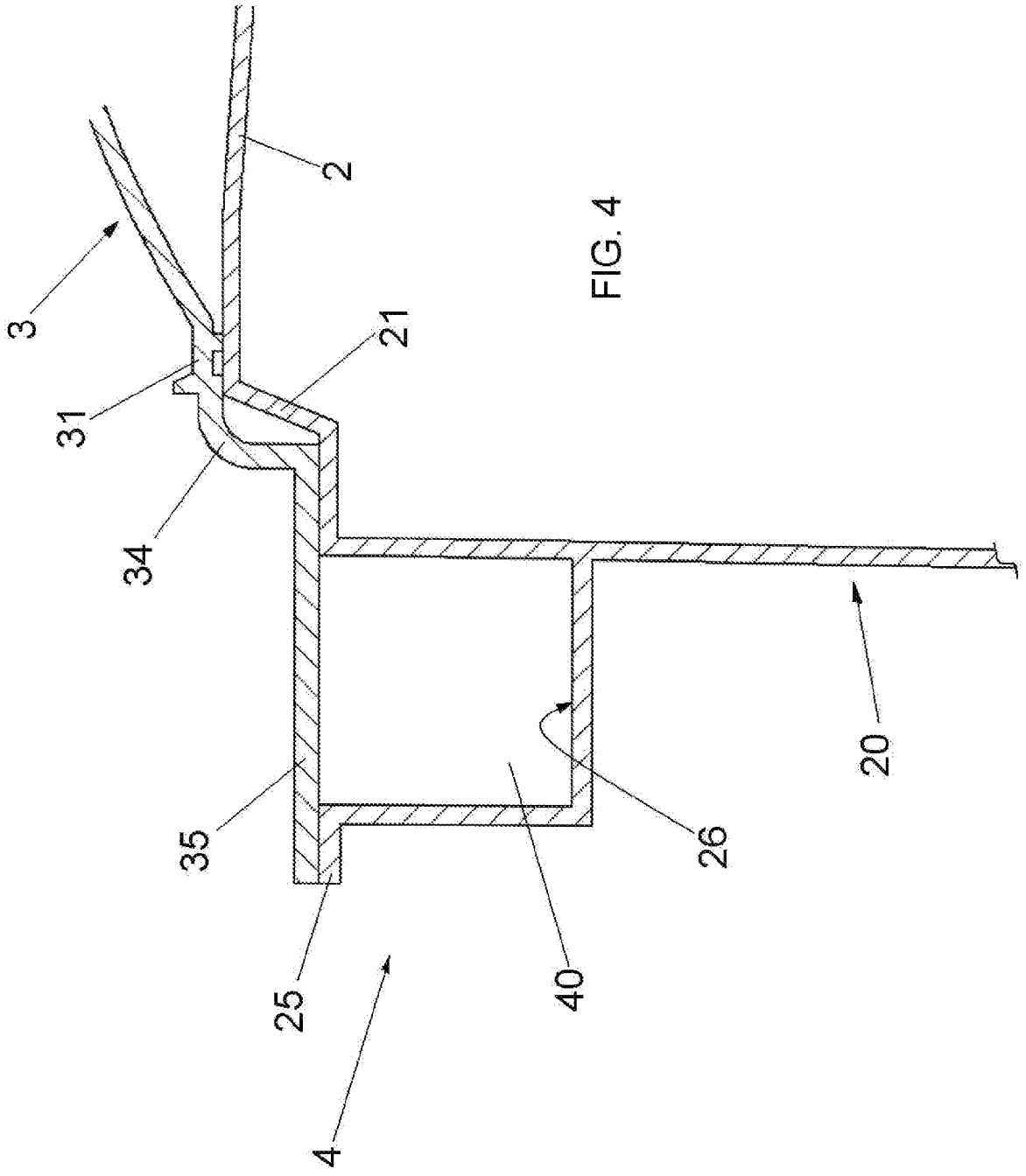


FIG. 4

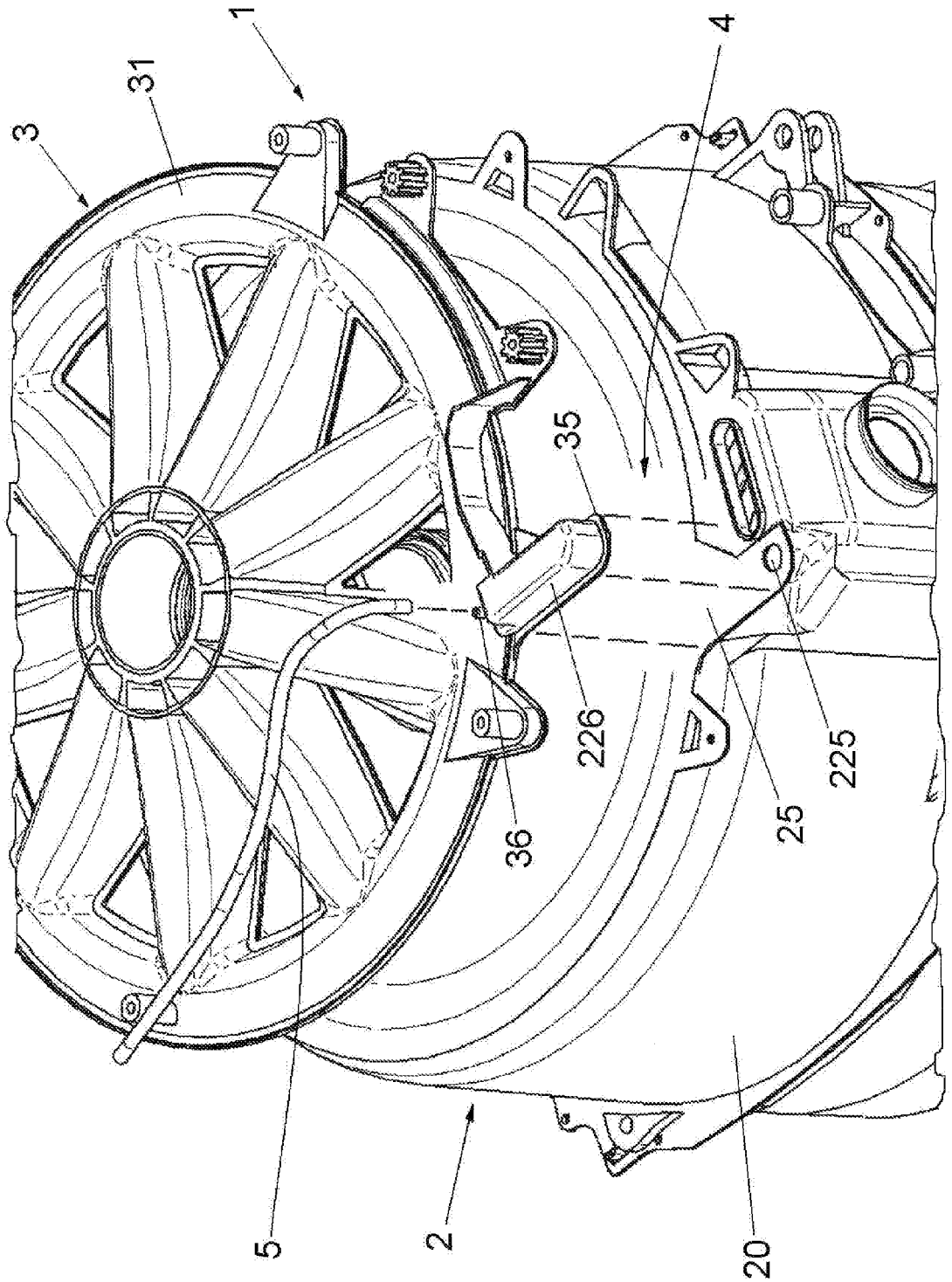


FIG. 5

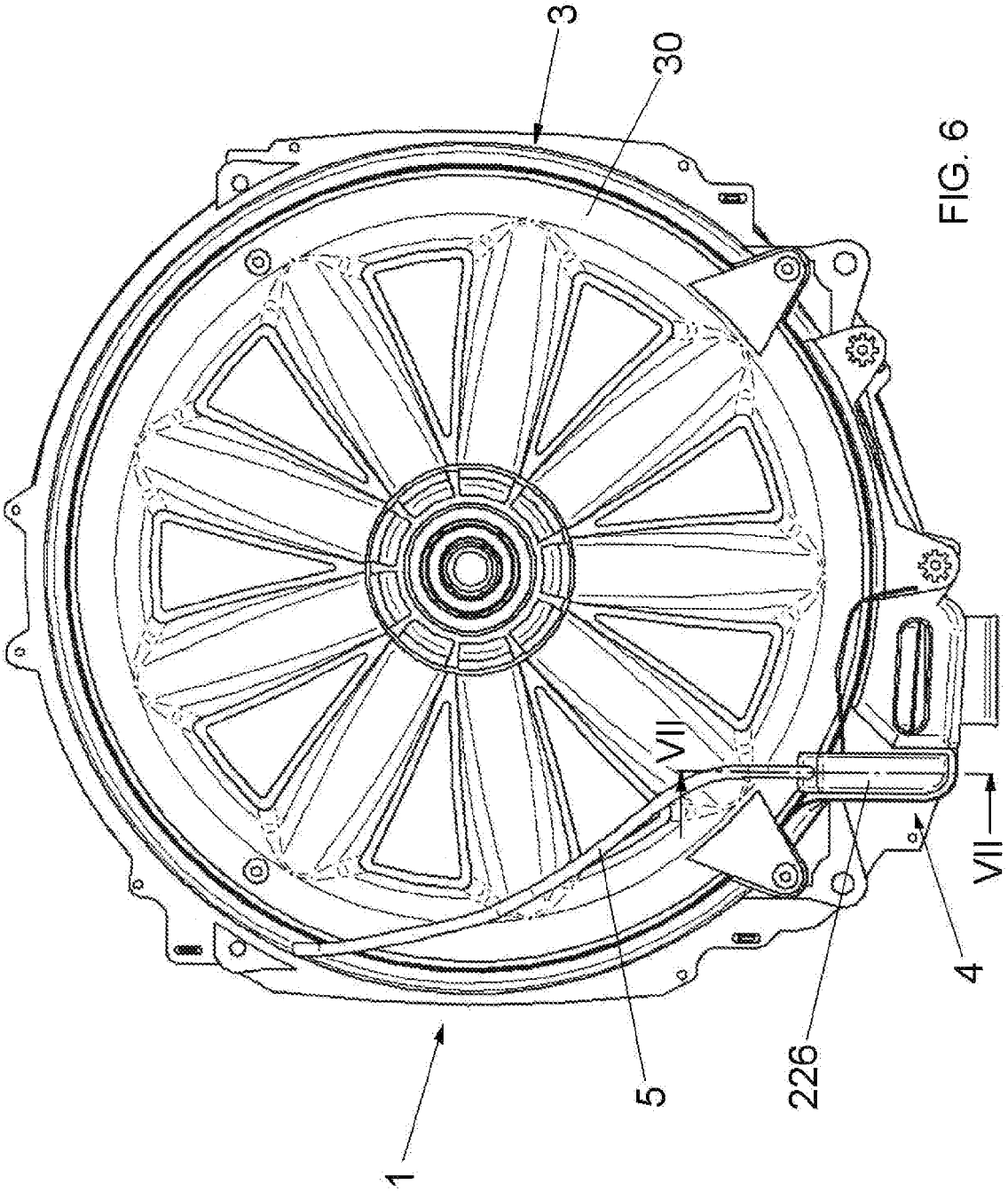


FIG. 6

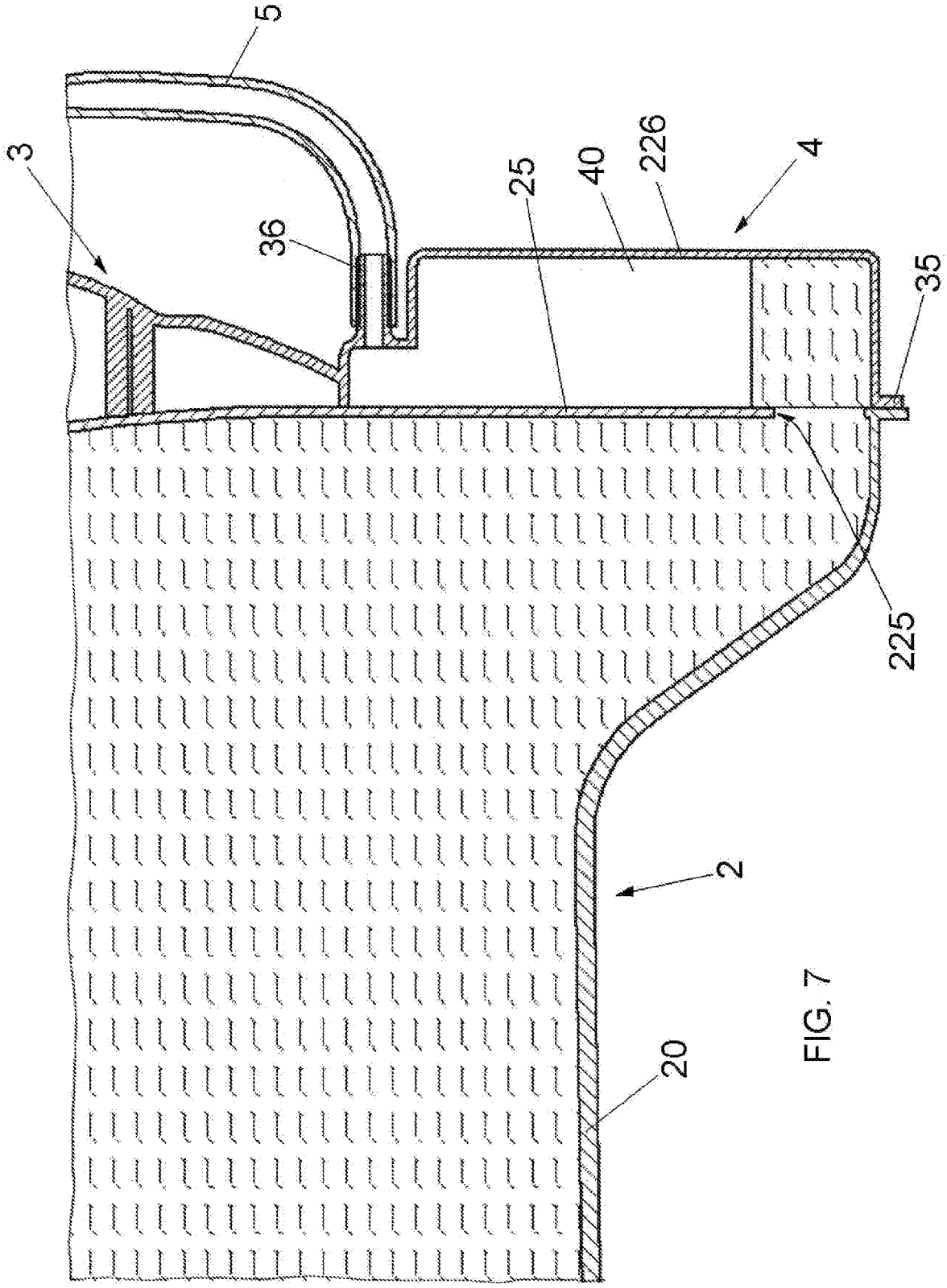


FIG. 7

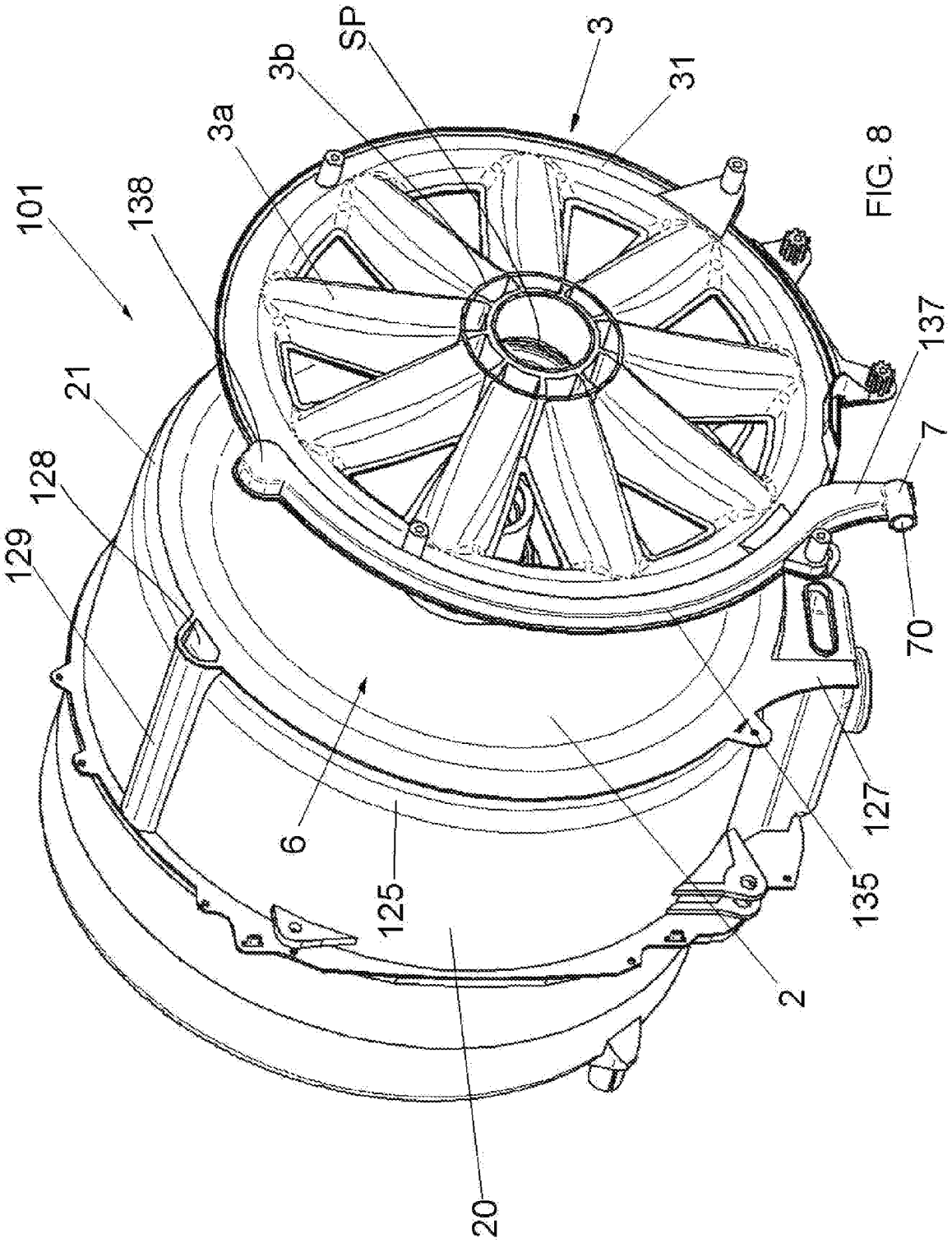


FIG. 8

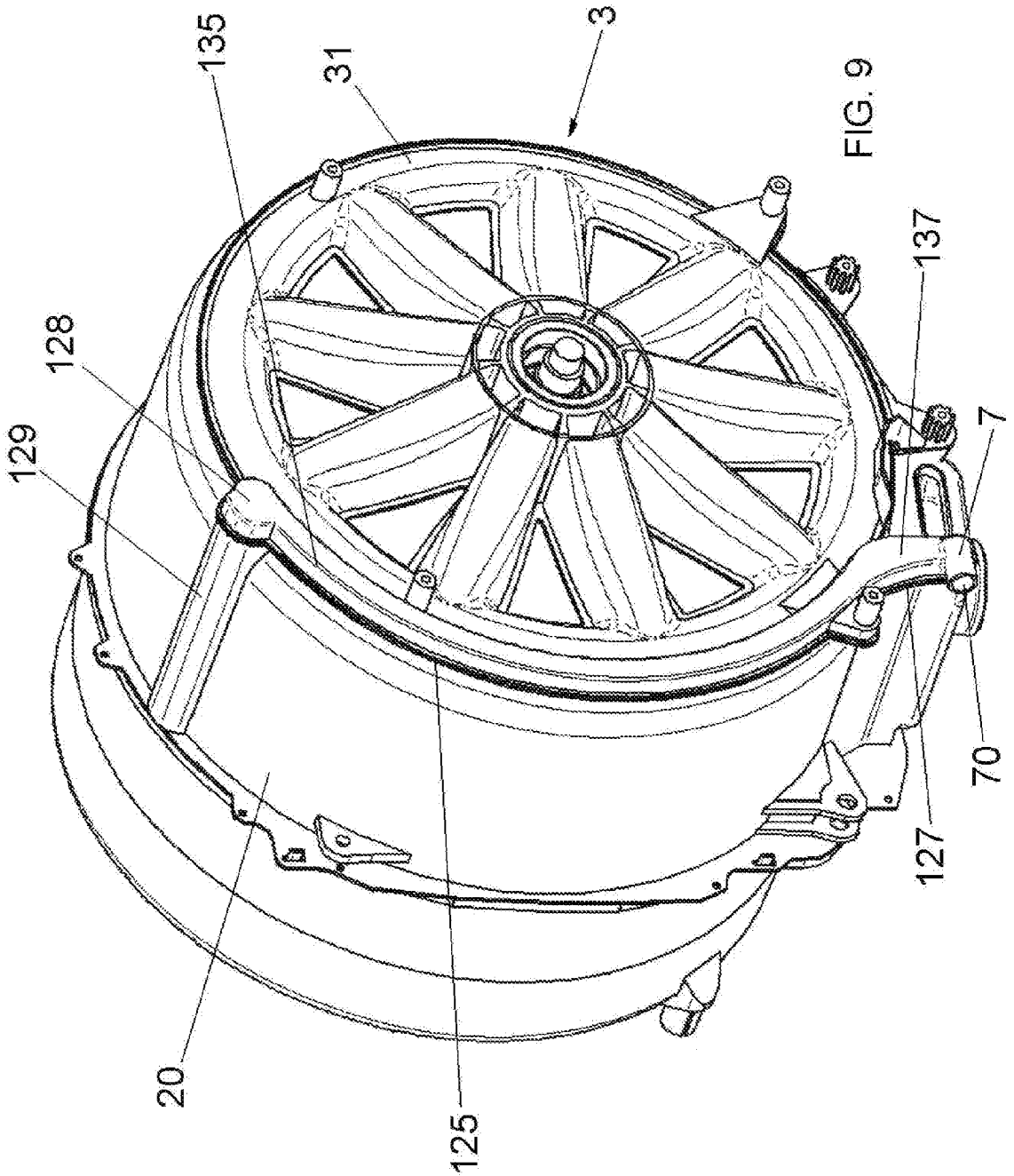


FIG. 9

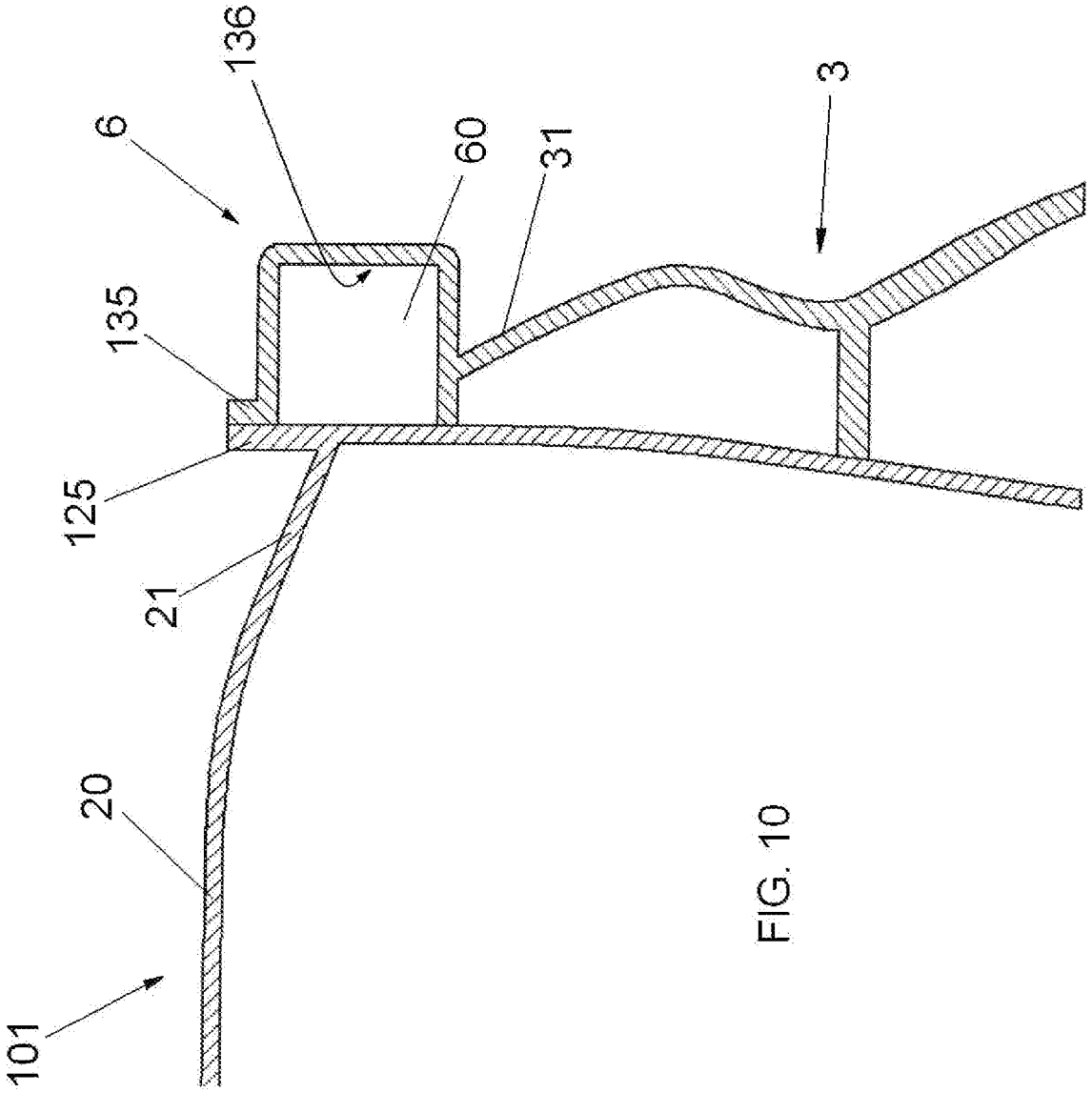


FIG. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 10 15 2286

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	DE 10 2004 057943 B3 (MIELE & CIE [DE]) 8 December 2005 (2005-12-08) * paragraph [0018] - paragraph [0023]; figures 1,2 *	1	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	10 June 2010	Fachin, Fabiano

CATEGORY OF CITED DOCUMENTS

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