

(19)



(11)

EP 2 600 820 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
13.11.2019 Bulletin 2019/46

(51) Int Cl.:
A61H 33/02 ^(2006.01) **B05B 1/04** ^(2006.01)
A61H 33/00 ^(2006.01)

(21) Application number: **11760558.4**

(86) International application number:
PCT/IB2011/053466

(22) Date of filing: **03.08.2011**

(87) International publication number:
WO 2012/017403 (09.02.2012 Gazette 2012/06)

(54) **HYDROMASSAGE TUB**

HYDROMASSAGE-BADEWANNE

BAIGNOIRE D'HYDROMASSAGE

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **03.08.2010 IT BO20100496**

(43) Date of publication of application:
12.06.2013 Bulletin 2013/24

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**EP-A1- 1 586 292 WO-A1-2004/056249
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Description

TECHNICAL FIELD

[0001] The present invention relates to a hydromassage tub.

BACKGROUND ART

[0002] As is known, a hydromassage tub is provided with a basin on the walls of which devices are applied by means of which air/water mixture jets are emitted inside the liquid mass surrounding the user.

[0003] A device for the production of jets in a hydromassage tub usually comprises:

- a water supply pipe;
- an air supply pipe;
- a mixing element for air with water;
- an air/water mixture supply duct towards a diffuser element, in turn, able to convey the air/water mixture itself inside the hydromassage tub; and
- a shutter adapted to close/open the air/water mixture supply duct towards the diffuser element.

[0004] However, the hydromassage tubs provided with current devices for the production of jets lack practicality and convenience.

[0005] In fact, first of all at least part of the fixing means of the device on the tub wall protrudes within the tub wall itself thus setting limits for their positioning in some areas of the basin, particularly those intended for the user back and loins support.

[0006] In addition, on the locking nut of the current mouths are formed zones of stagnation of organic material (particles of soap mixed with fragments of skin, etc.) present in the used water to be removed periodically.

[0007] A hydromassage tub that can be a good starting point for understanding the present invention and discloses the features of the preamble of claim 1 is illustrated in the international patent WO 2004/056249 (KOHLER NZ LTD). In this document, in fact, a hydromassage tub is described having a wall provided with a recess in which a device for the production of water jets is applied. To fix this device to the tub wall the head of the device itself is tightened against the recess wall. However, even if the outlet mouth of the jet in the tub is substantially flush with the internal surface of the tub wall, the head of the device is received within the recess, which itself becomes a receptacle for impurities and encrustations almost impossible to be removed completely.

DISCLOSURE OF INVENTION

[0008] Therefore, the main purpose of the present invention is to create an innovative hydromassage tub provided with a device for the production of jets, which tub is exempt from the drawbacks described above and at

the same time, is easy to maintain and clean especially in correspondence to the jet injection mouths into the mass of water.

[0009] Therefore, according to the present invention a hydromassage tub is provided as claimed in claim 1 or in any of the claims directly or indirectly dependent from claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] For a better understanding of the present invention some preferred embodiments are now described, purely by way of non limitative examples and with reference to the attached drawings, in which (in different scale):

- Figure 1 illustrates (in a relative enlargement) an example not covered by the claims of a type of hydromassage tub;
- Figure 2 shows a view of a portion of the tub illustrated in Figure 1;
- Figure 3 illustrates a rear view of a device used for the production of jets utilized in the tub shown in figures 1, 2;
- Figure 4A shows a longitudinal section of the device shown in Figure 3;
- Figure 4B illustrates an exploded view of the device shown in Figure 3;
- Figures 5A, 5B, 5C, 5D, 5E, 5F show views and sections relative to a diffuser used in the device illustrated in figures 3, 4A, 4B;
- Figures 6A, 6B, 6C, 6D illustrate a diffuser, as shown in Figures 5A, 5B, 5C, 5D, 5E, 5F, combined with a mounting plate;
- Figures 7A, 7B, 7C, 7D, 7E show a side view, a front view and some cross sections of the diffuser shown in Figures 5A, 5B, 5C, 5D, 5E, 5F, 6A, 6B, 6C, 6D, and
- Figure 8 illustrates (with a relative enlargement) an embodiment of a hydromassage tub object of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

[0011] In Figures 1-7, is generically indicated with 100, as a whole, an example of a hydromassage tub provided with at least one device 200 for the production of jets.

[0012] As illustrated in Figure 1, on a wall (WL) of the tub 100 at least a mouth 300 has been obtained.

[0013] The device 200 is illustrated in more detail in Figures 4A, 4B. This device 200 has an axis (X) of a substantially longitudinal symmetry.

[0014] Incidentally in figures 4A and 4B the air and water supply pipes occupy different positions with respect to what is shown, for example, in Figure 3.

[0015] In particular, with reference to Figures 4A, 4B the device 200 comprises a main hollow body 11 hydraulically connected with a water inlet duct 12, and with an

atmospheric air intake duct 13.

[0016] To the internal threaded wall of the main hollow body 11 a threaded cup 14 is screwed provided with through openings 15 arranged on a circumference.

[0017] Inside the threaded cup 14 a rear half-shell 17 is housed upon which, in use, rests the perimeter edge of a front half-shell 18.

[0018] The outer perimeter edges of the two half shells 17, 18 are interference mounted one onto the other and are held inside the threaded cup 14 by screwing a threaded locking ring 19 onto the thread provided within the threaded cup 14.

[0019] In other words, the threaded cup 14 has an external thread, which, in use, is screwed to the internal thread of the hollow body 11, and an internal thread on which is screwed the threaded locking ring 19.

[0020] Tightened between the hollow body 11 and the threaded cup 14 is a fixing plate 20 provided, in turn, with an annular crown edge 21 on which there is a circular breaking notch 22 adapted to accommodate a respective rubber seal 23, a recess 24 and a circular through hole 25.

[0021] In addition, the outer surface of the hollow body 11 is provided with a circular groove 11A adapted for accommodating a rubber seal 26 (see Figure 4B). The annular crown 21 has a series of through holes 21A distributed along a circumference concentric to the circular breaking notch 22. Each through hole 21A, in use, is crossed by a respective fixing screw (not shown) of the device 200 to the wall (WL) of the tub 100 (Figure 4A).

[0022] The rear half shell 17, in turn, has a central through hole 17A surrounded by a raised rim 17B (Figure 4B). Similarly, the front half-shell 18 has a central through hole 18A surrounded by a raised rim 18B (Figure 4A). In use, the raised rim 17B is at least partially within the central through hole 18A.

[0023] The device 200 is provided with a diffuser jet blade element 27. Said diffuser element 27, which is shaped in space, represents an important element which will be better described below. In the present context, the term "shaped in space" is to indicate that the diffuser develops in the three-dimensional space and also has a suitably shaped surface which "accompanies" the outflow of the air/water mixture towards the inside of the tub 100.

[0024] In more detail we can say that the diffuser element 27 comprises a cylindrical part 27A provided with an external thread 27B which, in use, is screwed onto an internal thread of the front half-shell 18. The diffuser element 27 also comprises a spout portion 27C ending with an outlet mouth 27D. Said outlet mouth 27D is coupled, using a special attachment that will be described below, to an opening 28A of a plaque 28.

[0025] At the end of the assembly a mounting plate 30, provided with a slot 30A is glued to the plaque 28 so that said slot 30A coincides with the opening 28A.

[0026] Note therefore, that in use, the outlet mouth 27D, the opening 28A and the slot 30A are arranged in correspondence to each another, and substantially

present the same width.

[0027] Furthermore, inside the diffuser element 27 is a supporting hollow element 31 supported by two spokes 32, 33 fixed to the internal wall of the spout portion 27C of the diffuser element 27.

[0028] The supporting hollow element 31, in turn, has a breaking notch 34 adapted to accommodate a spring 35 which, on one side, rests on a shoulder 36 formed in the breaking notch 34, and on the other side, urges a shutter 37 which, in use, due to the elastic urge of the spring 35, closes the central through hole 18A relative to the front half-shell 18.

[0029] In a further embodiment not shown is envisaged the use of lighting LEDs advantageously, but not necessarily, attached to the translucent annular crown 21. The light filters through cavities (INT), left vacant by mounting the device 200 on the wall (WL) of the tub 100 (Figure 2).

[0030] In use, when the device 200 is operated for the production of jets, the water entering the main hollow body 11 through the tube 12 (arrow (F1)) is mixed with atmospheric air flowing in the duct 13 (arrow (F2)) (Figure 4A).

[0031] In other words, the outside air is sucked through the duct 13 and the through openings 15 due to the water flow in the venturi formed by coupling a terminal portion of the shutter 37 with the central through hole 17A. The mixing of the air with water takes place in a mixing chamber 16 (Figure 4A).

[0032] The mixture of pressurized air/water at this point flows from the mixing chamber 16 to the central through hole 18A where the thrust of the air/water mixture takes place upon the shutter 37 against the elastic force provided by spring 35. The movement according to an arrow (F3) (along the axis (X)) of the shutter 37 implements the opening of the center through hole 18A and allows the flow of the mixture into the diffuser element 27, the slot 30A and the interior of the tub 100.

[0033] When the device 200 is turned off the shutter 37 moves according to an arrow (F4) (along the axis (X)) (Figure 4A)) due to the action of the spring 35 closing the central through hole 18A interrupting, in this way, the flow of the air/water to the spout portion 27C of the diffuser element 27.

[0034] As shown in more detail in Figures 5A, 5B, 5C, 5D, 5F, 6A, 6C, 6D, 7A, 7B, 7C, 7D, the spout portion 27C of the diffuser element is provided, in correspondence to the outlet mouth 27D with four knurled teeth 40.

[0035] The slot 28A, formed on the plaque 28, is surrounded by a frame 45 (Figure 6A) presenting some elastic knurled portions 46, which, in use, are snappingly coupled with the aforementioned four knurled teeth 40 (Figures 6A, 6C, 6D). In this way, as shown in particular in Figure 6C, the fixing of the diffuser element 27 to the plaque 28 is obtained, wherein the axis (X) of the diffuser element 27 is substantially perpendicular to the lying plane of the plaque 28 itself.

[0036] As shown in Figures 7B, 7C, 7D, 7E the area of the outlet mouth 27D (Figure 7B) is equal to that of

each section (SEZ.A-A), (SEZ.B-B), (SEZ.C-C) (Figures 7C, 7D, 7E) taken at different heights of the spout portion 27C of the diffuser element 27. For more clarity the areas we are talking about with reference to Figures 7B, 7C, 7D, 7E have been dashed. The fact of having always equal areas ensures an optimum channeling of air/water mixture inlet flow to the tub 100.

[0037] Moreover, as particularly shown in Figure 4A, the plate 30, and the relative slot 30A, are perfectly flush with an internal surface (ϕ) of the wall (WL). Note that the wall (WL) also presents an outer surface (ψ) with respect to the mass of water contained in the tub 100.

[0038] In other words, all the jet delivery elements and all the elements attaching the device 200 to the wall (WL) of the tub 100 are arranged outside the tub 100 itself, and outside an internal surface (ϕ) of a wall (WL) of the tub 100.

[0039] In other words in the actual tub 100 the outlet mouth 27D of the diffuser element 27 rests on the slot 30A so that the outline of the outlet mouth 27D matches the outline of the slot 30A. In addition, all the jet delivery elements and all the elements attaching the device 200 to the wall (WL) are arranged outside the internal surface (ϕ) of the wall (WL).

[0040] This fact allows to have an internal surface (ϕ) of the wall (WL) that can be perfectly smooth and that can be perfectly and easily cleaned, without having the presence of grooves and/or recesses where a retention of unremovable dirt can occur.

[0041] As illustrated in particular in Figure 5C, preferably, but not necessarily, the outlet mouth 27D of the diffuser element 27 presents a long rectangular section in which the ratio between the length (L) and the thickness (D) of said outlet mouth 27D is between 7 and 12.

[0042] According to an embodiment of the present invention illustrated in Figure 8, concerning a tub 100*, the device 200* does not have the plaque 28 and the plate 30 anymore. Therefore, according to the invention, the outlet mouth 27D* of the diffuser element 27* rests directly on a slot 300 created directly on a wall* (WL*) of the tub 100*.

[0043] Even in the case of this embodiment of Figure 8 all the jet delivery elements and all the elements attaching the device 200* (WL) to the wall are arranged outside the tub 100*, and outside an internal surface (ϕ^*) of the wall (WL*) of the tub 100* itself.

[0044] Furthermore, in a further embodiment, not shown, the outlet mouth has a circular shape.

[0045] It is clear that in all previously described embodiments, the diffusers cannot be oriented in space. Therefore, for obtaining an optimal distribution of the jets in the tub the optimal placement of these jets on the walls of the tub itself must be found by acting on the number of jets.

[0046] The main advantages of the system for the production of jets in a hydromassage tub object of this invention are the following:

- no elements adapted for the creation of the jet and belonging to the device for the formation of the jet protrude into the tub;
- also the elements attaching the device for the formation of the jet are on the outside of an internal surface of the wall of the tub itself; this fact implies that the tub wall is perfectly smooth and may not give rise to unpleasant contact with the user's body; and
- the internal surface of the tub wall is easy to clean because all the inset parts have been eliminated wherein an accumulation of impurities could occur.

Claims

1. A hydromassage tub (100*) provided with jet delivery elements including a device (200*) for the production of an air/water mixture jet, said device (200*) being fixed to a wall (WL*) of said tub (100*) itself; said tub (100*) being provided with an opening formed on the wall (WL*) to which said device (200*) is associated, the device being provided with a diffuser element (27*) ending with an outlet mouth (27D*) of an air/water mixture jet outlet towards the inside the tub (100*) itself;
characterized in that said opening is a slot (300*), wherein said outlet mouth (27D*) is set upon said slot (300*) so that the outline of said outlet mouth (27D*) itself matches the outline of said slot (300*); and said outlet mouth (27D*) of said diffuser element (27*) resting directly on said slot (300*) created directly on said wall (WL*) of said tub (100*);
and in that all jet delivery elements and all elements attaching the device (200*) to the wall (WL*) are arranged outside an internal surface (ϕ^*) of the wall (WL*) itself.
2. The tub (100*), as claimed in Claim 1, **characterized in that** said diffuser element (27*) comprises a cylindrical part (27A) and a spout portion (27C) ending in said outlet mouth (27D*), the area of said outlet mouth (27D*) being substantially equal to the one of each section (SEZ.A-A), (SEZ.B-B), (SEZ.C-C) taken at different heights of said spout portion (27C), to ensure an optimum channeling of the flow of the air/water mixture entering the tub (100*); and **in that** said outlet mouth (27D*) of said diffuser element (27*) has an elongated rectangular section wherein the ratio between its length (L) and its thickness (D) is comprised between 7 and 12.
3. The tub (100*), as claimed in Claim 1, **characterized in that** said outlet mouth (27D*) of said diffuser element (27*) has a circular shape.

Patentansprüche

1. Hydromassagewanne (100*), die mit Strahlabgabeelementen versehen ist, die eine Vorrichtung (200*) zur Erzeugung eines Luft/Wassergemisch-Strahls aufweisen, wobei die Vorrichtung (200*) an einer Wand (WL*) der Wanne (100*) selbst befestigt ist; wobei die Wanne (100*) mit einer Öffnung versehen ist, die an der Wand (WL*) ausgebildet ist, mit der die Vorrichtung (200*) assoziiert ist, wobei die Vorrichtung mit einem Diffusorelement (27*) versehen ist, das mit einer Auslassöffnung (27D*) eines Luft/Wassergemisch-Strahlausschlusses zur Innenseite der Wanne (100*) selbst endet;
dadurch gekennzeichnet, dass die Öffnung ein Schlitz (300*) ist, wobei die Auslassöffnung (27D*) auf den Schlitz (300*) so eingestellt ist, dass die Kontur der Auslassöffnung (27D*) selbst mit der Kontur des Schlitzes (300*) übereinstimmt; und
 die Auslassöffnung (27D*) des Diffusorelements (27*) direkt an dem Schlitz (300*) anliegt, der direkt an der Wand (WL*) der Wanne (100*) ausgebildet ist;
 und dass alle Strahlabgabeelemente und alle Elemente, die die Vorrichtung (200*) an der Wand (WL*) befestigen, außerhalb einer Innenfläche (φ^*) der Wand (WL*) selbst angeordnet sind.
2. Die Wanne (100*), nach Anspruch 1, **dadurch gekennzeichnet, dass** das Diffusorelement (27*) einen zylindrischen Teil (27A) und einen Mündungsabschnitt (27C) aufweist, der in der Auslassöffnung (27D*) endet, wobei die Fläche der Auslassöffnung (27D*) im Wesentlichen gleich der Fläche jedes Schnitts (SEZ. A-A), (SEZ. B-B), (SEZ. C-C) ist, der in unterschiedlichen Höhen des Mündungsabschnitts (27C) genommen wird, um eine optimale Kanalisierung des Stroms des Luft/Wassergemisches in die Wanne (100*) zu gewährleisten; und dadurch, dass die Auslassöffnung (27D*) des Diffusorelements (27*) einen länglichen rechteckigen Querschnitt aufweist, wobei das Verhältnis zwischen seiner Länge (L) und seiner Breite (D) zwischen 7 und 12 liegt.
3. Die Wanne (100*), nach Anspruch 1, **dadurch gekennzeichnet, dass** die Auslassöffnung (27D*) des Diffusorelements (27*) eine kreisförmige Form aufweist.

Revendications

1. Baignoire à hydromassage (100*) pourvue d'éléments de distribution de jet comprenant un dispositif (200*) pour la production d'un jet d'un mélange air/eau, ledit dispositif (200*) étant fixé à une paroi (WL*) de ladite baignoire (100*) ;

ladite baignoire (100*) étant pourvue d'une ouverture formée sur la paroi (WL*) à laquelle est associé ledit dispositif (200*),

le dispositif étant pourvu d'un élément de diffusion (27*) se terminant avec un bec de sortie (27D) d'une sortie de jet d'un mélange air/eau vers l'intérieur de la baignoire (100*) même ;

caractérisée en ce que

ladite ouverture est une fente (300*), dans laquelle ledit bec de sortie (27D*) est établi sur ladite fente (300*) de telle sorte que le contour dudit bec de sortie (27D*) même corresponde au contour de ladite fente (300*) ; et ledit bec de sortie (27D*) dudit élément de diffusion (27*) repose directement sur ladite fente (300*) créée directement sur ladite paroi (WL*) de ladite baignoire (100*) ;

et en ce que l'ensemble des éléments de distribution de jet et l'ensemble des éléments fixant le dispositif (200*) à la paroi (WL*) sont disposés en dehors d'une surface interne (φ^*) de la paroi (WL*) même.

2. Baignoire (100*) selon la revendication 1, **caractérisée en ce que** ledit élément de diffusion (27*) comprend une partie cylindrique (27A) et une partie d'orifice (27C) se terminant dans ledit bec de sortie (27D*), l'aire dudit bec de sortie (27D*) étant sensiblement égale à une aire de chaque section (SEZ.A-A), (SEZ.B-B), (SEZ.C-C) prise à des hauteurs différentes de ladite partie d'orifice (27C), afin d'assurer une canalisation optimale du flux de mélange air/eau entrant dans la baignoire (100*) ; et **en ce que** ledit bec de sortie (27D*) dudit élément de diffusion (27*) a une section rectangulaire allongée dans laquelle le rapport entre sa longueur (L) et son épaisseur (D) est compris entre 7 et 12.
3. Baignoire (100*) selon la revendication 1, **caractérisée en ce que** ledit bec de sortie (27D*) dudit élément de diffusion (27*) a une forme circulaire.

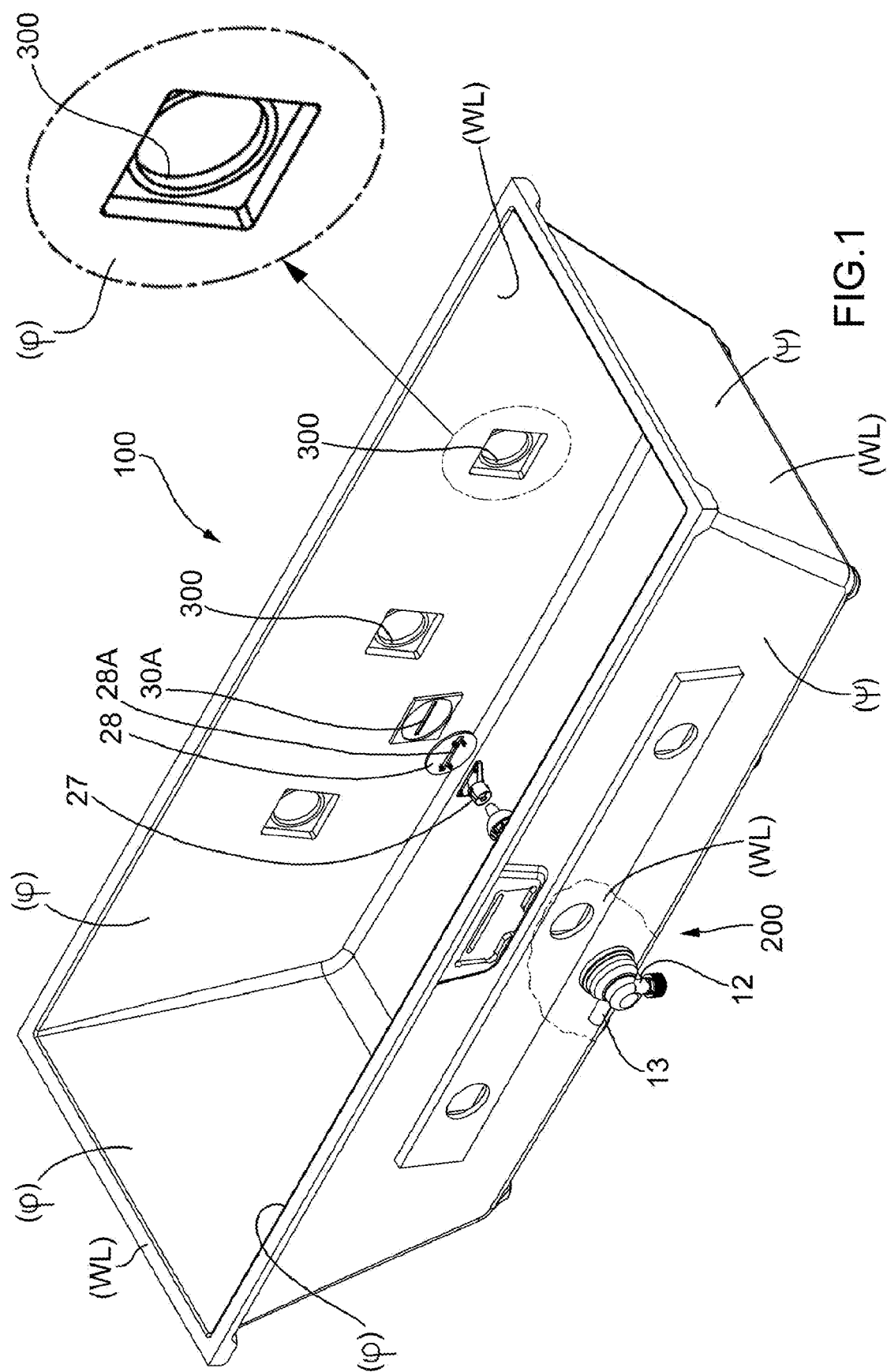


FIG. 1

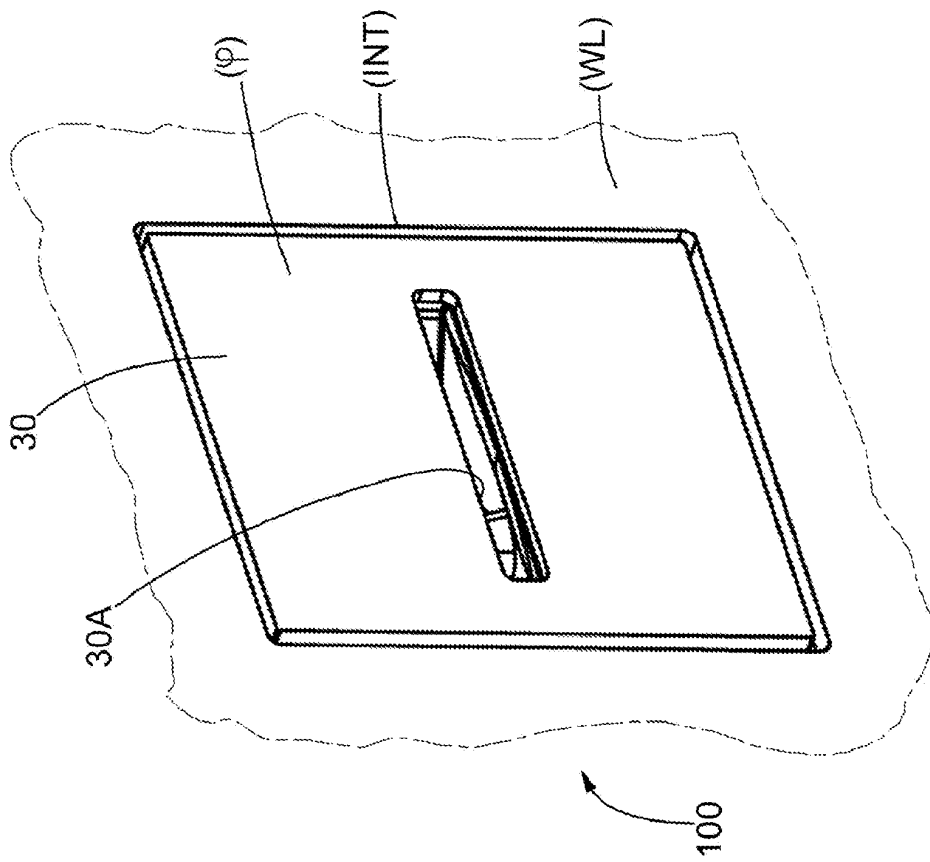


FIG. 2

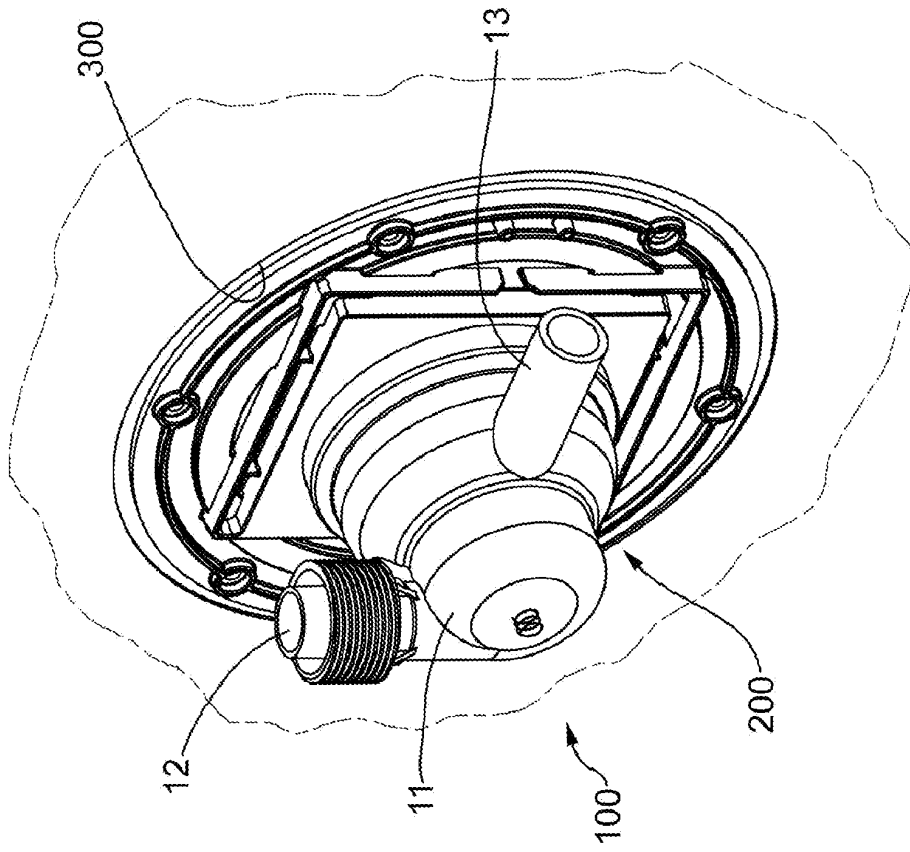


FIG. 3

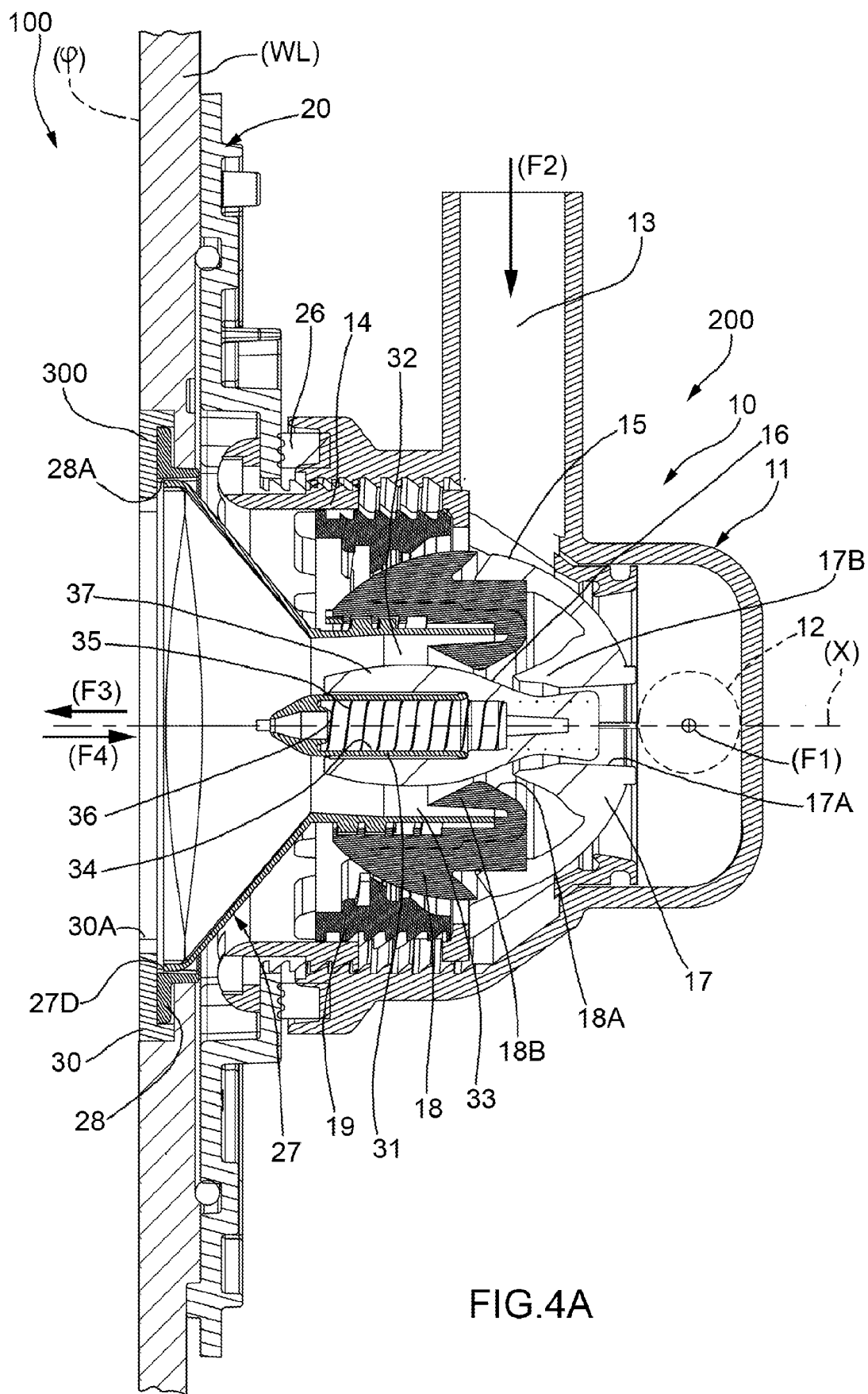


FIG.4A

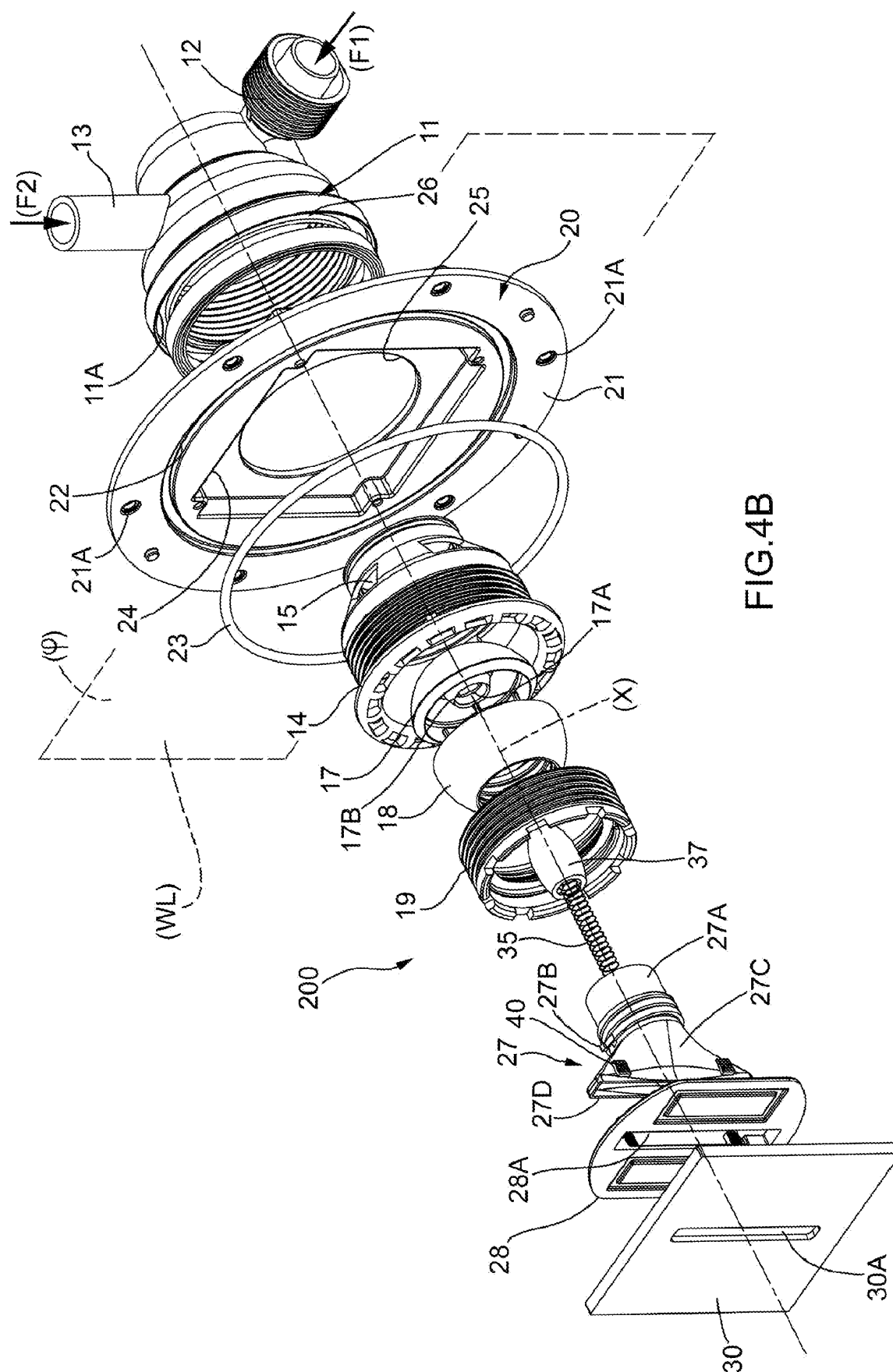


FIG. 4B

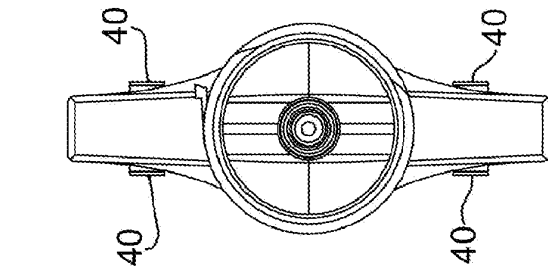


FIG. 5D

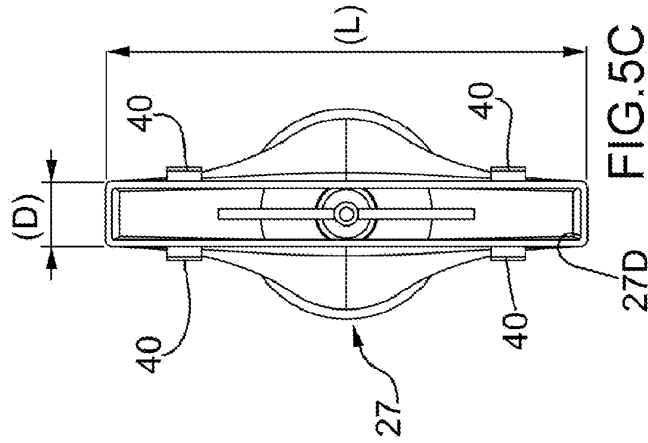


FIG. 5C

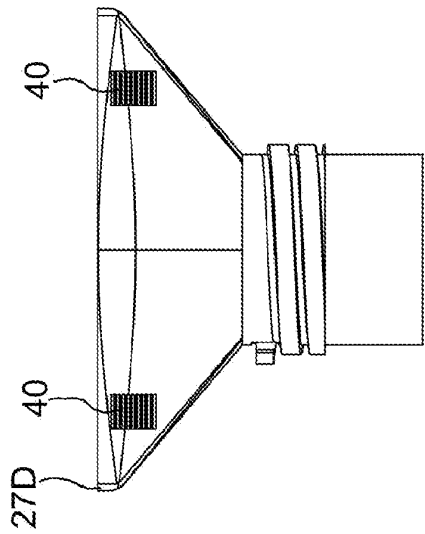


FIG. 5A

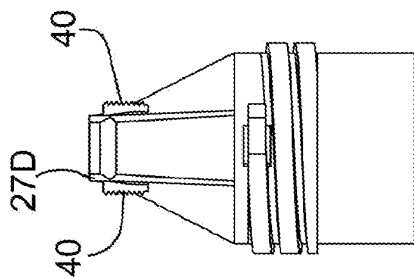


FIG. 5B

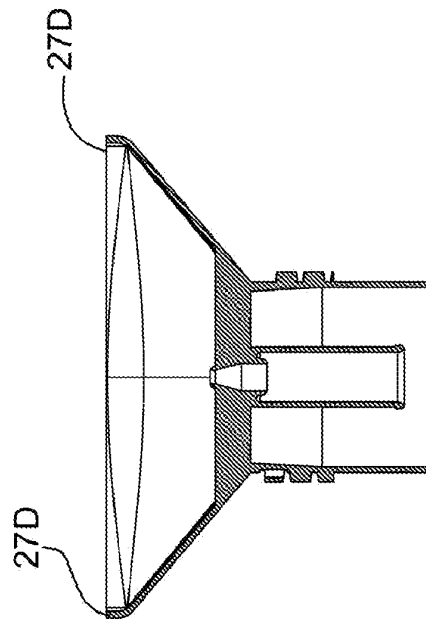


FIG. 5E

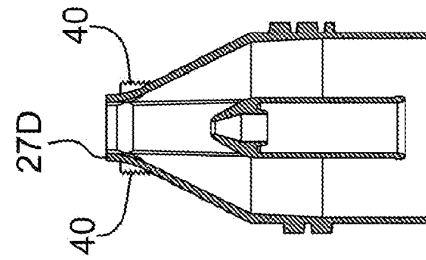


FIG. 5F

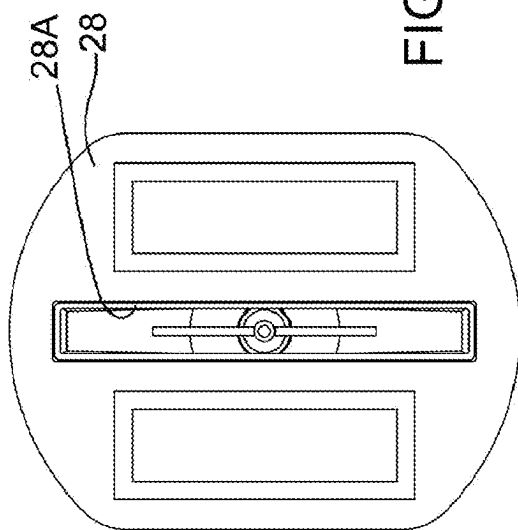


FIG. 6B

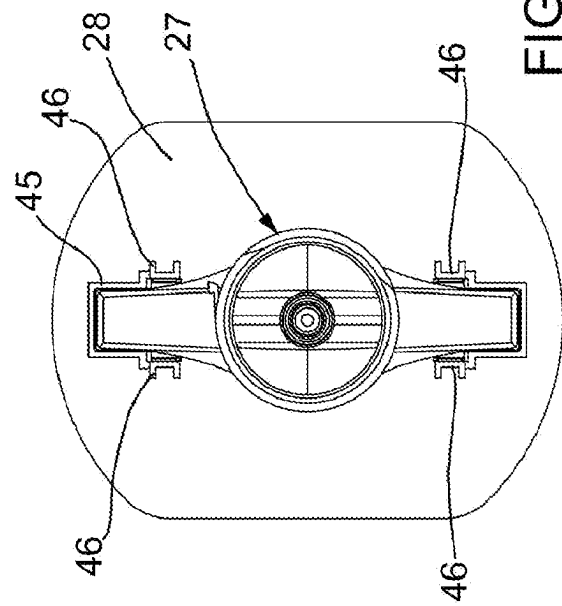


FIG. 6A

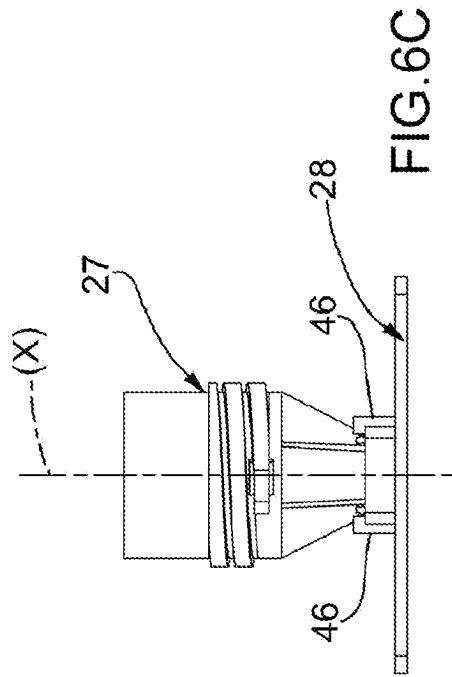


FIG. 6C

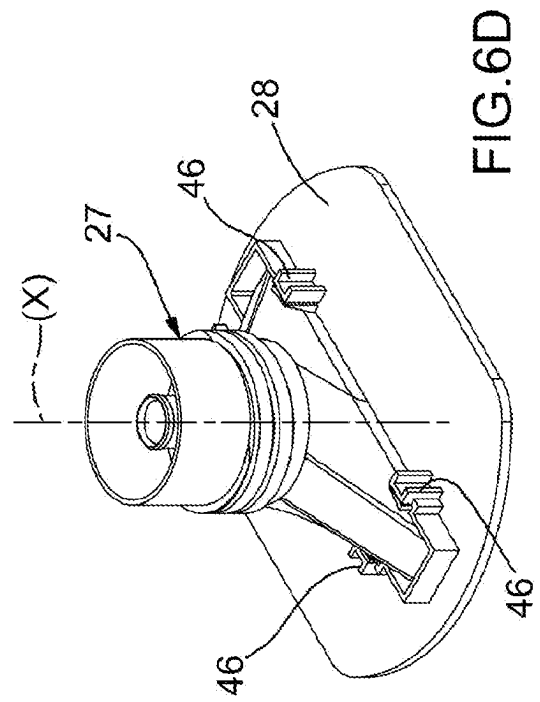
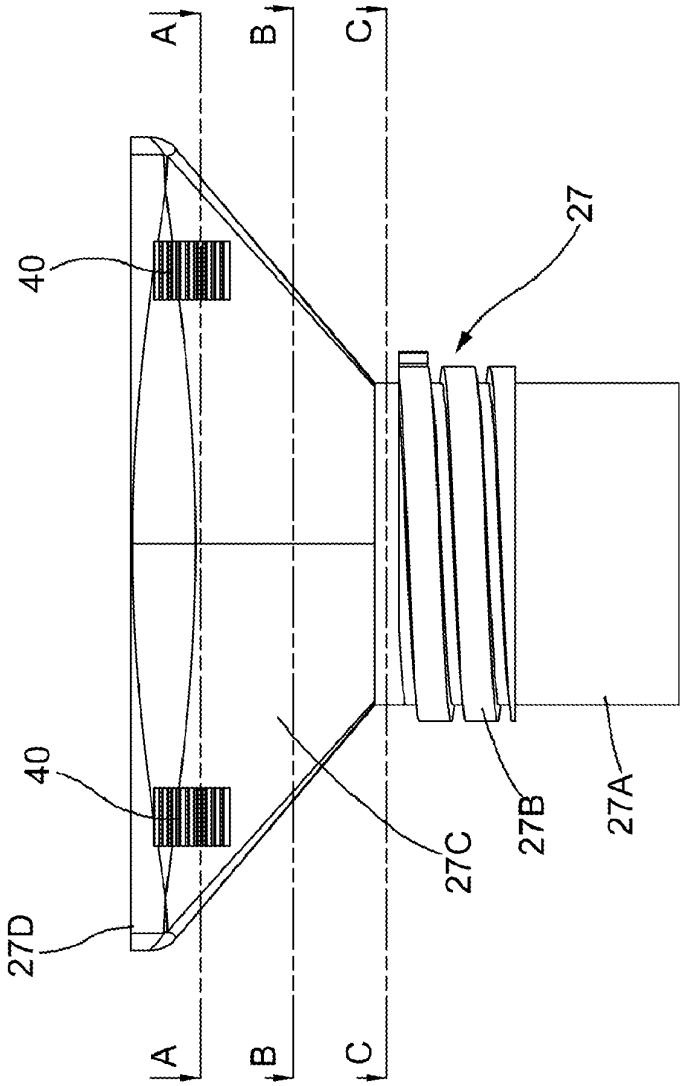
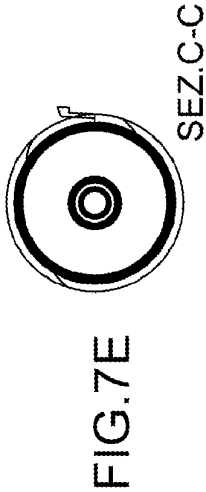
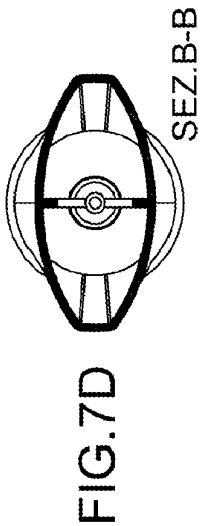
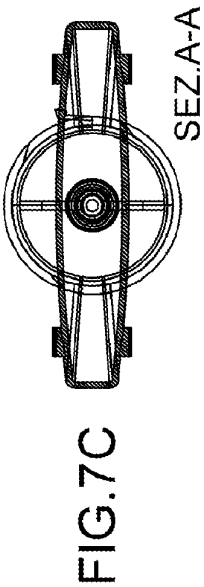
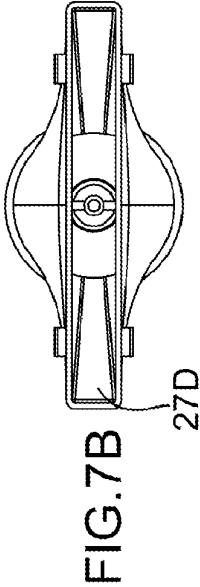
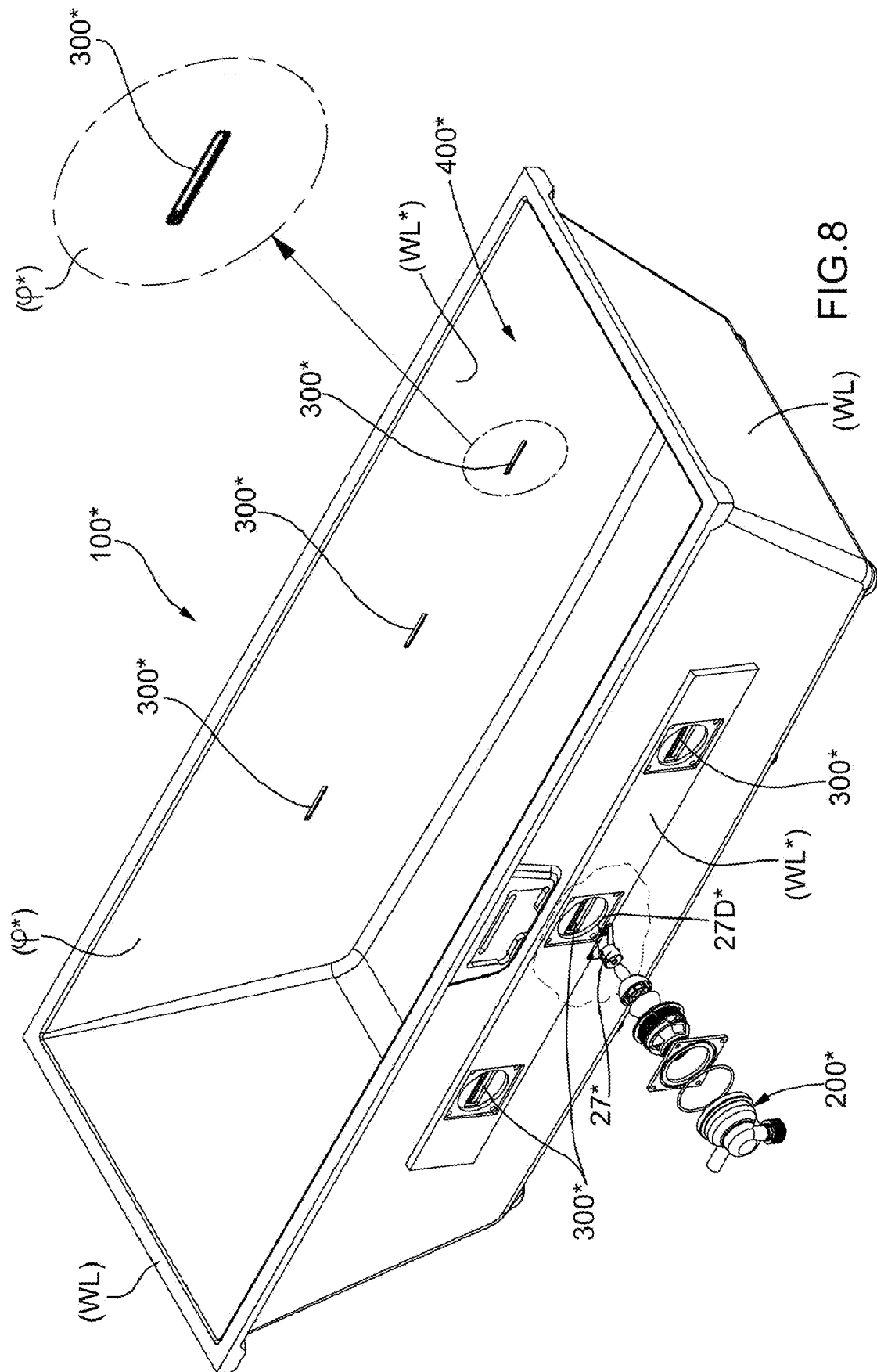


FIG. 6D





REFERENCES CITED IN THE DESCRIPTION

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