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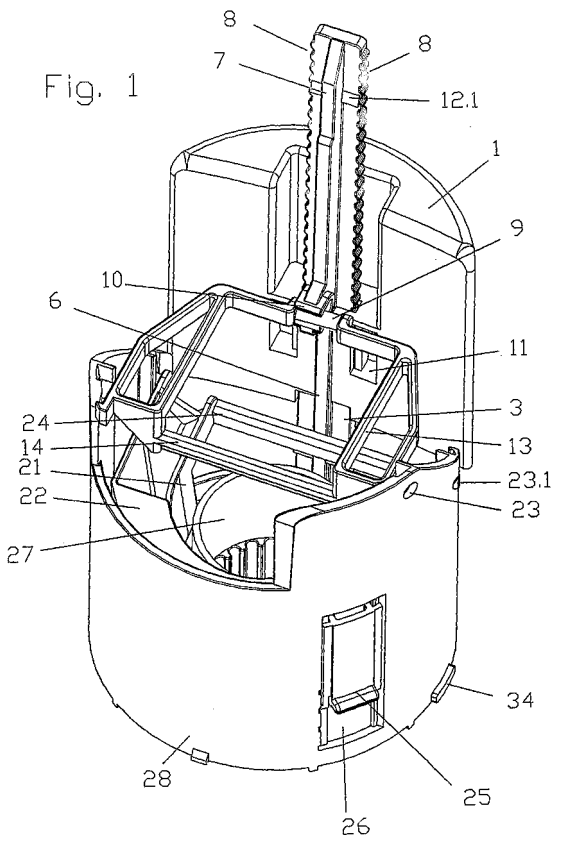
Remarks:
The claims as amended under Art. 19 PCT are disregarded for the European application (Rule 49.5 (c-bis) PCT).

(54) MECHANISM FOR FULL OR SELECTIVE FLUSHING OF TOILET TANKS

(57) The invention relates to a mechanism for the full or selective flushing of toilet tanks. The invention consists of a mechanism support comprising tilting elements which support floats, namely an outer float and an inner float, such that said floats co-operate to produce a full or selective flush according to the pressure exerted on the overflow tube. The outer float is connected to the tilting element by means of a system with vertical adjustment, such that said float can be moved vertically, thereby adjusting the quantity of water flushed during a partial flush. The invention can be used in the production of flush systems for toilets.

Fig. 1



EP 1 650 366 A1

Description

[0001] Mechanism for full or selective flushing in toilet cisterns.

[0002] The technical sector involved in this invention is that of cistern flushing mechanisms, especially for toilet cisterns.

[0003] Statement of the Prior State of the Art. ES P9800161/2 and ES P2000002034 have the object of selective cistern flushing, in order to enable appropriate and rational consumption of water for cleaning waste, both held by the same person as this present application.

[0004] Flushing mechanisms activated to cause flushing are also known, as are systems for double flushing. Certain items of this sort are known on the market with a double cistern, one larger and one smaller, which selectively discharge one amount of water or the other. The applicant for this patent also holds ES P9302624 for a flushing mechanism for cisterns with flushing interruption, formed of an assembly fitted with a dual valve with arms which interrupt the flush, when applied on the flushing mechanism again.

[0005] ES P9601407 for first certificate of addition to main patent P9302624 consisting mainly of an improvement to the hood fitted with delay valves.

[0006] ES P9602140 for a second certificate of addition to the main patent P9302624 consisting in an assembly joined to the over- hood fitted with annular type delay valves around the overflow pipe and enclosed in a space that has an access formed by a fine oblique pipe for evacuation from this space.

[0007] The object of this invention is the arrangement of an assembly which, though stemming directly from the previous ones, has a new arrangement so as to allow simple regulation of the discharge level of the partial flush. The mechanism thus simply adapts to any cistern structure, and bearing in mind the variety of cistern designs, as regards size, heights and unevenness of the walls and thus of the volume of each section at different levels of the cistern, enables the amount of liquid discharged on each occasion to be directly adjusted.

[0008] In order to make the following explanation clearer, nine sheets of drawings are enclosed representing the essence of this invention in nine figures.

[0009] Figure 1 shows a perspective view of the support for the mechanisms and the regulation rod with its float.

[0010] Figure 2 shows a perspective view of the mechanism support and the regulation rod with its float, in an exploded view.

[0011] Figure 3 shows an external view of the full flushing mechanism in perspective.

[0012] Figure 4 shows a view of the mechanism support assembly and regulation rod of the external float.

[0013] Figure 5 shows a joint view of the external float and the regulation rod.

[0014] Figure 6 shows an exploded view of the rod and external float, with the upper swivel, in exploded view.

[0015] Figure 7 shows a plan view of the external float.

[0016] Figure 8 shows a sectional perspective view of the hood and mechanism support.

[0017] Figure 9 shows an exploded view of the hood and mechanism support without the mechanisms.

[0018] In these figures the following numbers represent the items beside them:

1 the upper float
2 the regulation rod
3 the lower recess made in the float
4 the resilient securing pins of the float 1 with the regulation rod 2
5 the passage for regulation rod 2 in float 1
6 the slot of float 1 for the passage of the central portion projecting from the regulation rod
7 the central portion projecting from the regulation rod 2
8 the rack, preferably located on both sides of the central portion 7
9 the part of the swivel 13 corresponding to the resilient mouth 10
10 the resilient mouth of the rod 2
11 the windows made in both sides of the slot 6
12 the lower limiting stops of the float 1 in respect of the regulation rod 2.
12.1 the upper limiting stops of the float 1 in respect of the regulation rod 2.
13 the swivel joined to the partial flush float
14 the crosspiece for temporary retention of the drainage pipe of the partial flush float
16 the recess made in the top corresponding to the flange 17 of the float
17 the flange for guiding the regulation rod 2 set in the top of the hood
18 the bottom end of the regulation rod 2
19 the recess made in the hood for lower arrangement of the end of the rod 18
20 the hood
21 the internal swivel of the partial flush
22 the lower float
23 spindle of the swivel of the partial flush float
23.1 spindle of the swivel of the full flush float
24 the crosspiece of the lower float for full flushing
25 the window closing overlap made in window 26
26 the window for delayed outlet of the water flow from the inside of the hood
27 the passage of the overflow pipe
28 the mechanism support
29 the window in the hood for passage of connection 9 and 10 between the outer float and the inner mechanism
30 the slot in the body of the hood coinciding with the central portion 7 of the rod 2.
31 the flanges of the support 28 which sustain the mechanisms of the floats
32 the overflow pipe
33 the interlocking slots in the base of the hood 20

with the mechanism support 28.

34 the pins for interlocking the mechanism support 28 corresponding to the slots 33 in the hood.

Explanation of one form of embodiment.

[0019] The invention described is of the sort that form a flushing mechanism whose operating characteristic is that the flushing is performed partially or fully, and that the action determining the type of flushing consists of the greater or lesser pressure with which a button applying pressure to the overflow pipe is pressed.

[0020] The internal structure of the flushing mechanism is essentially formed of a hood which sustains two floats, 1 and 22, in such a way that these floats are connected to swivels 13 and 21 which have bars 14, 24 for interlocking with part of the overflow pipe so that this pipe, which is joined to the sealing rubber, is freed when the corresponding float 1 or 22 loses floatation through the level in the cistern having dropped.

[0021] However the earlier version did not allow regulation of the flushing level, and consequently of the flushing volume for partial discharge.

[0022] The regulation of the partial flush is enabled by the arrangement of a hood 20 which encloses a set of mechanisms located between this and a mechanism support 28 which is housed by said hood 20. This mechanism support includes the arrangement of the swivels 13 and 21 in the internal part of the hood. In this internal part of the hood there is a lower float 22 for full discharge. It also includes the arrangement of the two swivels 13 and 21. Nevertheless the float connected with the upper swivel 13, determining partial discharge, is located on the outside, joined with a system for height regulation in respect of a rod 2 for regulation which is connected by a resilient coupling 9 and 10 to the upper swivel 13.

[0023] The height regulation of the rod 2 takes place through the correspondence between pins 4 located in the interior or passage 5 of the external float 1 which has a longitudinal slot 6, corresponding to the shape of the rod 2 in which a prominent part 7 is housed in the longitudinal slot 6 and has one or more racks 8 set in said rod, so that in cooperation with the pins, the interlocking of the external float 1 is determined in any of the possible positions depending on the length of the rod 2 and on the space available outside the flushing mechanism, according to Figure 2, so that said external float 1 has a sphere of movement which extends along the top through the correspondence of the recess 16 and the flange 17 which connects the rod 2 to the hood 20.

[0024] The hood 20 has a window 29 through which the rod 2 is inserted into the swivel 13 by means of the resilient coupling 9 and 10 already described.

[0025] The mechanism support 28 is formed of an assembly which has a window 26 made in it which has a closing overlap 25 which generates a delay in the outlet of the flow of water through the inside of the hood, so that for full flushing it makes the sealing rubber descend some time after the level of water drops, which favours this delay generating a discharge of the full contents of the cistern.

[0026] The external hollows 19 and the one made in the flange 17 are vertically aligned, so that the rod 2 can be installed vertically in the external part of the hood 20.

[0027] The flushing mechanism which constitutes this invention is thus made up of:

- A support body 28 for the mechanisms connected to the floats,
- An internal float 22,
- An external float 1,
- A device for vertical regulation of said float
- Means for guiding and interlocking the float in vertical regulation having a vertical recess in the hood 20 or forming a hollow corresponding to the external float 1 which is set in the outside of said hood in whose outer wall it has a guide in flange 17 corresponding to a rod-guide 2, so that this is able to sustain the float 1 outside the hood and backing onto to this, which can adopt any vertical position along said vertical recess, through the interlocking to the rod-guide 2 connected to the float by means of an adjustable coupling.

[0028] The float 1 has: an upper recess 16, a lower recess 3, an open slot 6, a passage 5 for a central part 7 projecting from the rod 2 and pins 4 in correspondence with teeth 8 of the rod 2; the sliding coupling which connects the rod-guide 2 and the float 1 consists of a slot 6 and a passage 5 made in the body of the float. The rod 2 has at least one rack 8 set along one part of its length, a configuration of the anterior part which has a central portion longitudinally projecting from the rack 8, a substantially flat configuration of the rear part, which is able to go through the recess 5 for passage and through the slot 6 of the external float 1 which is fitted with pins 4 for resilient securing of the rod 2.

[0029] The rod 2 has, at approximately its lower central point, a coupling corresponding to a part of the swivel 21 so that the assembly of the rod 2 and the float 1 are arranged externally after setting up the assembly of mechanisms located inside the hood 20, this coupling being set on a projecting part of the central portion 7, which has a flat outermost face parallel to the central portion, also having on the opposite side convex bulges 12 or limits in the movement of the coupling to the swivel 21.

[0030] The coupling between the rod 2 and the upper swivel 13 is formed of a "U" or resilient securing mouth 10 and a corresponding part 9 able to be embraced by said "U" or resilient securing mouth, said rod 2 being set over the hood 20, and especially backing on to its body so that its upper part is inserted into the flange 17 while the lower part is housed in a recess 19 made in the base of this hood, the flange 17 and the upper recess 16 to the float coinciding, so that the float can be lifted until it

houses the flange 17 in its upper recess, the flange 17 and the lower recess 19 of the hood being vertically aligned.

[0031] The base of the flushing system consists of a mechanism support 28 which holds the lower float and the spindles of the swivels 23.1 of the lower float and 23 of the swivel 13 of the upper float.

[0032] The hood has a window 26 fitted with a sliding sealing overlap 25, determining the regulation of the outlet flow of water out of this, and in turn with slots 33 made in the bottom part of this that can interlock in pins 34 of the mechanism support body 28.

[0033] This is for industrial application in the manufacture of flushing mechanisms for toilet cisterns.

Claims

1. Mechanism for full or selective flushing in toilet cisterns, a mechanism which activates the flushing by the overflow pipe (32) being pulled and which is retained by one of the upper (14) or lower (24) crosspieces, connected to floats in one of the positions, either for partial flushing or full flushing until the corresponding one respectively completes each flushing stage, **characterised** because it has:

    - A support body (28) for the mechanisms connected to the floats,
    - An internal float (22),
    - An external float (1),
    - A device for vertical regulation of said float
    - Means for guiding and interlocking the float in the vertical regulation point.

2. Mechanism according to claim 1, in that the internal float of the hood corresponds to the one for activating full flushing of the cistern, **characterised in that** the hood (20), has a vertical recess made in it or a hollow formed corresponding to the external float (1) which is set in the outside of said hood.

3. Mechanism, according to claim 1, **characterised in that** the upper part of the wall of the hood where the external float (1) is located has a guide flange (17) corresponding to a guide rod (2), so that this can sustain the float (1) external to the hood and backing onto this, which can take any vertical position along said vertical recess, through interlocking to the rod-guide (2).

4. Mechanism, according to claim 1, **characterised in that** the float (1) is connected to the rod-guide (2), by means of an adjustable coupling.

5. Mechanism, according to claim 1, **characterised in that** the float (1) has:

    - An upper recess (16)
    - A lower recess (3)
    - An open slot (6)
    - A passage (5) for a central part (7) projecting from the rod (2)
    - Pins (4) in correspondence with teeth 8 of the rod (2).

6. Mechanism, according to claim 1, **characterised in that** the sliding coupling which connects the rod-guide (2) and the float (1) consists in a slot (6) and a passage (5) made in the body of the float.

7. Mechanism, according to claim 1, **characterised in that** rod (2) has:

    - at least one rack (8) set along part of its length,
    - a configuration of the frontal part which has a central portion longitudinally projecting from the rack (8),
    - a substantially flat configuration of the rear part, which is able to go through the recess (5) for passage and through the slot (6) of the external float (1) which is fitted with pins (4) for resilient securing of the rod (2).

8. Mechanism, according to claim 1, **characterised in that** the rod (2) has at approximately its lower central point, a coupling corresponding to a part of the swivel (21) so that the assembly of rod (2) and float (1) are set externally after setting up the assembly of mechanisms located inside the hood (20), this coupling being set in a projecting part of the central portion (7), which has its outermost face flat parallel to the central portion, also having on the opposite side convex bulges (12) or limits in the movement of the coupling to the swivel (21).

9. Mechanism, according to claim 8, **characterised in that** the coupling between the rod (2) and the upper swivel (13) is formed of a "U" or resilient securing mouth (10) and a corresponding part (9) able to be embraced by said "U" or resilient securing mouth.

10. Mechanism, according to claim 1, **characterised in that** the rod (2) is set over the hood (20), and particularly backs onto its body, so that its upper part is inserted into the flange (17) while the lower part is located in a recess (19) made in the base of said hood.

11. Mechanism, according to claim 1, **characterised in that** the flange (17) and the upper recess (16) of the float coincide, so that the float can be raised until it houses the flange (17) in its upper recess (16).

12. Mechanism, according to claim 1, **characterised in that** the flange (17) and the lower recess (19) of the

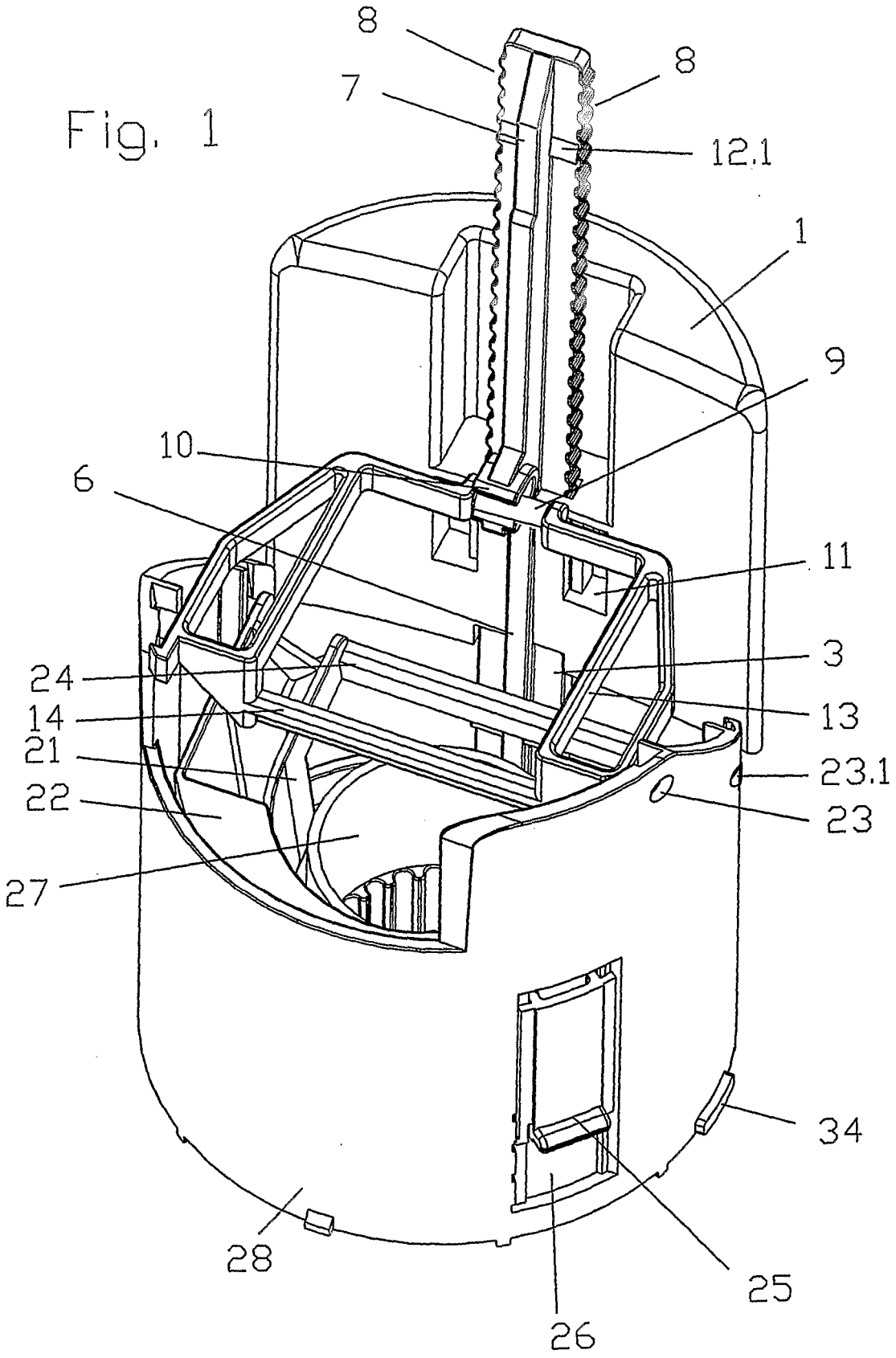
hood are vertically aligned.

13. Mechanism, according to claim 1, **characterised in that** the base of the flushing mechanism consists of a mechanism support (28) which holds the lower float and the spindles of the swivels (23.1) of the lower float and (23) of the swivel (13) of the upper float.

14. Mechanism, according to claim 1, **characterised in that** it has a window (26) fitted with a sliding sealing overlap (25), determining the regulation of the outlet flow of water outside the hood.

15. Mechanism, according to claim 1, **characterised in that** the hood (20) has slots (33) made in the bottom of this, able to interlock in pins (34) of the mechanism support body (28).

Fig. 1



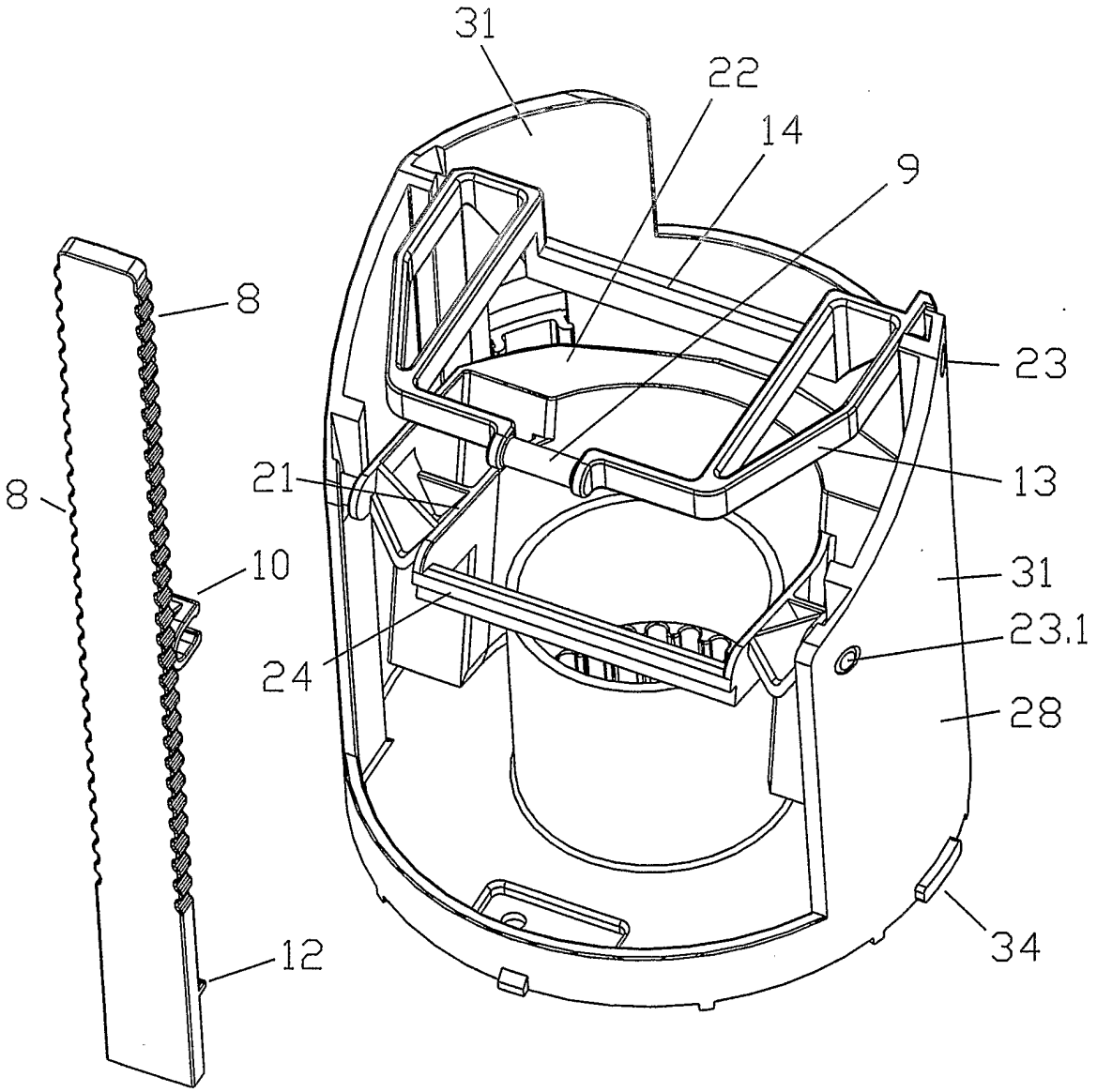


Fig. 2

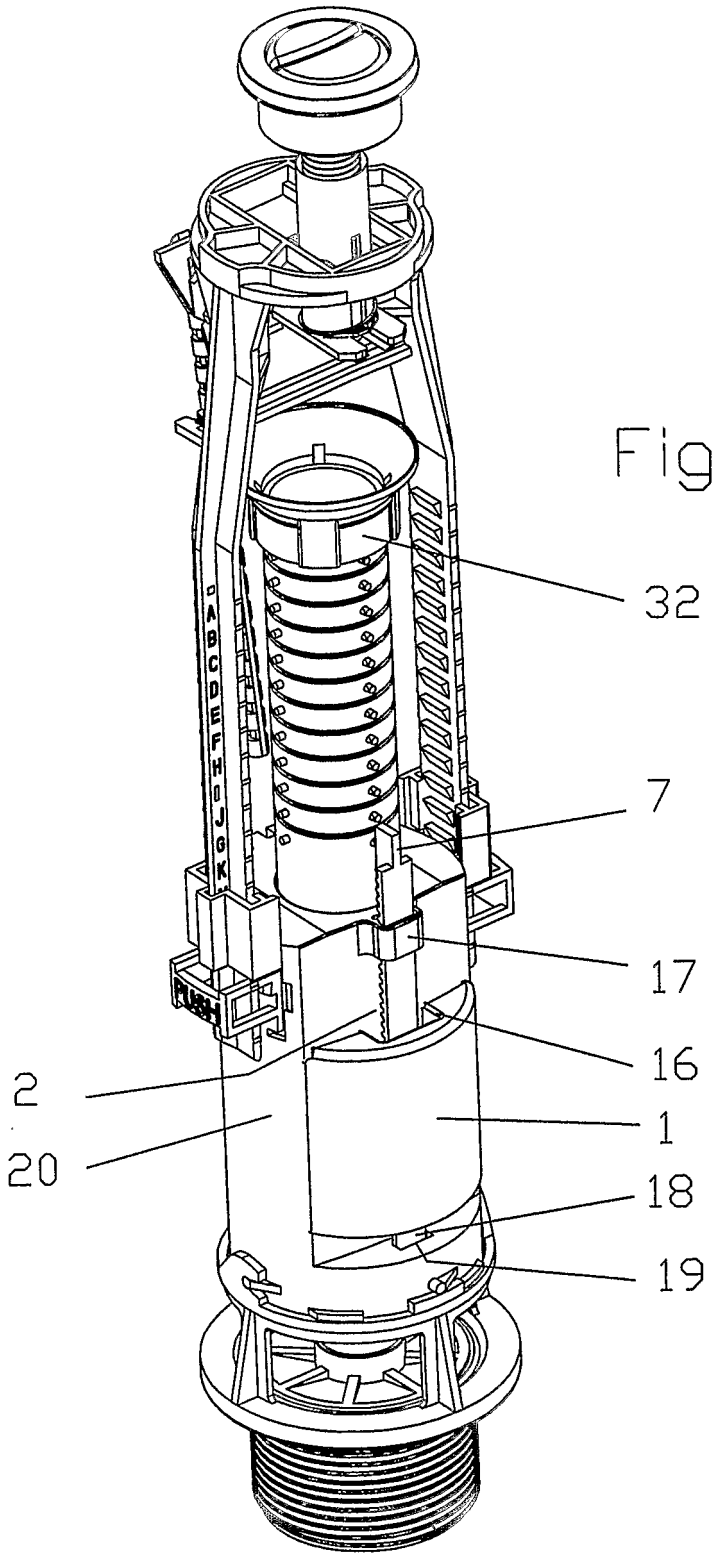
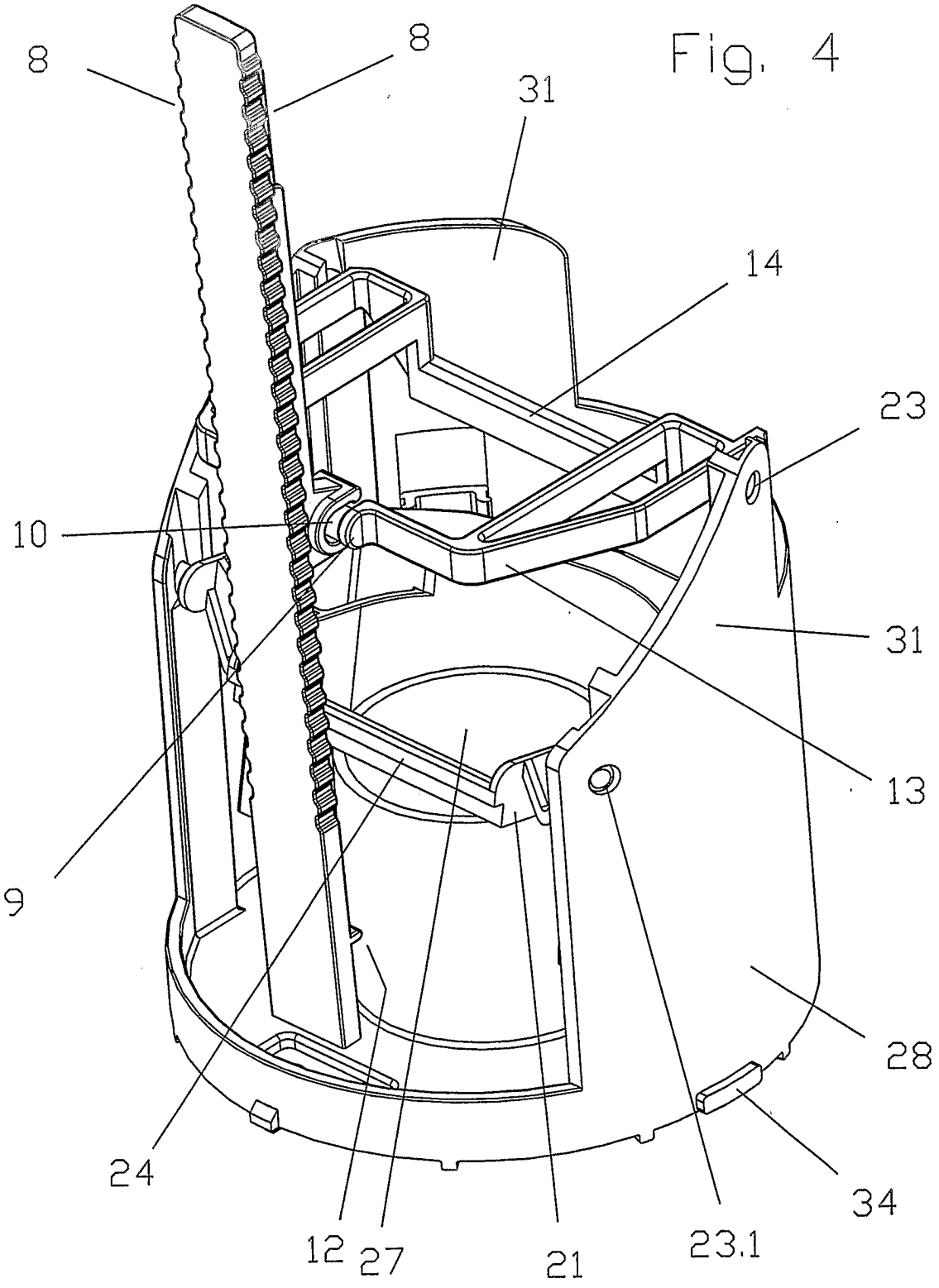


Fig. 3

Fig. 4



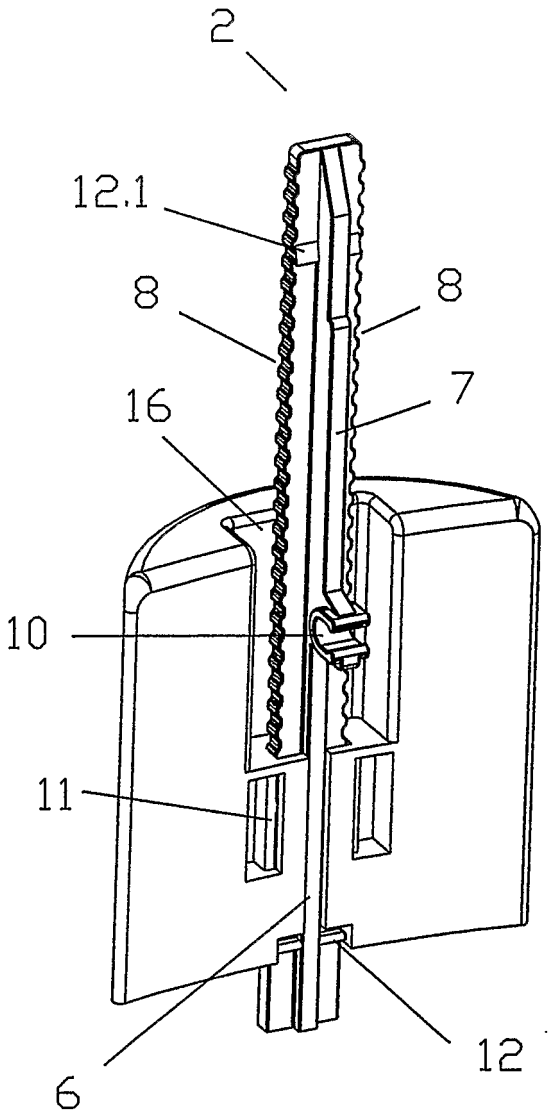


Fig. 5

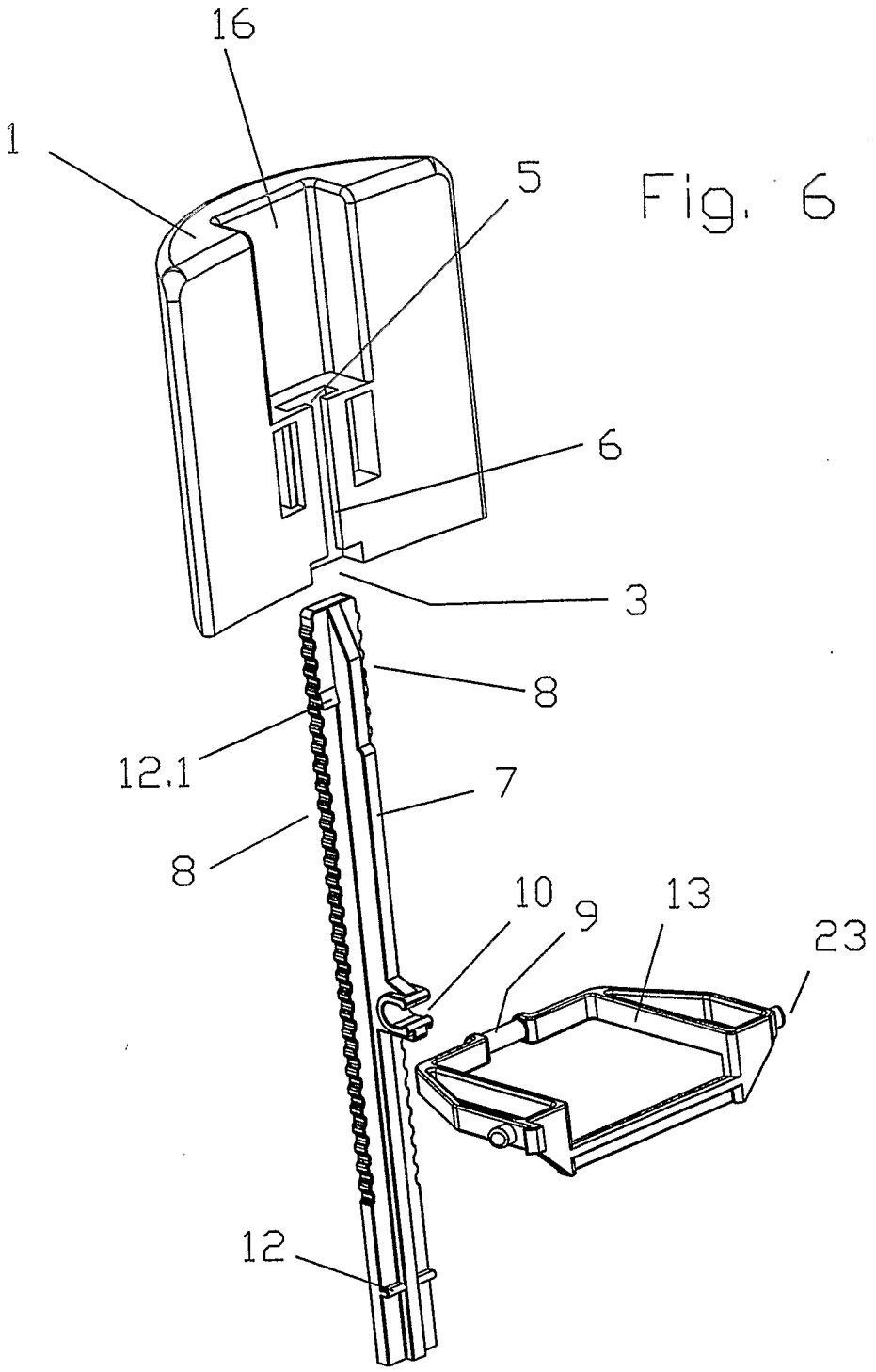


Fig. 6

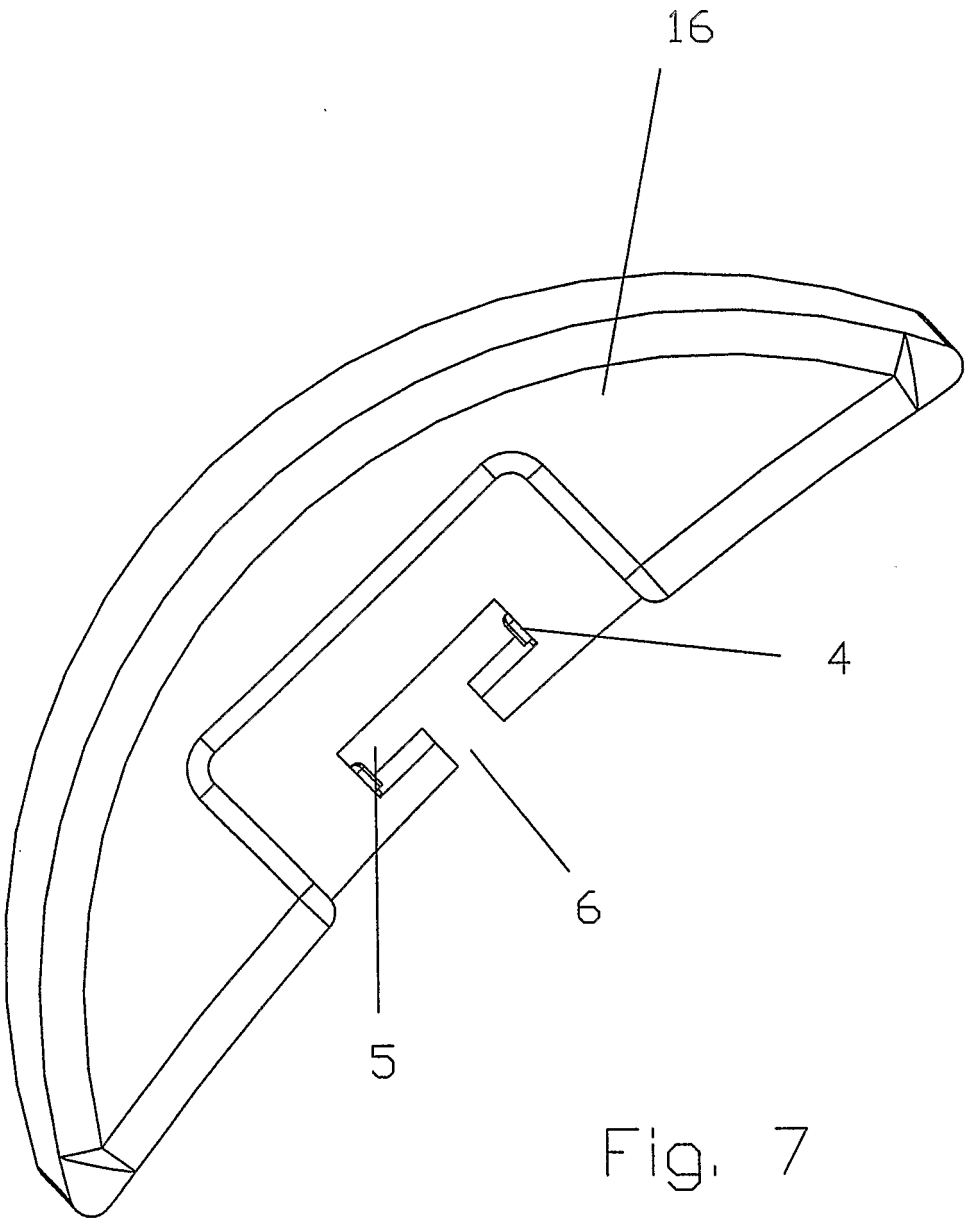


Fig. 7

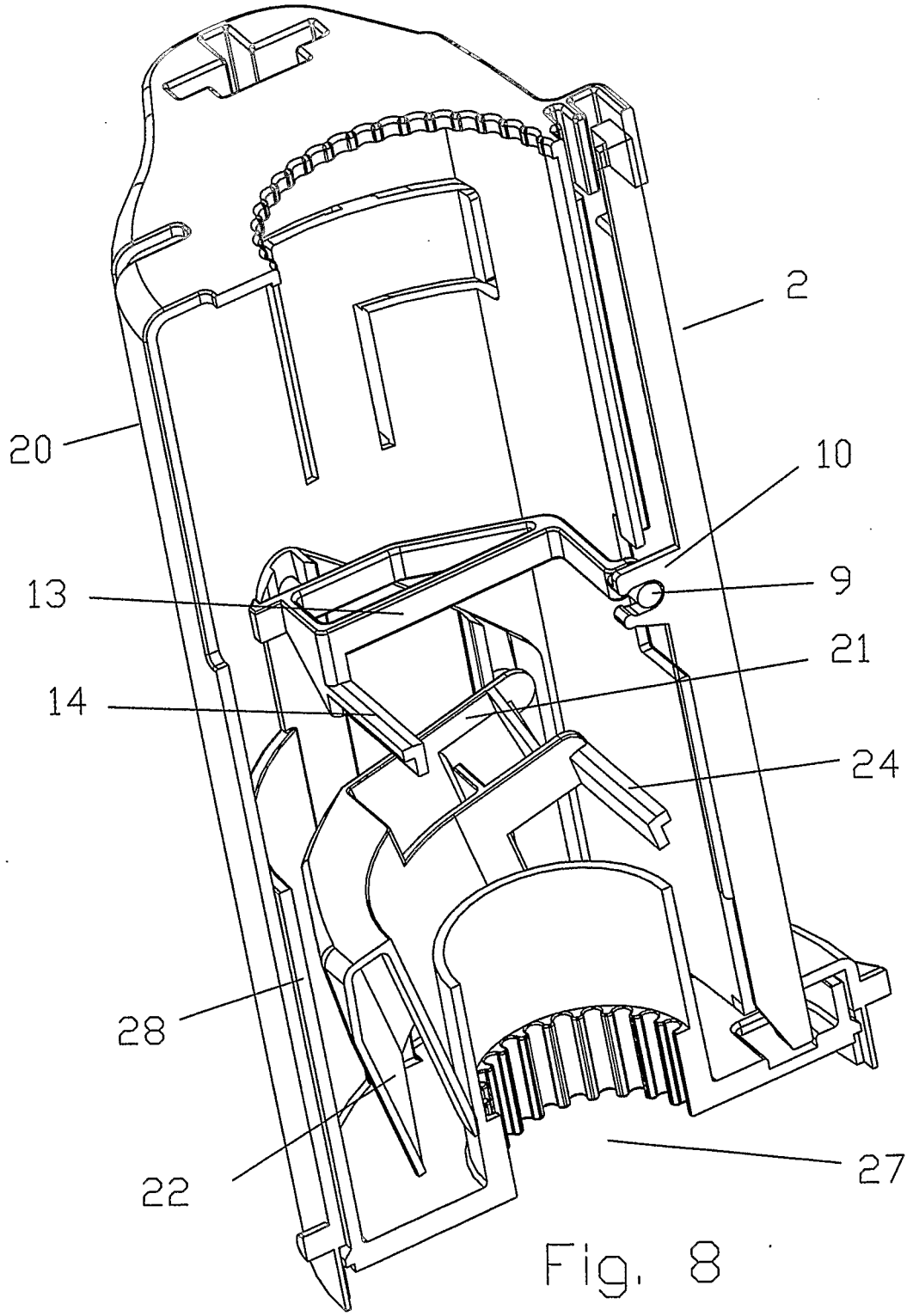
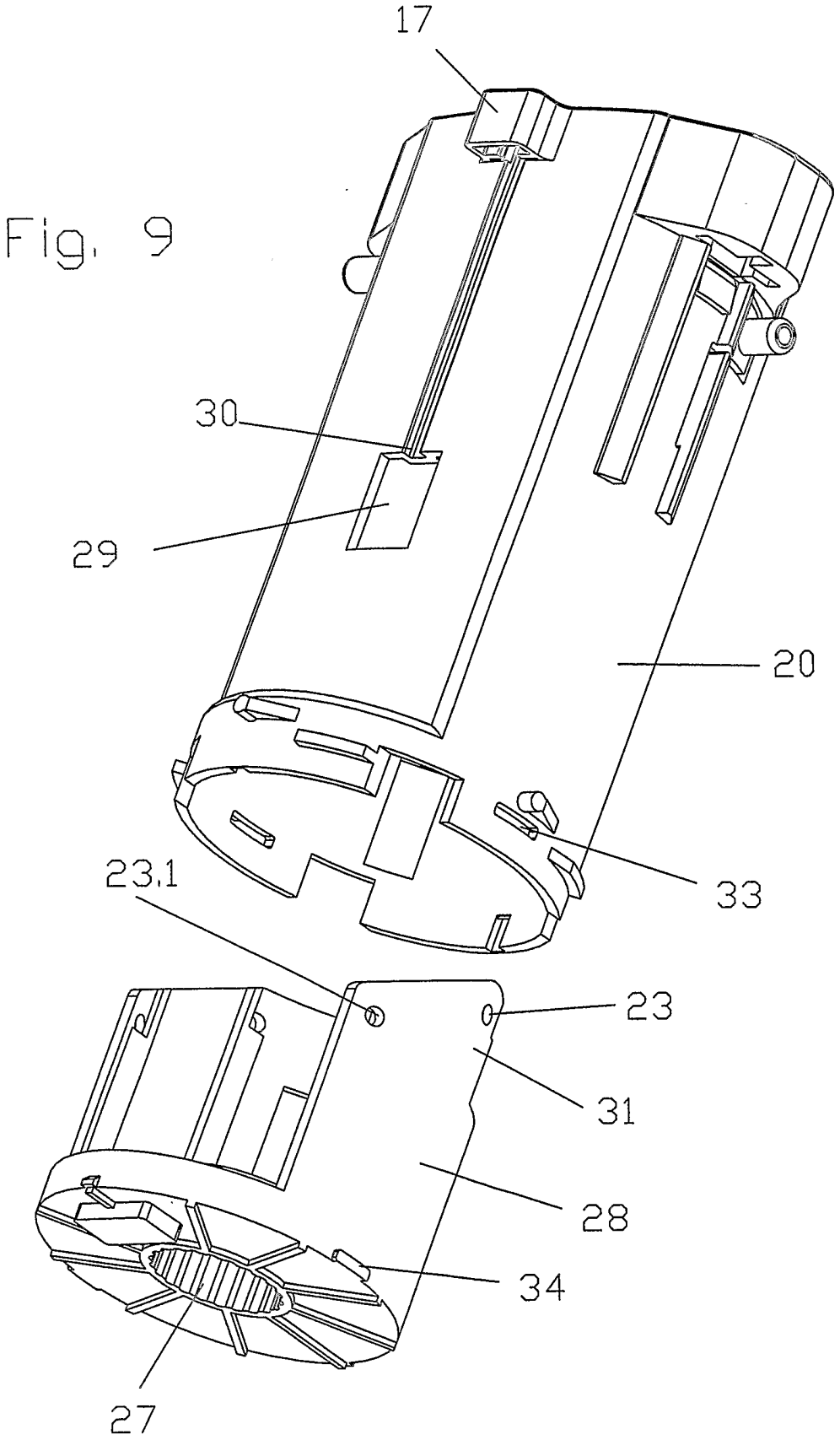


Fig. 8

Fig. 9



INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2004/070017

A. CLASSIFICATION OF SUBJECT MATTER

IPC[7] E03D1/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC[7] E03D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CIBEPAT,EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ES 2151374 (IDROLS, S.A.) 16.12.2000; **column 2, line 15- column 5, line 23; figures 1-3**	1, 2, 6-9, 14
Y		3, 10, 13, 15
A		4, 5, 11, 12
X	ES2136547 (Fominaya, P.) 16.11.1999; **column 3, line 50-column 5, line 37; figures 1 and 2**	1, 2, 6
Y		3, 10, 13, 15
A		4, 5, 7-9, 11, 12, 14
X	EP0727533 (WISA, B.V.) 21.08.1996; **column 3, line 20-column 4, line 36, figure 1**	1, 2, 6, 13
A		3-5, 7-12, 14, 15
A	ES2094076 (Ramos, I.) 01.01.1997; **the whole document**	1-15

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
04 August 2004 (04.08.04)	08 SEP 2004 08.09.2004
Name and mailing address of the ISA/ **S.P.T.O.** Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/ ES 2004/070017

Patent document cited in search report	Publication date	Patent familiy member(s)	Publication date
ES 2151374 AB	16.12.2000	ES 2187247 A	16.05.2003 16.05.2003 16.05.2003
ES2136547 A B	16.11.1999	NONE	----------
EP 0727533 A	21.08.1996	EP 19960200356 NL 1001567 C NL 9500316 A	14.02.1996 22.08.1996 01.10.1996
ES2094076 A B	01.01.1997	NONE	----------

Form PCT/ISA/210 (patent family annex) (July 1992)