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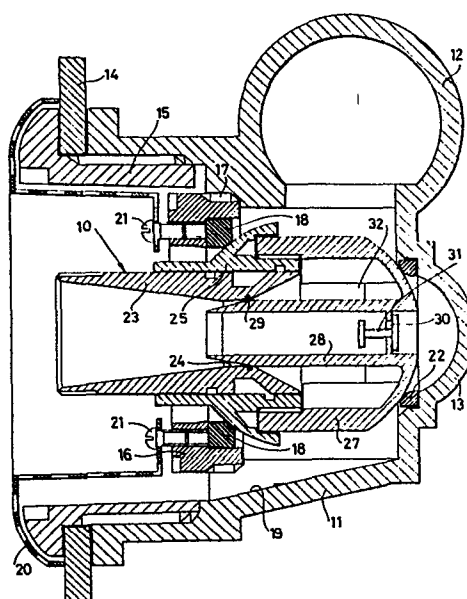
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Hydromassage nozzle.

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In a hydromassage nozzle are provided inclined planes for selfdrainage of the nozzle when it is inoperative and means for regulating the flowrate of the stream of water under pressure mixed with air passing through the constricted section of a venturi tube.



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"Improved hydromassage nozzle"

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The present invention relates to an improved hydromassage nozzle.

5 It is known that hydromassage consists of striking the user's body immersed in a tub or pool with a stream of water under pressure mixed with air delivered by one or more nozzles mounted in the walls of the tub or pool.

10 Specifically, the water, while passing through a section shaped like a venturi tube, causes negative pressure which in turn causes suction of air which mixes intimately with the water.

15 The nozzles of known type are also equipped with systems which make them adjustable although within a rather limited angle, in such a manner as to direct the stream with the desired inclination onto the user's body.

20 A first problem connected with the nozzles of known type is the problem of regulation, specifically of shutting off delivery of the stream from one nozzle, leaving in operation the other nozzles connected in the same water or air system. Indeed, when the water supply to a nozzle is
25 completely closed there is often suction of water from the interior of the tub through the air suction duct of the nozzle in question.

30 Another problem connected with known nozzles is stagnation of a certain quantity of water in the body of the nozzle during periods of inactivity,

and this involves problems which need no further comment.

Another problem presented by nozzles of known type is that of easy disassembly for access to the
5 internal parts for cleaning, maintenance and/or repair of failures.

The principal object of the present invention is to resolve the problems and drawbacks mentioned briefly above.

10 To achieve this object, according to a first aspect the present invention provides a nozzle for delivery of a stream of water under pressure mixed with air for hydromassage of the type comprising an adjustable body having a central passage shaped
15 like a venturi tube on whose axis is arranged an air suction passage while water under pressure enters transversely said central duct upstream from the inlet of said venturi tube so that the passage of the water under pressure through the
20 constriction of the venturi tube causes suction of air which mixes intimately with the water in said venturi tube, the adjustable body being furthermore housed in an adjustable manner around its own axis in a substantially cylindrical casing open at
25 both ends and fixed to the wall of the tub or pool in such a manner that the end turned toward the interior of the tub is seated at the outlet of the venturi tube while the other end puts said air suction passage in communication with an air
30 suction duct, there being made in said cylindrical

casing at least one opening for connection with a duct for supply of water under pressure, characterized in that said air suction passage consists of a duct which penetrates into the constricted section of said venturi tube and said
5 constricted section is movable with respect to said duct forming the air suction passage between an open position in which passage of water is allowed through said constricted section and the
10 total shutoff of said water passage, there being provided in said air suction duct a control valve which is caused to open by the negative pressure generated in the constricted section of the venturi tube when water under pressure is passing
15 therein.

According to another important aspect of the present invention said casing for housing said adjustable body and the flange which secures the nozzle to the wall of the tub or pool has a flared
20 portion inclined toward the interior of the tub for unaided drainage of said nozzle.

These and other aspects and advantages of the present invention will appear more clearly from the detailed description given below with reference to the annexed drawings wherein:-
25

Fig. 1 is a diametrical cross-section of the nozzle according to the present invention;

Fig. 2 is a view similar to that of Fig. 1 with the components of the nozzle in a different
30 operative position;

Fig. 3 is a cross-section which shows the adjustable body of the nozzle and Figs. 4 and 5 are respectively a plan view from above and a sectional view along plane V-V of Fig. 4 of an optional component of the nozzle of Fig. 3.

It appears opportune to state that the nozzle illustrated in Figs. 1 and 2 provides all the features peculiar to the present invention, but it is understood that ownership of the selfdrainage feature may be provided separately from that of regulation of the stream issuing from the nozzle and vice versa.

Referring therefore to Figs. 1, 2 and 3, the nozzle according to the present invention comprises an adjustable body 10 which is seated in a casing 11 on which are provided in the same piece the unions 12 and 13, respectively with the duct for water under pressure and with the air suction duct.

The casing 11 is fixed to the wall 14 of the tub or pool (not shown) by means of a ring-nut 15 which engages by screwing an internal threaded part of the casing 11.

To secure the adjustable body 10 in an integral manner to the casing 11 is provided an anular part 16 which engages by screwing a threaded portion 17 of said casing 11.

The pads 18 preferably of rubber or some other flexible material are integral with the anular part 16 for the purpose set forth below.

A nozzle cover 20 is in turn fixed to the anular part 16 with the screws 21 to mask aesthetically the flange 15 which fixes the nozzle.

5 On the bottom of the casing 11 at the suction duct 13 are provided support pads 22 for the adjustable body 10 made of rubber or some other flexible material for the purpose set forth below.

10 Now considering the adjustable body 10 illustrated in detail in Fig. 3 it comprises a duct 23 shaped with a constricted section like a venturi tube. On the outside of the duct 23 is mounted a sleeve 25 which forms a seat 26 in which is housed by threading a base 27 which bears as part of the
15 same piece a duct 28 for air suction. The duct 28 extends in the position illustrated in Figs. 1 and 3 to close the constricted section 24 of the venturi tube, the watertightness of said closure being aided by an anular gasket 29. At the other
20 end the duct 28 communicates with the air suction duct 13 through a hole 30 closed by a valve 31 which opens when there is negative pressure in the constricted section 24 of the venturi tube, shutting off air suction when there is no water
25 under pressure passing through the venturi tube, i.e. in the conditions of Fig. 1.

Fig. 1 illustrates a valve 31 of the double-disk type while Fig. 3 illustrates a disk-type check valve with compression spring. It is clear
30 that these arrangements are only illustrative and

not limitative.

In the base 27 are also made apertures or windows 32 through which the interior of said base can communicate with the duct 12 which supplies
5 water under pressure.

As appears clearly in the figures, the base 27 and the sleeve 25 both have rounded outer surfaces so that they can operate together with the pads 18 and 22, adjusting themselves with respect to the
10 axis of the venturi tube with a maximum inclination of 15° and over the entire arc of 360° .

Fig. 1 also shows that the internal surface 19 of the casing 11 is inclined toward the outlet of the nozzle so that water cannot stagnate therein
15 when the nozzle is not delivering the stream of water mixed with air.

The flange 15 also has a truncated-cone or tapered inner surface such as to comprise the continuation of the surface 19 and offer no
20 obstructions to natural discharge or drainage of water.

As can be seen in Fig. 2 moving of the duct 23 along its axis toward the mouth of the nozzle frees an annular passage between the constricted
25 section and the duct 28 so that the nozzle delivers the stream of water under pressure. The moving is adjustable and is secured by screwing and unscrewing the duct 23 with respect to the sleeve 25.

30 Figs. 4 and 5 illustrate an auxiliary part 33

having a base 34 which couples with the outlet of
the duct 23 and a tapered tip 35 with an outlet
slot 36 which creates a fan-shaped stream which
can cover a broader area to be subjected to
5 hydromassage.

The present invention has been described for a
preferred embodiment it being understood that
conceptually and mechanically equivalent modific-
ations and variants are possible and foreseeable
10 without exceeding its limits and understood fur-
thermore that each feature is to be considered
both individually and in combination with the
others.

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CLAIMS

1. Hydromassage nozzle of the type comprising an adjustable body with a central passage shaped like a venturi tube on the axis of which is
5 arranged an air suction passage while water under pressure enters transversely said central duct upstream of the inlet of said venturi tube so that passage of water under pressure through the constriction of the venturi tube causes suction of
10 air which mixes intimately with said water in said venturi tube, the adjustable body being furthermore housed in an adjustable manner around its own axis in a substantially cylindrical casing open at both ends and fixed to the wall of the tub or pool
15 in such a manner that at the end turned toward the interior of the tub is seated the outlet of the venturi tube while the other end puts said air suction passage in communication with an air suction duct, there being made in said cylindrical
20 casing at least one aperture for connection of a duct supplying water under pressure, characterized in that said air suction passage consists of a duct which penetrates the constricted section of said venturi tube and said constricted section is
25 movable with respect to said duct forming a passage for air suction between an open position in which passage of water through said constricted section is allowed and a position of complete shutoff of said water passage, there being pro-
30 vided in said air suction duct a control valve

which is opened by the negative pressure generated in the constricted section of the venturi tube when water under pressure passes therein.

5 2. Hydromassage nozzle according to the preamble of claim 1 characterized in that said casing which houses said adjustable body and the flange securing the nozzle to the wall of the tub or pool have a flared portion inclined toward the interior of the tub for selfdrainage of the
10 nozzle.

 3. Hydromassage nozzle according to claims 1 and/or 2 characterized in that said adjustable body comprises a duct in the form of a venturi tube and a sleeve screwed in an adjustable manner
15 onto said duct and forming a housing and seat for a base which bears said air suction duct and has nozzles for the inlet of water under pressure, the moving of said venturi tube duct being achieved by screwing and unscrewing said sleeve.

20 4. Nozzle according to claims 1 and/or 2 characterized in that an auxiliary part connectable to the end of said venturi tube duct and having an outlet slot for delivery of a fan-shaped stream is provided.

25 5. Hydromassage nozzle substantially as described above and illustrated in the annexed drawings.

Fig.1

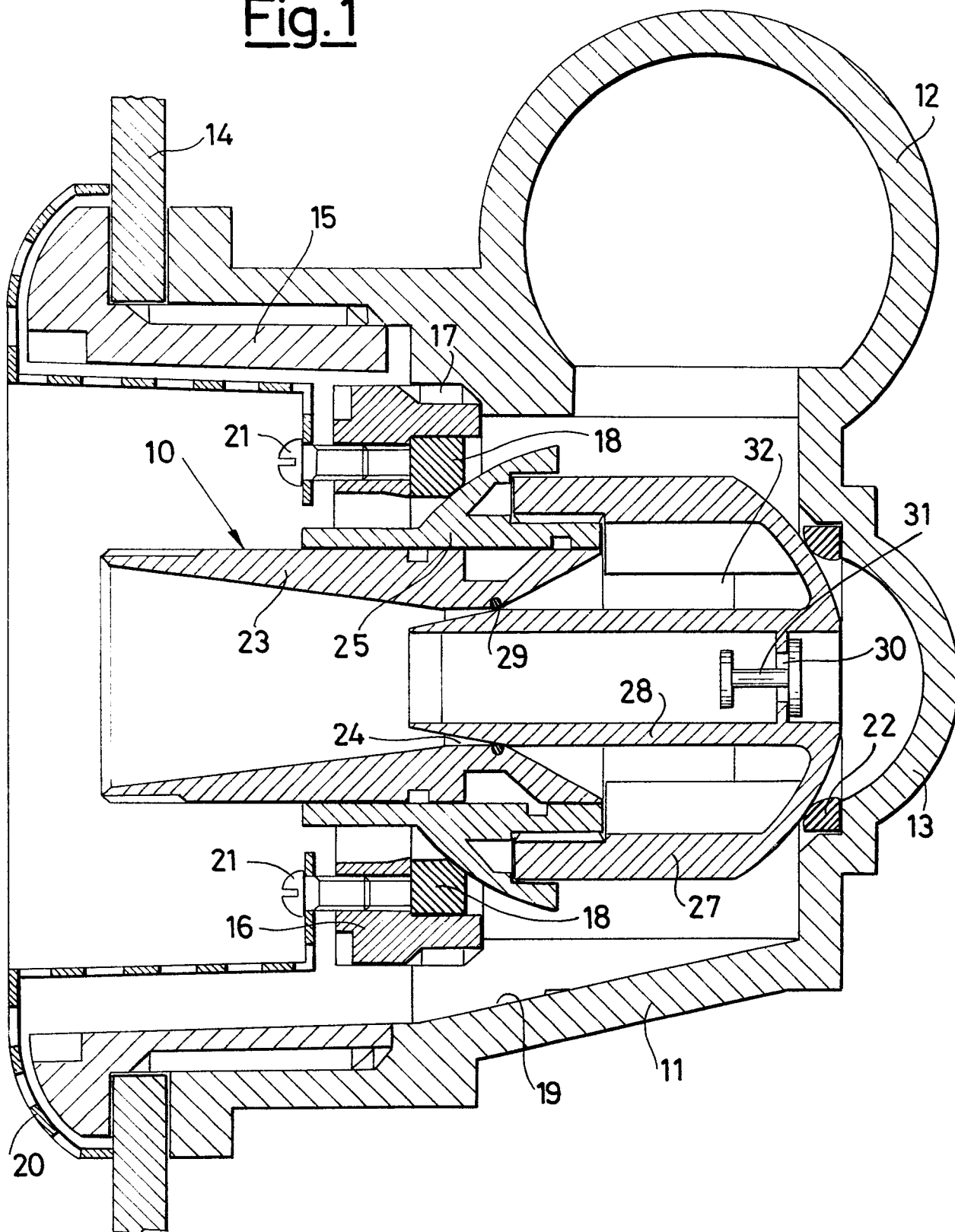


Fig.2

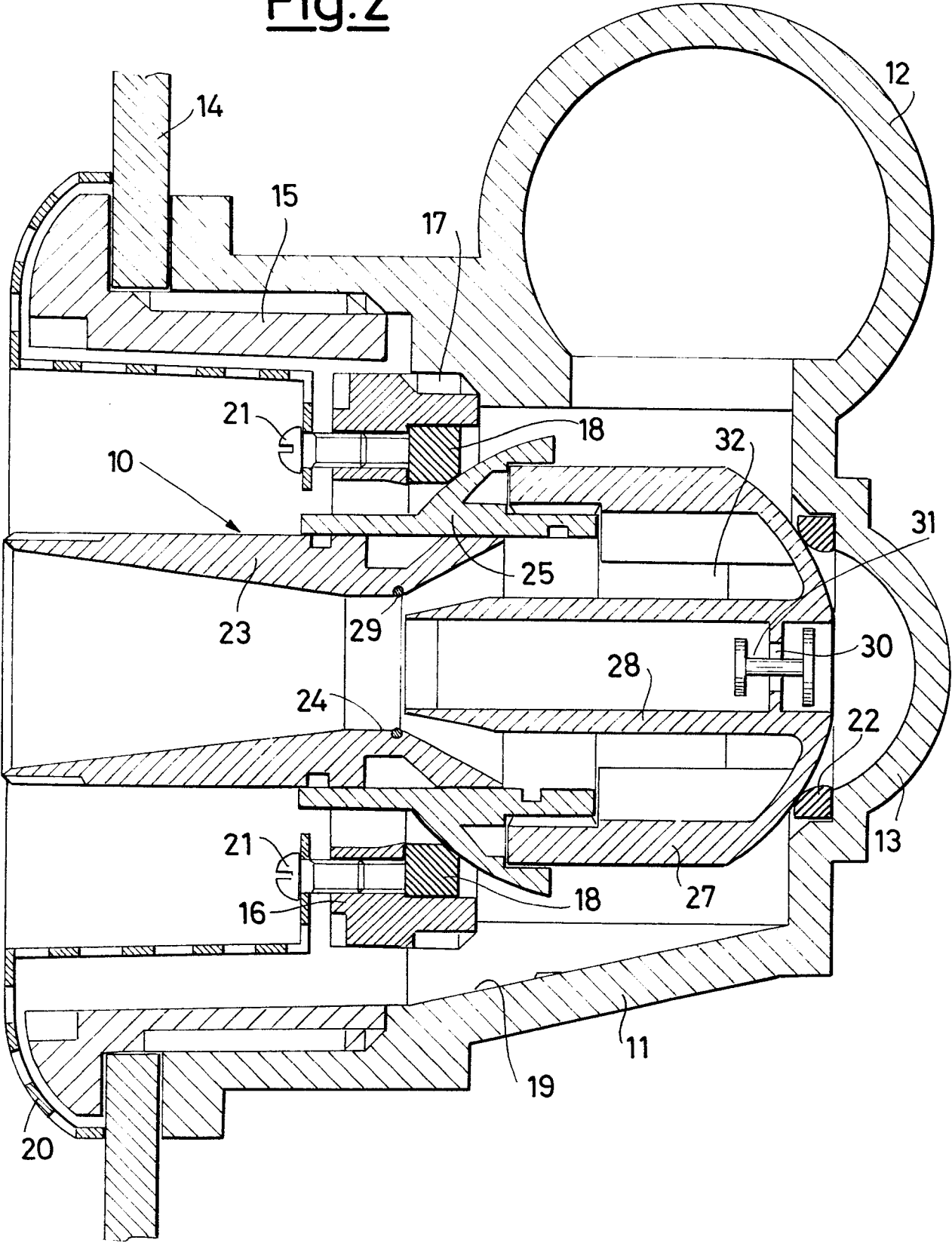
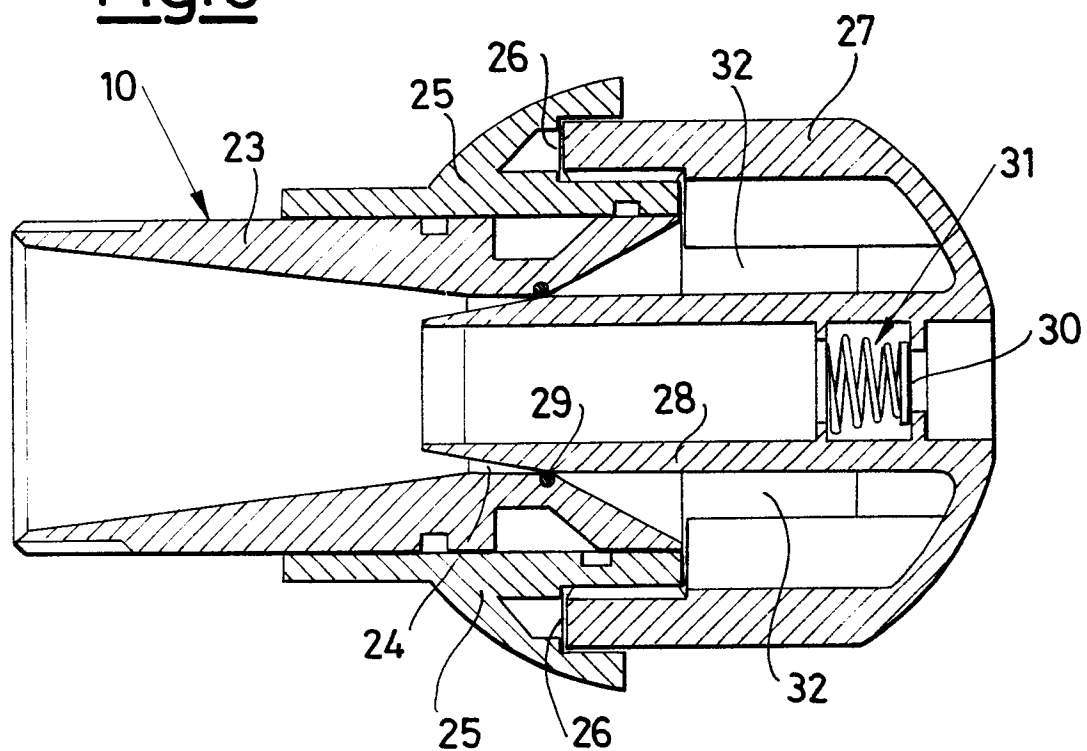
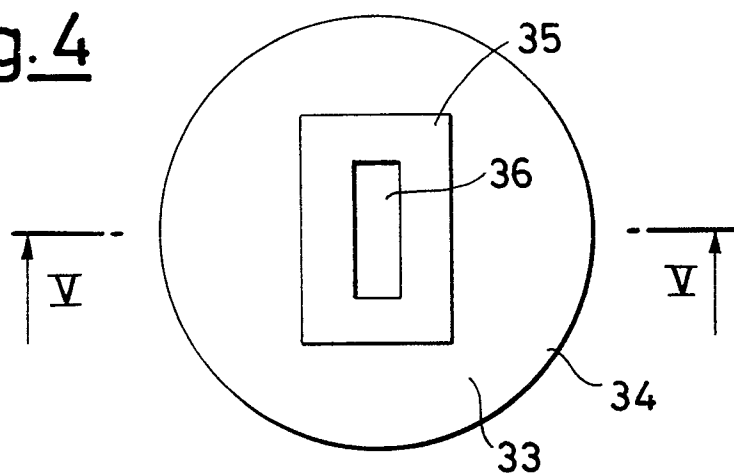


Fig. 3**Fig. 4****Fig. 5**