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(54) **FLUSHING DEVICE**

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DISPOSITIF DE PURGE

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(56) References cited:

WO-A1-2009/141638

DE-A1-102005 029 520

DE-C- 575 527

US-A1- 2006 081 292

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Description

[0001] The present invention relates to a device for flushing sewage systems so as to prevent the build up of deposits in the interior thereof.

[0002] Sewage systems usually comprise a network of connected pipes linking buildings to a sewage treatment facility or waste outlet. The pipes carry human waste such as washing water, faeces, urine, laundry waste and other material which goes down drains and then needs to be disposed of safely and effectively. In some remote locations sewage is collected in septic tanks or cesspits and may be treated in situ or transported by a vehicle to a sewage treatment facility where it may be disposed of safely, but the pipes of these systems may still require cleaning.

[0003] In view of the nature of sewage, deposits such as fats, oils and greases accumulate on the interior of the pipes and other conduits in the sewage system, which is particularly common in systems where the rate of sewage flow is low. Low flow may result from constant dry weather or periods of low waste being produced. The accumulation of such deposits can eventually lead to a complete or partial blockage that inhibits the flow of sewage through the system and ultimately leads to flooding or combined sewer overflow (CSO) discharges. Untreated sewage then becomes entrained in rivers and other watercourses and endangers the lives of life forms living therein and also humans bathing.

[0004] In order to minimise the risk of blockages, pipelines should be monitored and high risk areas cleaned periodically. Sewer pipes (also simply referred to as sewers) can be cleaned using pressurised water jetting systems, but these are known to damage the pipes and also pollute ambient air. Such procedures can also be costly.

[0005] Flushing devices for controlling sewage flow are known in the art and are usually installed in inspection chambers (see for example DE575527, DE102005029520 and US2006/081292). Those devices include a gate which is usually closed and opens only when sewage builds up behind the gate and reaches a predetermined level. As the gate opens the sewage is released rapidly to flush the system downstream of the inspection chamber. However, those devices are not without shortcomings. For instance, inspection chambers need to be prepared to receive those devices which often means shutting down public areas for several hours while the preparation and installation is effected. Though those devices control the flow of sewage downstream of the inspection chamber they cannot control the flow of sewage upstream of the inspection chamber. For instance, a downstream blockage may cause sewage to back-up beyond the flushing device and spill above ground level. WO2009/141638 discloses a system that cannot prevent upstream flow.

[0006] It is an object of the present invention to provide a cleaning system which is self-sufficient and is operable without human intervention. It is a further object of the

invention to provide a cleaning system that is simple to install, thus obviating the need to shut down public services. It is yet a further object to provide a system which serves to prevent sewage downstream from backing up past the system and spilling above ground.

[0007] According to the invention, there is provided a sewer flushing device for location in a sewage system, the device comprising:

10 a housing having an inlet, an outlet and a sewage flow path defined between said inlet and outlet, at least one of the inlet and the outlet being adapted sealingly to connect to a conduit of the sewage system;

15 a gate pivotally supported on the housing in the flow path for movement between open and closed positions and having upper and lower ends between which the pivot axis is disposed; and

20 biasing means in the form of a counter weight supported on a lower portion of the gate, and configured to bias the gate to a closed position whereat the flow path is substantially blocked thus causing a build-up of sewage upstream of the gate, the gate being urged towards its open position only when the build-up of sewage reaches a predetermined level thus causing the build-up of sewage to be rapidly released so as to flush the sewage system downstream of the flushing device the counter weight being moveable relative to the pivot axis selectively to vary the predefined level of sewage at which the gate moves to its open position.

[0008] The sewage flushing device may be located in an inspection chamber having an upstream conduit through which sewage enters the chamber and a downstream conduit through which sewage leaves the chamber. Sealingly connecting the inlet to the upstream conduit and or the outlet to the downstream conduit ensures that all sewage passing through the chamber also passes along the flow path of the flushing device, provided the housing includes no other opening. The gate is usually in its closed position and moves to its open position only when the build up of sewage behind the gate (upstream) reaches

45 a predetermined level, thus causing that build-up of sewage to be released through the outlet. A build up of sewage in front (downstream) of the gate would not cause the gate to move to its open position and would preferably further inhibit such movement of the gate. The flushing device can thus also act like a non-return valve and, in the event of a blockage downstream of the flushing device, prevent sewage flowing from a downstream section to an upstream section and possibly flooding homes and offices. This may not apply where an overflow feature is present as that overflow may allow sewage to flow back when it reaches a predetermined level.

[0009] The advantage of arranging the pivot axis part-way along the length of the gate is that in its open position

the gate may be substantially horizontal or at least in a plane substantially parallel to the flow path. Preferably the gate has a narrow cross-section and most preferably is formed from a thin plate such that when it is arranged in its open position it causes minimum restriction on the flow of sewage past or around it.

[0010] Advantageously the housing is a closed unit defining a chamber in which the gate is mounted and having an inlet at one end and an outlet at the other. In one arrangement the housing has a rectangular cross-section defining a generally rectangular chamber. Preferably the housing includes a tubular portion extending outwardly therefrom and having a free end defining the inlet or the outlet, the tubular portion most preferably being circular and of a standard size so as to cooperate with a standard size conduit of the sewage system. Furthermore, the tubular portion has an exterior face that may be provided with seals arranged to co-operate with the interior face of the upstream conduit. For example, annular recesses may be formed in the exterior face for receiving seals, such as O-rings.

[0011] In one arrangement, the housing includes an overflow aperture on an upper portion thereof and preferably above the predetermined level of sewage at which the gate moves to its open position. This way, if the gate fails to open when the predetermined level is exceeded, the sewage will begin to spill through the overflow aperture rather than backing up inside the sewage system and possibly flooding. The aperture may be located upstream or downstream of the gate according to which of the inlet and or outlet is sealingly connected to their respective conduit. For instance, if the inlet is connected to the upstream conduit then the aperture may be located upstream of the gate so that sewage may flow out of the housing and into the downstream conduit. Conversely, if the outlet is connected to the downstream conduit then the overflow aperture may be located downstream of the gate so that sewage may flow into the housing and through the outlet. A cover may be included for selective closure of the aperture depending on the season and the application of the flushing device. The cover may be pivotally or slidably mounted to the housing, or may even be a separate item arranged for complete removal. The level of the overflow aperture relative to the gate may be raised by providing an upward extension of the housing. The level may also potentially be variable to allow adjustment of when overflow occurs.

[0012] The flushing device may also be provided with attachment means by which it may be safely lifted without being damaged, the attachment means preferably comprising a flange upstanding from an upper portion of the housing and having a hole therein for receiving a chain or a hook connected to suitable lifting apparatus. This feature is particularly advantageous for larger, heavier flushing devices as they may be quite cumbersome and consequently difficult to manoeuvre.

[0013] Furthermore, there may also be provided a gate support assembly provided on the housing and defining

one of a pair of lugs or a pair of openings that co-operate with a cooperating pair of lugs or openings provided on the gate. In a preferred arrangement, the support assembly may include a pair of opposed brackets, each defining a lug or opening and being mounted on an interior face of the housing. Those brackets may be secured to the interior face by suitable means such as welding, fasteners or adhesive, or even located in opposed slots defined within the interior face so as not to project into the interior chamber and possibly restrict sewage flow.

[0014] The pair of lugs and the pair of openings may be integral to the gate and formed during the manufacturing process, which may comprise stamping, moulding, casting or other suitable techniques. In an alternative embodiment each lug or opening is defined by a hinge member which may be a distinct unit secured to an appropriate part of the gate. For instance, the gate may be furnished with a pair of hinge members disposed one third of the way up on opposed sides, each may have an outwardly extending lug arranged coaxially with the other lug so as to define the pivot axis. The lugs are sized to form a close running fit with the openings formed on the brackets or directly on the housing. Alternatively, each hinge member may define an opening.

[0015] In a preferred arrangement the biasing means comprise a counter weight supported on the lower end of the gate and which may be moveable relative to the pivot axis selectively to vary the predefined level of sewage at which the gate moves to its open position. For instance the gate may include a channel disposed part way along the length of the gate and along which a portion of the counter weight may slide. The counter weight may include clamping means for securing the counter weight in the required position, and the clamping means may include an over centre latch, nuts and bolts or other known fasteners.

[0016] By way of example only, two embodiments of the present invention will now be described in detail, with reference being made to the accompanying drawings, in which:

Figure 1 is a perspective view of part of an inspection chamber of a sewage system;

Figure 2 is a front perspective view of a flushing device according to a first embodiment of the invention;

Figure 3 is a rear perspective view of the flushing device of Figure 2;

Figure 4 is a perspective view of the flushing device of Figures 2 and 3 located in the inspection chamber of Figure 1;

Figure 5 is a rear perspective view corresponding to Figure 3, but showing the gate and related components disassembled;

Figure 6 is a cross-section through the flushing device shown in Figures 2 to 5; and

Figure 7 is a flushing device according to a second embodiment of the invention.

[0017] Figure 1 shows part of an inspection point (also referred to as a manhole) of a sewage system. The manhole comprises a chamber 10 having a downstream wall 11 provided with a circular sewage outlet conduit 12, an upstream wall (not shown) provided with a circular sewage inlet conduit (not shown) and a floor 13 in which there is formed a semicircular channel 14 extending between the sewage inlet and outlet conduits. The channel 14 provides a flow path for sewage between the inlet and outlet conduits.

[0018] Referring specifically to Figures 2 and 3, there is shown a flushing device generally indicated 20 and comprising a housing 21 defining an interior chamber and a gate 22 pivotally mounted to the housing, inside the interior chamber. The housing 21 includes a base 23 having a semicircular cross-section, two sidewalls 24 up-standing from the base, a top 25 supported on the sidewalls and provided with a lifting flange 26, and a front wall 27 enclosing the front of the housing 21. The rear end 30 of the housing is open to define an inlet 31 in fluid communication with the interior chamber. The front wall 27 has an upper inclined portion 27a and a lower portion 27b from which a tubular connector 32 extends, the free end of the connector defining an outlet 33 in fluid communication with the interior chamber. The connector 32 has a circular cross-section with a radius corresponding to that of the semicircular base 23. That way, the base may locate in the channel 14 of the manhole 10 and the connector 32 may locate fully into the sewage outlet 12 such that the lower portion of the front wall 27b abuts the downstream wall 11, as shown in Figure 4. Three annular grooves 35 are formed around the external surface of the connector 32 for receiving O-rings 37 (Figure 6) which serve effectively to seal the connection between the housing 10 and the sewage outlet conduit 12.

[0019] Referring to Figure 5, the gate 22 is generally planar and has two opposed side edges 40, a top edge 41 and a semicircular bottom 42 so as to correspond closely to the shape and size of the internal profile of the housing 21. The gate 22 is pivoted to the housing 21 by a hinge mechanism that allows the gate to move between open and closed positions. The hinge mechanism comprises two hinge members 45 mounted to opposed side edges 40 of the gate 22 and two hinge plates 46 coupled to the hinge members 45 and secured to the interior surfaces 48 of the sidewalls 24. Each hinge member 45 comprises a central portion 49 arranged to locate in a cut-out 50 formed in a respective side edge 40 and a pair of flanges 51 sandwiching the central portion 49 and arranged to bear against the front and rear surfaces of the gate 22, immediately surrounding the cut-out 50. The two hinge members 45 have generally circular outer faces 53 furnished with cylindrical lugs 54 that together define the pivot axis of the gate 22.

[0020] Each hinge plate 46 includes a circular hole 55 at one end for receiving the lug 54 of the respective hinge member 45, the hole 55 and lug 54 being sized to form a close running fit. A slot 58 is formed in the interior sur-

face 48 of each side wall 24 of the housing 21 and the shape and size of the slot 58 corresponds to the shape and size of the plate 46 so that the plate may locate therein and not project beyond the interior surface 48 of the side wall. Each slot 58 extends from the rear edge of the side wall 24 and slopes downwardly toward the outlet 33. The gate assembly, including the hinge members 45 and the hinge plates 46, is located within the housing 21, by first aligning the plates 46 with the slots 58 and then urging the assembly forward. The assembly can be held in position by securing the plates 46 to the sidewall 24 using adhesive, bolts or other suitable fasteners (not shown).

[0021] A counterweight 65 is supported on the lower part of the gate 22 to bias the gate in its closed position. The presence of the counter weight 65 on the lower part of the gate ensures that the lower part of the gate is heavier and that the moment of force generated by the lower part of the gate 22 is greater than the moment of force generated by the upper part of the gate. Consequently, the gate is free to pivot so that the centre of mass of the lower part of the gate locates below the pivot axis thus causing the gate to adopt its closed position. The gate moves to its open position when the weight of the sewage exerted on to the gate is so great that the moment of force on the upper part of the gate exceeds the moment of force on the lower part of the gate. The weight of the sewage (the predetermined level of sewage) at which the gate moves can be varied by adjusting the size and or position of the counter weight and thus the moment of force on the lower part of the gate.

[0022] In the present embodiment, the counter weight 65 is fastened to the gate 22 by bolts 66 running through channels 67. Not only do the bolts 66 facilitate easy replacement of the counter weight but also the channels 67 facilitate positional adjustment of the counter weight towards or away from the pivot axis. The counterweight can take many other forms. It may be possible, especially where the gate is formed from a plastic material, to incorporate the counter-weight within the gate during its manufacture.

[0023] Referring now to Figure 6, there is shown a vertical cross-section through the housing 21, including broken lines 70 indicating the rotational path adopted by the top of the gate 22 as it moves between closed and open positions. In that figure, the gate 22 is shown in its closed position whereat the rear face of the upper portion bears against a flange 71 depending downwardly from the top 25 of the housing 21 and which flange acts as a seal to restrict flow and also an abutment to limit movement. The gate 22 is biased to that position by the counter weight 64, as discussed above. When sewage enters the inspection chamber it flows in to the housing 21 through the inlet 31 and starts to build up against the rear face of the gate. When the moment of force created by the build-up of sewage exceeds the moment created by the counter weight 64, the gate 22 pivots to its open position whereat the upper portion of the forward face rests on a pair of abutments 73 provided on the interior faces 48 of

the sidewalls 24. In the open position the gate 22 is disposed substantially parallel with the sewage flow path inside the housing 21 and is thus unlikely to restrict the flow of sewage passing thereby. The moment created by the counter weight 65 can be adjusted by varying its position or size: a heavier counter weight or a lower positioned counter weight will create a larger moment and thus increase the level of sewage needed to cause the gate to pivot.

[0024] Figure 7 shows a second embodiment of the invention, which is very similar to the first embodiment so like features have been accorded like reference numerals. This embodiment includes a housing 21 very similar to that of the first embodiment except the top 25 includes an opening 80 into the interior chamber. Thus, if the gate 22 fails to open (possibly due to debris being tangled between the hinge members 45 and the plates 46) when the predetermined level of sewage is exceeded, sewage in the inspection chamber can spill into the chamber through the opening 80 and flow out through the outlet 33. Effectively the opening allows the gate 22 to be bypassed should it fail to open when the predetermined level of sewage is significantly exceeded. The level of the opening 80, and thus the sewage level at which overflow starts, can be raised by extending the material of the housing upwards or by providing an extension tube or the like that locates around the opening to raise its upper lip. A blanking plate may also be adapted to attach to seal the overflow opening 80 if that feature is not desired.

Claims

1. A sewer flushing device for location in a sewage system, the device comprising:

a housing (21) having an inlet (31), an outlet (33) and a sewage flow path defined between said inlet and outlet, at least one of the inlet and the outlet being adapted sealingly to connect to a conduit of the sewage system;

a gate (22) pivotally supported on the housing (21) for movement between open and closed positions and having upper (41) and lower (42) ends between which the pivot axis is disposed; and

biasing means in the form of a counter weight (65) supported on a lower portion of the gate (22), and configured to bias the gate to a closed position whereat the flow path is substantially blocked thus causing a build-up of sewage upstream of the gate, the gate being urged towards its open position only when the build-up of sewage reaches a predetermined level thus causing the build-up of sewage to be rapidly released so as to flush the sewage system downstream of the flushing device **characterised in that the**

counterweight is moveable relative to the pivot axis selectively to vary the predefined level of sewage at which the gate moves to its open position.

2. A sewer flushing device as claimed in claim 1 and further including a gate support assembly mounted to the housing and defining one of a pair of lugs or a pair of openings (55) that co-operate with the other of the pair of lugs (54) or the pair of openings provided on the gate.
3. A sewer flushing device as claimed in claim 2, wherein the support assembly comprises a pair of opposed brackets (46), each being mounted on an interior face of the housing.
4. A sewer flushing device as claimed in claim 3, wherein the housing includes a pair of slots (58) formed in the interior face to accommodate the brackets.
5. A sewer flushing device as claimed in any of claims 2 to 4, wherein the gate has opposed edges (40) provided with hinge members being the lugs or the openings.
6. A sewer flushing device as claimed in any preceding claim wherein the housing includes an overflow aperture (80) on an upper portion thereof.
7. A sewer flushing device as claimed in claim 6 and further comprising a cover adapted to close the aperture.
8. A sewer flushing device as claimed in any preceding claim, wherein the housing includes a tubular portion (32) having a free end defining the inlet or the outlet.
9. A sewer flushing device as claimed in claim 8, wherein the tubular portion has an exterior face provided with seals (37) arranged to co-operate with the interior face of the upstream or downstream conduit.
10. A sewer flushing device as claimed in any preceding claim and further comprising attachment means (26) by which the device can be lifted and manoeuvred.

Patentansprüche

1. Kanalspülvorrichtung zum Anordnen in einem Kanalsystem, umfassend:

ein Gehäuse (21) mit einem Einlass (31), einem Auslass (33) und einem zwischen dem Einlass und dem Auslass definierten Abwasserströmungsweg, mindestens einer von Einlass und Auslass ist abdichtend angepasst, um mit einer

- Leitung des Kanalsystems verbunden zu werden;
ein Tor (22), welches schwenkbar an dem Gehäuse (21) gelagert ist, um sich zwischen offenen und geschlossenen Positionen zu bewegen, und mit einem oberen Ende (41) und einem unteren Ende (42), zwischen welchen die Schwenkachse angeordnet ist; und
Vorspannmittel in Form eines Gegengewichts (65), welches an einem unteren Bereich des Tors (22) gelagert ist, und konfiguriert ist, um das Tor in eine geschlossene Position vorzuspannen, in welcher der Strömungsweg im Wesentlichen blockiert ist, was zu einer Ansammlung von Abwasser stromaufwärts des Tors führt, das Tor wird nur dann in seine offene Position gedrängt, wenn die Ansammlung von Abwasser ein vorgegebenes Niveau erreicht, wodurch die Ansammlung von Abwasser schnell freigesetzt wird, um das Abwassersystem stromabwärts der Spülvorrichtung zu spülen, **dadurch gekennzeichnet, dass** das Gegengewicht relativ zu der Schwenkachse selektiv bewegbar ist, um den vordefinierten Abwasserspiegel zu variieren, bei dem sich das Tor in seine offene Position bewegt.
2. Kanalspülvorrichtung nach Anspruch 1, ferner mit einer Torabstützanordnung, welche an dem Gehäuse montiert ist und eine von einem Paar Laschen oder einem Paar Öffnungen (55) definiert, welche mit dem anderen von dem Paar Laschen (54) oder dem Paar Öffnungen zusammenwirken, welche an dem Tor vorgesehen sind.
 3. Kanalspülvorrichtung nach Anspruch 2, wobei die Stützenanordnung ein Paar gegenüberliegender Halter (46) hat, welche jeweils an einer Innenfläche des Gehäuses angebracht sind.
 4. Kanalspülvorrichtung nach Anspruch 3, wobei das Gehäuse ein Paar Steckplätze (58) hat, welche in der Innenfläche ausgebildet sind, um die Halter aufzunehmen.
 5. Kanalspülvorrichtung nach einem der Ansprüche 2 bis 4, wobei das Tor gegenüberliegende Kanten (40) hat, welche Gelenkelemente haben, welche die Laschen oder die Öffnungen sind.
 6. Kanalspülvorrichtung nach einem der vorhergehenden Ansprüche, wobei das Gehäuse an einem oberen Bereich eine Überlauföffnung (80) hat.
 7. Kanalspülvorrichtung nach Anspruch 6, ferner mit einer Abdeckung, welche zum Verschließen der Öffnung geeignet ist.

8. Kanalspülvorrichtung nach einem der vorhergehenden Ansprüche, wobei das Gehäuse einen rohrförmigen Abschnitt (32) mit einem freien Ende hat, welches den Einlass oder den Auslass definiert.
9. Kanalspülvorrichtung nach Anspruch 8, wobei der rohrförmigen Abschnitt eine Außenfläche hat, welche Dichtungen (37) hat, die so angeordnet sind, dass sie mit der Innenfläche der stromaufwärts oder stromabwärts gelegenen Leitung zusammenwirken.
10. Kanalspülvorrichtung nach einem der vorhergehenden Ansprüche, ferner mit Befestigungsmitteln (26), mittels welchen die Vorrichtung angehoben und manövriert werden kann.

Revendications

1. Dispositif de purge pour égout pour être placé dans un système d'égout, le dispositif comprenant:
 - un boîtier (21) ayant une entrée (31), une sortie (33) et un trajet d'écoulement d'eaux usées défini entre lesdites entrée et sortie, au moins l'une des entrée et sortie étant adaptée de manière étanche pour se connecter à un conduit du système d'égout;
 - un portillon (22) supporté de façon pivotante sur le boîtier (21) pour se déplacer entre des positions ouverte et fermée et ayant des extrémités supérieure (41) et inférieure (42) entre lesquelles l'axe de pivotement est disposé; et
 - des moyens de sollicitation sous la forme d'un contrepoids (65) appuyés sur une partie inférieure du portillon (22), et configurés pour solliciter le portillon dans une position fermée dans laquelle le trajet d'écoulement est substantiellement bloqué provoquant ainsi une accumulation d'eaux usées en amont du portillon, le portillon étant poussé vers sa position ouverte uniquement lorsque l'accumulation d'eaux usées atteint un niveau prédéterminé provoquant ainsi la libération rapide des eaux usées afin de purger le système d'égout en aval du dispositif de purge, **caractérisé en ce que** le contrepoids est mobile par rapport à l'axe de pivotement de manière sélective pour faire varier le niveau prédéfini d'eaux usées pour lequel le portillon se déplace dans sa position ouverte.
2. Dispositif de purge pour égout tel que revendiqué dans la revendication 1 et incluant en outre un ensemble formant support du portillon monté sur le boîtier et définissant l'une d'une paire de pattes ou d'une paire d'ouvertures qui coopèrent avec l'autre paire de pattes (54) ou la paire d'ouvertures pourvues sur le portillon.

3. Dispositif de purge pour égout tel que revendiqué dans la revendication 2, dans lequel l'ensemble formant support comprend une paire de supports opposés (46), chacun étant monté sur une face intérieure du boîtier. 5
4. Dispositif de purge pour égout tel que revendiqué dans la revendication 3, dans lequel le boîtier inclut une paire de fentes (58) formées dans la face intérieure pour recevoir les supports. 10
5. Dispositif de purge pour égout tel que revendiqué dans l'une quelconque des revendications 2 à 4, dans lequel le portillon a des bords opposés (40) pourvus d'éléments de charnière définissant l'autre des pattes et des ouvertures. 15
6. Dispositif de purge pour égout tel que revendiqué dans l'une quelconque des revendications précédentes dans lequel le boîtier inclut une ouverture de trop-plein (80) sur une partie supérieure de celui-ci. 20
7. Dispositif de purge pour égout tel que revendiqué dans la revendication 6 et comprenant en outre un couvercle adapté pour fermer l'ouverture. 25
8. Dispositif de purge pour égout tel que revendiqué dans l'une quelconque des revendications précédentes, dans lequel le boîtier inclut une partie tubulaire (32) ayant une extrémité libre définissant l'entrée ou la sortie. 30
9. Dispositif de purge pour égout tel que revendiqué dans la revendication 8, dans lequel la partie tubulaire comporte une face extérieure pourvue de joints d'étanchéité (37) agencés pour coopérer avec la face intérieure du conduit amont ou aval. 35
10. Dispositif de purge pour égout tel que revendiqué dans l'une quelconque des revendications précédentes et comprenant en outre des moyens de fixation (26) par lesquels le dispositif peut être soulevé et manoeuvré. 40

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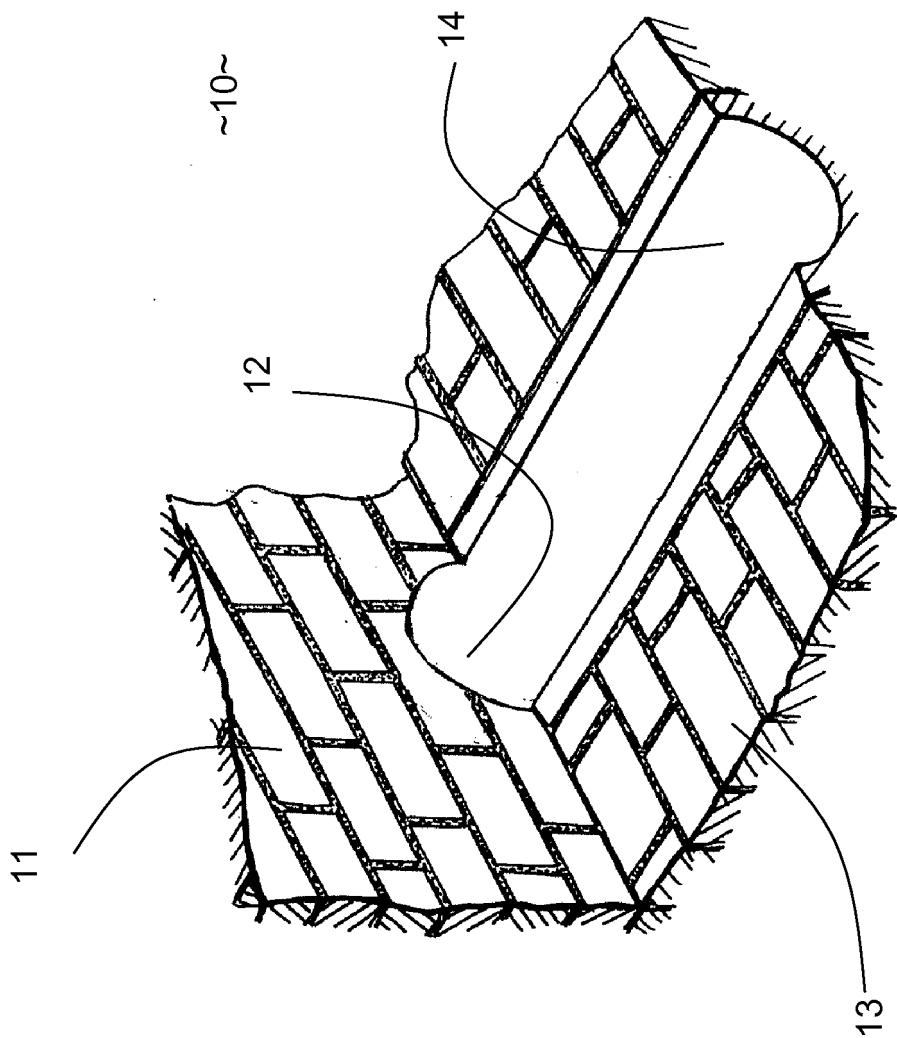


FIG. 1

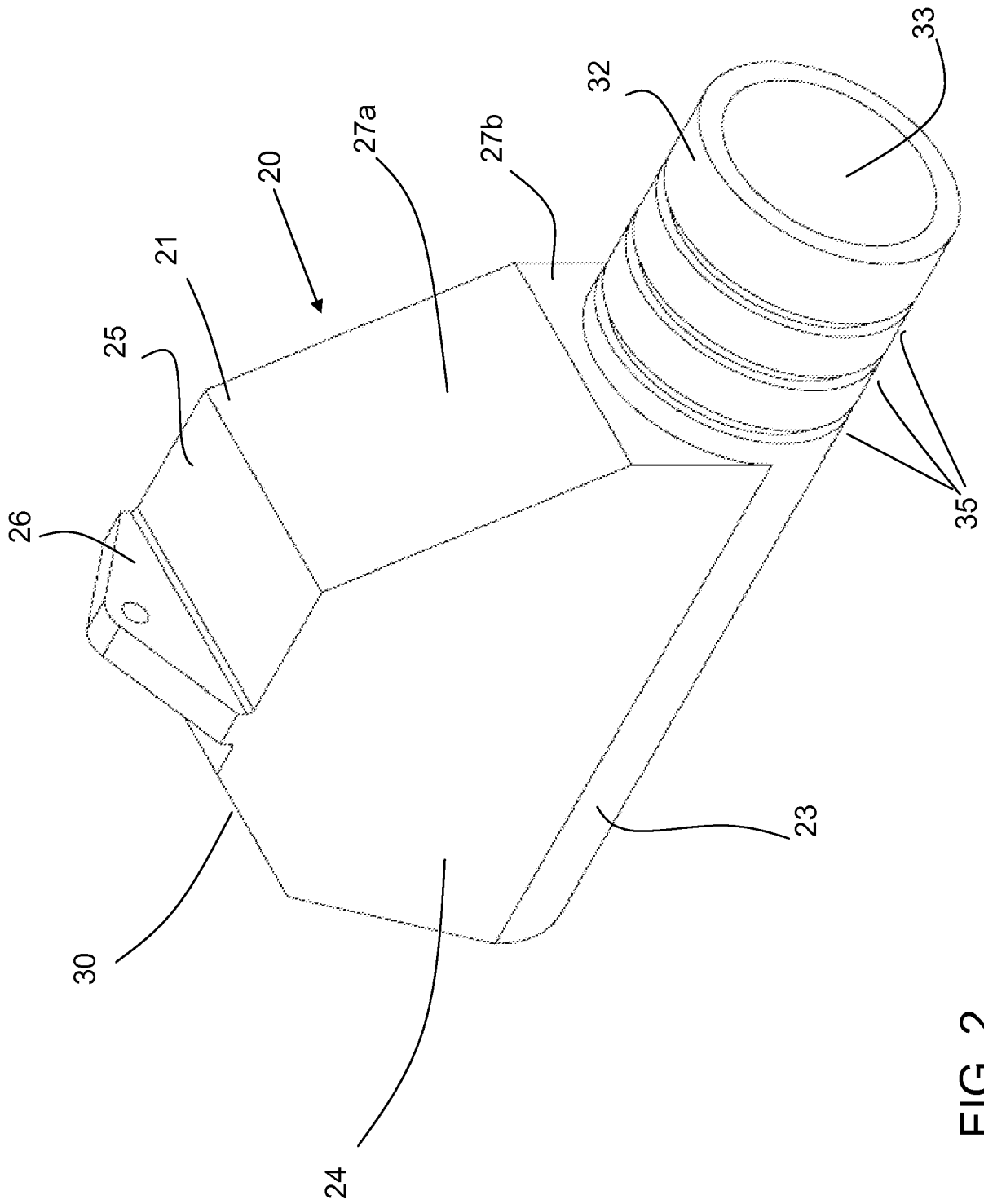


FIG. 2

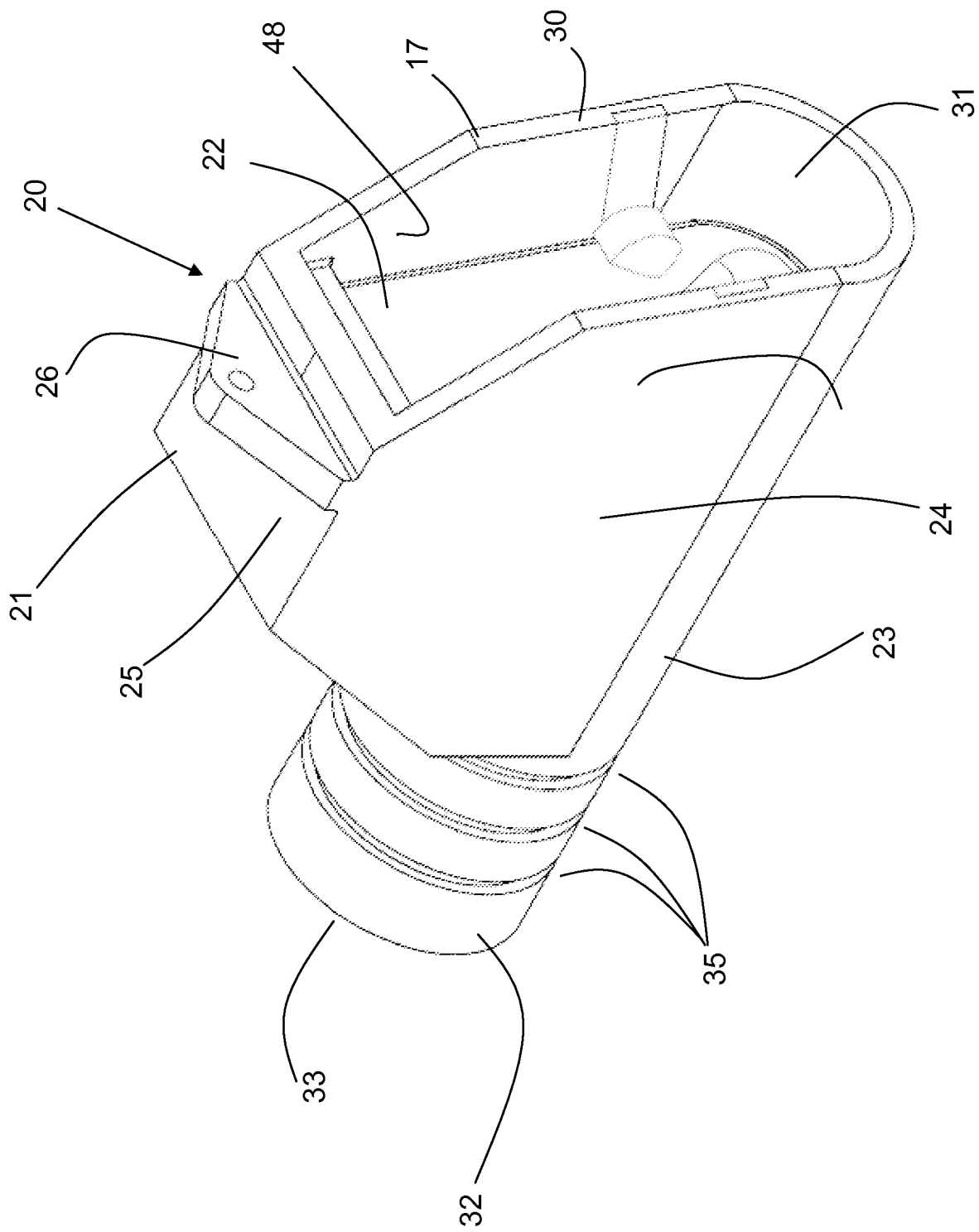


FIG. 3

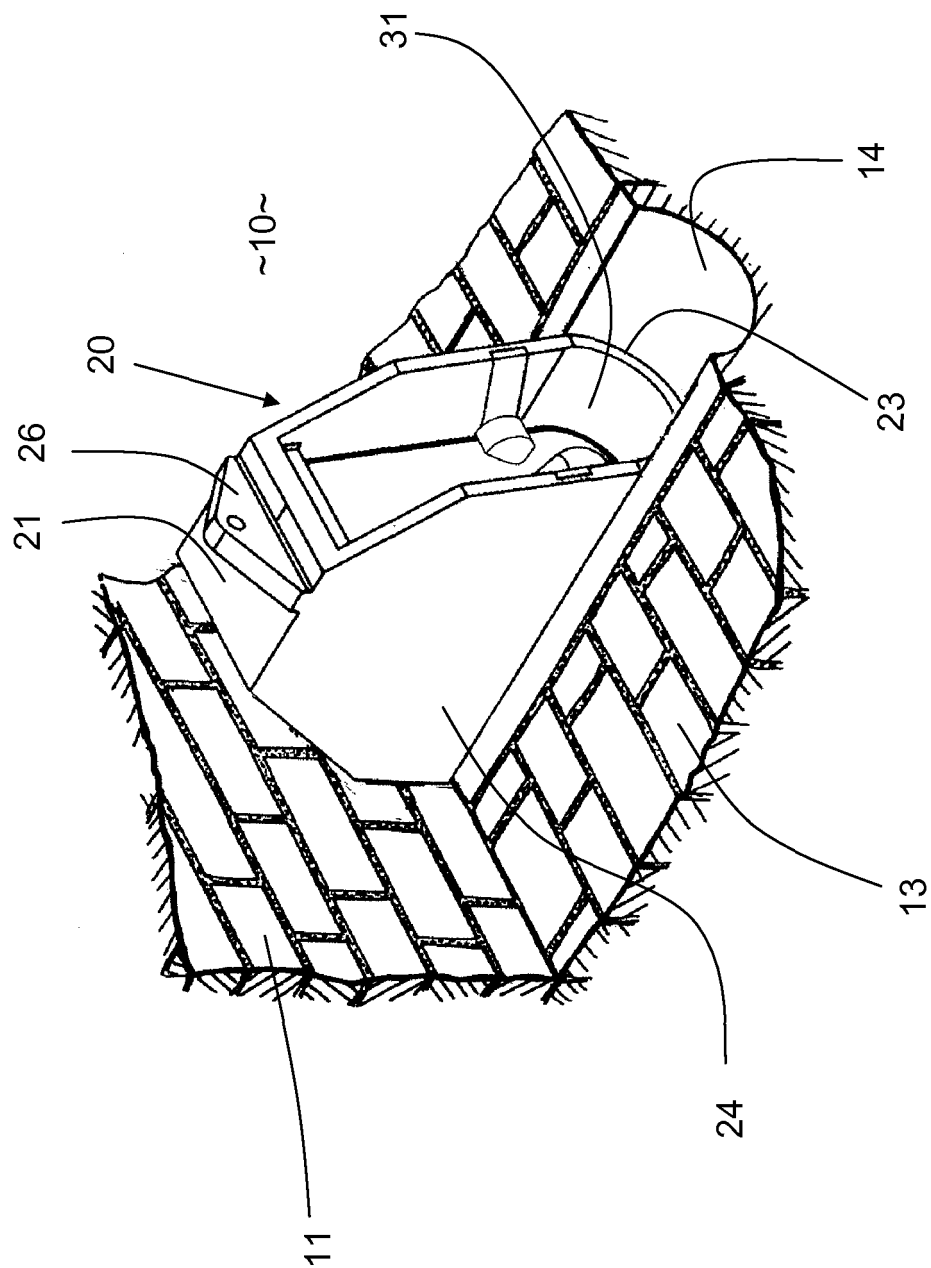


FIG. 4

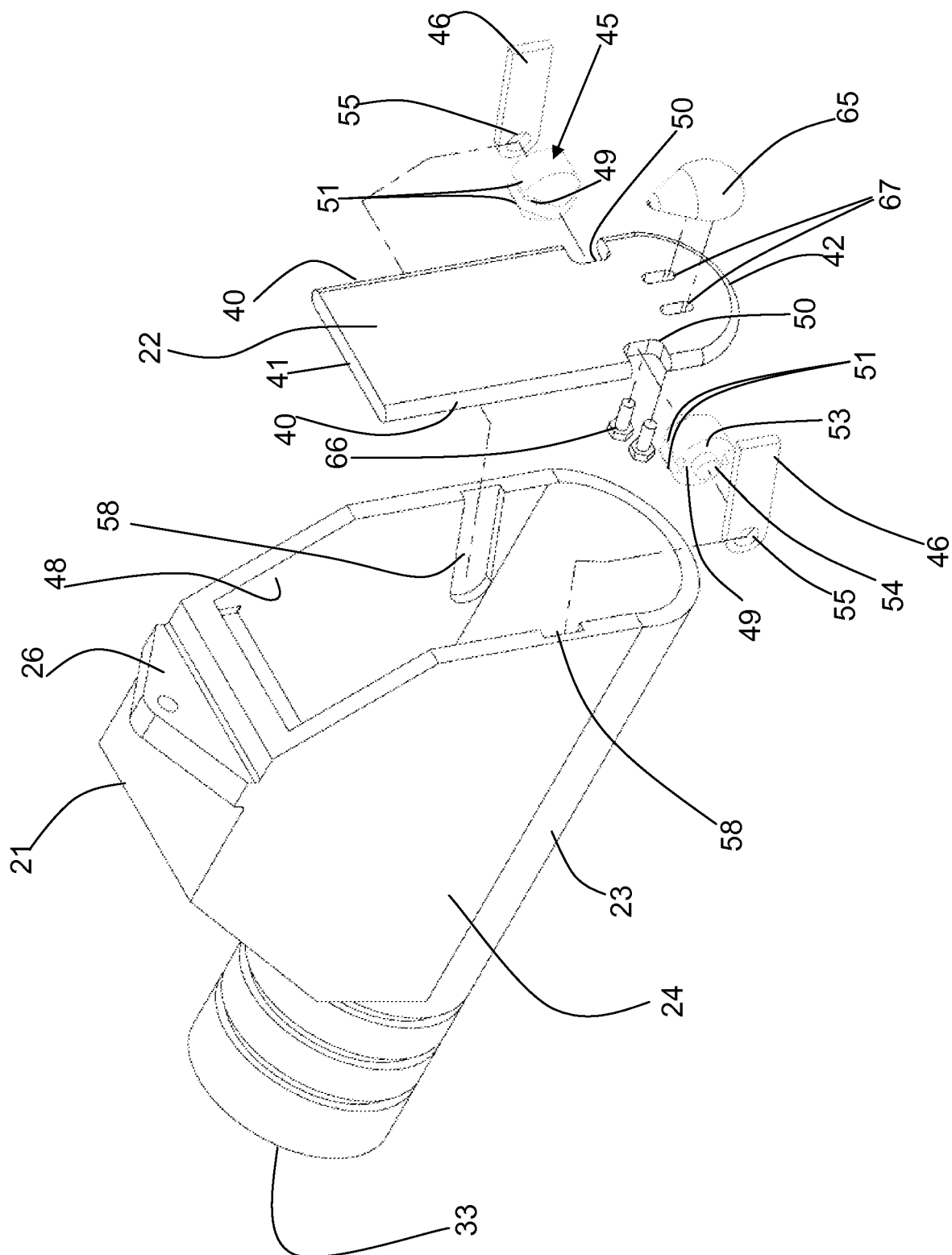


FIG. 5

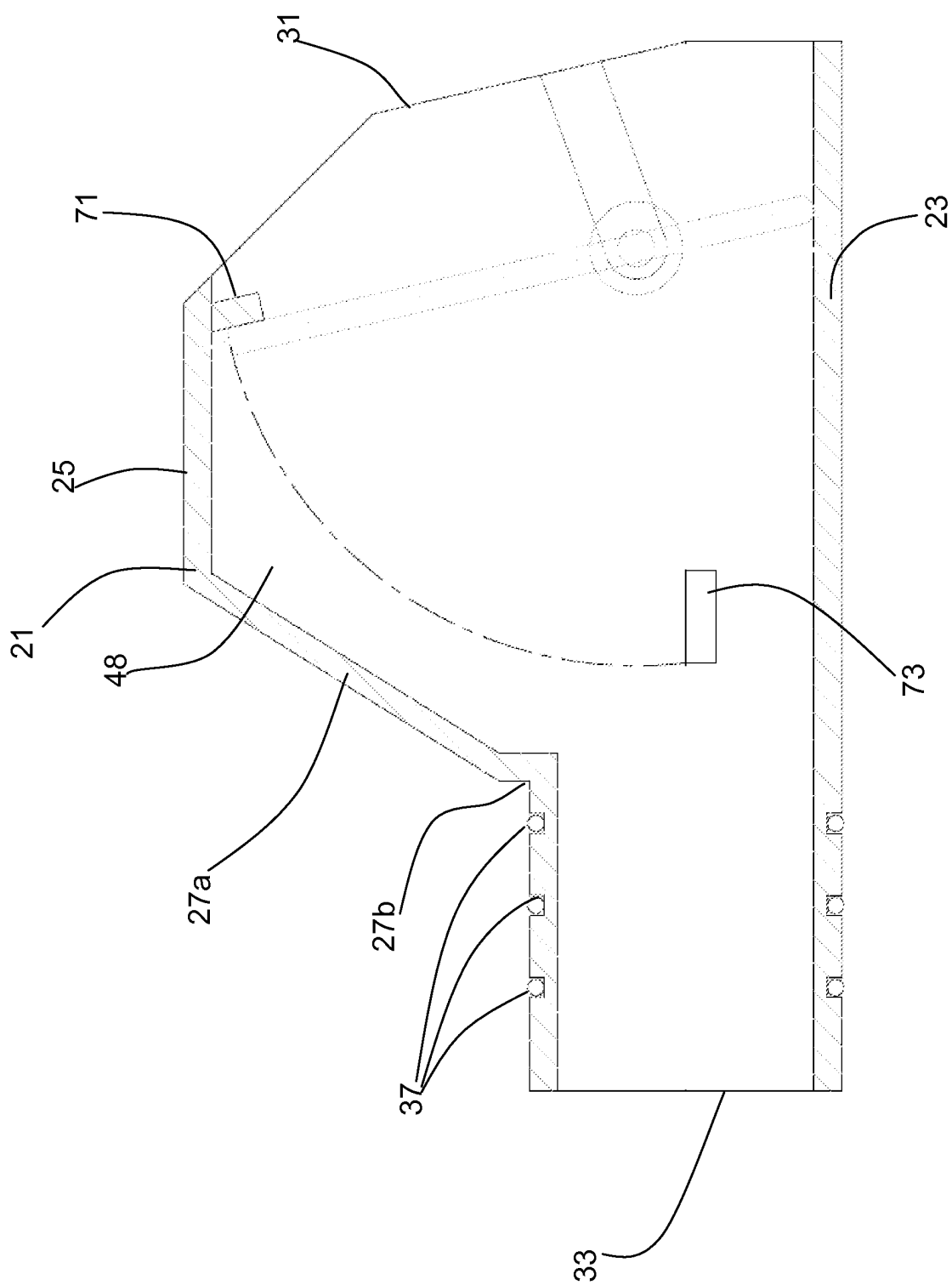


FIG. 6

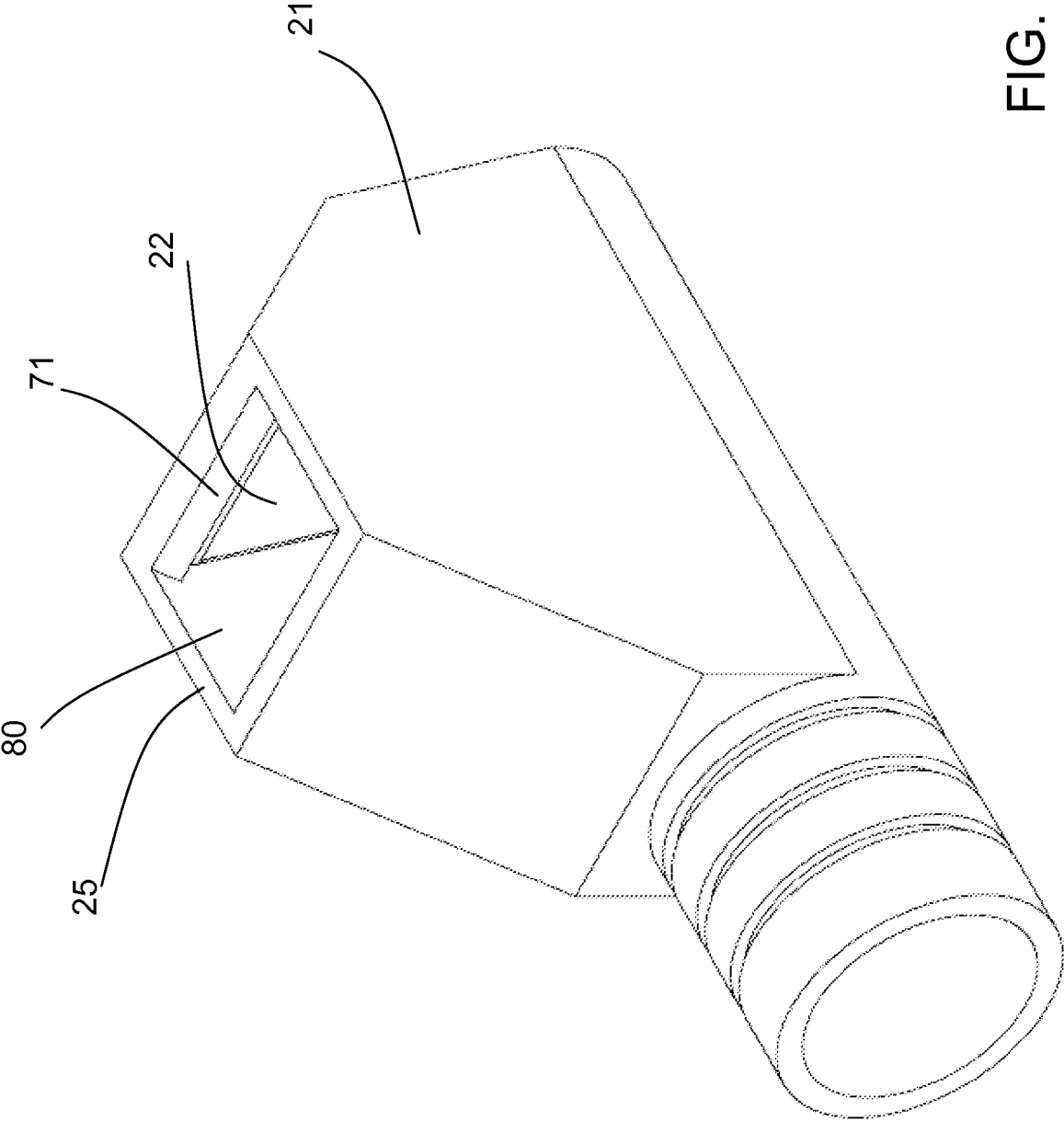


FIG. 7

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 575527 [0005]
- DE 102005029520 [0005]
- US 2006081292 A [0005]
- WO 2009141638 A [0005]