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(54) **AN APPARATUS FOR THE SHREDDING AND PUMPING OF SEWAGE AND WASTE WATER PROVIDED WITH IMMERSION ENGINE**

VORRICHTUNG ZUM ZERFASERN UND PUMPEN VON SCHMUTZWASSER UND ABWASSER
MIT EINEM TAUCHMOTOR

APPAREIL DE BROyage ET DE POMPAGE D'EAUX D'ÉGOUT ET D'EAUX USÉES DOTÉ D'UN
MOTEUR IMMERGÉ

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(72) Inventors:

- **Di Battista, Vittorio**
01033 Civita Castellana (VT) (IT)
- **Traversari, Carmela**
01015 Sutri (VT) (IT)

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(74) Representative: **Emmi, Mario et al**

Studio Brevetti Turini Srl
Viale Matteotti, 25
50121 Firenze (FI) (IT)

(73) Proprietors:

- **Di Battista, Vittorio**
01033 Civita Castellana (VT) (IT)
- **Traversari, Carmela**
01015 Sutri (VT) (IT)

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Description

Technical field

[0001] The present invention refers to the technical field relative to the apparatus for the shredding and pumping of sewage and waste water that function with an immersion engine.

[0002] In particular, the invention refers to an innovative apparatus which is configured to allow a quick and easy access to the internal components, in particular to the shredding chamber, in order to free it in case of obstruction or clogging due to foreign bodies.

Background art

[0003] Apparatus for the shredding and pumping of sewage and waste water with immersion engine have long been known.

[0004] These apparatus are installed in proximity of WC and other utilities, such as showers, washbasins and bidets, so that they can shred all the solid waste transported by the waste water that is carried inside them. In this way, a sort of pre-treatment of the sewage takes place before it enters the common drainage system.

[0005] Such apparatus, well known and commercialized from time, comprise a containment box into which the sewage is carried (both waste water and sewage) coming from the different utilities (for example the WC, the bidet, the shower, etc). The size of the box is such that it can be easily placed behind the WC in proximity of the drainage of it. The connection to said drainage of the WC takes place through an opening placed on a side of the box itself and provided with a fastening attachment. The box has generally a box-like shape very similar to that of the containment boxes of the drainage water of the WC, therefore of the rectangular or trapezoidal type. The box of said apparatus is placed in proximity of the ground behind the drainage system of the WC and with said opening that faces the drainage itself, so as to realize a first connection. The rectangular shape allows its easy insertion in a small space. Inside the box an immersion engine is foreseen, for example an electric one, which foresees in its inferior part an impeller that serves as a pump when it is conducted in rotation. The superior part of the engine terminates instead into a shredding chamber that faces the opening of connection to the WC. The shredding chamber foresees a rotatable blade operated by the engine. The operation of the engine makes, on the one hand, that the impeller creates a depression that carries the liquid contained in the box towards an external drainage while, at the same time, also the blade placed in the shredding chamber is conducted in rotation.

[0006] Basically, the connection to the WC is such as to carry the sewage directly inside the shredding chamber where the faeces and/or the toilet paper are shredded through the action of rotation of the blade before mixing with the other liquid (waste water) injected in the box.

The liquid containing the shredded refuse mixes with the other liquid contained in the box and coming from the other utilities (shower, bidet, etc.). The effect of depression generated by the impeller placed in the inferior zone of the engine pushes all the liquid contained in the box towards a drain opening that terminates with an appropriate conduit external to the box to the drainage system.

[0007] As said above, the other utilities of waste water enter directly in the box and not in the shredding chamber since they generally lack solid bodies. All the liquid contained in the box is pushed towards the outside through the action of suction generated by the impeller.

[0008] In accordance with the background art described, the attachments to the box of the utilities of waste water (therefore washbasins, bidets, showers, etc.) take place with fastening attachments placed on the body of the box. The drainage of the water treated and collected in the box is instead placed exactly on the lid. Basically, the conduit arranged internally to the box, and that carries the liquids contained in it towards the outside, is connected exactly to the lid itself. For that reason, externally to the lid, it carries also the external drain pipe that takes to the domestic drainage system.

[0009] It is therefore clear that a solution that foresees fastening attachments of any type placed on the lid (but also eventual delivery attachments) renders significantly complicated all the operations of maintenance that are deemed necessary during the operative life of the apparatus.

[0010] It is in fact possible that the rotatable blade gets clogged or blocked in the shredding chamber due to the fact that in the WC solid bodies have been improperly discharged, such as pieces of plastic envelopes or other types of material. In this case an intervention that requires an access to the box is necessary, therefore removing the lid. To do this, and before removing the lid, it is necessary to disconnect all the delivery/drainage pipes that converge to it. The whole causes a significant waste of time and, above all, causes inconveniences to the user since the disconnection of conduits always implies a leakage of liquid that falls onto the floor.

[0011] The alternative solution would be that of removing the whole box disconnecting it from the WC and leaving the lid in position but it is clear that also this solution is clearly not easy to put into practice, as in the case of the preceding one.

[0012] DE-A-34 42 565 discloses an apparatus for the treatment of sewage according to the preamble of claim 1. 5

Disclosure of invention

[0013] It is therefore the aim of the present invention to provide an apparatus for shredding with immersion engine that solves at least in part said inconveniences.

[0014] In particular, it is the aim of the present invention to provide an apparatus that allows an easy access to the engine placed in the box without requiring the removal

of delivery/drain pipes or, least of all, without requiring the disassembly of box from the WC.

[0015] These and other aims are therefore reached with the present apparatus 1 for the treatment of sewage coming from one or more external utilities, in accordance with claim 1.

[0016] The apparatus (1) subject of the invention comprises:

- A box (2) for collecting the sewage coming from said external utilities;
- A lid (3) for closing the box;
- An apparatus for the shredding/pumping (100) of the sewage arranged inside the box (2) so as to shred the sewage coming from at least one of said external utilities and pump all the sewage carried in the box (2) towards the outside;
- A drain pipe (117, 17, 17', 17'', 17''') is further foreseen connected to said apparatus (100) to drain the sewage contained in it towards the outside of the box (2);

[0017] In accordance with the invention, the drain pipe (117, 17, 17', 17'', 17''') faces the outside of the box through one or more drainage holes (27, 25) directly placed in the body of the box (2).

[0018] In this way, the lid (3) can be realized lacking any opening configured to connect one or more drain pipes of sewage or the entry of it in the box.

[0019] There is no need anymore of drainage pipes that ends on the lid.

[0020] According to the invention, therefore, it is now possible to easily access to the internal components for eventual operations of maintenance by simply removing the lid in a quick and simple way.

[0021] Further advantages can be deduced from the dependent claims.

Brief description of drawings

[0022] Further characteristics and advantages of the present invention will result clearer with the description that follows of some embodiments, made to illustrate but not to limit, with reference to the annexed drawings, wherein:

- Figure 1 shows an apparatus 1 in accordance with the present invention;
- Figure 2 shows a top view in order to show some internal components of the box;
- Figure 3 shows a top view of the lid;
- Figures 4 and 5 show a lateral and front view of the apparatus 100 for shredding/sucking;
- Figure 6, in a front view, shows in detail the engine, the shredding blade and the drain pipe;
- Figure 7, always in a top view, shows the same components of figure 6;
- Figure 8 shows in an axonometric view the drain

pipe.

Description of some preferred embodiments

[0023] Figure 1 shows in a first axonometric view an apparatus 1 in accordance with the invention.

[0024] The apparatus foresees a box 2, which forms inside it a containment volume to contain both the sewage that conveys in it and the different mechanical components for the treatment of the sewage.

[0025] The apparatus, as per the background art, is therefore arranged in such a way as to be an element interposed between the various possible utilities and a drain that carries the sewage in the common drainage system.

[0026] The superior part of the box 2 is closed by a lid 3 of the removable type so as to allow an easy access to the internal volume and therefore to its components arranged in it.

[0027] The lid 3 can therefore be fixed to the box through fastening attachments, well known in the state of the art, such as hooks, joint clips or by simple mechanical interference. Alternatively, the lid could also be simply leant in a loose way.

[0028] Figure 3 shows, in a top view, just the lid separated from the box. The figure shows how the lid lacks openings for the connection of specific conduits both of entry and exit of fluid.

[0029] This, as better described in detail below, allows an easy removal of the lid itself and therefore an easy access to the internal volume of the box during any maintenance operation.

[0030] The only opening present in the lid 3 is highlighted in figure 3 with number 40. Such an opening 40 is just a normal air valve, already present in lids of similar apparatus, which allows the flowing of the air present inside the box when it initiates to get filled with sewage to be treated. Being said valve well known in the state of the art, it will not be further described in detail here.

[0031] Figure 2 shows a top view of the box lacking the lid so as to highlight in part some of its components arranged inside the containment volume and described below. In particular, a first entry opening 10 is highlighted, which is arranged on the front face 2' of the box 2.

[0032] The box obviously foresees also a back face (2'') and two sides (2''') and (2''') that together with the front face conform said box and delimit the internal volume.

[0033] The opening 10 therefore creates a first access to the internal volume of the box. This entry opening 10 is the main one and is destined to the direct connection to the drain of the WC.

[0034] To this aim, said entry opening 10 ends, through a connection conduit 11, to a shredding chamber 12. In this way, the sewage directly coming from the drain of the WC, that is the liquid containing the solid bodies, such as faeces and/or toilet paper, enters into the shredding chamber where it is appropriately shredded before being

sent towards the external drainage system.

[0035] Figures 4 and 5 extrapolate the apparatus 100 for shredding/aspiration of the sewage and described in detail right below.

[0036] In particular, in the lateral view of figure 4, said connection 11 is highlighted that carries the sewage in entry from the WC towards the shredding chamber 12 where it is appropriately shredded. The chamber 12 foresees a plurality of holes 13 so that all the solid parts crumbled and mixed in the liquid can normally deflow outside the shredding chamber 12, mixing with the remaining liquid (generally waster water) carried into the box 2.

[0037] The same shredding centrifugal force allows the exit of the liquid containing the crumbled solid parts.

[0038] Figure 5, in a front view, shows the rotatable blade 14 (rotatable around the vertical axis 14' of figure 7) placed inside.

[0039] The underlying part 15, as shown both in figure 5 and in figure 6, lodges the electric engine responsible for the rotation of the blade 14 into an appropriate containment carter 15.

[0040] The same electric engine operates, as per the state of the art, a fan always lodged in said underlying part 15 and that generates a depression that channels the fluid contained in the box towards the outside.

[0041] In particular, the part 15 has an entry opening that forms a passage conduit through which the sewage contained in the box is sucked to be expelled towards the outside. The figure does not show this opening where the impeller is also lodged because it is well known in the state of the art and it is not the subject of the present invention.

[0042] The fan, or impeller for that matter, pushes the fluid inside the part 15 in an appropriate conduit that terminates with the part of conduit 16.

[0043] Figure 7 from the top shows very well both the conduit 16, which extends on the right of the carter 15 of lodging of the engine (defined precisely as inferior part 15), and the conduit 16' placed on the left.

[0044] In accordance with the invention, these parts of conduit 16 or 16' serve for connecting in an exchangeable way, and therefore removable, an appropriate drain pipe (117, 17, 17', 17'', 17''').

[0045] As shown in figure 8, the drain pipe has the shape of a cross and foresees a curved inferior part 117 that connects, in an exchangeable way, either to the conduit 16 or to the conduit 16'. It is also foreseen a rectilinear section 17, provided inside it with a non-return valve 35, which terminates with a superior cross joint.

[0046] The different parts are preferably separable among them but the conduit could also be realized in a single piece.

[0047] The valve 35 is of the "clapet" type and is well known in the state of the art. This type of valve is structured in such a way as to translate upwards after the pressure exercised by the flow in exit along the drain pipe and is repositioned in closing position when the push pressure falls under a pre-established threshold value.

[0048] The superior cross joint foresees a horizontal pipe (17', 17'') and a vertical section 17''. The horizontal section, being an open conduit on both sides, terminates with two exit holes of the liquid, while the vertical section is curved and presents an exit for the liquid.

[0049] This removable drainage system is shown in figure 6 and in figure 7 when assembled to the conduit 16. In this way (see always figure 6), the conduit 17' passes through an appropriate hole placed on the side (2'') of the box 2, while the conduit 17'' passes through an appropriate hole placed always in the box on the back face (2'''). These conduits are connected to a drainage through a common external connection pipe, while the conduit 17''', in this case, is closed by an appropriate plug to avoid the pouring inside the box.

[0050] Figure 1, just for clarity purposes, shows the passage of said conduits 17' and 17'' through the box.

[0051] As shown in figure 2, the holes 27 and 25 are placed in a perfectly symmetrical way with respect to the preceding ones where the conduits 17' and 17'' pass. The conduit 16' is symmetrical to the conduit 16 as well. This makes that the drain pipe can be detached from the conduit 16 to be inverted and assembled on the left on the conduit 16' and, this time, with the conduit 17''' that passes through the hole 27 of the side 2''' and the curved conduit 17'' that passes through the other hole 25 on the same side 2'''.

[0052] This versatility renders significantly simplified all the assembly of the apparatus since it allows to prevent different possible positionings of the drainages in the rooms where it is assembled. Depending on where the drainage is positioned, the drain pipe can be freely positioned in different positions inside the box.

[0053] In accordance with said invention, above all, it is not necessary anymore that the lid 3 is furnished with openings to which the drain pipe is hooked, rendering it now easily removable and therefore rendering the access to the internal components easy.

[0054] Going on with the description, figure 7 shows an hermetic container 18 to avoid any water infiltration, and that contains the electric components that serve to the functioning of the engine lodged, as said, in the seat 15 of figure 6.

[0055] In particular, the container 18 foresees a pressure switch which controls the operation of the engine when the quantity of liquid contained in the box exceeds a certain threshold (therefore registers a pressure increase).

[0056] Figure 2 shows an opening 24 in the box 2 that could be realized in any other convenient part and serves only for the passage of the electric feeding wires of the engine and of the other components contained in the container 18.

[0057] Always figure 2 shows an opening that is the one that lodges a manual operating button of the electric engine (button that manually controls the electric components always present in the box 18). It could be in fact necessary the operation of the engine also in conditions

wherein there is no liquid in the box.

[0058] The holes 21, 22 and 23 present in figure 1 and highlighted also in figure 7 are the holes for the attachment to other utilities such as a shower, a washbasin, a bidet, etc. A further hole coaxial to the hole 23 is present also on the opposite side. These holes can be placed in different positions and can also be in a different number but the low position favours the deflow of the liquid by gravity.

[0059] It is then highlighted in figure 1 the opening 19 which can be closed by a plug 20 represented in figure 7 instead. This opening 19 serves for emptying the box, in the case for example of a maintenance intervention, inserting in the plug 20, of the knock out type, the end needle of a collection bag of the sewage, well known in the state of the art and not described further here.

[0060] Always figure 7 shows a plug 20' identical to the preceding one and that obstructs a symmetrical hole placed on the opposite part to the preceding one, in such a way that there is the possibility of choosing also on what side to make the emptying.

[0061] In use, therefore, the assembly of the apparatus is arranged by placing it behind the WC in such a way that the drainage of it is inserted and connected to the opening 10.

[0062] All the other utilities (one or more than one) are connected through all the other openings present (21, 22, 23).

[0063] These openings can be advantageously threaded to favour a screwing of the pipe terminals and the screwing of plugs in case that one or more of said holes is not used. The connection with screwing by means of threading guarantees a good hold but, it can be obviously substituted by a hole without threading.

[0064] At the moment of the installation the side where to place the drain pipe (117, 17, 17', 17'', 17'''), that is whether to connect it on the part of the conduit 16 or on the part of the conduit 16', can be chosen.

[0065] This will depend on where the drainage spot in the drainage system is positioned in the room.

[0066] More conduits (16, 16') and more holes of the box can be arranged in such a way as to allow two or more positionings of the drain pipe in the box.

[0067] At this point, thanks not only to the fact that the drain pipe is removable but above all that it is internal to the box and converges towards it, the lid is now free from any pipe or conduit that carries liquid from a utility towards the box or from the box towards the drainage system.

[0068] In this way, after the need of a maintenance intervention, the removal of the lid can take place in a simple way to have access to the internal components.

[0069] In the present description, by the term sewage is meant in a generic sense a mix of liquid with solid parts which are then treated, that is shredded, getting mixed and remaining present in the liquid.

[0070] By the term waste water, as it is well known, is meant liquids lacking faeces and/or toilet paper, while sewage contains the faecal solid parts and/or toilet paper

to be treated through shredding.

Claims

1. An apparatus (1) for the treatment of sewage coming from one or more external utilities and comprising:

- A box (2) for collecting sewage coming from said one or more external utilities, said box having a first entry opening (10), said first entry opening (10) creating a first access to the internal volume of the box (2) and being destined to the direct connection to the drain of a WC;
- A lid (3) for closing the box;
- An apparatus for the shredding and pumping (100) of the sewage arranged inside the box (2) so as to shred the sewage coming from at least the WC and push all the sewage carried in the box (2) towards the outside;
- A drain pipe (117, 17, 17', 17'', 17''') installed into the box and connected to said apparatus (100) for the shredding and pumping, for draining towards the outside of the box (2) the sewage contained in the box (2); said drain pipe (117, 17, 17', 17'', 17''') terminating outside the box (2) through one or more drain holes (27, 25) directly placed in the body of the box (2), the drain pipe being assembled in a removable way, **characterized in that** the apparatus for the shredding and pumping (100) of the sewage comprises a shredding chamber (12); said first entry opening (10) being connected through a connection conduit (11) to said shredding chamber (12); the apparatus for the shredding and pumping (100) of the sewage comprising at least two attachments (16, 16') for connection of the drain pipe (117, 17, 17', 17'', 17'''), and the box foreseeing more than one drain holes (27, 25) arranged so that the drain pipe results being placeable inside the box in two or more different positions.

2. An apparatus (1), according to claim 1, wherein the attachments (16, 16') and the holes (27, 25) are placed so that the drain pipe can be applied indifferently on two diametrically opposed positions of the box.

3. An apparatus (1), according to claim 1 or 2, wherein two holes (25) are foreseen placed symmetrically on the face (2''') of the box and two holes (27) found respectively one on the side (2'') and the other one on the side (2'') and coaxial between them.

4. An apparatus (1), according to claim 3, wherein the drain pipe has the shape of a cross and foresees a horizontal section (17''', 17') joined to a vertical section (17'') so that an end (17', 17''') of the horizontal

section can be inserted in a hole found on a side (2", 2'") of the box and when the position changes the other horizontal section (17', 17'") is inserted in the hole found on the opposite side (2", 2'").

5. An apparatus (1), according to claim 4, wherein the vertical section (17'") is curved so as to converge towards the hole found on the back side (2'") of the box.
6. An apparatus (1), according to one or more of the preceding claims, wherein the drain pipe foresees a non-return valve (35).
7. An apparatus (1), according to one or more of the preceding claims from 1 to 6, wherein the drain pipe is composed of parts (117, 17, 17', 17'") that can be disassembled among them.
8. An apparatus (1), according to one or more of the preceding claims from 1 to 6, wherein the drain pipe is a single piece.
9. An apparatus (1), according to one or more of the preceding claims, wherein the drain pipe is realized in a plastic material by moulding or die casting.
10. An apparatus (1), according to claim 1, wherein the lid (3) foresees an air opening (40) for the air.

Patentansprüche

1. Vorrichtung (1) für die Behandlung von Abwasser, das von einer oder mehreren externen Nutzereinrichtungen kommt, die Folgendes umfasst:
 - einen Kasten (2) für das Sammeln von Abwasser, das von einer oder mehreren externen Nutzereinrichtungen kommt, wobei der Kasten eine erste Eintrittsöffnung (10) aufweist und diese erste Eintrittsöffnung (10) einen ersten Zugang zu dem Innenvolumen des Kastens (2) bildet und zur direkten Anbindung an den Abfluss eines WCs bestimmt ist;
 - einen Deckel (3) zum Verschließen des Kastens;
 - eine im Inneren des Kastens (2) angeordnete Vorrichtung für das Zerkleinern und Pumpen (100) des Abwassers, um das zumindest vom WC kommende Abwasser zu zerkleinern und das gesamte im Kasten (2) geleitete Abwasser nach außen zu schieben;
 - eine Ablaufleitung (117, 17, 17', 17'"), die in dem Kasten eingebaut ist und an der Vorrichtung (100) für das Zerkleinern und Pumpen angeschlossen ist, um das im Kasten (2) enthaltene Abwasser in Richtung der Außenseite des

Kastens (2) abzuleiten;

wobei die Ablaufleitung (117, 17, 17', 17'") außerhalb des Kastens (2) durch eines oder mehrere direkt im Gehäuse des Kastens (2) angebrachte Ablauflöcher (27, 25) endet und die Ablaufleitung in einer abnehmbaren Weise montiert ist, **dadurch gekennzeichnet, dass** die Vorrichtung für das Zerkleinern und Pumpen (100) des Abwassers eine Zerkleinerungskammer (12) umfasst, wobei die erste Eintrittsöffnung (10) durch eine Anschlussleitung (11) mit der Zerkleinerungskammer (12) verbunden ist; die Vorrichtung für das Zerkleinern und Pumpen (100) des Abwassers umfasst mindestens zwei Befestigungen (16, 16') für den Anschluss der Ablaufleitung (117, 17, 17', 17'"), und der Kasten sieht mehr als ein Ablaufloch (27, 25) vor, die so angeordnet sind, dass die Ablaufleitung innerhalb des Kastens in zwei oder mehreren verschiedenen Positionen anbringbar ist.

2. Vorrichtung (1) nach Anspruch 1, wobei die Befestigungen (16, 16') und die Löcher (27, 25) so angeordnet sind, dass die Ablaufleitung wahlweise an zwei diametral entgegengesetzten Positionen des Kastens angebracht werden kann.
3. Vorrichtung (1) nach Anspruch 1 oder 2, bei der zwei Löcher (25) symmetrisch an der Seitenfläche (2'") des Kastens angeordnet vorgesehen sind und sich zwei Löcher (27) befinden, jeweils eines auf der Seite (2'") und das andere auf der Seite (2"), mit einer gemeinsamen Achse dazwischen.
4. Vorrichtung (1) nach Anspruch 3, wobei die Ablaufleitung die Form eines Kreuzes aufweist und einen horizontalen Abschnitt (17'") vorsieht, der mit einem vertikalen Abschnitt (17'") verbunden ist, so dass ein Ende (17', 17'") des horizontalen Abschnitts in ein auf einer Seite (2", 2'") des Kastens befindliches Loch eingefügt werden kann, und wenn die Position wechselt, wird der andere horizontale Abschnitt (17', 17'") in das auf der gegenüberliegenden Seite befindliche Loch eingefügt (2", 2'").
5. Vorrichtung (1) nach Anspruch 4, wobei der vertikale Abschnitt (17'") gekrümmt ist, um in Richtung des auf der Rückseite (2'") des Kastens befindlichen Lochs zusammenzulaufen.
6. Vorrichtung (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei die Ablaufleitung ein Rückschlagventil vorsieht.
7. Vorrichtung (1) nach einem oder mehreren der vorhergehenden Ansprüche 1 bis 6, wobei die Ablaufleitung aus Teilen (117, 17, 17', 17'") besteht, die untereinander demontiert werden können.

8. Vorrichtung (1) nach einem oder mehreren der vorhergehenden Ansprüche 1 bis 6, wobei die Ablaufleitung ein einzelnes Stück ist.
9. Vorrichtung (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei die Ablaufleitung aus einem Kunststoffmaterial durch Formen oder Druckguss ausgeführt ist.
10. Vorrichtung (1) nach Anspruch 1, wobei der Deckel (3) eine Luftöffnung (40) für die Luft vorsieht.

Revendications

1. Appareil (1) pour le traitement des eaux usées provenant d'une ou de plusieurs installations externes et comprenant :

- un boîtier (2) pour collecter les eaux usées provenant desdits une ou plusieurs installations externes, ledit boîtier possédant une première ouverture d'entrée (10), ladite ouverture d'entrée (10) offrant un premier accès au volume interne du boîtier (2) et étant destinée au raccordement direct au système de vidange d'un WC ;

- un couvercle (3) pour fermer le boîtier ;

- un appareil de déchiquetage et de pompage (100) des eaux usées, installé à l'intérieur du boîtier (2) afin de déchiqeter les eaux usées provenant au moins du WC et de pousser toutes les eaux usées contenues dans le boîtier (2) vers l'extérieur ;

- un tuyau de vidange (117, 17, 17', 17", 17'''), installé dans le boîtier et raccordé audit appareil (100) pour le déchiquetage et le pompage, pour vidanger vers l'extérieur du boîtier (2) les eaux usées contenues dans le boîtier (2) ;

ledit tuyau de vidange (117, 17, 17', 17", 17''') ayant son extrémité placée à l'extérieur du boîtier (2) et traversant un ou plusieurs trous de vidange (27, 25) placés directement dans le corps du boîtier (2), le tuyau de vidange étant assemblé de manière amovible, **caractérisé en ce que** l'appareil de déchiquetage et de pompage (100) des eaux usées comprend une chambre de déchiquetage (12), ladite première ouverture d'entrée (10) étant raccordée, via un conduit de raccordement (11), à ladite chambre de déchiquetage (12) ;

l'appareil de déchiquetage et de pompage (100) des eaux usées comprend au moins deux dispositifs de fixation (16, 16') pour le raccordement du tuyau de vidange (117, 17, 17', 17", 17''') et le boîtier prévoyant d'accueillir plusieurs trous de vidange (27, 25), disposés de manière à ce que les résidus du tuyau de vidange puissent

être placés à l'intérieur du boîtier dans deux ou plusieurs positions.

2. Appareil (1), selon la revendication 1, dans lequel les dispositifs de fixation (16, 16') et les trous (27, 25) sont positionnés de manière à ce que le tuyau de vidange puisse être placé indifféremment dans deux positions du boîtier diamétralement opposées.
3. Appareil (1), selon la revendication 1 ou 2, dans lequel deux trous (25) sont destinés à être placés de manière symétrique sur la face (2''') du boîtier et deux trous (27) se trouvent respectivement l'un sur le côté (2'') et l'autre sur le côté (2'') et de manière coaxiale l'un par rapport à l'autre.
4. Appareil (1), selon la revendication 3, dans lequel le tuyau de vidange est en forme de croix et prévoit une section horizontale (17'', 17') raccordée à une section verticale (17'') de sorte qu'une extrémité (17', 17'') de la section horizontale puisse être insérée dans un trou percé sur un côté (2'', 2'') du boîtier et, au changement de position, l'autre section horizontale (17', 17'') puisse être insérée dans le trou percé sur le côté opposé (2'', 2'').
5. Appareil (1), selon la revendication 4, dans lequel la section verticale (17'') est incurvée de manière à converger vers le trou percé à l'arrière (2'') du boîtier.
6. Appareil (1), selon l'une quelconque des revendications précédentes, dans lequel le tuyau de vidange prévoit un clapet anti-retour (35).
7. Appareil (1), selon l'une quelconque des revendications précédentes 1 à 6, dans lequel le tuyau de vidange est composé de pièces (117, 17, 17', 17'', 17''') pouvant être assemblées les unes avec les autres.
8. Appareil (1), selon l'une quelconque des revendications précédentes 1 à 6, dans lequel le tuyau de vidange est une pièce unique.
9. Appareil (1), selon l'une quelconque des revendications précédentes, dans lequel le tuyau de vidange est fabriqué dans un matériau en plastique par moulage ou coulée sous pression.
10. Appareil (1), selon la revendication 1, dans lequel le couvercle (3) prévoit une ouverture d'air (40) pour l'air.

FIG. 1

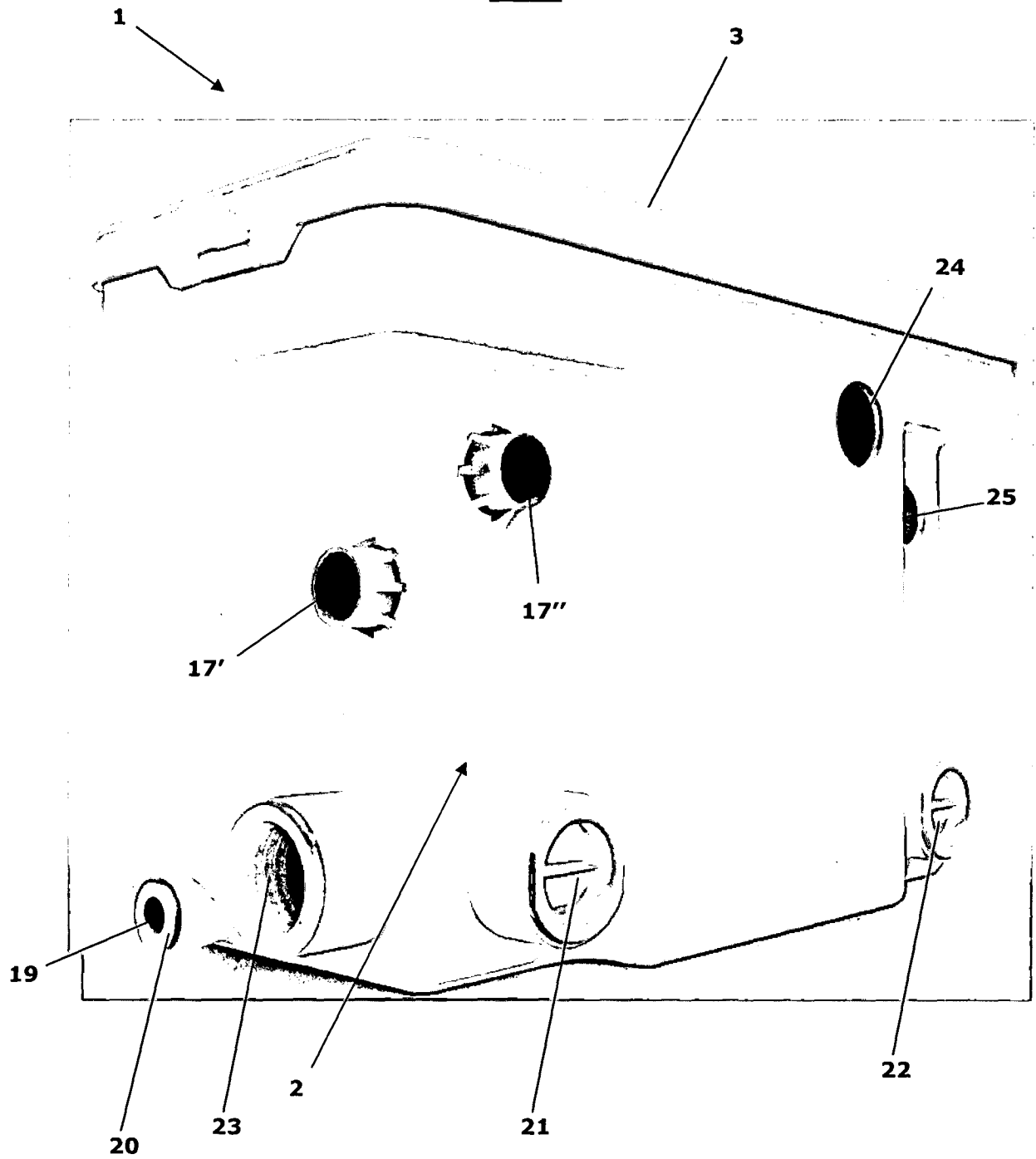


FIG. 2

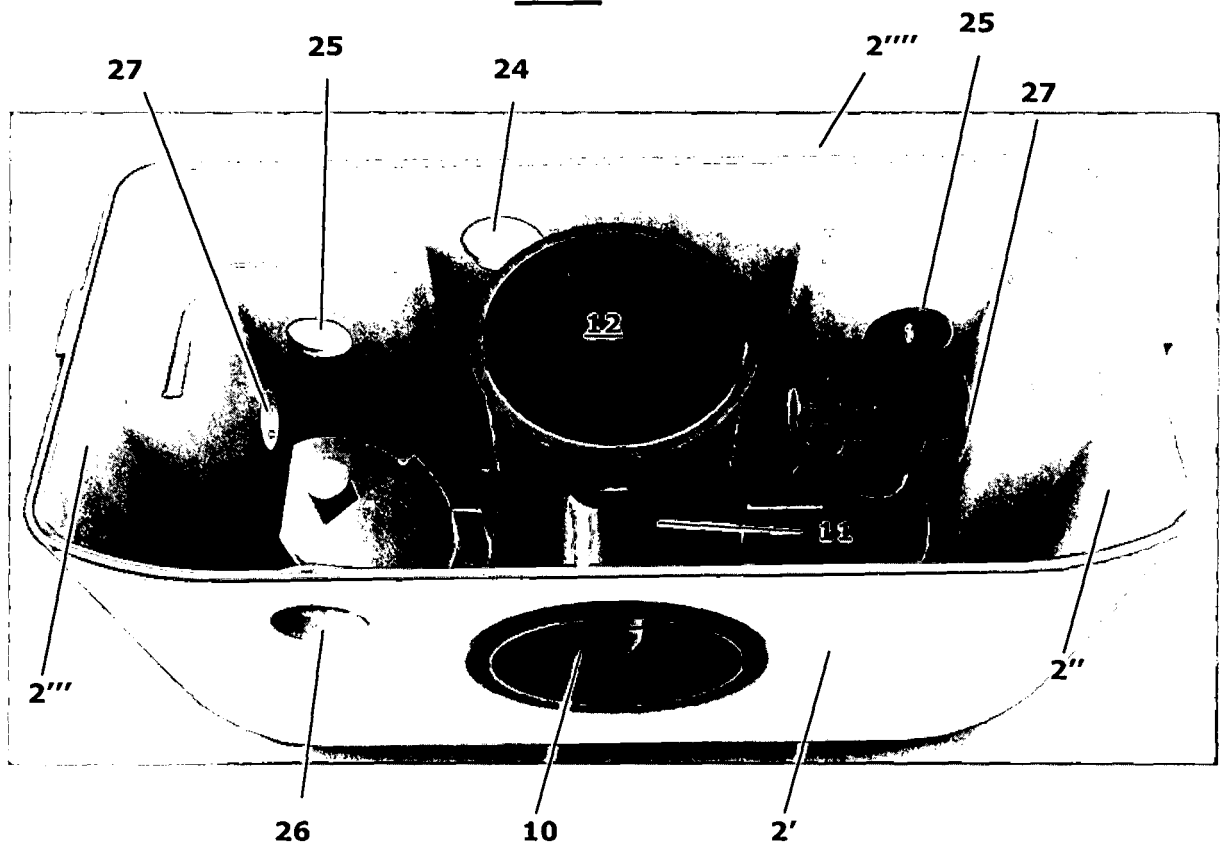


FIG. 3

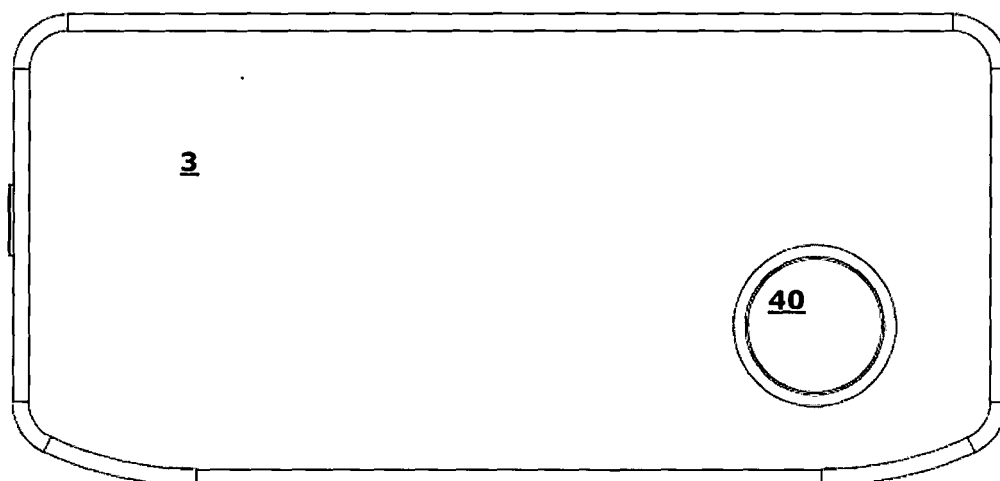


FIG. 4

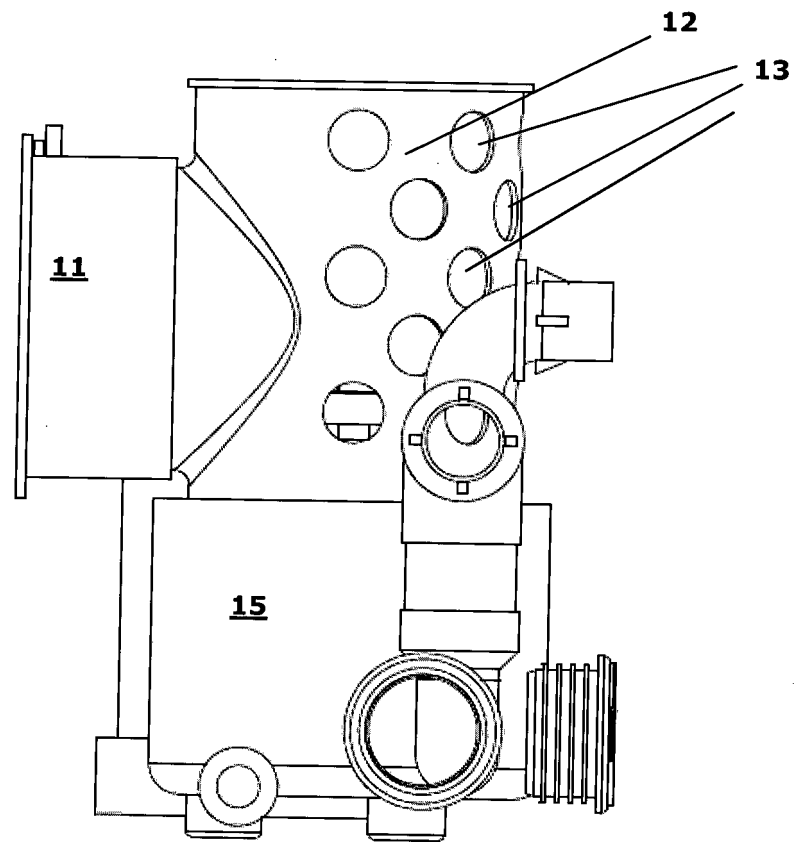


FIG. 5

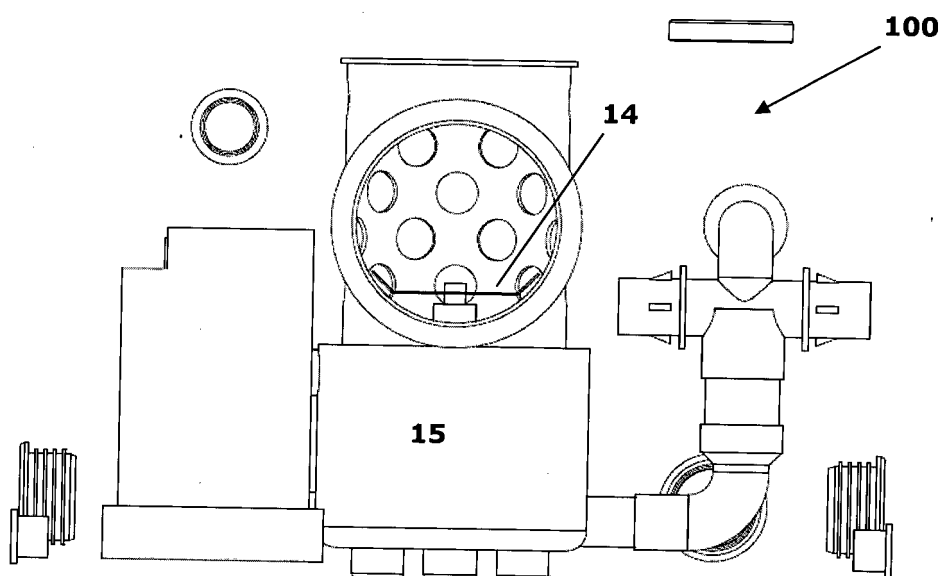


FIG. 6

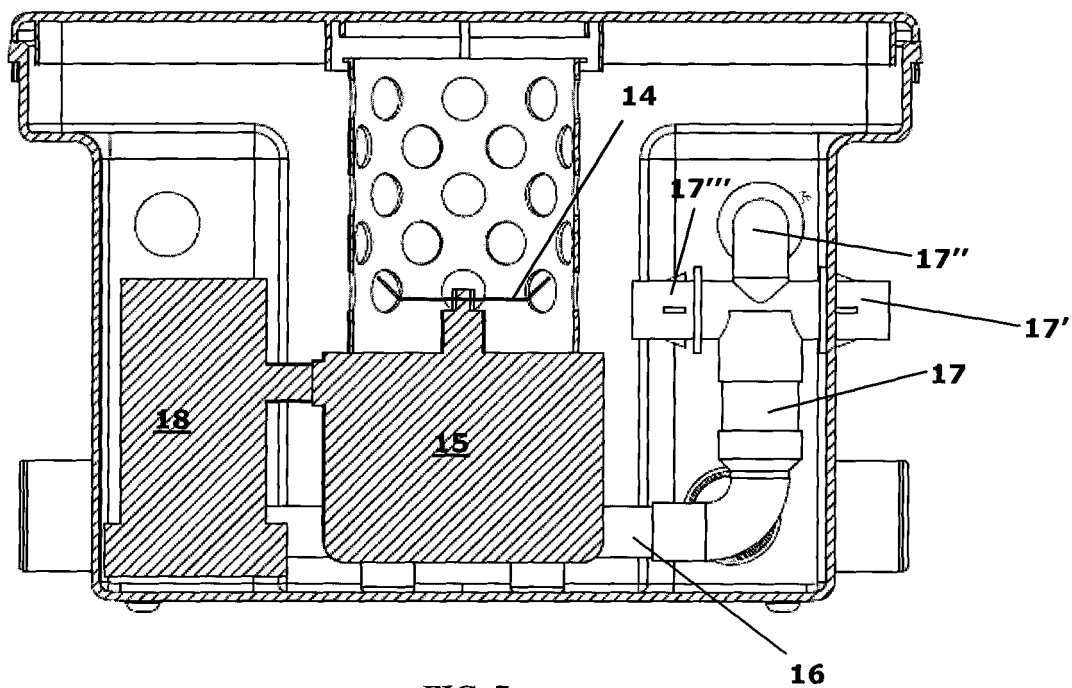


FIG. 7

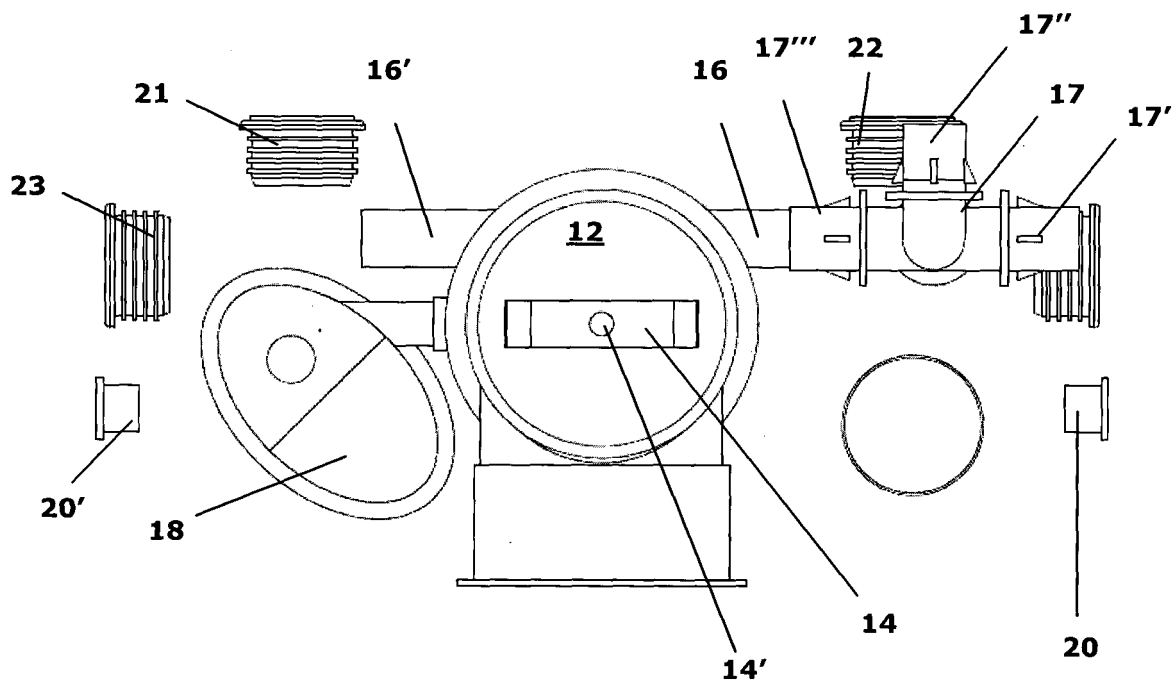
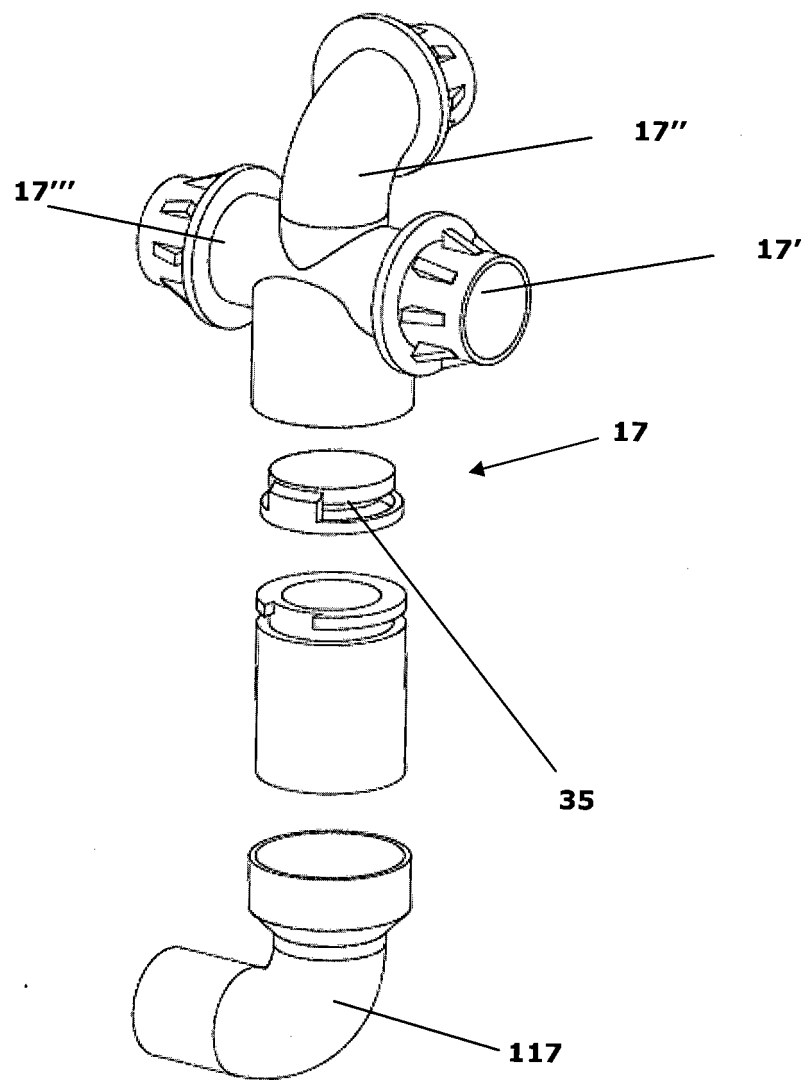


FIG. 8



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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