



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

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

(51) Int Cl.:
E03B 1/04 (2006.01) E03C 1/01 (2006.01)

(21) Application number: **11791978.7**

(86) International application number:
PCT/ES2011/070415

(22) Date of filing: **09.06.2011**

(87) International publication number:
WO 2011/154583 (15.12.2011 Gazette 2011/50)

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

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(30) Priority: **09.06.2010 ES 201030889**

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(54) **DOMESTIC-WASTEWATER RECYCLING SYSTEM**

(57) The invention relates to a domestic wastewater recycling system comprising a stainless steel intermediate tank (2) connected to a storage tank by means of pipes having delivery means, which storage tank is in turn connected with toilet cisterns. The intermediate tank (2) is fixed to a stainless steel supporting base (6) and has therein a removable filter (7) and electrical contact probes for measuring the maximum and minimum level of water. In the supporting base (6) there is a pumper unit (17) and a protective fuse box where the electrical components are housed. The filter (7) has a mesh (8) and a chamber (9). The inlet pipe (3) through which the wastewater enters the intermediate tank (2) has an internal conduit (10) leading to the tank which is connected directly with the chamber (9) of the filter (7) which is also connected to an overflow pipe which is connected with a main overflow (13) in the upper part of the intermediate tank (2) which is connected with a general drainage line (20).

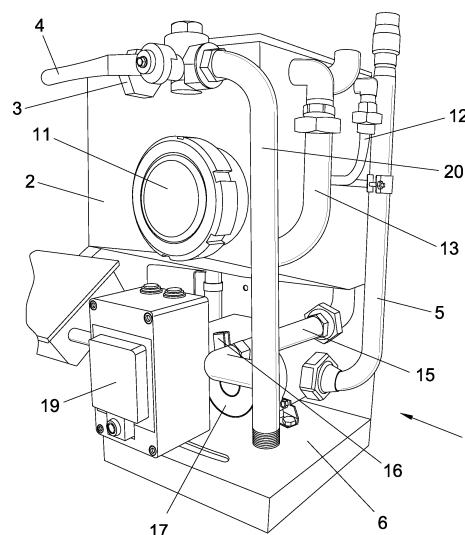


FIG. 1

Description

Object of the Invention

[0001] As expressed in the title of the present specification, the invention relates to an intermediate tank assembly for domestic wastewater recycling equipment which provides improved advantageous features for its intended function, which features involving an improvement in the current state of the art in this field will be described in detail below.

[0002] In particular, the object of the invention is an intermediate tank intended for forming part of a domestic wastewater recycling equipment or system, specifically applicable for a disposition of said type such as that described in patent number P200101084 belonging to the present applicant which, being configured as a compact assembly that includes the elements intended for collecting and delivering the water to be recycled in said equipment, has a series of structural improvements with respect to that already known considerably improving system efficiency.

Field of Application of the Invention

[0003] The field of application of the present invention is encompassed within the technical field of the industry dedicated to the manufacture of recycling elements, apparatus and devices, particularly those intended for recycling water.

Background of the Invention

[0004] As a reference to the state of the art, mention must be made of said invention patent number P200101084 relating to a disposition for recycling domestic wastewater describing equipment for which the tank proposed herein is particularly intended, which is essentially configured from an intermediate tank which collects water coming from washers and wash basins through a pipe controlled by a shutoff cock and by a peripheral electric pump, which is responsible for delivering water using pipes from the intermediate tank to another storage tank located in a non visible manner at a lower point of the slabs.

[0005] From this point, the water moves down by gravity to the toilet cisterns and as a precaution against possible excess, there is provided an overflow drainage allowing direct stored water removal.

[0006] Likewise, each tank incorporates a buoy in the intermediate tank responsible for ordering the operation or the shutdown of the electric pump, and a buoy in the storage tank responsible for achieving a continuous service and cleaning thereof.

[0007] However, even though said disposition satisfactorily performs its intended function, it has certain aspects that can be improved, focusing particularly on the need of having a system for retaining impurities and sus-

pending elements in the water to be recycled, on reducing electric consumption, noise and the size of intermediate tank, thus allowing its installation in any room of a dwelling, no matter how small it is, as well as on greater device reliability, these being the objectives of the present invention through the development of a new and improved booster or intermediate tank, there being a need to highlight that the applicant is unaware of the existence of any other invention for the same purpose presenting technical, structural and constitutive features similar to the tank proposed herein.

Brief Description of the Invention

[0008] Therefore, the intermediate tank assembly for domestic wastewater recycling equipment proposed by the present invention is configured as a novelty within its field of application because the objectives mentioned above are satisfactorily achieved in a specific manner in light of its implementation, the characterizing details distinguishing it being suitably listed in the final claims accompanying the present specification.

[0009] Specifically, the invention proposes a tank intended for forming part of a domestic wastewater recycling equipment of the type incorporating a receiving tank for receiving the water coming from a washer or the like, from which said water is moved upwards to a second storage tank through the corresponding pipes and delivery means, and the water is subsequently channeled by gravity to toilet cisterns.

[0010] Said tank is configured as a compact assembly that includes the elements intended for collecting and delivering the water to be recycled and the construction of which is of stainless steel, using this very material for said tank itself, for its supporting and anchoring base as well as for the water inlet and outlet pipes, and the dimensions of which, in relation with the known systems, specifically with respect to that described in the patent mentioned above as the prior art, have been reduced by 50%, and said tank has the particularity of incorporating inside the receptacle forming said tank itself a cylindrical filter also made of stainless steel, having a diameter of about 80 mm and a length corresponding to the tank measurements since it spans the entire width thereof.

[0011] A filtering mesh makes up approximately 2/3 of the length of said filter, while the remaining 1/3 is occupied by a chamber where the water to be recycled coming from the washer is poured therein to be filtered from the inside to the outside.

[0012] Furthermore and as a safety measure for the equipment and for helping users save money in view of an obstruction in the filter due to the lack of attention in filter cleaning, which could affect the proper operation of the washer, the tank has an overflow outlet which is in turn connected with the main overflow, pouring directly into a sewer.

[0013] The location and housing of said filter in the booster tank is determined by the existence of a male

thread welded to said tank having a diameter of 80 mm, as has already been mentioned, to allow removing and housing the filter in question and subsequently washing it.

[0014] Furthermore, said threaded lid of the filter is completed with a female cover which can be screwed on manually.

[0015] Likewise, it must be pointed out that the previously mentioned chamber of the filter is also responsible for advantageously eliminating noise of any kind produced by water when it is poured into the tank, thus achieving quiet equipment.

[0016] Likewise, the tank has an additional pipe provided with a shutoff cock, the function of which is to allow removing the water stored in the tank at will and to thus facilitate cleaning the filter without any type of water spillage or seepage, for which dry filter cleaning is performed.

[0017] The existence of a pumper unit replacing the electric pump incorporated in the already known prior art system as the means for moving the water upwards to the storage tank is contemplated at the same time and associated with the tank assembly by means of the incorporation thereof in the supporting base provided for such purpose in the lower part thereof, thus achieving minimum electric consumption, making its operation smoother and preventing any type of noise, further allowing reducing the size of the assembly by up to 50%, and therefore facilitating its installation in very small rooms.

[0018] Continuing with the features of the new booster tank proposed by the present invention, the incorporation of respective electrical contact probes replacing the buoy incorporated in the prior art equipment must be highlighted, a significant improvement in terms of device reliability being achieved, its task being to measure both the maximum and the minimum level of water, transmitting the electric contact order for the operation or shutdown of the pumper unit. The incorporation of said probes entails at the same time the incorporation of an electrical component called a level relay.

[0019] Finally, the existence of a leak-tight protective fuse box intended for housing the electrical components for protecting the pumper unit and the probes installed in the tank, which thus benefit from said electrical element to prevent faults in view of possible alterations in the electrical output that it receives, is contemplated.

[0020] Therefore, both the circuit breaker for the pumper unit and the level relay for the level probes will be deposited in said box, being coupled next to the pumper unit in the same supporting base in which it is fixed.

[0021] In view of the foregoing, it is clearly stated that the described intermediate tank assembly for domestic wastewater recycling equipment represents an innovation in the structural and constitutive features that were unknown until now for said purpose, and this combined with its practical usefulness give it sufficient grounds to obtain the privilege of exclusivity that is sought.

Description of the Drawings

[0022] To complement the description that is being made and for the purpose of aiding to better understand the features of the invention, a set of drawings is attached as an integral part of said description in which the following has been depicted with an illustrative and non-limiting character:

[0023] Figures 1 and 2 shows the respective side-front perspective views taken from opposite sides of an embodiment of the intermediate tank assembly object of the invention, the general external configuration and the main parts and elements that it comprises being seen therein.

[0024] Figure 3 shows a perspective view of the upper part of the example of the intermediate tank assembly according to the invention shown in the preceding figures, which has been depicted as being opened on top in order to allow observing the elements internally incorporated by the receptacle of said tank itself, specifically the filter housed therein.

Preferred Embodiment of the Invention

[0025] In view of the mentioned drawings and according to the reference numbers used, a preferred embodiment of the invention which comprises the parts and elements indicated and described in detail below can be observed therein.

[0026] Therefore, as observed in said drawings, the assembly tank in question, applicable as has already been reiterated in a domestic wastewater recycling equipment such as an intermediate receiving tank for receiving the water coming from a washer or the like, and from which the water moves upwards to a storage tank through the corresponding pipes and by means of forced delivery means for channeling it by gravity to the toilet cisterns, is configured as a compact assembly (1) that includes the elements intended for collecting and delivering the water to be recycled, comprising a small-sized stainless steel receptacle forming said receiving tank (2) itself, to which there are coupled at least one inlet pipe (3) with its corresponding shutoff cock (4), and one outlet pipe (5), both also made of stainless steel, being fixed on a supporting base (6) also made of stainless steel, with the particularity that said tank (2) internally incorporates a cylindrical filter (7), also made of stainless steel, of about 80 mm in diameter the length of which spans the entire width of the mentioned receptacle.

[0027] A mesh (8) makes up approximately 2/3 of the length of said cylindrical filter (7), while the remaining 1/3 is occupied by a chamber (9) where the inlet pipe (3) pours the water to be recycled therein to be filtered from the inside to the outside by means of the corresponding internal conduit (10).

[0028] This cylindrical filter (7) is coupled at one of its ends to a male thread welded to the tank (2) in a hole made therein for such purpose, thus allow its extraction

for its subsequent washing, which is completed with a cover (11) having a female thread which is operated manually.

[0029] Furthermore and as a safety measure in view of a possible obstruction in the filter, said filter is connected to an overflow outlet (12) which is in turn connected with the main overflow (13) of the tank (2), pouring directly into the sewer through a drainage line (20) provided for such purpose, and which is connected to the shutoff cock (4).

[0030] The tank (2) has on the bottom an inclined lower base (14), there being an additional drainage pipe (15) with a shutoff cock (16) therein for removing the water stored in said tank (2) and facilitating the dry cleaning of the filter (7).

[0031] The existence of a pumper unit (17) as a means for moving the water upwards to the storage tank of the equipment (not depicted) is contemplated at the same time and associated with the assembly (1) by means of the incorporation thereof in the supporting base (6) provided in the lower part of the tank (2).

[0032] Likewise, the receptacle forming the tank (2) internally incorporates two electrical contact probes (18) intended for measuring the maximum and minimum level of water, transmitting the electric contact order for the operation or shutdown of the pumper unit (17).

[0033] Finally, the existence of a leak-tight protective fuse box (19) fixed next to the pumper unit (17) in the supporting base (6), in which the electrical components for protecting the pumper unit (17) and the probes (18) installed in the tank (2), i.e., the circuit breaker for the pumper unit and the level relay for the level probes, are housed must be highlighted.

[0034] Having sufficiently described the nature of the present invention as well as the manner of carrying it out to practice, it is not considered necessary to further describe the invention so that any person skilled in the art can comprehend the scope thereof and the advantages derived from it, stating that it could be carried out to practice within its essentiality in other embodiments differing in detail from that indicated by way of example, which embodiments will also achieve the protection sought provided that the fundamental principle thereof is not altered, changed or modified.

Claims

1. An intermediate tank assembly for domestic wastewater recycling equipment of the type having a receiving tank (2) for receiving the water coming from a washer or the like, and from which the water is moved upwards to a storage tank through the corresponding pipes and by means of forced delivery means for channeling it by gravity to toilet cisterns, **characterized in that** it is formed from a compact assembly (1) that includes the elements intended for collecting and delivering the water to be recycled,

comprising:

- a small-sized stainless steel receptacle, forming said receiving tank (2) itself, which is fixed on a supporting base (6) also made of stainless steel and internally incorporates a removable cylindrical filter (7) also made of stainless steel,
- a pumper unit (17) as the means for moving the water upwards, associated with the assembly (1) by means of the incorporation thereof in the supporting base (6) provided in the lower part of the tank (2),
- two electrical contact probes (18) intended for measuring the maximum and minimum level of water, internally incorporated in the receptacle forming the tank (2)
- and a leak-tight protective fuse box (19) fixed next to the pumper unit (17) in the supporting base (6), in which the electrical components for protecting the pumper unit (17) and the probes (18) installed in the tank (2), i.e., the circuit breaker for the pumper unit and the level relay for the level probes, are housed;

wherein said filter (7) has a mesh (8) and a chamber (9) where the inlet pipe (3) pours the water to be recycled therein by means of the corresponding internal conduit (10); and wherein the filter (7) is connected to an overflow outlet (12) which is in turn connected with the main overflow (13) of the tank (2) connected in turn to a drainage line (20).

2. The intermediate tank assembly for domestic wastewater recycling equipment according to claim 1, **characterized in that** the filter (7) is about 80 mm in diameter and its length spans the entire width of the receptacle forming the tank (2).
3. The intermediate tank assembly for domestic wastewater recycling equipment according to claims 1 and 2, **characterized in that** the mesh (8) makes up approximately 2/3 of the length of the cylindrical filter (7), while the remaining 1/3 is occupied by the chamber (9).
4. The intermediate tank assembly for domestic wastewater recycling equipment according to claims 1 and 2, **characterized in that** the cylindrical filter (7) is coupled at one of its ends to a male thread welded to the tank (2) in a hole made therein for such purpose, which is completed with a cover (11) having a female thread which is operated manually.
5. The intermediate tank assembly for domestic wastewater recycling equipment according to claim 1, **characterized in that** the tank (2) has on the bottom an inclined lower base (14), there being an additional drainage pipe (15) with a shutoff cock (16) therein.

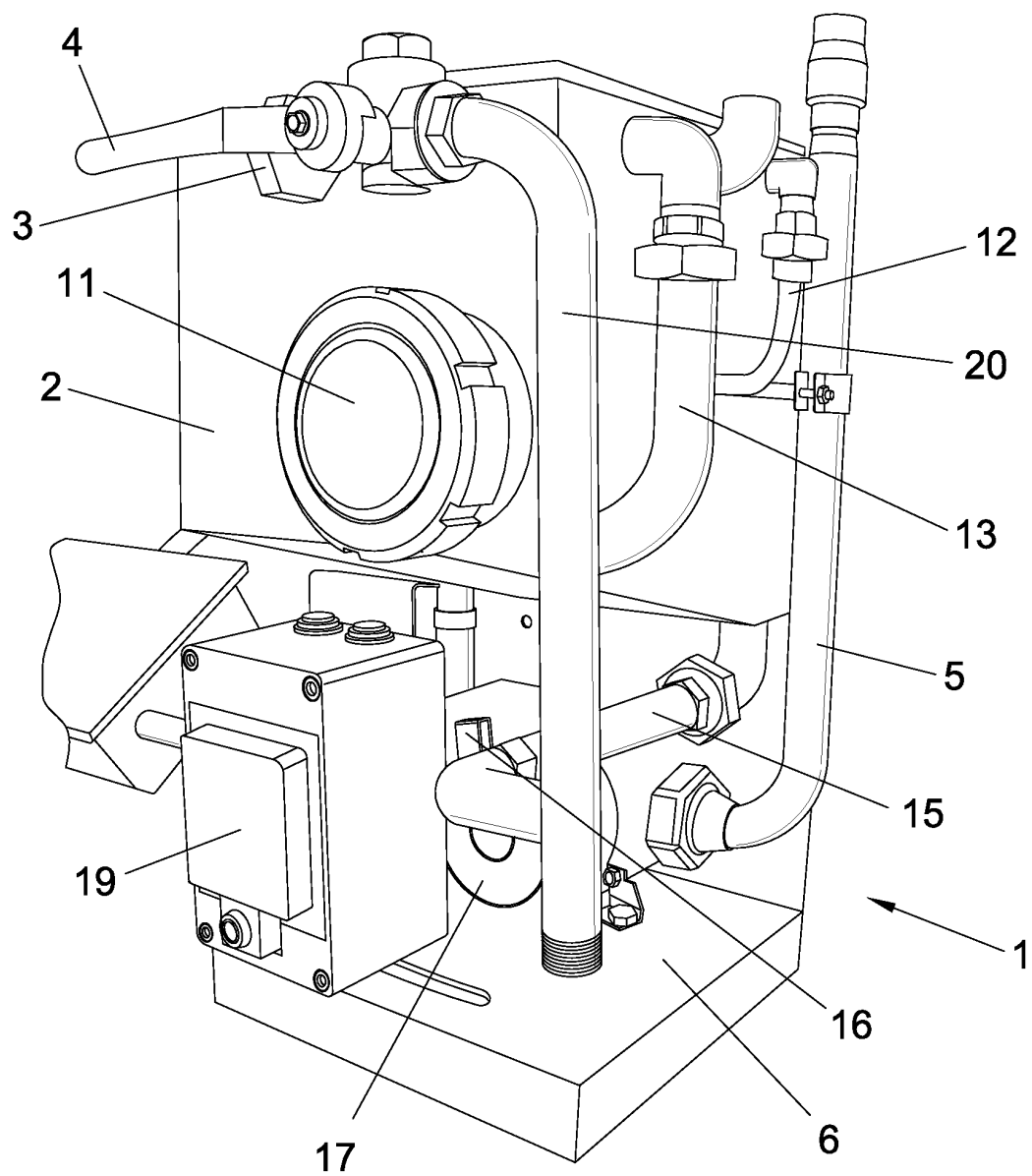


FIG. 1

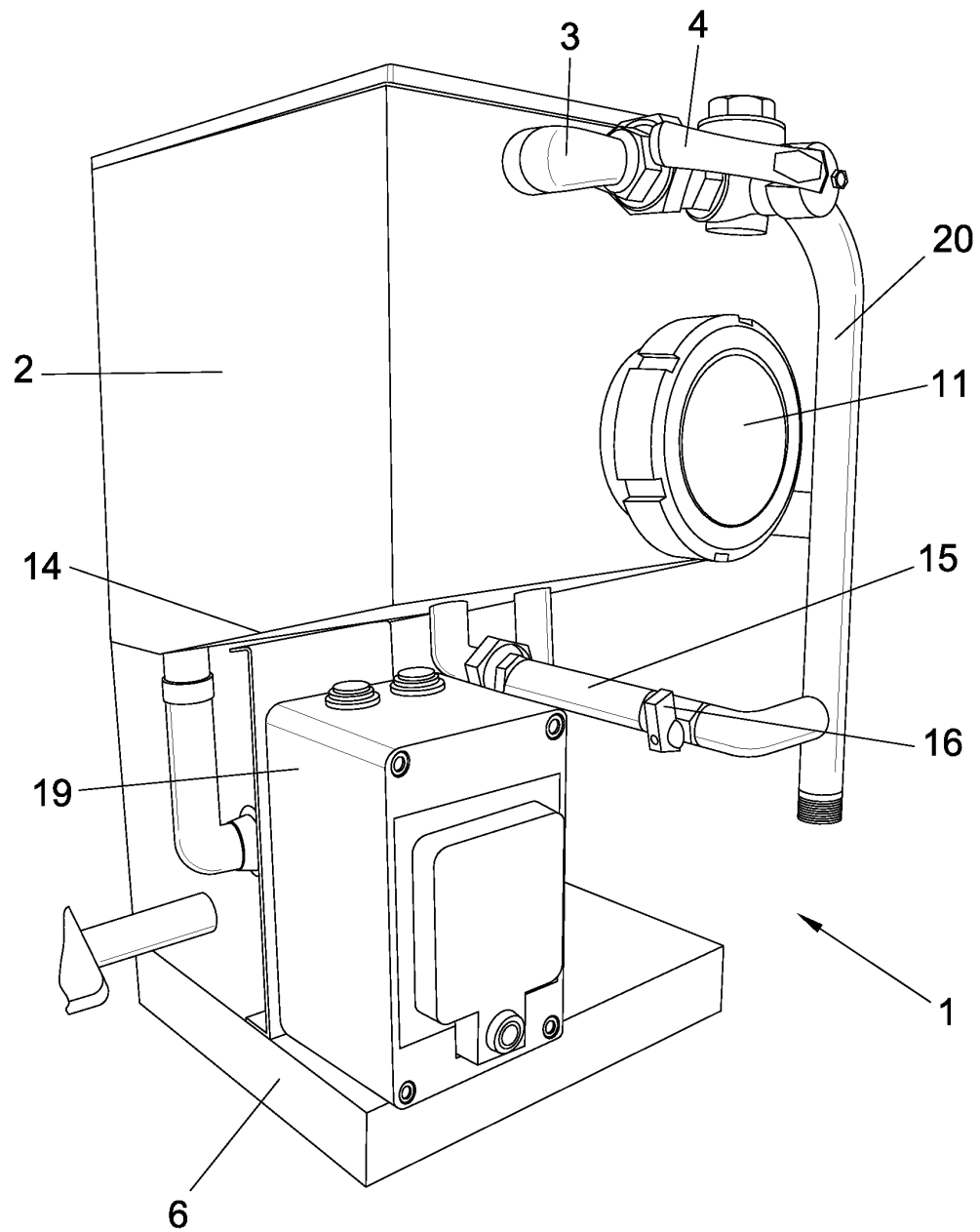


FIG. 2

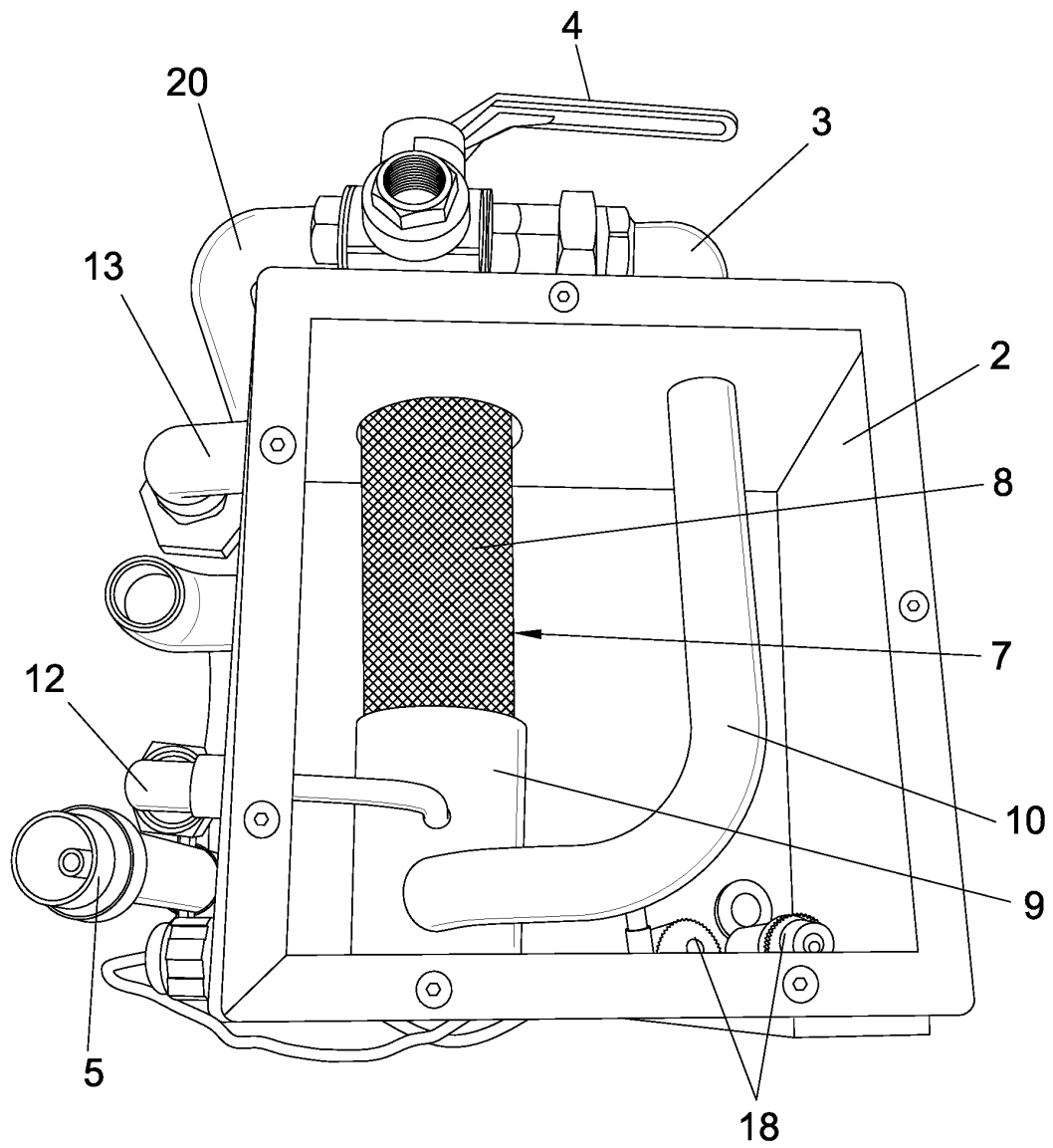


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2011/070415

A. CLASSIFICATION OF SUBJECT MATTER

E03B1/04 (2006.01)**E03C1/01** (2006.01)

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)

E03B, E03C

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)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"O" document referring to an oral disclosure use, exhibition, or other means.	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents, such combination being obvious to a person skilled in the art
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search
28/10/2011Date of mailing of the international search report
(08/11/2011)

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No.
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International application No.

PCT/ES2011/070415

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