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(71) Applicant (for all designated States except US):
PIPELIFE NORGE AS [NO/NO]; N-6650 Surnadal (NO).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **STORHEIL, Jens Martin** [NO/NO]; N-7125 Vanvikan (NO). **HOLTEN, Per** [NO/NO]; N-6652 Surna (NO). **PUCE, Vilnis** [AT/AT]; Karlsgasse 20-9, A-1040 Wien A (AT).

(74) Agent: **CURO AS**; Industriveien 53, N-7080 Heimdal (NO).

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(54) Title: COVER DEVICE FOR DRAINAGE INSPECTION CHAMBERS

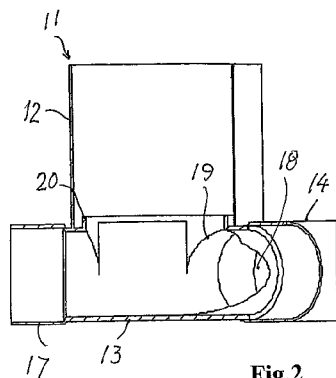


Fig.2

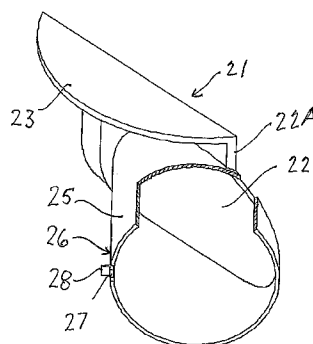


Fig.3

(57) Abstract: Cover device (21) for a drainage inspection chamber (11) with at least two inlet pipe sockets (14 - 16), of which at least one inlet pipe socket extends in an acute angle to a central axis. The cover device (21) has a cover member (22) which may be placed releasably fixed by an inlet so that it blocks leaks of liquid or mass which flows through the drainage inspection chamber. It comprises at least one supporting member (25) which is connected or integrated with the cover member (22), and may be put in engagement with an inlet pipe socket (14) from inside. The cover member (22) is mainly plate shaped with an oval shape.

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Cover device for drainage inspection chambers.

The invention relates to a cover device as described in the preamble of claim 1 for drainage inspection chambers, more precisely for drainage inspection chambers with two or more inlets, where, for one or more inlet opening(s), a cover device is releasably attached in the opening, to cover the opening so that the drainage chamber may be used without connection of inlets for this inlet opening(s) and may eventually be connected with (an) additional inlet(s) at a later stage.

10 Background

Drainage chambers used in systems for effluent or out-flow are used with a varying number of inlets. It is usual to have one, two or three inlets and one outlet. This may be provided by making four variants, one right flow variant, one variant with three inlets and one outlet and two different right/left-variants with two inlets. This demands wide-ranging production equipment and needs space for storing different variants to solve varying needs. In total it increases the cost.

In some cases flexibility is needed, mainly the possibility for extending to a larger number of inlets at a later stage. Up to now this has been solved by mounting of drainage inspection chambers with a maximum number of inlets, as the inlets that are not used from the start are blocked by seal assemblies mounted from the outside. These seal assemblies are intended for dismantling from the outside when extending to a larger number of inlets. Such drainage expansion chambers are for example described in the brochure "Kumsystemer" (in Norwegian) from Pipelife Norge AS, 2005.

Drainage inspection chambers used with known cover devices are not beneficial with regard to flow characteristics. In addition they give the possibility for build up of litter in eddy producing corners, and in some cases form places for undesired animals, such as rats.

30 Objective

The main objective of the invention is to develop a cover device for a drainage inspection chamber, which is simple to mount and dismantle from the inside of the drainage inspection chamber. It is important that it is easy to dismantle when one is going to bring into use additional inlets on drainage inspection chambers that are already installed and in use.

Further it is an objective to develop such a cover device that gives better hydraulic characteristics for a drainage inspection chamber in which one or more such cover devices are mounted. Such a cover device should only use a small amount of materials and have a low weight.

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The invention

The invention is described in claim 1. With such a cover device the objectives of the invention may be achieved to a great extent. The most important advantage is operational, by the fact that it in all configurations gives a drainage inspection chamber without accumulation of mud or litter. On already installed drainage inspection chambers the new cover devices may be installed simply to improve the hydraulic characteristics, and prevent undesired animals from settling there.

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The denotation "socket" shall in this connection be understood as a pipe structure which is arranged to be coupled together with a pipe end, either directly or with the help of a coupling element.

More characteristics of the invention are depicted in claims 2 – 6.

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Further details of the invention will appear from the following example description.

Example

The invention is more particularly described below with reference to the Figures where

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Fig. 1 shows a view in perspective of a drainage inspection chamber where the invention may be used,

Fig. 2 shows a central sectional view through the drainage inspection chamber in Fig. 1 along the dotted line in Fig. 1.

Fig. 3 shows a view in perspective of a filling in element for use with a drainage inspection chamber as shown in Fig. 1 and 2.

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Fig. 4 shows an additional view in perspective of the filling in element in Fig. 3.

Fig. 5 shows a detail of the filling in element of Fig. 3 and 4.

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Fig. 1 and 2 show a drainage inspection chamber 11 with a cylindrical pipe shaped part 12 called a raise pipe or raise pipe socket, which is arranged with a vertical axis and which near its closed bottom 13 has three pipe sockets 14 – 16 for connection of an inlet pipe (not shown) and one pipe end or – socket 17 for a drainage pipe. Each socket has an

outer part adapted to receive a pipe end, and an inner and narrower part, with an intermediate step 31.

5 These four pipe sockets run together and form with their underside the bottom 13 which constitutes the flow channel in the drainage inspection chamber 11.

10 The pipe sockets 14 – 17 lie in the same plane with the three inlet sockets 14 – 16 arranged symmetrically around the axis defined by the outlet socket 17. The two side pipe sockets 14 and 16 each make a 45° angle with the middle pipe socket 15. Other angles may be used. It may also occur that the side pipes lie a bit higher than the main channel in the drainage inspection chamber.

15 This drainage inspection chamber will have three inlet openings inside. Of these there are shown one central inlet opening 18 and one side opening 19 in Fig. 2. Inside the inlet sockets 14 – 16 and the outlet socket 17 are internally extending to a common ring 20 providing support (or engagement) for a mounted raise pipe inside the raise pipe socket 12.

20 Fig. 3 and 4 show a cover device or fill-in element 21 which is designed to be placed in the inlet socket 14 with insertion and extraction from the inner side of the drainage inspection chamber 11. The fill-in element 21 has a plate formed cover part 22 which in contour is adapted to the inlet opening. This is not shown in Fig. 2, but it is symmetrical with the side opening 19. The fill-in element 21 has in general an elliptic contour and it is curved in the height direction in accordance with the curl of the end of the inlet pipe socket which it shall
25 lie near to and cover.

The cover part 22 is extended upwards with a gently sloping flange 22A. The flange 22A has further a wing 23 which stands out sideways such that it in mounted position forms a contact face from the inside sideways against the ring 20.

30 The cover part 22 is integrated with a pipeline plug 25 which in dimension and position in relation to the cover part 22 is arranged to fit into the inlet pipe socket 14. The diameter of the pipeline plug 25 is adapted to the opening of the inlet pipe socket 14 so that an easy sliding fit is provided.

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In the wall of the pipeline plug 25 there is integrated a tongue 26 which extends towards the free end of the pipeline plug and which is radially elastic. By the outer free end 27 the tongue 26 has a protruding knob 28 with a sloping support surface 29.

When mounting the tongues are pressed radially inwards so that they may be inserted in the opening of the inlet pipe socket 14 together with the pipeline plug 25.

In Fig. 5 the tongue 26 is shown more in detail with a stick formed main part 30 which is elastic in the radial direction and at the end 27 carries the knob 28. The knob 28 has an outwardly inclined face facing the cover part 22, so that it fits against the step 31 inside the pipe socket and so that it may slide more easily off this when it is pulled/pushed inwards when dismantling.

The fill-in element 21 which is made in similar symmetric manner for the opposite inlet pipe socket 16, may be put in place from inside the drainage inspection chamber and is then held in place by the pipeline plug 25 and tongue 27. With the fill-in element in this position the drainage inspection chamber 11 may be put in place and put to use with one or two of the inlet pipe sockets 14 – 16 connected to a pipe.

If at a later stage it should become necessary to extend the connection, the fill-in element 21 may be pulled/pushed out of position and lifted away from inside the drainage inspection chamber.

This solution gives several advantages. The most important is that it is not necessary to have different drainage inspection chambers in production and in store. Also when a drainage inspection chamber is to be established with permanent connections, without the need for later expansion, a drainage inspection chamber may be used with one or two fill elements according to the invention.

With one fill element according to the invention in place in the drainage inspection chamber, the flow conditions will only be changed a little. This means a minimal increase in the flow resistance and no room for deposit of waste. Neither will it give room for undesired animals.

Modifications

The fill-in element may also be fastened with grasping legs, for example two, three or four legs, which expand in a ring out from the cover plate coaxially with the inlet pipe socket. Such grasping legs must then have an outer surface which forms a supporting contact face

against the inner part of the inside of the inlet socket. At least one of the grasping legs should have a radially protruding hook.

5 In an alternative embodiment the cover members are integrated with a curved plate part which forms a part of a ring, and the cover members are delimited by weakening grooves for making openings, and where the curved plate part is arranged to form a supporting member against the adjacent parts of the inlet sockets. The weakening grooves which are placed inside the openings of the inlet pipe sockets are designed for pressing out and/or cutting of the material which is delimited by each weakening groove, for the inlet pipe
10 sockets which are going to be used.

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Claims

1. Cover device (21) for a drainage inspection chamber (11) with at least two inlet sockets (14 – 16) of which at least one inlet socket extends at an acute angle to a central axis, so
5 that one or more inlet openings (19) are formed in the wall near the drainage inspection chambers (11) bottom (13), where there is in each inlet socket (14 – 16) formed a step (31) meant for insertion of the end of an inlet pipe, where the cover device (21) has a cover member (22) which may be placed releasably fixed by an inlet so that it blocks leaks of liquid and mass floating through the drainage inspection chamber, **characterized in**
10 -that it consists of at least one supporting member (25) which is connected or integrated with the cover member (22), and which may be put in engagement with an inlet pipe socket (14) from inside, and
-that the cover member (22) is mainly plate shaped with an oval shape.
- 15 2. Cover device according to claim 1, **characterized in** that the supporting member (25) is pipe shaped for insertion in the inlet socket (14).
3. Cover device according to claim 2, **characterized in** that the supporting member (25) comprises two or more legs protruding from the cover plate.
20
4. Cover device according to one of the claims 1 to 3, **characterized in** that the supporting member (25) at least has one radially protruding knob (28) which in a radially elastic way may be pressed in and that in a locking manner can grip in a step (31) in the inlet pipe socket.
25
5. Cover device according to claim 4, **characterized in** that the protruding knob (28) is arranged on a longitudinal radial elastic leg (26) in the supporting member (25).
6. Cover device according to one of the claims 1 to 5, **characterized in** that the cover
30 members are integrated to the curved plate part which forms a part of a ring and is delimited by weakening grooves for making openings, as the curved plate part is arranged to form a supporting member against the adjacent parts of the inlet sockets.
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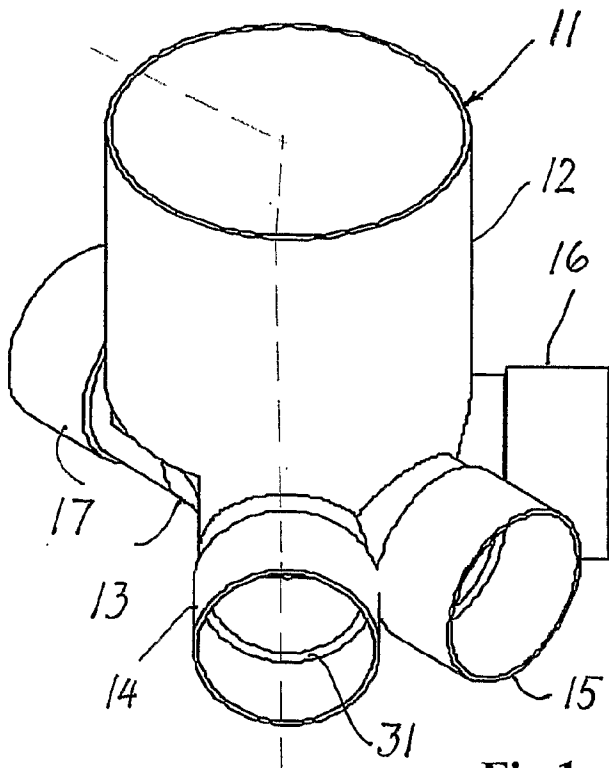


Fig.1

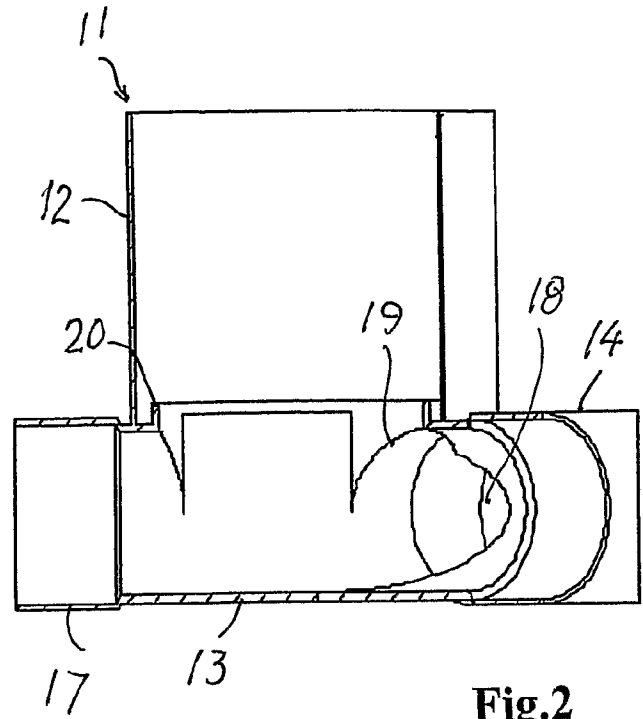


Fig.2

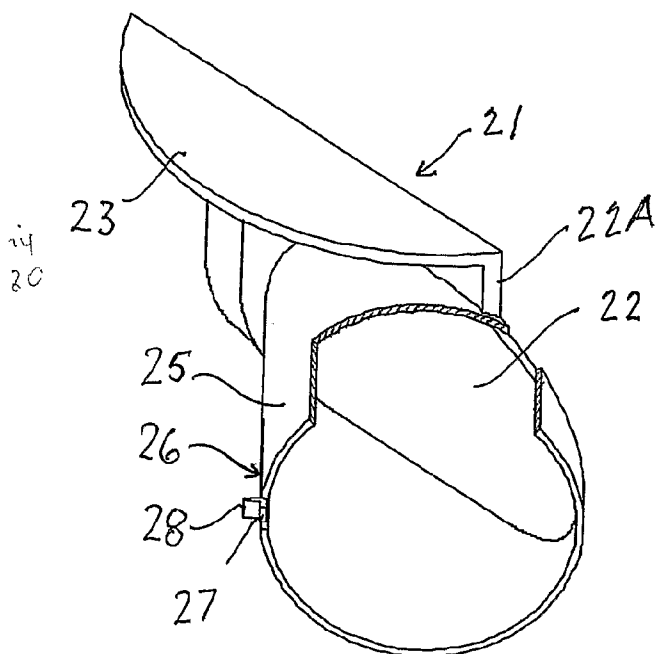


Fig.3

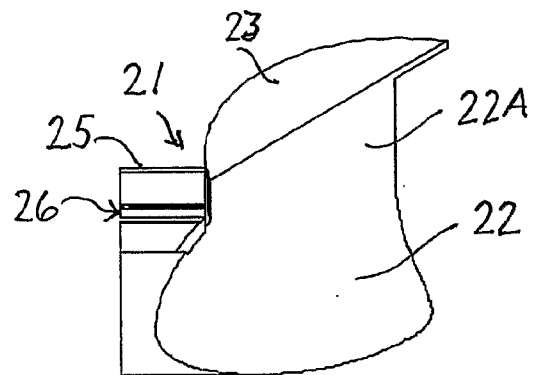


Fig.4

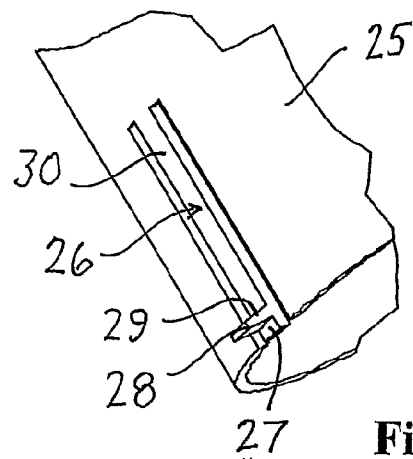


Fig.5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO2007/000203

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: E03F, E02D

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

SE,DK,FI,NO classes as above

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

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1297562 A (YORKSHIRE IMPERIAL PLASTICS LIMITED), 22 November 1972 (22.11.1972), page 1, line 9 - line 19; page 1, line 77 - line 86; page 2, line 16 - line 66, figures 1-2,5-6 --	1-6
A	GB 2099877 A (IMI YORKSHIRE IMPERIAL PLASTICS LIMITED), 6 June 1982 (06.06.1982), page 1, line 100 - page 2, line 31, figures 1-3, abstract -- -----	1-6

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

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Date of the actual completion of the international search

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Name and mailing address of the ISA/

Swedish Patent Office

Box 5055, S-102 42 STOCKHOLM

Facsimile No. +46 8 666 02 86

Authorized officer

Tommy Blomberg / JA A

Telephone No. +46 8 782 25 00

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International application No.
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Paper copies can be ordered at a cost of 50 SEK per copy from PRV InterPat (telephone number 08-782 28 85).

Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT

Information on patent family members

29/12/2007

International application No.

PCT/NO2007/000203

GB	1297562	A	22/11/1972	NONE
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GB	2099877	A	06/06/1982	NONE
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