PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 4 :		(11) International Publication Number:
E03F 5/14	A1	WO 88/ 03201
		(43) International Publication Date: 5 May 1988 (05.05.88)

(21) International Application Number: PCT/DK87/00132

(22) International Filing Date: 22 October 1987 (22.10.87)

(31) Priority Application Number: 5085/86

(32) Priority Date: 23 October 1986 (23.10.86)

(33) Priority Country: DK

(71)(72) Applicant and Inventor: CHRISTENSEN, Mogens [DK/DK]; Kagsåvej 111, DK-2730 Herlev (DK).

(74) Agent: DANSK PATENT KONTOR A/S; H.C. Ørsteds Vej 70, DK-1879 Frederiksberg C (DK).

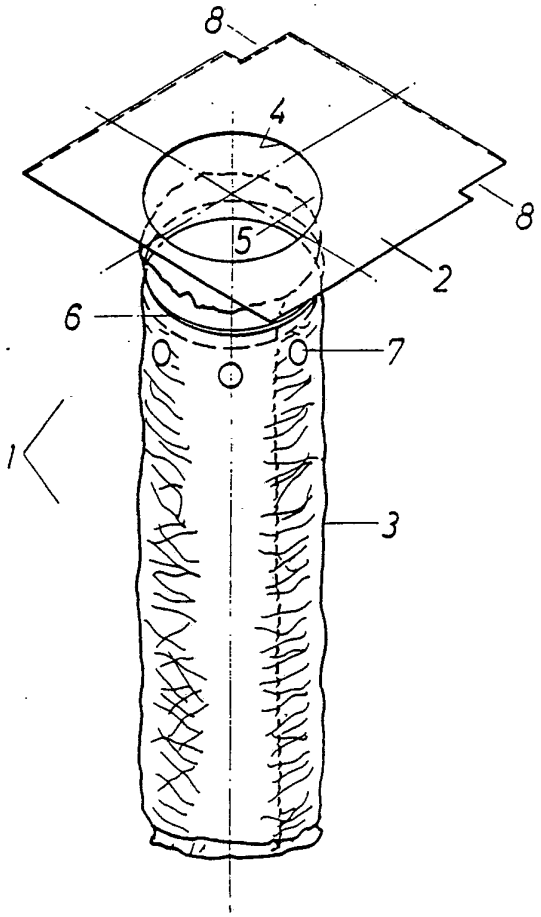
(81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), FI, FR (European patent), GB (European patent), IT (European patent), LU (European patent), NL (European patent), NO, SE (European patent), US.

Published
With international search report.

(54) Title: A DEVICE FOR WATER DRAINS AND A FILTER MEANS FOR USE WITH SAME

(57) Abstract

A filter means (1) to be placed in a drain (not shown) consists of a carrier plate (2), to the under-side of which a filter bag (3) has been mounted. Gravel, pebbles, twigs and the like which should not come into the drain system are caught by the filter bag (3), which can be emptied now and then by removing the carrier plate (2) together with the filter bag (3) from the drain. The filter bag (3) can be made with overflow holes (7) to prevent overloading, e.g. after big downpours.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	**FR**	France	**ML**	Mali
AU	Australia	**GA**	Gabon	**MR**	Mauritania
BB	Barbados	**GB**	United Kingdom	**MW**	Malawi
BE	Belgium	**HU**	Hungary	**NL**	Netherlands
BG	Bulgaria	**IT**	Italy	**NO**	Norway
BJ	Benin	**JP**	Japan	**RO**	Romania
BR	Brazil	**KP**	Democratic People's Republic of Korea	**SD**	Sudan
CF	Central African Republic			**SE**	Sweden
CG	Congo	**KR**	Republic of Korea	**SN**	Senegal
CH	Switzerland	**LI**	Liechtenstein	**SU**	Soviet Union
CM	Cameroon	**LK**	Sri Lanka	**TD**	Chad
DE	Germany, Federal Republic of	**LU**	Luxembourg	**TG**	Togo
DK	Denmark	**MC**	Monaco	**US**	United States of America
FI	Finland	**MG**	Madagascar		

A DEVICE FOR WATER DRAINS AND A FILTER MEANS FOR USE WITH SAME

TECHNICAL FIELD

The invention relates to a device for water drains of the kind described in the preamble of claim 1.

BACKGROUND ART

Such a device is known from US Patent No. 4,419,232. In the device thus known the downwardly directed collar is downwardly converging conical, and the upper edge of the filter bag is mounted to the collar by means of small holes in the bags hooked on to studs, hooks or the like on the outer surface of the collar. The overflow openings consist of V-shaped slots formed in the filter bag on a somewhat lower level than said mounting holes.

This known device has two major disadvantages:

The first disadvantage is that the overflow openings are not reliable as the V-shaped slots can easily become clogged during long periods with little precipitation so that they cannot not fulfil their object, i.e. to relieve the filter bag of water during e.g. a cloudburst.

The second disadvantage is that the mounting of the filter bag to the downwardly directed collar does not ensure tight contact between the upper edge of the bag and the collar, and during e.g. a cloudburst and with the sides of the openings adhering to each other an overpressure in the bag can easily cause the upper edge of the bag to be released from the suspension means on the collar so that the bag falls down.

A coarse-meshed wire basket, which in this known device is placed on top of the downwardly directed collar to protect the filter bag against sticks and other pointed or sharp objects, cannot remedy said disadvantages.

DISCLOSURE OF THE INVENTION

The object of the invention is to provide a device of the kind mentioned by way of introduction which does not have the above-mentioned disadvantages. Said object is achieved by a device according to the invention having the features mentioned in the characterizing part of claim 1. By the features mentioned in items d) and e) of claim 1 it is achieved that the filter bag can be fastened round the collar in a simple and reliable manner obtaining complete tightness and security against the bag getting loose, and by the shape of the overflow openings mentioned in item f) of the claim it is achieved that said overflow openings do not become clogged during long periods with little precipitation.

The overflow openings can be formed in the downwardly directed collar, but in order to make the collar as short as possible and to save the costs involved in making holes in it, the embodiment indicated in claim 2 is preferred, as only insignificant extra costs are in-

curred by making the holes in the filter bags, e.g. by punching. In this manner, the size, shape, position and number of the holes can be changed merely by changing bags.

The invention also relates to a filter bag for use in a device according to the invention. Said filter bag is of the kind mentioned in the preamble of claim 3, and according to the invention it is characterized by the arrangement indicated in the characterizing clause of claim 3.

BRIEF DESCRIPTION OF THE DRAWING

In the following, the invention is explained in more detail with reference to the drawing, in which exemplary embodiments of filter means according to the invention are illustrated, as

Figure 1 in an isometric view illustrates a first embodiment of the filter means,

Figure 2 in plan and side views, respectively, illustrates the filter means illustrated in Figure 1, and

Figures 3 and 4 in the same way as Figures 1 and 2 illustrate a second embodiment of the filter means according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The filter means 1 illustrated in Figures 1 and 2 includes two main components, i.e. a carrier plate 2 and a filter bag 3 mounted to the under-side of the carrier plate 2.

In the carrier plate 2, which can be made of stainless steel, plastic or other suitable materials, an opening 4 is made and in continuation of said opening a collar 5 is mounted to the under-side of the carrier plate 2. In the exemplary embodiment shown the filter bag 3 is mounted to the carrier plate 2 by being placed on the collar 5 and fastened thereto by means of a strap 6, which can optionally be releasable with a view to an easy replacement of the filter bag 3. In the upper part of the filter bag 3, which can consist of a suitable water-permeable material such as nylon, a number of overflow holes 7 are made which connect the inside of the bag with its surroundings.

In the exemplary embodiment illustrated in Figures 1 and 2 the carrier plate 2 is formed especially with a view to placement in a water drain, the upper side of which is covered by a grating (not shown) hinged to a frame (not shown) which is again mounted to or relative to the drain proper. The carrier plate 2 is with a view to said use made with approximately the same outside dimensions as the grating, but ~~in two~~ adjacent corners it has cutouts 8 making room for the hinge flaps of the grating placed in said two corners. Said hinged gratings are normally formed in such a way that in the completely open position they will hold the carrier plate 2 by clamping the part lying between the cutouts 8, and only persons who are aware of this fact will normally be able to remove the carrier plate, as for this purpose it is only necessary to swing the grating a short distance away from the completely open position so that the carrier plate is released.

During normal operation, water, e.g. rain water running down through the grating (not shown) over the carrier

plate 2, will be led by said grating to the opening 4 and into the filter bag 3. Sand, gravel, pebbles, twigs and the like which should not come into the drain system will be caught by the filter bag 3, whereas water will run freely through the wall of the bag. During periods of strong flow, e.g. after a big downpour, it will be possible for some of the water to run out through the overflow holes 7, whereby overloading of the filter bag 3 and escpecially of its mounting to the collar 5 is avoided. The filter bag 3 can be provided with pockets (not shown) for placement of indicators made to detect pollutants in the water flowing through the drain. Such pockets are preferably placed on the outer surface of the bag and preferably consist of a material which is transparent in such a manner that the indicators can be shown from the outside without being removed from the pockets. The use of such indicators is especially useful in cases where the filter means 1 is placed in a drain, through which waste water from e.g. an industrial firm is flowing.

The filter means shown in Figures 3 and 4 is identical with the filter means shown in Figures 1 and 2 as regards all the parts having the same reference numbers as in Figures 1 and 2, and consequently, there is no need to describe these parts further, except for the carrier plate 2', which unlike the carrier plate 2 shown in Figures 1 and 2 is adjustable as it includes an adjustable side member 9, wherein transverse slots 10 are formed, and bolts 11 are led through the slots 10 and normal holes in the carrier plate 2' so that the side member 9 can be fastened to the carrier plate 2' in different positions corresponding to the size of the opening, in which the carrier plate 2 is to be placed. It is obviously within the scope of the invention to make the carrier plate unadjustable of adjustable in

other ways so that it can be adjusted as needed to the openings of the drains, in which the filter member is to be placed.

C L A I M S

1. A device for drains for retaining material likely to block downstream drains, said device comprising a filter means (1) permeable to water, but substantially impermeable to said material, said filter means (1) comprising

a) a carrier means (2,2'), which is placed in the opening of the drain and shaped in such a manner that it blocks the flow through said drain, except for the flow through at least one downwardly directed collar (5) mounted to the carrier means (2,2'), and

b) at least one filter bag (3) consisting of fine-meshed material, which with its upstream-directed mouth is releasably mounted to the downstream side of the carrier means (2,2') round the or each of the downwardly directed collar or collars (5), whereas

c) near the mouth of the filter bag (3) at least one overflow opening (7) connects the space upstream to the filter organ (1) with the space downstream thereof,

c h a r a c t e r i z e d in

d) that the collar(s) (5) downwardly directed from the carrier means (2,2') has/have a mainly cylindrical outer surface,

e) that the device includes at least one strap (6) reaching round the collar (5), with which strap the upper part of each filter bag (3) is fastened round the downwardly directed collar (5) in question, and

f) that the overflow opening(s) (7) is/are formed as permanently open, preferably round, holes.

2. A device according to claim 1, c h a r a c t e r i z e d in that the overflow hole(s) (7) is/are formed in the filter bag (3) near its mouth.

3. A filter bag (3) for use in a device according to claim 2 and consisting of fine-meshed material, having near its mouth at least one overflow opening (7) extending through the bag material, c h a r a c t e r i z e d in that at least one overflow opening (7) is formed as a permanently open, preferably round, hole.

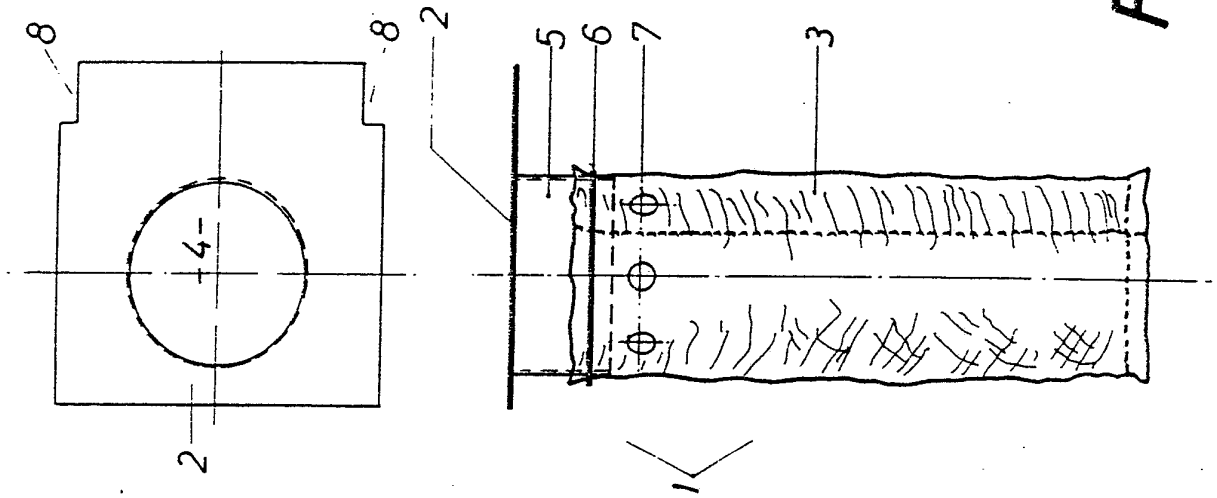


Fig.2

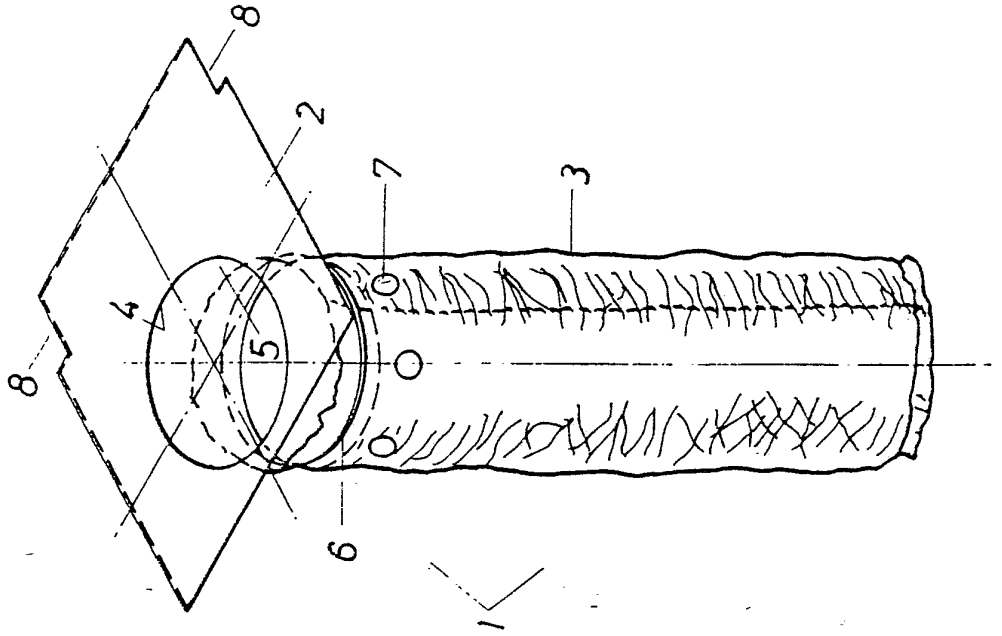


Fig.1

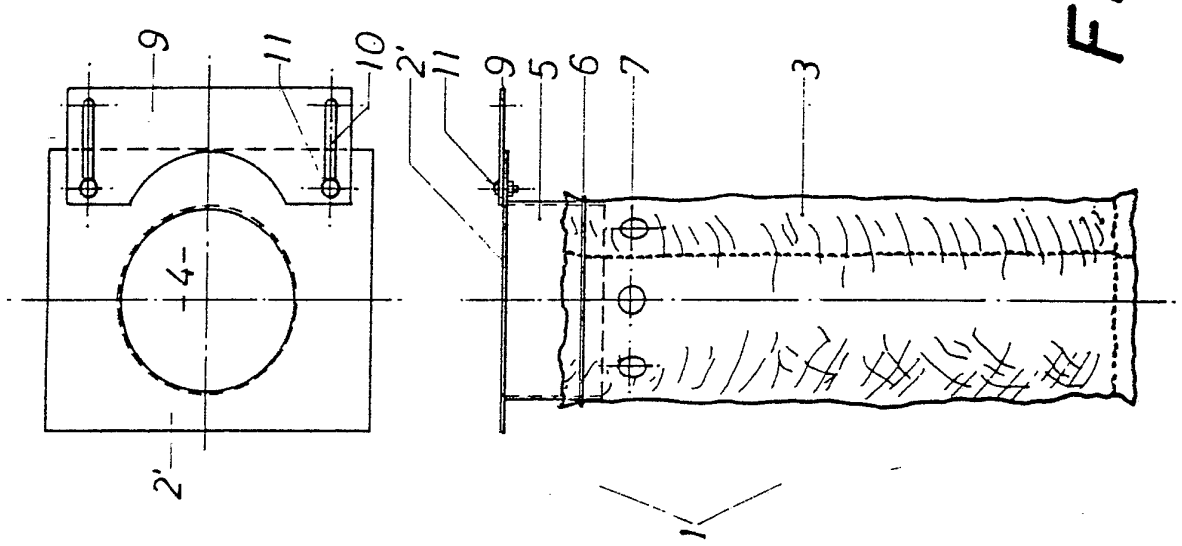


Fig.4

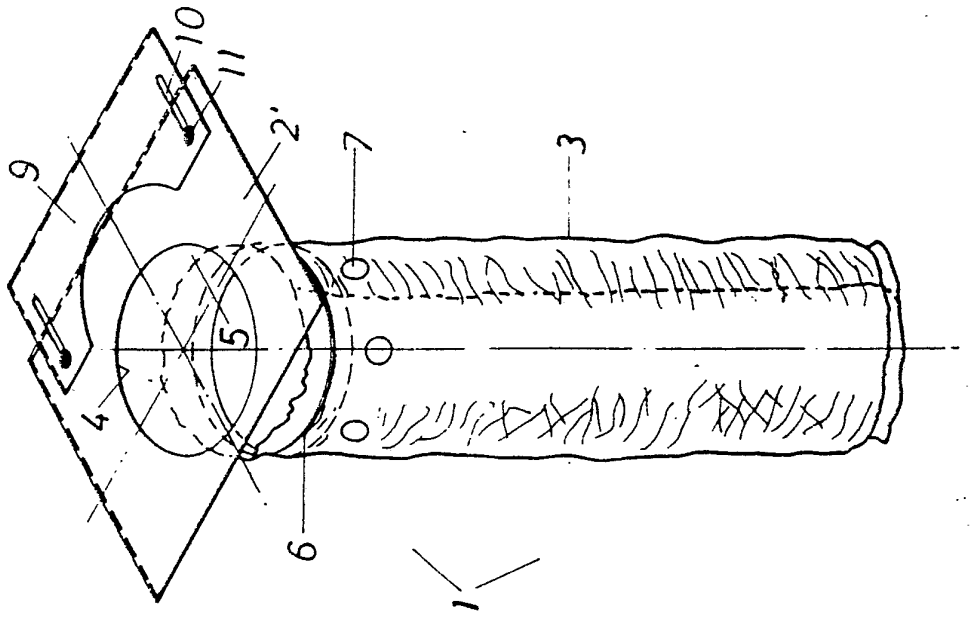


Fig.3

INTERNATIONAL SEARCH REPORT

International Application No PCT/DK87/00132

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC 4

E 03 F 5/14

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC 4	E 03 F 5/02-/04, /14-/16; E 04 D 13/04, /08; E 03 C 1/26-/28; B 01 D 23/04-/08
US Cl	210: 162-166, 459-463; 404: 2-5; 4: 286-292; 52: 16

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
X,Y	US, A, 4 419 232 (ARNTYR et al) 6 December 1983 See column 2, lines 57-68 and column 3, lines 1-35 & SE, 427680 WO, 83/01268 EP, 0102355 CA, 1176993	1-3
Y	US, A, 3 815 748 (JOHANNESSEN) 11 June 1974 See fig 3-5 & DE, 2215556 GB, 1407836 CA, 994680	1-3
Y	US, A, 628 146 (J C HUNGERBUELER) 4 July 1899 See page 1, lines 74-87	1-3

.../...

* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"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 such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
1988-01-20	1988 -01- 27
International Searching Authority	**Signature of Authorized Officer**
Swedish Patent Office	Tommy Blomberg

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
Y	US, A, 1 218 975 (W R BRISON) 13 March 1917 See page 1, lines 74-85	1-3
Y	US, A, 1 199 628 (J W STAUFFER) 26 September 1916 See page 1, lines 89-105	1-3
A	US, A, 2 246 012 (E SANDERS) 17 June 1941	1
A	DK, B, 148 289 (SVEND JØRGENSEN) 6 February 1984	1