

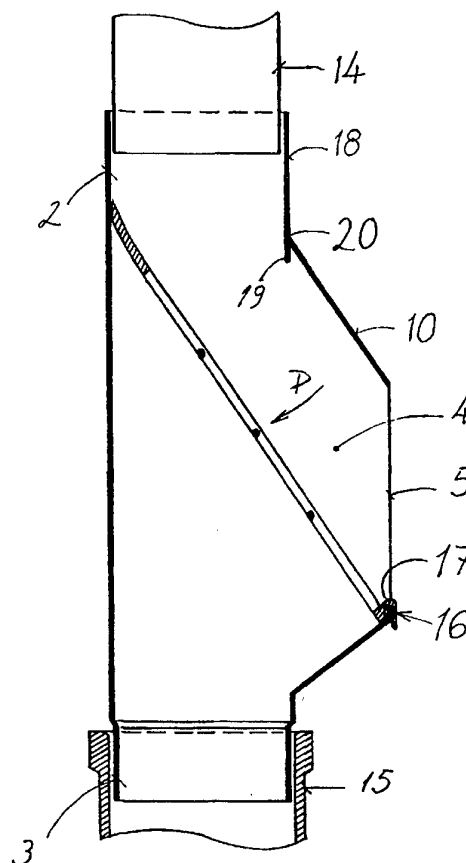


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶: E04D 13/08	A1	(11) International Publication Number: WO 95/14832 (43) International Publication Date: 1 June 1995 (01.06.95)
(21) International Application Number: PCT/SE94/01118 (22) International Filing Date: 23 November 1994 (23.11.94) (30) Priority Data: 9303895-8 24 November 1993 (24.11.93) SE (71)(72) Applicants and Inventors: JONASSON, Ulf [SE/SE]; Diskusvägen 51, S-740 30 Björklinge (SE). STEIN, Lars [SE/SE]; Skottsundvägen 39, S-862 00 Kvissleby (SE). (74) Agent: WALLENGREN, Yngvar; Patentbyrå Y. Wallengren AB, P.O. Box 116, S-331 21 Värnamo (SE).		(81) Designated States: AM, AT, AT (Utility model), AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DE (Utility model), DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ). Published <i>With international search report.</i> <i>In English translation (filed in Swedish).</i>

(54) Title: SEPARATING DEVICE**(57) Abstract**

A device for separating leaves from a water flow in a downpipe (14, 15) includes a chamber (4) of greater cross section than the downpipe. The chamber has a side aperture (5) and a interior grid (6) which fills out the cross section of the chamber (4) and whose lower end connects to the side aperture (5). The grid (6) has a considerable cavity area between longitudinal ribs (21) which are parallel with the direction of inclination of the grid and which have an upper, liquid tight portion (23) which is intended to direct a water flow along the grid (6).



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SEPARATING DEVICE

TECHNICAL FIELD

5 The present invention relates to a device for placing in a substantially vertically directed pipe and intended for separating solid material particles out of a liquid flow running through the pipe, the device comprising a chamber of greater cross section than the pipe in which it is placed, and the chamber displaying an outlet aperture at a side portion, and an interiorly
10 disposed grid which substantially fills out the through flow area of the chamber and which inclines downwards in such a manner that its lower portion connects to the lower region of the outlet aperture of the chamber. The device according to the present invention is primarily intended to separate leaves, barks, twigs and the like from a liquid flow in a downpipe
15 which is connected to a rainwater system, whereby blocking of the system may be prevented.

BACKGROUND ART

20 This type of device is previously known from, for example, GB-A-2 132 657 and US-A-4 472 274. One drawback inherent in the device according to the British publication is, however, that the grid displays ribs which are oriented substantially at right angles to the direction of inclination of the grid. This factor impedes the outflow of the material particles.

25 Outflow of material particles from the chamber in the device according to the US specification is also unsatisfactory. A further disadvantage from which the separator device according to the US Patent specification suffers is that the outlet aperture 30 lies in the plane of the grid, which implies
30 problems in water leakage out over the prior art separator device proper.

OBJECTS OF THE INVENTION

35 The present invention has for its object to obviate the problems inherent in prior art technology and to propose a device by means of which solid material particles may be led off in an extremely efficient manner from a

pipe in which the device is fitted. This has been made possible by means of the device as disclosed by way of introduction, which is characterized by the combination of the following features:

5 - The grid is provided with a plurality of parallel ribs which are oriented in substantially the same direction as the direction of inclination of the grid;

- The ribs of the grid are disposed such that a considerable cavity area is created between the ribs;

10

- The grid displays a liquid tight portion in its upper region, which implies that a powerful liquid flow is generated in the plane of the grid, this assisting in flushing out the solid particles.

15 BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

The present invention will now be described in greater detail hereinbelow, with particular reference to the accompanying Drawings, in which:

20 Figs 1-3 show different embodiments of the device according to the present invention;

Fig. 4 is a section through the device according to Fig. 1, fitted on a downpipe; and

25

Fig. 5 shows a grid according to the present invention, seen in the direction of the arrow P in Fig. 4.

DESCRIPTION OF PREFERRED EMBODIMENTS

30

Referring to Fig. 1, this Drawing shows a first embodiment of the device according to the invention. This embodiment 1 comprises a circular, upper pipe connection 2 and a circular, lower pipe connection 3.

35 The pipe connections have been given generous length in order to ensure reliable and tight fit between connecting pipes. A chamber 4 is disposed

between these pipe connections and displays a cross section which is larger than the cross section of the pipe or pipes in which the device is intended to be fitted. An aperture 5 is provided in one side portion of the chamber 4. In such instance, the aperture is intended to face out away from the building facade where the device is intended to be located. The lower portion of a grid 6 is secured in the side wall of the chamber at the lower region of the aperture 5. This grid is disposed in a direction which slopes downwards, whereby solid material particles will be able to slide along the grid and out through the aperture 5. As a result, the device according to the present invention will be self-cleaning.

Fig. 2 shows a second embodiment 7 which is of the same type as the device shown in Fig. 1, but with the difference that the upper and lower pipe connections 8 and 9, respectively, are of rectangular cross section. Otherwise, both the devices according to Fig. 1 and 2 display a guard or hood 10, 11 placed over the grid.

Fig. 3 shows a third embodiment 12 of the device according to the invention which displays an upwardly open chamber 13. Naturally, this embodiment will be more economical to manufacture than the embodiments according to Figs. 1 and 2, since these embodiments display a chamber which is upwardly covered.

Fig. 4 shows a section through the device according to Fig. 1, its upper pipe connection 2 being secured to a downpipe 14, while its lower pipe connection 3 is secured to a drainpipe 15 which is in communication with a rainwater sewerage system. In this instance, the downpipe 14 is inserted in the upper pipe connection 2, while the pipe connection 3 is inserted in the top of the drainpipe 15.

As is apparent from Fig. 4, the upper region of the grid 6 rests against the wall of the chamber 4, while the lower region of the grid 6 is secured in the lower edge of the chamber aperture 5 by means of a snap connection device 16. As a result, the grid may readily be replaced. As is further apparent from Fig. 4, the snap connection 16 has a portion 17 which projects up a distance above the longitudinal plane of the grid. This portion 17 effectively prevents

water from running out over the lower edge of the outlet aperture 5, which prevents water leaking out over the outside of the device according to the present invention.

5 As will also be apparent from Fig. 4, the front portion 18 of the upper pipe connection 2 has been extended down a distance (see 19) in relation to the connection point 20 with the guard or hood 10. This circumstance implies that the capillary action of the water flow is disrupted, which eliminates the risk that water follows along the hood or guard 10 on its inside and out
10 through the aperture 5.

A major feature of the present invention is the design of the grid 6 which is shown in greater detail in Fig. 5. The grid displays a plurality of parallel ribs 21 which are oriented in the direction of inclination of the grid and are
15 disposed in well adapted mutual spaced apart relationship. The ribs 21 are preferably of oval cross section, which facilitates passage of the water through the grid. The parallel longitudinal ribs 21 are united at suitable points by means of transverse ribs 22 which are disposed on the underside of the grid.

20 In its upper region, the grid 6 displays a liquid-tight, closed portion 23 whose purpose is to create a powerful water flow in the plane of the grid at the upper region of the grid, this assisting in flushing out solid matter trapped by the grid, through the chamber aperture 5.

25 As a result of the inclination of the grid, its discharge into the open air without obstructing edges and with a positive water flow, the solid matter particles will be effectively separated off and conveyed out of the device according to the invention.

30 The device according to the invention is primarily intended to be manufactured from a suitable, weatherproof plastic material, but may of course also be manufactured from other materials such as sheet metal. The grid in a sheet metal construction may be designed of round bar, pressed
35 profile sheet, or plastic.

The present invention is naturally not restricted to the above disclosed and illustrated embodiments, but may be modified without departing from the spirit and scope of the appended Claims. For example, the upper and lower pipe connections may be in the form of mountable sections with varying pipe dimensions as desired. Further, the chamber may be of two-part design, with a horizontal or oblique joint. In such instance, the parts may be assembled together by a simple snap action, or possibly by gluing. The chamber may be designed with a guard or hood over the grid, in the form of a lid which may be permanently fixed in place or be dismountable.

CLAIMS

1. A device for placing in a substantially vertically directed pipe and intended for separating solid material particles out of a liquid flow running
5 through the pipe, the device comprising a chamber of greater cross section than the pipe in which it is placed, and the chamber displaying an outlet aperture at a side portion, and an interiorly disposed grid which substantially fills out the through flow area of the chamber and which inclines downwards in such a manner that its lower portion connects to the
10 lower region of the outlet aperture of the chamber, characterized by the combination of the following features:

- the grid (6) is provided with a plurality of parallel ribs (21) which are oriented in substantially the same direction as the direction of inclination of
15 the grid;

- the ribs (21) of the grid (6) are disposed such that a considerable cavity area is created between the ribs; and

20 - the grid displays a liquid tight portion (23) in its upper region, which implies that a powerful liquid flow is generated in the plane of the grid, which assists in flushing out the solid particles from the outlet aperture (5) of the chamber (4).

25 2. The device as claimed in Claim 1, characterized in that the grid (6) is disposed in the chamber (4) so that its upper portion rests against the inner wall of the chamber while its lower portion is secured in the lower edge of the chamber aperture (5) by means of a snap connection (16), whereby the grid may readily be replaced.

30

3. The device as claimed in Claim 2, characterized in that the snap connection (16) displays a portion (17) which projects up a distance above the longitudinal plane of the grid (6) and which effectively prevents the water from running out over the lower edge of the outlet aperture (5).

35

4. The device as claimed in any one of the preceding Claims, the grid (6) being covered upwardly by means of a guard (10), characterized in that the front portion (18) of the upper pipe connection (2) is extended down a distance (19) in relation to the connection point (20) with the guard (10).

Fig. 1 1/3

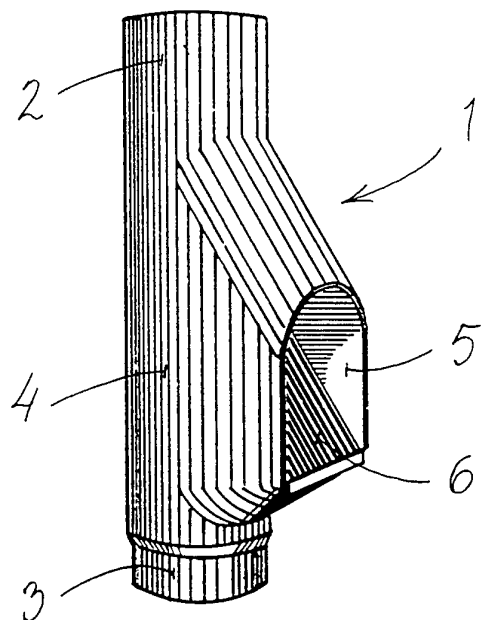


Fig. 3

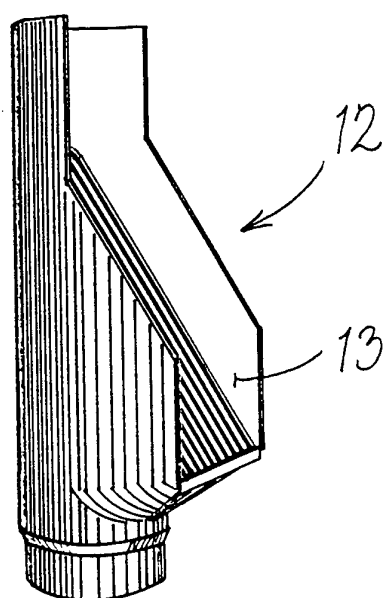


Fig. 2

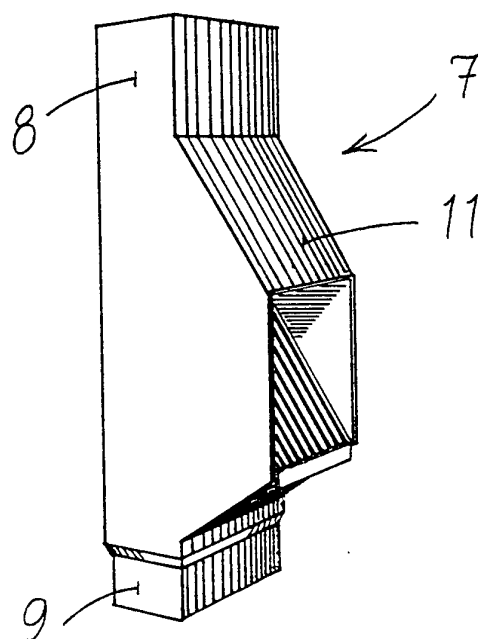
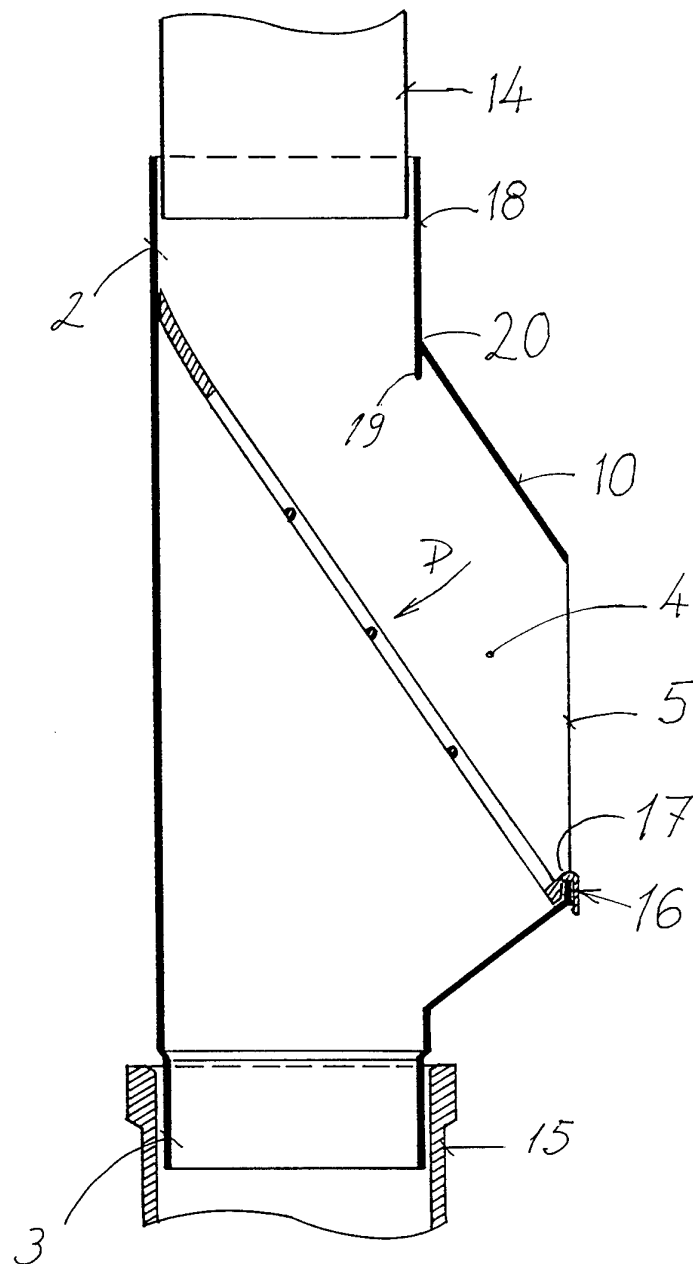
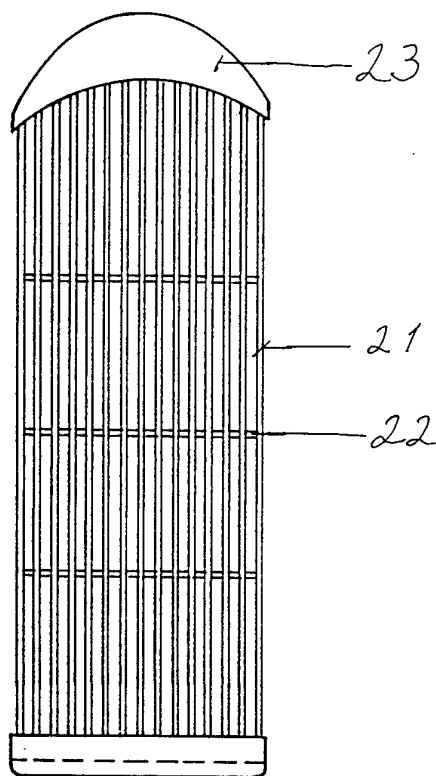


Fig. 4 2/3

SUBSTITUTE SHEET

Fig 5 3/3



INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 94/01118

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: E04D 13/08

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)

IPC6: E04D

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB, A, 2132657 (COPE WHELOON & COMPANY LIMITED), 11 July 1984 (11.07.84), figures 5,6, detail 7 --	1-4
A	US, A, 4472274 (R.M. WILLIAMS), 18 Sept 1984 (18.09.84), figure 7, detail 132 -- -----	1-4

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

* Special categories of cited documents:

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INTERNATIONAL SEARCH REPORT
Information on patent family members

31/12/94

International application No.
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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB-A-	2132657	11/07/84	NONE	
US-A-	4472274	18/09/84	NONE	