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(54)

Opening and cleaning apparatus for pipelines

(57)

The invention relates to an apparatus for opening and cleaning pipelines, which comprises a hose system (12), which comprises a rotating nozzle (1) fastened to the pressure hose (3) by threads and spraying water forwards, and an opening wire (5) encircling the pressure hose (3), an unclogging means (6) comprising an

actuating linkage (11), a collector rim (7) comprising a journal bearing (14) and grooves (15) as well as a pressure cleaner (8). The opening wire (5) encircling the pressure hose (3) as a support is supported at one end on the surface-treated rear end (4) of the nozzle (1) and at the other end on the surface-treated grooves (15) in the collector rim (7).

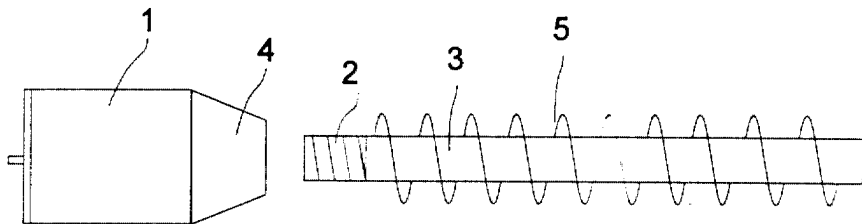


FIG. 1

Description

[0001] The invention relates to an apparatus for opening and cleaning pipelines as defined in the preamble of claim 1.

[0002] Clogged pipelines have conventionally been means of unclogging or pressure cleaning. Opening a pipe system with the aid of unclogging means involves the problem that the pipeline is unclogged only over a diameter of 2 cm. The pipelines are consequently not thoroughly cleaned, and will usually need to be unclogged several times a year. On the other hand, opening pipelines by means of pressure cleaning involves the problem that the nozzles in the pressure cleaning system usually spray water backwards, thus moving the obstructions backwards and causing the pipelines to be even more tightly clogged, with the pressure cleaner hose getting jammed. A water spray that is directed backwards may also damage the pipe joints, risking water damage. On the other hand, pressure cleaning systems that spray water forwards entail the problem that the hose is difficult to control and cannot be introduced into the pipeline due to the counter-pressure of the nozzle and the flexibility of the hose. When the pipeline is completely clogged, it must first be cleaned by unclogging and then cleaned by means of pressure cleaning in order to be entirely opened.

[0003] Finnish Utility Model Publication 3292 describes a solution to the problems mentioned above. The solution consists of a combination of unclogging and pressure cleaning systems, allowing a clogged pipeline to be opened and cleaned at the same time. The apparatus for opening and cleaning pipelines described in this publication comprises a rotating nozzle that sprays water forwards and a rotating unclogging means surrounding the hose. This arrangement does not entail the problems relating to conventional methods mentioned above, because water is sprayed forwards, thus transferring the obstructions in the right flow direction in the pipe, and without causing the risk of damage to the pipeline. The hose does not get jammed, because the unclogging means surrounding the hose can be rotated.

[0004] Nonetheless, this system involves the problem of the nozzle and journaling construction restricting the diameter of the pipelines to be opened, and of the long nozzle not bending well in narrow curves. In addition, the design of the collector rim used for winding the hose causes the hose to be bent in curves during the winding.

[0005] The object of this invention is to provide a new apparatus for opening and cleaning pipelines, which does not have the drawbacks mentioned above.

[0006] To achieve this, the apparatus for opening and cleaning pipe systems in accordance with the invention is characterised by the features defined in claim 1.

[0007] The preferred embodiments of the invention are characterised by the features defined in the dependent claims.

[0008] The apparatus for opening and cleaning pipelines of the invention allows pipes with a narrower diameter than before to be opened and cleaned at the same time. A 25 mm pipeline diameter will be sufficient. The use of the apparatus does not break the pipe joints, and enable pipelines to be opened in a single operation. The hose does not bend while being wound on the collector rim, and the service of the apparatus is facilitated.

[0009] The invention is explained below with the aid of examples and with reference to the accompanying drawings, in which

figure 1 shows a hose system of the apparatus of the invention for opening and cleaning pipelines,

figure 2 shows an apparatus of the invention for opening and cleaning pipelines,

figure 3 shows the cross-section of the collector rim of the apparatus of the invention for opening and cleaning pipelines, and

figure 4 shows the apparatus of the invention for opening and cleaning pipelines when used for opening pipelines.

[0010] In figure 1, the hose system of the apparatus of the invention for opening and cleaning pipelines comprises a nozzle 1, threads 2, a pressure hose 3, the nozzle rear part 4 and an opening wire 5.

[0011] The apparatus of the invention for opening and cleaning pipelines shown in figure 2 comprises an unclogging means 6, a collector rim 7, a pressure cleaner 8, a water hose 9, an electric wire 10, an actuating linkage 11, a hose system 12, a pressure hose 13 and a journal bearing 14.

[0012] The collector rim of the apparatus of the invention for opening and cleaning pipelines shown in figure 3 comprises a hose system 12 and grooves 15.

[0013] In figure 4, the apparatus of the invention for opening and cleaning pipelines, when used for opening pipelines, comprises a nozzle 1, a hose system 12, an apparatus for opening and cleaning pipelines 16, an obstruction 17 and a pipeline 18.

[0014] In the preferred embodiment of the apparatus of the invention for opening and cleaning pipelines the rotating nozzle 1, which sprays water forwards, is fastened to the pressure hose 3 by means of threads 2. The pressure hose 3 is encircled by an opening wire 5, whose second end is supported on the rear part 4 of the nozzle 1. There is no need for any separate journaling between the opening wire 5 and the rear part 4, because the rear part 4 of the nozzle has been provided with a gliding surface made e.g. of Teflon or any similar slippery and resistant material.

[0015] The nozzle 1, the pressure hose 3 and the opening wire 5 form the hose system 12, which passes through the unclogging means 6 to the collector rim 7,

about which the hose 12 is wound under the control of grooves 15. The diameter of the collector rim 7 may be dimensioned for instance so that one metre of hose 12 is collected about the collector rim 7 during one lap turn. The grooves 15 have been provided with a slide surface made of e.g. Teflon or any similar slippery and resistant material. The hose 12 is connected over the journaling 14 with the pressure hose 13, which feeds pressurised water from the pressure cleaner 8 to the hose 12.

[0016] The pressure cleaner 8 is connected to the pipeline network or any other water source with a water hose 9, and the pressure cleaner 8 and the unclogging means 6 are connected to an electricity source over an electric wire 10.

[0017] When the apparatus of the invention for opening and cleaning pipelines 16 is used, the hose 12 is fed into the pipeline 18 until the nozzle 1 reaches the obstruction 17. If the hose 12 cannot be fed by hand to pass by the obstruction 17, the unclogging means 6 can be activated, and then the opening wire 5 starts rotating about the pressure hose 3. The hose 12 is subsequently fed forwards by means of the actuating linkage in the unclogging means 6. When the nozzle 1 has passed by the obstruction 17, the hose 12 is run far enough, all the way to a vertical pipe, for instance, to ascertain that the obstruction 17 is not merely moved forwards.

[0018] The pressure cleaner 8 is activated, and then the nozzle 1 starts spraying water forwards, and at the same time the hose 12 is slowly retracted in the pipeline 18. This is done to ensure that the amount of water is sufficient to transport the impurities detached by the nozzle 1, and to ascertain that the washing is performed on a clean pipe and a larger pipe size, without causing further clogging. As it is being retracted, the hose 12 is wound about the collector rim 7 guided by the grooves 15 in the collector rim 7.

[0019] It is obvious to those skilled in the art that the invention is not limited to the disclosure above, but may vary within the scope of the following claims.

Claims

1. An apparatus for opening and cleaning pipelines, comprising

- a hose system (12), which comprises a rotating nozzle (1), which is fastened to the pressure hose (3) by means of threads (2) and sprays water forwards, and an opening wire (5) encircling the pressure hose (3),
- unclogging means (6) which comprises an actuating linkage (11),
- a collector rim (7), which comprises a journal bearing (14) and grooves (15), and

- a pressure cleaner (8),

characterised in that the opening wire (5) encircling the pressure hose (3) as a support is supported at one end on the surface-treated rear part (4) of the nozzle (1) and at the other end on the surface-treated grooves (15) of the collector rim (7).

2. An apparatus for opening and cleaning pipelines as defined in claim 1, **characterised** in that the unclogging means (6) and the pressure cleaner (8) can be used simultaneously.

3. An apparatus for opening and cleaning pipelines as defined in claim 1 or 2, **characterised** in that the hose (12) is fed by means of the actuating linkage (11) provided in the unclogging means (6).

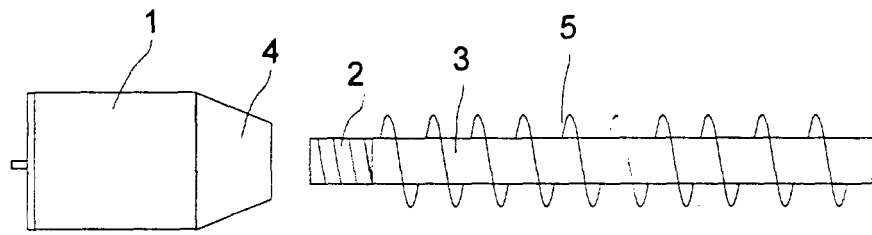


FIG. 1

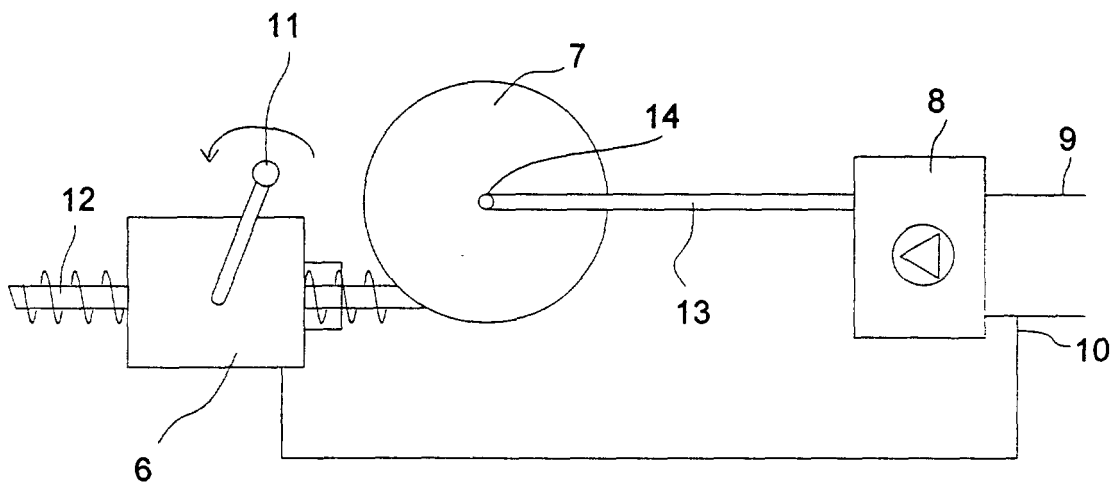


FIG. 2

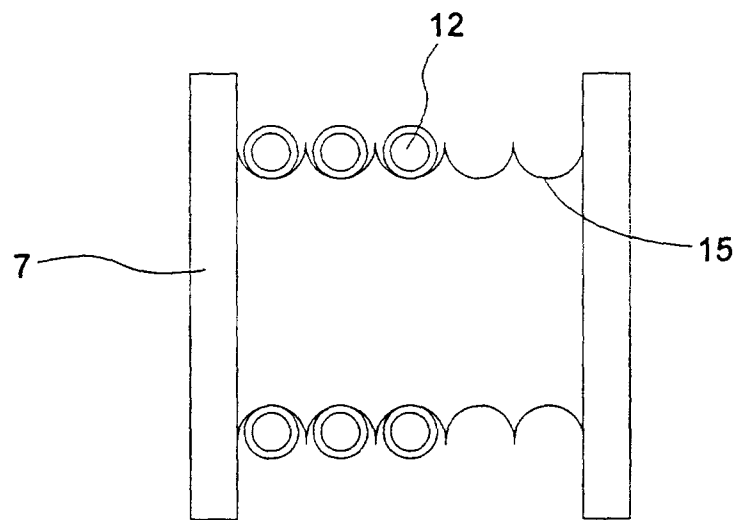


FIG. 3

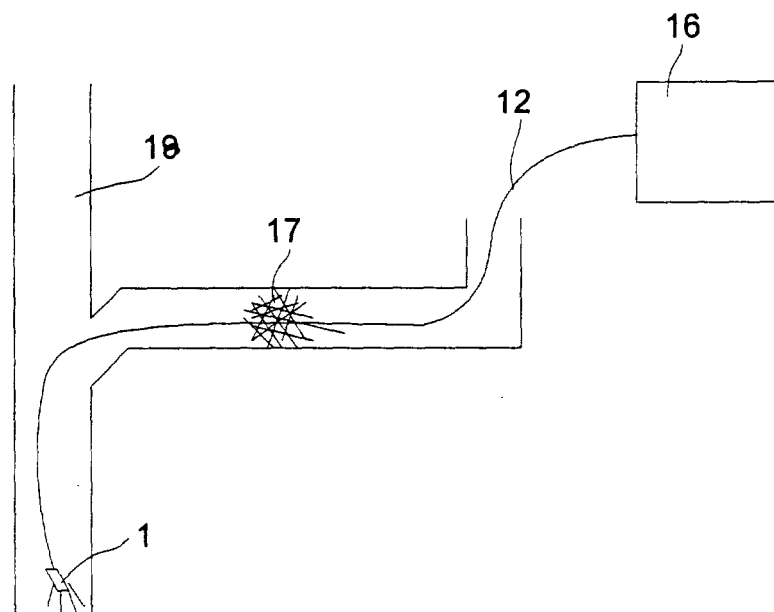


FIG. 4



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 01 66 0018

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 4 773 113 A (RUSSELL V LEE) 27 September 1988 (1988-09-27) * abstract; claims 1,20,31; figures 1-3,5-10 * * column 4, line 35 - column 5, line 68 * * column 8, line 6 - column 11, line 51 * ---	1-3	B08B9/04
X	US 5 862 561 A (IRWIN LAWRENCE F) 26 January 1999 (1999-01-26) * abstract; claims 1,6,12; figures 1-7 * * column 2, line 13 - column 8, line 36 * -----	1-3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B08B E04F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 8 May 2001	Examiner Plontz, N
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 66 0018

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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08-05-2001

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