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(54) DEVICE FOR THE RETRACTABILITY OF THE FLEXIBLE HOSE OF CENTRAL VACUUM SYSTEMS

(57) A metallic housing (1) having a substantially parallelepiped shape and provided to be flush-mounted in a wall or to be left exposed, inside which there is a rigid tubing (2) having a cross-section and a length which are suitable to accommodate internally the flexible hose (6), already used with the cleaning accessories, when drawn by the suction of the control unit, the tubing (5) of the system being connected to the tubing (2) of the housing (1).

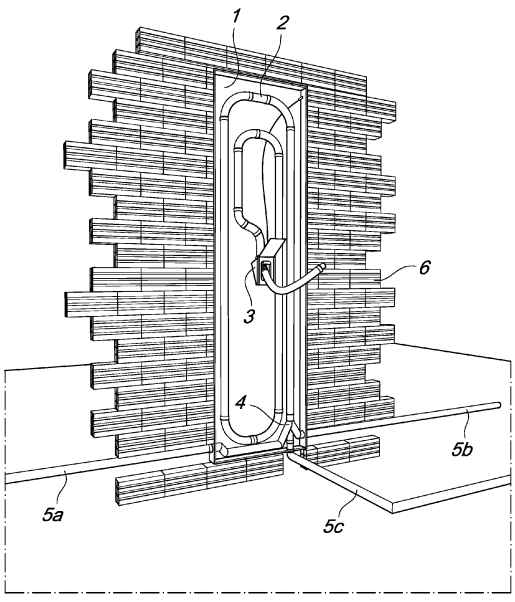

Fig. 1

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Description

[0001] The present invention relates to a device for the retractability of the flexible hose of central vacuum systems.

[0002] It is known that central vacuum systems, where it is possible to install them, are preferred over portable vacuum cleaners since the latter recirculate back into the spaces in which they operate the aspirated air, which is never filtered perfectly.

[0003] In summary, these systems are constituted by a central vacuum unit located in a service room or in a sheltered outdoor place and connected, by means of in-wall tubing, to one or more vacuum inlets into which the flexible hose of adapted cleaning accessories, similar to those of portable vacuum cleaners, is coupled when needed.

[0004] Some central systems, already appreciated for the external expulsion of the aspirated air and of the microdust entrained by it, are appreciated even more if, at each end of use, it is not necessary to roll up and store the flexible hose which, in this case, is retracted by the suction of the central unit into the rigid tubing of the system and kept therein until it is used again.

[0005] Obviously, these are systems that are provided for this purpose right from the outset, since in order to be able to obtain the retractability of the flexible hose the rigid tubing must have a cross-section and a layout that allows the aspirated hose to travel along it easily and without hindrance.

[0006] Since it is complicated and excessively onerous to intervene in existing central systems in order to replace their tubing, which is almost always in-wall, with a tubing that allows retractability of the flexible hose in the described manner, the aim of the present invention is to overcome the drawbacks of the prior art.

[0007] The above aim and other objects that will become more apparent hereinafter are achieved by a device as claimed in claim 1.

[0008] The solution proposed with the present invention, which is as simple as it is unusual and most of all advantageous, both from the practical standpoint and from the economic standpoint, consists in summary in extending the rigid tubing of the system with an additional fraction which, in addition to having the adequate cross-section and the length that are sufficient to accommodate the flexible hose inside it, is entirely contained within an adapted rigid enclosure which is shaped so that it can be placeable easily wherever necessary.

[0009] Further characteristics and advantages of the invention will become better apparent from the detailed description of a preferred, but not exclusive, embodiment of the device according to the present invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figures 1 and 2 show the rendering of the installation of the invention as an integration of a conventional central system;

Figure 3 is a cutout of the front view of the invention;

Figure 4 is a view of a first embodiment of the invention, taken along the vertical sectional plane X-X of Figure 3;

Figure 5 is a view of a second embodiment of the invention, termed two-sided, taken along the vertical sectional plane X-X of Figure 3;

Figure 6 is a detail view of a detail of Figure 4 related to the extraction box 3a of the flexible hose 6;

Figure 7 is a detail view of a detail of Figure 5 related to the extraction box 3b of the flexible hose 6;

Figure 8 is a detail view of a detail of Figure 3 related to the narrowing 2a of the tubing 2 and the stopping of the flexible hose 6 retracted inside;

Figure 9 is a view of the extraction and stopping of the flexible hose after lifting one of the two cover doors of the box 3b which in this case is already installed and complete with finishing plaster 11.

[0010] With reference to the drawings, Figures 1 and 2 show a device comprising a housing 1, having a substantially parallelepiped shape, which is flush-mounted in a dividing wall of the room in which to operate with the cleaning accessories inserted in the flexible hose 6 extracted as needed.

[0011] In particular, Figure 2 shows that at least two faces of the housing 1, the ones that are flush with the masonry wall, are provided with a metallic mesh (or equivalent) for the grip of the plaster which, similar to that of housings for retracting sliding doors and for other similar situations, allows the completion of the housing with the same finish as the wall in which it is flush-mounted. However, it is not excluded that the housing in question might be intended for an "exposed" installation and therefore may arrive for installation already esthetically finished to be fixed against a wall and proximate to the tubing 5 of the system to which the tubing 2 of the housing 1 is to be connected.

[0012] Preferably, the housing 1 can be made of metallic material, although the adoption of any other material with equivalent characteristics is not excluded.

[0013] In fact, inside the housing 1, both if it is to be flush-mounted or if it is to remain visible, there is the tubing 2 into which to accommodate the entire flexible hose 6 when drawn by the suction applied by a central vacuum system (which comprises a control unit) which, via the tubing 5, is stably connected to the tubing 2 since the housing 1 is installed.

[0014] It should be noted that one end of the tubing 2 communicates with the box 3, from which the flexible hose 6 is to be extracted when needed, while the other end, being designed to be connected to the in-wall tubing 5 that arrives from the vacuum apparatus, according to the embodiment of Figure 1, ends with a connector of the type of a branch 4 for connection to the tubing 5 that originates from one of the three possible directions of which two, 5a and 5b, are along the wall and one, 5c, is

under the floor.

[0015] The rigid tubing 2, regardless of whether it is connected to the tubing 5 of the system with a branch 4 or with any other connector, has a narrowing of the terminal portion 2a (Figure 8) against which the thicker end 6a (shoulder) of the retractable hose 6 stops when a portion of said hose (Figures 6 and 7) on which it is possible to act manually for extraction remains inside the box 3, such extraction being also necessarily limited by the arrival of said thicker end 6a (shoulder) against the rounded mouth 30 of the hole for access of the flexible hose 6 to the box (Figure 9).

[0016] All this independently of the fact that it is a box 3a with just the cover door 7 or a box 3b with the cover doors 8 and 9, which besides can be opened alternately since they are mutually coupled by at least one group of two or more levers 10 which, pivoted in succession (Figure 7), are arranged aligned (Figure 9) when one of the two cover doors is stopped open, thus forcing the other one to remain closed until the former is closed (mechanical interlocking of the two cover doors 8 and 9).

[0017] The embodiment of Figures 7 and 9, to which Figures 3 and 5 also refer, is termed two-sided here since it allows the extraction and use of the flexible hose 6 in each of the two rooms separated by the wall in which the housing 1 is flush-mounted.

[0018] Furthermore, the installation of a two-sided housing of the type shown in Figure 3 has the advantage of being executable by orienting in each instance the outlet of the end 2a of the tubing 2 toward the direction of arrival of the tubing 5 of the central system to which it is to be connected.

[0019] In practice it has been found that the device according to the invention fully achieves the set aim and objects.

[0020] The device thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0021] Moreover, all the details may be substituted by other, technically equivalent elements.

[0022] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to the requirements and to the state of the art.

[0023] The disclosures in Italian Utility Model Application No. 202021000002579 from which this application claims priority are incorporated herein by reference.

[0024] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A device for the retractability of the flexible hose of central vacuum systems, **characterized in that** it comprises at least one housing (1), having a substantially parallelepiped shape, configured for an arrangement chosen between flush-mounted in a wall and exposed, said housing (1) comprises a rigid tubing (2), associated with a vacuum apparatus by means of a tubing (5), which has a cross-section and a length which are suitable to accommodate internally a flexible hose (6) that can be extracted from said housing (1) by pulling from the terminal end of said hose (6) that faces outward through an opening of said housing (1), said hose (6) being retractable into said rigid tubing (2) by virtue of the action of the negative pressure established by the suction applied by said apparatus.

2. The device for the retractability of the flexible hose of central vacuum systems according to claim 1, wherein one end of the tubing (2) ends in a box (3) which can be accessed from the outside of the housing (1) and from which the flexible hose (6) is extracted when needed while the other end ends with a connector of the type of a branch (4) which allows the connection of the tubing (2) to the tubing (5) of the system.

3. The device according to one or more of the preceding claims, wherein a rear end (6a) of the flexible hose (6) has an external thicker shoulder region which produces its stopping upon extraction, against a rounded mouth (30) of a hole for access to the box (3a, 3b), and upon retraction, against a narrowing (2a) of the terminal portion of the tubing (2) of the housing (1).

4. The device according to claim 3, wherein when automatic retraction, due to suction, of the flexible hose (6) into the box (3a, 3b) ceases, a portion of said hose (6) continues to protrude on which one acts manually after opening an adapted cover door (7, 8, 9) for complete retraction.

5. The device according to one or more of the preceding claims, wherein the box (3) is provided with two hatches (8 and 9) to allow the extraction and use of the flexible hose (6) in each of the two spaces separated by the wall in which the housing (1) is flush-mounted.

6. The device according to claim 5, wherein the cover doors (8 and 9) of the extraction box (3b) comprise interlocking means for their mutual coupling, which are provided with at least one set of at least two levers (10) which, hinged in succession, are arranged aligned when one of the two cover doors (8, 9) is in the open configuration, blocking the other cover door in the closed configuration.

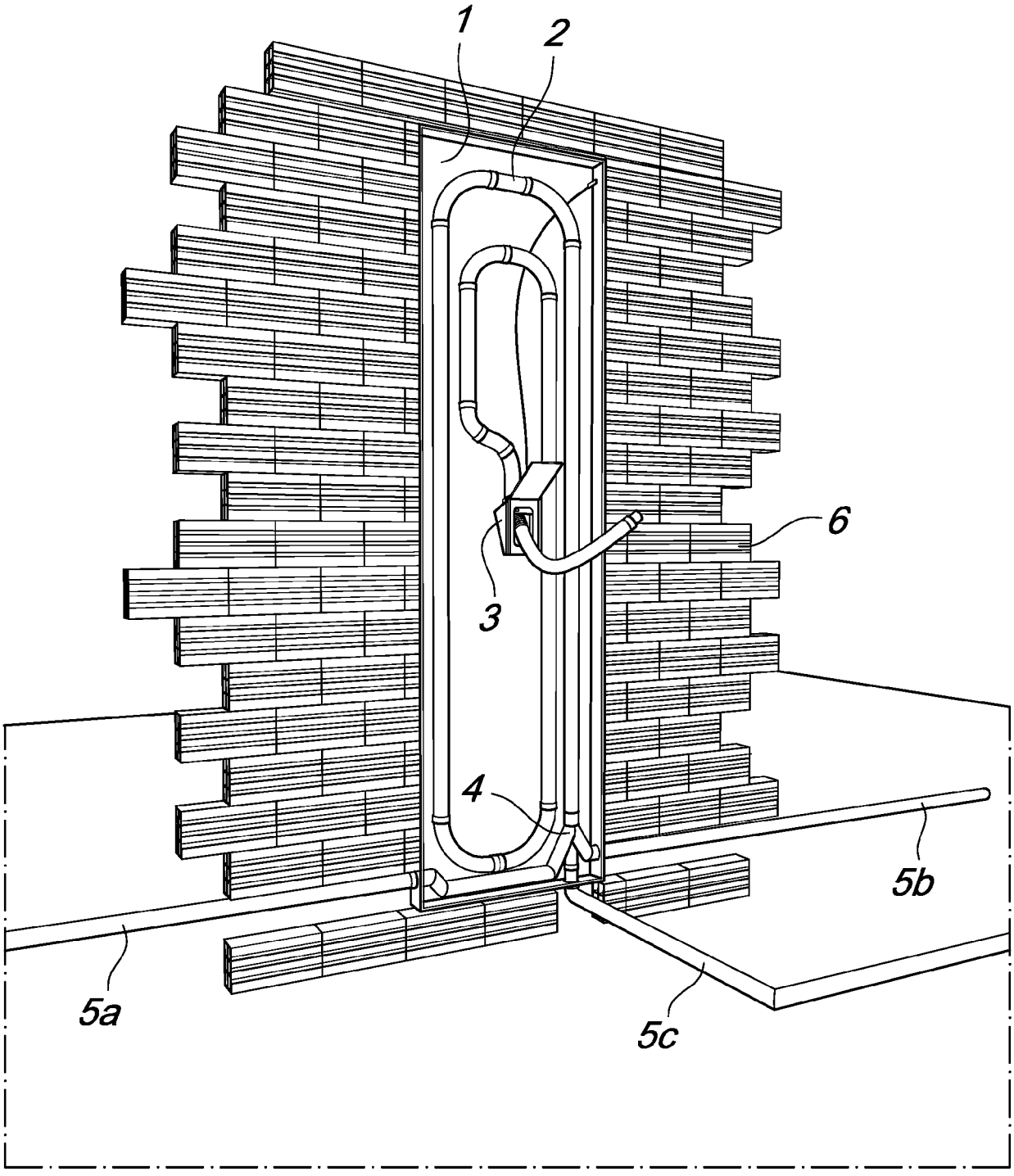

Fig. 1

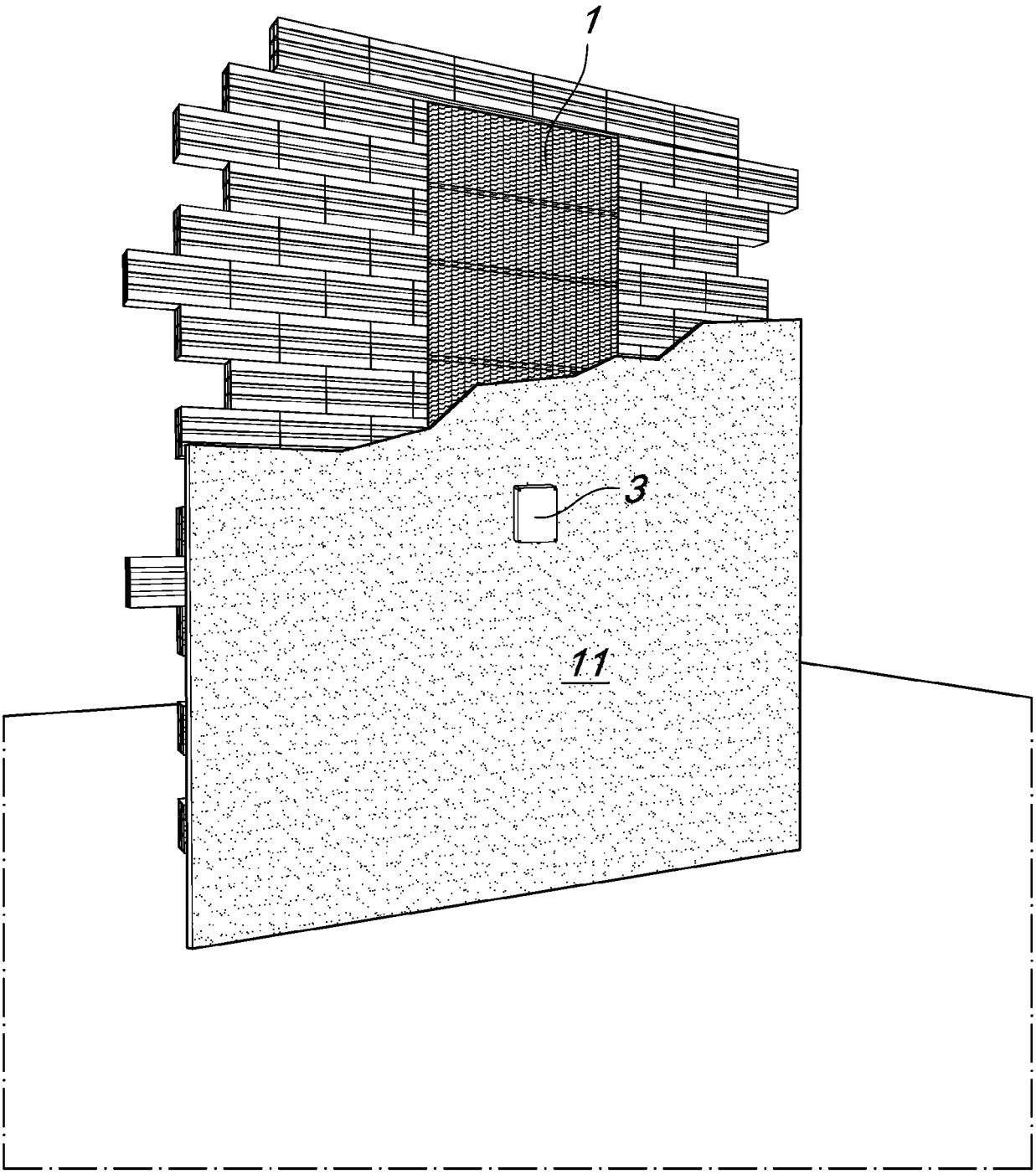

Fig. 2

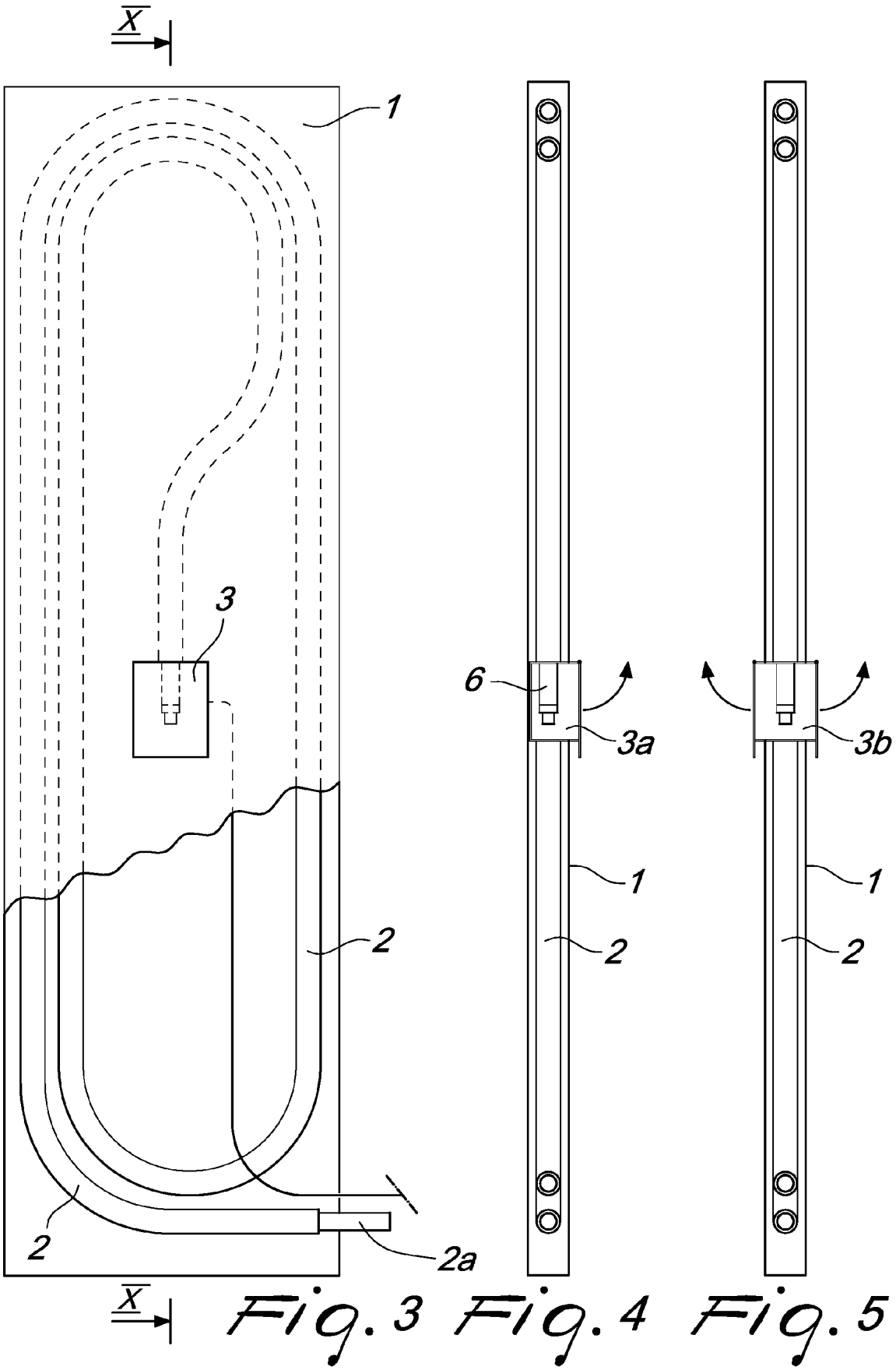

Fig. 3 Fig. 4 Fig. 5

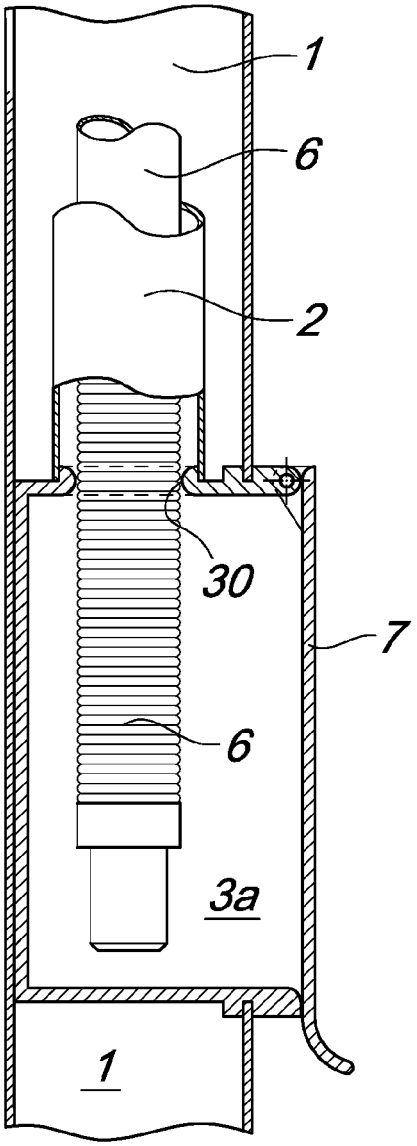

Fig. 6

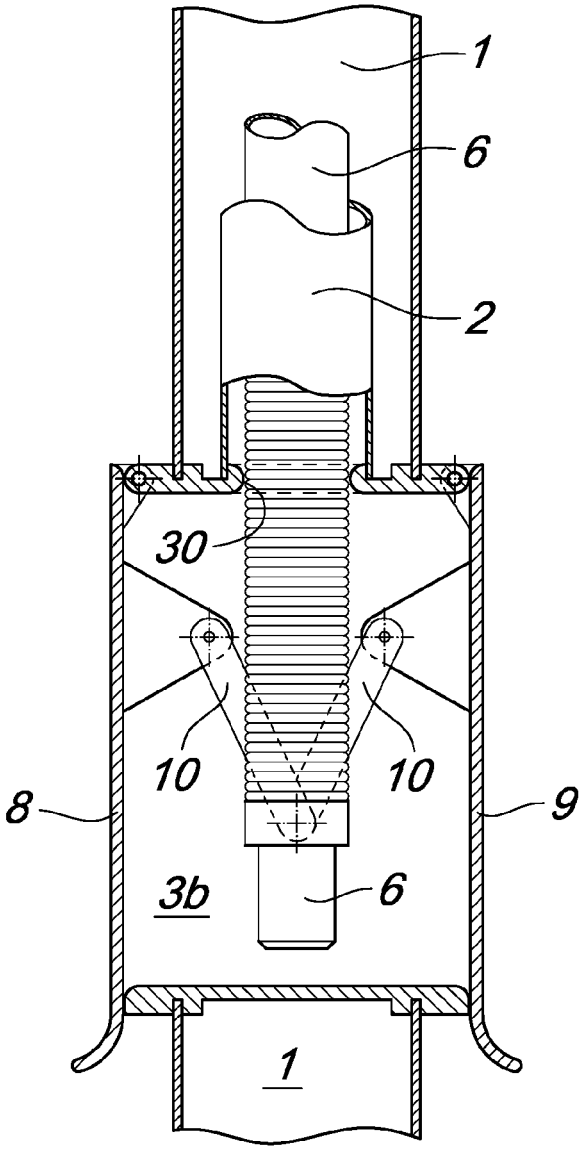

Fig. 7

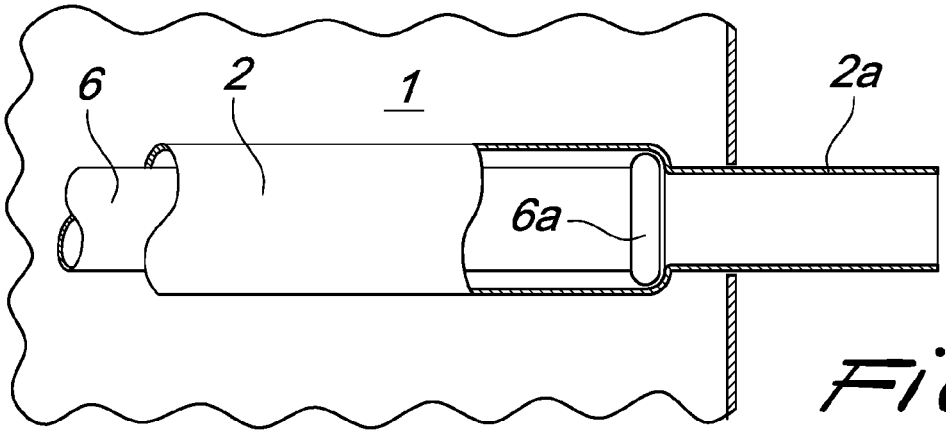

Fig. 8

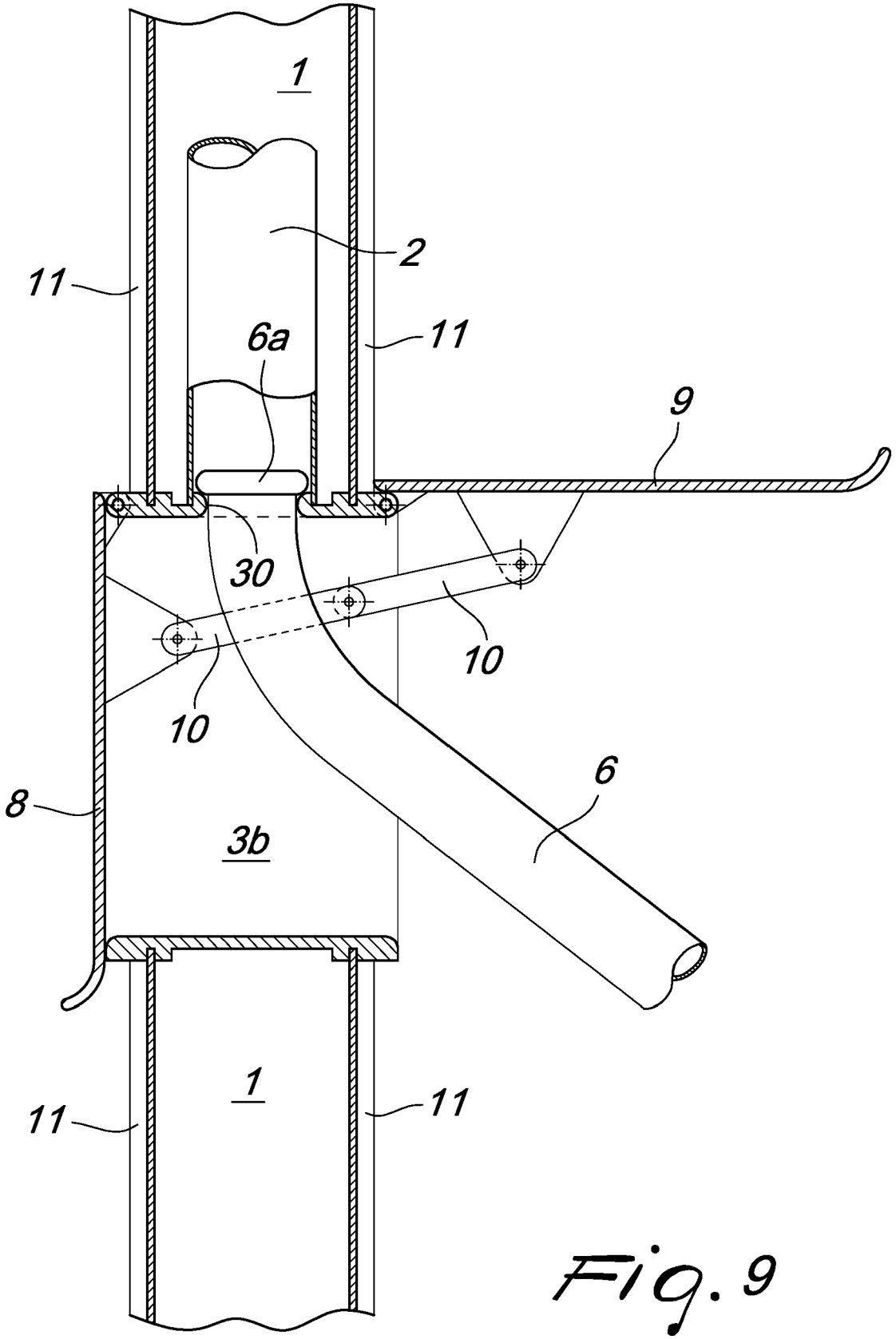

Fig. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 22 17 2330

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2011/041282 A1 (SMITH JAMES F [US] ET AL) 24 February 2011 (2011-02-24)	1-4	INV. A47L5/38
A	* the whole document *	5,6	A47L9/24
X	US 2007/174991 A1 (TROTTER JERRY [US]) 2 August 2007 (2007-08-02)	1-4	
A	* the whole document *	5,6	
X	WO 01/24677 A1 (DRIVSTUEN GARY [US]; GLAZER HOWARD [US]) 12 April 2001 (2001-04-12)	1-4	
A	* the whole document *	5,6	

TECHNICAL FIELDS SEARCHED (IPC)

A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 September 2022	Jezierski, Krzysztof

CATEGORY OF CITED DOCUMENTS

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16-09-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011041282 A1	24-02-2011	US 2011041282 A1	24-02-2011
		US 2014101886 A1	17-04-2014
US 2007174991 A1	02-08-2007	CA 2570018 A1	01-08-2007
		US 2007174991 A1	02-08-2007
WO 0124677 A1	12-04-2001	AU 7855400 A	10-05-2001
		WO 0124677 A1	12-04-2001

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Patent documents cited in the description

- IT 202021000002579 **[0023]**