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(54) A device for collecting and removal of condensation liquids

(57) The invention relates to a device for collecting and removal of condensation liquids from ceilings, tubings and the like (13), said device in the orientation intended for use comprising: a lower base part (3) and an upper compartment (2) for receiving the liquids; wherein said upper compartment (2) is elongated and having a first end (6) and a second end (6') and said upper compartment (2) comprises a first side (4), a second side (5) and a bottom part (9), said bottom part (9) connecting the first side (4) and the second side (5); and wherein said bottom part (9) of the upper compartment (2) comprises one or more drain holes (10) for draining the liquid out of the upper compartment (2); wherein said lower base part (3) comprises an elongated part and a pipe connection (7); and wherein said elongated part of said lower base part (3) comprises a lower compartment (16) for receiving the liquid originating from said one or more drain holes (10) in the bottom part (9) of the upper compartment (2); and wherein the inner of said pipe connection (7) is in liquid connection with said lower compartment (16) of said elongated part of said lower base part (3); and wherein said pipe connection (7) comprises means for connecting a pipe (12), a handle or a hose; characterised in that said elongated part of said lower base part (3) and said elongated upper compartment (2) for the liquids are releasable connected; and that at least one of said first side (4) or said second side of said upper compartment (2) is flexible so as to enable adaptation to the contour of a tube (13). Furthermore, the invention relates to use of such a device.

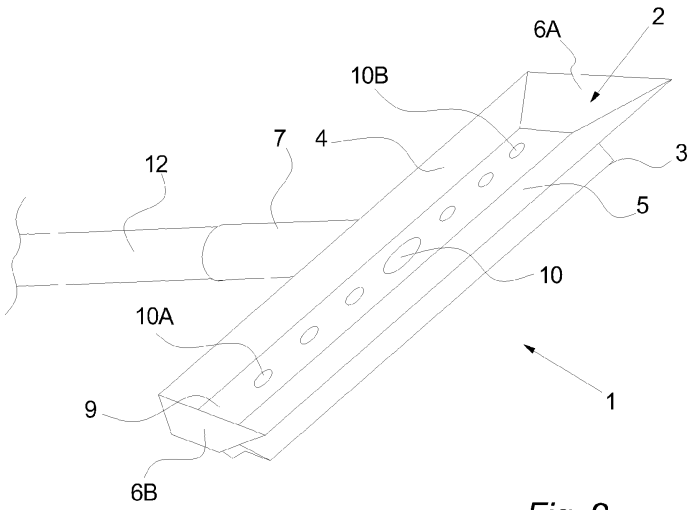

Fig. 2

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Description

Technical Field of the Invention

[0001] The present invention relates in a first aspect to a device for scraping off liquid from a tube or the like and in a second aspect to the use of such device.

Background Art

[0002] In buildings where a high level of hygiene is required such as e.g. building where food is produced or processed, or where animals are slaughtered, problems may occur in relation to condensation of liquid on tubes or ceilings which may drip e.g. into the food.

[0003] Prior art document US 6,378,159 discloses a squeegee where the outermost edge of the disclosed squeegee is made of a flexible material enabling the squeegee to scrape off liquid from plane surfaces.

[0004] A problem related to the prior art is how to scrape off liquid from a circular object such as a pipe whether the circumference of the pipe is plane or not. The squeegee as described in US 6,378,159 is not suitable for scraping off liquid form circular objects due to its construction which is made for plane surfaces.

[0005] It is the intention with the present invention to overcome the above mentioned problems.

Summary of the Invention

[0006] The invention relates to a device for collecting and removal of condensation liquids from ceilings, tubings and the like, said device in the orientation intended for use comprising:

a lower base part and an upper compartment for receiving the liquids;

wherein said upper compartment is elongated and having a first end and a second end and said upper compartment comprises a first side, a second side and a bottom part, said bottom part connecting the first side and the second side; and

wherein said bottom part of the upper compartment comprises one or more drain holes for draining the liquid out of the upper compartment;

wherein said lower base part comprises an elongated part and a pipe connection; and

wherein said elongated part of said lower base part comprises a lower compartment for receiving the liquid originating from said one or more drain holes in the bottom part of the upper compartment; and

wherein the inner of said pipe connection is in liquid connection with said lower compartment of said elongated part of said lower base part; and

wherein said pipe connection comprises means for connecting a pipe, a handle or a hose;

characterised in that

said elongated part of said lower base part and said elongated upper compartment for the liquids are releasably connected; and

that at least one of said first side or said second side of said upper compartment is flexible so as to enable adaptation to the contour of a tube.

[0007] The present invention solves the above mentioned problems by providing a head of a squeegee having at least one side of an upper compartment made of a flexible material. It is preferably the trailing side, also referred to as second side of the upper compartment, which is made of flexible material. Because the entire trailing side is made of a flexible material it is able to deform to fit the circumference of a wide range of pipes having different diameters.

[0008] Furthermore the head of the squeegee as described in the present application is releasably mounted to a lower base part. This provides flexibility to the user of the squeegee because the head of the squeegee is replaceable. Hence if the diameter of a pipe is very large, the head of the squeegee may be replaced by a head suitable for scraping such

a pipe. A changed diameter of a tube may pose correspondingly changed requirements in relation to the degree of flexibility of the material of the second side in order to optimise performance.

[0009] In an embodiment of the invention, the device has an extension in the direction defined by the elongated part of the upper compartment of 10 - 80 cm, such as 20 - 70 cm, e.g. 30 - 60 cm, such as 40 - 50 cm. Such a dimension has proven suitable in respect of most tubes to be scraped and encountered within the relevant industry.

[0010] In an embodiment of the invention, the upper compartment and lower base part comprise releasing means for mutually releasing the upper compartment from the lower base part, thus allowing easy exchange of the upper compartment.

[0011] In an embodiment of the invention, the releasing means comprises click locking/unlocking means for securely locking and unlocking the upper compartment and lower base part.

[0012] Such embodiments allow easy exchange in case the device is going to be used to scrape tubes having different diameters.

[0013] In an embodiment of the invention, the upper compartment at the respective ends comprises a first end section and a second end section each connecting the first side, the second side and the bottom part of the upper compartment. This embodiment will further reduce the amount of spilled liquids in the scraping process.

[0014] In an embodiment of the invention, the first side and/or the second side of said upper compartment is made of a thermoplastic elastomer such as a thermoplastic elastomer comprising 5% — 80% polypropylene. Such an embodiment has shown to impart the desired degree of flexibility.

[0015] In an embodiment of the invention, the lower base part is made of copolymer based on propylene monomers. Such materials have proven beneficial for the intended purpose.

[0016] In an embodiment of the invention, the device comprises an extension pipe fitted to the pipe connection of the lower base part. This embodiment provides for better possibilities for collecting the liquids to be scraped off as well as provide for an extension so as to allow better reach in high places.

[0017] In an embodiment of the invention, the distal end of the extension pipe relative to the lower base part is provided with a container or a hose for collection of the collected condensation liquids.

[0018] Moreover the invention relates to the use of a device according to any of the preceding claims for collecting and removal of condensation liquids from ceilings, tubings and the like.

[0019] In an embodiment of the invention said trailing side 5 in relation to the intended orientation of use and direction of movement 15 is extending above the end parts 6A and 6B.

[0020] In an embodiment of the invention the outermost part of the trailing side 5 in relation to the intended orientation of use and direction of movement 15 is formed with an edge pointing in direction of the intented direction of movement 15.

Figure list

[0021]

Figure 1 illustrates a front view of the device according to an aspect of the invention,

Figure 2 illustrates a top view of the device according to an aspect of the invention,

Figure 3A illustrates a cross-sectional view of the device illustrated in figure 1,

Figures 3B-3C illustrate alternative edges of the trailing side / second side of the upper compartment,

Figure 4 illustrates the device according to an aspect of the invention where the device is in use, and

Figure 5 illustrates a cross-sectional view of an embodiment of the invention where the upper compartment is released from the lower base part.

Detailed description of the Invention

[0022] Figure 1 illustrates a front view of a squeegee 1 according to a first aspect of the invention. The illustrated squeegee 1 comprises an upper compartment 2 and a lower base part 3.

[0023] The upper compartment 2 is defined by a first side 4, a second side 5, a first end part 6A, a second end part 6B and a bottom part (not illustrated). The lower base part 3 comprises a pipe connection 7 enabling a pipe 12 to be connected to the lower base part 3. The pipe connection 7 may be understood as a lower compartment 16 or as part of the lower compartment 16 and may be used for guiding collected liquid away from the lower compartment 16 and into a pipe 12.

[0024] The upper compartment 2 is made of a flexible material as described below. The lower base part 3 is preferably of a relatively stiff nature in order to secure the integrity of the squeegee 1 during use of the squeegee 1.

[0025] Figure 2 is a top view of the squeegee 1 illustrated in figure 1 illustrating the bottom part 9 of the upper compartment 2. As it is illustrated, the bottom part 9 comprises one or more drain holes 10 enabling liquid to escape the upper compartment 2.

[0026] Furthermore figure 2 illustrates the first end part 6A and the second end part 6B.

[0027] Both the upper compartment 2 and the lower base part 3 are elongated in a direction essentially perpendicular to the surface from which the squeegee 1 is to scrape off a condensation liquid. The lower base part 3 should at least extend enough to be able to collect condensing liquid from the upper compartment 2 which is drained by the two outermost drain holes 10A and 10B of the bottom part 9 of the upper compartment 2.

[0028] With this said it should be noted that if the upper compartment 2 comprises a compartment under the bottom part 9 (see e.g. figure 5) for collecting the drained liquid, the length of the lower base part 3 does not need to be able to collect drained liquid from drain holes 10A and 10B. In this situation the lower base part 3 should only enable maintenance of the upper compartment 2 and conduct liquid from such compartment into the pipe connection 7.

[0029] Figure 3A is a cross sectional view of the squeegee 1 illustrated in figure 1. The cross sectional view is at line AA and it should be noted that the squeegee 1 illustrated in figure 3A is illustrated in a preferred use situation. When using the squeegee 1 in this preferred use situation for removal of liquid such as condensation liquid from a tube, ceiling or the like 13, the second side 5 of the upper compartment 2 is in physical contact with e.g. the tube 13.

[0030] When contact between the second side 5 and the pipe 13 is achieved, the squeegee 1 is pulled in the orientation intended for use as illustrated by arrow 15. Thereby the second side 5 is scraping condensing liquid such as liquid drops 14 from the tube 13 down into the upper compartment 2.

[0031] The drops 14 are drained from the upper compartment 2 by drain holes 10 in the bottom part 9. From the drain holes 10, the drops 14 enter a lower compartment 16 through which the drops 14 are guided into the pipe connection part 7 and further down into a pipe 12 or the like.

[0032] The lower compartment 16 may be a space defined when the upper compartment 2 is attached to the lower base part 3 as illustrated in figure 3. Alternatively the lower compartment 16 may be defined solely by the upper compartment 2 or solely be the lower base part 3.

[0033] The upper compartment 2 and the lower base part 3 is connected by means of locking parts 11 of the upper compartment 2 and recesses 8 of the lower base part 3. It should be noted that the locking parts 11 and the recesses 8 may be formed in various ways and be located randomly on either the upper compartment 2 and the lower base part 3.

[0034] According to the first aspect of the invention the first side 4 may also be referred to as leading side and the second side 5 may also be referred to as trailing side. When referring to a leading side 4 and a trailing side 5 this should be understood in relation to the orientation and direction of movement intended when using squeegee 1 in the preferred use (indicated by arrow 15). The leading side 4 is the front side - in relation to the direction of movement - of the upper compartment 2 when the squeegee 1 is pulled towards oneself; whereas the trailing side 5 is the rear side - in relation to the direction of movement - of the upper compartment 2 when the squeegee 1 is pulled towards oneself.

[0035] The trailing side 5 may extend above the end part 6A and 6B of the upper compartment 2. In this figure this is illustrated by the fact that the leading side 4 is as high as the end part 6A indicated by a dotted line and the trailing side 5 terminates above the line indicating the height of the end part 6A.

[0036] The end of the trailing side 5 in the circle BB is illustrated in alternative embodiments in figure 3B and 3C.

[0037] In figure 3B the end or termination of the trailing side 5 is formed with an edge pointing in direction of the orientation intended for use 15 of the squeegee. Such termination of the trailing side 5 may facilitate an optimized scraping of a surface 13.

[0038] In figure 3C the end or termination if the trailing side 5 is illustrated as being essentially parallel with the surface 13 to be scraped. When applying force to the squeegee, the end of the trailing side 5 may be deformed e.g. as illustrated in figure 3A.

[0039] According to the first aspect of the invention the pipe connection 7 is extending out from the lower base part 3 in an angle which is towards the user when the squeegee 1 is used in the above mentioned preferred way and thereby away from the trailing side 5 of the upper compartment 2 as illustrated in figure 3.

[0040] It should be mentioned that theoretically, if the first side 4 is made of a flexible material, the first side 4 may be used to scrape the tube 13 if the squeegee 1 is pushed away from oneself. In this way of using the squeegee 1 the first side 4 becomes the trailing side scraping off condensing liquid of a tube 13. The principles in this way of using the squeegee 1 is the same as described above where it is the second side 5 which is scraping the tube 13 when the squeegee 1 is pulled towards oneself. An analogue situation arises in case both the first side 4 and the second side 5 are flexible.

[0041] The physical contact between the tube 13 and the trailing side 5 leads to a deformation of the trailing side 5 due to a combination of the flexible material which the trailing side 5 is made of and the force which e.g. a person scraping the tube 13 with the squeegee 1 is applying to the pipe 12. Hence the greater force the user applies to the pipe 12 the

more the trailing side 5 is deformed and in the same way the more flexible the material of which the trailing side 5 is made, the more the trailing side 5 is deformed when exposed to an applied force.

[0042] The relation between flexibility of the trailing side 5 and the applied force is now explained in further details in relation to figure 4. The squeegee illustrated in figure 4 is illustrated from the trailing side 5 hence in this illustration the squeegee 1 is moving "into the illustration" as indicated by the arrow 15.

[0043] A distinguishing feature of the first aspect of the present invention is that at least the trailing side 5 of said upper compartment 2 is flexible. In the present description and the appended claims the term "flexible" shall be understood according to the following definition:

[0044] When the squeegee 1 according to the first aspect of the present invention is pushed essentially vertically against a horizontally arranged tube 13 having an outer diameter 0 with a force F in such a way that the elongated upper compartment 2 is essentially perpendicular to the axially direction of the tube 13 and in such a way that the edge of the trailing side 5 defines an essentially horizontal line, the edge of the trailing side 5 touches the tube 13 at the two most extreme points A and B, wherein the distance of the arch extending from the point A to the point B along the outer surface of the tube 13 is d.

[0045] Within this definition according to the invention of the first aspect of the present invention, at least one of the following set of values applies in order to comply with the requirement of being flexible:

Diameter Ø of tube (cm)	Force F (N)	Min. distance d (cm)
40	40	15-25, such as 21
50	40	20-35, such as 29
60	40	25-40, such as 32
100	50	45-55, such as 51
160	50	65-75, such as 65

[0046] It should be noted that the relationship in-between the content of the table above is for guidance only and should not be seen as fixed.

[0047] Figure 5 illustrates an aspect of the invention where the upper compartment 2 can be releasably mounted on the lower base part 3. As illustrated the upper compartment 2 comprises protruding locking parts 11 and the lower base part 3 comprises locking recesses 8. By means of the protruding locking parts 11 and the recesses 8 the upper compartment 2 and the lower base part 3 can be releasably mounted.

[0048] If the first side 4 and / or the second side 5 is made of a flexible material the protruding locking parts 11 of the upper compartment may be forced from the top of and down to fit into the recess 8 of the lower base part 3.

[0049] Alternatively the upper compartment 2 may be releasably mounted by sliding the upper compartment 2 onto the lower base part 3 from one end of the lower base part 3.

[0050] Yet another alternative is to equip the lower base part 3 with a clip and lock release mechanism (not illustrated), which when pressing a button makes space for placing the upper compartment 2 and when releasing the button the upper compartment is attached to the lower base part 3.

[0051] The above mentioned ways of connecting the upper compartment 2 and the lower base plate may be referred to as a release mechanism 17.

[0052] Figure 5 furthermore illustrates that the upper compartment 2 may comprise a lower compartment 16A beneath the bottom part 9. In this embodiment the lower base part 3 comprises a base for the upper compartment 2 and the pipe connection 7 may still be seen a part of the lower compartment 16.

[0053] In an embodiment of the invention all parts of the squeegee are made of materials which allow cleaning at temperatures up to 121 degrees Celsius or more.

[0054] In an embodiment of the invention the upper compartment 2 comprises a thermoplastic elastomer. For example the upper compartment 2 may be made of a thermoplastic elastomer such as a thermoplastic elastomer comprising 5% - 80% polypropylene preferably 5%-50% polypropylene, more preferably 10%-40% polypropylene, most preferably 13%-25% polypropylene.

[0055] As described in relation to figure 3A-3B the end 5A of the trailing side 5 may be terminated in different ways and in different heights in relation to the end parts 6A and 6B. Different endings 5A of the trailing side 5 may be used to optimize the the scraping capabilities of the squeegee 1 when the squeegee 1 is use to scrape different surfaces or liquid with different density or even solid material from the surface to be scraped.

[0056] In the same way the trailing side 5 of the upper compartment 2 may be angled differently according to what the squeegee is to scrape (e.g. liquid or solid material, etc) and the surface to be scraped (e.g. a tube, a ceiling, etc). To illustrate this, a further trailing side 5B is illustrated having an angle V' from the bottom part 9 where the trailing side

5 is illustrated having an angle V to the bottom part 9. Hence if the upper compartment 2 is constructed with a trailing side 5B having a smaller angle V' the scraping capabilities of the squeegee are changed e.g. to optimize scraping of plane surfaces. In this way and because it is possible to change the upper compartment 2 the squeegee 1 of the present invention provides a range of possibilities in relation to the surface to be scraped (such as a tube or a ceiling) and material to be scraped (such as liquid or solid material).

Claims

1. A device for collecting and removal of condensation liquids from ceilings, tubings and the like (13), said device in the orientation intended for use comprising:

   a lower base part (3) and an upper compartment (2) for receiving the liquids;
   wherein said upper compartment (2) is elongated and having a first end (6) and a second end (6') and said upper compartment (2) comprises and comprises a first side (4), a second side (5) and a bottom part (9), said bottom part (9) connecting the first side (4) and the second side (5); and
   wherein said bottom part (9) of the upper compartment (2) comprises one or more drain holes (10) for draining the liquid out of the upper compartment (2);
   wherein said lower base part (3) comprises an elongated part and a pipe connection (7); and
   wherein said elongated part of said lower base part (3) comprises a lower compartment (16) for receiving the liquid originating from said one or more drain holes (10) in the bottom part (9) of the upper compartment (2); and
   wherein the inner of said pipe connection (7) is in liquid connection with said lower compartment (16) of said elongated part of said lower base part (3); and
   wherein said pipe connection (7) comprises means for connecting a pipe (12), a handle or a hose;
   characterised in that
   said elongated part of said lower base part (3) and said elongated upper compartment (2) for the liquids are releasable connected; and
   that at least one of said first side (4) or said second side (5) of said upper compartment (2) is flexible so as to enable adaptation to the contour of a tube (13).

2. A device according to claim 1, wherein the device has an extension in the direction defined by the elongated part of the upper compartment (2) of 10 - 80 cm, such as 20 - 70 cm, e.g. 30 - 60 cm, such as 40 - 50 cm.

3. A device according to claim 1 or 2, wherein the upper compartment (2) and lower base part (3) comprise releasing means for mutually releasing the upper compartment (2) from the lower base part (3), thus allowing easy exchange of the upper compartment (2).

4. A device according to claim 3, wherein the releasing means (17) comprises click locking/unlocking means for securely locking and unlocking the upper compartment (2) and lower base part (3).

5. A device according to any of the preceding claims, wherein the upper compartment (2) at the respective ends comprises a first end sections (6A) and a second end section (6B), each connecting the first side (4), the second side (5) and the bottom part (9) of the upper compartment (2).

6. A device according to any of the preceding claims, wherein the first side (4) and the second side (5) of said upper compartment (2) is made of a thermoplastic elastomer such as a thermoplastic elastomer comprising 5% - 80% polypropylene.

7. A device according to any of the preceding claims, wherein the lower base part (3) is made of copolymer based on propylene monomers.

8. A device according to any of the preceding claims, wherein the device comprises an extension pipe (12) fitted to the pipe connection (7) of the lower base part (3).

9. A device according to claim 8, wherein the distal end of the extension pipe (12) relative to the lower base part (3) is provided with a container or a hose for collection of the collected condensation liquids.

10. Use of a device according to any of the preceding claims for collecting and removal of condensation liquids from

ceilings, tubings and the like.

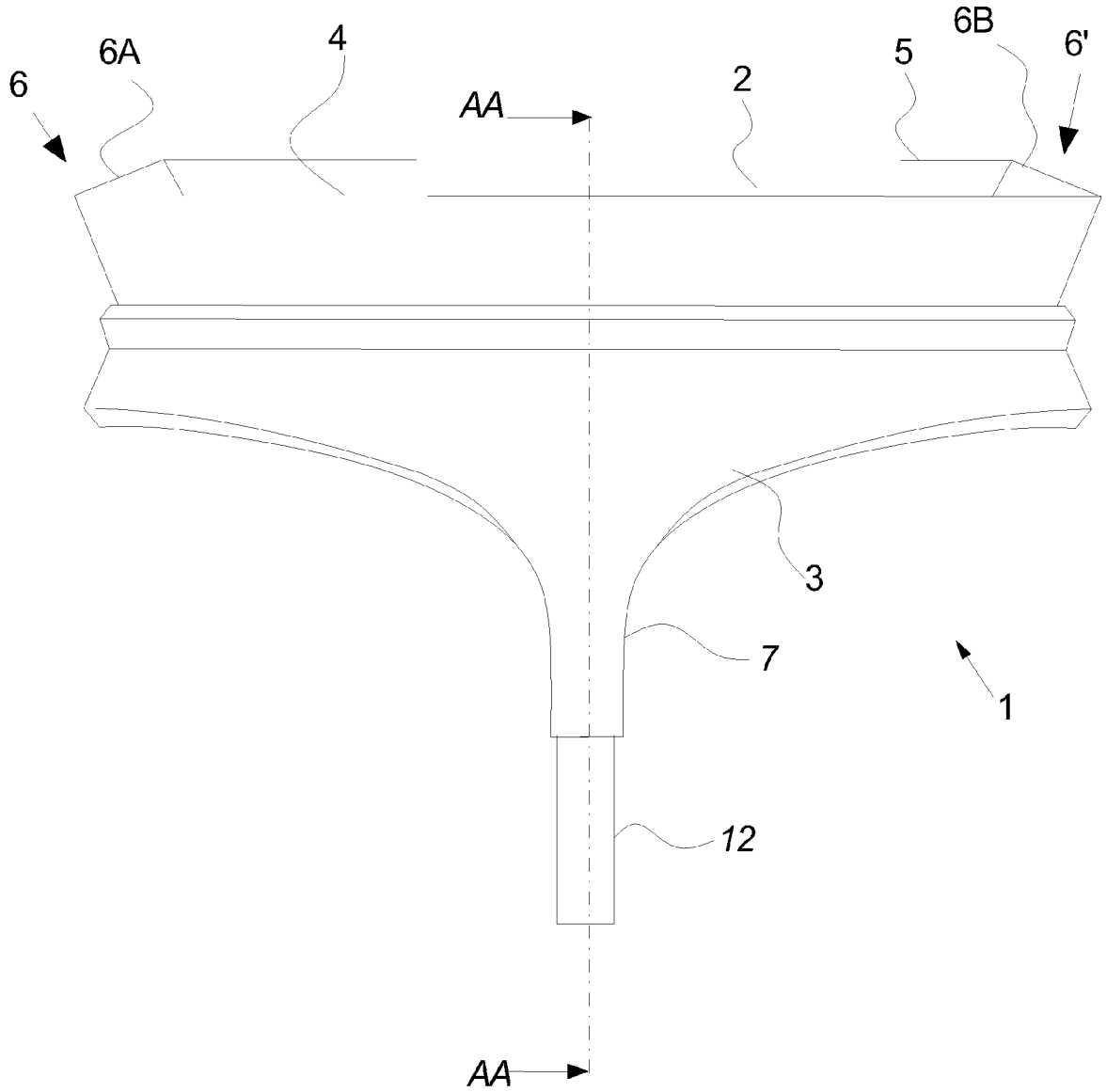

Fig. 1

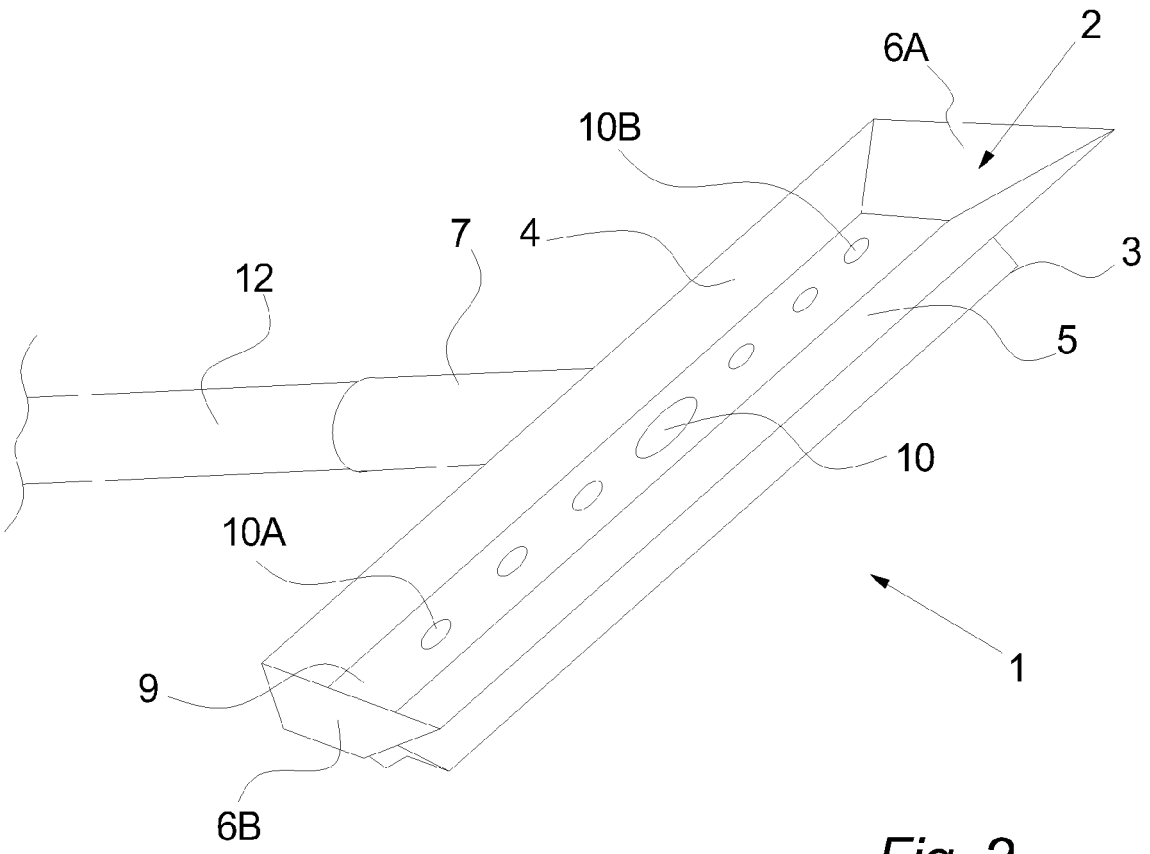

Fig. 2

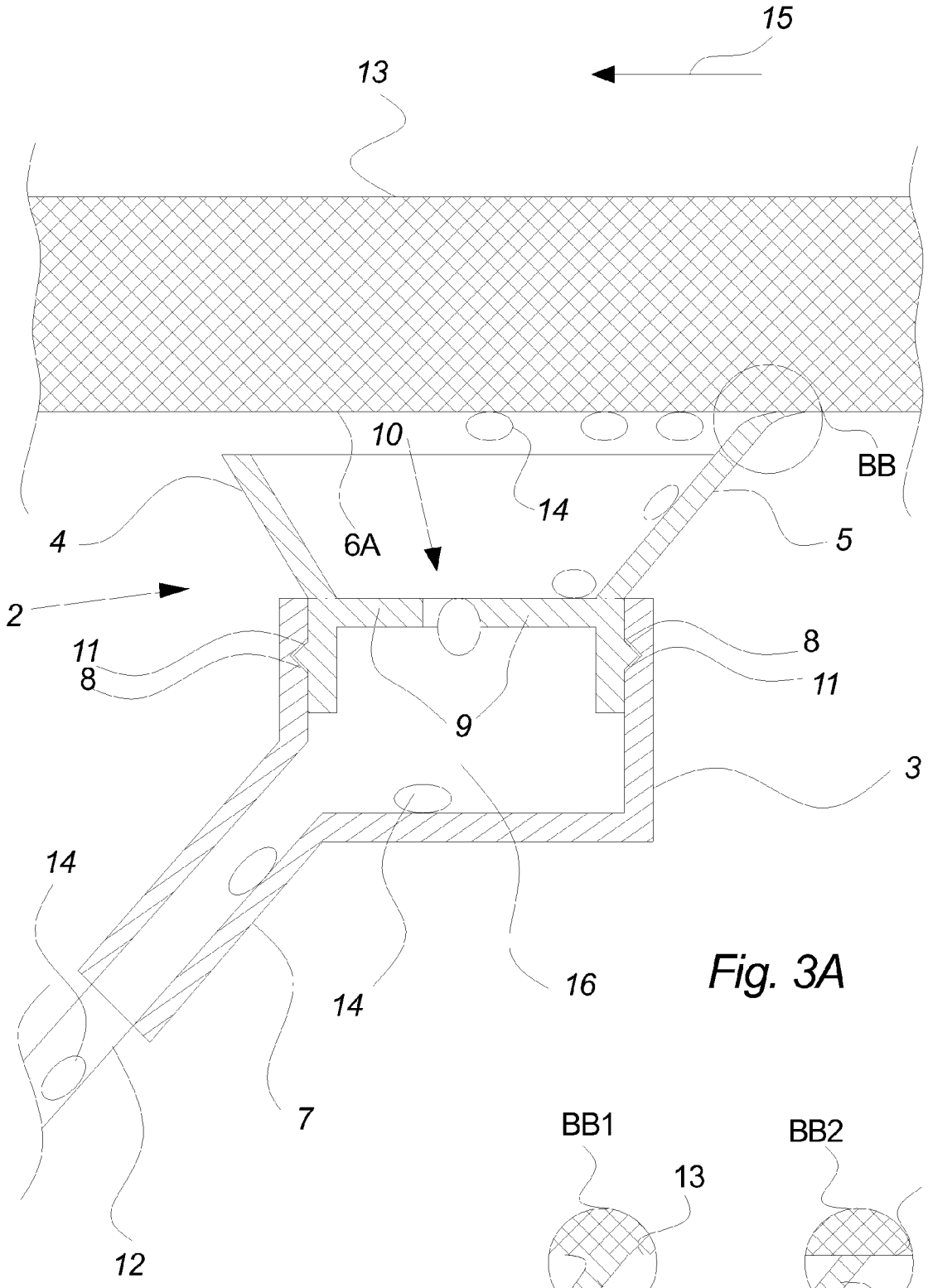

Fig. 3A

Fig. 3B

Fig. 3C

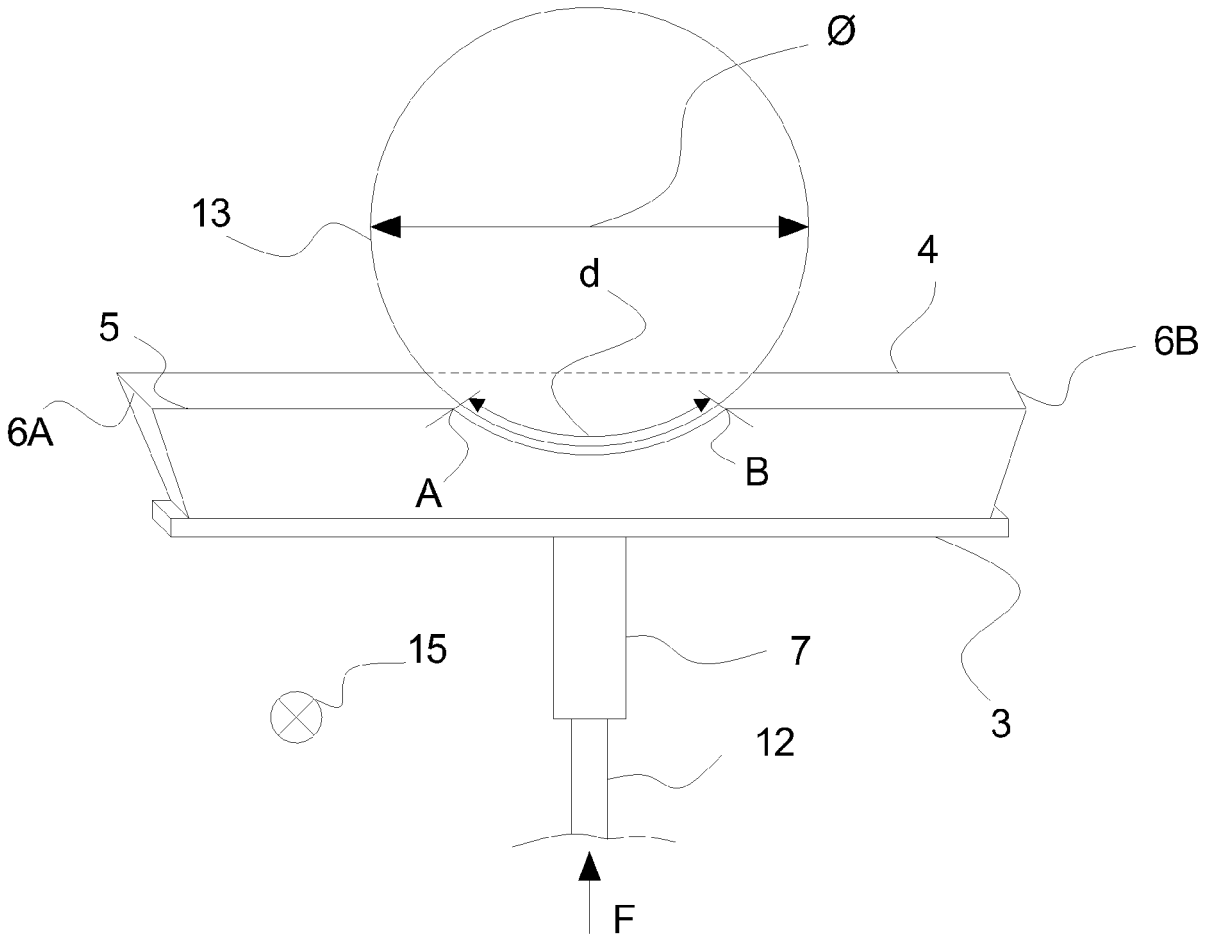

Fig. 4

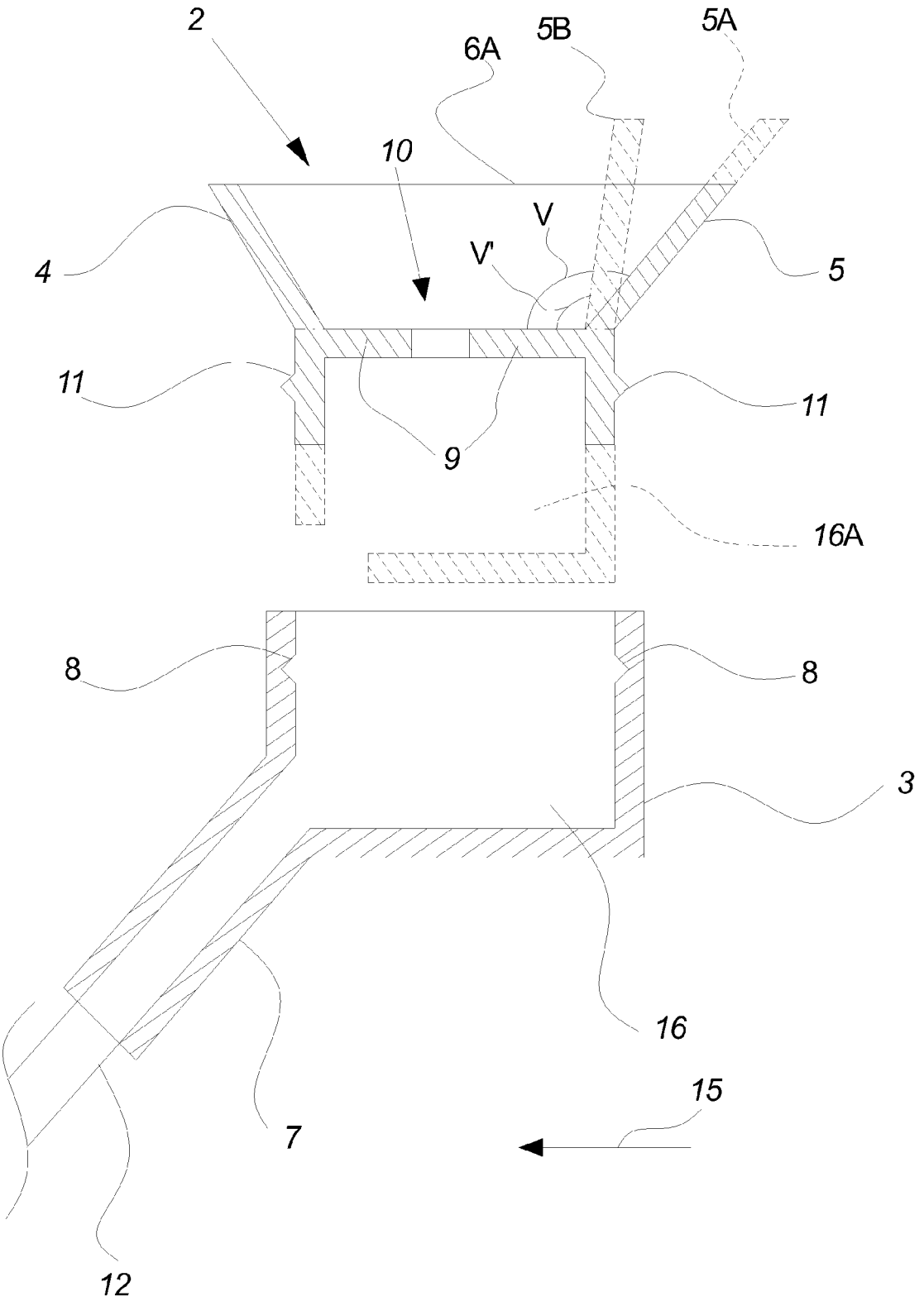

Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 6378159 B **[0003] [0004]**