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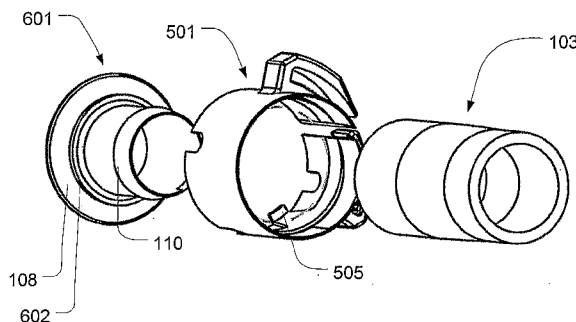
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(54) Title: HOSE CLAMP



(57) **Abstract:** This invention relates to a hose clamp (501) for clamping a hose (103) on a pipe (110) inserted into said hose, said hose clamp comprising a hose-surrounding and clamping means, where said hose clamp is adapted to be positioned around said hose for clamping said hose on said pipe where the hose clamp comprises pipe attachment means adapted to attach said hose clamp to said pipe prior to inserting said pipe into said hose and clamping said hose to said pipe (116). The invention also relates to a pipe adapted to be connected to a hose by inserting said pipe into said hose where the pipe further comprises clamp attachment means adapted to attach a hose clamp as described above prior to inserting said pipe into said hose and clamping said hose to said pipe. Further, the system relates to a system and method of connecting a hose and pipe.

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Hose Clamp

FIELD OF THE INVENTION

The present invention relates to a hose clamp solution for water systems of
5 whirlpool baths.

Water systems for whirlpool baths, as they are currently known in the art,
generally comprise a plurality of water-jet outlets connected to the side walls
of the tub such that water can be pumped into the tub. The water-jet outlets
10 are therefore interconnected with a water-carrying circuit in order to pump
water into the tub. The water-carrying circuit typically comprises one or more
water pumps, pipes, hoses, and different kinds of joints. The water-carrying
circuit therefore comprises a large number of couplings where for instance a
15 hose is connected to a pipe branch on a water-jet outlet or on a T-shaped
joint. These couplings need to be sealed in order to prevent leaking from the
water-carrying circuit. It is known that the sealed coupling of a hose to a pipe
branch can be achieved by various methods, from simple gluing to
mechanical clamping with clips.

20 The water-carrying circuit is often very complex and comprises a large
number of sealed couplings. The water-carrying circuits therefore need to be
assembled manually which is a very time and cost consuming process
because many hoses and pipe branches need to be connected through a
sealed coupling.

25

CA 989597 describes a hose clamp for clamping a hose to a pipe branch.
The hose clamp comprises an open-ended hose surrounding band with a
interlocking clamping assembly comprising a first and a second interlocking
part. When using this hose clamp to make a sealed coupling between a hose
30 and a pipe branch the hose first needs to be put over the pipe branch and
thereafter the hose clamp needs to be mounted outside the hose and
adjusted so that it will secure the hose to the pipe branch when the first and

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second interlocking parts are interlocked and thereby clamping the hose to the pipe branch. This method is very time consuming for the whirlpool installer because many hoses and pipe branches need to be coupled. Especially the step of mounting the hose clamp outside the hose and thereafter adjust the position of the hose clamp so that it clamps the hose at the pipe branch. If the hose is not clamped to the pipe at the right position the coupling may leak. Further, in many situations the hose needs to be held in position manually when mounting the hose clamp. The consequence is that the whirlpool installer needs to hold the hose in position on the pipe branch with one hand and mount the hose clamp with the other hand which is a very difficult and time consuming task. Alternatively, two or more whirlpool installers could perform the assembling; however, this would significantly increase the costs of the assembling. Another problem is that there is a limited amount of space between the outer side of the whirlpool tub and the frame in which the whirlpool tub is placed. The consequence is that the installation process is further complicated because the installation opportunities are limited.

US2006/0130285 A1 discloses as hose clamp similar to the one disclosed in CA 989597; however, the hose clamp disclosed in US2006/0130285 further comprises a C-shaped inner band having flexible arms. The C-shaped inner band can be snapped/clicked onto the hose prior to clamping the hose to the pipe branch. The problems concerning the adjustment of the hose clamp position still apply to this type of clamp.

EP1134474A1 describes an insert coupling for connecting a flexible hose to a pipe. The pipe comprises a housing with a bore and the insert coupling is mounted in the housing. The insert coupling comprises a clamping bush and a clamping ring comprising projecting teeth, and the clamping ring is adapted to be inserted inside the clamping brush. A hose can be inserted into the insert coupling and the insert coupling would prevent retraction of the hose. This is achieved because the clamping bush is adapted to push the projecting teeth into the hose jacket when the hose is retracted. Lubrication

such as oil, soap, vaseline, etc. needs to be provided at the outside of the hose in order to insert the hose into the pipe housing. When this system is used in whirlpools, the lubrication could easily pollute the water. This coupling system requires relatively stiff hoses, because the hose is only
5 retained inside the pipe housing by the projecting teeth, and the system is therefore not suitable for systems using soft hoses as is the case in many whirlpools. Further, it is very difficult to separate the hose from the pipe once it has been inserted into the pipe housing. This is inappropriate because the whirlpool installer might connect a wrong hose to a pipe and therefore needs
10 to separate the hose and the pipe in order to correct the mistake. Further, hoses and pipes eventually need to be changed/replaced with new hoses and pipes due to for instance leakages. Another aspect is the fact that this system comprises many subparts which have to be produced separately causing increasing production costs.

15

OBJECT AND SUMMARY OF THE INVENTION

The object of the present invention is to solve the above described problems.

20 This is achieved by a hose clamp for clamping a hose on a pipe inserted into said hose, said hose clamp comprising a hose-surrounding and clamping means, said hose clamp is adapted to be positioned around said hose for clamping said hose on said pipe where the hose clamp comprises pipe attachment means adapted to attach said hose clamp to said pipe prior to
25 inserting said pipe into said hose and clamping said hose to said pipe. Hereby is achieved that a hose could be clamped to the pipe very fast and without the use of tools, because the pipe attachment means simplifies the clamping process. The pipe attachment means makes it possible to premount the hose clamp at the pipe prior to inserting the pipe into the hose.
30 The premounting could for instance be done by a machine at the pipe and hose clamp manufacturer such that the whirlpool installer does not need to mount hose clamps at the pipe. As a consequence, much time is saved when

a person connects hoses to pipes due to the fact that the person only needs to insert the pipe into the hose and thereafter clamp the hose clamp. Further, it is easier to mount the hose clamp at an optimal clamping position at the pipe because the clamp pipe attachment means could be adapted so that the hose clamp would automatically be brought into the optimal clamping position at the pipe. Hereby it is achieved that the whirlpool installer could mount the hose clamp at the pipe without using time to adjust the clamping position. Thereby a lot of recourses are saved when connecting hoses to pipes. The hose-surrounding surrounds at least a part of the hose and has an inner surface that is substantially aligned with the outer surface of the hose.

In another embodiment of the hose clamp, the hose-surrounding comprises an open-ended band, and said clamping means comprises at least two interlocking parts. Hereby the clamping process is further simplified because the hose clamp could be clamped very tightly and fast. The open-ended band makes it possible to tighten the hose clamp because the inner circumference could be reduced due to the fact the ends of the open-ended band could overlap when the two interlocking parts engage with each other.

In another embodiment of the hose clamp, at least a part of the hose-surrounding has a smaller inner circumference compared to the remaining parts of said hose-surrounding. This causes a tighter clamping of the hose because the clamping force obtained by locking the interlocking parts would be applied to a smaller area of the hose.

In another embodiment of the hose, the hose-surrounding further comprises a number of spikes adapted to fix the surface of said hose when said hose clamp is clamped, such that said hose is retained inside said hose-surrounding. Hereby it is prevented that the hose could accidentally be pulled out of the hose-surrounding and off the pipe. This is achieved because the spike would enter the hose surface and thereby function as barbs that retain

the hose inside the hose-surrounding. The spikes could be made of the same material as the hose-surrounding, e.g. plastic, and be constructed by injection molding. However, the spikes could also be made of metal spikes molded into the plastic.

5

In another embodiment of the hose clamp, the pipe attachment means comprises at least one support surface extending transversally relatively to the inner surface of said hose-surrounding. Herby the hose clamp could easily be positioned in a longitudinal direction being the direction along the hose and pipe fitting, because the transversally extending support surface could be adapted to engage with a corresponding interlocking surface at the pipe.

In another embodiment of the hose clamp, the hose clamp further comprises observation cuts for observing the position of the hose within said hose clamp. Hereby it is made possible to observe the position of the hose inside the hose clamp. This makes it easier to determine when the hose is placed in a correct position at the pipe fitting. The observation cuts could be strategically placed holes or cut outs in the hose-surrounding. They could for instance be placed at the bottom of the hose clamp allowing a person to observe when the hose has been pushed to the bottom of the pipe fitting.

The present invention further relates to a pipe adapted to be connected to a hose by inserting said pipe into said hose where the pipe further comprises clamp attachment means adapted to attach a hose clamp as described above prior to inserting said pipe into said hose and clamping said hose to said pipe. Hereby a pipe, where a hose clamp can be mounted at the pipe prior to connecting a hose to the pipe, is provided. One advantage of the pipe is that the process of connecting the pipe to a hose is simplified and could be made much quicker compared to prior art. The pipe could be made of plastic,

metal or a combination of the two. Further, the same advantages as described above are achieved.

5 In one embodiment of the pipe, the clamp attachment means comprises at least one interlocking surface extending transversally outwardly from the outer surface of said pipe surface. Herby a hose clamp could easily be positioned at the pipe in a longitudinal direction being the direction along the hose and pipe fitting. The transversally extending interlocking surface could be adapted to engage with a corresponding locking surface at the hose
10 clamp and thereby automatically bring the hose clamp in the optimal clamping position. Further, the same advantages as described above are achieved.

15 In one embodiment of the pipe, the clamp attachment means comprises at least one supporting flange adapted to interlock with said pipe attachment means of said hose-clamp. Herby the pipe attachment means of a hose clamp could engage and interlock with a support flange at the pipe. The supporting surface would support the hose clamp when it is positioned at the pipe and further when engaging with the pipe attachment means of the hose
20 clamp preventing the hose clamp from getting out of position.

The present invention further relates to a system comprising at least one hose clamp as described above and at least one pipe. Hereby a complete system comprising pipe and hose clamp is provided whereby the above
25 advantages are achieved.

In another embodiment of the system, the system further comprises at least one outlet part. The outlet part would allow water to flow inside the system to flow out of the system for instance through a water jet. Hereby a pipe system
30 for providing easy montage of a water jet in a whirlpool bath is provided. The pipe system could easily be connected to a water circulation system using a

hose, a hose clamp and a pipe as described above. The pipe system could for instance be mounted at the sides or at the bottom of the whirlpool bath such that water would be let into the whirlpool bath through the outlet part of the pipe system. Hereby the same advantages as described above are
5 achieved.

The invention further relates to a method of connecting a hose to a pipe by inserting said pipe into said hose, said method comprises the step of attaching a hose clamp comprising pipe attachment means to said pipe prior
10 to inserting said pipe into said hose. Hereby the same advantages as described above are achieved

In another embodiment of the method, the hose clamp further comprises clamping means and said method further comprises the step of clamping
15 said hose to said pipe using clamping means. Hereby the same advantages as described above are achieved

BRIEF DESCRIPTION OF THE DRAWINGS

In the following, preferred embodiments of the invention will be described
20 referring to the figures, where

Figure 1 illustrates an exploded view of a first embodiment of the present invention.

25 Figure 2 illustrates a perspective view of a first embodiment of the present invention.

Figure 3 illustrates a cross sectional view along line A-A of a first embodiment of the present invention.

30

Figure 4 illustrates a cross sectional view along line B-B of a first embodiment of the present invention.

5 Figure 5a illustrates a perspective view of a hose clamp according to the present invention.

Figure 5b illustrates a hose clamp according to the present invention from above.

10 Figure 5c illustrates a cross sectional view along line C-C of a hose clamp.

Figure 5b illustrates detail D of a hose clamp.

15 Figures 6a and 6b illustrate exploded views of a second embodiment of the present invention.

Figures 7a and 7b illustrate an exploded view and a perspective view of a jet system according to the present invention.

20 Figure 8 illustrates a cross sectional view of a third embodiment of the present invention.

Figure 9 illustrates a cross sectional view of a fourth embodiment of the present invention.

25

DESCRIPTION OF PREFERRED EMBODIMENTS

Figure 1 illustrates an exploded view of a first embodiment of the present invention and illustrates a hose clamp (101), a pipe (102) and a hose (103). The hose clamp comprises a hose-surrounding (104), clamping means and clamp positioning means. The hose-surrounding is in this embodiment
30 carried out as a cylinder, and the clamping means is carried out as two ribs

(105) fixed at the top of the cylinder and extending inwardly towards the bottom of the cylinder. The clamp positioning means are carried out as two support surfaces (107) that are placed at the bottom of the cylinder and are extending inwardly and transversally perpendicular to the cylinder surface.

5

The pipe comprises a pipe fitting (110) adapted to be entered in the hose and pipe positioning means comprising a supporting flange (108) placed at the bottom of the pipe fitting and two locking wings (109) extending outwards from and transversally perpendicular to the branch. The supporting flange and the wings are adapted to be able to engage with the support surfaces (107) at the hose clamp, such that the hose clamp can be securely mounted to the pipe. This is achieved by adapting the support surfaces (107) and the locking wings such that the pipe fitting (110) can be inserted in the hose-surrounding and such that the locking surfaces would get in contact with the supporting flange. Thereafter the hose clamp can be rotated 90 degrees resulting in that the support surfaces would engage between the supporting flange and the locking wings. The result is that the hose clamp would interlock with the pipe branch, and the hose could thereafter be mounted on the pipe fitting by pushing the hose onto the branch and inside the hose-surrounding. Figure 2 illustrates this situation. The consequence is that the hose-clamp could be premounted at the pipe fitting by e.g. a machine before the pipe and hose-clamp are distributed to a whirlpool installer. The whirlpool installer can therefore very quickly connect hoses to pipes.

Figure 3 illustrates a cross sectional view along line A-A in figure 2. It can be seen that the supporting surfaces (107) at the hose clamp engage between the supporting flanges (108) and the locking wings (109) at the pipe. In one embodiment the locking wings comprise a locking knot (301) adapted to interlock with an interlocking hole (302) in the supporting surfaces through a snapping engagement. The result is that the hose clamp is further secured to the pipe.

Figure 4 illustrates a cross sectional view along line B-B in figure 3. This figure illustrates how the ribs (105) clamp the hose to the branch. The ribs are in this embodiment resilient, so that it is possible to push the hose into the cylinder from the cylinder top, and the ribs would thereafter clamp the hose to the pipe fitting due to the resilient force. The ends of the ribs could be embodied as sharp edges so that the ends would enter the hose jacket making the clamping of the hose more tightly. Further, this would also make it very difficult to pull the hose backwards thereby releasing the hose from the pipe branch. However, by rotating the hose clamp 90 degrees such that supporting surfaces disengage with the supporting flange and the locking wings it is possible to disassemble the hose and pipe branch.

Figure 5a illustrates a perspective view of another hose clamp (501) according to the present invention, and figure 5b illustrates the same clamp seen from above. The hose-surrounding is in this embodiment carried out as an open-ended band (502), and the clamping means comprises a first interlocking part (503) and a second interlocking part (504). The open-ended band is embodied as an elastic plastic band that in its relaxed position substantially forms a cylinder. The clamp positioning means is carried out as three interlocking surfaces (505) extending inwardly and transversally perpendicular at the bottom of the open-ended band. The open-ended band further comprises an inner surface (506), where the inner circumference of the hose-surrounding band is smaller than the remaining parts of the hose-surrounding. This causes a tighter clamping of the hose because the clamping force obtained by locking the interlocking parts would be applied to a smaller area of the hose. The hose clamp has further been provided with spikes (508) that are embodied as a part of the open-ended band. The spikes would enter the hose (not shown) when the hose-clamp is tightened causing an improved clamping of the hose. Further, the hose-clamp comprises monitoring openings (507) cut out of the open-ended band. The monitoring

openings make it possible to monitor when the hose has been correctly placed at the pipe fitting for instance to monitor when the hose has been pushed to the end of the pipe fitting.

5 The second interlocking part (504) has an upper tongue (528) and a lower jaw (530) which cooperate with each other to form an elongated, open-ended cavity (532) there between. The upper tongue (518) and the lower jaw (530) could optionally be somewhat thicker in the radial direction than the lower jaw (520) and the upper tongue (528) in order to maximize the clamping force
10 when the interlocking parts (503, 504) are engaged as will be described hereinafter. The thicker members, e.g. the upper tongue (518) and the lower jaw (530), serve to constrain the clamp in the radial direction, while the thinner members, e.g. the lower jaw (520) and the upper tongue (528), act as guides and supports for the thicker members.

15

Rows of teeth (524, 534) are formed on the lower surface of the upper tongue (518) and the upper surface of the lower jaw (530), respectively. The teeth (524, 534) have any mating, interlocking shape, e.g. a generally triangular shape, and may have a directionality and/or shape that permits
20 relative overriding in the locking direction and resists overriding in the unlocking direction; e.g. the teeth (524, 534) may point into the open-ended cavities (522, 532), respectively. The teeth (524, 534) are formed of intersecting surfaces which define an acute angle relative to the direction of the locking movement and are inclined relative to the jaws (520, 530),
25 respectively, so that the upper tongue (518) and the lower jaw (530) can slide relative to one another towards a locking position, but preventing movement in the opposite direction.

Finger grip pads (526, 536) are integrally formed on the interlocking parts
30 (503, 504), respectively, opposite to the cavities (522, 532). The upper tongue (518) of the first interlocking part (503) is sized and shaped to fit

snugly into the open-ended cavity (532) of the second interlocking part (503) between the upper tongue (528) and the lower jaw (530). Likewise, the lower jaw (530) of the second interlocking part (504) is sized and shaped to fit snugly into the open-ended cavity (522) of the first interlocking part (503)
5 between the upper tongue (518) and the lower jaw (520).

Figure 5c illustrates a cross sectional view along line C-C in figure 5b. The first interlocking part (503) further comprises releasing grooves (509) where it is possible to insert a sharp-pointed/thin object such as a screwdriver after
10 the first and second interlocking parts have engaged. The interlocking parts can then be disengaged by twisting the sharp-pointed/thin object when it has been inserted into the releasing grooves causing the teeth (524, 534) to disengage. The result is that the hose clamp could be dismantled whereby it is possible to disconnect the hose and the pipe.

15

Figure 5d illustrates detail D in figure 5c. The hose-surrounding (502) has further been provided with spikes (508) that are embodied as a part of the open-ended band and placed at one end of the inner surface (506). The spikes would enter the hose jacket (not shown) when the hose-clamp is
20 tightened causing an improved clamping of the hose. The height and shape of the spikes could be embodied differently depending on the structure of the hose jacket. The spikes could alternatively be embodied as nails molded into the hose-surrounding. The nails could be made of metal, hard plastic or any other stiff material suitable for penetration of the hose jacket.

25

Figure 6a and 6b illustrate two exploded views of a second embodiment of the present invention viewed from two different viewpoints. Both figures illustrate a hose clamp (501) described in figure 5, a pipe (601) and a hose
(103).

30

The pipe comprises a pipe fitting (110) adapted to be entered in the hose and pipe positioning means comprising a supporting flange (108) placed at the bottom of the branch and a locking flange (602) extending outwards from and transversally perpendicular to the pipe fitting. The supporting flange and locking flange are adapted to be able to interlock with the three locking surfaces (505) at the hose clamp, such that the hose clamp can be mounted to the pipe branch prior to mounting the hose. This is achieved by placing the locking flange (602) at a distance equivalent to the thickness of the locking surfaces from the supporting flange (108). The hose clamp can then be mounted at the pipe by opening the open-ended band and thereafter letting the supporting surfaces engage between the supporting flange and locking flange. The supporting surfaces would be secured in this position due to the elastic force of the open-ended band.

The hose can easily be connected to the pipe fitting once the hose-clamp has been mounted at the pipe, and the first and second interlocking part could then be locked whereby the hose-surrounding would be clamped to the pipe fitting.

Figure 7 illustrates a jet system for mounting a water jet outlet in a whirlpool bath, where figure 7a and 7b respectively illustrate an exploded view and a perspective view of the jet system. The jet system comprises a jet body (701) comprising two pipes (601a, 602b) for connection to a water circulation system (not shown) and an outlet part (703). The jet body is constructed such that there is an open connection between the two pipes (601a, 601b) allowing water to flow from the first pipe (601a) to the second pipe (601b) and vice versa. Thus, the jet body could be connected to a water circulation system by connecting the two pipes to hoses, such that water is let in the jet body at the first pipe (601a) and out of the second pipe (601b) or vice versa. Further, there is an open connection to the outlet part (703) allowing a part of the water to flow through the jet body and out of the outlet part (703).

The jet system further comprises a water jet system (704), which would be mounted at the outlet part, such that a water jet would be created and flow into the whirlpool when the jet body is connected to a water circulation system. The water jet system could be constructed in a number of different ways as known in the prior art of water jet systems.

The pipes (601a, 601b) are constructed as described in figure 6 and 7, and the hoses (not shown) are clamped to the pipes using hose clamps (501a, 501b) as described in figure 5 to 7. The hose clamps could be pre mounted on the pipe by the manufacturer, e.g. by a machine. The consequence is that the whirlpool installer could very fast mount the jet system at a whirlpool tub and connect the jet system to the water circulation system of the whirlpool.

The jet system further comprises an air inlet (702) which makes it possible to connect the jet system to an air system that pumps/sucks air into the water jet. The jet system therefore further comprises a y-shaped air branch (705) comprising two pipes (601c, 601d) as described in figure 6-7, corresponding hose-clamps (501c, 501d), and an air outlet member (706). The outlet member is adapted to be connected to the air inlet (702) of the jet body. The jet body system could thereafter be connected to an air system by using the branches (601c, 601d) and air hoses (not shown) in a similar way as it is connected to the water circulation system.

Figure 8 illustrates a cross sectional view of another embodiment of the present invention, where the pipe (601), the hose clamp (501) and the hose (103) have been assembled. The clamp positioning means, in this embodiment carried out as a recess (801) in the hose-surrounding, and the pipe positioning means are carried out as a supporting flange (108) adapted to engage with the recess. Further, the figure illustrates how the spikes (508) would enter the hose (103) in order to retain the hose at the pipe.

Figure 9 illustrates a cross sectional view of another embodiment of the present invention, where the pipe (601), the hose clamp (501) and the hose (103) have been assembled. The clamp positioning means is in this embodiment carried out as a support surface (901) extending outwards of and transversally perpendicular to the hose-surrounding. The pipe positions means are carried out as a supporting flange (108) with an engagement hook (902). The engagement hook is adapted to engage with the outwardly extending support surface and thereby position the hose clamp at the pipe.

10

The parts disclosed in the present could be made of steel or plastic, such as nylon, and manufactured via injection molding. However, the parts could also be made of metal. The above described embodiments only serve as examples, and a person skilled in the art could easily derive alternative embodiments within the scope of the present invention.

15

Claims

1. A hose clamp for clamping a hose on a pipe inserted into said hose, said hose clamp comprising a hose-surrounding and clamping means, said hose clamp is adapted to be positioned around said hose for clamping said hose
5 on said pipe **characterized in that** said hose clamp comprises pipe attachment means adapted to attach said hose clamp to said pipe prior to inserting said pipe into said hose and clamping said hose to said pipe.
2. A hose clamp according to claim 1 **characterized in that** said hose-surrounding comprises an open-ended band and said clamping means
10 comprises at least two interlocking parts.
3. A hose clamp according to claim 1-2 **characterized in that** at least a part of said hose-surrounding has a smaller inner circumference compared to the
15 remaining parts of said hose-surrounding.
4. A hose clamp according to any of the preceding claims 1-3 **characterized in that** said hose-surrounding further comprises a number of spikes adapted to fix the surface of said hose when said hose clamp is clamped, such that
20 said hose is retained inside said hose-surrounding.
5. A hose clamp according to any of the preceding claims 1-4 **characterized in that** said pipe attachment means comprises at least one support surface extending transversally relative to the inner surface of said hose-surrounding.
25
6. A hose clamp according to any of the preceding claims 1-5 **characterized in that** said hose clamp further comprises observation cuts for observing the position of the hose within said hose clamp.
- 30 7. A pipe adapted to be connected to a hose by inserting said pipe into said hose **characterized in that** said pipe further comprises clamp attachment

means adapted to attach a hose clamp according to claims 1-6 to said pipe prior to inserting said pipe into said hose and clamping said hose to said pipe.

5 8. A pipe according to claim 7 **characterized in that** said clamp attachment means comprises at least one interlocking surface extending transversally outwardly from the pipe surface.

10 9. A pipe according to any of the preceding claims 7-8 **characterized in that** said clamp attachment means comprises at least one supporting flange adapted to interlock with said pipe attachment means of said hose-clamp.

10. A system comprising at least one hose clamp according to claim 1-6 and at least one pipe according to claim 7-9.

15

11. A system according to claim 10 **characterized in that** said system further comprises at least one outlet part.

20 12. A method of connecting a hose to a pipe by inserting said pipe into said hose, said method comprising the step of attaching a hose clamp comprising pipe attachment means to said pipe prior to inserting said pipe into said hose.

25 13. A method according to claim 12 characterized in that said hose clamp further comprises clamping means and said method further comprises the step of clamping said hose to said pipe using clamping means.

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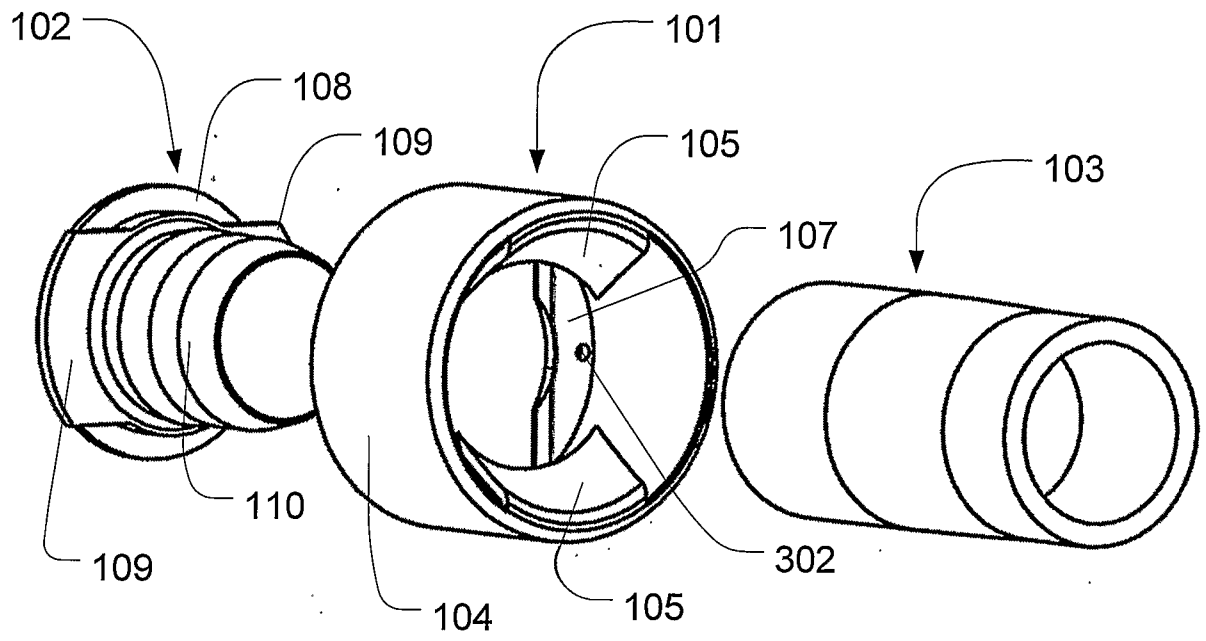


Fig. 1

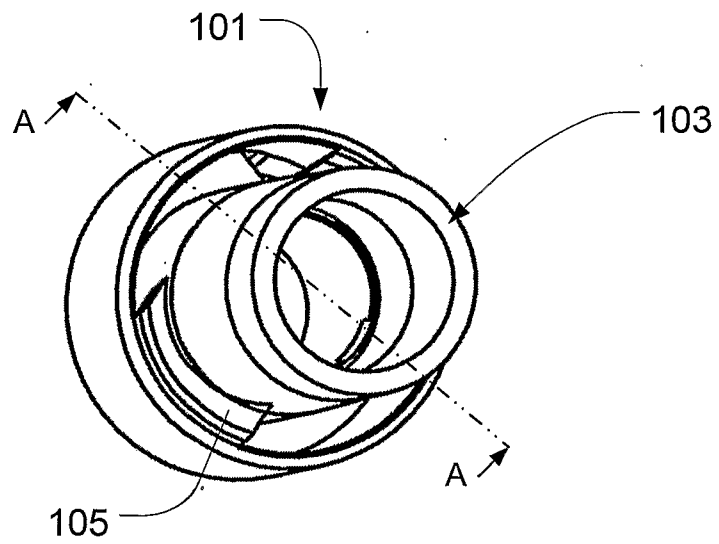


Fig. 2

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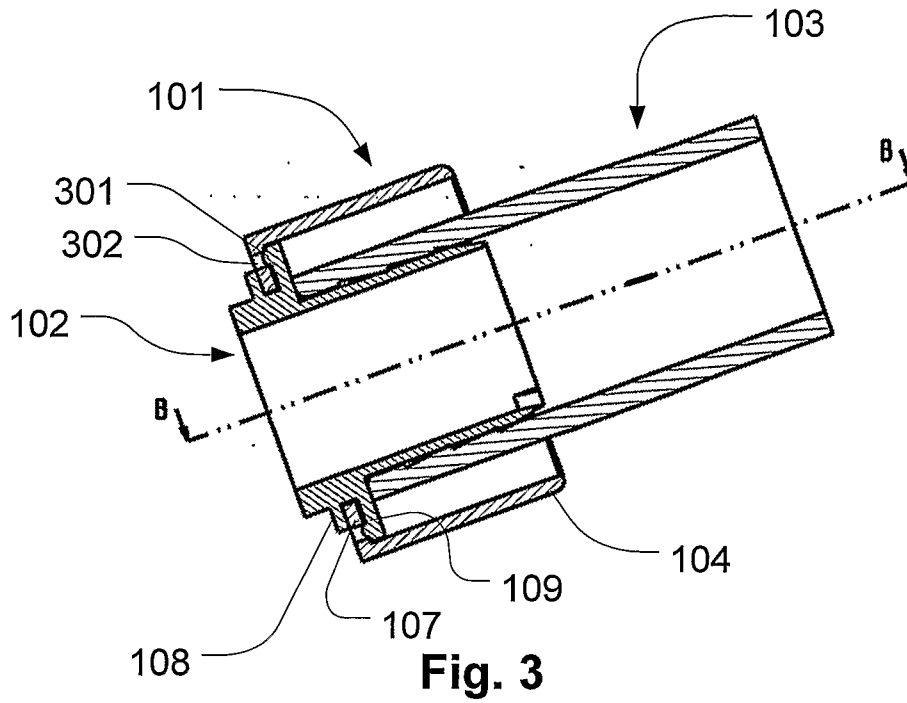


Fig. 3

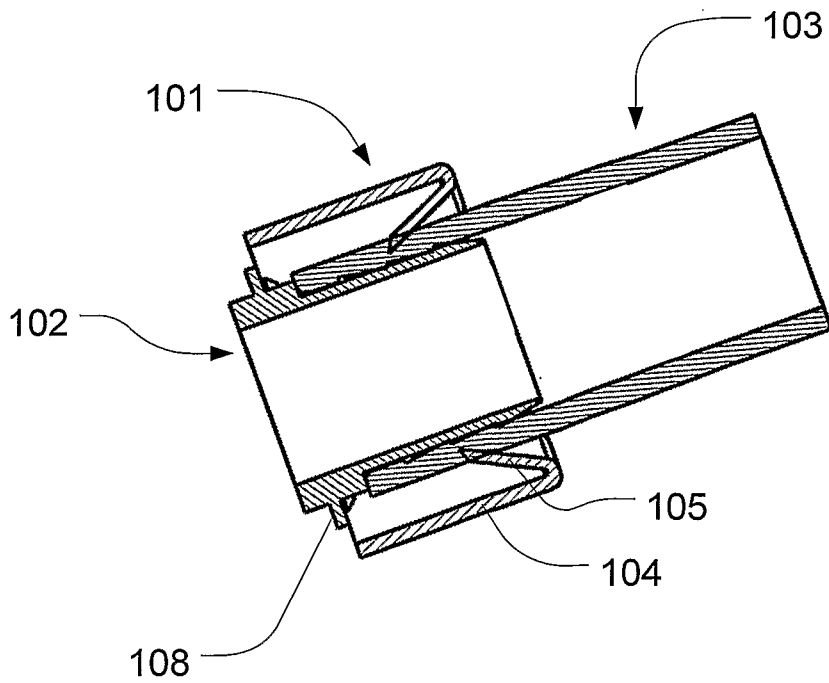


Fig. 4

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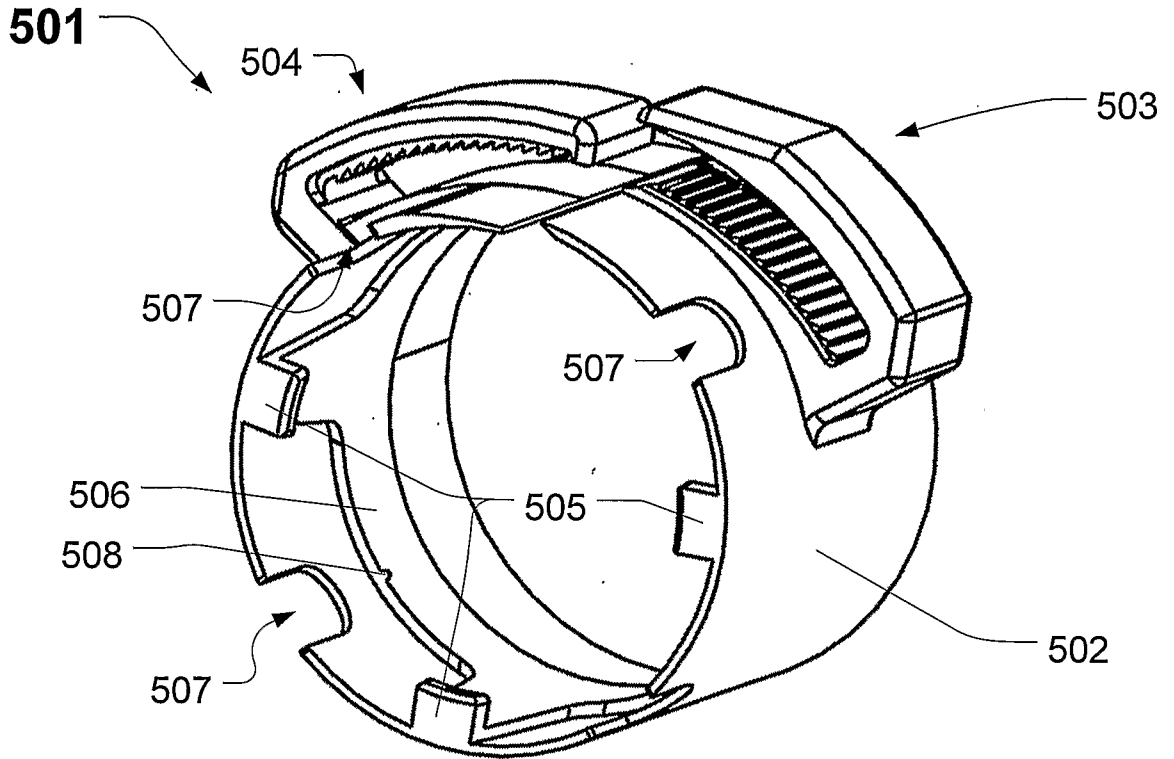


Fig. 5a

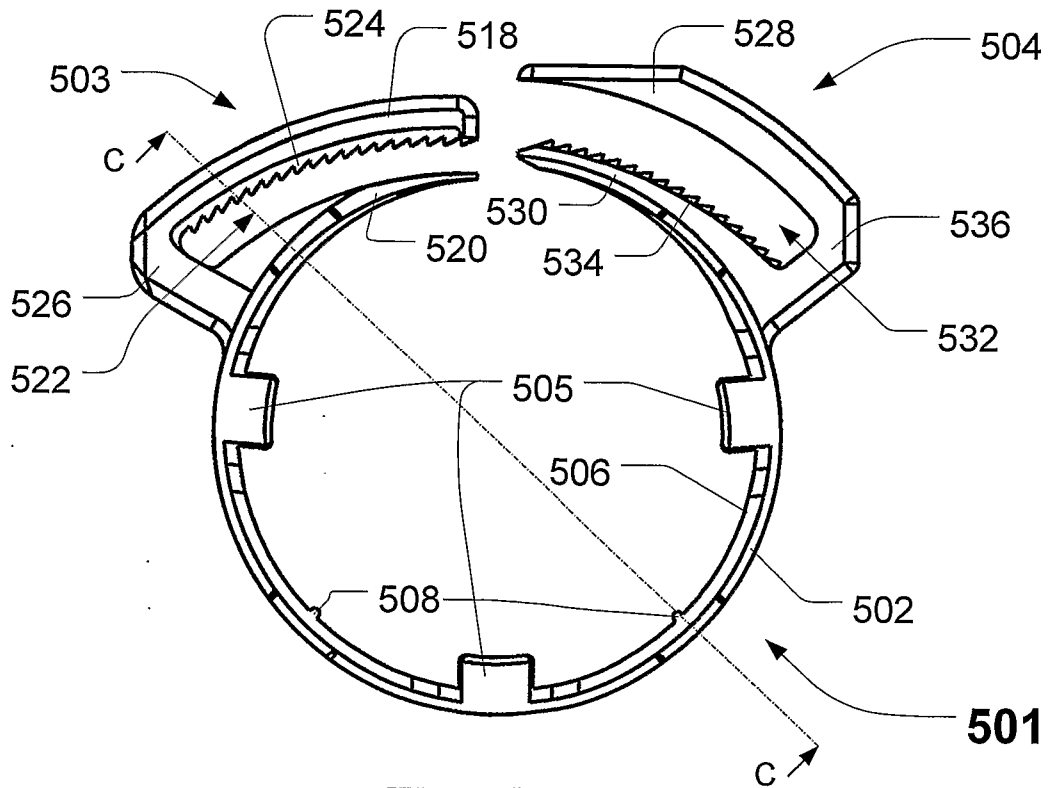


Fig. 5b

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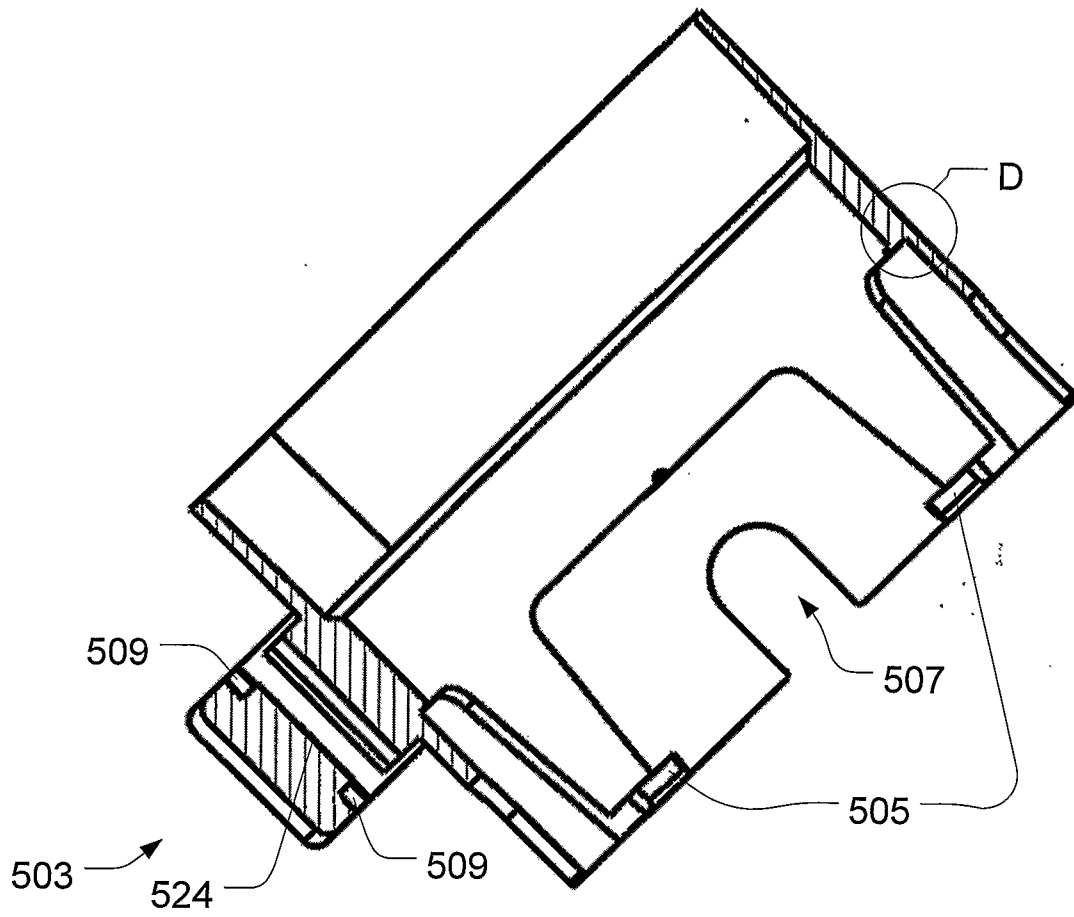


Fig. 5c

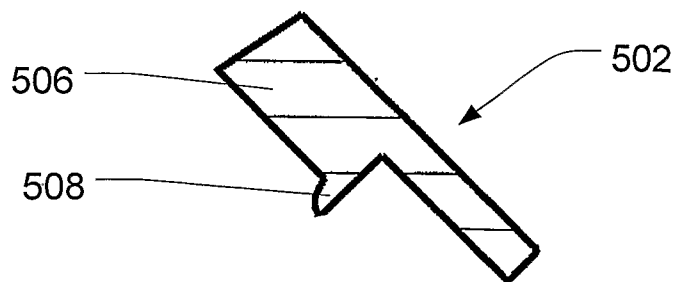


Fig. 5d

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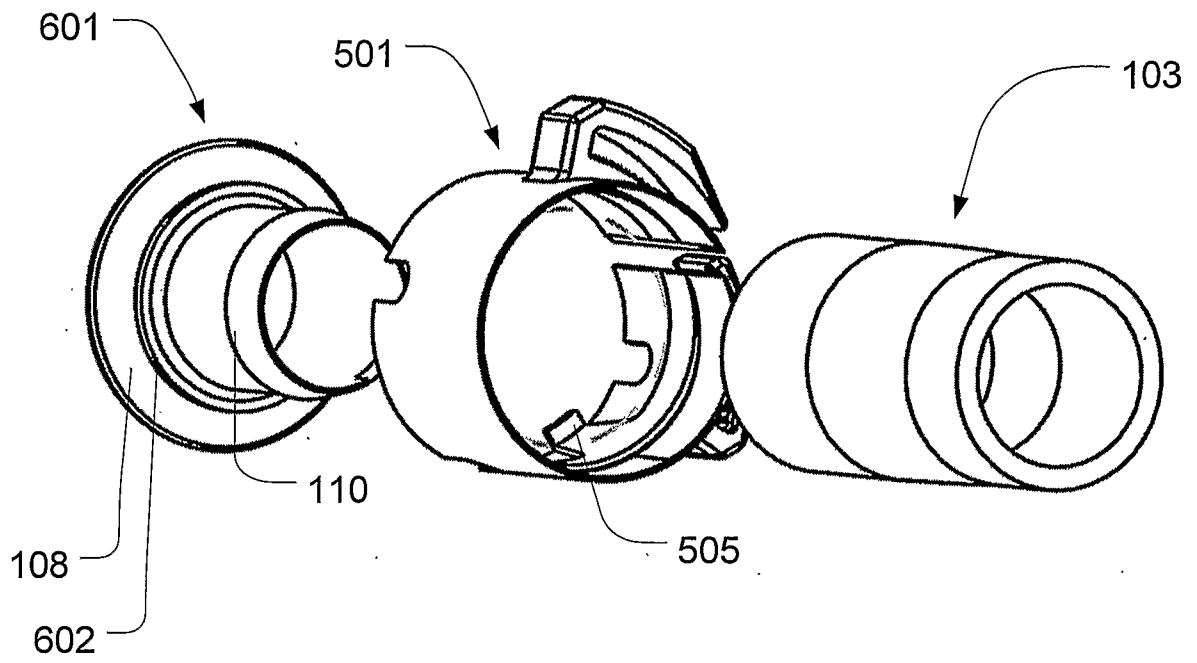


Fig. 6a

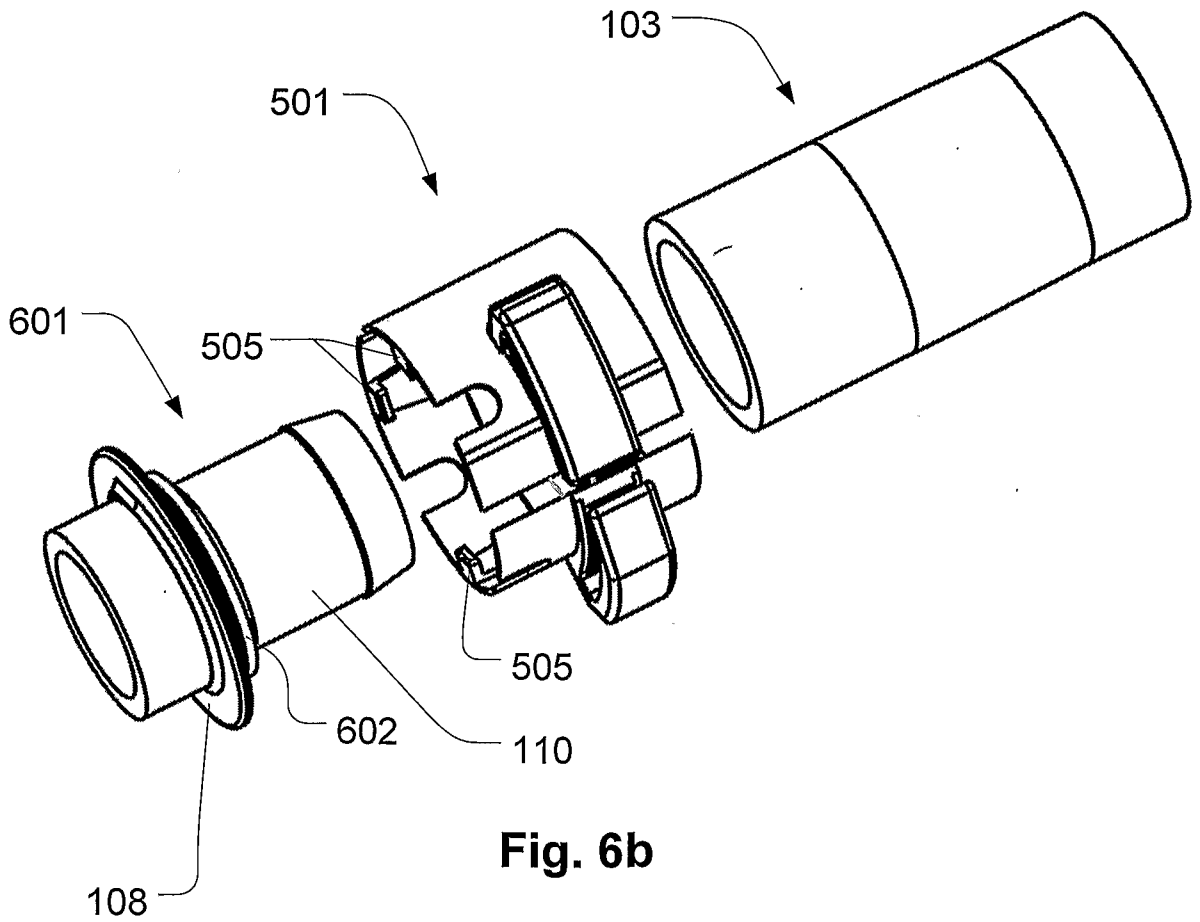


Fig. 6b

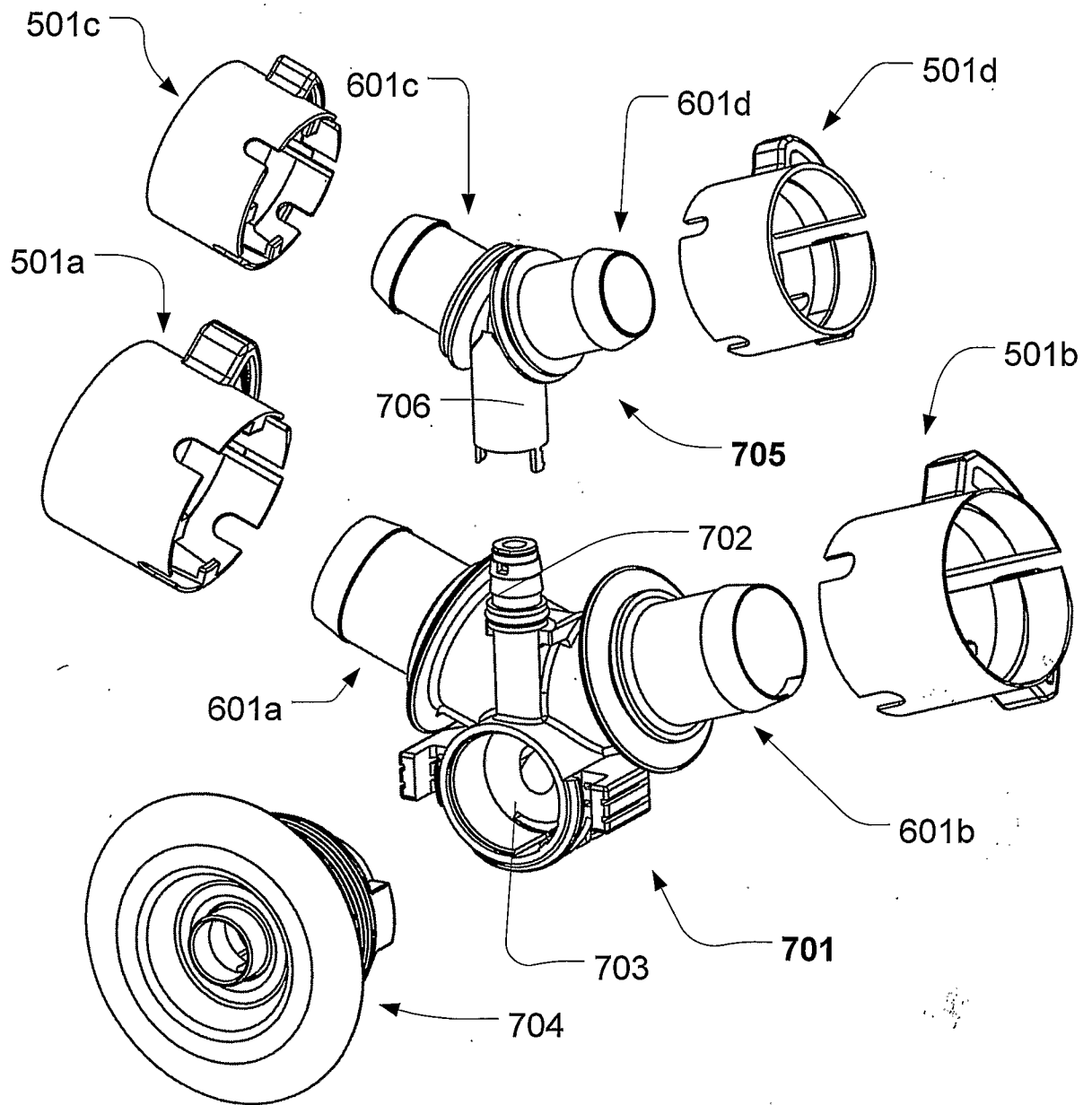


Fig. 7a

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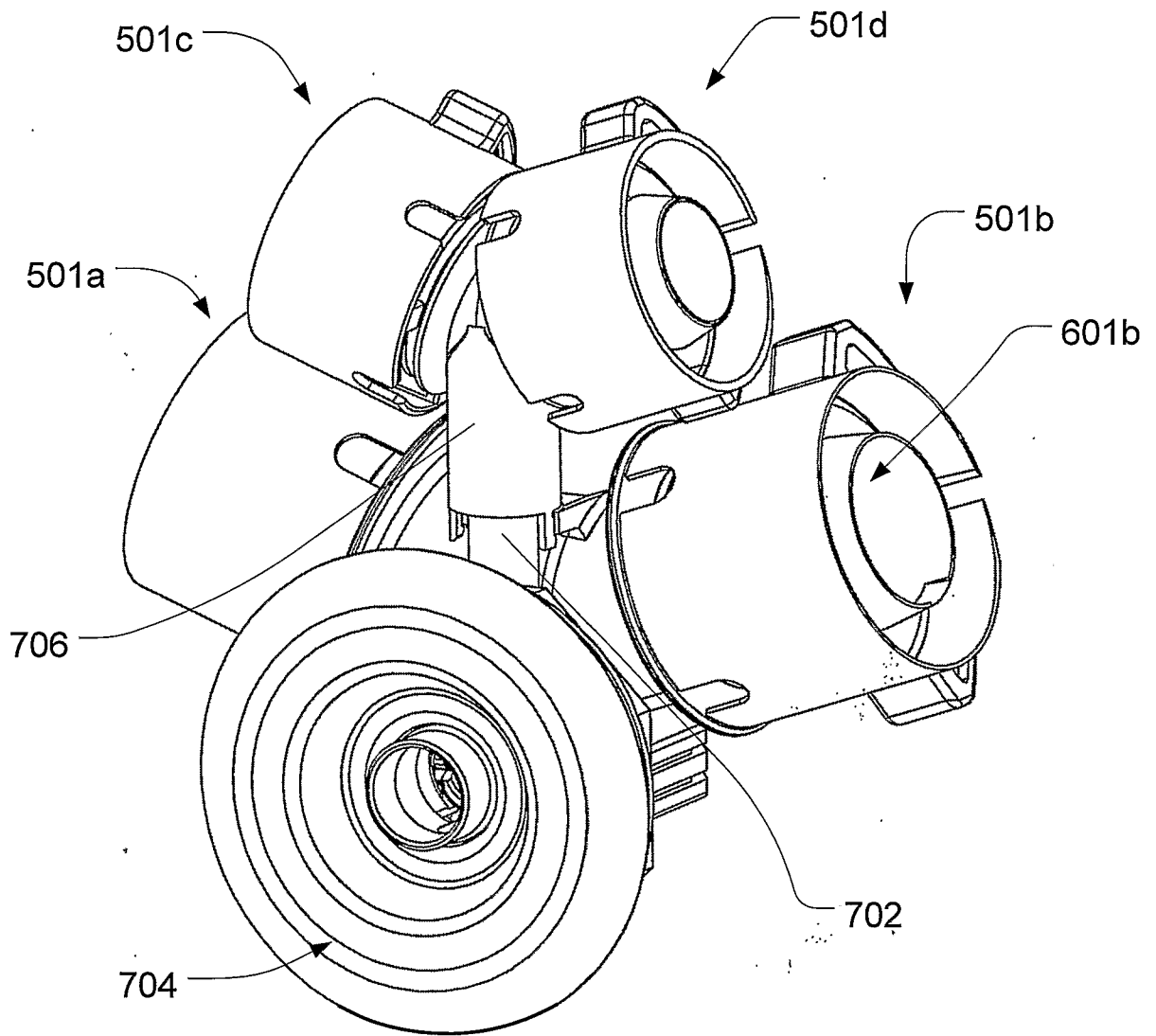


Fig. 7b

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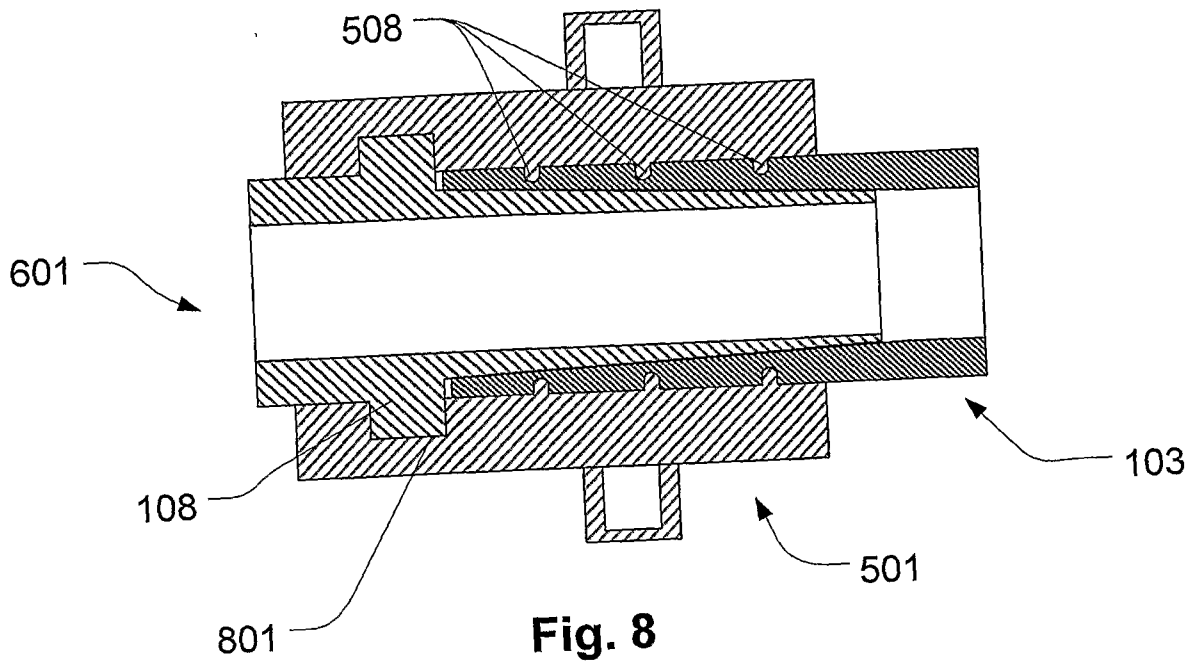


Fig. 8

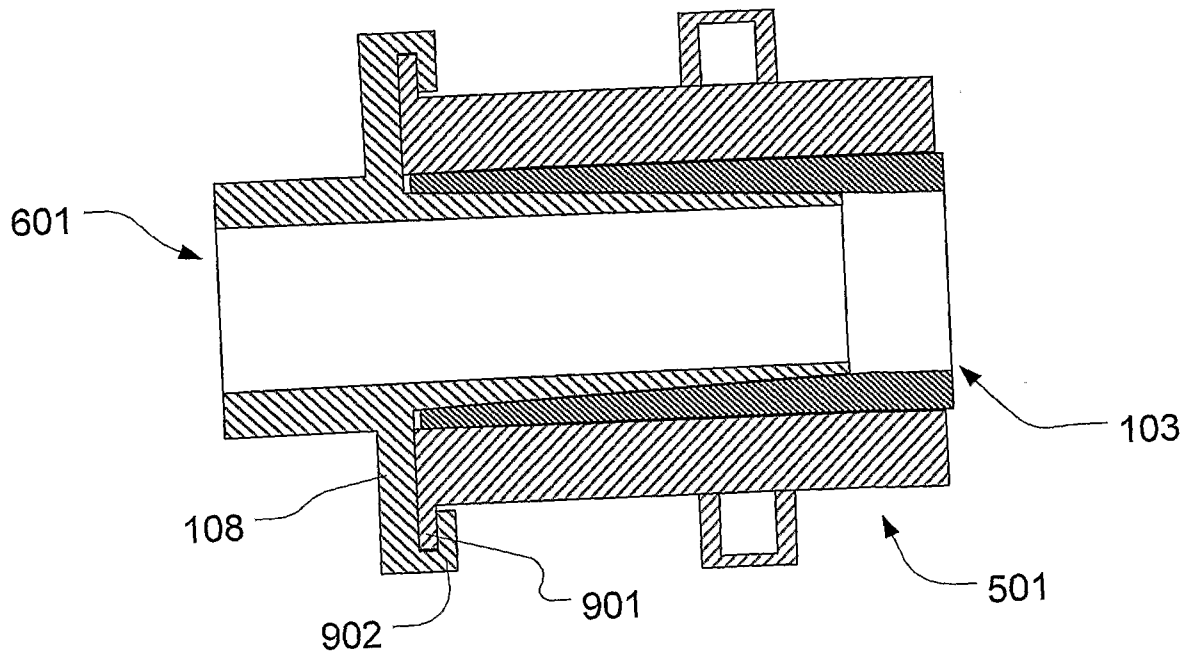


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2006/000487

A. CLASSIFICATION OF SUBJECT MATTER
INV. F16L33/02 F16L33/207 F16L33/22

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)
F16L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	EP 0 807 781 A (GUEST JOHN D [GB]) 19 November 1997 (1997-11-19) the whole document	1,3,5-13
X	US 5 195 788 A (OETIKER HANS [CH]) 23 March 1993 (1993-03-23) column 5 - column 7; figures 1-8	1-3,5, 7-13
X	US 4 039 212 A (SKARUD ROLAND) 2 August 1977 (1977-08-02) column 2 - column 4; figures 1-4	1-5,7-13
X	GB 2 161 568 A (RASMUSSEN GMBH) 15 January 1986 (1986-01-15) page 2, line 110 - page 4, line 2; figures 1-5	1-3,5-13
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See patent family annex.

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Date of the actual completion of the international search

11 June 2007

Date of mailing of the international search report

18/06/2007

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INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2006/000487

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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