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Amended claims in accordance with Rule 137(2) EPC.

(54) **Cleaning apparatus**

(57) By the invention a cleaning apparatus for cleaning an elevated surface comprising, in combination, a high pressure cleaner (40), a gun (100) having a trigger (104), and a outer tube, which may be a telescopic tube (60), surrounding a flexible hose (70) for a fluid and a detergent, wherein a valve (116) may be provided in, or at, the gun (100), and the valve (116) is regulating the supply of the detergent to an injector (150) which is provided in the flow path of the fluid, and wherein the flexible hose (70) is terminated in a nozzle (80) attached to the distal end of the outer tube, is provided. A method of cleaning a roof of a residential house is also provided.

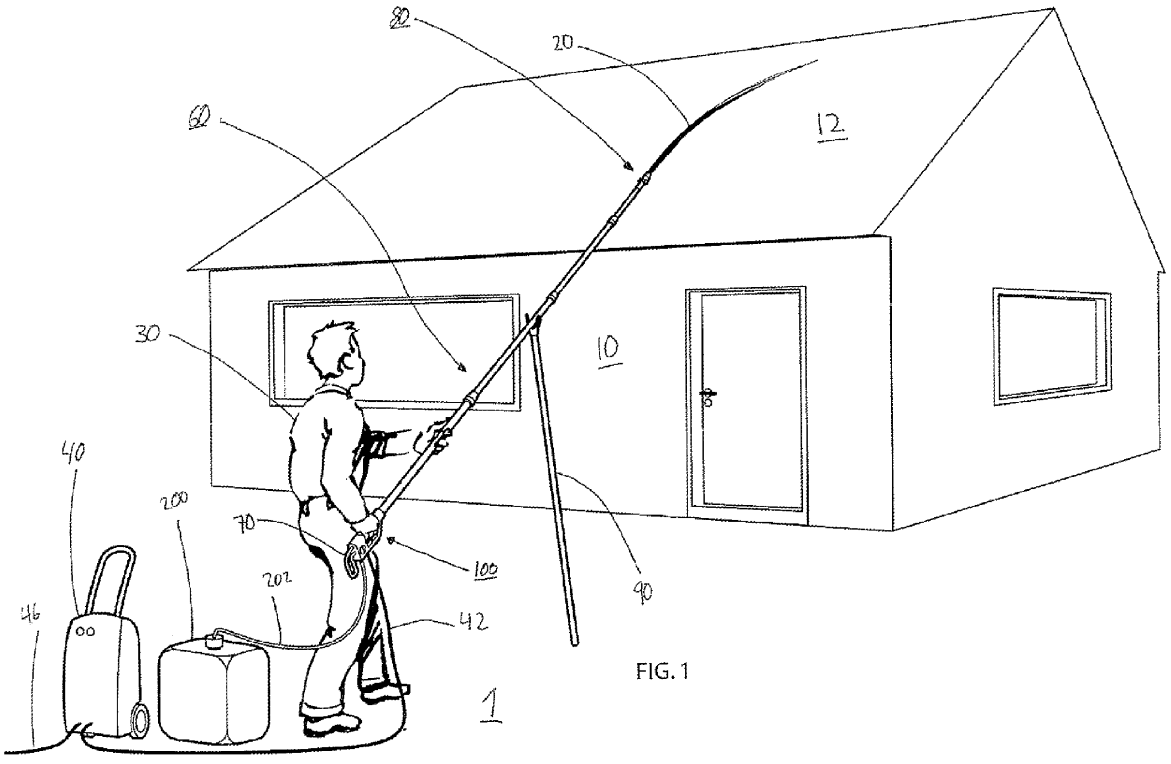

FIG. 1

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Description

[0001] The present invention relates to an apparatus and a method for cleaning elevated structures such as residential house roofs.

[0002] In many countries roofs on residential houses get covered by organic matter, such as algae, which affect the appearance of the houses negatively. Further, the organic matter can accelerate the natural deterioration of the roof, leading to an increased need for roof maintenance and ultimately a costly roof replacement. Roof problems associated with organic matter typically occur in areas with high amounts of rain and warm winters and cold summers

[0003] Attempts to remove organic matter from a residential house roof include mechanical cleaning relying on brooms or brushes or a high pressure water jet to forceful remove the organic matter, and chemical cleaning where an appropriate detergent, typically mixed with water, is applied to the roof. Mechanical cleaning, using brooms or brushes or other tools which mechanically contact the roof, may lead to damage to the roof if used too forcefully, Likewise cleaning using only a high pressure water jet may also damage the roof due to the high pressure needed. A combination of a high pressure water and a detergent is therefore preferred as this reduces the risk of damaging the roof. Further the cleaning, whether mechanical or chemical, should be performable without the need for a person standing on the roof or on a ladder, i.e, preferably the cleaning should be performance by a person standing on the ground as this reduces the risk of injuries.

[0004] For cleaning of residential roofs or other elevated structures, numerous devices typically comprising long wands or poles have been described in amongst others US6905080, US20020190145, EP2105550, DE20202532 (utility model) and FR2901718. The devices rely on an external source of high pressurized water and, if used to apply a detergent solution, requires that the detergent is provided to the devices already mixed with water. For chemical cleaning of organic deposits, the detergent, typical based on Benzalkoniumchlorid, should be mixed with water to a specific concentration for it to be effective.

[0005] A readily available source of high pressurized water for use by a consumer cleaning a residential roof is a consumer high pressure cleaner.

[0006] Although many consumer high pressure cleaners are capable of adding a detergent through an injector mounted at the high pressure pump, or an injector mounted in a lance connected to the pump, the detergent being sucked into and mixed with the water due to the pressure differences between the water and the detergent supply as the water passes the injector, the correct concentration of detergent in the water cannot be achieved as a typical consumer high pressure cleaner with an injector mounted at the pump typically only reach a concentration of around 2-5%. Increasing the concentration of detergent to water through increasing the pressure difference is possible but results in decreased performance during normal high pressure cleaning, i.e. when no detergent is added. Thus the above described devices for cleaning residential roofs cannot apply an affective mixture of detergent and water to a residential roof. Further, the above described devices do not allow a consumer to adjust the concentration of detergent, while cleaning a residential roof, without interrupting cleaning thus making the cleaning less efficient and more time-consuming.

[0007] Techniques related to the mixing of water and detergents are described in amongst others US5669558, WO2008086952, US3361300, US20060234616 and WO9809739.

[0008] An object of the present invention is to simplify and rationalize chemical cleaning of residential roofs.

[0009] A further object of the present invention is to provide a cleaning apparatus which is usable together with a consumer high pressure cleaner by a consumer standing on the ground.

[0010] A yet further object of the present invention is to provide a cleaning apparatus capable of supplying a detergent solution to a residential roof in an effective mixture.

[0011] A further object of the present invention is to provide a method for applying a detergent solution to a residential roof.

[0012] The above objects, as well as numerous further objects which will be evident from the following detailed description of preferred embodiments of the cleaning apparatus of the present invention is according to a first aspect of the present invention obtained by a cleaning apparatus for cleaning an elevated surface comprising, in combination:

a high pressure cleaner,
a gun having a trigger, and
an outer tube surrounding a flexible hose for a fluid and a detergent, wherein an injector is provided in the flow path of said fluid, and wherein said flexible hose is terminated in a nozzle attached to the distal end of said outer tube.

[0013] The elevated surface may be a surface on a residential house or other low rise building such as a wall, roof, window, the surfaces of a rain gutter, the surfaces of a chimney, but preferably a roof of a residential house. However, it is contemplated that the elevated surface could also be a surface on a bridge, a surface on a crane, a surface on a wind turbine, a surface on a vehicle etc. The elevated surface is typically 2-16 m above the user's feet.

[0014] It is however contemplated within the context of the present invention that also a depressed surface such as the walls of a manhole or a cellar staircase, where it would be expedient to achieve cleaning without actually entering

the manhole or cellar staircase, could be cleaned by the cleaning apparatus according to the first aspect of the present invention.

[0015] The high pressure cleaner according to the first aspect of the present invention may be adapted to supply the fluid to the gun at high pressure. By using a high pressure cleaner a high concentration, such as 10%, of detergent in the fluid may be reached

[0016] The gun according to the first aspect of the present invention may be in fluid communication with the high pressure cleaner via a high pressure hose. The trigger may be adapted to interrupt the flow of fluid. The trigger may be connected to a main valve provided in the flow path of the fluid. The main valve may be a ball valve. The gun may be held by a user of the cleaning apparatus.

[0017] The outer tube according to the first aspect of the present invention may be attached to the gun and may surround a flexible hose for the fluid and a detergent. The outer tube may be elongated and may be made of metal or plastic.

[0018] The fluid according to the first aspect of the present invention may be water. The detergent according to the present invention may be supplied from a detergent container The detergent may be supplied to the gun through a hose.

[0019] In the context of the present invention the term detergent is to be understood as comprising any agent for cleaning an object The detergent may be for example a tenside, a soap, a surfactant, a herbicide, an acid, an abrasive, an oxidant, an enzyme etc.

[0020] The injector according to the first aspect of the present invention may be a based on the Venturi effect. The injector may be enclosed in the gun or may alternatively be attached to the gun or may alternatively be provided at the gun such as on the high pressure hose or in a fitting fluidly connecting the high pressure hose to the gun.

[0021] The flexible hose according to the first aspect of the present invention may be in fluid communication with the gun. The flexible hose may be bendable, but may also be stretchable

[0022] In one preferred embodiment of the cleaning apparatus according to the first aspect of the present invention the outer tube is a telescopic tube. This is advantageous as it allows the cleaning apparatus to be more easily transportable and storageable while still allowing elevated surfaces to be reached for cleaning. The telescopic tube may include co-axial tube sections joined by locking mechanisms

[0023] In one preferred embodiment of the cleaning apparatus according to the first aspect of the present invention the cleaning apparatus further comprises a valve provided in, or at, said gun, the valve being adapted to regulate the supply of the detergent to the injector. This is advantageous as it allows a user to adjust the concentration of detergent in the fluid without interrupting cleaning by letting go of the gun.

[0024] The valve according to the first aspect of the present invention may be actuable by the user of the cleaning apparatus without interrupting cleaning. The valve may be enclosed in the gun or may alternatively be attached to the gun or may alternatively be provided at the gun such as on the hose supplying detergent from the detergent container or in a fitting fluidly connecting the hose from the detergent container to the gun The valve may be a ball valve, a globe valve or a needle valve etc, but any valve may be used provided that it allows a regulation of the supply of the detergent to the injector. It is preferred that the valve allows stepless regulation, but the valve may also be an on-off valve.

[0025] It is however contemplated within the context of the present invention that the valve could be substituted by a steplessly or steppedly regulated pump and the injector could be substituted by a fluid connection between the pump and the flow path of the fluid, wherein the pump may be an electric pump.

[0026] In one preferred embodiment of the cleaning apparatus according to the first, aspect of the present invention the gun further includes a main valve actuable by the trigger for interrupting the flow of the fluid and the injector is provided downstream of the main valve. By providing the injector downstream of the main valve the injector is protected from the high pressure arising when the main valve is closed. This is advantageous as it lessens the risk of leaks in the injector and allows the injector to be constructed out of less expensive materials.

[0027] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the elevated surface is a roof of a house and the cleaning apparatus is adapted to allow a user standing on the ground adjacent the house to clean the roof. By standing on the ground the safety for the user is increased.

[0028] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the high pressure cleaner is a conventional consumer high pressure cleaner.

[0029] This is advantageous as it decreases the cost for a user, which is in the possession of a consumer high pressure cleaner, wishing to clean an elevated surface.

[0030] In the context of the present invention the term conventional consumer high pressure cleaner is to be understood as comprising high pressure cleaners delivering a fluid at a maximum pressure below 200 bar.

[0031] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the trigger of the gun is lockable when triggered.

This allows the user to adjust his grip of the gun to actuate the valve to regulate the detergent supply without interrupting cleaning.

[0032] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the outer tube is may be a telescopic tube having a fully extended length of at least 2 m, such as least 3 m, preferably at least 5

m This is advantageous as it allows the user to clean the roof of most residential homes.

[0033] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the outer tube may be a telescopic tube comprising a plurality of co-axial tube sections joined by locking mechanisms, each of the plurality of tube sections being independently lockable in relation to an adjacent tube section.

[0034] This allows the telescopic tube to assume any length between a fully retracted length, where all tube sections are nested within each other, to a fully extended length, thus achieving the advantage that the telescopic tube may be shortened when the fully extended length is not needed, thus simplifying the handling of the cleaning apparatus for the user.

[0035] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the cleaning apparatus further comprises a support structure adapted to support the outer tube. This simplifies the handing of the cleaning apparatus for the user.

[0036] The support structure may have a first part for supporting the outer tube and a second part being supported by the ground on which the user stands, or by an additional user of the cleaning apparatus.

[0037] In one embodiment the support structure includes a tripod or a monopod. The support structure may be telescopic. Alternatively the support structure may include a harness worn by the user and connected to the outer tube for supporting the outer tube. Alternatively the support structure may include, at the nozzle, a wheel being rollable on, or a runner being slideable over, the elevated surface to support the outer tube by supporting the nozzle on the elevated surface.

[0038] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the cleaning apparatus further comprises a counterweight attached to the gun or the outer tube to counter balance the weight of the outer tube and/or the thrust from the nozzle.

[0039] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the flexible hose is a low pressure hose.

[0040] In the context of the present invention the term low pressure hose is to be understood as a hose having a maximum pressure limit before failure which is less than the pressure limit before failure of the high pressure hose establishing fluid communication between the high pressure cleaner and the gun.

[0041] This may be possible as the flexible hose may be downstream of the main valve whereby the high pressures which arise when the main valve is closed are not present in the flexible hose.

[0042] This is advantageous as the weight and cost of the flexible hose decreases. The flexible hose may have a larger flow area than the high pressure hose.

[0043] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the valve is selectively actuable to allow the detergent to be injected into the fluid at a rate adapted to achieve a concentration in the range from 0% to at least 10% detergent in the fluid.

[0044] This is advantageous as it allows the cleaning apparatus according to the first aspect of the present invention to be used for various cleaning requiring various concentrations of detergent. This also allows various types of detergents, requiring various dilutions, to be used Further, when the concentration of detergent in the fluid is zero percent, the cleaning apparatus may be used to rinse off the elevated surface.

[0045] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the detergent is benzalkoniumchloride and the fluid is water.

[0046] This is advantageous as benzalkoniumchloride is an effective detergent for cleaning an elevated surface, in particular removing organic deposits from a roof.

[0047] In one embodiment of the cleaning apparatus according to the first aspect of the present invention the nozzle is angleable and/or produces a pencil jet

[0048] This is advantageous as it increases the reach of the cleaning apparatus. Further, it is contemplated within the context of the present invention that by angling the nozzle, and thus changing the direction of the thrust from the nozzle, the handling of the cleaning apparatus may be simplified as the thrust from the nozzle may be directed to counteract the weight of the outer tube.

[0049] According to a second aspect of the cleaning apparatus according to the present invention a method for cleaning the roof of a residential house by a user standing on the ground adjacent the house is provided comprising the steps of:

Providing a cleaning apparatus according to the first aspect of the present invention, and
applying the fluid and the detergent to the roof.

[0050] in a preferred embodiment of the method according to the second aspect of the present invention the method according to the second aspect of the present invention further comprises the step of:

Adjusting the valve to obtain a specific concentration of said detergent in said fluid.

[0051] This is advantageous as it allows the concentration of detergent in the fluid to be adjusted to suit the detergent used, the extent of cleaning needed and the type of roof, which increases the efficiency of the cleaning.

[0052] In one embodiment according to the second aspect of the present invention the cleaning of the roof comprises the removal of organic deposits selected from the group comprising algae, lichen, mold and moss, or combinations thereof, from the roof,

[0053] The cleaning apparatus according to the first aspect of the present invention has the advantage that it allows a user, while standing on the ground, to apply an effective concentration of detergent to an elevated surface such as a residential roof using a normal consumer high pressure cleaner as source of pressurized water, without the risk of falling down from the roof, thus increasing the safety of cleaning.

[0054] In a preferred embodiment of the cleaning apparatus according to the first aspect of the invention the user may easily, and without interrupting cleaning by letting go of the gun, adjust the concentration of detergent for different types of roofs, different types of detergents and/or different types to be performed, thus simplifying and rationalizing the cleaning.

[0055] The invention and its many advantages will be described in more detail below with reference to the accompanying schematic drawings which for the purpose of illustration show some non-limiting embodiments and in which

Fig, 1 shows the cleaning of a roof using one embodiment of the cleaning apparatus according to the present invention,
Fig. 2 shows the cleaning apparatus,
Fig. 3 shows the gun,
Fig. 4 shows the foam generating nozzle,
Fig. 5 shows in cross section the gun, and
Fig. 6 shows in cross section the injector in the gun-

[0056] Fig. 1 shows the cleaning of a roof, designated the reference numeral 12, of a residential house, designated the reference numeral 10, by a user, designated the reference numeral 30, standing on the ground, designated the reference numeral 1, adjacent the house 10. The user 30 grasps a gun, in its whole designated the reference numeral 100, in one of his hands and grasps a telescopic tube, in its whole designated the reference numeral 60, with his other hand. The telescopic tube 60 is supported by a support structure, designated the reference numeral 90, shown as a monopod, however the support structure 90 may be omitted if desired, A consumer high pressure cleaner, designated the reference numeral 40 receives water from a mains water hose, designated the reference numeral 46, and supplies pressurized water to the gun 100 via a high pressure hose, designated the reference numeral 42. Detergent is supplied to the gun 100 from a detergent container, designated the reference numeral 200 through a detergent hose, designated the reference numeral 202. Within the gun 100 the pressurized water and the detergent are mixed, as will be described in more detail with reference to figs, 5-6 below, resulting in a detergent solution, designated the reference numeral 20, which is led through a flexible hose, designated the reference numeral 70, extending through, and surrounded by, the telescopic tube 60, to a nozzle, designated the reference numeral 80, wherefrom it is applied to the roof 12.

[0057] The consumer high pressure cleaner 40 could for example be a Nilfisk C 100.5 consumer high pressure cleaner having a maximum water pressure of about 100 bar and a water flowrate of about 440 1/h. As an alternative to placing the detergent container 200 on the ground adjacent the user 30 and supplying the detergent through the detergent hose 202, the detergent container 200 could be directly connected to the gun, omitting the detergent hose 202, whereby it could serve as a counterweight to balance the telescopic tube 70.

[0058] Further, though the outer tube of the first aspect of present invention is shown as telescopic tube 60 in figs 1-6, a non-telescopic outer tube may also be used.

[0059] Fig. 2 shows the telescopic tube 60 in more detail. The telescopic tube incudes a plurality of tube sections, one of which is designated the reference numeral 62 and a plurality of locking mechanisms, one of which is designated the reference numeral 64, each of which may be independently actuable by the user to permit or hinder as desired the telescopic movement between two neighbouring tube sections. One end of the telescopic tube 60 is connected to a gun 100, and the other end of the telescopic tube 60 is connected to the nozzle 80.

[0060] The tube sections 62 are preferably made of metal such as aluminium, but may also be made from carbon or glass fibre reinforced plastic or composite. The locking mechanisms 64 are preferably made from plastic or metal.

[0061] Fig. 3 shows the gun 100 attached to the telescopic tube 60. The gun 100 has a handle, designated the reference numeral 102, and a trigger, designated the reference numeral 104, to allow the user 30 (not shown) to open/close the flow of pressurized water from the consumer high pressure cleaner 40 (not shown) which supplies pressurized water to the gun 100 via the high pressure hose 42. Detergent can be sucked in via a suction inlet, designated the reference numeral 106, which will be shown in more detail in fig. 6, supplied by the detergent container 200 (not shown) via the detergent hose 202. A control knob, designated the reference numeral 108, is located on the gun 100 where it can be easily manipulated by the user 30 (not shown). The flow of pressurized water is mixed with the detergent and the resulting detergent solution 20 (not shown) is led to the nozzle 80 (not shown) via the flexible hose 70 which runs through the telescoping tube 60. The flexible hose 70 forms a loop, designated the reference numeral 72, which accumulates any

excess of flexible hose 70 and allows the flexible hose 70 to move, as indicated in fig. 3 by the double arrow designated the reference sign A, into, or out of the gun 100 as the telescopic tube 60 is extended or retracted respectively. The telescopic tube 60 may for example be retracted for convenient storage. The internal routing of the flexible, hose will be described in more detail with reference to fig. 5 below.

[0062] The gun is typically molded out of plastics which may be carbon or glass fibre reinforced. The gun may also be made of metal. Preferably the gun 100 is made from two molded halves assembled by screws

[0063] The flexible hose 70 is typically made out of rubber or plastics, which may be reinforced by Kevlar or other synthetic fibres.

[0064] Fig. 4 shows the nozzle 80 connected to the telescopic tube 60 ejecting the detergent solution 20 as a pencil jet. The nozzle 80 includes an pivoting connection, designated the reference numeral 82. allowing the detergent solution 20 to be directed, and a tip, designated the reference numeral 84, which allows the detergent solution to be applied to the roof as a pencil jet or as a wider spray by turning the tip 84 as desired by the user 30 (not shown). The nozzle 80 is typical molded out of plastic but may include metal components in the tip.

[0065] Fig. 5 shows in cross section the gun 100. The trigger 104 activates a main valve, designated the reference numeral 110, which allows pressurized water to flow from the consumer high pressure cleaner 40 (not shown) via the high pressure hose 42 and an inlet, designated the reference numeral 112, to an outlet designated the reference numeral 114. An injector, in its whole designated the reference numeral 150, is connected to the main valve 110 and the outlet 114 to allow detergent supplied by the detergent container 200 (not shown) via detergent hose 202 to be sucked from the suction inlet 106 through a valve, designated the reference numeral 116, for mixing with the pressurized water The telescopic tube 60 is attached to the gun 100 and the flexible hose 70 leads the detergent solution from the outlet 114, in the loop 72, through an aperture, designated the reference numeral 118, into the gun 100 and through the telescopic tube 60 to the nozzle 80 (not shown). The flexible hose 70 is anchored to the nozzle 80 and the outlet 114, thus it may run freely within the gun 100 and the telescopic tube 60, allowing any excess of flexible hose 70. such as when the telescopic tube 60 is retracted, to be expelled from the telescopic tube 60 and the gun 100 through the aperture 118 as indicated by the double arrow A to accumulate in the loop 72.

[0066] Fig 6 shows in cross section the injector 150. The flow of pressurized water from the consumer high pressure cleaner 40 (not shown), indicated by an arrow designated the reference numeral 44, draws in detergent, indicated by an arrow designated the reference numeral 204, due to the high velocity, and subsequently the reduced pressure, of the pressurized water as it passes a restriction, designated the reference numeral 152, in the injector 150, The detergent valve 116 can be actuated through rotation of the control knob 108 (not shown), thereby reducing or increasing the flow of detergent indicated by the arrow 204

List of reference signs and numerals with reference to the figures:

A. Double arrow indicating movement of the flexible hose 70
1. Ground
10. Residential house
12 Roof
20. Detergent solution
30. User
40. Consumer high pressure cleaner
42. High pressure hose
44. Arrow indicating flow of pressurized water
46. Mains water hose
60. Telescopic tube
62. Tube section
64. Locking mechanism
70. Flexible hose
72. Loop
80. Nozzle
82. Pivoting connector

(continued)

84. Tip
90. Support structure
100. Gun
102. Handle
104. Trigger
106 Suction inlet
108 Valve control knob
110. Main valve
112. Inlet
114. Outlet
116. Valve
118. Aperture
150. injector
152. Restriction 200. Detergent container
202. Detergent hose
204. Arrow indicating flow of detergent

Claims

1. A cleaning apparatus for cleaning an elevated surface comprising, in combination:

a high pressure cleaner (40),
a gun (100) having a trigger (104), and
an outer tube surrounding a flexible hose (70) for a fluid and a detergent, wherein an injector (150) is provided in the flow path of said fluid, and wherein said flexible hose (70) is terminated in a nozzle (80) attached to the distal end of said outer tube.

2. The cleaning apparatus according to claim 1, said outer tube being a telescopic tube (60).

3. The cleaning apparatus according to any preceding claim, further comprising a valve (116) provided in, or at, said gun (100), said valve (116) being adapted to regulate the supply of said detergent to said injector (150).

4. The cleaning apparatus according to any preceding claim, said gun (100) further including a main valve (110) actuable by said trigger (104) for interrupting the flow of said fluid and said injector (150) being provided downstream of said main valve (110).

5. The cleaning apparatus according to any preceding claim, said elevated surface being a roof (12) of a house (10) and said cleaning apparatus being adapted to allow a user (30) standing on the ground (1) adjacent said house (10) to clean said roof (12).

6. The cleaning apparatus according to any preceding claim, said high pressure cleaner being a conventional consumer high pressure cleaner (40).

7. The cleaning apparatus according to any preceding claim, said trigger (104) of said gun (100) being lockable when triggered.

8. The cleaning apparatus according to any of the claims 2-7, said telescopic tube (60) having a fully extended length

of at least 2 m, such as least 3 m, preferably at least 5 m.

9. The cleaning apparatus according to any of the claims 2-8, said telescopic tube (60) comprising a plurality of coaxial tube sections (62) joined by locking mechanisms (64), each of said plurality of tube sections (62) being independently lockable in relation to an adjacent tube section.

10. The cleaning apparatus according to any preceding claim, said cleaning apparatus further comprising a support structure (90) adapted to support said outer tube.

11. The cleaning apparatus according to any preceding claim, said flexible hose (70) being a low pressure hose.

12. The cleaning apparatus according to any of the claims 3-11, said valve (116) being selectively actuable to allow said detergent to be injected into said fluid at a rate adapted to achieve a concentration in the range from 0% to at least 10% detergent in said fluid.

13. The cleaning apparatus according to any preceding claim, said detergent being benzalkoniumchloride and said fluid being water.

14. The roof cleaning apparatus according to any preceding claim, said nozzle (80) being angleable and/or producing a pencil jet.

15. A method for cleaning the roof (12) of a residential house (10) by a user (30) standing on the ground adjacent said house (10) comprising the steps of:

Providing a cleaning apparatus according to any preceding claim, and
applying said fluid and said detergent to said roof (12).

Amended claims in accordance with Rule 137(2) EPC.

1. A cleaning apparatus for cleaning an elevated surface comprising, in combination:

a high pressure cleaner (40),
a gun (100) having a trigger (104) for controlling the fluid delivered from the high pressure cleaner (40),
an injector (150) provided in the flow path of said fluid,
an outer telescopic tube (60) surrounding a flexible hose (70) for a fluid and a detergent, wherein said flexible hose (70) is terminated in a nozzle (80) attached to the distal end of said outer telescopic tube whereby a valve (116) is provided in, or at, said gun (100), said valve (116) being adapted to regulate the supply of said detergent to said injector (150).

2. The cleaning apparatus according to any preceding claim, said gun (100) further including a main valve (110) actuable by said trigger (104) for interrupting the flow of said fluid and said injector (150) being provided downstream of said main valve (110).

3. The cleaning apparatus according to any preceding claim, said elevated surface being a roof (12) of a house (10) and said cleaning apparatus being adapted to allow a user (30) standing on the ground (1) adjacent said house (10) to clean said roof (12).

4. The cleaning apparatus according to any preceding claim, said high pressure cleaner being a conventional consumer high pressure cleaner (40).

5. The cleaning apparatus according to any preceding claim, said trigger (104) of said gun (100) being lockable when triggered.

6. The cleaning apparatus according to any of the claims 1-5, said telescopic tube (60) having a fully extended length of at least 2 m, such as least 3 m, preferably at least 5 m.

7. The cleaning apparatus according to any of the claims 1-6, said telescopic tube (60) comprising a plurality of co-

axial tube sections (62) joined by locking mechanisms (64), each of said plurality of tube sections (62) being independently lockable in relation to an adjacent tube section.

8. The cleaning apparatus according to any preceding claim, said cleaning apparatus further comprising a support structure (90) adapted to support said outer telescopic tube.

9. The cleaning apparatus according to any preceding claim, said flexible hose (70) being a low pressure hose.

10. The cleaning apparatus according to any preceding claim, said nozzle (80) being angleable and/or producing a pencil jet.

11. A method for cleaning the roof (12) of a residential house (10) by a user (30) standing on the ground adjacent said house (10) comprising the steps of:

Providing a cleaning apparatus according to any preceding claim, and
applying said fluid and said detergent to said roof (12).

12. The method according to claim 11, said detergent being applied to said roof (12) in a concentration in the range from 0% to at least 10% detergent in said fluid.

13. The method according to any of the claims 11-12, said detergent being benzalkoniumchloride and said fluid being water.

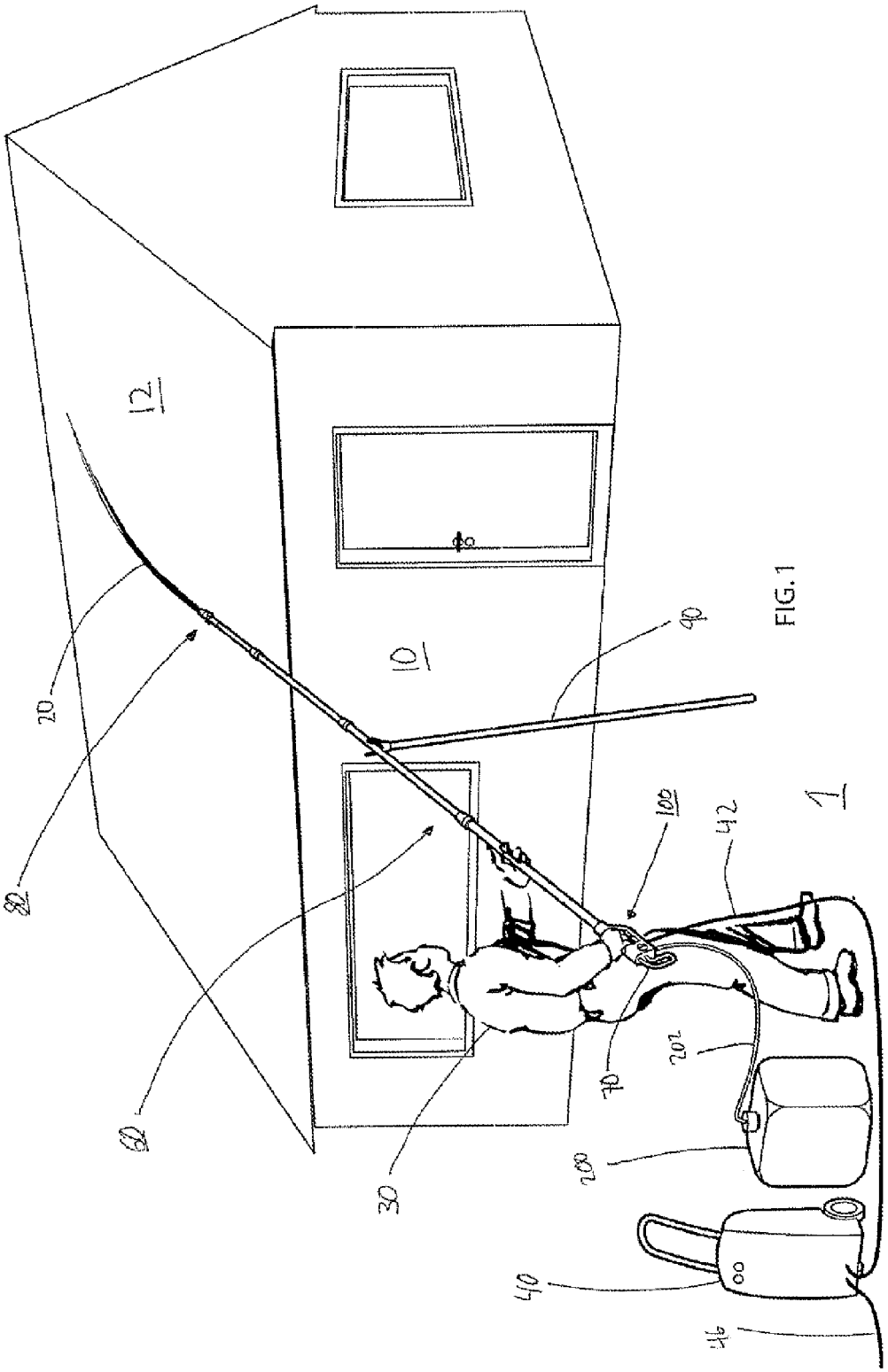


FIG. 1

FIG. 2

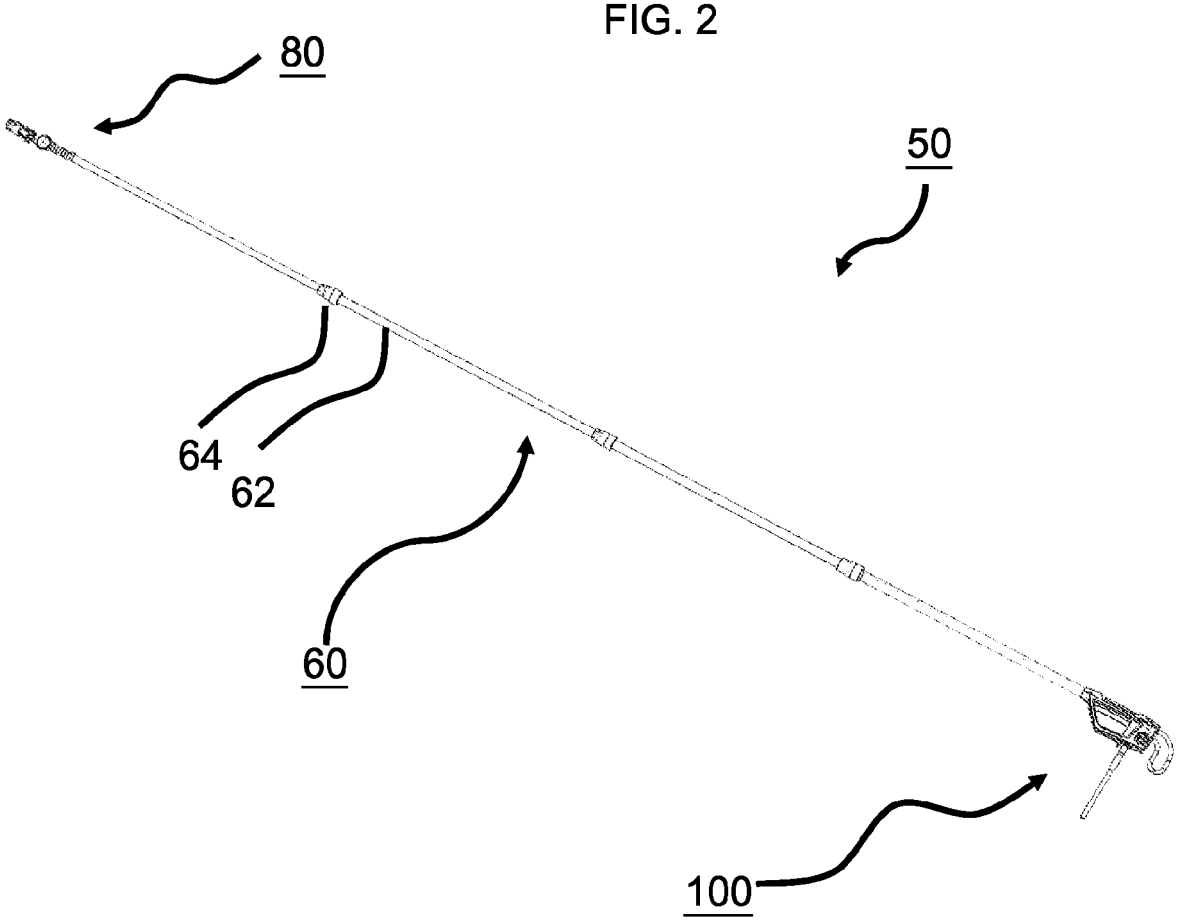


FIG. 3

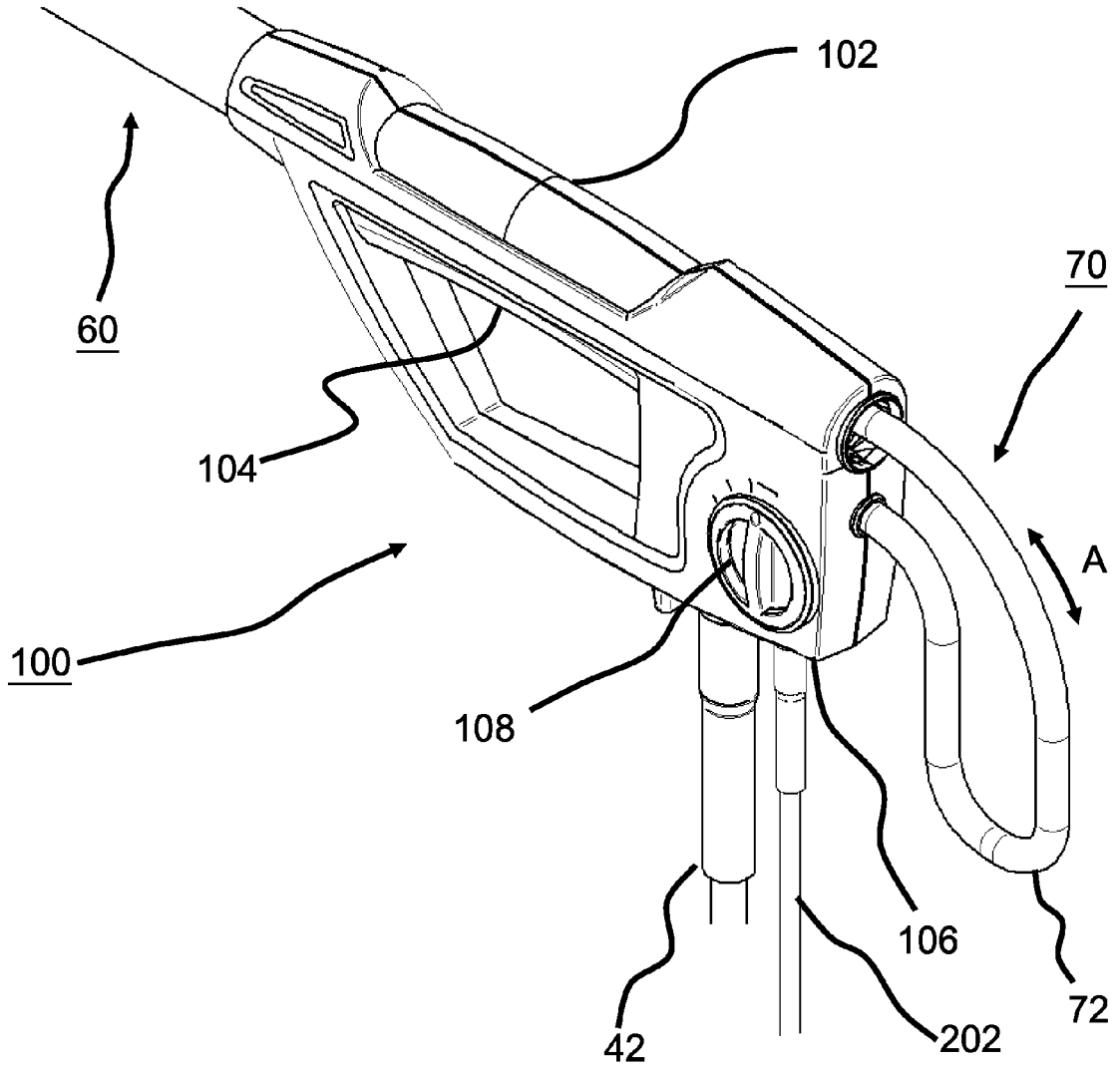


FIG. 4

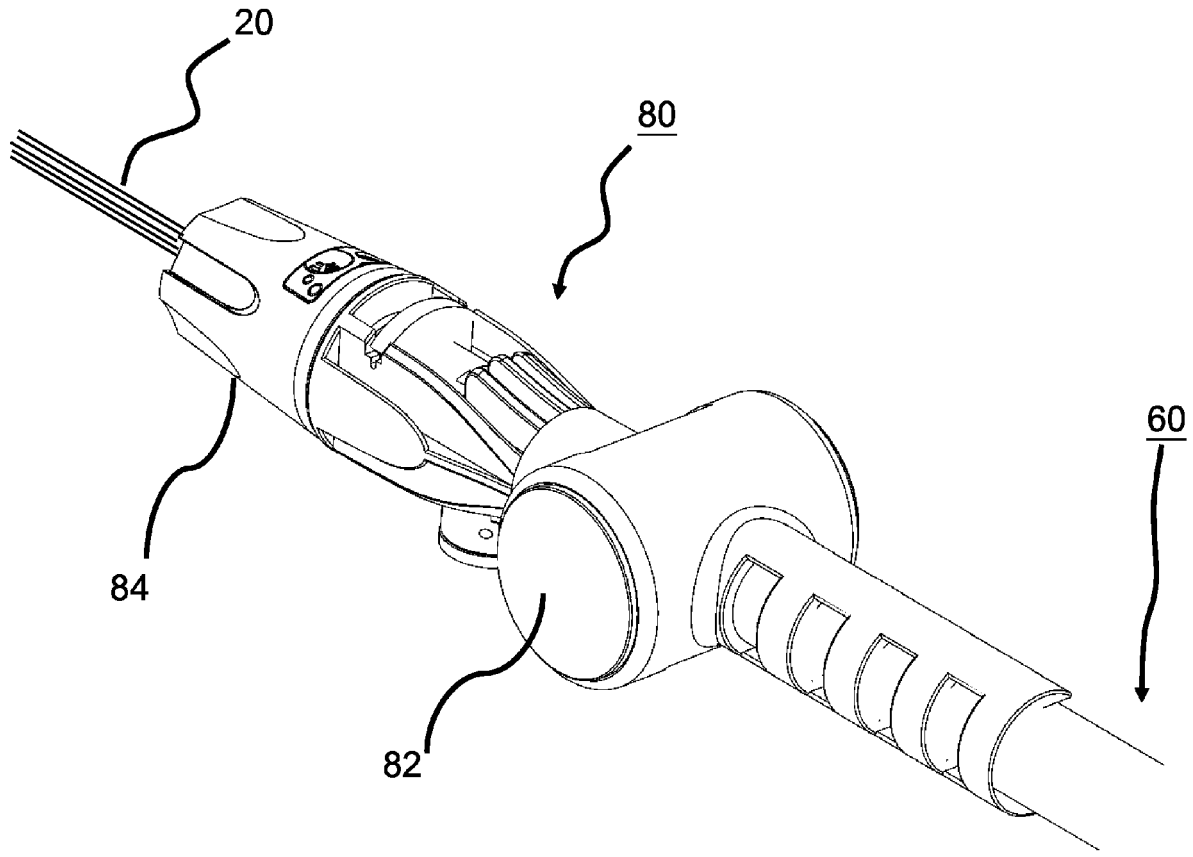


FIG. 5

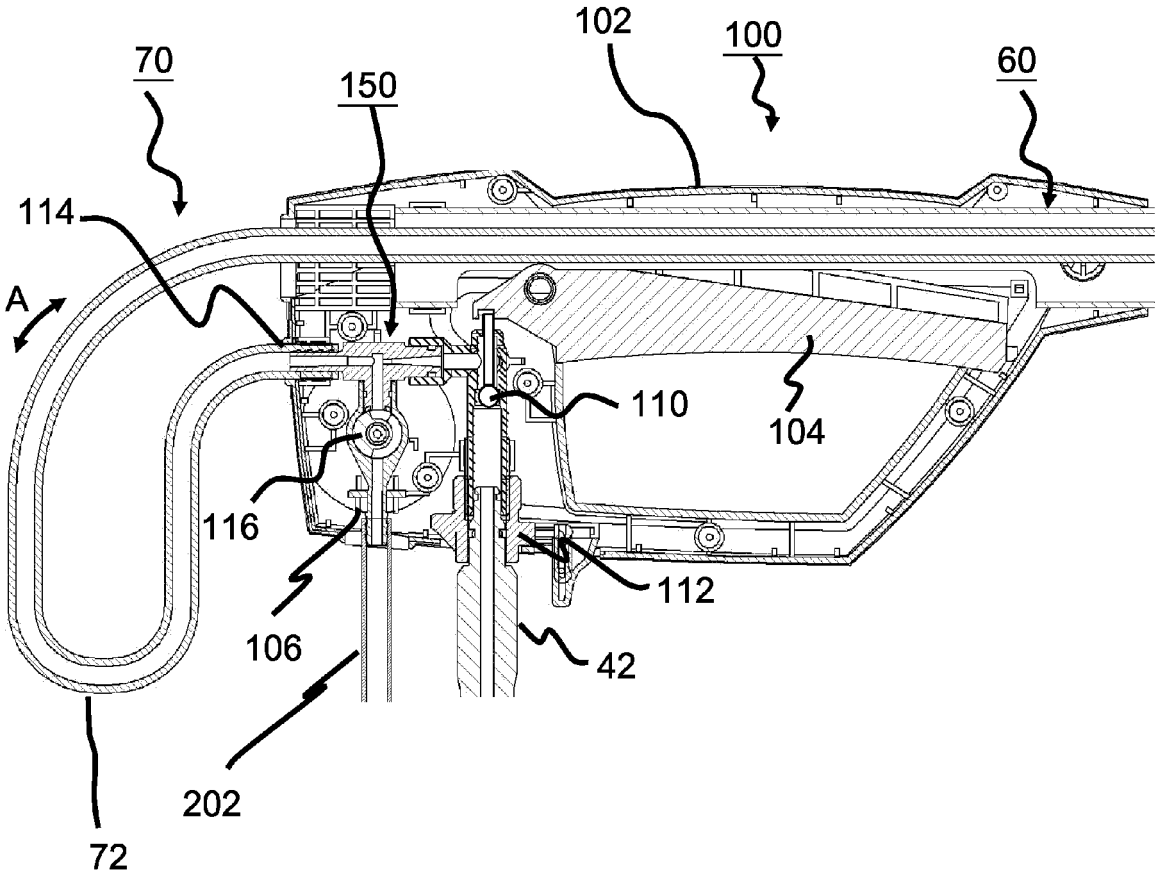
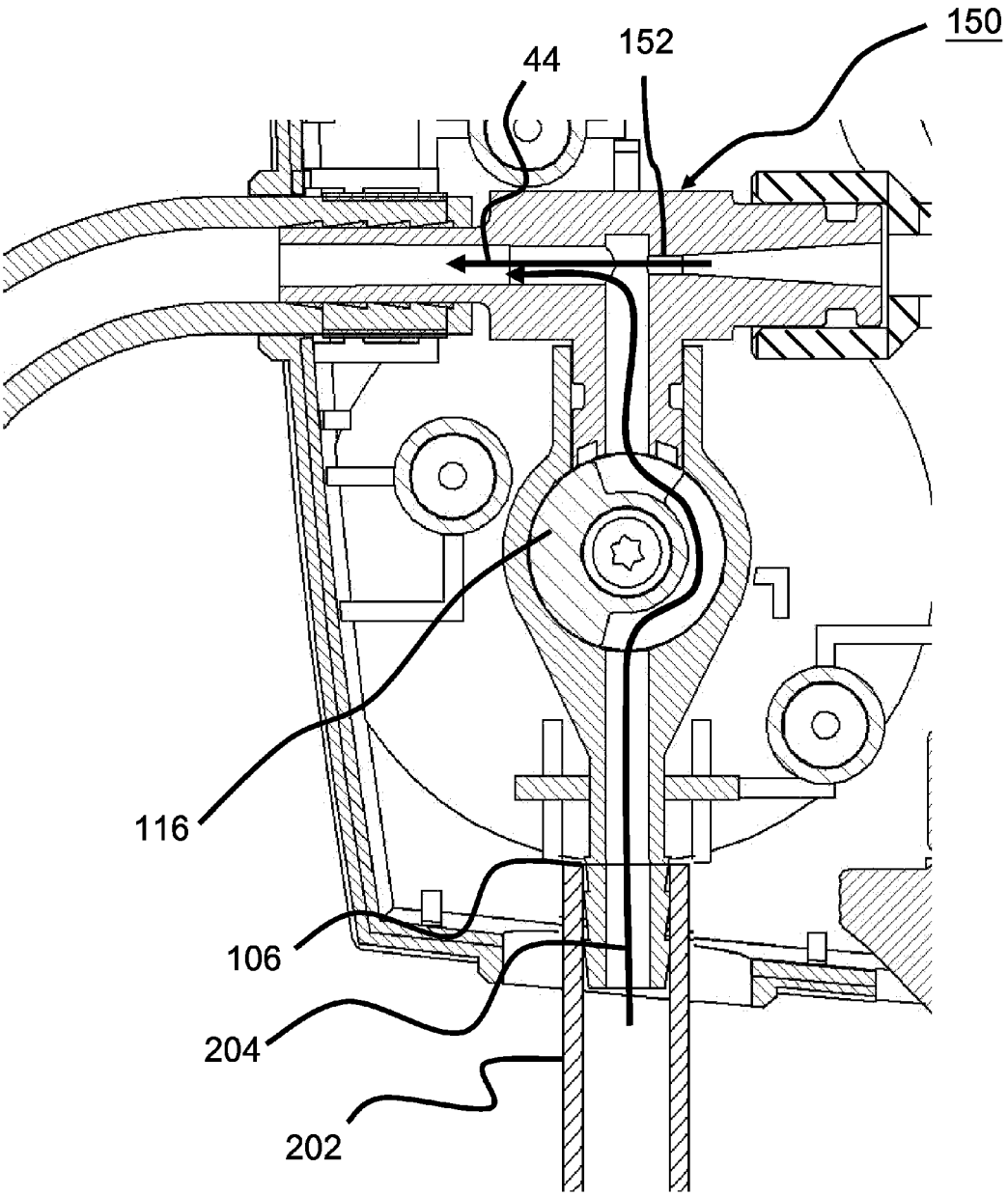


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 10 15 0870

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	US 2006/255183 A1 (BURDSALL THOMAS A [US] ET AL) 16 November 2006 (2006-11-16) * abstract; figures * * paragraph [0002] - paragraph [0003] * * paragraph [0015] - paragraph [0027] *	1-15	

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B08B
B05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	12 July 2010	Plontz, Nicolas

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