



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
30.11.2011 Bulletin 2011/48

(51) Int Cl.:
F24D 19/00 (2006.01) **B65D 83/14** (2006.01)
B65D 83/62 (2006.01)

(21) Application number: **10194341.3**

(22) Date of filing: **05.05.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR

(30) Priority: **14.08.2004 GB 0418282**
15.11.2004 GB 0425205
16.02.2005 GB 0503230

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
05742116.6 / 1 794 505

(71) Applicant: **AQUEOUS LOGIC LIMITED**
Sutton
Surrey SM3 9PW (GB)

(72) Inventors:
• **Sevier, David**
Epsom, Surrey KT18 7HY (GB)
• **Thaxter, Ian**
Sutton, Surrey SM2 5LB (GB)

(74) Representative: **Gill, David Alan**
W.P. Thompson & Co.
55 Drury Lane
London WC2B 5SQ (GB)

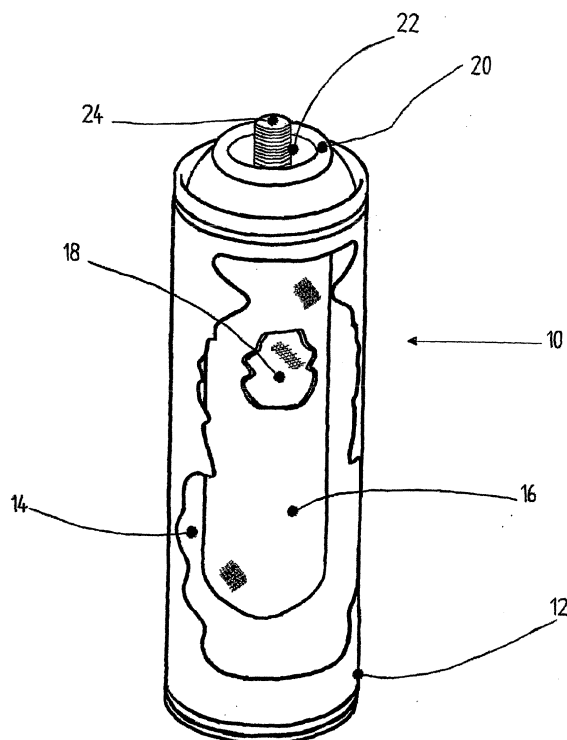
Remarks:

- This application was filed on 09-12-2010 as a divisional application to the application mentioned under INID code 62.
- Claims 16 - 30 are deemed to be abandoned due to non-payment of the claims fees (Rule 45(3) EPC).

(54) **Dispensing device and related dispensing adaptor device**

(57) The present invention provides for a dispensing device for the addition of products to seal and semisealed systems such as for example water treatment chemicals to domestic closed loop systems and in which the product can be dispensed from a bicompartamental aerosol can which can be connected directly to the heating system through threaded attachments such that the contents of the can are directly discharged into heating system. No draining down is required and the dosing can be done under hot or cold conditions and the bicompartamental aerosol can avoids the problem of the propellant being discharged into the system since the chemical is separated within the can from the propellant. An arrangement of the invention can also comprise a dosing adaptor device serving to allow easy addition of water treatment chemicals to heating systems and which adaptor devices can be used for bleeding the excess air from the system by either the use of special bleed keys that are designed to open the dosing devices back check valves or by partly unscrewing the dosing devices.

FIG. 1



Description

[0001] The present invention relates to a dispensing device and a dispensing adaptor device, for example for use in dosing product into a target receiver in which the product is to be deployed, consumed or generally used.

[0002] The desire to dispense a product into a generally closed receptacle and/or system commonly arises in a wide variety of situations from, for example, replacement of ink in inkjet printer devices to the introduction of treatment chemicals into a closed fluid-bearing systems such as, for example, a heating system in the form of a central heating system.

[0003] While dispensing arrangements and adaptor arrangements are known for such purposes, they are disadvantageously limited insofar as they represent unnecessarily complicated, possibly inefficient, bulky and slow means for achieving the required dispensing of the product. Also such known arrangements are not readily adaptable to the variety of possible circumstances and physical situations that can arise even when, for example, dosing product to a domestic central heating system.

[0004] The addition of water treatment chemicals to closed loop systems can be problematic. It can be time consuming and difficult to add chemicals to systems. Often draining systems down to release pressure is required before addition can take place. This is followed by adding either liquids or slurries to a point within the system. Often such a point comprises one of the radiators. This operation is messy and spillages are common. After the chemical addition, the system is refilled and the system vented to remove air. All the aforementioned operations are time consuming and disruptive. It is for these reasons that the majority of closed loop systems go untreated with water treatment chemicals.

[0005] While newly built boilers can be provided with appropriate dosing points, such features are not generally found in existing systems. Such systems may have standard filling valves or only a threaded cap at the top of the radiator as a possible access point for the addition of chemicals to the system. It is found however that these points can be used but adaptors are needed to join the dosing device to the system.

[0006] There are two general types of radiators comprising either two or four connector radiators. The two connector type radiators have connections only for the inflow and outflow pipes. The top of each panel of the radiator is fitted with bleed pins that screw directly into the wall of the radiator. Systems fitted with two panel radiators are notoriously difficult to dose chemicals to. As a result, such systems normally are left without the addition of corrosion reducing chemicals.

[0007] With reference to UK Patent Application GB-A-2 162 164 there is disclosed a system for dosing a treatment medium into a domestic central heating system and which requires a potentially problematic connection between a variety of separate members and activation of appropriate pumping means, and further exhibits limited

possibility for engagement of the dosing arrangement to the central heating system.

[0008] The present invention seeks to provide for a dispensing device and a dispensing adaptor device offering advantages over known such devices.

[0009] According to a first aspect of the present invention, there is provided a product dispensing device comprising a container having a first compartment containing the said product and arranged to be in communication with an outlet through which said product is to be dispensed, a second compartment containing a propellant arranged to exert pressure on the said first compartment so as to dispense the said product through the outlet, wherein the outlet includes an engagement formation arranged to engage with an engagement formation of an inlet associated with a target arrangement into which the product is to be dispensed, and further includes a selectively openable closure means which, when opened, allows product to be dispensed through the outlet and into the said target arrangement under the pressure exerted by the said propellant.

[0010] The product dispensing device has proved particularly advantageous since it can be readily mounted to an appropriate inlet of a target arrangement into which the product is to be dispensed, whether, for example, a printer cartridge or domestic central heating system, and the product then released, under pressure from the device in a simple and efficient manner. In particular, the device can prove advantageously small and adaptable so as to mount to the inlet of the said member so as to allow for the dispensing of product thereto even in situations where there is limited access space.

[0011] It should of course be appreciated that the reference to a target arrangement is intended to mean any device, system, receptacle etc to which the product is to be dispensed from the device.

[0012] Further, through use of the propellant within the container, the product can be dispensed in an effectively automatic manner once these respective engagement formations have achieved engagement.

[0013] In particular, the engagement can be advantageously achieved in a sealed manner.

[0014] Advantageously, the container comprises a bi-compartmental container and the propellant can comprise pressurised fluid or a pressurised gas, or even compressed air.

[0015] The use of a bicompartimental container is advantageous since none of the propellant is then dispensed with the product and remains wholly within its separate compartment within the container.

[0016] The bicompartimental container can comprise any appropriate form of divided container such as that formed by a bag provided in the container and crimped on top of the container, crimped onto a valve member of the container, or a piston type container having compartments divided by a slideable dividing disk for example.

[0017] Advantageously, the openable closure can be formed by way of a frangible seal member which, can

comprise a metal seal or seal formed of some other appropriate material as required.

[0018] Further, the openable closure can be arranged to be selectively re-closed and can comprise a valve arrangement which can include a resiliently mounted closure member.

[0019] The dispensing device is advantageously in the form of a can such as for example an aerosol can.

[0020] With regard to the engagement formation, this can advantageously include a screw thread which can be of a male or female variety.

[0021] The sealed engagement between the engagement formation can thereby be achieved through the mutually cooperable threaded members.

[0022] Advantageously, the outlet is arranged such that the making of the engagement between the respective engagement formations serves to open the openable closure.

[0023] In one particular embodiment, the product comprises a treatment chemical which, in particular, can be arranged to be dosed to a closed system such as a water heating system and, in particular, to a domestic central heating system.

[0024] Of course, the product can comprise any appropriate product that requires dispensing, whether a treatment medium or consumable product such as for example ink in a cartridge for an inkjet printer.

[0025] According to another aspect of the present invention, there is provided an adaptor device arranged for the dispensing of product from a dispensing device to a target arrangement, the adaptor device having a body including a first portion presenting a first screw thread, a second portion presenting a second screw thread, first and second passages associated with the said first and second portions respectively and arranged to be in communication for the passage of product therebetween, at least one of the passages including a one way valve member.

[0026] Advantageously, the one-way valve member is arranged to present a surface to be engaged by an engagement formation and to achieve selective opening thereof.

[0027] As a further advantage, the adaptor device includes an opening arranged to receive a nozzle of a dispensing device.

[0028] Advantageously, the communication with such a nozzle is arranged to be achieved via a cap member.

[0029] In particular, the cap member can include a threaded portion for threaded engagement to the adaptor device. As will be appreciated, the cap can advantageously serve to maintain sealed closure of the adaptor even if the back-check valve starts to leak.

[0030] According to another aspect of the present invention, there is provided an adaptor device arranged for the dispensing of product from a dispensing device to a target arrangement, the adaptor device having a body including a first portion presenting a first screw thread, a second portion presenting a second screw thread, first

and second passages associated with the said first and second portions respectively and arranged to be in communication for the passage of product therebetween and including an engagement formation arranged to engage with a selectively openable closure member of a product dispensing device for the dispensing of product there-through.

[0031] Advantageously, the engagement formation is arranged to pierce a frangible seal associated with a product dispensing device.

[0032] In this manner, the engagement formation advantageously includes a blade portion.

[0033] Alternatively, or in addition, the engagement formation advantageously comprises an elongate member arranged to engage with a valve member of the product dispensing device.

[0034] The elongate member can advantageously comprise a valve activation pin. In particular, the elongate member can be provided with a bore through which the product can pass.

[0035] In particular, the engagement formation is arranged to engage with a valve member of a bicompartamental dispensing device as defined above.

[0036] It will of course be appreciated that both the said screw thread portions can comprise male screw thread portions, female screw thread portions or a combination of a male and a female screw thread portions.

[0037] The device can advantageously include a closure or plug member arranged to engage with one of the male or female threads thereof so as to assist with closure of at least one of the passages thereof.

[0038] Advantageously, the closure plug/cover can advantageously include an engagement formation arranged to engage with the said one way valve member.

[0039] In one embodiment, the respective axes of the said screw threads are common, or at least parallel. Alternatively, the axes can be angled in some manner, for example, such as orthogonal to each other.

[0040] The positioning of the respective axes of the screw threads in a non-aligned and non-parallel manner, advantageously assists with the adaptability that can be achieved through use of the device. This assists the dispensing of product through the adaptor device particularly in situations where access to the target device/system to be dosed is not readily achievable.

[0041] Of course, it should be appreciated that the present invention can also comprise an adaptor device including the above-mentioned one way valve arrangement and the said engagement formation arranged to engage with a selectively openable closure member and such as defined above.

[0042] The present invention provides for a particularly advantageous arrangement for dispensing product to a wide variety of target devices/systems as required and which allows for such dispensing in particularly easy and efficient and, if required a readily sealed, manner.

[0043] The invention is disclosed further hereinafter, by way of example only, with reference to the accompa-

nying drawings in which:

Fig. 1 illustrates a bicompartmental aerosol can according to an embodiment of one aspect of the present invention;

Fig. 2 illustrates is an aerosol can according to another embodiment of one aspect of the present invention;

Fig. 3 is a partial view of a fitting that is designed to mate to the aerosol cans of Figs. 1 and 2.

Fig. 4 is a partial view of a further arranged to mate with cans such as those of Figs. 1 and 2.

Fig. 5 illustrates a closing adaptor device according to an embodiment of another aspect of the present invention;

Fig. 6 illustrates a dosing device according to another embodiment of an aspect of the present invention.

Fig. 7 illustrates another variant of a dosing adaptor device of the present invention;

Figs. 8 and 10 illustrate further variants of dosing adaptor devices of the present invention;

Fig. 9 illustrates an arrangement for bleeding excess air from closed loops that are fitted with a dosing adaptor device shown in Fig. 8;

Fig. 11 is a tool for bleeding excess air from closed loops that are fitted with the dosing device shown in Fig. 10.

Figs. 12 to 15 illustrate yet further dosing adaptor devices of the present invention.

[0044] Turning first to the dosing device 10 of Fig. 1 in the form of a can 12 there is illustrated a space 14 between a bag 16 and wall of the can 12 and in which a propellant is located. A sealing cap 20 serves to seal the bag 16 and helps keep its contents, i.e. the product to be dispensed, separate from the propellant. A threaded connector 22 is provided designed to mate to connections shown later in Figs. 3 and 4. A sealed metal top 24 is provided for the connector that is designed to be scored and pierced by the hollow point of the connection of Figs. 3 and 4. As noted the contents 18 stored in the bag 16 comprise the product to be dispensed from the dosing device 10.

[0045] Advantageously, the dosing of propellant is avoided by using a bicompartmental aerosol arrangement can. The can 12 as noted consists of an internal bag 16 that seals on to a sealing neck 20 of the closure on the top of the can 12. Within the bag 16, the desired

product, i.e. chemical 18 is stored and which is kept separate and sealed from the propellant that is in the separate compartment 14. When the frangible metal seal 24 of the can is pierced/broken, the product within the bag 16 discharges due to pressure exerted by the propellant in the compartment 14. Even when the product 18 has fully discharged, the propellant gas does not discharge. In this way, the dosing of the propellant is avoided.

[0046] In Fig. 2, there is illustrated a dosing device 26 in the form of an aerosol can 28 having product 30 and a propellant therein and wherein the can 28 includes a sealing cap 32 and threaded connector 34 designed to mate to connections shown in Figs. 3 and 4. A sealed metal top 36 is provided and arranged to be scored and pierced by the hollow point such as that illustrated in Figs. 3 and 4.

[0047] Turning now to Fig. 3 there is illustrated a device 38 that can be fitted to, for example, an inlet point of a radiator, or boiler filling loop, and having a metal body 40. A bore 42 is provided within a hollow tube 44 such that chemicals can pass there-through. The hollow tube 44 provided has a sharp, angled end designed to score, prior to piercing, a sealed metal top such as that described above. Internal threads 46 are provided to mate with the threads 22, 34 illustrated in Figs. 1 and 2.

[0048] In Fig. 4, there is illustrated a similar device 48 but with external threads 50 provided on the body 58. A space 52 within a hollow tube 54 is again provided so that chemicals can pass there-through. The hollow tube 54 has a sharp, angled end again designed to score a sealed metal top as before prior to piercing a sealed metal top as before. Internal threads provided and designed to mate with threads 22, 34 of the dosing device of Figs. 1 and 2 to form a sealed connection.

[0049] According to the invention, and in particular the embodiments of Figs. 1 and 2, water treatment chemicals can be placed in a sealed pressurised can that is designed to directly mate with a fitting on a heating system so that the product therein can be directly dosed to hot or cold pressurized systems without the need to partly or fully drain down the closed loop system. As seen, the top of the can is fitted with a threaded engagement formation in the illustrated embodiment that is either male or female but opposite to the type that is on the system to which the product is to be dosed. The top of the threaded connector 22, 34 is either a sealed frangible sheet of metal 24, 36 formed during the manufacturing process or the top of an internal valve that prevents the product releasing until it is caused to open during the mating process with a system connector, such as for example that described below.

[0050] The threaded connector 22, 34 is screwed into such a system connector to form an airtight seal. The threading process causes either the frangible metal seal 24, 36 to be pierced by a hollow angled tube 12, 16 that scores the metal surface prior to piercing or the internal valve at the top of the can to open (various arrangements are possible as a number of valves of this type are widely

used). Once the metal seal is pierced or the valve is opened, the product within the can discharges into the closed loop system as required. After the can has fully discharged, it is disconnected from the closed loop system by unscrewing and is discarded.

[0051] Such an arrangement has a number of advantages. It is highly convenient. It avoids an operator needing to handle chemicals. It is quick. The dosing system allows the dosing of hot or cold closed loop system that may or may not be pressurized directly without the need to drain down.

[0052] The system adaptor which the cans mate to can be fitted on a number of points on a closed loop system/boiler. One particular appropriate location is the filling valve that is currently used to mate with the removable flexible hose of the domestic water supply. The filling valve has external threads which the flexible connector attaches to. With only minor adjustments, this valve can be fitted with internal threads and a hollow point such as in Fig. 4. In this manner the filling valve can be used to fill the heating system with water and to dose water treatment chemicals to. The valve can also be used by the plumber as a tool to mate with heating systems that are not fitted with can specific fittings but which have threaded connectors that the fitting can be screwed into.

[0053] Turning now to Fig. 5, there is illustrated an embodiment of a dispensing adaptor device comprising a body 60. Screw threads 62 designed to mate to a threaded male connection on the heating system are provided along with seals 64, 66. A hollow valve release pin 68 is included and designed to depress the internal valve of an aerosol can such that the product within the can is released. A threaded portion 70 is designed to mate with the aerosol can. From a magnified part view 72, there is seen a hole 76 in the valve release pin 68 along with an internal hollow bore 78 extending in the middle and along the length thereof such that product from the aerosol container can enter the hole 76 and travel down the bore 78 into the space that is bounded by the threads 62 and then into the heating system (not shown). The valve release pin includes side walls 74.

[0054] An appropriate aerosol can can be mated to a threaded male point on a heating system by using the adaptor tool shown in Fig. 5. The adaptor body is attached to a point such as a threaded filling valve. The pressurised aerosol can is then threaded onto the body 60 via threads 70 until it seals against the rubber seal 66. The filling valve is then opened. The aerosol can then rapidly discharges the product contained therein into the heating system. The filling valve is then closed and the adaptor tool and the empty can are removed.

[0055] The adaptor tool in Fig. 5 can be used to dose a female threaded joint such as a radiator by using a standard threaded male to threaded male connector that is widely available. While the tool is able to dose radiators and other such points in this way, it may suffer from the disadvantage that it will be difficult to maintain system pressure following dosing and still remove the can and

adaptor. This is not the case when dosing via a valve (filling valve).

[0056] Fig. 6 shows an arrangement comprising a device with a body 80 and having screw threads 82 designed to mate with a female threaded connection on a heating system and with a seal 84. Threads 86 are provided to mate with the threaded connector of the aerosol can and with threads 96 of a sealing cap 98. A further seal 88 is also provided along with a hollow valve release pin 90. The release pin 90 is also illustrated in enlarged view 102 showing a body 104 of the hollow valve release pin with holes 106 formed through the body thereof and to communicate with a hollow tube 108 within the pin 90 and which runs down the centre of the valve release pin through the body 80 to a back check valve 92. A cap 94 having a body 98 that screws into the threads 86 of the adaptor tool is illustrated as are threads 96 that can engage with the threads 86. A blind bore 100 is provided within the cap such that the valve release pin 90 is not operatively engaged when the cap 94 is screwed into place.

[0057] The adaptor tool in Fig. 6 has further advantages. This adaptor tool is designed to be screwed into the threaded blank end of the radiator. Once the adaptor tool is in place, the can is mated with the adaptor tool. This has the effect of opening the can's valve and releasing its contents into the adaptor tool. This causes the adaptor tool's back-check valve to open and the chemical to enter the radiator. When the can is unscrewed from the tool, the closed back-check valve prevents the system water from escaping out of the adaptor tool. The radiator valves can be closed and the tool removed or the tool can be left in place. As noted, the adaptor tool has threads 86 so that a cap 94 can be screwed into the tool. This has aesthetic and practical advantages as the back-check valve may leak over time. The sealing cap will prevent leaks from escaping. The tool in figure two can have either a flow activated check valve or a spring-loaded valve that is forced open when the can is mated with the tool.

[0058] The cap 94 that screws into the adaptor tool of Fig. 6 has a flat face that has at least one groove cut into it for receipt of a screwdriver. Alternatively the flat face can have two parallel shallow holes drilled into the face so that it can be screwed into the tool of Fig. 6. Other gripping systems are possible and priority is claimed over them.

[0059] Fig. 7, shows an arrangement of a dosing adaptor device comprising a seal 110, a body 112, threads 114 designed to mate to the cap 122 and mastic type tube adaptors designed to mate to filling loops. Further, a passage 116 is provided through the body 112 of the adaptor and which may or may not be threaded. However threads 118 are provided to mate with the threads 114. A seal 120 is provided in a cap 122 and a threaded hole 124 is provided through the cap 122. A threaded screw 126 can be provided and arranged to be threaded into the hole 124.

[0060] The adaptor tool of Fig. 7 is an example that

can be used to dose mastic type tubes of water treatment products to heating systems via radiators without the need to drain water therefrom to reduce system pressure. This tool is designed to mate with standard mastic type tube filling loop adaptors and the cap 122 is removed and the threads 114 engage with threads to the tube. The injection process in which the chemical product is squeezed out of the mastic type tube causes the back check valve 128 to open and the chemical then enters the heating system. Once this is done, the back check valve 128 closes and the system water is prevented from escaping. Potential leakage from the back check valve overtime is prevented by use of the screw-fitted cap 122.

[0061] As noted, the cap 122 has a threaded screw or pin 126 located through the centre thereof. This screw or pin 126 can be removed such that mastic type tubes of water treatment products that have adaptors designed to fit into radiator bleed valve holes can mate to the bore 124 in cap 122. The back check valve 128 will then function as previously described. Following dosing, the screw 126 is re-inserted into the bore 124 to prevent leakage.

[0062] The variation shown in Fig. 7 is useful as it allows standard mastic type tubes of water treatment chemicals to be dosed via radiators without the spilling problems that occur when the mastic type tube dosing adaptor is removed. This is a particularly messy problem when dosing pressurised systems. For this reason, most plumbers normally will isolate a radiator and release system pressure prior to dosing with mastic type tubes to the radiator. The adaptor tool of Fig. 7 overcomes this problem. Radiators fitted with these devices can be dosed directly with mastic tubes without needing to release system pressure before or after dosing.

[0063] Turning now to Fig. 8, either the wall of a radiator or a bleed valve insert is illustrated 134 and which offers a threaded bleed valve hole 136. An opening 138 in the bleed pin hole connects to the heating system and to threads 140 of a shank of the device 146 that mesh with the bleed pin hole threads 136. An optional flat or groove can be machined on one side of the threads to make releasing air easier. Within the body 146 is an internal back-check valve 142. A seal 144 is provided around the threaded shank. Internal threads 148 are provided to match those 154 on a plug having a face 152. An opposite face 156 of the plug can be provided with a groove or allen key hole to assist engagement thereto. An o-ring seal 150 is associated with the internal threads 148.

[0064] In Fig. 9 there is illustrated a device with a dome or point 158 to open the back check valve of Fig. 8 slightly when the key is screwed onto the thread 148 of Fig. 8. A groove or flat 168 is formed down the side of the device to allow air to escape. External threads 170 that match the threads 148 of the device in Fig. 8 are provided on the body 172 of the device and arms 174 are provided on the device to assist with its turning.

[0065] In the adaptor device of Fig. 10 machined flats 178 are provided for engagement of a spanner or wrench. External threads 180 are provided and serve to mesh with

the bleed hole threads 136 and as usual a seal 182 is provided. Further external threads 184 are provided that mesh with the threads 192 of a cap 190. Within the body 186 of the device there is provided a back check valve 188. Also internal threads 192 that mesh with the threads at 184 are included along with a flat seal 194.

[0066] In Fig. 11 there is illustrated a device 198 having internal threads 200 that mesh with the threads at point 184 on the dosing device shown in Fig. 10. Arms 196 of the device are provided for turning the device. The device illustrated includes a central stalk 202 arranged to depress the back-check valve slightly when screwed in.

[0067] In the adaptor device of Fig. 12, a body 204 of the device is arranged with internal threads 206 that mesh with the threads a sealing cap (not shown). A seal 208, a hollow valve release pin 210 that is designed to depress the internal valve of the aerosol can such that the can's contents release are both provided. As illustrated in an enlarged part view 212, the release pin offers a surface 214 and also hole(s) 216 in the valve release pin which also include an internal hollow 218 in the middle of the release pin 210 such that liquid from the aerosol container can enter the hole and travel down the hollow tube. External threads 220 are designed to mate with the threads 148, 234 of the devices shown in Figs. 8 and 13.

[0068] Fig. 13, illustrates an adaptor device 230 having a bore 226 to allow fluids to pass through the device when a back-check valve 232 is depressed. Threads are designed to mate with the threads 136 of the bleed pin hole described above. A threaded insert 238 has threads 236 that match those of the adaptor 230. The plug has a face 240 with a groove or allen key hole formed therein and provided to assist engagement thereto.

[0069] Fig. 14 shows an adaptor device with internal threads 242 that match those of an aerosol can valve arrangement such as described previously. An internal seal 244 and a hollow valve release pin 246 is included and designed to depress the internal valve of the aerosol can such that product within the can is released. A blind bore 255 is provided in a plug 259 such that when the plug is fully screwed into the threads 242 the pin 246 is not touched nor damaged nor is it operatively engaged. External threads 257 mesh with the threads 242. A groove 260 or allen key hole cut in the face thereof is provided. Further, a seal 249, a back check valve 251 and external threads 253 to mesh with those of the bleed pin hole's threads are included. A partial enlarged view 248 shows the release pin 246 with a bore 252 and a hole 254 in the valve release pin 250. An internal hollow 252 is found in the middle of the release pin 250 such that liquid from the aerosol container can enter the hole and travel down the bore 252 to open the back-check valve 251 and so be dispensed.

[0070] Turning finally to Fig. 15 there is illustrated an adaptor device with internal threads 262 that can mesh with the external threads at 184 noted above. Also provided are internal threads 266 that may or may not match those of an aerosol can. A hollow valve release pin 268

is included and designed to depress the internal valve of the aerosol can such that product therein can be released. Seals 278, 280 are also included. An enlarged view 270 of the release pin 268 is included and shows a surface 272 of the release pin and also a hole 274 therein. As before an internal/central longitudinal bore 276 is provided within the release pin 268 such that product from the aerosol container can enter the hole and travel down the bore of the release pin 268.

[0071] The invention can therefore advantageously provide for a dosing adaptor device that can thread into a radiator bleed valves and that can be used to dose closed loop systems. Such devices can thread into the radiator bleed pin point, contain a back-check valve to prevent system pressure being released unless required, contain a removable plug to stop water leakage in the event that the back-check valve leaks, allow the connection of further tools/water treatment containers to allow the dosing of chemicals to the closed loop system and allow the manual bleeding of air from the radiators.

[0072] Devices that meet these requirements are shown in Figs 8, 10, 13, and 14. All of these illustrated devices are intended to be threaded into bleed valve points and to operate on pressurised closed loop systems. The back-check valves prevent the escape of system water. While the valves open to allow water treatment chemicals to be dosed when a pressure greater than that within the system is applied to the dosing side of the back-check valve. The devices shown in Figs 8, 10, 13, and 14 are also provided with caps or plugs to prevent the leakage of system liquid in the event that the internal back-check valve starts to fail.

[0073] The devices shown in Figs. 8 and 10 can be varied by being in an elbow configuration for ease of access. If the back-check valve 142 and 188 is positioned in a vertical orientation then the bleed keys shown in Figs. 9 and 11 can be used to bleed air from the system that the dosing device is attached to. If the back-check valve is positioned in the horizontal position, then the bleed keys shown in Figs. 9 and 11 will not work. Air can be bled from these devices by partly unscrewing the dosing device from the bleed pin hole. The devices shown in Figs. 13 and 14 also bleed air in this manner. Devices that directly bleed air in this way will bleed air better if a flat or groove on one side of the thread that screws into the bleed pin hole is machined. This makes the escaping of air easier. The dosing devices that have a machined flat will seal on the bottom of the bleed pin hole in the manner that many current bleed pins do.

[0074] The device shown in Fig. 14 is similar to the device of Fig. 8 except that it has a central pin that opens the valve on a closing aerosol can when it is attached to the dosing device. This allows direct dosing to the dosing device.

[0075] The device in Fig. 13 is useful for situations where the bleed point is situated at the back of the radiator in the horizontal position. This dosing device can provide easy access by screwing an adaptor tool such as that of

Fig. 15 directly into the screw threads 262 (external threads instead of internal threads at 262 are required for this). The tool shown in Fig. 15 is one that can adapt to pressurised aerosol cans through the central pin 268. This dosing tool can be varied by not having a central pin 268 and having various different threads 266 that fit mastic tubes.

[0076] Fig. 12 shows an adaptor tool that can be used to join vessels of water treatment chemicals with devices such as those shown in Figs. 8 and 13. The tool is shown with external threads (220) that can be used to connect to the devices shown in Figs. 8 and 13. The tool can be varied to have an internal thread and seal so that it can connect to the device shown in Fig. 10. The tool can be varied in the manner previously described for the device in Fig. 13 with or without the central pin that operates the internal valve on the aerosol cans.

[0077] Thus, the present invention allows for, in particular, water treatment chemicals to be packaged into pressurised aerosol cans. The cans have an externally threaded valve to prevent the treatment chemicals escaping until use. The valve is caused to open when the internal valve stem is depressed. Once this is done, the can contents discharge rapidly. Using such a can, it is possible to directly dose a heating system without relieving pressure prior to chemical addition. This can advantageously save considerable time.

Claims

1. An adaptor device arranged for the dispensing of product from a dispensing device to a target arrangement, the adaptor device having a body including a first portion presenting a first screw thread, a second portion presenting a second screw thread, first and second passages associated with the said first and second portions respectively and arranged to be in communication for the passage of product therebetween, at least one of the passages including a one way valve member.
2. An adaptor device as claimed in Claim 1, wherein the one way valve member is arranged to present a surface to be engaged by an engagement formation to achieve the selective opening thereof.
3. A dispensing adaptor device arranged for the dispensing of product from a dispensing device to a target arrangement, the adaptor device having a body including a first portion presenting a first screw thread, a second portion presenting a second screw thread, first and second passages associated with the said first and second portions respectively and arranged to be in communication for the passage of product therebetween, and including an engagement formation arranged to engage with a selectively openable closure member of a product dispensing

- device for the dispensing of product therethrough.
4. A device as claimed in Claim 3, wherein the engagement formation is arranged to piece an openable member of the product dispensing device. 5
 5. A device as claimed in Claim 3 or 4, wherein the engagement formation comprises an elongate member arranged to activate a valve member of the product dispensing device. 10
 6. A device as claimed in Claim 5, wherein the said elongate member comprises a valve activation pin.
 7. A device as claimed in any one or more of Claims 3 to 6, wherein the engagement formation has a passage formed therein. 15
 8. A device as claimed in Claim 5, 6 or 7, wherein the engagement formation is arranged to cooperate with an openable closure means of a product closing device as claimed in any one or more of Claims 1 to 13. 20
 9. A device as claimed in any one or more of Claims 1 to 8, wherein one screw thread comprises a male screw thread and the other a female screw thread. 25
 10. A device as claimed in any one or more of Claims 1 to 9 and including a closure or plug member arranged to engage with one of the screw threads thereof so as to assist with closure of at least one of the said passages thereof. 30
 11. A device as claimed in Claim 10, wherein the closure or plug member is provided with a bore extending therethrough for the receipt of a nozzle of a dispensing device therein. 35
 12. A device as claimed in Claim 11, wherein the said bore extending therethrough is threaded and arranged to receive a threaded closure member. 40
 13. A device as claimed in any one or more of Claims 1 to 12 wherein the axes of the said screw threads are common. 45
 14. A device as claimed in any one or more of Claims 1 to 13, wherein the axes of the said screw thread are of an angle. 50
 15. A device as claimed in Claim 1 or 2 and any one or more of Claims 3 to 14.
 16. A device as claimed in Claim 4, wherein the engagement formation includes a blade portion. 55
 17. A device as claimed in Claim 14, wherein the axes are orthogonal.
 18. A product dispensing device comprising a container having a first compartment containing the said product and arranged to be in communication with an outlet through which said product is to be dispensed, a second compartment containing a propellant arranged to exert pressure on the said first compartment so as to dispense the said product through the outlet, wherein the outlet includes an engagement formation arranged to engage with an engagement formation of an inlet associated with a target arrangement into which the product is to be dispensed, and further includes a selectively openable closure means which, when opened, allows product to be dispensed through the outlet and into the said target arrangement under the pressure exerted by the said propellant.
 19. A device as claimed in Claim 18, wherein the engagement formation of the outlet is arranged to provide for sealed engagement to the engagement formation of the said inlet.
 20. A device as claimed in Claim 18 or 19, wherein the container comprises a bicompartmental container.
 21. A device as claimed in Claim 18, 19 or 20, wherein the propellant comprises pressurised fluid, gas or compressed air.
 22. A device as claimed in any one or more of Claims 18 to 21, wherein the openable closure means is formed by way of a frangible seal member.
 23. A device as claimed in any one or more of Claims 18 to 21, wherein the openable closure means is arranged to be selectively re-closed.
 24. A device as claimed in any one or more of Claims 18 to 21 or 23, and comprising a valve member.
 25. A device as claimed in Claim 24, wherein the valve arrangement includes a resiliently mounted closure member.
 26. A device as claimed in any one or more of Claims 18 to 25, and comprising a pressurised can.
 27. A device as claimed in any one or more of Claims 18 to 26, wherein the said engagement formation of the outlet comprises a screw thread.
 28. A device as claimed in any one or more of Claims 18 to 27, wherein the outlet is arranged such that the making of the engagement between the respective engagement formations serves to open the openable closure member.
 29. A device as claimed in any one or more of Claims

18 to 28 and arranged for dispensing product into a pressurised target arrangement.

- 30.** A device as claimed in any one or more of Claims 18-29 and comprising a heating dosing device.

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FIG. 1

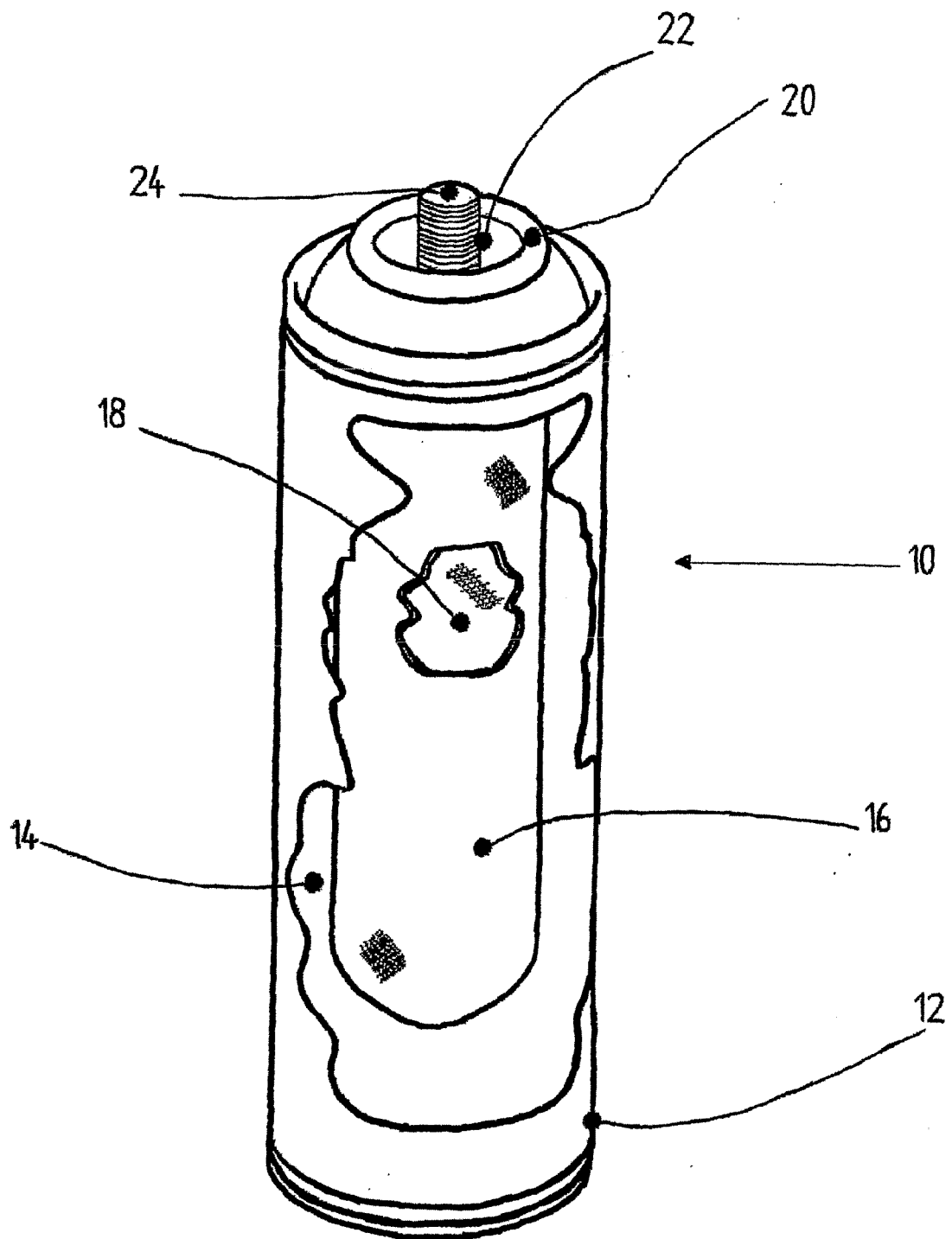
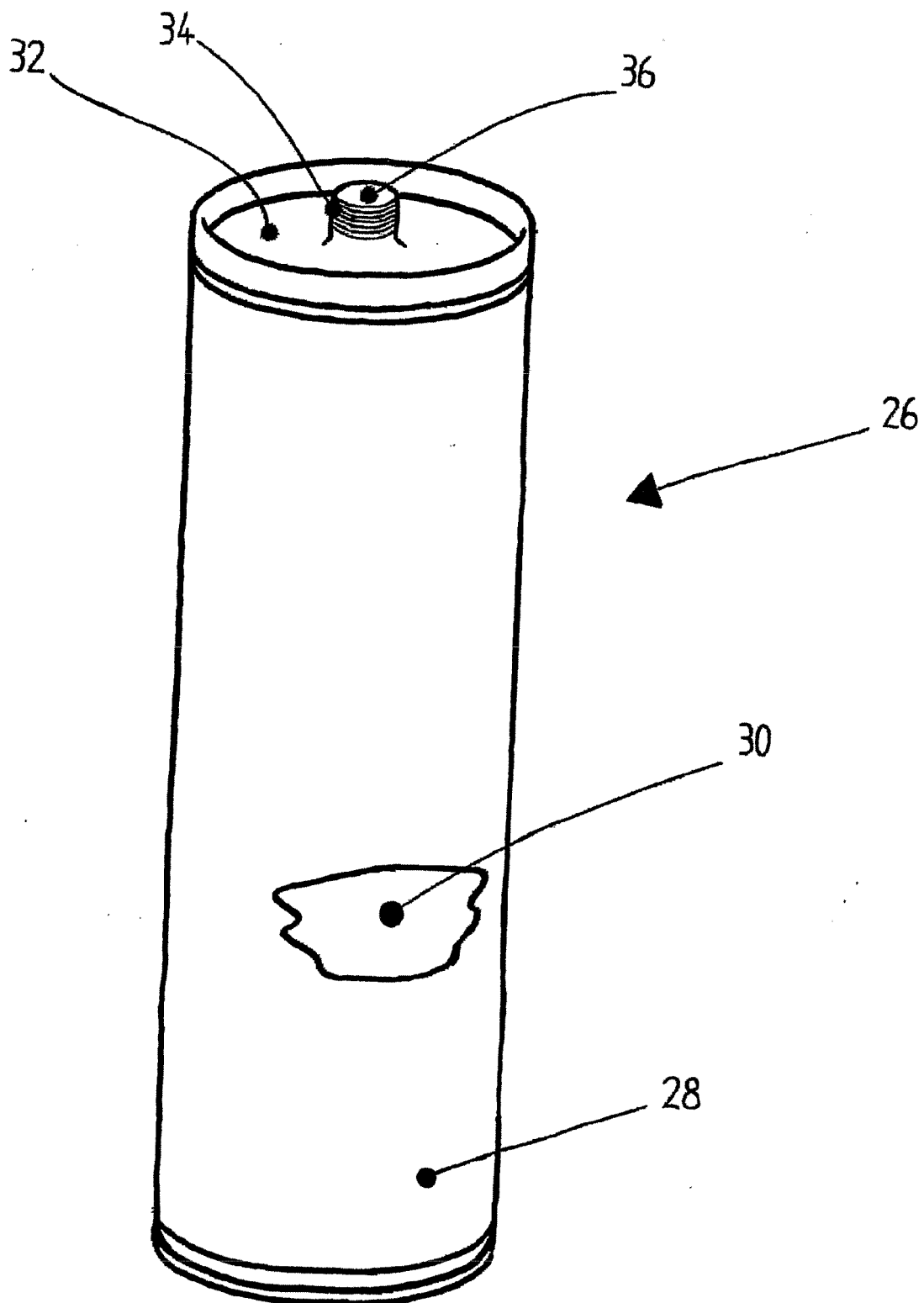


FIG 2



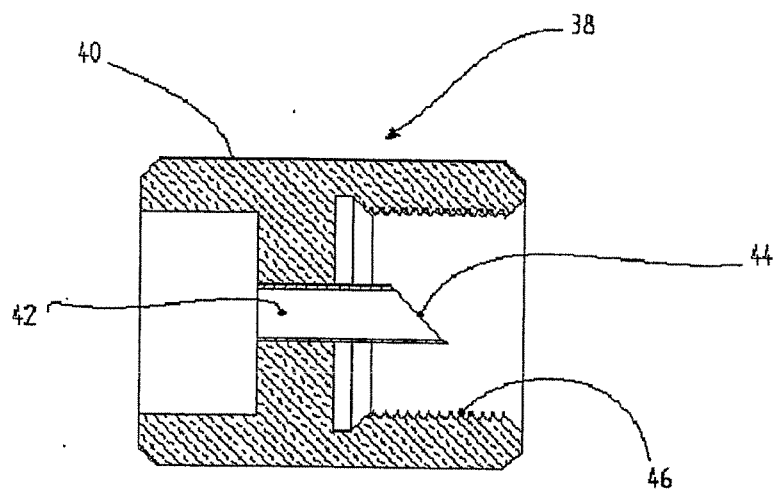


Fig. 3

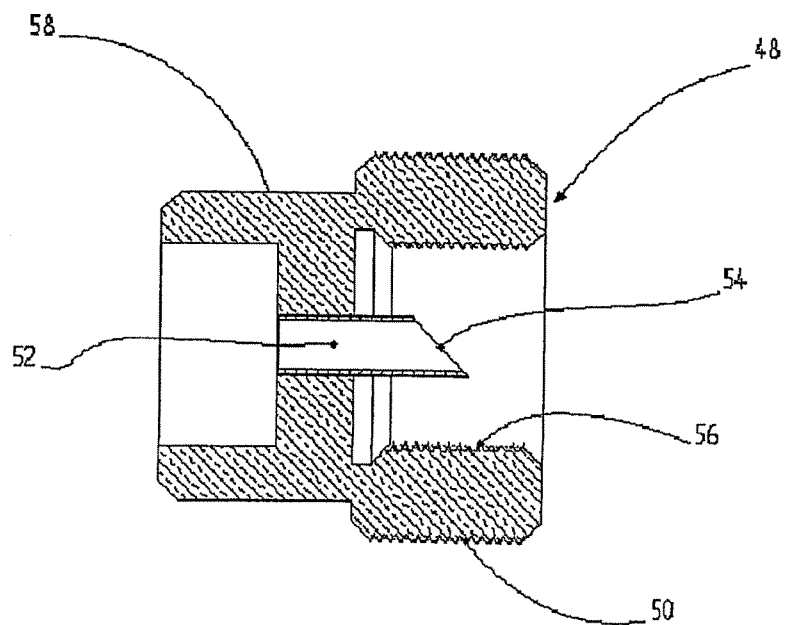


Fig. 4

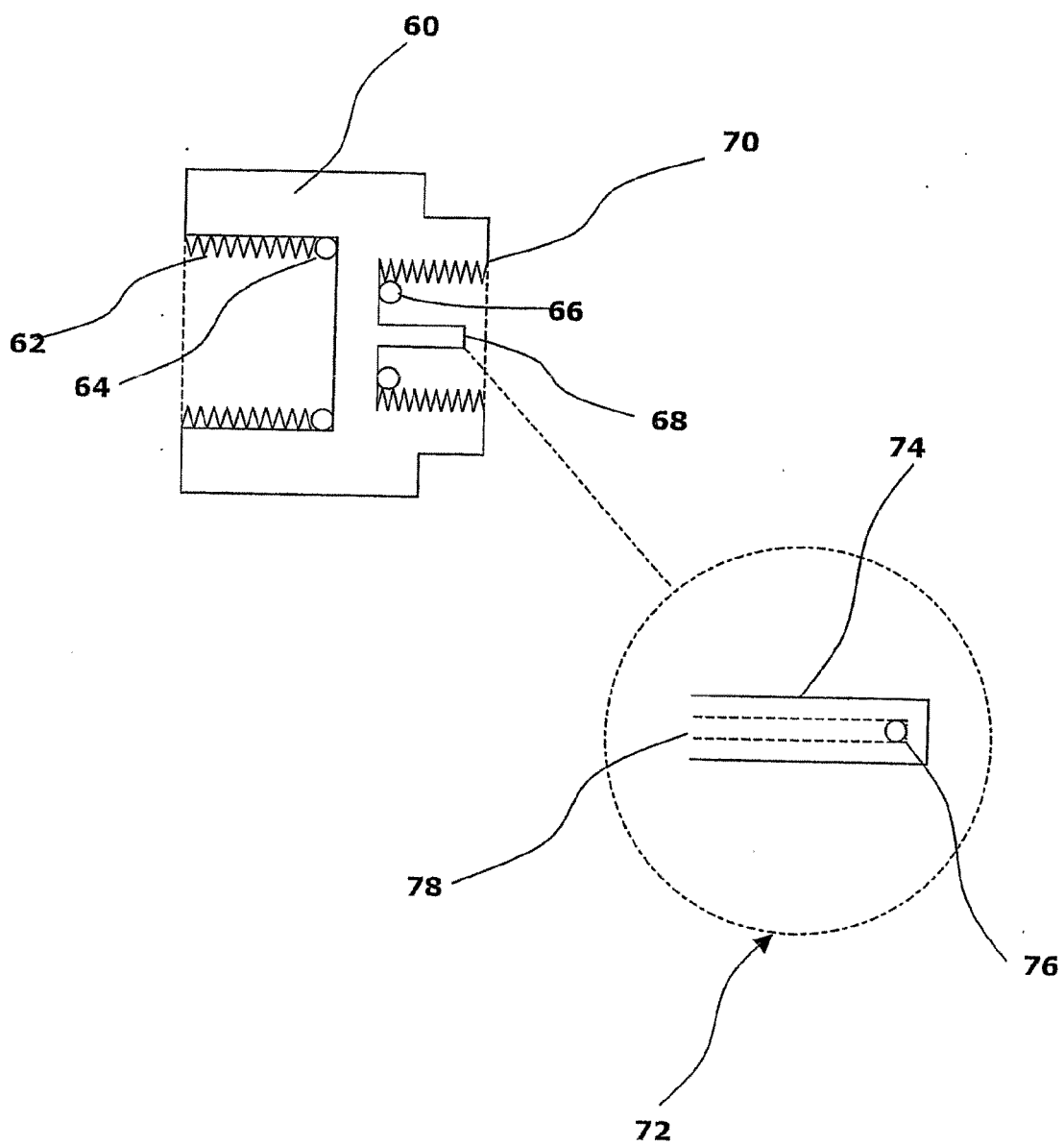


Fig. 5

Fig. 6

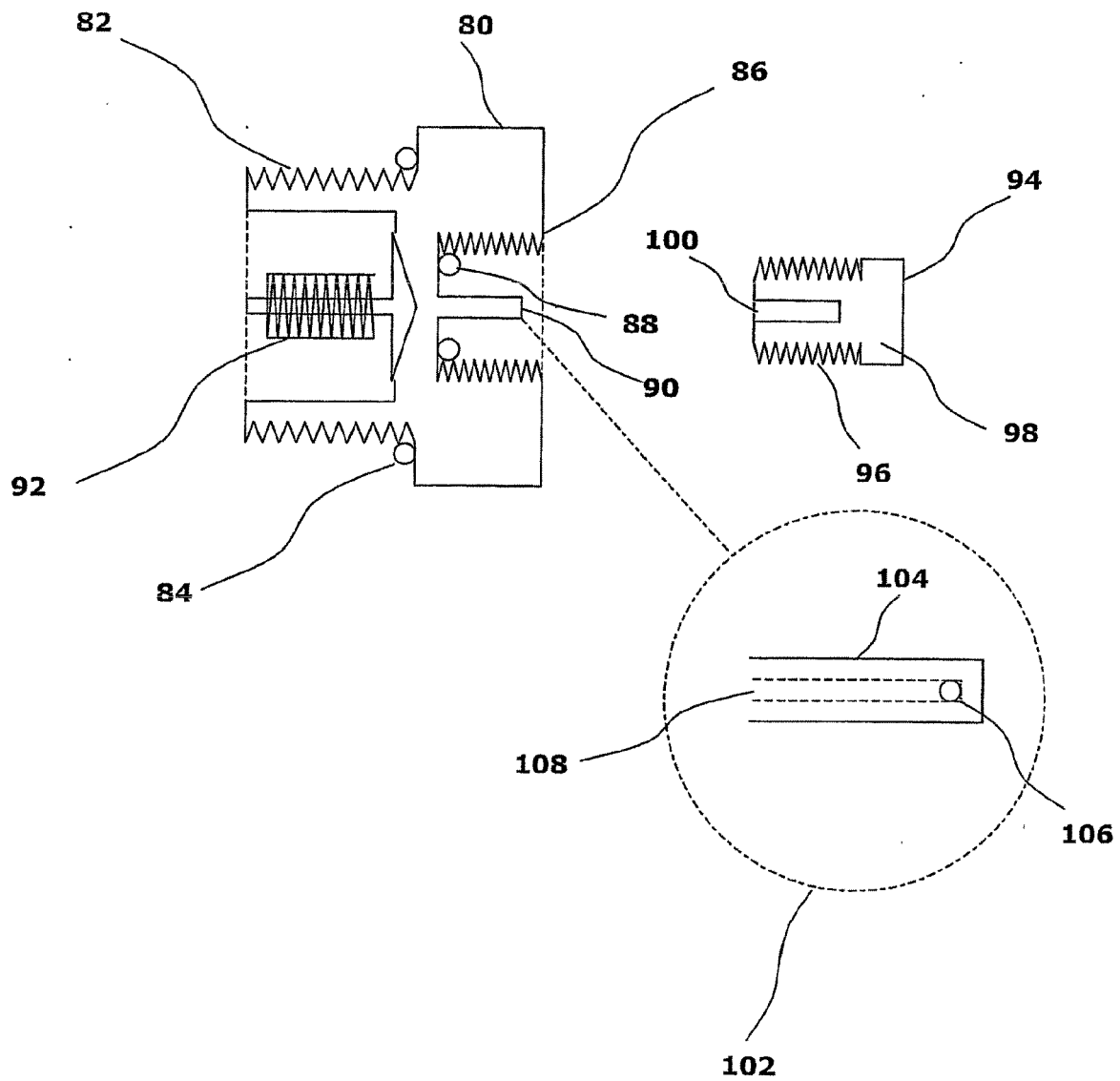


Fig. 6

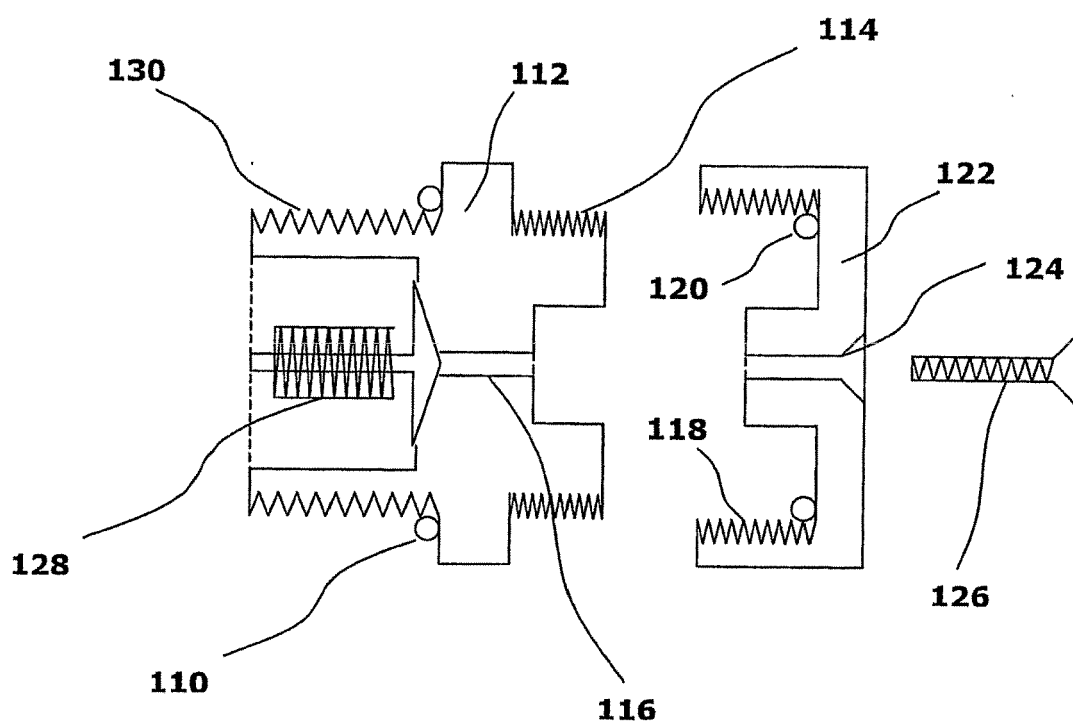
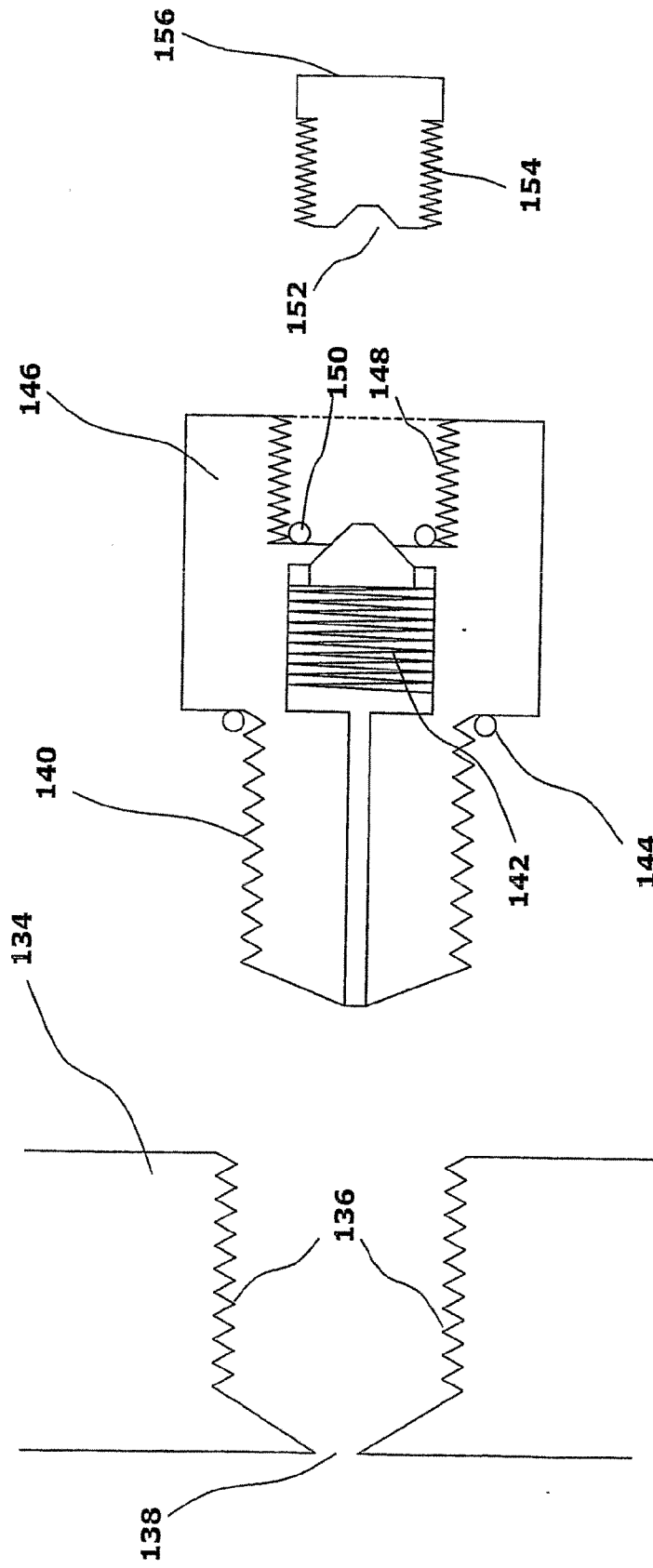


Fig. 7

Fig. 8



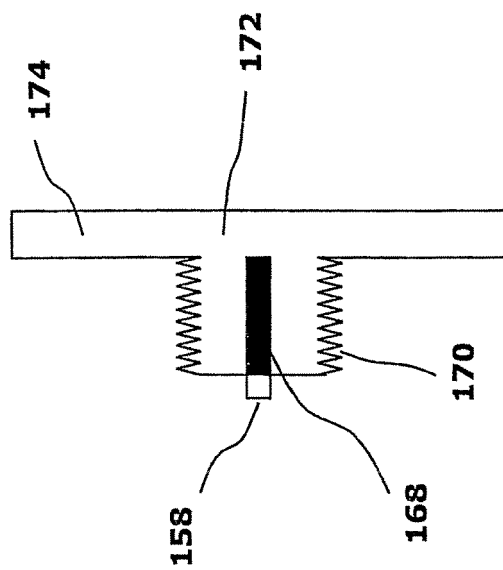


Fig. 9

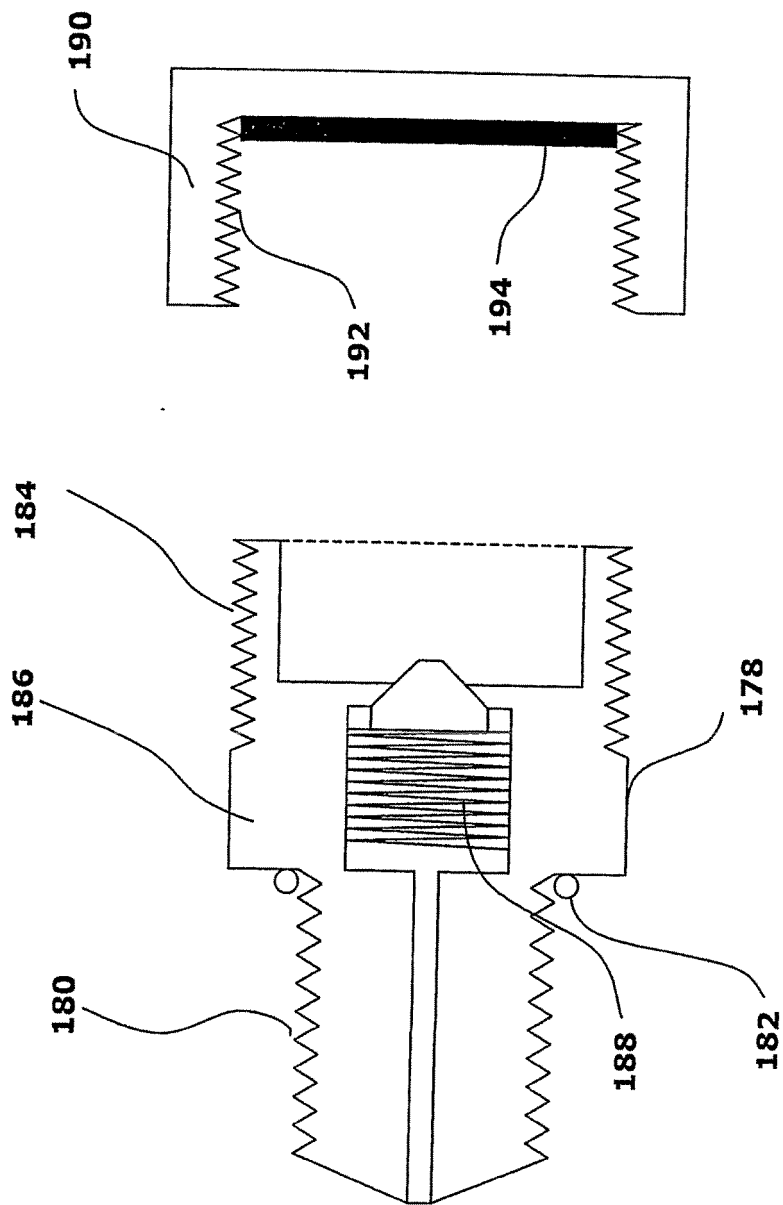


Fig. 10

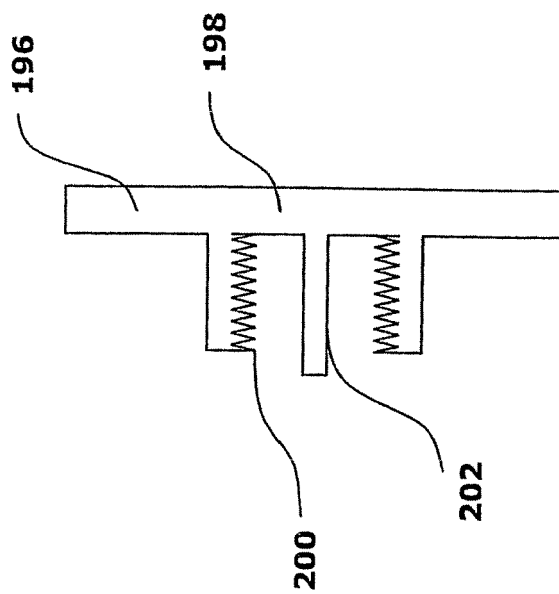


Fig. 11

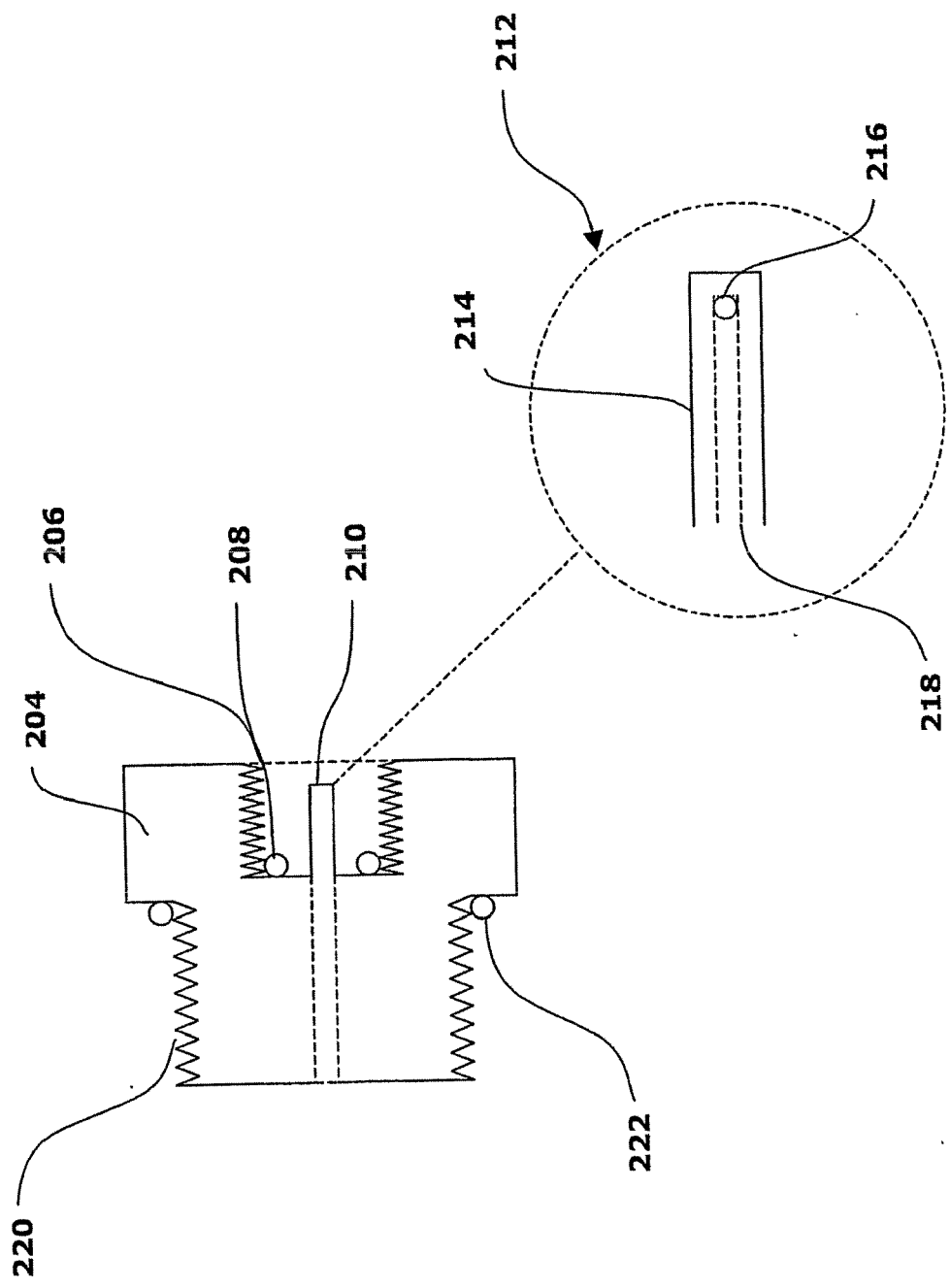


Fig. 12

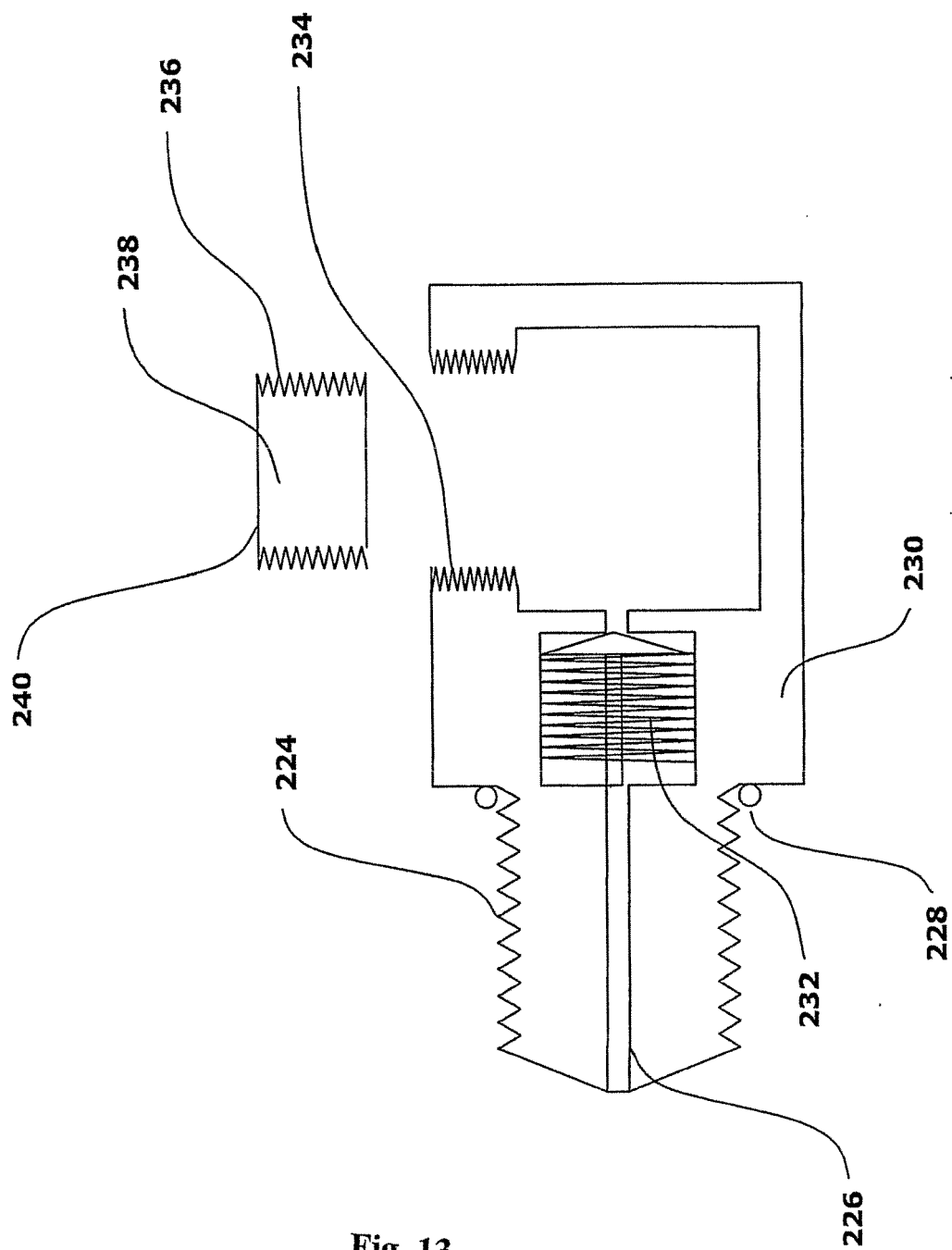


Fig. 13

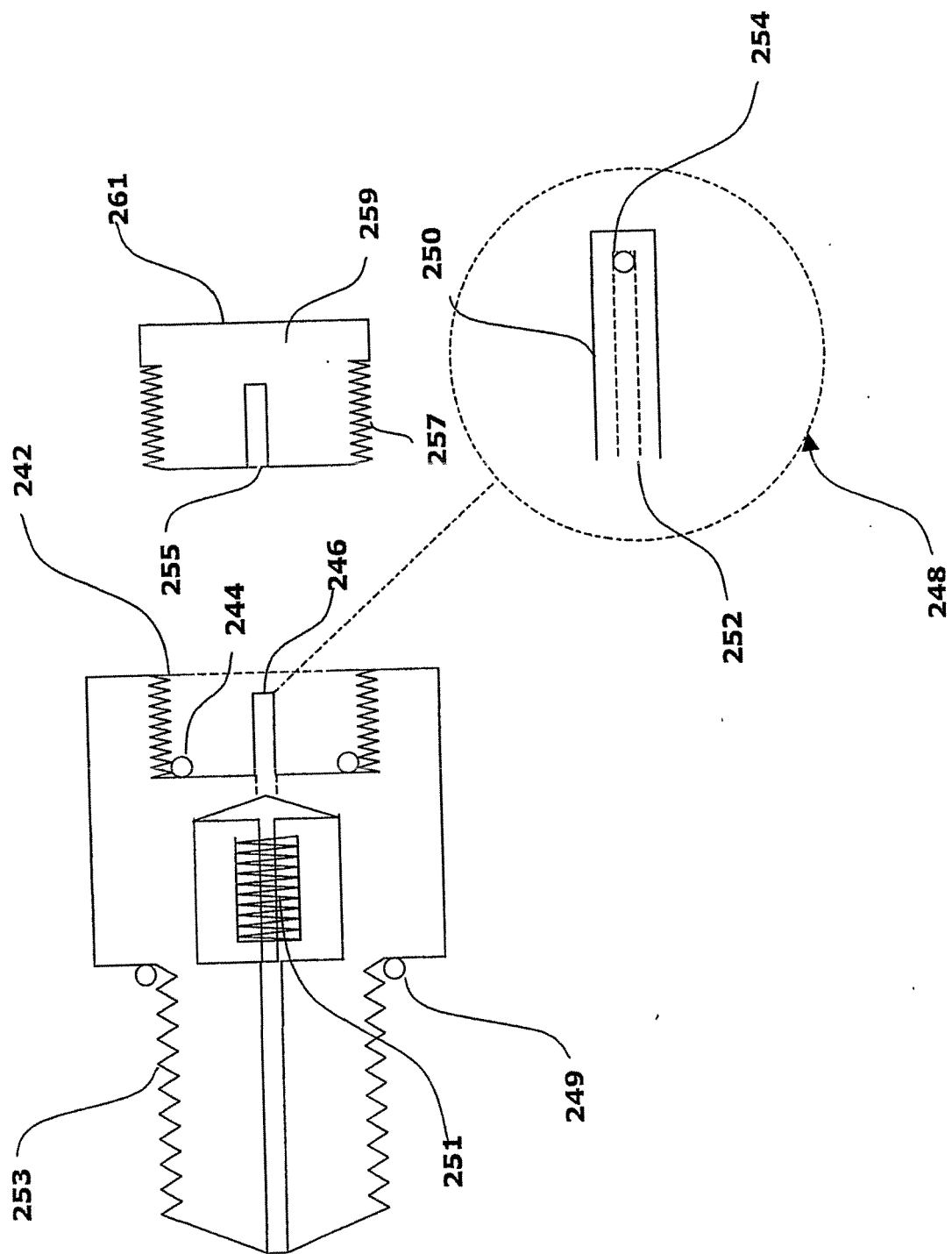


Fig. 14

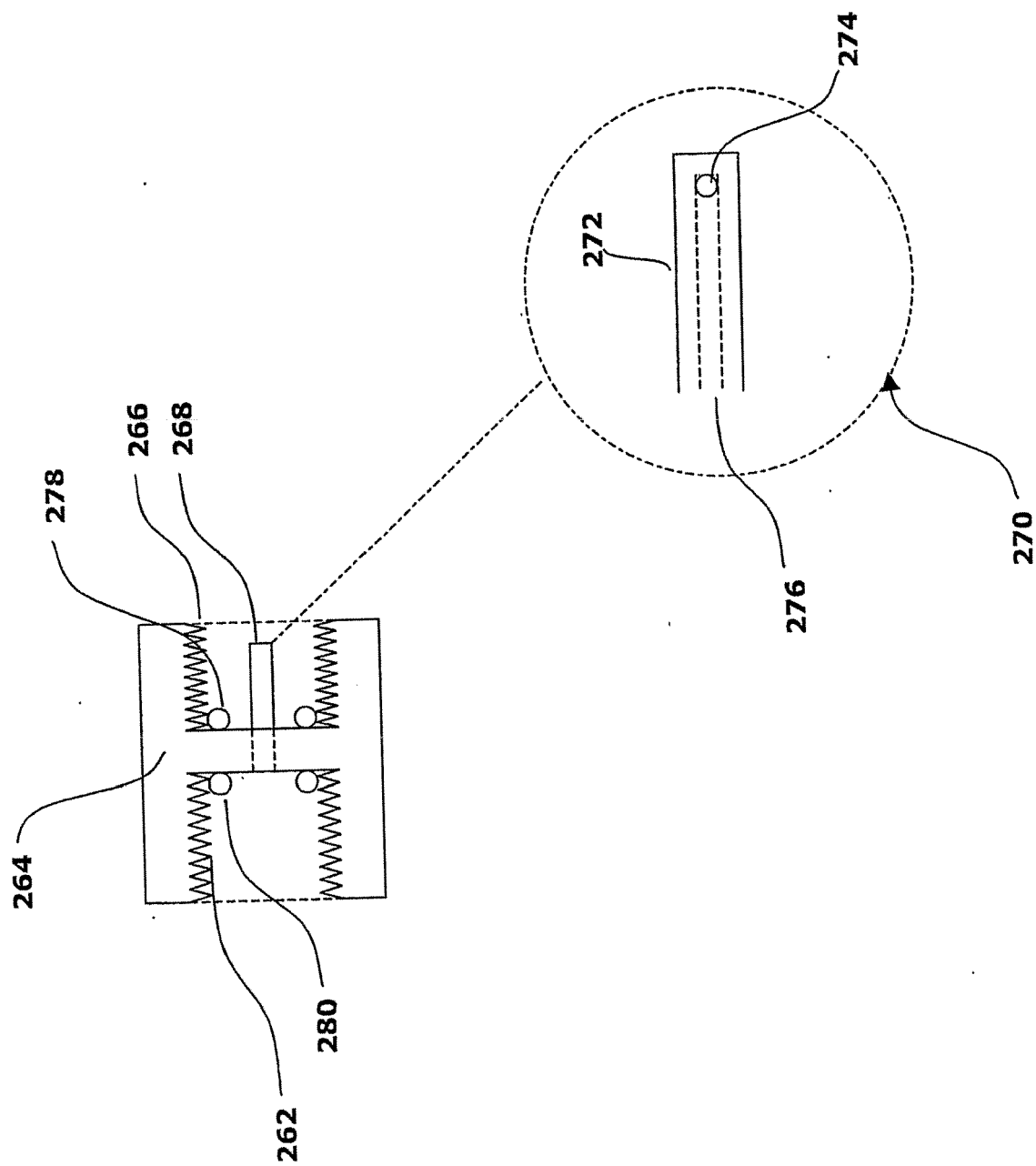


Fig. 15



EUROPEAN SEARCH REPORT

Application Number
EP 10 19 4341

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CH 370 372 A (KISAG AG [CH]) 15 July 1963 (1963-07-15) * the whole document *	1-15	INV. F24D19/00 B65D83/14 B65D83/62
X	EP 0 867 219 A1 (KISAG AG [CH]) 30 September 1998 (1998-09-30) * the whole document *	1-15	
X	US 3 474 940 A (HOGG CHRISTOPHER A) 28 October 1969 (1969-10-28) * the whole document *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			F24D F24H B65D B01F A47J F16K
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 October 2011	Examiner Rohr, Peter
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P4/C01)



Application Number

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):
- ☒ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:
- ☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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

EP 10 19 4341

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

27-10-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
CH 370372	A	15-07-1963	NONE	
EP 0867219	A1	30-09-1998	AT 209958 T DE 59705664 D1	15-12-2001 17-01-2002
US 3474940	A	28-10-1969	DE 1299184 B GB 1147685 A	10-07-1969 02-04-1969

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 2162164 A [0007]