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(54) **GARMENT CARE DEVICE WITH A SAFETY MECHANISM FOR A DETACHABLE PLUG**

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EP-A1- 3 643 831 DE-A1- 102011 075 125

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Description

FIELD OF THE INVENTION

[0001] The invention relates to safety system for a garment care device comprising a steam generator and an opening arranged in the steam generator.

[0002] The invention may be used in the field of garment care.

BACKGROUND OF THE INVENTION

[0003] Garment care devices comprising a steam generator and an opening arranged in the steam generator are known.

[0004] An example of such a known device is illustrated in Fig. 1A and Fig. 1B. Fig. 1A depicts an external view of this known garment care device 100, while Fig. 1B depicts a partial cross-sectional view.

[0005] The garment care device 100 comprises a housing 101. A steam generator 102 is arranged in the housing 101. An opening 103 is arranged in the steam generator 102 for accessing an inside part of the steam generator 102. A detachable plug 104 is used for closing the opening 103. A hose cord 100b is connected between the steam generator 102 and an iron 100a.

[0006] As shown in Fig. 1B, the detachable plug 104 closes the opening 103 by being screw-fitted into a tubular element 105 which delimits the opening 103. In the particular example shown in Fig. 1B, the tubular element extends from the steam generator 102 towards the housing 101.

[0007] In this type of garment care device 100, the opening 103 is intended to operate a de-calc or rinse of the steam generator 102. Indeed, when water is heated and then evaporates in the steam generator 102, scale may overtime accumulate in the steam generator 102.

[0008] When the plug 104 is removed from the opening 103, scale can be discharged together with the remaining water full of minerals, for example into a sink or a cup. Note that the plug 104 is sometimes provided at its extremity with a spoon or scraper element 107 used to free the path of the opening 103 if there is a relatively large amount of accumulated scale, which may occur, for example, when the user does not regularly rinse the steam generator 102.

[0009] Although this known type of garment care device 100 greatly helps the user to de-scale/de-calc the steam generator 102, and thus helps to extend the lifetime of the device 100, the user is usually advised to conduct this operation with care. Typically, the user is asked to switch off and unplug the device 100 from the power supply, to allow it to cool down for an hour after the previous use. Such guidance is, for example, explained in the user manual of the garment care device 100.

[0010] However, in cases where the user does not follow these recommendations, in particular does not wait a sufficient amount of time after the previous use

of the device 100, this de-scaling process may entail risks to the user. Indeed, if the steam generator 102 is still hot and contains steam under pressure, when the user starts to remove the plug 104, some steam SS might be projected towards the user's hand. In such a scenario, there is a risk of injury to the user because the user may be scalded by the steam SS.

[0011] EP 3 088 599 A1 discloses a household ironing appliance comprising a steam generator provided with a discharge opening.

[0012] EP 0 069 858 A1 discloses an electrical household appliance for producing and feeding steam to an electric iron.

[0013] DE 10 2011 075125 A1 discloses an electrical heating element having a heating conductor for heating water, and a carrier element for receiving the heating conductor. The carrier element is deformed reversibly by a temperature change, and the deformation is transferred to the heating conductor.

[0014] EP 3 643 831 A1 discloses a method for cleaning an iron provided with a scale recovery cavity.

OBJECT AND SUMMARY OF THE INVENTION

[0015] It is an object of the invention to provide a detachable plug, and in particular a garment care device comprising such a detachable plug, that avoids or mitigates the above-mentioned problems.

[0016] The invention is defined by the independent claims. The dependent claims define advantageous embodiments.

[0017] To this end, the garment care device according to the invention comprises: a steam generator,

a plug arranged on the steam generator to access the inside of the steam generator, the plug being detachable by rotation via a thread, the plug comprising a mechanism having mechanical movements being dependent on the temperature of the steam generator, such that: when the temperature of the steam generator is equal to or above a given temperature threshold, the mechanism is adapted to prevent the plug from being detached from the steam generator.

[0018] At or above the given temperature threshold, the mechanism prevents detachment of the plug from the steam generator. Only once the steam generator has cooled below the given temperature threshold is the plug capable of being removed by the user. The safety of the device is correspondingly improved.

[0019] Detailed explanations and other aspects of the invention will be given below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Particular aspects of the invention will now be explained with reference to the embodiments described

hereinafter and considered in connection with the accompanying drawings, in which identical parts or sub-steps are designated in the same manner:

Fig. 1A provides a perspective view of an exterior of a prior art garment care device;

Fig. 1B provides a cross-sectional view showing an interior of the garment care device shown in Fig. 1A; Fig. 2A provides a cross-sectional view of a detachable plug for a garment care device according to the invention according to an example when the temperature is lower than a given temperature threshold; Fig. 2B provides a cross-sectional view of the detachable plug shown in Fig. 2A when the temperature is at or exceeds the given temperature threshold;

Fig. 3A provides a perspective view of a detachable plug for a garment care device according to the invention according to another example,

Fig. 3B provides an exploded view of the detachable plug shown in Fig. 3A;

Figs. 4A to 4C provide views of a sliding element of an exemplary detachable plug according to the invention;

Figs. 5A to 5C provide views of an inside bottom part of the exemplary detachable plug according to the invention; and

Fig. 6 provides a cross-sectional view of part of a mechanism of a detachable plug according to a further example of the invention,

Fig. 7 illustrates the characteristics of a reversibly thermally deformable element used in a garment care device according to the invention,

Fig. 8 depicts a cross-sectional view of a garment care device according to the invention,

Fig. 9 depicts a top view of a garment care device according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0021] The present invention relates to a detachable plug for accessing the inside of a steam generator of a garment care device. The plug is detachable from the steam generator by rotation via a thread. The plug comprises a mechanism having mechanical movements being dependent on the temperature of the steam generator, such that when the temperature of the steam generator is equal to or above a given temperature threshold, the mechanism is adapted to prevent the plug from being detached from the steam generator. In other words, when the temperature of the steam generator is below the given temperature threshold, the mechanism is adapted to allow the plug to be detached from the steam generator.

[0022] In an embodiment, the plug comprises a first part and a second part. The second part comprises a threaded portion for engaging with a complementary threaded portion provided around an opening of the

steam generator.

[0023] The first part is rotatable by the user. To this end, the first part can be coupled to a handle, e.g. a knob, which can be grasped by the user, and used to rotate the first part.

[0024] In this embodiment, the mechanism is configured such that the first part and the second part are keyed, i.e. locked, to each other when the temperature of the steam generator is below the given temperature threshold, such that user rotation of the first part causes rotation of the second part to allow the plug to be detached from the steam generator. The mechanism is further configured such that the first part and the second part are not keyed to each other when the temperature of the steam generator is equal to or above the given temperature threshold.

[0025] The first and second parts being keyed to each other below the given temperature threshold means that rotation of the first part by the user also causes the second part to rotate. Accordingly, when the temperature is sufficiently low, the torque applied by the user to the first part is transferred to the second part engaged to the opening of the steam generator via the threaded coupling, thereby to loosen the thread (when the first part is being twisted in the appropriate direction).

[0026] At or above the given temperature threshold, the first and second parts are not keyed to each other such that user rotation of the first part does not cause rotation of the second part. Rather, the first part merely rotates relative to the second part when the temperature is at or above the given temperature threshold.

[0027] This may improve user safety because the temperature of the steam generator is required to fall below the given temperature threshold before the mechanism permits detachment of the plug.

[0028] Preferably, the given temperature threshold is in the range [100; 200] °C. Such a temperature threshold assists to ensure that the plug is only detachable when the scalding risk to the user is reduced.

[0029] The first part and the second part can be keyed to each other in any suitable manner. In an embodiment, the mechanism comprises a sliding element arranged to slide between a first position in which the sliding element keys the first part to the second part, and a second position in which the sliding element does not key the first part to the second part. The sliding element's adoption of the first or second position in this example is dependent on the temperature of the steam generator.

[0030] The mechanism comprises a reversibly thermally deformable element whose expansion (i.e. increase in length) when the temperature of the steam generator is equal to or above the given temperature threshold causes the mechanism to prevent the plug from being detached from the steam generator. The decrease of length of the reversibly thermally deformable element when the temperature of the steam generator is below the given temperature threshold causes the mechanism to allow the plug to be detached from the steam generator.

[0031] Preferably, the reversibly thermally deformable element is arranged such that its expansion when the temperature of the steam generator is equal to or above the given temperature threshold causes the first part to be no longer keyed to, i.e. unlocked from, the second part.

[0032] This expansion is nevertheless reversible such that when the temperature of the steam generator falls below the given temperature threshold, the associated contraction of the reversibly thermally deformable element assists to cause the first part to be again keyed to the second part. In other words, the reversibly thermally deformable element returns to its original compressed shape.

[0033] Suitable materials which can be used for the reversibly thermally deformable element are known. They are sometimes referred to as shape memory material. Particular mention is made of nickel titanium alloy, also known as Nitinol.

[0034] The nickel titanium alloy has, for example, a concentration of nickel of approximately 50 to 51 mole%, 55 to 56 wt.%, and a concentration of titanium of 50 to 49 mole%, 45 to 44 wt.%. The given temperature threshold can be tuned by making small changes to the concentrations of nickel and titanium in the alloy.

[0035] Preferably, the reversibly thermally deformable element is in the form of a spring, such as a helical spring. This spring is also referred to herein as a "first spring". This first spring may assist to control the direction, e.g. predominant direction, of movement of the reversibly thermally deformable element.

[0036] In the case of the first spring being a helical spring, the reversible deformation expansion of the helical spring causes axial lengthening/shortening of the helical first spring. This (predominantly) axial movement can usefully be applied to engaging/removing the keying between the first and second parts.

[0037] The first spring may, for example, be a helical nickel titanium alloy spring.

[0038] The given temperature threshold to which the reversibly thermally deformable element is heated in order to increase its length in order to unlock the first part from the second part may be different from the temperature to which the element must be cooled in order to subsequently restore the mechanical key between the first and second parts. The latter temperature is nonetheless lower than the given temperature threshold such that the first and second parts are keyed to each other below the given temperature threshold.

[0039] In the case of the helical nickel titanium alloy spring, the axial elongation of the spring may occur when temperature reaches or exceeds 75°C and it can be compressed back to a shorter length when the temperature decreases below 65°C.

[0040] Preferably, the mechanism comprises a second spring 132 for biasing the first and second parts into engagement with each other below the given temperature threshold. In this case, the resistance of the second spring is overcome by the increase of length of the above-

described reversibly thermally deformable element when the temperature is equal to or above the given temperature threshold.

[0041] The second spring may be formed of any suitable material, such as stainless steel. The second spring is not intended to axially lengthen and contract to the same degree as the reversibly thermally deformable material in the relevant temperature range of the steam generator. The second spring 132 may also be situated further away from the steam generator than the first spring when the plug is closing the opening.

[0042] Thus, the increase in length of the reversibly thermally deformable element, e.g. the first spring, overcomes the resistance of the second spring in order to remove the keying of the first part with the second part at or above the given temperature threshold.

[0043] When the steam generator has cooled sufficiently, the second spring forces reengagement of the first and second parts by compressing the reversibly thermally deformable element.

[0044] In an embodiment, the mechanism comprises a hollow housing and the above-described sliding element slides within the hollow housing between the first position in which the first and second parts are keyed with each other and the second position in which the first and second parts are not keyed with each other.

[0045] The hollow housing is, for example, a hollow cylinder, i.e. a hollow cylindrical housing, although other shapes for the housing can be envisaged.

[0046] Preferably, the sliding element is arranged relative to the reversibly thermally deformable element such that the sliding element moves from the first position to the second position by increase of length of the above-described reversibly thermally expandable element at or above the given temperature threshold. For example, this movement can be effected by axial increase of length of a helical spring formed from a suitable reversibly thermally deformable material, such as nickel titanium alloy.

[0047] Preferably, the second part comprises an inside bottom part of the hollow housing, and the sliding element comprises a first extremity adapted to lock with the inside bottom part when the temperature of the steam generator is below the given temperature threshold.

[0048] The term "inside bottom part" is intended to refer to a part which is proximal to the opening of the steam generator and distal with respect to the portion of the plug, e.g. handle, which the user turns in order to gain access to the steam generator.

[0049] The inside bottom part and the sliding element may experience relatively high torsion stress during operation. Hence, they are preferably made from high strength materials, such as SUS304 stainless steel, whose yield strength is around 215MPa.

[0050] In this embodiment, the first part comprises a rotating shaft. A second extremity of the sliding element is adapted to permanently slidably lock with the rotating shaft. In other words, the sliding element is engaged with the rotating shaft via the second extremity of the sliding

element irrespective of the temperature of the steam generator.

[0051] When the temperature of the steam generator is at or above the given temperature threshold, the increase of length of the reversibly thermally deformable element causes the sliding element to be positioned such that the first extremity of the sliding element and the inside bottom part become unlocked from each other.

[0052] Thus, rotation of the rotating shaft by the user is not transferred to the inside bottom part (and the hollow housing) when the temperature is at or above the given temperature threshold.

[0053] In the example in which the reversibly thermally deformable element is defined by the above-described first spring, the length of the first spring at or above the given temperature threshold is such that the first extremity of the sliding element and the inside bottom part are unlocked.

[0054] Preferably, the reversibly thermally deformable element, e.g. the first spring, is arranged inside the hollow housing. The reversibly thermally deformable element is thus shielded by the hollow housing from the water and/or steam present in the steam generator. The housing can therefore protect the reversibly thermally deformable element from being fouled by scale.

[0055] Preferably, the housing is formed from a material having relatively high thermal conductivity, combined with sufficient strength and corrosion resistance. Suitable materials for forming the housing thus include aluminum or brass. Aluminum has a thermal conductivity of around 205 W/mK, and brass has a thermal conductivity about 109 W/mK (Young, Hugh D., University Physics, 7th Ed. Table 15-5). Such a material can assist heat transfer from the steam/water within the steam generator into the interior of the hollow housing of the plug. This effective heat transfer, in turn, facilitates unlocking of the first part from the second part of the mechanism when the temperature of the steam generator is at or above the given temperature threshold.

[0056] In an example, the hollow housing comprises a first portion coupled to a second portion. In this example, the second portion comprises the threaded portion for engaging with the complementary threaded portion delimiting the opening of the steam generator.

[0057] Such a two-portion hollow housing may facilitate assembly of the plug.

[0058] Preferably, the first spring is arranged inside the second portion. In this example, at least the second portion is formed of the material having relatively high thermal conductivity, combined with sufficient strength and corrosion resistance, e.g. aluminum or brass.

[0059] In this manner, the heat from the steam generator is transmitted to the first spring via the second portion of the hollow housing.

[0060] In other examples, the hollow housing takes the form of a unitary component.

[0061] In an embodiment, the reversibly thermally deformable element, e.g. the first spring, is arranged inside

the steam generator when the plug is attached thereto. Locating the reversibly thermally deformable element inside the steam generator in this manner facilitates transfer of heat to the reversibly thermally expandable element, which may enhance the responsiveness of the mechanism to the temperature of the steam generator.

[0062] Upon the temperature of the steam generator falling below the given temperature threshold, the decrease of length of the reversibly thermally deformable element assists to cause the first extremity and the bottom part to again become locked, i.e. keyed, to each other.

[0063] In the example in which the reversibly thermally deformable element is defined by the above-described first spring, the (compressed) length of the first spring below the given temperature threshold is such that the first extremity of the sliding element and the inside bottom part are locked to each other. The reversion to this locked state can also be assisted by the second spring, as previously described.

[0064] The first spring exerts a first force on the first extremity of the sliding element, and the second spring exerts a second force on the second extremity of the sliding element. The second force is applied in the opposite direction to the first force.

[0065] The first spring is such that the first force is greater than the second force when the temperature of the steam generator is at or above the given temperature threshold, and the second spring is such that the second force is greater than the first force when the temperature of the steam generator is below the given temperature threshold.

[0066] In a particular example, the mechanism comprises the hollow housing, and the hollow housing has the inside bottom part. The mechanism further includes a rotating shaft connected to a user handle, and the sliding element adapted to slide inside the hollow housing. In this example, the rotating shaft and the handle define the previously described first part of the plug, and the hollow housing and the inside bottom part define the second part of the plug. The sliding element comprises a first extremity adapted to lock with the inside bottom part, and a second extremity adapted to permanently slidably lock with the rotating shaft. The mechanism further comprises the first spring arranged inside the hollow housing for exerting the first force on the first extremity, and the second spring is also arranged inside the hollow housing for exerting the second force on the second extremity. The second force is opposite to the first force, as previously described.

[0067] The first spring is thermally deformable such that:

when the temperature of the steam generator is above the given temperature threshold, the length of the first spring is such that the first extremity and the inside bottom part are unlocked,
when the temperature of the steam generator is

below the given temperature threshold, the length of the first spring is such that the first extremity and the inside bottom part are locked.

[0068] More generally, the releasable locking of the first extremity of the sliding element and the inside bottom part may be implemented in any suitable manner. In a first example, the inside bottom part comprises a first pin protruding in the direction of the first extremity. In this case, the first extremity comprises a first cavity adapted to lock with the first pin.

[0069] The first pin may, for example, form a peg which can be received within the first cavity included in the first extremity of the sliding element.

[0070] Preferably, the first pin is of a non-circular cross-sectional shape, and the first cavity has a cross-sectional shape complementary to the non-circular cross-sectional shape. This facilitates locking of the first pin and the first cavity when the temperature of the steam generator is below the given temperature threshold.

[0071] The first pin can have any suitable non-circular cross-sectional shape, such as square, rectangular, hexagonal, triangular, crossed, D-shape, etc.

[0072] In a second example, the first extremity comprises a second pin protruding in the direction of the inside bottom part. In this case, the inside bottom part comprises a second cavity adapted to lock with the second pin.

[0073] The second pin may, for example, form a peg which can be received within the second cavity included in the inside bottom part.

[0074] Preferably, the second pin is of a non-circular cross-sectional shape, and the second cavity has a cross-sectional shape complementary to the non-circular cross-sectional shape. This facilitates locking of the second pin and the second cavity when the temperature of the steam generator is below the given temperature threshold.

[0075] The second pin can have any suitable non-circular cross-sectional shape, such as square, rectangular, hexagonal, triangular, crossed, D-shape, etc.

[0076] Figs. 2A and 2B provide cross-sectional views of a detachable plug 104 according to a non-limiting example. The plug 104 shown in Figs. 2A and 2B is closing an opening 103 which provides access to a steam generator 102 of a garment treatment device 100 when the plug 104 is detached from the steam generator 102.

[0077] The plug 104 comprises a hollow housing 108, which in this example takes the form of a hollow cylinder. The hollow housing 108 has an inside bottom part 110.

[0078] In this example, the inside bottom part 110 comprises a first pin 111A.

[0079] The inside bottom part 110 is affixed, e.g. permanently locked, to the hollow housing 108. An annular portion 114 of the inside bottom part 110 is fitted into a complementary engagement member 112 of the hollow housing 108.

[0080] The inside bottom part 110 can, for example, be

mounted to the engagement member 112 of the hollow housing 108 via a screw mechanism. The screw mechanism may also be fixed, e.g. jammed, via the application of a suitable strong adhesive, such as locktite® from Henkel AG & Company, KGaA.

[0081] In other examples, the inside bottom part 110 and the hollow housing 108 are integrally formed.

[0082] The plug 104 further comprises a rotating shaft 116. A first end 118 of the rotating shaft 116 is engaged with, e.g. permanently locked to, a complementary recess 120 in a handle 122. Rotation of the handle 122 by the user thus causes the rotating shaft 116 to rotate, irrespective of the temperature of the steam generator 102.

[0083] The handle 122 can have any suitable shape, provided that the user is able to grasp the handle 122 and rotate the rotating shaft 116 using the handle 122. For example, the plug 104 shown in Figs. 1A and 1B has a handle 122 in the form of a knob.

[0084] In this example, the handle 122 and the rotating shaft 116 at least partly define a first part 116, 122 of the plug 104. Moreover, the hollow housing 108 and the inside bottom part 110 at least partly define a second part 108, 110 of the plug 104.

[0085] It is noted that a relatively small gap tolerance can be provided between the hollow housing 108 and the rotating shaft 116. Such a relatively small gap tolerance is acceptable in this case because the rotating shaft 116 is not intended to axially slide relative to the hollow housing 108.

[0086] As shown in Fig. 2A, when the temperature of the steam generator 102 is less than a given temperature threshold T1, the first part 116, 122 is keyed to the second part 108, 110. The second part 108, 110, and in particular the hollow housing 108, is engaged via a threaded coupling 123 to the tubular element 105. Turning the handle 122 in the appropriate direction, e.g. anticlockwise, enables loosening and removal of the hollow housing 108 from the tubular element 105.

[0087] The plug 104 comprises a mechanism having mechanical movements being dependent on the temperature of the steam generator 102.

[0088] When the temperature of the steam generator 102 is equal to or above the given temperature threshold T1, as shown in Fig. 2B, the mechanism is adapted to prevent the plug 104 from being detached from the steam generator 102. When the temperature of the steam generator 102 is below the given temperature threshold T1, the mechanism is adapted to allow the plug to be detached from the steam generator, as shown in Fig. 2A.

[0089] In the example depicted in Figs. 2A and 2B, the mechanism comprises a sliding element 124. The sliding element 124 slides within the hollow housing 108 between a first position in which the first part 116, 122 and the second part 108, 110 are keyed with each other, as shown in Fig. 2A, and a second position in which the first part 116, 122 and the second part 108, 110 are not keyed with each other.

[0090] The sliding element's 124 adoption of the first or second position is dependent on the temperature of the steam generator 102. In this example, this is achieved thermo-mechanically via the change of length of a reversibly thermally deformable element. This has the benefit of simplicity and low cost manufacture, although any suitable alternative thermal actuation principle can be used.

[0091] In the example shown in Figs. 2A and 2B, the reversibly thermally deformable element is in the form of a first spring 130, helical-shaped and formed from nickel titanium alloy. This first spring 130 is shown in a compressed shape in Fig. 2A, and in an expanded state in Fig. 2B. Change in length of the nickel titanium alloy is sufficient when the temperature is equal to or exceeds the given temperature threshold T1 to cause the first part 116, 122 to be unlocked from the second part 108, 110.

[0092] The sliding element 124 has a first extremity 126 and a second extremity 128.

[0093] The second extremity 128 of the sliding element 124 is adapted to permanently slidably lock with the rotating shaft 116. In other words, the sliding element 124 is engaged with the rotating shaft 116 via the second extremity 128 irrespective of the temperature of the steam generator 102.

[0094] This is achieved in the example shown in Figs. 2A and 2B by the second extremity 128 of the sliding element 124 comprising a recess 129A in which a second end 129B of the rotating shaft 116 is located, irrespective of the movement of the sliding element 124 caused by the temperature changes of the steam generator 102.

[0095] In other words, the sliding element 124 is always in contact with the rotating shaft 116, so the alignment between the sliding element 124 and the rotating shaft 116 is maintained throughout the range of movement of the sliding element 124.

[0096] The first extremity 126 of the sliding element 124 is adapted to lock with the inside bottom part 110 when the temperature of the steam generator is below the given temperature threshold T1, as shown in Fig. 2A.

[0097] However, when the temperature of the steam generator 102 is at or above the given temperature threshold T1, the expansion/lengthening of the first spring 130 causes the sliding element 124 to be positioned such that the first extremity 126 of the sliding element 124 and the inside bottom part 110 become unlocked, as shown in Fig. 2B.

[0098] Thus, rotation of the rotating shaft 116 by the user is not transferred to the inside bottom part 110 (and the hollow housing 108) when the temperature is at or above the given temperature threshold T1. Since this prevents the user from removing the plug 104, the plug 104 improves user safety, as previously described.

[0099] In the example shown in Figs. 2A and 2B, the mechanism comprises a second spring 132 for biasing the first part 116, 122 into engagement with the second part 108, 110 below the given temperature threshold T1.

[0100] The first spring 130 exerts a first force F1 on the

first extremity 126 of the sliding element 124, and the second spring 132 exerts a second force F2 on the second extremity 128 of the sliding element 124. The second force F2 is applied in the opposite direction to the first force F1.

[0101] The first spring 130 is such that the first force F1 is greater than the second force F2, i.e. the spring force of the second spring 132, when the temperature of the steam generator 102 is above the given temperature threshold T1. The second spring 132 is such that the second force F2 is greater than the first force F1 when the temperature of the steam generator 102 is below the given temperature threshold T1.

[0102] The first spring 130, e.g. formed from the nickel titanium (Nitinol) alloy, acts like a temperature sensor. When the first spring 130 is exposed to elevated temperatures, it changes its geometry and decouples the first part 116, 122 from the second part 108, 110, thus preventing the user from removing the plug 104.

[0103] At lower temperatures, the first spring is compressed to its original compressed shape/geometry, for example with the help of the second spring 132. This assists the first part 116, 122 to be recoupled to the second part 108, 110, thus enabling the user to unscrew the plug 104.

[0104] The sizing and spring constant of the second spring 132 may allow the reversibly thermally deformable element, e.g. the nickel titanium (Nitinol) alloy, to extend sufficiently when in a relatively hot environment, as well as provide a strong enough compressive force to return the first spring 130 to its original compressed shape when the environment cools down. At this same time, the sliding element 124 is pushed back towards the inside bottom part 110.

[0105] Fig. 7 illustrates the characteristics of a reversibly thermally deformable element used in a garment care device according to the invention.

[0106] The reversibly thermally deformable element corresponds to the first spring 130, made of Nitinol alloy, when interacting with and under the effect (i.e. force) of the second spring 132. The variations of length of the first spring 130 are thus measured for various increasing/decreasing temperatures of the assembly first spring 130 / second spring 132.

[0107] The horizontal axis corresponds to the temperature around the assembly first spring 130 / second spring 132.

[0108] The vertical axis corresponds to the change of length of the first spring 130.

[0109] Note that the temperature of the assembly first spring 130 / second spring 132 may be relatively different than the temperature of the steam generator itself. Indeed, the first spring 130 is encapsulated in the plug which acts as a thermal resistance.

[0110] In this example, the second spring 132 has a spring constant of 0.37N/mm.

[0111] As illustrated, the first spring 130 does not behave in a symmetrical manner to a temperature increase

or a temperature decrease.

[0112] In other words, the plug starts to be detachable from the steam generator at a temperature being different than the given temperature threshold T1 of the steam generator.

[0113] For example, using a first spring 130 and a second spring 132 having the characteristics of Fig. 7 when cooperating together:

when the temperature of the steam generator increases, the plug is prevented from being detached from the steam generator from a temperature T1 having a value of 130 °C (if the temperature is taken on a top part of the steam generator),

when the temperature of the steam generator decreases, the plug can be detached from the steam generator from a temperature T1 below 60 °C (if the temperature is taken on a top part of the steam generator).

[0114] In the example shown in Figs. 2A and 2B (as well as in the examples shown in Figs. 3A, 3B, 5A, 5B, and 5C), the inside bottom part 110 comprises a first pin 111A. In the detachable plug 104, the first pin 111A protrudes in the direction of the first extremity 126.

[0115] As best shown in Fig. 2A, the first extremity 126 comprises a first cavity 127A which is adapted to lock with the first pin 111A. The first pin 111A may, for example, form a peg which can be received within the first cavity 127A.

[0116] Fig. 3A provides a perspective view of a detachable plug 104 according to another example. Fig. 3B provides an exploded view of the detachable plug 104 shown in Fig. 3A. In this example, the hollow housing 108 comprises a first portion 108A coupled to a second portion 108B. The second portion 108B comprises the threaded portion for engaging with the complementary threaded portion delimiting the opening 103 of the steam generator 102.

[0117] Such a two-portion hollow housing 108A, 108B may facilitate assembly of the plug 104.

[0118] In this example, a screw hole 133 in the handle 122 enables the handle 122 to be secured to the rotating shaft 116 such that rotation of the handle 122 causes rotation of the rotating shaft 116, as previously described.

[0119] As shown in Fig. 3B, the plug 104 has a retaining ring 134, e.g. a circlip, which retains the rotating shaft 116 in the hollow housing 108.

[0120] The first and second portions 108A, 108B in this example are coupled to each other via a threaded joint (not visible). The hollow housing 108A, 108B in this example has a substantially cylindrical shape. A first recessed region 136 in the exterior surface of the first portion 108A and a second recessed region 137 in the exterior surface of the second portion 108B mean that the exterior shape of the hollow housing 108A, 108B is not precisely cylindrical, but the first and second recessed regions 136, 137 nonetheless facilitate tightening of the

threaded joint by accommodating a suitable tool, such as a wrench.

[0121] In the example shown in Figs. 3A and 3B, a seal holder 138, e.g. an O-ring holder 138, is fitted to the second portion 108B. This seal holder 138 is for carrying a seal, e.g. an O-ring, provided between the hollow housing 108A, 108B and the tubular element 105 delimiting the opening 103 of the steam generator 102. This arrangement assists to seal the steam generator 102 when the plug 104 is attached thereto.

[0122] Whilst not visible in Figs. 2A, 2B, 3A, and 3B, the plug 104 can comprise a scraper element 107 to assist with removal of scale from the steam generator 102. For example, such a scraper element 107 may be attached to the hollow housing 108 and extend into the steam generator 102 via the opening 103 when the plug 104 is attached to the steam generator 102.

[0123] Figs. 4A to 4C provide views of a sliding element 124 of an exemplary detachable plug 104. The perspective view provided in Fig. 4A shows the first cavity 127A in which the first pin 111A of the inside bottom part 110 is locatable.

[0124] The perspective view provided in Fig. 4B shows the recess 129A of the sliding element 124 in which the second end 129B of the rotating shaft 116 is located, throughout the range of movement of the sliding element 124, as previously described.

[0125] As shown in Fig. 4B, the recess 129A has a non-circular, e.g. polygonal, cross-sectional shape, and this is complemented by the cross-sectional shape of the second end 129B of the rotating shaft 116. Thus, rotation of the rotating shaft 116 is transferred to the sliding element 124, and in turn to the hollow housing 108 when the temperature of the steam generator 102 is below the given temperature threshold T1.

[0126] In the example shown in Figs. 4A to 4C, the first cavity 127A has a non-circular cross-sectional shape. The non-circular, e.g. polygonal, cross-sectional shape of the first cavity 127A complements the cross-sectional shape of the first pin 111A, as shown in Figs. 5A and 5B. Thus, the non-circular cross-sectional shape of the first pin 111A and the first cavity 127A in this example facilitates locking of the first extremity 126 with the inside bottom part 110 when the temperature of the steam generator 102 is below the given temperature threshold T1.

[0127] Fig. 5B provides view of the inside bottom part 110 which shows an indent 140. This indent 140 is for receiving a suitable tool, such as a screw driver, to enable securement of the inside bottom part 110 to the hollow housing 108 via a screw mechanism, as previously described.

[0128] The sliding element 124 preferably slides freely in the hollow housing 108 to minimize the risk of the sliding element 124 becoming jammed inside the hollow housing 108. Also, the first cavity 127A in the sliding element 124 is ideally large enough to always engage the first pin 111A when the first spring 130 is exposed to

temperatures lower than the given temperature threshold T1. At the same time, the first cavity 127A is required to be able to transfer the turning torque from the handle 122 to the first pin 111A to enable the user to unscrew the plug 104.

[0129] Sufficient tolerance is given to the sliding interface between the first cavity 127A and the first pin 111A such that when the first cavity 127A is aligned to the first pin 111A, the sliding element 124 will always re-engage the first pin 111A.

[0130] Stack tolerance calculations can be carried out to ensure that the first cavity 127A in the sliding element 124 is large enough to ensure that the sliding element 124 can always slide back into engagement with the first pin 111A, yet small enough to ensure the sliding element 124 can transfer the turning force to the first pin 111A.

[0131] It is noted that following cooling of the steam generator 102, there is a possibility of the above-described non-circular cross-sectioned first cavity 127A of the sliding element 124 not being aligned with the non-circular cross-sectioned first pin 111A. For example, the sliding element 124 may be rotated at 90° relative to the inside bottom part 110 such that the first pin 111A cannot be located into the first cavity 127A. But in this case, turning of the handle 122 to the appropriate degree, e.g. by 90° in the same example, will enable the second spring 132 to cause the sliding element 124 to be pushed back towards the inside bottom part 110 when the first cavity 127A becomes re-aligned with the first pin 111A.

[0132] Analogous alignment considerations are applicable to the alternative sliding element 124/inside bottom part 110 configuration shown in Fig. 6. In this case, the first extremity 126 of the sliding element 124 comprises a second pin 111B which protrudes in the direction of the inside bottom part 110. In this configuration, the inside bottom part 110 comprises a second cavity 127B adapted to lock with the second pin 111B.

[0133] The second pin 111B may, for example, form a peg which can be received within the second cavity 127B. Preferably, the second pin 111B has a non-circular, e.g. polygonal, cross-sectional shape, and the second cavity 127B has a cross-sectional shape complementary to the non-circular shape. This facilitates locking of the first extremity 126 with the inside bottom part 110 when the temperature of the steam generator 102 is below the given temperature threshold T1, as previously described.

[0134] The plug 104 according to the invention is mounted to the steam generator 102 similarly as the plug illustrated in Fig. 1B.

[0135] Fig. 8 depicts a cross-sectional view of a garment care device according to the invention,

[0136] Fig. 9 depicts a top view of a garment care device according to the invention.

[0137] The above embodiments as described are only illustrative, and not intended to limit the technique approaches of the present invention. Although the present invention is described in details referring to the preferable embodiments, those skilled in the art will understand that

the technique approaches of the present invention can be modified or equally displaced without departing from the protective scope of the claims of the present invention. In particular, although the invention has been described based on a garment care device, it can be applied to any household device having a steam generator. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. Any reference signs in the claims should not be construed as limiting the scope.

Claims

1. A garment care device (100) comprising:

a steam generator (102),
a plug (104) arranged on said steam generator (102) to access the inside of said steam generator (102), said plug (104) being detachable by rotation via a thread,

characterised in that the plug (104) comprises a mechanism having mechanical movements being dependent on the temperature of said steam generator (102), such that when the temperature of said steam generator (102) is equal to or above a given temperature threshold (T1), said mechanism is adapted to prevent the plug (104) from being detached from the steam generator (102), wherein the mechanism comprises a reversibly thermally deformable element whose expansion when the temperature of the steam generator (102) is equal to or above the given temperature threshold (T1) causes the mechanism to prevent the plug (104) from being detached from the steam generator (102), and whose contraction when the temperature of the steam generator (102) is below the given temperature threshold (T1) causes the mechanism to allow the plug (104) to be detached from the steam generator (102).

2. The garment care device (100) as claimed in claim 1, wherein the plug (104) comprises a first part (116, 122) and a second part (108, 110), the second part (108, 110) comprising a threaded portion for engaging with a complementary threaded portion provided around an opening (103) of the steam generator (102).

3. The garment care device (100) as claimed in claim 2, wherein the first part (116, 122) is rotatable by the user, and the mechanism is configured such that the first part (116, 122) and the second part (108, 110) are keyed to each other when the temperature of the steam generator (102) is below the given temperature threshold (T1) such that user rotation of the first part (116, 122) causes rotation of the second part

(108, 110) to allow the plug (104) to be detached from the steam generator (102), and wherein the first part (116, 122) and the second part (108, 110) are not keyed to each other when the temperature of the steam generator (102) is equal to or above the given temperature threshold (T1).

4. The garment care device (100) as claimed in claim 3, wherein the mechanism comprises a sliding element (124) arranged to slide between:

- a first position in which the sliding element (124) keys the first part (116, 122) to the second part (108, 110), and
- a second position in which the sliding element (124) does not key the first part (116, 122) to the second part (108, 110).

5. The garment care device (100) as claimed in any one of claims 1 to 4, wherein the reversibly thermally deformable element is in the form of a spring (130).

6. A garment care device (100) as claimed in claim 1, wherein said mechanism comprises:

a hollow housing (108) having an inside bottom part (110),
 a rotating shaft (116) connected to a user handle (122),
 a sliding element (124) adapted to slide inside said hollow housing (108), said sliding element (124) comprising a first extremity (126) adapted to lock with said inside bottom part (110), and a second extremity (128) adapted to permanently slidably lock with said rotating shaft (116),
 a first spring (130) arranged inside said hollow housing (108) for exerting a first force (F1) on said first extremity (126),
 a second spring (132) arranged inside said hollow housing (108) for exerting a second force (F2) on said second extremity (128), said second force (F2) being opposite to said first force (F1),
 wherein said reversibly thermally deformable element is in the form of said first spring (130), said first spring (130) being thermally deformable such that:

when the temperature of said steam generator (102) is above said given temperature threshold (T1), the length of said first spring (130) is such that said first extremity (126) and said inside bottom part (110) are unlocked,
 when the temperature of said steam generator (102) is below said given temperature threshold (T1), the length of said first spring (130) is such that said first extremity (126)

and said inside bottom part (110) are locked.

7. The garment care device (100) as claimed in claim 6, wherein the first spring (130) is formed from nickel titanium alloy.

8. A garment care device (100) as claimed in claim 6 or claim 7, wherein:

said first spring (130) is such that said first force (F1) is greater than said second force (F2) when the temperature of said steam generator (102) is above said given temperature threshold (T1),
 said second spring (132) is such that said second force (F2) is greater than said first force (F1) when the temperature of said steam generator (102) is below said given temperature threshold (T1).

9. A garment care device (100) as claimed in any one of claims 6 to 8, wherein:

said inside bottom part (110) comprises a first pin (111A) protruding in direction of said first extremity (126),
 said first extremity (126) comprises a first cavity (127A) adapted to lock with said first pin (111A).

10. A garment care device (100) as claimed in claim 9, wherein:

said first pin (111A) is of a non-circular cross-sectional shape, and
 said first cavity (127A) has a cross-sectional shape complementary to said non-circular cross-sectional shape of the first pin (111A).

11. A garment care device (100) as claimed in any one of claims 6 to 8, wherein:

said first extremity (126) comprises a second pin (111B) protruding in direction of said inside bottom part (110),
 said inside bottom part (110) comprises a second cavity (127B) adapted to lock with said second pin (111B).

12. A garment care device (100) as claimed in claim 11, wherein:

said second pin (111B) is of a non-circular cross-sectional shape, and
 said second cavity (127B) has a cross-sectional shape complementary to said non-circular cross-sectional shape of the second pin (111B).

13. A garment care device (100) as claimed in any one of

claims 6 to 12, wherein said first spring (130) is arranged inside said hollow housing (108).

14. A garment care device (100) as claimed in any one of claims 6 to 12, wherein said first spring (130) is arranged inside said steam generator (102) when the plug (104) is attached thereto. 5
15. A garment care device (100) as claimed in any one of the preceding claims, wherein the given temperature threshold (T1) is in the range [100; 200] °C. 10

Patentansprüche

1. Kleidungspflegevorrichtung (100), umfassend:

einen Dampferzeuger (102),
einen Stopfen (104), der am Dampferzeuger (102) angeordnet ist, um Zugang zum Inneren des Dampferzeugers (102) zu erhalten, wobei der Stopfen (104) durch Drehung über ein Gewinde gelöst werden kann, 20
dadurch gekennzeichnet, dass der Stopfen (104) einen Mechanismus umfasst, der mechanische Bewegungen aufweist, die derart von der Temperatur des Dampferzeugers (102) abhängen, dass, wenn die Temperatur des Dampferzeugers (102) gleich einer gegebenen Temperaturschwelle (T1) ist oder über dieser liegt, der Mechanismus dazu ausgelegt ist, zu verhindern, dass der Stopfen (104) vom Dampferzeuger (102) gelöst wird, wobei der Mechanismus ein reversibel thermisch verformbares Element umfasst, dessen Ausdehnung, wenn die Temperatur des Dampferzeugers (102) gleich der gegebenen Temperaturschwelle (T1) ist oder über dieser liegt, bewirkt, dass der Mechanismus verhindert, dass der Stopfen (104) vom Dampferzeuger (102) gelöst wird, und dessen Schrumpfung, wenn die Temperatur des Dampferzeugers (102) unter der gegebenen Temperaturschwelle (T1) liegt, bewirkt, dass der Mechanismus ermöglicht, dass der Stopfen (104) vom Dampferzeuger (102) gelöst wird. 25 30 35 40 45

2. Kleidungspflegevorrichtung (100) nach Anspruch 1, wobei der Stopfen (104) einen ersten Teil (116, 122) und einen zweiten Teil (108, 110) umfasst, wobei der zweite Teil (108, 110) einen Gewindeabschnitt zum Ineinandergreifen mit einem komplementären Gewindeabschnitt umfasst, der um eine Öffnung (103) des Dampferzeugers (102) herum vorgesehen ist. 50
3. Kleidungspflegevorrichtung (100) nach Anspruch 2, wobei der erste Teil (116, 122) vom Benutzer gedreht werden kann und der Mechanismus derart konfiguriert ist, dass der erste Teil (116, 122) und der zweite 55

Teil (108, 110) miteinander verkeilt sind, wenn die Temperatur des Dampferzeugers (102) unter der gegebenen Temperaturschwelle (T1) liegt, derart, dass eine Drehung des ersten Teils (116, 122) durch den Benutzer eine Drehung des zweiten Teils (108, 110) bewirkt, um zu ermöglichen, dass der Stopfen (104) vom Dampferzeuger (102) gelöst wird, und wobei der erste Teil (116, 122) und der zweite Teil (108, 110) nicht miteinander verkeilt sind, wenn die Temperatur des Dampferzeugers (102) gleich der gegebenen Temperaturschwelle (T1) ist oder über dieser liegt.

4. Kleidungspflegevorrichtung (100) nach Anspruch 3, wobei der Mechanismus ein Gleitelement (124) umfasst, das so angeordnet ist, dass es gleitet zwischen:

- einer ersten Position, in der das Gleitelement (124) den ersten Teil (116, 122) mit dem zweiten Teil (108, 110) verkeilt, und
- einer zweiten Position, in der das Gleitelement (124) den ersten Teil (116, 122) nicht mit dem zweiten Teil (108, 110) verkeilt.

5. Kleidungspflegevorrichtung (100) nach einem der Ansprüche 1 bis 4, wobei das reversibel thermisch verformbare Element in Form einer Feder (130) vorliegt.

6. Kleidungspflegevorrichtung (100) nach Anspruch 1, wobei der Mechanismus umfasst:

ein hohles Gehäuse (108), das einen inneren Bodenteil (110) aufweist,
eine Drehwelle (116), die mit einem Benutzergriff (122) verbunden ist,
ein Gleitelement (124), das dazu ausgelegt ist, im Inneren des hohlen Gehäuses (108) zu gleiten, wobei das Gleitelement (124) ein erstes Ende (126), das dazu ausgelegt ist, mit dem inneren Bodenteil (110) zu verriegeln, und ein zweites Ende (128) umfasst, das dazu ausgelegt ist, dauerhaft gleitfähig mit der Drehwelle (116) zu verriegeln,
eine erste Feder (130), die im Inneren des hohlen Gehäuses (108) angeordnet ist, zum Ausüben einer ersten Kraft (F1) auf das erste Ende (126),
eine zweite Feder (132), die im Inneren des hohlen Gehäuses (108) angeordnet ist, zum Ausüben einer zweiten Kraft (F2) auf das zweite Ende (128), wobei die zweite Kraft (F2) der ersten Kraft (F1) entgegengesetzt ist, wobei das reversibel thermisch verformbare Element in Form der ersten Feder (130) vorliegt, wobei die erste Feder (130) thermisch derart verformbar ist, dass:

- wenn die Temperatur des Dampferzeugers (102) über der gegebenen Temperaturschwelle (T1) liegt, die Länge der ersten Feder (130) derart beschaffen ist, dass das erste Ende (126) und der innere Bodenteil (110) entriegelt sind, wenn die Temperatur des Dampferzeugers (102) unter der gegebenen Temperaturschwelle (T1) liegt, die Länge der ersten Feder (130) derart beschaffen ist, dass das erste Ende (126) und der innere Bodenteil (110) verriegelt sind.
7. Kleidungspflegevorrichtung (100) nach Anspruch 6, wobei die erste Feder (130) aus Nickel-Titan-Legierung gebildet ist.
8. Kleidungspflegevorrichtung (100) nach Anspruch 6 oder Anspruch 7, wobei:
- die erste Feder (130) derart beschaffen ist, dass die erste Kraft (F1) größer ist als die zweite Kraft (F2), wenn die Temperatur des Dampferzeugers (102) über der gegebenen Temperaturschwelle (T1) liegt, die zweite Feder (132) derart beschaffen ist, dass die zweite Kraft (F2) größer ist als die erste Kraft (F1), wenn die Temperatur des Dampferzeugers (102) unter der gegebenen Temperaturschwelle (T1) liegt.
9. Kleidungspflegevorrichtung (100) nach einem der Ansprüche 6 bis 8, wobei:
- der innere Bodenteil (110) einen ersten Stift (111A) umfasst, der in Richtung des ersten Endes (126) vorspringt, das erste Ende (126) einen ersten Hohlraum (127A) umfasst, der dazu ausgelegt ist, mit dem ersten Stift (111A) zu verriegeln.
10. Kleidungspflegevorrichtung (100) nach Anspruch 9, wobei:
- der erste Stift (111A) eine nicht kreisförmige Querschnittsform aufweist, und der erste Hohlraum (127A) eine Querschnittsform aufweist, die zu der nicht kreisförmigen Querschnittsform des ersten Stifts (111A) komplementär ist.
11. Kleidungspflegevorrichtung (100) nach einem der Ansprüche 6 bis 8, wobei:
- das erste Ende (126) einen zweiten Stift (111B) umfasst, der in Richtung des inneren Bodenteils (110) vorspringt, der innere Bodenteil (110) einen zweiten Hohlraum (127B) umfasst, der dazu ausgelegt ist, mit dem zweiten Stift (111B) zu verriegeln.
12. Kleidungspflegevorrichtung (100) nach Anspruch 11, wobei:
- der zweite Stift (111B) eine nicht kreisförmige Querschnittsform aufweist, und der zweite Hohlraum (127B) eine Querschnittsform aufweist, die zu der nicht kreisförmigen Querschnittsform des zweiten Stifts (111B) komplementär ist.
13. Kleidungspflegevorrichtung (100) nach einem der Ansprüche 6 bis 12, wobei die erste Feder (130) im Inneren des hohlen Gehäuses (108) angeordnet ist.
14. Kleidungspflegevorrichtung (100) nach einem der Ansprüche 6 bis 12, wobei die erste Feder (130) im Inneren des Dampferzeugers (102) angeordnet ist, wenn der Stopfen (104) daran angebracht ist.
15. Kleidungspflegevorrichtung (100) nach einem der vorstehenden Ansprüche, wobei die gegebene Temperaturschwelle (T1) im Bereich [100; 200] °C liegt.

Revendications

1. Dispositif d'entretien de vêtement (100), comprenant :
- un générateur de vapeur (102),
un obturateur (104) disposé sur ledit générateur de vapeur (102) pour accéder à l'intérieur dudit générateur de vapeur (102), ledit obturateur (104) étant détachable par rotation par l'intermédiaire d'un filetage,
caractérisé en ce que l'obturateur (104) comprend un mécanisme présentant des mouvements mécaniques dépendant de la température dudit générateur de vapeur (102), de telle sorte que, lorsque la température dudit générateur de vapeur (102) est égale ou supérieure à un seuil de température donné (T1), ledit mécanisme soit adapté pour empêcher l'obturateur (104) d'être détaché du générateur de vapeur (102), dans lequel le mécanisme comprend un élément réversiblement thermodéformable dont la dilatation, lorsque la température du générateur de vapeur (102) est égale ou supérieure au seuil de température donné (T1), amène le mécanisme à empêcher l'obturateur (104) d'être détaché du générateur de vapeur (102), et dont la contraction, lorsque la température du générateur de vapeur (102) est inférieure au seuil de température donné (T1), amène le mécanisme à

- permettre à l'obturateur (104) d'être détaché du générateur de vapeur (102).
2. Dispositif d'entretien de vêtement (100) selon la revendication 1, dans lequel l'obturateur (104) comprend une première partie (116, 122) et une seconde partie (108, 110), la seconde partie (108, 110) comprenant une partie filetée destinée à entrer en prise avec une partie filetée complémentaire prévue autour d'une ouverture (103) du générateur de vapeur (102). 5 10
 3. Dispositif d'entretien de vêtement (100) selon la revendication 2, dans lequel la première partie (116, 122) peut être tournée par l'utilisateur, et le mécanisme est configuré de telle sorte que la première partie (116, 122) et la seconde partie (108, 110) soient clavetées l'une à l'autre lorsque la température du générateur de vapeur (102) est inférieure au seuil de température donné (T1) de telle sorte que la rotation par l'utilisateur de la première partie (116, 122) provoque la rotation de la seconde partie (108, 110) pour permettre à l'obturateur (104) d'être détaché du générateur de vapeur (102), et dans lequel la première partie (116, 122) et la seconde partie (108, 110) ne sont pas clavetées l'une à l'autre lorsque la température du générateur de vapeur (102) est égale ou supérieure au seuil de température donné (T1). 15 20 25 30
 4. Dispositif d'entretien de vêtement (100) selon la revendication 3, dans lequel le mécanisme comprend un élément coulissant (124) agencé pour coulisser entre : 35
 - une première position dans laquelle l'élément coulissant (124) clavette la première partie (116, 122) à la seconde partie (108, 110), et
 - une seconde position dans laquelle l'élément coulissant (124) ne clavette pas la première partie (116, 122) à la seconde partie (108, 110). 40
 5. Dispositif d'entretien de vêtement (100) selon l'une quelconque des revendications 1 à 4, dans lequel l'élément réversiblement thermodéformable est sous la forme d'un ressort (130). 45
 6. Dispositif d'entretien de vêtement (100) selon la revendication 1, dans lequel ledit mécanisme comprend : 50
 - un logement creux (108) présentant une partie inférieure intérieure (110),
 - un arbre rotatif (116) relié à une poignée utilisateur (122), 55
 - un élément coulissant (124) adapté pour coulisser à l'intérieur dudit logement creux (108),
 - ledit élément coulissant (124) comprenant une

première extrémité (126) adaptée pour se verrouiller avec ladite partie inférieure intérieure (110), et une seconde extrémité (128) adaptée pour se verrouiller de manière coulissante en permanence avec ledit arbre rotatif (116), un premier ressort (130) agencé à l'intérieur dudit logement creux (108) pour exercer une première force (F1) sur ladite première extrémité (126), un second ressort (132) agencé à l'intérieur dudit logement creux (108) pour exercer une seconde force (F2) sur ladite seconde extrémité (128), ladite seconde force (F2) étant opposée à ladite première force (F1), dans lequel ledit élément réversiblement thermodéformable est sous la forme dudit premier ressort (130), ledit premier ressort (130) étant thermodéformable de telle sorte que :

lorsque la température dudit générateur de vapeur (102) est supérieure audit seuil de température donné (T1), la longueur dudit premier ressort (130) soit telle que ladite première extrémité (126) et ladite partie inférieure intérieure (110) sont déverrouillées, lorsque la température dudit générateur de vapeur (102) est inférieure audit seuil de température donné (T1), la longueur dudit premier ressort (130) soit telle que ladite première extrémité (126) et ladite partie inférieure intérieure (110) sont verrouillées.

7. Dispositif d'entretien de vêtement (100) selon la revendication 6, dans lequel le premier ressort (130) est formé d'un alliage de nickel et de titane. 35
8. Dispositif d'entretien de vêtement (100) selon la revendication 6 ou la revendication 7, dans lequel : 40
 - ledit premier ressort (130) est tel que ladite première force (F1) est supérieure à ladite seconde force (F2) lorsque la température dudit générateur de vapeur (102) est supérieure audit seuil de température donné (T1),
 - ledit second ressort (132) est tel que ladite seconde force (F2) est supérieure à ladite première force (F1) lorsque la température dudit générateur de vapeur (102) est inférieure audit seuil de température donné (T1). 50
9. Dispositif d'entretien de vêtement (100) selon l'une quelconque des revendications 6 à 8, dans lequel : 55
 - ladite partie inférieure intérieure (110) comprend une première broche (111A) faisant saillie en direction de ladite première extrémité (126),

ladite première extrémité (126) comprend une première cavité (127A) adaptée pour se verrouiller avec ladite première broche (111A).

10. Dispositif d'entretien de vêtement (100) selon la revendication 9, dans lequel :

ladite première broche (111A) présente une forme de section transversale non circulaire, et ladite première cavité (127A) présente une forme de section transversale complémentaire à ladite forme de section transversale non circulaire de la première broche (111A).

11. Dispositif d'entretien de vêtement (100) selon l'une quelconque des revendications 6 à 8, dans lequel :

ladite première extrémité (126) comprend une seconde broche (111B) faisant saillie en direction de ladite partie inférieure intérieure (110), ladite partie inférieure intérieure (110) comprend une seconde cavité (127B) adaptée pour se verrouiller avec ladite seconde broche (111B).

12. Dispositif d'entretien de vêtement (100) selon la revendication 11, dans lequel :

ladite seconde broche (111B) présente une forme de section transversale non circulaire, et ladite seconde cavité (127B) présente une forme de section transversale complémentaire à ladite forme de section transversale non circulaire de la seconde broche (111B).

13. Dispositif d'entretien de vêtement (100) selon l'une quelconque des revendications 6 à 12, dans lequel ledit premier ressort (130) est agencé à l'intérieur dudit logement creux (108).

14. Dispositif d'entretien de vêtement (100) selon l'une quelconque des revendications 6 à 12, dans lequel ledit premier ressort (130) est agencé à l'intérieur dudit générateur de vapeur (102) lorsque l'obturateur (104) est attaché à celui-ci.

15. Dispositif d'entretien de vêtement (100) selon l'une quelconque des revendications précédentes, dans lequel le seuil de température donné (T1) est dans la plage [100 ; 200] °C.

55

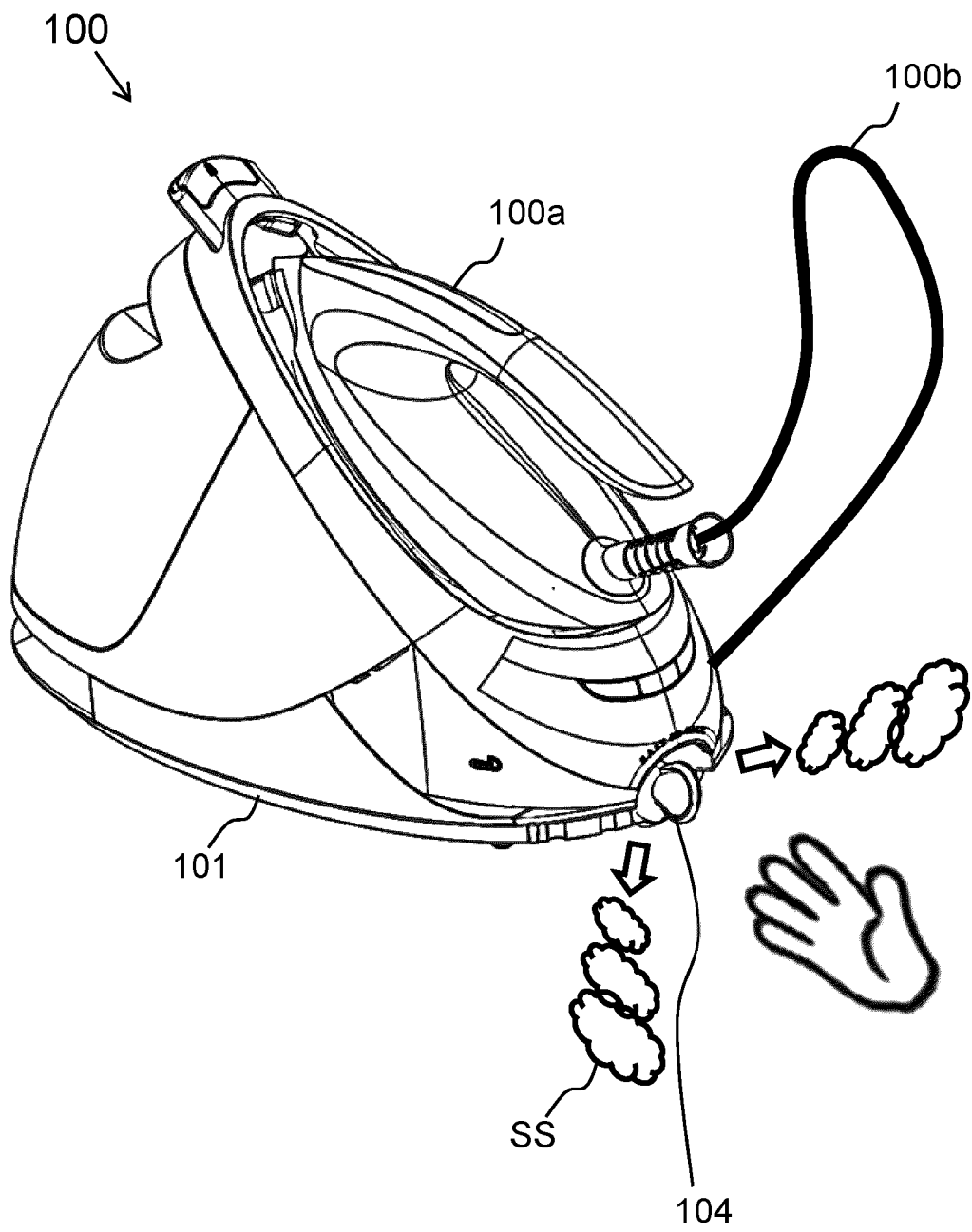


FIG.1A

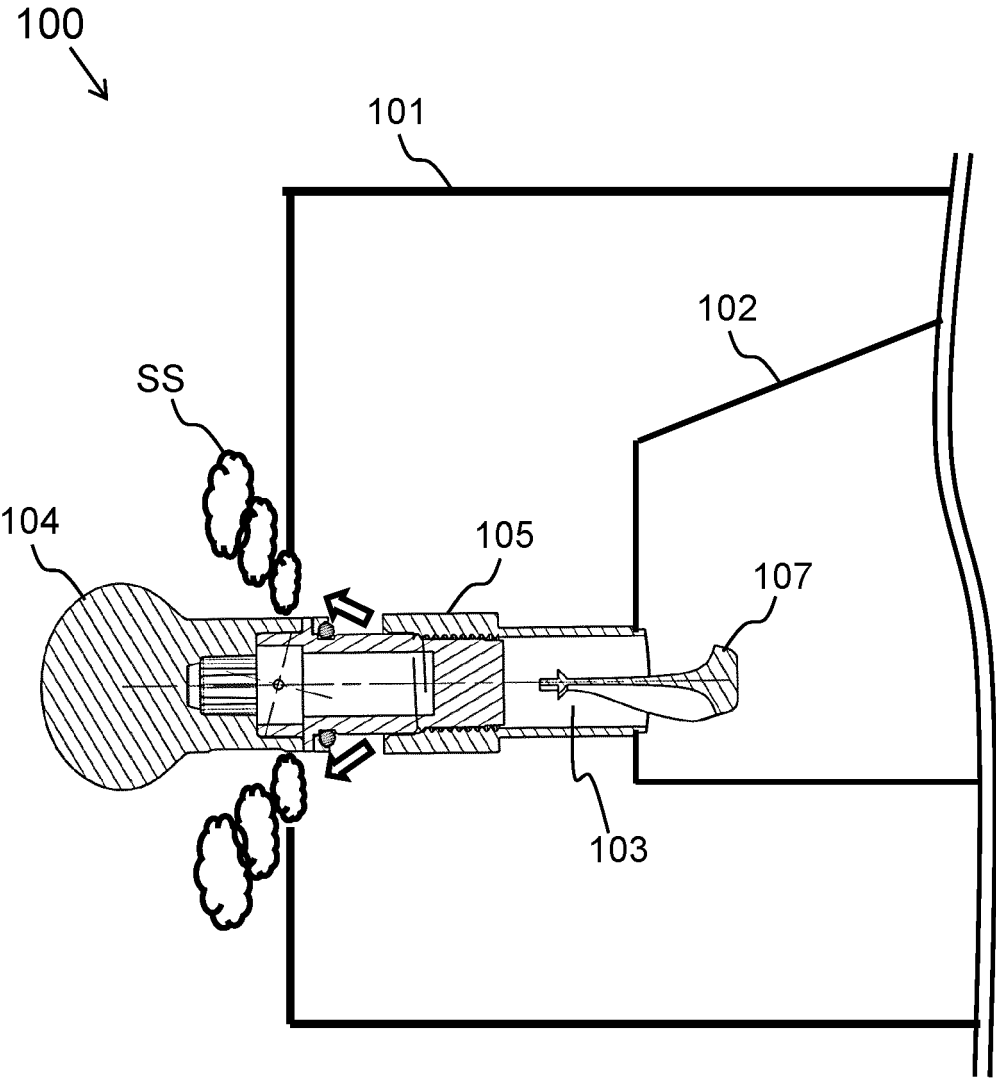


FIG.1B

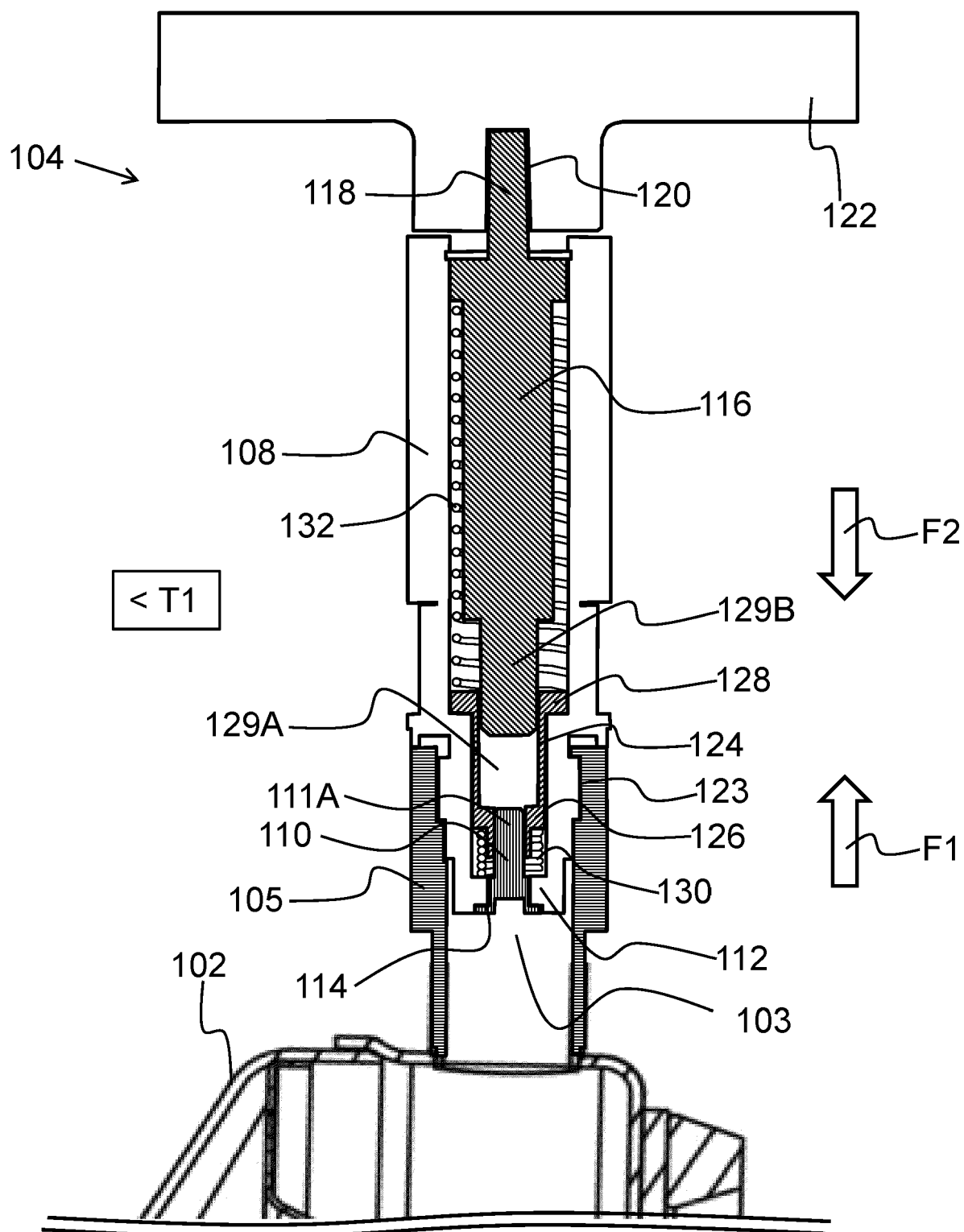


FIG. 2A

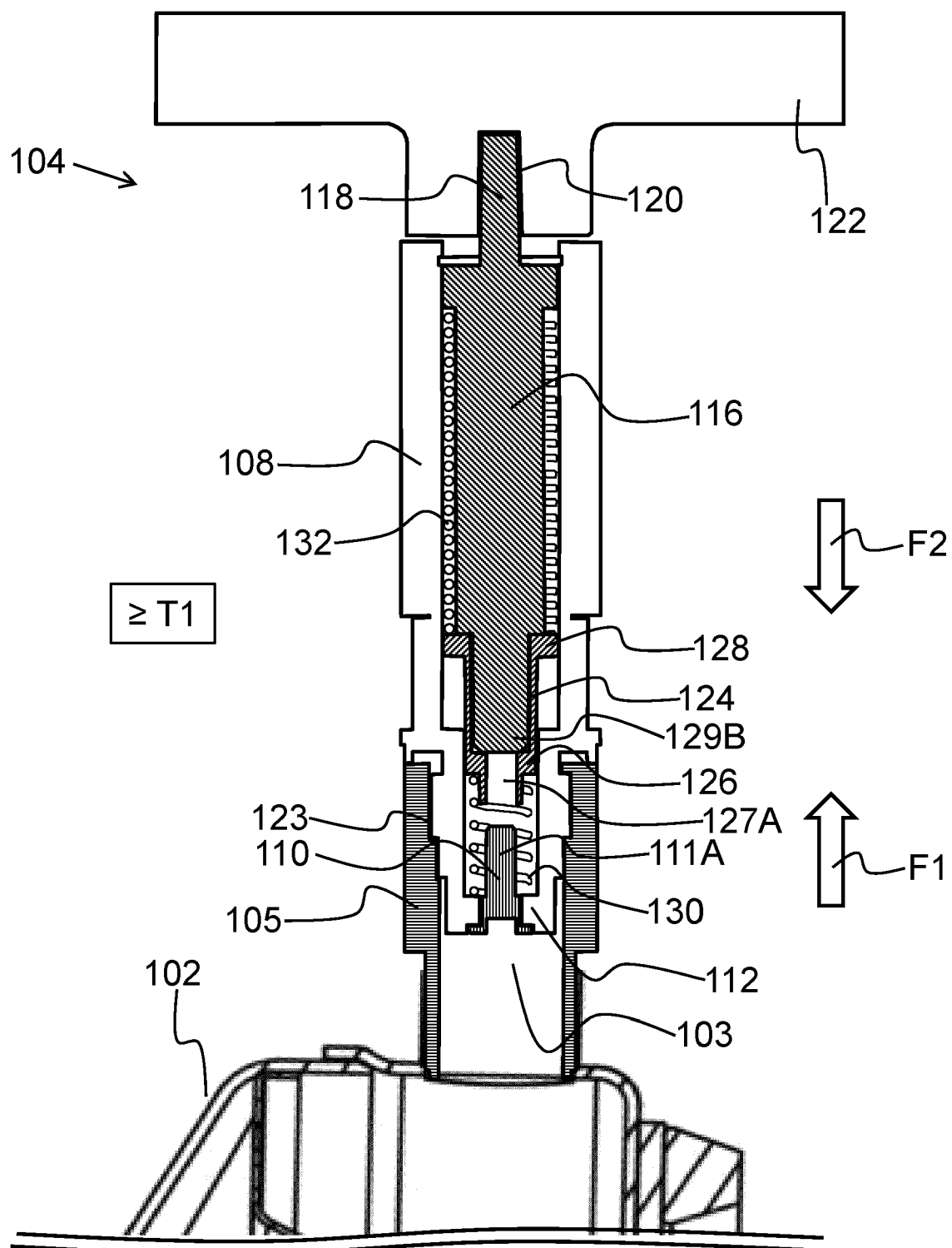


FIG. 2B

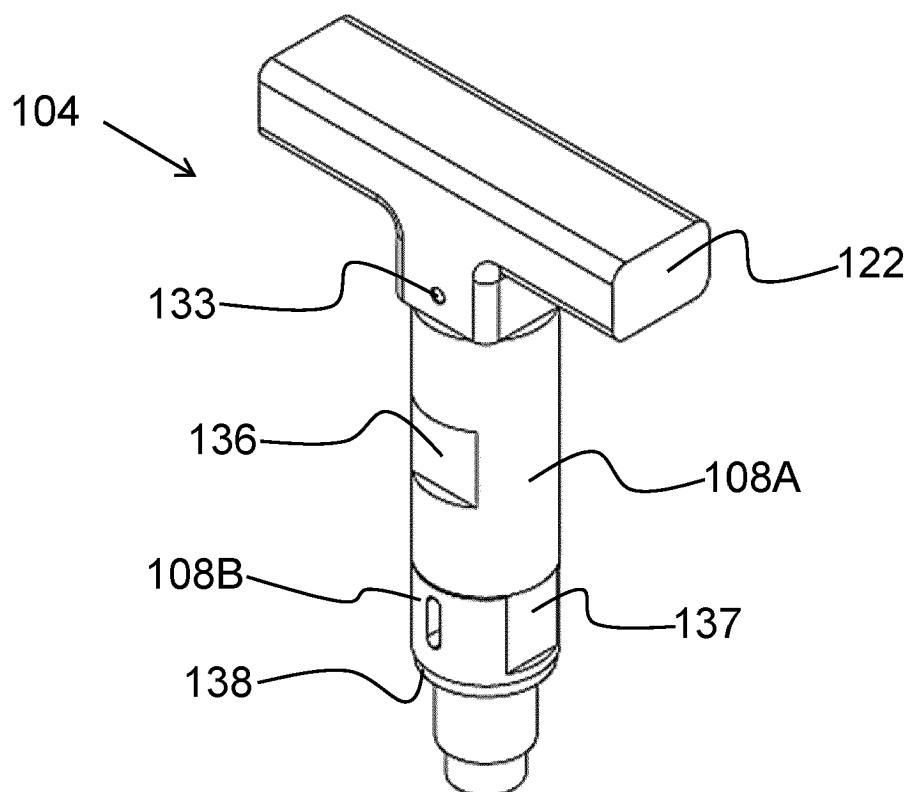


FIG. 3A

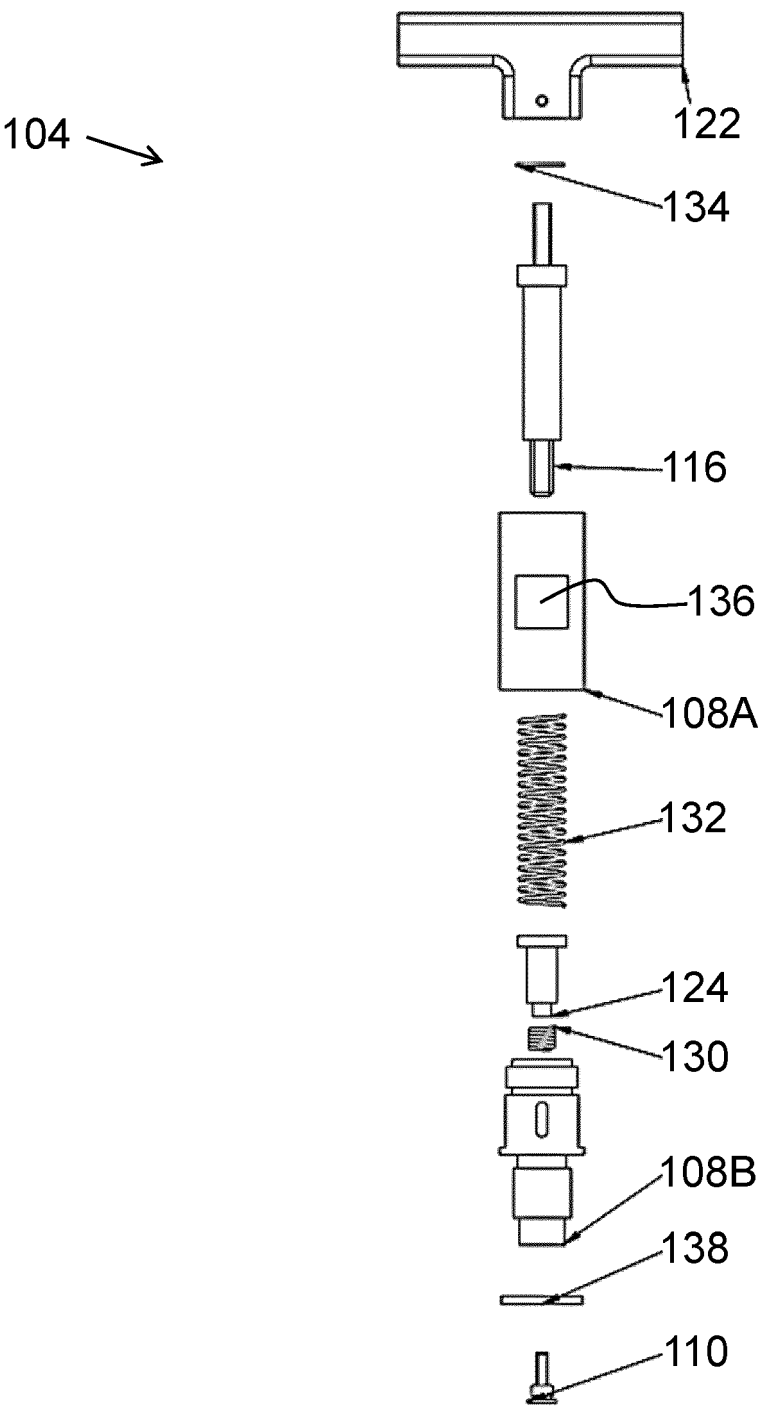


FIG. 3B

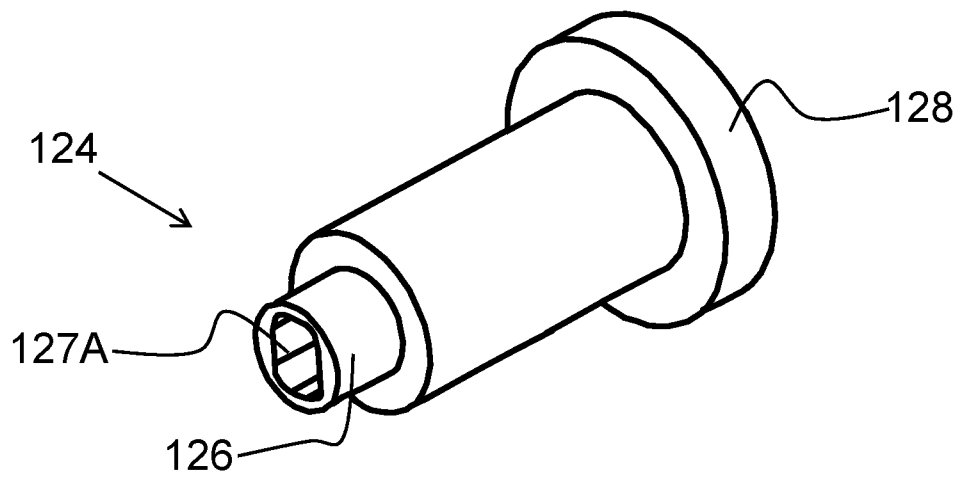


FIG. 4A

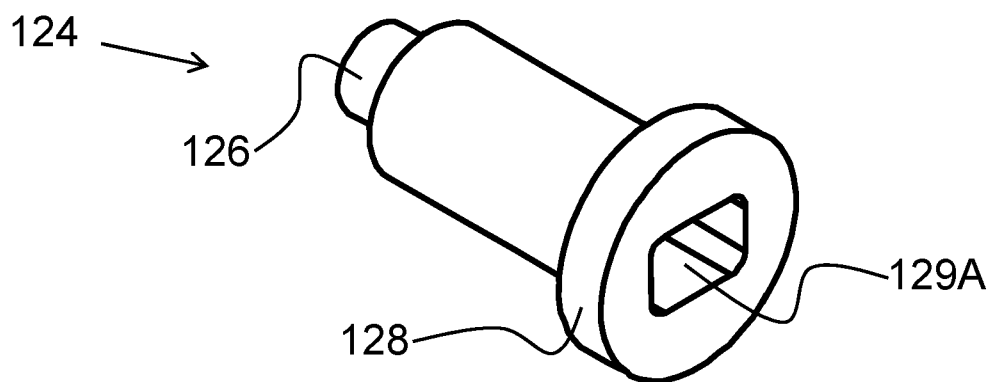


FIG. 4B

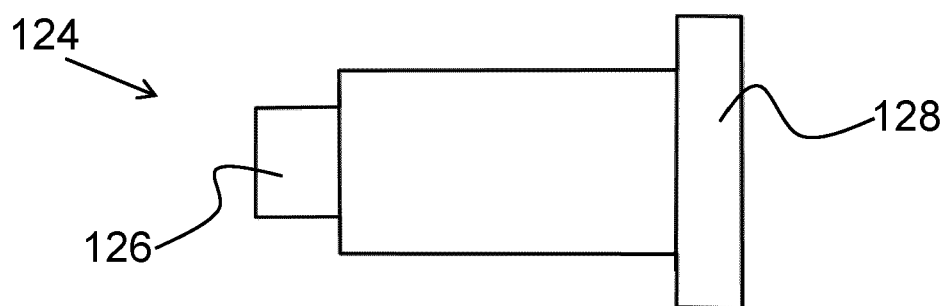


FIG. 4C

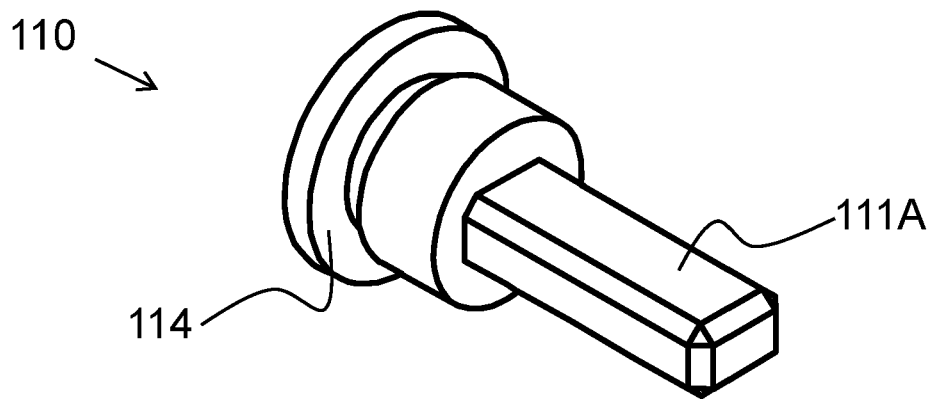


FIG. 5A

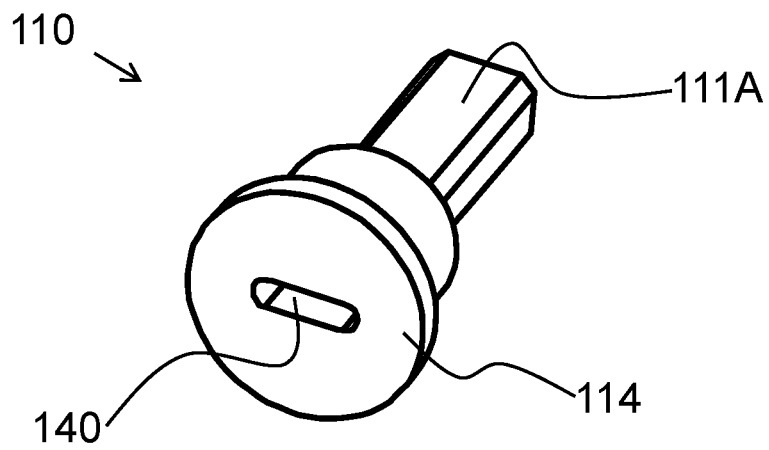


FIG. 5B

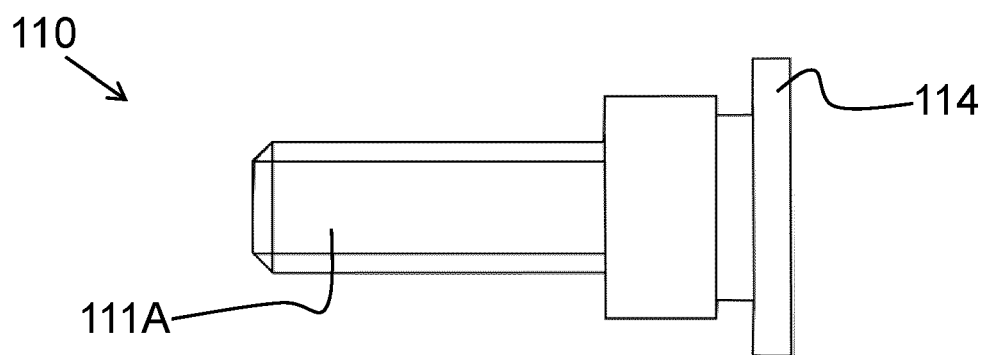


FIG. 5C

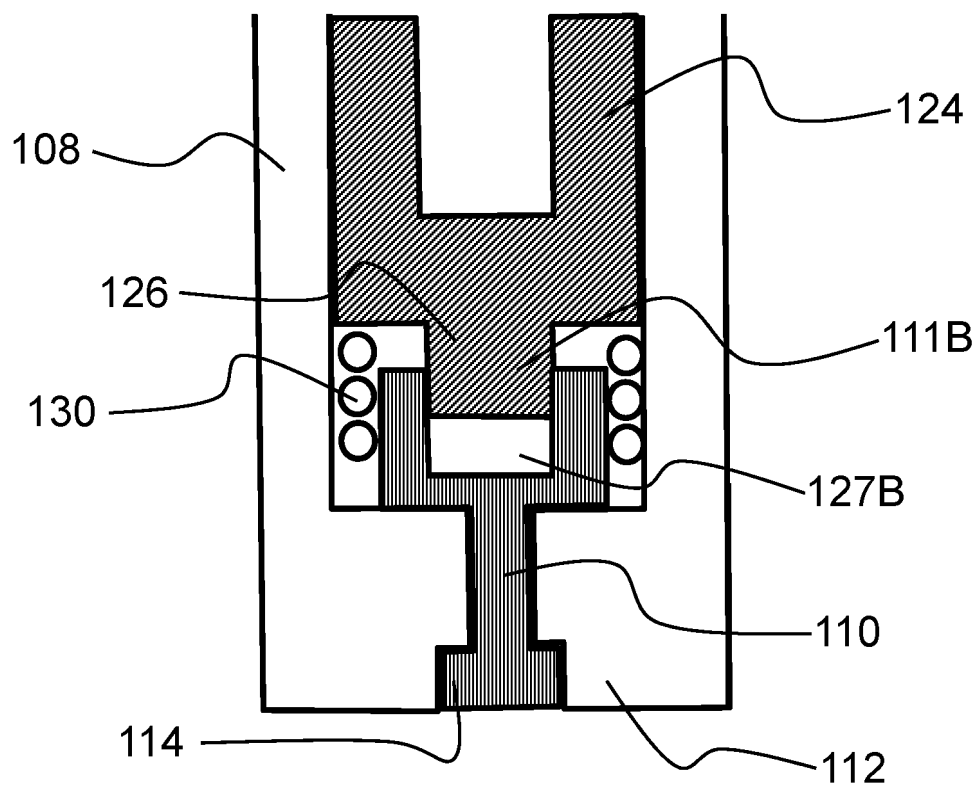


FIG. 6

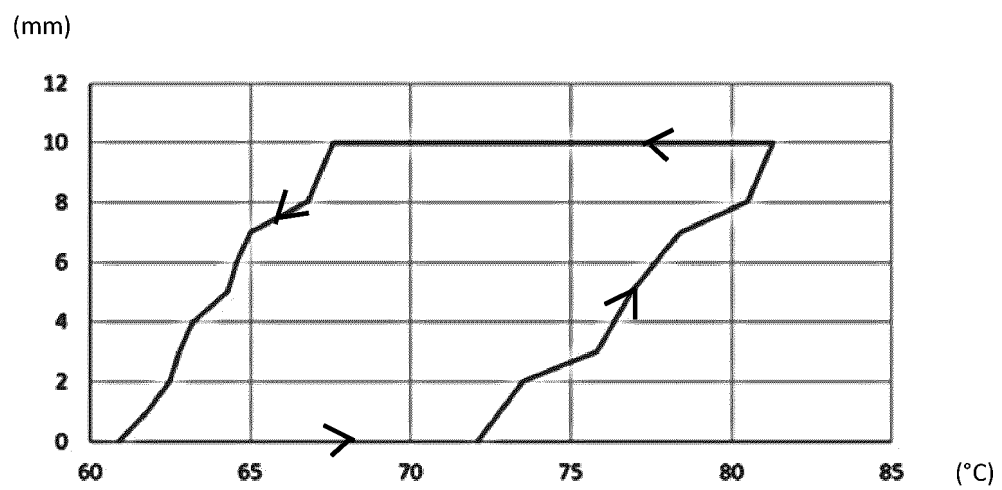


FIG. 7

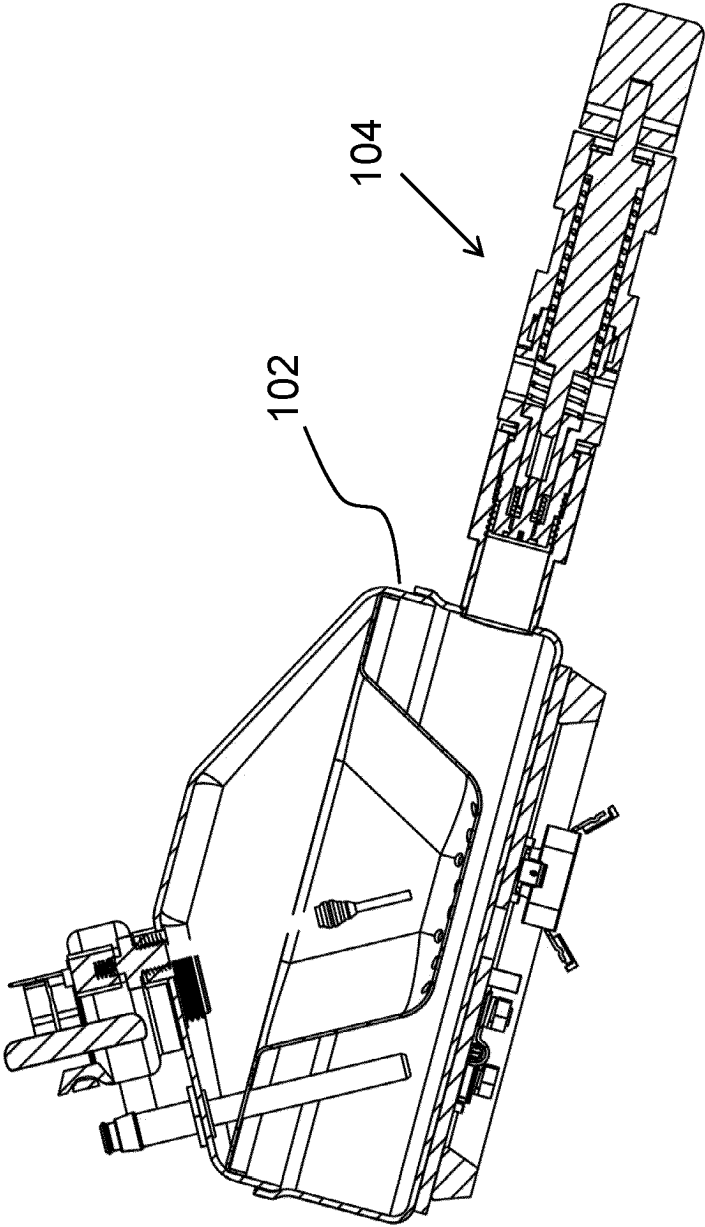


FIG. 8

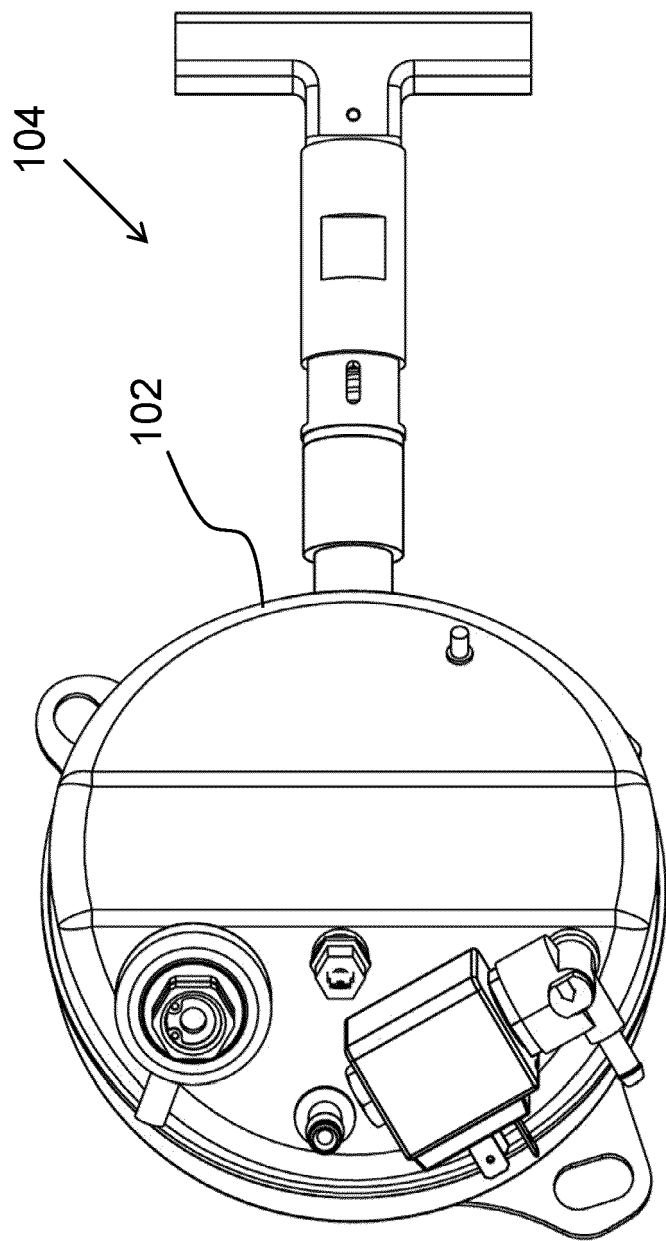


FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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