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(54) **GARMENT STEAMER COMPRISING A PIVOTABLE STEAMER HEAD**

(57) The invention relates to a garment steamer (100) comprising a handle (102) for holding the garment steamer, and a steamer head (104). The steamer head comprises a steam generator (106) for generating steam. At least one electrical wire (118) and/or a water pipe (120) extends between the handle and the steamer head. The

garment steamer further comprises a pivot coupling (PC) connecting the handle and the steamer head. The pivot coupling comprises a pivot shaft (116) having an external curved surface supporting said at least one electrical wire and/or water pipe.

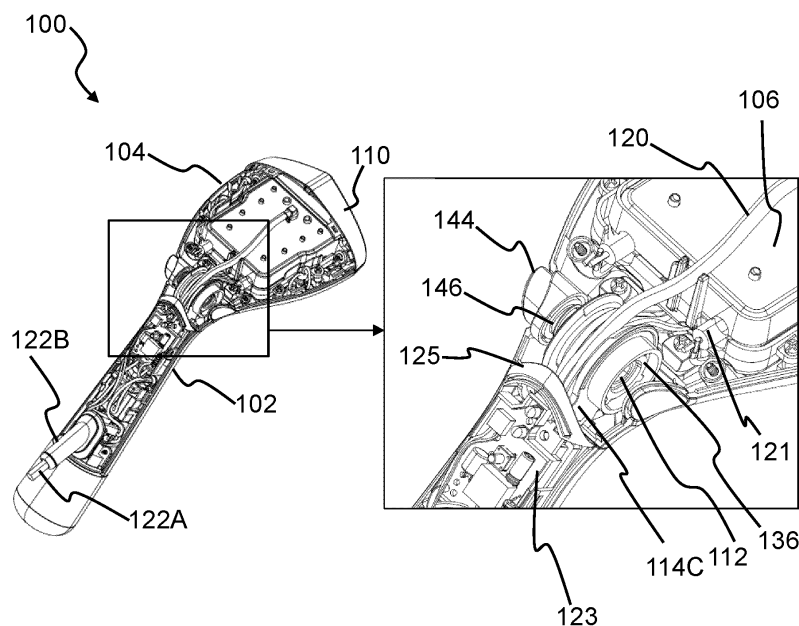


FIG.5

Description

FIELD OF THE INVENTION

[0001] The invention relates to a garment steamer, and in particular to a garment steamer having a handle and a steamer head pivotably attached to the handle.

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

BACKGROUND OF THE INVENTION

[0003] Various types of garment steamer are known for steaming garments to remove creases through the use of heat and moisture provided by steam. Garment steamers typically comprise a handle for holding the garment steamer, and a steamer head attached to the handle. The steamer head comprises a steam generator for generating the steam.

[0004] One type of garment steamer is a handheld garment steamer, in which the steam generator, a water tank for storing water for supplying to the steam generator, and a treatment plate (also referred to as a soleplate, front plate or steaming plate) are integrated into a single portable hand unit.

[0005] The handheld garment steamer is therefore portable, and is typically used to steam a garment vertically hanging from a hanger. Conventional handheld steamers have accordingly been designed with the handle set at an angle with respect to the steamer head to make the garment steamer more comfortable to use/ergonomic when steaming such a hanging garment.

[0006] More recently, garment steamers, and in particular handheld garment steamers, have been offered which can be used for steaming hanging garments and garments laying on a mat or ironing board. However, the angle of the handle relative to the steamer head that is comfortable to use/ergonomic for steaming a garment hanging, e.g. vertically, from a hanger may not be comfortable to use/ergonomic for steaming a garment laying, e.g. horizontally, on a mat or ironing board.

[0007] Some handheld garment steamers have been designed for ironing horizontally in the manner of a traditional steam iron. However, such handheld steamers may not be comfortable to use/ergonomic for steaming a hanging garment.

[0008] Such issues might be addressable by introducing some adjustability into the design of the garment steamer.

[0009] However, this can be challenging because of the risk that the adjustment capability compromises the robustness of the garment steamer, particularly since the user is likely to make repeated adjustments over the operating lifetime of the garment steamer.

OBJECT AND SUMMARY OF THE INVENTION

[0010] It is an object of the invention to propose a gar-

ment steamer that avoids or mitigates the above-mentioned problems.

[0011] The invention is defined by the independent claims. The dependent claims define advantageous embodiments.

[0012] To this end, the garment steamer according to the invention comprises

- a handle for holding the garment steamer,
- a steamer head comprising a steam generator for generating steam,
- at least one electrical wire and/or a water pipe extending between the handle and the steamer head, and
- a pivot coupling connecting the handle and the steamer head, the pivot coupling comprising a pivot shaft having an external curved surface supporting said at least one electrical wire and/or water pipe.

[0013] The pivot coupling can assist the user to select the appropriate angle of the steamer head relative to the handle when, for instance, steaming a garment hanging, e.g. vertically, from a hanger and steaming a garment laying, e.g. horizontally, on a mat or ironing board. This can make the garment steamer more comfortable to use.

[0014] Moreover, by the electrical wire(s) and/or water pipe extending between the handle and the steamer head being supported on the external curved surface of the pivot shaft, the risk of damage to the electrical wire(s) and/or water pipe, e.g. by kinking or pinching, by the pivot coupling is reduced.

[0015] Thus, the garment steamer may be both comfortable to use and robust.

[0016] The pivot coupling preferably comprises at least one pair of opposing flanges projecting away from the external curved surface of the pivot shaft, with the at least one pair of opposing flanges and the external curved surface forming a groove to receive the at least one electrical wire and/or water pipe.

[0017] This groove can assist to guide and protect the electrical wire(s) and/or water pipe extending between the handle and the steamer head such that the risk of damage to the electrical wire(s) and/or water pipe by the pivot coupling is reduced.

[0018] Preferably, the pivot shaft is fixed relative to the steamer head, and the at least one pair of opposing flanges comprises a first pair of opposing flanges which are fixed relative to the pivot shaft.

[0019] In such embodiments, the electrical wire(s) and/or water pipe can be held laterally between the first pair of opposing flanges.

[0020] Preferably, the pivot shaft is fixed relative to the steamer head, and the at least one pair of opposing flanges comprising a second pair of opposing flanges which are fixed relative to the handle and adapted to rotate around the pivot shaft.

[0021] The second pair of opposing flanges can further assist to laterally hold the electrical wire(s) and/or water

pipe in place.

[0022] In embodiments in which both the first and second pairs of opposing flanges are included, the second pair of opposing flanges preferably projects to a height taller than the first pair of opposing flanges.

[0023] The taller second pair of opposing flanges can assist to prevent the electrical wire(s) and/or water pipe escaping from the dedicated path therebetween during assembly of the garment steamer. This can assist to minimize the risk of damage to the electrical wire(s) and/or water pipe, for example via contact with the housing of the garment steamer during its assembly.

[0024] Preferably, the first pair of opposing flanges is sandwiched between the second pair of opposing flanges.

[0025] This may assist to minimize or prevent lateral shifting of the pivot shaft.

[0026] Preferably, the second pair of opposing flanges is attached to the handle via a second member.

[0027] Preferably, the pivot shaft is attached to the steamer head via a first member.

[0028] In some embodiments, the garment steamer comprises a loop member, e.g. a rigid loop member, mounted to the handle, with the loop member defining an aperture through which the at least one electrical wire and/or water pipe extend(s) to reach the external curved surface of the pivot shaft. As well as assisting to guide the electrical wire(s) and/or water pipe onto the external curved surface, the loop member can also assist to protect the electrical wire(s) and/or the water pipe from damage during assembly of the garment steamer.

[0029] The loop member is, for example, connected to the second member.

[0030] This can facilitate assembly of the garment steamer, e.g. relative to the scenario in which the second member and the loop member are separate components.

[0031] In some embodiments, the pivot coupling is adapted to permit pivoting of the steamer head relative to the handle between a first angular position and a second angular position, with the pivot coupling comprising a locking mechanism adapted to releasably lock the pivot coupling in the first angular position and the second angular position.

[0032] For example, the first angular position is for facilitating steaming of a hanging garment, and the second angular position is for facilitating steaming of a garment laying on a mat or ironing board.

[0033] The locking mechanism is preferably formed by:

- a hinge gear comprising a set of teeth, the hinge gear being arranged along a longitudinal axis of the pivot shaft, and
- at least one of the above-mentioned second pair of opposing flanges comprising a first set of slots arranged to receive and engage said set of teeth thereby to lock the pivot coupling in the first angular position, and a second set of slots arranged to receive and engage said set of teeth thereby to lock the pivot

coupling in the second angular position.

[0034] The hinge gear is preferably moveable in a first axial direction to release the set of teeth from the first set of slots or from the second set of slots, and moveable in a second axial direction to engage the set of teeth with the first set of slots or the second set of slots.

[0035] Preferably, the locking mechanism comprises a user-actuable release member, with the hinge gear being moveable via actuation of the user-actuable release member by a user of the garment steamer.

[0036] For example, the user-actuable release member is a push button or a lever.

[0037] The hinge gear is preferably coupled to an additional pivot shaft adapted to translate along the longitudinal axis of the pivot shaft upon actuation of the user-actuable release member by the user.

[0038] This actuation by the user involves, for example, pushing of the above-mentioned push button.

[0039] In some embodiments, the locking mechanism comprises a spring arranged to provide a force on the additional pivot shaft in the second axial direction to retain the set of teeth in and engaging the first set of slots or the second set of slots, with the user-actuable release member being actuable to overcome said force.

[0040] For example, the above-mentioned push button may be pushable to overcome said force.

[0041] Preferably, the garment steamer is a handheld garment steamer.

[0042] For example, the handheld garment steamer is a portable handheld steamer comprising a steam generator, a water tank for storing water for supplying to the steam generator, and a treatment plate in which at least one steam outlet is provided.

[0043] Detailed explanations and other aspects of the invention will be given below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0044] 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 :

Figs.1A and 1B schematically depict a garment steamer according to an example,

Fig.1C provides a cross-sectional view of the garment steamer shown in Figs.1A and 1B,

Fig.2 provides a cross-sectional view showing the interior of a steamer head and part of a handle included in the garment steamer shown in Fig.1C,

Fig.3 provides a perspective view of the interior of part of the handle and the part of the steamer head shown in Fig.1C,

Fig.4 provides an enlarged view of a pivot coupling between the part of the handle and the steamer head shown in Fig.1C,

Fig.5 provides a perspective view of the interior of the garment steamer shown in Fig.1C, with an inset providing an enlarged view showing the pivot coupling supporting electrical wire(s) and a water pipe extending between the steamer head and the handle,

Fig.6 provides a further interior view of the garment steamer shown in Fig.1C,

Fig.7 provides a perspective view showing a handle-attached part of the pivot coupling shown in Figs.4 and 5,

Fig.8 provides a perspective view showing the handle-attached part shown in Fig.7 and a steamer head-attachable part of the pivot coupling,

Fig.9A provides a cutaway view showing an assembled locking mechanism for releasably locking the pivot coupling in different angular positions,

Fig.9B provides a perspective view of part of the locking mechanism shown in Fig.9A,

Fig.10 schematically depicts a stage of assembly of the garment steamer shown in Fig.1C, and

Fig.11 provides a cutaway view showing a portion of the handle-attached part of the pivot coupling shown in Fig.7.

DETAILED DESCRIPTION OF THE INVENTION

[0045] Figs.1A and 1B provide views of a garment steamer 100 comprising a handle 102 for holding the garment steamer 100, and a steamer head 104. The steamer head 104 is connected to the handle 102 by a pivot coupling PC.

[0046] The pivot coupling PC permits pivoting of the steamer head 104 relative to the handle 102. This can assist the user to select the appropriate angle of the steamer head 104 relative to the handle 102 when, for instance, steaming a garment (not shown) hanging, e.g. vertically, from a hanger and steaming a garment laying, e.g. horizontally, on a mat or ironing board.

[0047] Fig.1A shows the garment steamer 100 being upright for steaming a hanging garment, and Fig.1B shows the garment steamer 100 being horizontal for steaming a garment laying on a mat or ironing board.

[0048] Fig.1C provides a cross-sectional view showing the interior of the garment steamer 100.

[0049] Fig.3 provides a perspective view of the interior of part of the handle and the part of the steamer head shown in Fig.1C.

[0050] Fig.5 provides a perspective view of the interior of the garment steamer shown in Fig.1C, with an inset providing an enlarged view showing the pivot coupling supporting electrical wire(s) and a water pipe extending between the steamer head and the handle.

[0051] Fig.6 provides a further interior view of the garment steamer shown in Fig.1C.

[0052] Fig.10 schematically depicts a stage of assembly of the garment steamer shown in Fig.1C.

[0053] Fig.1C in particular shown the steam generator

106 arranged in the steamer head 104. The steam generator 106 generates steam from a water tank 124 arranged in the handle 102.

[0054] In the non-limiting example shown in Figs. 1A to 1C, the steam generated by the steam generator 106 is released from the steamer head 104 via one or more steam outlets 108 provided in a treatment plate 110.

[0055] The treatment plate 110 can be brought into contact with the garment being treated using the garment steamer 100. The angular adjustment of the steamer head 104 relative to the handle 102 enabled by the pivot coupling PC can assist the user to comfortably hold the treatment plate 110 against a garment which is either hanging or laying on a mat or ironing board.

[0056] The treatment plate 110 can be formed of any suitable thermally robust and heat conductive material, such as a metal alloy or a metal, e.g. aluminium.

[0057] The steamer head 104 can function as a casing in which certain components of the garment steamer 100, in particular the steam generator 106, are arranged. To this end, the steamer head 104 can comprise a casing material, i.e. housing, such as an engineering thermoplastic, e.g. polypropylene.

[0058] Similarly, the handle 102 can also function as a casing for some of the components of the garment steamer 100, such as electrical components for controlling the steam generator 106. To this end, the handle 102 can comprise a suitable casing material, such as an engineering thermoplastic, e.g. polypropylene.

[0059] Referring again to Fig.1C, at least one electrical wire(s) 118 and/or a water pipe 120 extend between the handle 102 and the steamer head 104.

[0060] The steam generator 106 comprises an electrical heater 121 for heating the steam generator 106 to vaporize water being introduced into the steam generator to generate steam.

[0061] The heater 121 is supplied in electricity by the electrical wire(s) 118.

[0062] For example, the wire(s) 118 are made of copper with an insulation layer/jacket made of silicone rubber or any suitable material, and their external diameter in the range 1 to 3mm, preferably 2.35mm.

[0063] The steam generator 106 is supplied in water by the water pipe 120 from the water tank 124.

[0064] In other words, water can be supplied from the water tank 124 in the handle 102 to the steam generator 106 in the steamer head 104 via the water pipe 120.

[0065] For example, the water pipe 120 is made silicone or EPDM rubber material, and its external diameter is in the range of 5 to 10mm, preferably 6mm.

[0066] Arranging the water tank 124 in the handle 102, noting that the steam generator 106 is included in the steamer head 104, can provide a favourable balance of weight between the handle 102 and the steamer head 104. In this manner, the centre of gravity of the garment steamer 100 can be closer to where the user grips the garment steamer 100 during steaming of a garment. This may assist the user to manoeuvre the garment steamer

100, particularly when steaming a garment.

[0067] In the non-limiting example shown in Figs.1A to 1C, the garment steamer 100, and in particular the heater 121, is powered by a mains supply of electricity. In this case, the garment steamer 100 comprises a power cord 122A for connecting the garment steamer 100 to the mains supply of electricity.

[0068] The power cord 122A is preferably joined to the handle 102. In the particular example shown in Figs.1A to 1C, the power cord 122A is joined to the handle 102 at or proximal to a lower end of the handle 102, which lower end is distal with respect to the steamer head 104. This can assist the user to manoeuvre the garment steamer 100, particularly when steaming a garment.

[0069] Considering that the heater 121 is arranged in the steamer head 104, the electrical wire(s) 118 accordingly extend, e.g. are routed, between the handle 102 and the steamer head 104. In order to prevent that the electrical wire(s) 118 become kinked or pinched by the pivot coupling PC, in particular due to repeated angular adjustment of the steamer head 104 relative to handle 102 during the operating lifetime of the garment steamer 100, the implementation according to the invention of the pivot coupling PC comprises specific features that will be described in more detail herein below.

[0070] The power cord 122A can be joined to the handle 102, e.g. at or proximal to the lower end of the handle 102, in any suitable manner. In the non-limiting example shown in Figs.1A to 1C, the power cord 122A is joined to the handle 102 via a power cord grommet 122B. The power cord grommet 122B can be formed of any suitable material, such as thermoplastic polyurethane.

[0071] Referring to Fig.1C, the electrical wire(s) 118 in this example connect the heater 121 to a power switch 152 included in the handle 102, which in turn connect to a mains supply of electricity via the power cord 122A. Alternatively, the electrical wire(s) 118 may connect the heater 121 to a control circuitry 123 included in a printed circuit board assembly included in the handle 102, which control circuitry 123 comprises for example a micro-controller and relay.

[0072] Considering that the water tank 124 is arranged in the handle 102, the water pipe 120 accordingly extends, e.g. is routed, between the handle 102 and the steamer head 104.

[0073] In order to prevent the risk that the water pipe 120 becomes damaged due to the pivot coupling PC, the implementation according to the invention of the pivot coupling PC comprises specific features that will be described in more detail herein below.

[0074] The pivot coupling PC accordingly comprises, referring to Figs.2 to 11, a pivot shaft 116 having an external curved surface supporting the electrical wire(s) 118 and/or water pipe 120.

[0075] By guiding the electrical wire(s) 118 and/or water pipe 120 between the handle 102 and the steamer head 104 on the external curved surface of the pivot shaft 116, the risk of damage to the electrical wire(s) 118 and/or

water pipe 120, e.g. by kinking or pinching by the pivot coupling, PC are reduced.

[0076] The guiding of the electrical wire(s) 118 and/or water pipe 120 by the external curved surface of the pivot shaft 116 is apparent in Figs.2 and 3. A portion of the electrical wire(s) 118 and/or a portion of the water pipe 120 can follow the curvature of the external curved surface of the pivot shaft 116 so that the electrical wire(s) 118 and/or water pipe 120 arches or arch over the pivot coupling PC between the handle 102 and the steamer head 104. In the vicinity of the external curved surface of the pivot shaft 116, the portion(s) of the electrical wire(s) 118 and/or water pipe 120 may fold/unfold with pivoting of the steamer head 104 relative to the handle 102.

[0077] The pivot coupling PC preferably comprises at least one pair of opposing flanges 114A/114B, 116A/116B projecting away from the external curved surface of the pivot shaft 116. The at least one pair of opposing flanges and the external curved surface form a groove to receive the electrical wire(s) 118 and/or water pipe 120.

[0078] This groove can assist to guide and protect the electrical wire(s) 118 and/or water pipe 120 extending between the handle 102 and the steamer head 104 such that the risk of damage to electrical wire(s) 118 and/or water pipe 120 by the pivot coupling PC are reduced.

[0079] Preferably, the pivot shaft 116 is fixed relative to the steamer head 104, and the at least one pair of opposing flanges 114A/114B, 116A/116B comprises a first pair of opposing flanges 116A/116B which are fixed relative to the pivot shaft 116. The electrical wire(s) 118 and/or water pipe 120 can thus be held laterally between the first pair of opposing flanges 116A/116B, as best shown in Fig.9A.

[0080] Preferably, the pivot shaft 116 is fixed relative to the steamer head 104, with the at least one pair of opposing flanges 114A/114B, 116A/116B comprising a second pair of opposing flanges 114A/114B which are fixed relative to the handle 102 and adapted to rotate around the pivot shaft 116. The second pair of opposing flanges 114A/114B can further assist to laterally hold the electrical wire(s) 118 and/or water pipe 120 in place, as best shown in Figs.3 and 9A.

[0081] Preferably, the second pair of opposing flanges 114A/114B is attached to the handle 102 via a second member 114C, as best shown in Figs.9A and 11.

[0082] The second pair of opposing flanges 114A/114B and the second member 114C can be formed of any suitable material, such as plastic, metal, or a metal alloy.

[0083] By, for example, the second pair of opposing flanges 114A/114B and/or the second member 114C being formed separately from the casing material of the handle 102, e.g. formed with a more rigid material in comparison to the casing material, the robustness of the attachment of the handle 102 to the steamer head 104 may be enhanced.

[0084] Preferably, the pivot shaft 116 is attached to the steamer head 104 via a first member 116C, as shown in Fig.8.

[0085] The first pair of opposing flanges 116A/116B and the first member 116C can be formed of any suitable material, such as plastic, metal, or a metal alloy.

[0086] The first pair of opposing flanges 116A/116B is preferably sandwiched between the second pair of opposing flanges 114A/114B. This may assist to minimize or prevent lateral shifting of the pivot shaft 116.

[0087] Moreover, such sandwiching may enable the dimensions and/or profile of the groove to be tailored according to, for instance, the electrical wire(s) 118 and/or water pipe 120 intended to be received in the groove.

[0088] In some embodiments, the second pair of opposing flanges 114A/114B project to a height taller than the first pair of opposing flanges 116A/116B. In other words, the second pair of opposing flanges 114A/114B project to a height which is further away from the external curved surface of the pivot shaft 116 than a height to which the first pair of opposing flanges 116A/116B project relative to the external curved surface.

[0089] The taller second pair of opposing flanges 114A/114B can assist to prevent the electrical wire(s) 118 and/or water pipe 120 escaping from the dedicated path therebetween during assembly of the garment steamer 100. This minimizes the risk of damage to the electrical wire(s) 118 and/or water pipe 120, for example via contact with a top housing portion 130 of the steamer head 104, which top housing portion 130 is affixed to a bottom housing portion 128 during assembly of the steamer head 104.

[0090] In the non-limiting example shown in the Figures, the first pair of opposing flanges 116A/116B is sandwiched between the second pair of opposing flanges 114A/114B, and the second pair of opposing flanges 114A/114B has a height taller than the first pair of opposing flanges 116A/116B. Thus, the groove has a narrower portion between the first pair of opposing flanges 116A/116B, and a wider portion where the second pair of opposing flanges 114A/114B project higher than the first pair of opposing flanges 116A/116B.

[0091] The narrower portion, for example, receives the water pipe 120, with the wider portion receiving the electrical wire(s) 118, as shown in Fig.9A. Thus, the first pair of opposing flanges 116A/116B in this example primarily hold the electrical wire(s) 118 therebetween.

[0092] In other examples (not shown), the first and second pairs of opposing flanges project to the same height as each other relative to the external curved surface, for instance to the shorter height of the first pair of opposing flanges in the example depicted in the Figures. This may be sufficient to laterally hold the electrical wire(s).

[0093] In some embodiments, a loop member 125, e.g. a rigid loop member 125, is mounted to the handle 102, with the loop member 125 defining an aperture 126 through which the electrical wire(s) 118 and/or water pipe

120 extend(s) to reach the external curved surface of the pivot shaft 116. In the non-limiting example shown in the Figures, the loop member 125 is connected to the second member 114C. This can facilitate assembly of the garment steamer 100, e.g. relative to the scenario in which the second member 114C and the loop member 125 are separate components.

[0094] As well as assisting to guide the electrical wire(s) 118 and/or the water pipe 120 onto the external curved surface, the loop member 125 can also assist to protect the electrical wire(s) 118 and/or water pipe 120 from damage during assembly of the garment steamer 100.

[0095] In some embodiments, the pivot coupling PC is adapted to permit pivoting of the steamer head 104 relative to the handle 102 between a first angular position and a second angular position, with the pivot coupling PC comprising a locking mechanism adapted to releasably lock the pivot coupling PC in the first angular position and the second angular position.

[0096] For example, the first angular position is for facilitating steaming of a hanging garment, and the second angular position is for facilitating steaming of a garment laying on a mat or ironing board. Changing from the first angular position to the second angular position may, for instance, involve pivoting the steamer head 104 relative to the handle 102 such that the plane of the treatment plate 110 is moved towards or reaches a parallel relationship with an elongation axis of the handle 102, as shown in Fig.1B.

[0097] The locking mechanism can be implemented in any suitable manner, with a non-limiting example being shown in Figs.7 and 8. In embodiments in which the at least one pair of opposing flanges 114A/114B, 116A/116B comprises the second pair of opposing flanges 114A/114 fixed relative to the pivot shaft 116, the locking mechanism can be formed by:

- a hinge gear 136 comprising a set of teeth 138, the hinge gear 136 being arranged along a longitudinal axis of the pivot shaft 116, and
- at least one of the second pair of opposing flanges 114A, 114B comprising a first set of slots 142A arranged to receive and engage said set of teeth 138 thereby to lock the pivot coupling PC in the first angular position, and a second set of slots 142B arranged to receive and engage said set of teeth 138 thereby to lock the pivot coupling PC in the second angular position.

[0098] The hinge gear 136 is preferably moveable in a first axial direction to release the set of teeth 138 from the first set of slots 142A or from the second set of slots 142B, and moveable in a second axial direction to engage the set of teeth 138 with the first set of slots 142A or the second set of slots 142B.

[0099] Preferably, the locking mechanism comprises a user-actuable release member 144, with the hinge

gear 136 being moveable via actuation of the user-actuable release member 144 by a user of the garment steamer 100. The user-actuable release member 144 shown in Figs.7 and 8 takes the form of a push button, although other types of user-actuable release member 144 can be contemplated, such as a lever.

[0100] The hinge gear 136 is preferably coupled to an additional pivot shaft 112 adapted to translate along the longitudinal axis of the pivot shaft 116 upon actuation of the user-actuable release member 144 by the user, for example upon pushing of the above-mentioned push button.

[0101] In some embodiments, the locking mechanism comprises a spring 146 arranged to provide a force on the additional pivot shaft 112 in the second axial direction to retain the set of teeth in and engaging the first set of slots 142A or the second set of slots 142B, with the user-actuable release member 144, e.g. push button, being actuable to overcome said force.

[0102] Actuating the actuable release member 144, e.g. pushing the push button, to overcome the force may therefore release the locking mechanism so that the angular position can be selected. The spring 146 biases the actuable release member 144 back to its unactuated position in which the selected angular position is locked.

[0103] The user-actuable release member 144 can be coupled to the additional pivot shaft 112 in any suitable manner. In the non-limiting example shown in Figs.7 and 8, the user-actuable release member 144, in this case the push button, is coupled to the additional pivot shaft 112 via a connector member 148. In this example, the connector member 148 is fastened to the additional pivot shaft 112 by a fastener 150, e.g. a screw.

[0104] As also shown in Figs.7 and 8, the spring 146 is positioned between the connector member 148 and one of the second pair of opposing flanges 114A.

[0105] In some embodiments, the steamer head 104 comprises a bottom housing portion 128, and a top housing portion 130, as best shown in Fig. 10.

[0106] A range of pivoting of the steamer head 104 relative to the handle 102 is, for instance, defined by movement of the steamer head 104 relative to the handle 102 in a first direction being limited by contact between at least one first stopper portion 132A, 132B and the bottom housing portion 128. Similarly, movement of the steamer head 104 relative to the handle 102 in a second direction opposite to the first direction can be limited by contact between at least one second stopper portion 134A, 134B and the top housing portion 130.

[0107] In such embodiments, the at least one first stopper portion 132A, 132B and the at least one second stopper portion 134A, 134B are provided in the handle 102. For example, the at least one first stopper portion 132A, 132B and the at least one second stopper portion 134A, 134B are included the second member 114C, as best shown in Figs.7, 8, 10 and 11.

[0108] Returning to Figs.1A to 1C, following filling of

the water tank 124, the garment steamer 100 can be used to steam garments. To this end, the garment steamer 100 can be turned on via the power switch 152, e.g. following connecting the garment steamer 100 to a mains supply of electricity via the power cord 122A.

[0109] The steam supply can be controlled via the steam trigger 154. The steam trigger 154 can, for example, be used to control a pump 156 which pumps water from the water tank 124 to the steam generator 106 via the water pipe 120.

[0110] In the non-limiting example shown in the Figures, and particularly Figs. 10 and 11, the steam trigger 154 is assembled from the outside of a bottom handle casing portion 158 and is retained in place by catches. A return spring 160 is used to bias the steam trigger 154 to its starting position.

[0111] 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 steamer, it can be applied to any household device, for example handheld household device, having a steam generator arranged in of first part and rotating relative to a second part. 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 steamer (100) comprising:

- a handle (102) for holding the garment steamer,
- a steamer head (104) comprising a steam generator (106) for generating steam,
- at least one electrical wire (118) and/or a water pipe (120) extending between the handle and the steamer head, and
- a pivot coupling (PC) connecting the handle and the steamer head, the pivot coupling comprising a pivot shaft (116) having an external curved surface supporting said at least one electrical wire (118) and/or water pipe (120).

2. The garment steamer (100) according to claim 1, wherein the pivot coupling (PC) comprises at least one pair of opposing flanges (114A/114B, 116A/116B) projecting away from the external curved surface, the at least one pair of opposing flanges and the curved surface forming a groove to

receive said at least one electrical wire (118) and/or water pipe (120).

3. The garment steamer (100) according to claim 2, wherein:
 - the pivot shaft (116) is fixed relative to the steamer head (104), and
 - the at least one pair of opposing flanges comprises a first pair of opposing flanges (116A/116B) being fixed relative to the pivot shaft (116).
4. The garment steamer (100) according to claim 2, wherein:
 - the pivot shaft (116) is fixed relative to the steamer head (104), and
 - the at least one pair of opposing flanges comprises a second pair of opposing flanges (114A/114B) being fixed relative to the handle (102) and adapted to rotate around said pivot shaft (116).
5. The garment steamer (100) according to claim 4, wherein the second pair of opposing flanges (114A/114B) has a height taller than the first pair of opposing flanges (116A/116B).
6. The garment steamer (100) according to claim 4 or 5, wherein the first pair of opposing flanges (116A/116B) is sandwiched between the second pair of opposing flanges (114A/114B).
7. The garment steamer (100) according to any of claims 4 to 6, wherein the second pair of opposing flanges (114A/114B) is attached to the handle (102) via a second member (114C).
8. The garment steamer (100) according to any of claims 1 to 7, wherein the pivot shaft (116) is attached to the steamer head (104) via a first member (116C).
9. The garment steamer (100) according to any of claims 1 to 8, comprising a loop member (125) mounted to the handle (102), the loop member defining an aperture (126) through which said at least one electrical wire (118) and/or water pipe (120) extend(s) to reach the external curved surface of the pivot shaft (116).
10. The garment steamer (100) according to any one of claims 1 to 9, wherein the pivot coupling (PC) is adapted to permit pivoting of the steamer head (104) relative to the handle (102) between a first angular position and a second angular position, the pivot coupling comprising a locking mechanism adapted to releasably lock the pivot coupling in the first angular

position and the second angular position.

11. The garment steamer (100) according to claim 10 as according to claim 4, wherein the locking mechanism is formed by:
 - a hinge gear (136) comprising a set of teeth (138), the hinge gear being arranged along a longitudinal axis of the pivot shaft (116), and
 - at least one of said second pair of opposing flanges (114A, 114B) comprising a first set of slots (142A) arranged to receive and engage said set of teeth thereby to lock the pivot coupling (PC) in the first angular position, and a second set of slots (142B) arranged to receive and engage said set of teeth thereby to lock the pivot coupling in the second angular position.
12. The garment steamer (100) according to claim 11, wherein the hinge gear (136) is:
 - moveable in a first axial direction to release the set of teeth (138) from the first set of slots (142A) or from the second set of slots (142B), and
 - moveable in a second axial direction to engage the set of teeth (138) with the first set of slots or the second set of slots.
13. The garment steamer (100) according to claim 12, wherein the hinge gear (136) is moveable via a user-actuable release member (144) adapted to be actuated by a user of the garment steamer.
14. The garment steamer (100) according to claim 13, wherein the hinge gear (136) is coupled to an additional pivot shaft (112) adapted to translate along the longitudinal axis of the pivot shaft (116) upon actuation of the user-actuable release member (144) by the user.
15. The garment steamer (100) according to claim 14, wherein the locking mechanism comprises a spring (146) arranged to provide a force on the additional pivot shaft (112) in the second axial direction to retain the set of teeth (138) in and engaging the first set of slots (142A) or the second set of slots (142B), the user-actuable release member (144) being actuable to overcome said force.

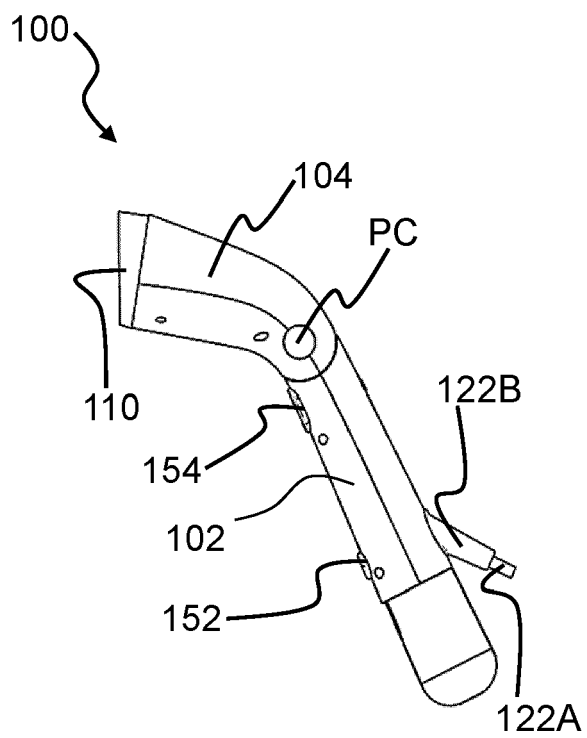


FIG. 1A

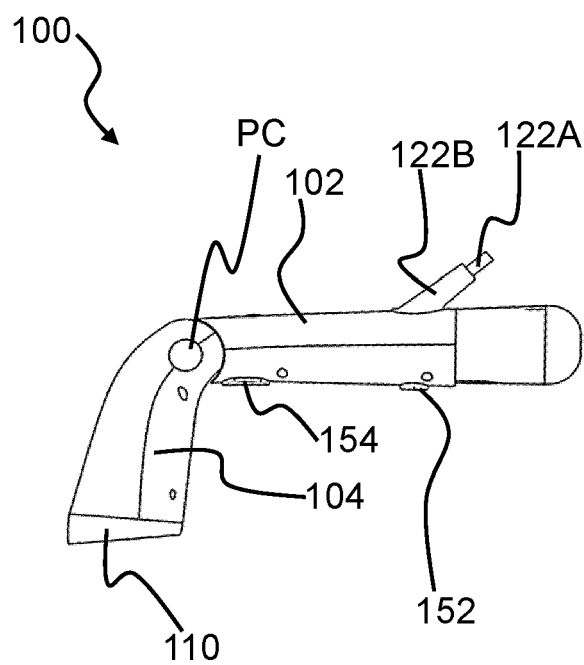


FIG. 1B

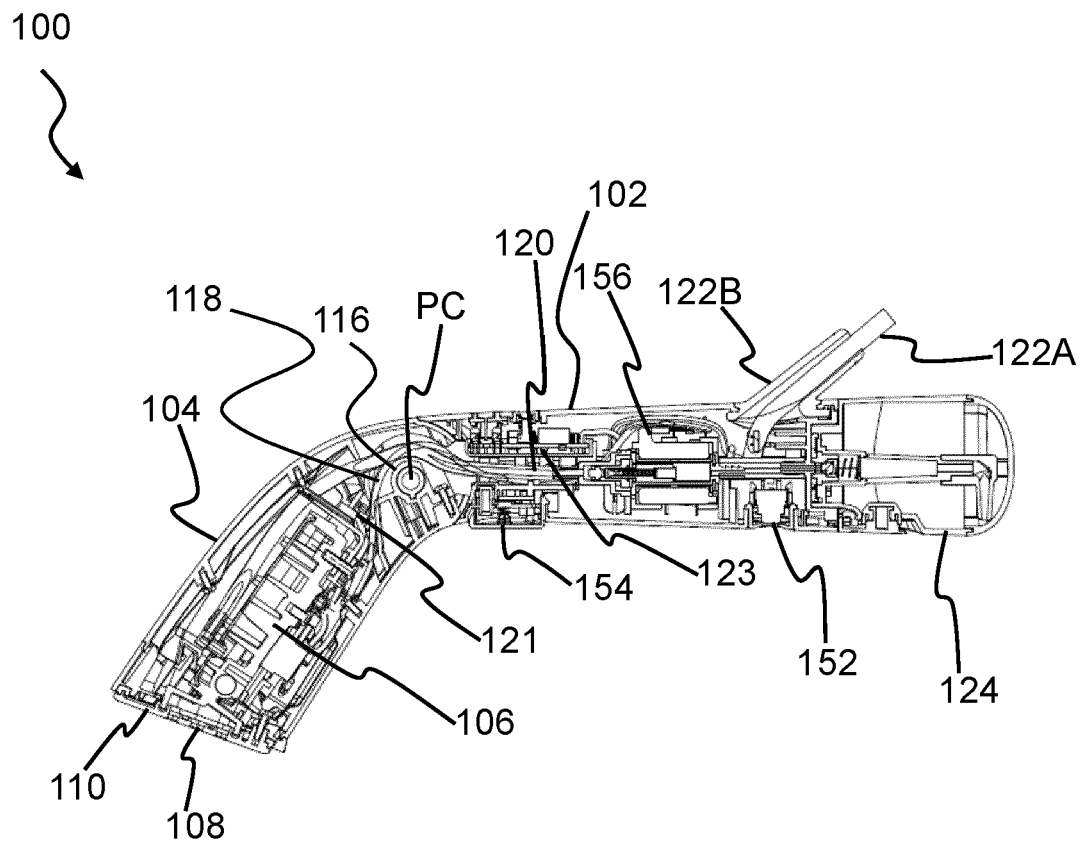


FIG.1C

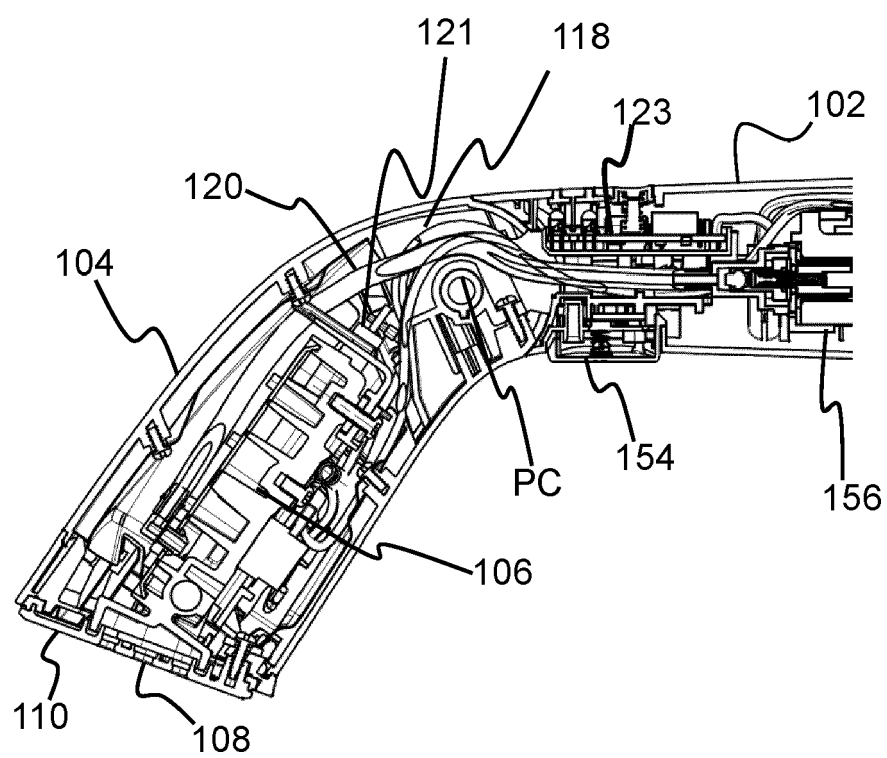


FIG.2

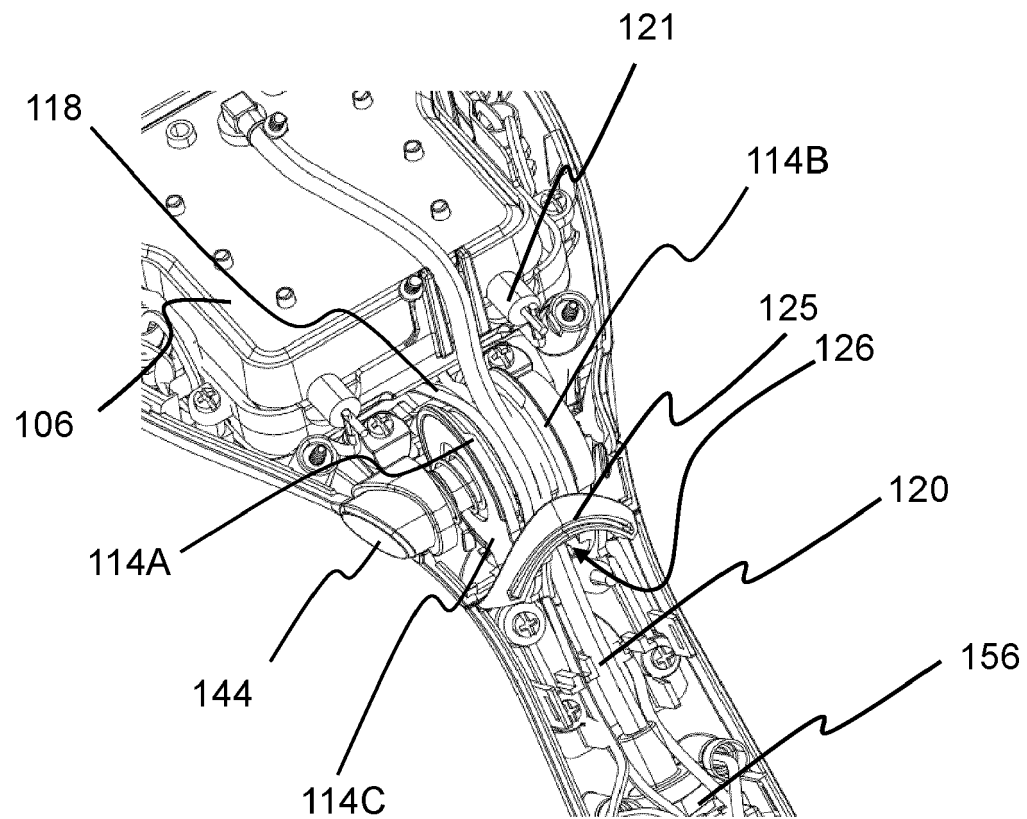


FIG.3

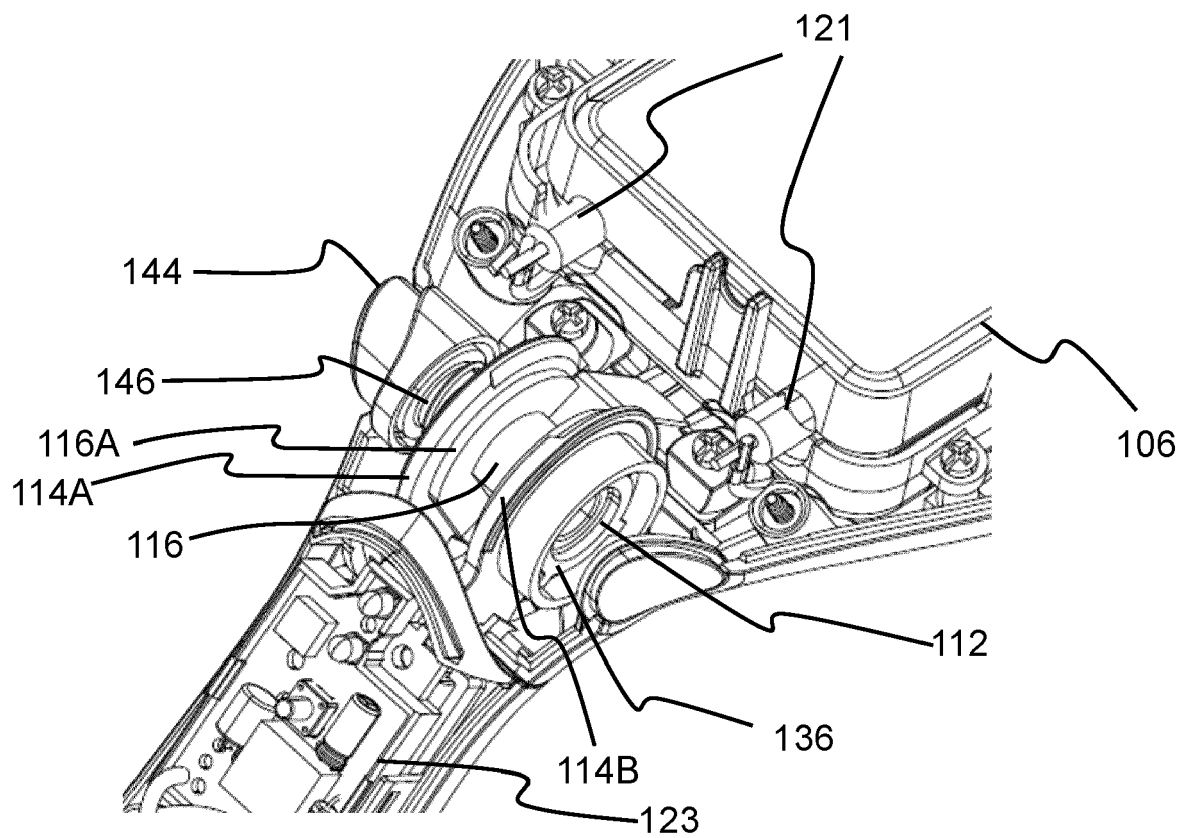


FIG.4

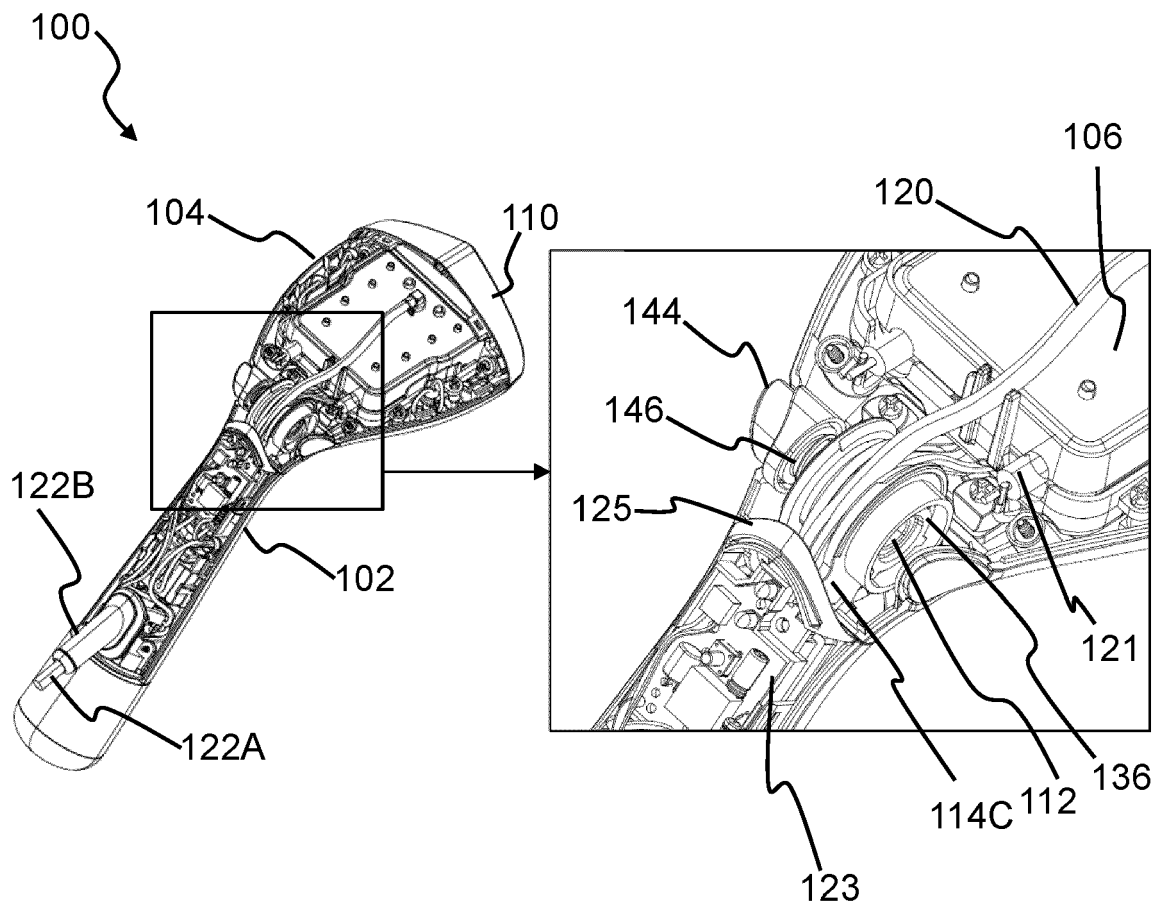


FIG.5

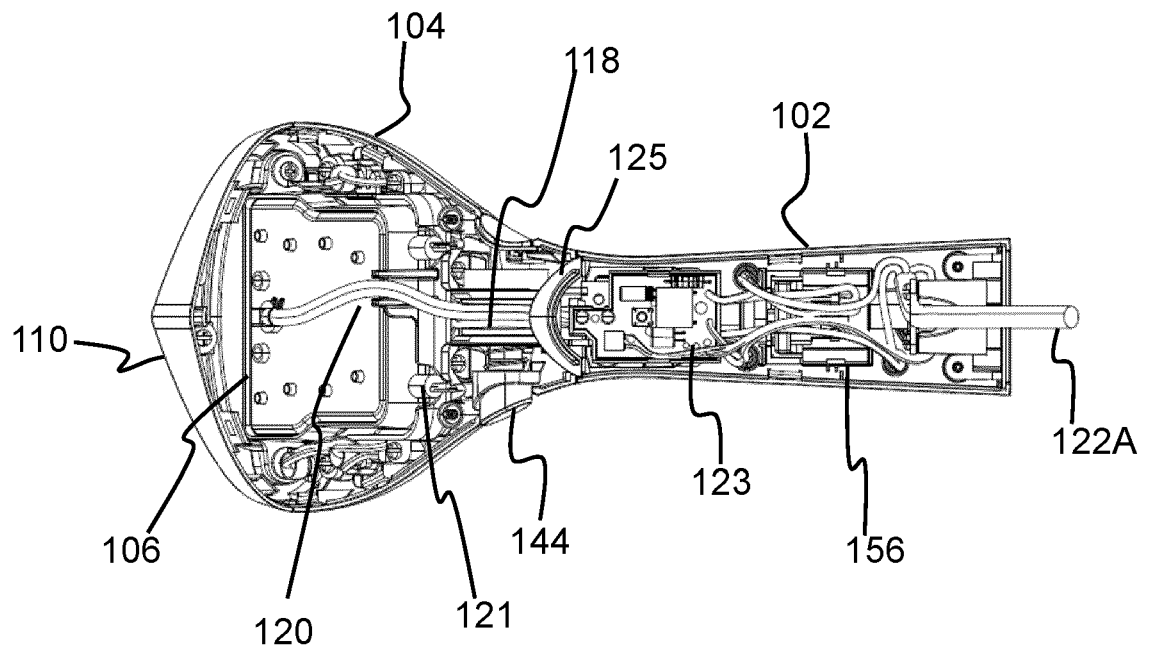


FIG.6

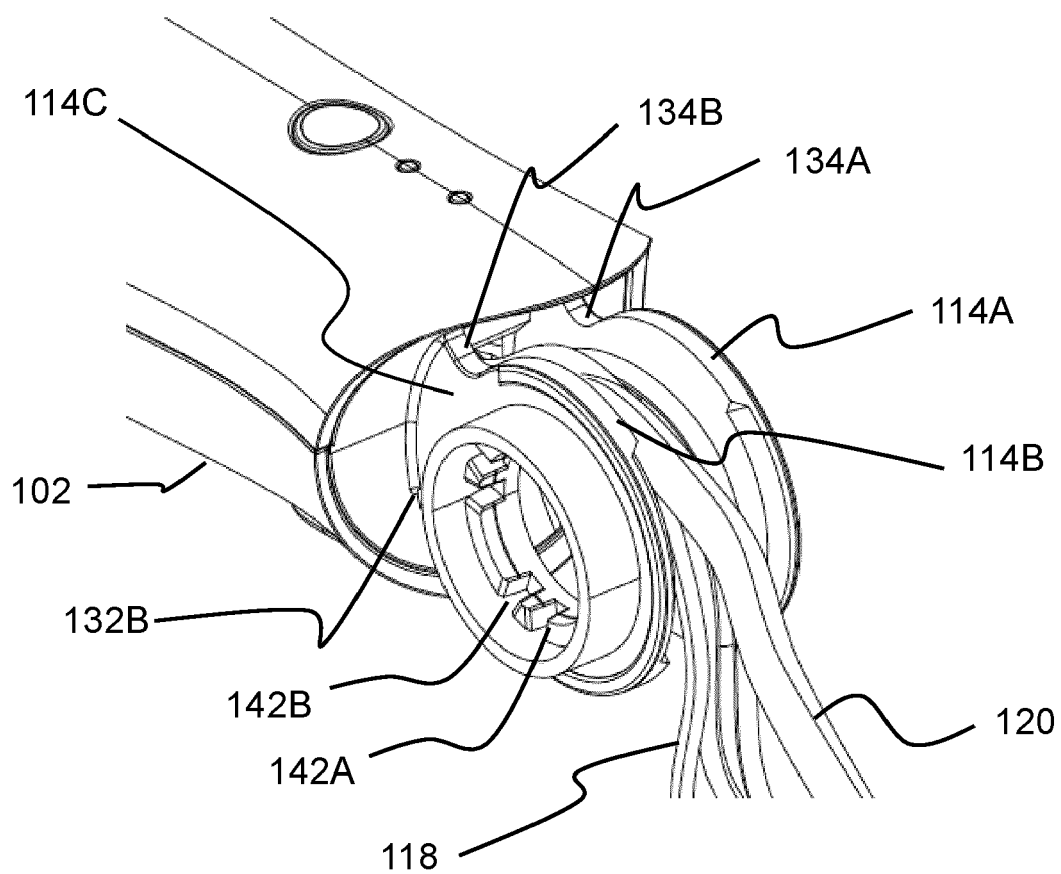


FIG.7

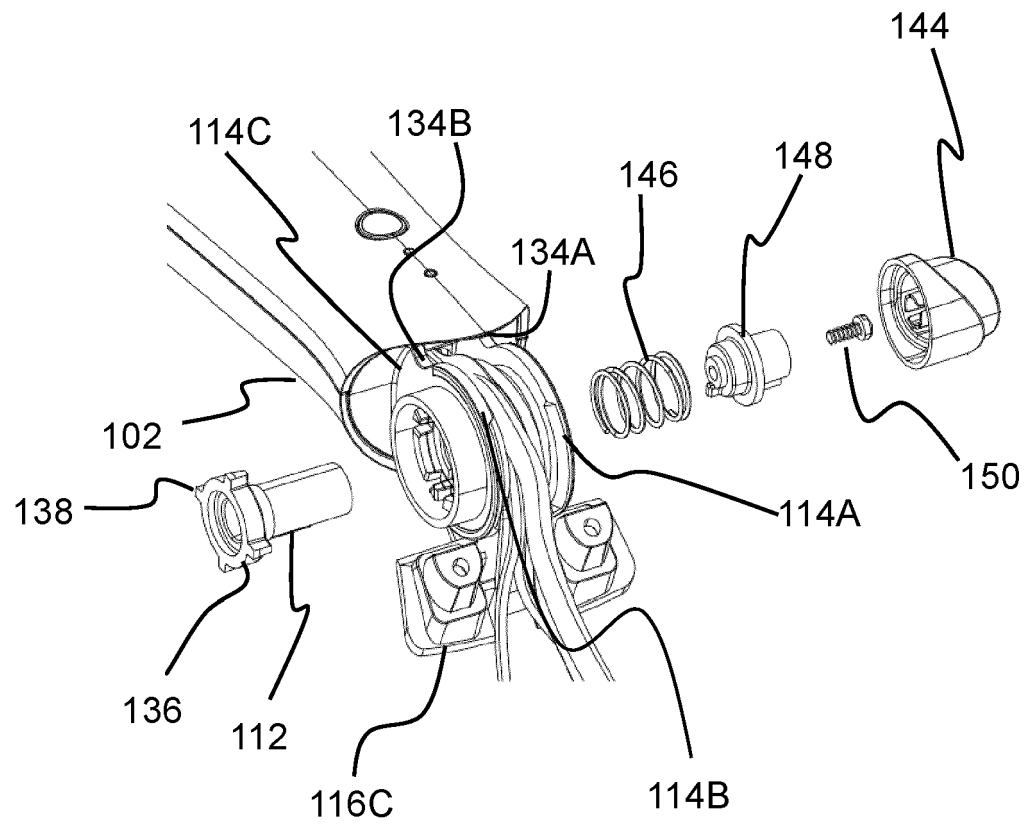


FIG.8

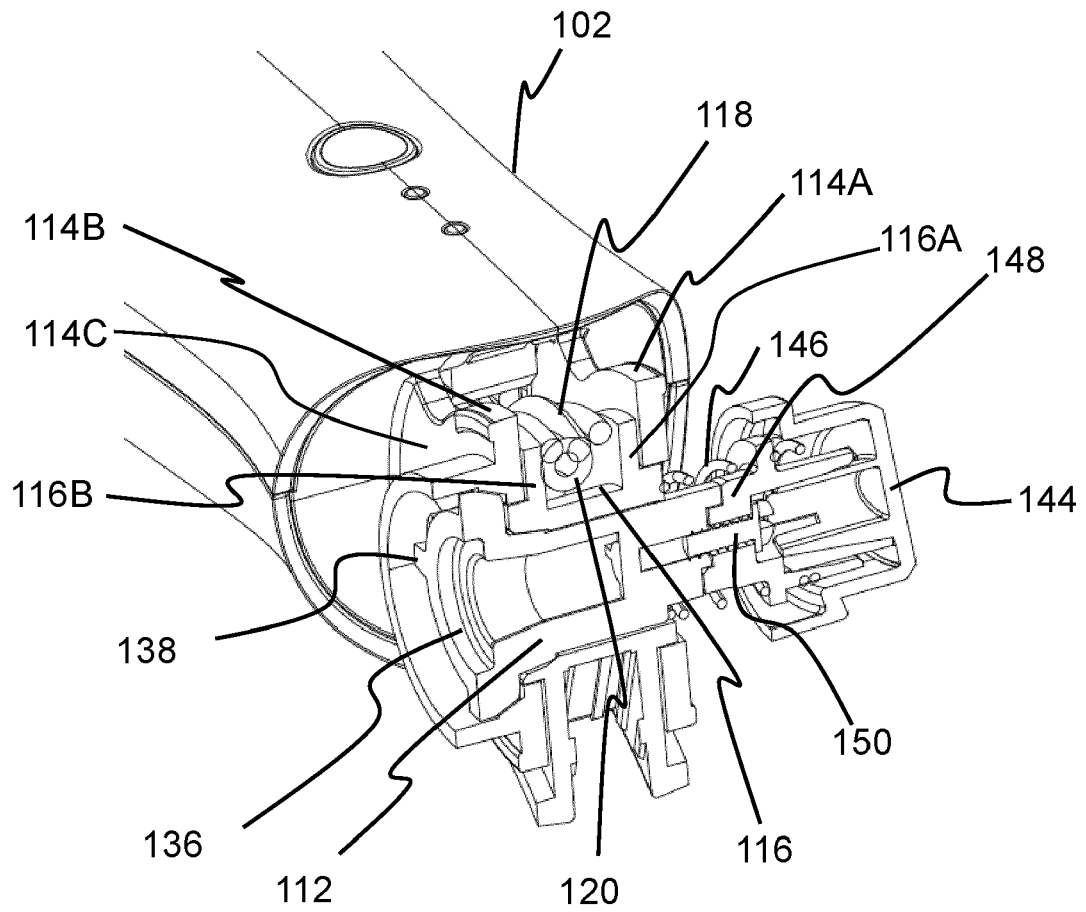


FIG.9A

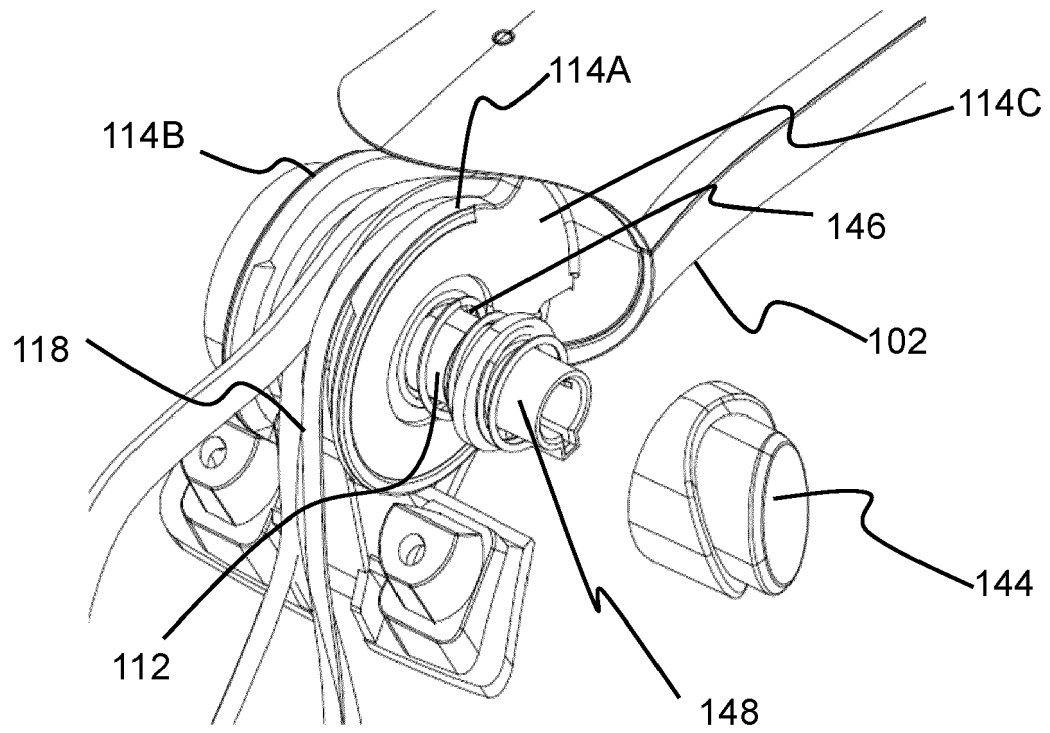


FIG.9B

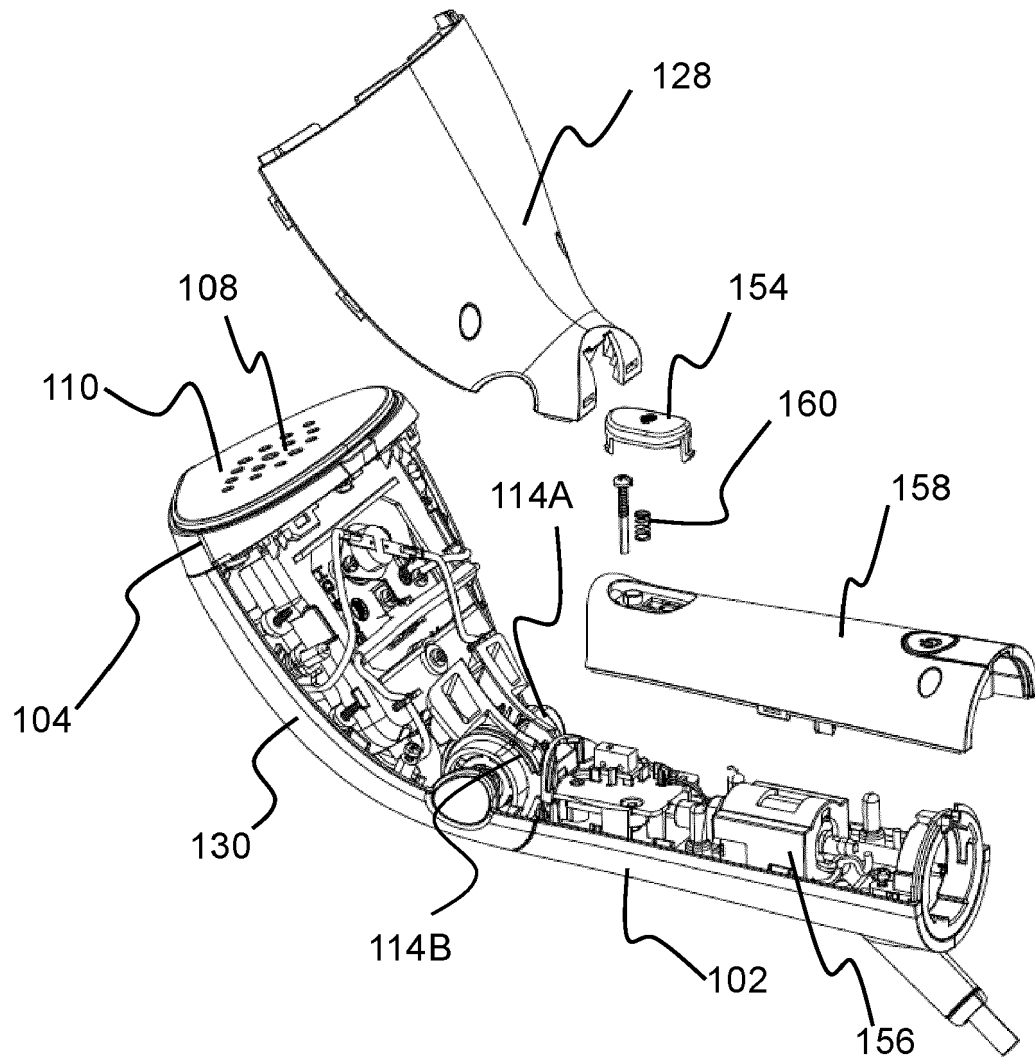


FIG.10

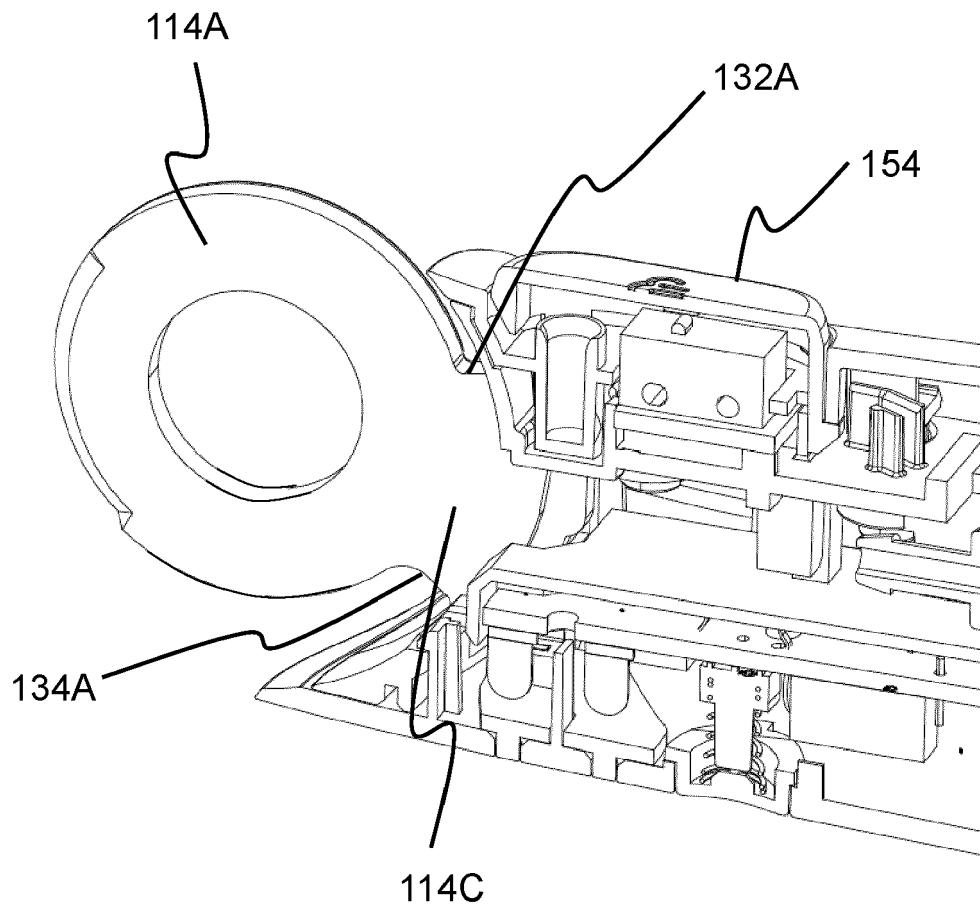


FIG.11



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Application Number

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A	* paragraphs [0029], [0030] * * claims; figures *	3, 4, 9	ADD. D06F75/10
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A	* paragraph [0028] - paragraph [0033] * * claims; figures *	9, 12-15	
X	US 4 571 483 A (FATHI SAUL S [US]) 18 February 1986 (1986-02-18)	1	
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Place of search Munich		Date of completion of the search 14 April 2022	Examiner Popara, Velimir
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