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(54) **GARMENT STEAMER COMPRISING A DETACHABLE WATER TANK**

(57) The invention relates to a garment steamer (100) comprising a handle (110) for holding the garment steamer, a steam generator (102) for generating steam, and a water tank (104) for containing water to be supplied to the steam generator. The water tank is detachable from the handle. The water tank comprises a water inlet (106) for receiving water, a door assembly (108) adapted to take a first position in which the water inlet is fluidly closed, and a second position in which the water inlet is opened. The door assembly and the handle are adapted and cooperate with each other such that the handle maintains the door assembly in the first position when the water tank is attached to the handle.

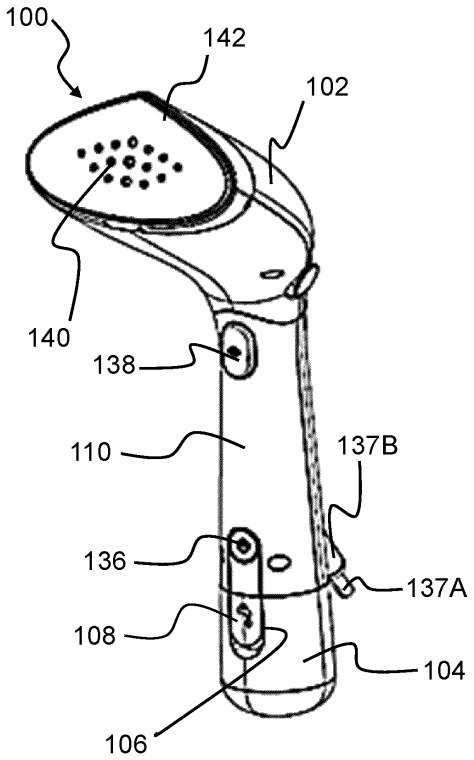

FIG.1A

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Description

FIELD OF THE INVENTION

[0001] The invention relates to a garment steamer, and in particular to the refillable water tank included in such a garment steamer.

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

BACKGROUND OF THE INVENTION

[0003] Various types of garment steamer for treating garments with steam are known. Garment steamers typically comprise a steam generator and a water tank for containing water to be supplied to the steam generator.

[0004] Handheld garment steamers can comprise a steam generator and a detachable water tank integrated into a single portable hand unit. The water tank has a water inlet for permitting filling/refilling and emptying of the water tank. The water inlet can be closed by a door, e.g. a cap, to retain water in the water tank.

[0005] The water tank typically has a base, or bottom end portion. The water inlet is, for example, arranged in the base. Due to limited space at the base of the water tank, the water inlet and the door tend to be relatively small, which can hamper filling/refilling and emptying of the water tank. A more conveniently located water inlet and door, e.g. which permits the water inlet to be made larger, would be desirable for facilitating refilling/filling and emptying of the water tank.

[0006] However, due to the proximity of the water tank relative to the other components, in particular electrical components, of the garment steamer, adjusting the position of the water inlet and door can risk compromising safety due to potential water spillage onto such components. For example, water could be spilled onto a power connection at which a mains power cord is connected to the electronics of the garment steamer. Such water spillage can increase the risk of the user suffering an electric shock and/or damage to the garment steamer.

OBJECT AND SUMMARY OF THE INVENTION

[0007] It is an object of the invention to propose a garment steamer that avoids or mitigates above-mentioned problems.

[0008] The invention is defined by the independent claims. The dependent claims define advantageous embodiments.

[0009] To this end, the garment steamer according to the invention comprises

- a handle for holding the garment steamer,
- a steam generator for generating steam, and
- a water tank for containing water to be supplied to the steam generator, the water tank being detachable from the handle, the water tank comprising:

  i) a water inlet for receiving water,

  ii) a door assembly being adapted to take a first position in which the water inlet is fluidly closed, and a second position in which the water inlet is opened, the door assembly and the handle being adapted and cooperating with each other such that the handle maintains the door assembly in the first position when the water tank is attached to the handle.

[0010] Thus, the user is first required to detach the water tank from the handle in order to be able to fill/refill the water tank via the water inlet. This may assist to improve user safety because the risk of splashing of the handle of the garment steamer, which can include electrical components for operation of the steam generator, while filling/refilling or emptying the water tank is lessened.

[0011] The door assembly and the handle are, in at least some embodiments, adapted and cooperate with each other such that the door assembly is immobilized in the first position when the water tank is attached to the handle, with the door assembly being permitted to move to expose the water inlet when the water tank is detached from the handle.

[0012] The second position can, for instance, be a fully open position in which the door assembly is moved to completely expose the water inlet.

[0013] Preferably, the door assembly is pivotable relative to the water tank to expose the water inlet when the water tank is detached from the handle.

[0014] Such a pivotable door assembly may facilitate filling/refilling and emptying of the water tank when the water tank is detached from the handle. The pivotable door assembly can provide easier access to fill/refill and empty the water tank than, for instance, a screw cap which requires multiple turns to remove.

[0015] In some embodiments, the handle comprises a portion arranged to contact a part of the door assembly such that the door assembly is immobilized in the first position when the water tank is attached to the handle.

[0016] This portion of the handle can be regarded as a stopper element which, when the water tank is attached to the handle, immobilizes the door assembly in the first position.

[0017] In embodiments in which the door assembly is pivotable relative to the water tank, the portion is preferably defined by an edge portion of the handle, with the edge portion abutting the part of the door assembly to prevent pivoting of the door assembly from the first position when the water tank is attached to the handle.

[0018] In some embodiments, the water tank comprises:

- an upper end portion to which the handle is detachably coupled,
- a bottom end portion opposite the upper end portion, and
- a side portion extending between the upper end por-

tion and the bottom end portion, with the water inlet being arranged in said side portion.

[0019] Arranging the water inlet in the side portion of the water tank can facilitate filling/refilling and emptying, for example by permitting the water inlet to be made larger than if the water inlet were to be arranged in one of the end portions. However, a side portion-arranged water inlet can risk damage to the garment steamer and/or safety issues when such a water inlet is openable to admit water while the water tank remains attached to the handle. Accordingly, the side portion-arranged water inlet, in the case of the present disclosure, is advantageously enabled by such filling/refilling or emptying being required to take place when the water tank is detached from the handle.

[0020] Preferably, the door assembly comprises a seal member for sealing the water inlet when the door assembly is in the first position.

[0021] In some embodiments, the door assembly comprises a door and a seal member attached to the door for sealing the water inlet when the door assembly is in the first position.

[0022] The seal member can assist the door assembly to fluidly close the water inlet when the door assembly is in the first position.

[0023] The seal member is preferably formed from an elastomeric material. Such an elastomeric material can resiliently deform, and thereby assist the door assembly to fluidly close the water inlet when the door assembly is in the first position.

[0024] In some non-limiting examples, the seal member comprises a protrusion, and the door door comprises an engagement member whose shape complements the protrusion thereby to engage and receive the seal member.

[0025] Preferably, the seal member further comprises an outer groove adapted to match an inner periphery of the water inlet.

[0026] By the outer groove matching the inner periphery of the water inlet, the sealing of the water inlet in the first position can be improved. For example, the outer groove extends around an outer periphery of the seal member.

[0027] The outer groove can, for instance, extend around the protrusion.

[0028] The outer groove can enhance the capability of the seal member to deform/flex when the door assembly is being opened, thereby reducing the risk of the seal member becoming detached from the door. The outer groove also improves the sealing of the water inlet in the first position, as explained above.

[0029] In some embodiments, the garment steamer comprises a threaded coupling or a bayonet coupling for detachably coupling the water tank and the handle.

[0030] Such a coupling can assist to minimise the risk of the water tank becoming dislodged, or unintentionally disconnected from the handle, if the user attempts to force the door assembly open, e.g. to the second position, without first detaching the water tank from the handle.

[0031] Preferably, the garment steamer is a handheld garment steamer.

[0032] For example, the steam generator and the detachable water tank are integrated into a single portable hand unit when the garment steamer is such a handheld garment steamer.

[0033] Detailed explanations and other aspects of the invention will be given below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0034] 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 depict a garment steamer according to an example,
Figs.2A and 2B depict a water tank of the garment steamer shown in Figs. 1A and 1B,
Figs.3A and 3B depict the garment steamer shown in Figs.1A and 1B with the water tank detached,
Figs.4A and 4B provide cross-sectional views of part of the garment steamer shown in Figs. 1A and 1B,
Fig.5 provides the view of Fig.4B with an inset providing an enlarged view of a door assembly in a first, closed, position, and
Fig.6 provides an enlarged view of the door assembly in a second, open, position.

DETAILED DESCRIPTION OF THE INVENTION

[0035] Figs.1A and 1B provide views of a garment steamer 100 comprising a steam generator 102 for generating steam. The garment steamer 100 further comprises a water tank 104 for containing water to be supplied to the steam generator.

[0036] Water can be transported from the water tank 104 to the steam generator via a suitable water dosing assembly (not visible in Figs. 1A and 1B).

[0037] The water tank 104 has a water inlet 106 for receiving water. Thus, the water tank 104 can be filled/refilled, and also emptied, via the water inlet 106.

[0038] Referring to Figs.2A and 2B, the water tank 104 also comprises a door assembly 108, 109 adapted to take a first position P1 in which the water inlet 106 is fluidly closed, and a second position P2 in which the water inlet 106 is opened.

[0039] Preferably, the door assembly 108, 109 comprises a seal member 109 for sealing the water inlet 106 when the door assembly is in the first position P1. The seal member 109 can thus assist the door assembly 108, 109 to fluidly close the water inlet 106 when the door assembly 108, 109 is in the first position P1.

[0040] The seal member109 can be formed of any suit-

able material capable of minimising or preventing water leakage from the water tank via the water inlet 106 when the door assembly 108, 109 is in the first position P1. For example, the seal member is formed from an elastomeric material, such as rubber, e.g. silicone rubber.

[0041] The door assembly 108, 109 can include, or in some examples be, a door 108.

[0042] The above-described seal member 109 can, for instance, be secured to the door 108, as will be explained in more detail herein below.

[0043] The door 108 can be formed of any suitable material, such as a plastic material, e.g. an engineering thermoplastic.

[0044] Referring again to Figs.1A and 1B, the garment steamer 100 comprises a handle 110. The handle 110 permits the user to hold the garment steamer 100.

[0045] The handle 110 can also function as a casing for some of the components, in particular electrical components for controlling the steam generator 102. To this end, the handle 110 can comprise a suitable casing material, such as an engineering thermoplastic.

[0046] In at least some embodiments, the garment steamer 100 is a handheld garment steamer.

[0047] For example, the steam generator 102 and the water tank 104 are integrated into a single portable hand unit when the garment steamer 100 is such a handheld garment steamer.

[0048] More generally, the water tank 104 is detachable from the handle 110.

[0049] Figs.1A and 1B show the garment steamer 100 with the water tank 104 attached to the handle 110. Figs. 2A and 2B depict the water tank 104 detached from the handle 110. Figs.3A and 3B show the garment steamer 100 without the water tank 104, in other words after detachment of the water tank 104.

[0050] Detachably coupling the water tank 104 and the handle 110 can be achieved in any suitable manner. Preferably, a threaded coupling or a bayonet coupling detachably couples the water tank 104 and the handle 110.

[0051] Such a bayonet coupling is employed in the non-limiting example depicted in the Figures. In this case, coupling members 112A, 112B are provided at an upper end portion 114A of the water tank 104, as shown in Figs. 2A and 2B. These coupling members 112A, 112B each engage with one of the complementary slots 116A, 116B provided at a lower end 118 of the handle 110, as shown in Fig.3B. Fig.4A shows the water tank 104 attached to the handle 110 by the coupling members 112A, 112B engaging the slots 116A, 116B.

[0052] Numerous alternative ways of detachably coupling the water tank 104 and the handle 110 are conceivable, such as a bayonet coupling with the coupling members being instead provided at the lower end 118 of the handle 110, and the slots being provided at the upper end portion 114A of the water tank 104.

[0053] More generally, the door assembly 108, 109 and the handle 110 are adapted and cooperate with each other such that the handle 110 maintains the door assembly 108, 109 in the first position P1 when the water tank 104 is attached to the handle 110.

[0054] Thus, the user is first required to detach the water tank 104 from the handle 110 in order to be able to fill/refill and empty the water tank 104 via the water inlet 106. This may assist to improve user safety because the risk of splashing of the handle 110 of the garment steamer 100, which can include electrical components for operation of the steam generator 102, while filling/refilling and emptying the water tank 104 is lessened.

[0055] The door assembly 108, 109 can be regarded as cooperating with the handle 110 of the garment steamer 100 such that the door assembly 108, 109 cannot be opened while the water tank 104 is attached thereto.

[0056] In other words, the door assembly 108, 109 and the handle 110 are, in at least some embodiments, adapted and cooperate with each other such that the door assembly 108, 109 is immobilized or locked in the first position when the water tank 104 is attached to the handle 110, with the door assembly 108, 109 being permitted to move to expose the water inlet 106 when the water tank 104 is detached from the handle 110.

[0057] When, for example, the water tank 104 is coupled to the handle 110 via the above-described threaded or bayonet coupling, such a coupling can assist to minimise the risk of the water tank 104 becoming dislodged, or unintentionally disconnected from the handle 110, if the user attempts to force the door assembly 108, 109 open, e.g. to the second position P2, without first detaching the water tank 104 from the handle 110.

[0058] In some embodiments, the water tank 104 comprises the upper end portion 114A, a bottom end portion 114B opposite the upper end portion 114A, and a side portion 120 extending between the upper and bottom end portions 114A, 114B. In such embodiments, the water inlet 106 is preferably arranged in the side portion 120.

[0059] Arranging the water inlet 106 in the side portion 120 of the water tank 104 can facilitate filling/refilling and emptying, for example by permitting the water inlet 106 to be made larger than if the water inlet were to be arranged in one of the end portions 114A, 114B.

[0060] However, a side portion-arranged water inlet 106 can risk damage to the garment steamer 100 and/or safety issues when such a water inlet 106 is openable to admit or release water while the water tank 104 remains attached to the handle 110. Accordingly, the side portion-arranged water inlet 106 in the case of the present disclosure is advantageously enabled by such filling/refilling or emptying being required to take place when the water tank 104 is detached from the handle 110.

[0061] The water tank 104 is preferably axially symmetric, or substantially axially symmetric, about an axis A1 extending towards the handle 110 through the centre of the water tank 104. For reference, the axis A1 is shown in Fig.1B.

[0062] The term "substantially axially symmetric" may reflect the presence of the water inlet 106 and the door assembly 108, 109, for example at the above-described

side portion 120 of the water tank 104, which may disrupt the axial symmetry without altering the overall shape of the water tank 104.

[0063] The door assembly 108, 109 is preferably arranged at or proximal to the upper end portion 114A of the water tank 104 where the water tank 104 attaches to the handle 110. This arrangement is facilitated by the above-described adaptation and cooperation of the water tank 104 and the handle 110 because the latter alleviates the potential safety risk, for example of electric shock, associated with water spill onto components, such as a power connection, proximal to the upper end portion 114A of the water tank 104.

[0064] Preferably, the door assembly 108, 109 is rotatable. In particular, the door assembly 108, 109 is preferably pivotable relative to the water tank 104 to expose the water inlet 106 when the water tank 104 is detached from the handle 110.

[0065] Such a pivotable door assembly 108, 109 may facilitate filling/refilling and emptying of the water tank 104 when the water tank 104 is detached from the handle 110. The pivotable door assembly 108, 109 can provide easier access to fill/refill the water tank 104 than, for instance, a screw cap which requires multiple turns to remove.

[0066] For example, the door assembly 108, 109 is pivotable such that the door assembly 108, 109 swings outwardly away from the water tank 104, as shown in Fig.2B.

[0067] Referring to Figs.2B, 5 and 6, the water tank 104 preferably comprises a tank housing 122, and a pivot coupling 124 pivotably couples the door assembly 108, 109 to the tank housing 122.

[0068] The pivot coupling 124 is thus arranged to permit pivoting, e.g. outward pivoting away from the water tank 104, of the door assembly 108, 109 relative to the tank housing 122 to expose the water inlet 106 when the water tank 104 is detached from the handle 110.

[0069] In some embodiments, the handle 110 comprises a portion 126 arranged to contact a part 128 of the door assembly 108, 109 such that the door assembly 108, 109 is immobilized in the first position P1 when the water tank 104 is attached to the handle 110.

[0070] This portion 126 of the handle 110 can be regarded as a stopper element which, when the water tank 104 is attached to the handle 110, immobilizes the door assembly 108, 109 in the first position P1, as shown in Fig.5.

[0071] In embodiments, such as in the non-limiting example depicted in the Figures, in which the door assembly 108, 109 is pivotable relative to the water tank 104 to expose the water inlet 106, the portion 126 can be defined by an edge portion of the handle 110. This edge portion 126 abuts the part 128 of the door assembly 108, 109 to prevent pivoting of the door assembly 108, 109 from the first position P1 to expose the water inlet 106 when the water tank 104 is attached to the handle 110.

[0072] As shown in Fig.6, when the water tank 104 is detached from the handle 110, the edge portion 126 of the handle 110 no longer abuts the part 128 of the door assembly 108, 109, and the door assembly 108, 109 can correspondingly be moved, in this case pivoted, to expose the water inlet 106. Thus, the door assembly 108, 109 can take the second position P2.

[0073] The part 128 of the door assembly 108, 109 can be in contact with the edge portion 126 of the handle 110 when the water tank 104 is attached to the handle 110. However, due to manufacturing tolerances of the door assembly 108, 109 and various parts that form the edge portion 126 of the handle 110, there could be a relatively small gap between the part 128 and the edge portion 126. However, this relatively small gap does not hamper the function of the edge portion 126 and the part 128 to prevent movement, e.g. pivoting, of the door assembly 108, 109 from the first position P1 to expose the water inlet 106 when the water tank 104 is attached to the handle 110.

[0074] In the non-limiting example depicted in the Figures, the pivot coupling 124 is positioned proximal to the upper end portion 114A, and arranged such that the door assembly 108, 109 swings or rotates outwards from the water tank 104 and upwards towards the upper end portion 114A when the door assembly 108, 109 is moving from the first, fully/fluidly closed, position P1 to the second, open, position P2. The edge portion 126 is included in the lower end 118 of the handle 110.

[0075] By the part 128, in this case a top part 128, of the door assembly 108, 109 being in contact with the edge portion 126, or the above-described relatively small gap being present between the top part 128 and the edge portion 126, opening of the door assembly 108, 109 when the water tank 104 is attached to the handle 110 is prevented. In other words, the user has to detach the water tank 104 from the handle 110 in order to access the water inlet 106 for filling/refilling or emptying the water tank 104.

[0076] More generally, the second position P2 can be regarded as a position in which the door assembly 108, 109 is moved sufficiently to expose the water inlet 106 for filling/refilling and emptying the water tank 104.

[0077] The second position P2 can, for instance, be a fully open position in which the door assembly 108, 109 is moved to completely expose the water inlet 106. An example of this is depicted in Fig.6.

[0078] In some non-limiting examples, the door assembly 108, 109 further comprises a door holding member (not shown) arranged to maintain the door assembly 108, 109 in an open position, such as the fully open position shown in Fig.6 or a partially open position intermediate between the first, closed, position P1 and the fully open position. Such a door holding member can improve user convenience due to the user not being required to themselves hold the door assembly 108, 109 open during filling/refilling or emptying of the water tank 104.

[0079] For example, the door holding member comprises, or is in the form of, a protrusion arranged such that a portion of the door assembly 108, 109 rests against the protrusion while the door assembly 108, 109 is in the

open position, such as the second position P2, to maintain the door assembly 108, 109 in the open position. The protrusion still permits the door assembly 108, 109 to be moved, e.g. pivoted, towards the open or closed positions by manual forcing of the portion of the door assembly 108, 109 past the protrusion.

[0080] In some embodiments, such as the non-limiting example depicted in the Figures, the seal member 109 comprises a protrusion 130, and the door 108 includes an engagement member 132 whose shape complements the protrusion 130 thereby to engage and receive the seal member 109.

[0081] Preferably, the seal member 109 further comprises an outer groove 134 adapted to match, e.g. follow the shape of, an inner periphery of the water inlet 106.

[0082] By the outer groove 134 matching the inner periphery of the water inlet 106, the sealing of the water inlet 106 in the first position P1 can be improved. For example, the outer groove 134 extends around an outer periphery of the seal member 109.

[0083] The outer groove 134 can, for instance, extend around the protrusion 130.

[0084] The outer groove 134 can enhance the capability of the seal member 109 to deform/flex when the door assembly 108, 109 is being opened, thereby reducing the risk of the seal member 109 becoming detached from the door 108.

[0085] Returning to Figs. 1A and 1B, following filling of the water tank 104, closure of the door assembly 108, 109, and attachment of the water tank 104 to the handle 110, the garment steamer 100 can be used to steam garments.

[0086] To this end, the garment steamer 100 can be turned on via the power switch 136, e.g. following connecting the garment steamer 100 to a mains supply of electricity via power cord 137A.

[0087] In the non-limiting example shown in the Figures, the power cord 137A connects to the handle 110 via a power cord grommet 137B. The power cord grommet 137B can be formed of any suitable material, such as thermoplastic polyurethane.

[0088] The steam supply can be controlled via the steam trigger 138, and the steam generated by the steam generator 102 is supplied to the garment(s) being steamed via one or more steam outlets 140 provided in a treatment plate 142.

[0089] Part of the above-mentioned water dosing assembly is visible in Figs.4A, 4B, 5 and 6, in the form of a valve arrangement 144. In this example, the valve arrangement 144 comprises a ball valve, included in the water tank 104, for controlling the flow of water therefrom towards the steam generator 102.

[0090] 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 detachable water tank. 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 (110) for holding the garment steamer,
- a steam generator (102) for generating steam, and
- a water tank (104) for containing water to be supplied to the steam generator, the water tank being detachable from the handle, the water tank comprising:

  i) a water inlet (106) for receiving water,
  ii) a door assembly (108, 109) being adapted to take a first position (P1) in which the water inlet is fluidly closed, and a second position (P2) in which the water inlet is opened,

the door assembly and the handle being adapted and cooperating with each other such that the handle maintains the door assembly in the first position (P1) when the water tank is attached to the handle.

2. The garment steamer (100) according to claim 1, wherein the door assembly (108, 109) is pivotable relative to the water tank (104) to expose the water inlet (106) when the water tank is detached from the handle (110).

3. The garment steamer (100) according to claim 1 or claim 2, wherein the handle (110) comprises a portion (126) arranged to contact a part (128) of the door assembly (108, 109) such that the door assembly is immobilized in the first position (P1) when the water tank (104) is attached to the handle.

4. The garment steamer (100) according to claim 3 as according to claim 2, wherein the portion (126) is defined by an edge portion of the handle (110), the edge portion abutting the part (128) of the door assembly (108, 109) to prevent pivoting of the door assembly from the first position (P1) when the water tank (104) is attached to the handle.

5. The garment steamer (100) according to any one of claims 1 to 4, wherein the water tank (104) comprises:

- an upper end portion (114A) to which the handle (110) is detachably coupled,
- a bottom end portion (114B) opposite the upper end portion, and
- a side portion (120) extending between the upper end portion and the bottom end portion, with the water inlet (106) being arranged in said side portion.

6. The garment steamer (100) according to any one of claims 1 to 5, wherein the door assembly (108, 109) comprises a door (108) and a seal member (109) attached to the door for sealing the water inlet (106) when the door assembly is in the first position (P1).

7. The garment steamer (100) according to claim 6, wherein the seal member (109) is formed from an elastomeric material.

8. The garment steamer (100) according to claim 6 or claim 7, wherein the seal member (109) comprises a protrusion (130), said door comprising an engagement member (132) whose shape complements the protrusion thereby to engage and receive the seal member.

9. The garment steamer (100) according to claim 8, wherein the seal member (109) further comprises an outer groove (134) adapted to match an inner periphery of the water inlet (106).

10. The garment steamer (100) according to any one of claims 1 to 9, comprising a threaded coupling or a bayonet coupling for detachably coupling the water tank (104) and the handle (110).

11. The garment steamer (100) according to any one of claims 1 to 10, wherein the garment steamer is a handheld garment steamer.

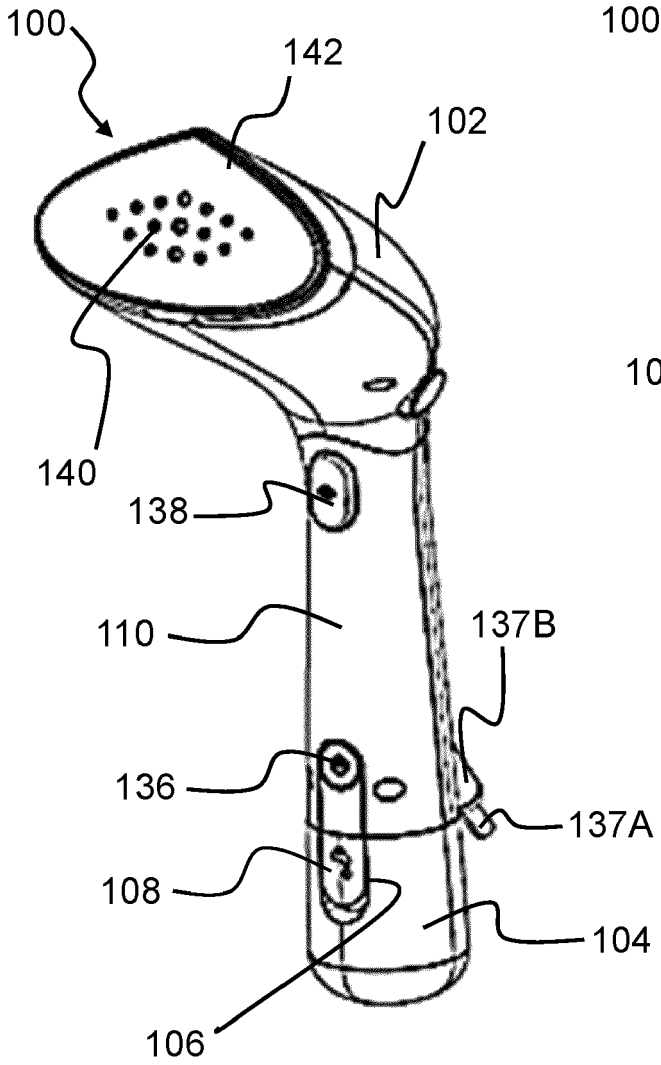

100
142
102
140
138
110
137B
136
137A
108
104
106

FIG.1A

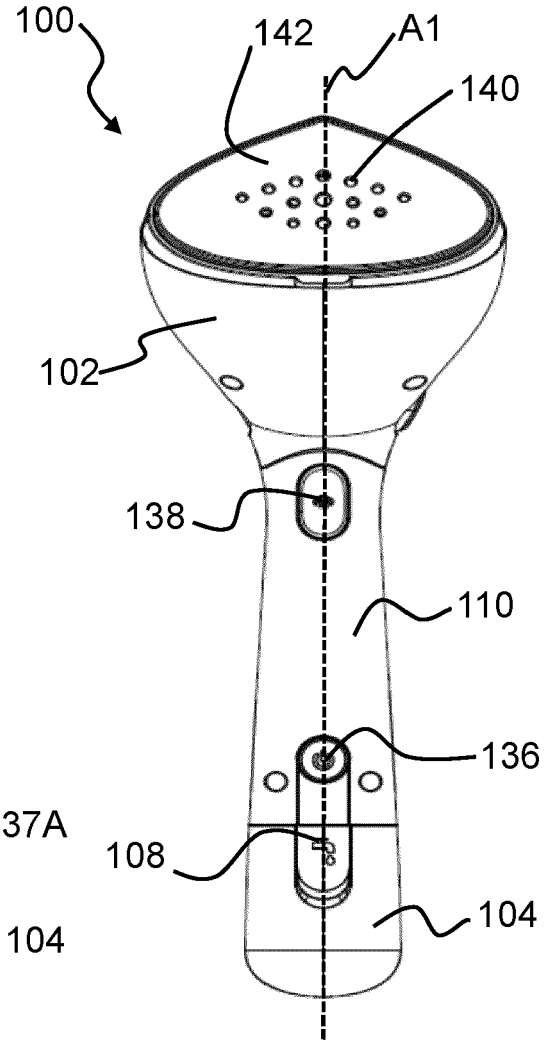

100
142
A1
140
102
138
110
136
108
104

FIG.1B

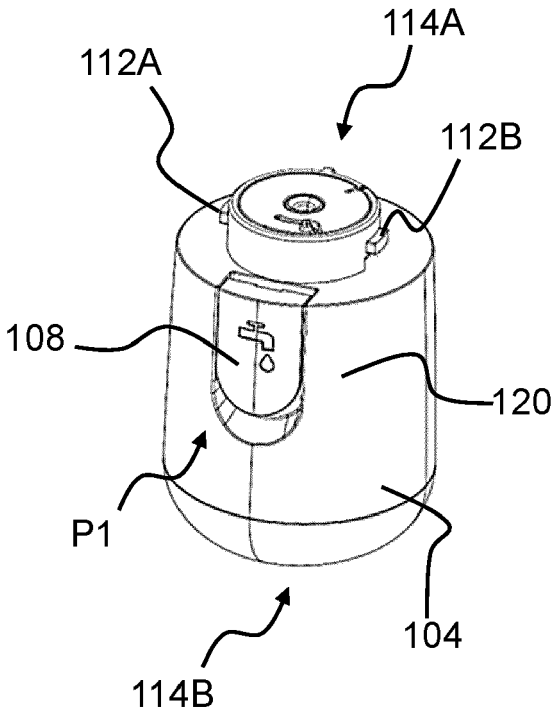

114A
112A
112B
108
120
P1
104
114B

FIG.2A

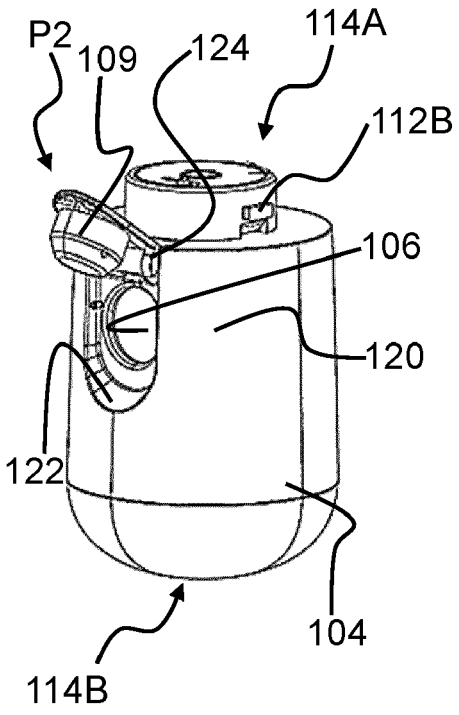

P2
109
124
114A
112B
106
120
122
104
114B

FIG.2B

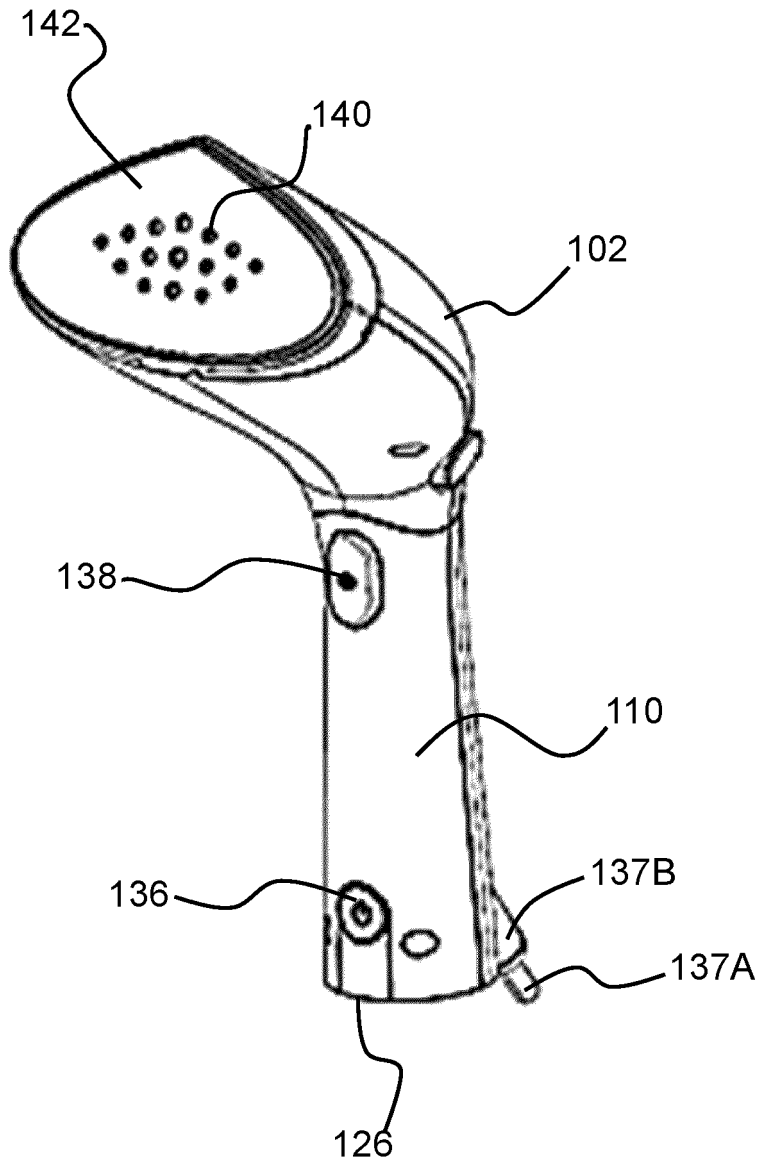


FIG.3A

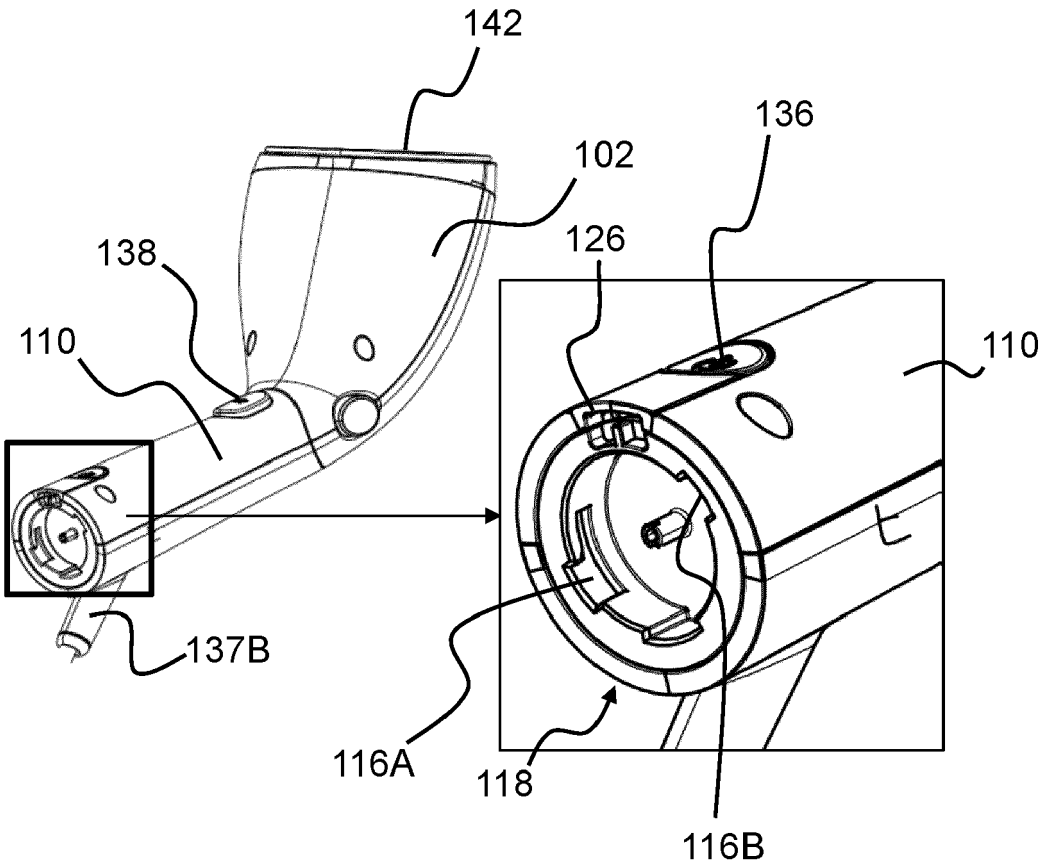


FIG.3B

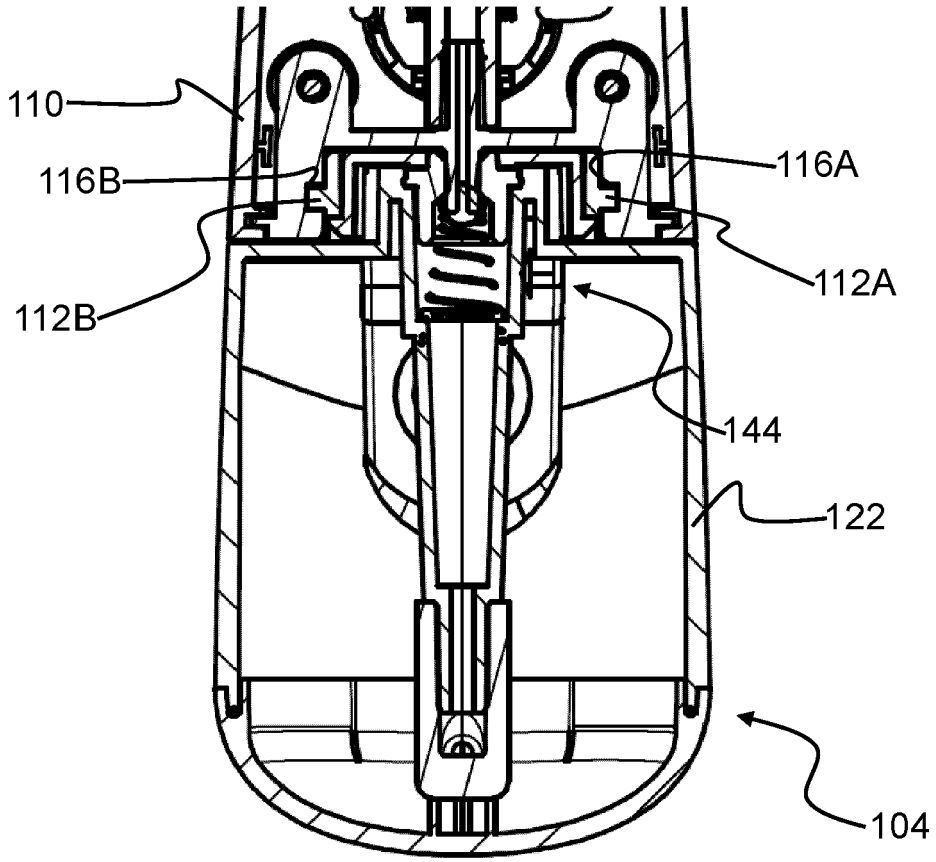


FIG.4A

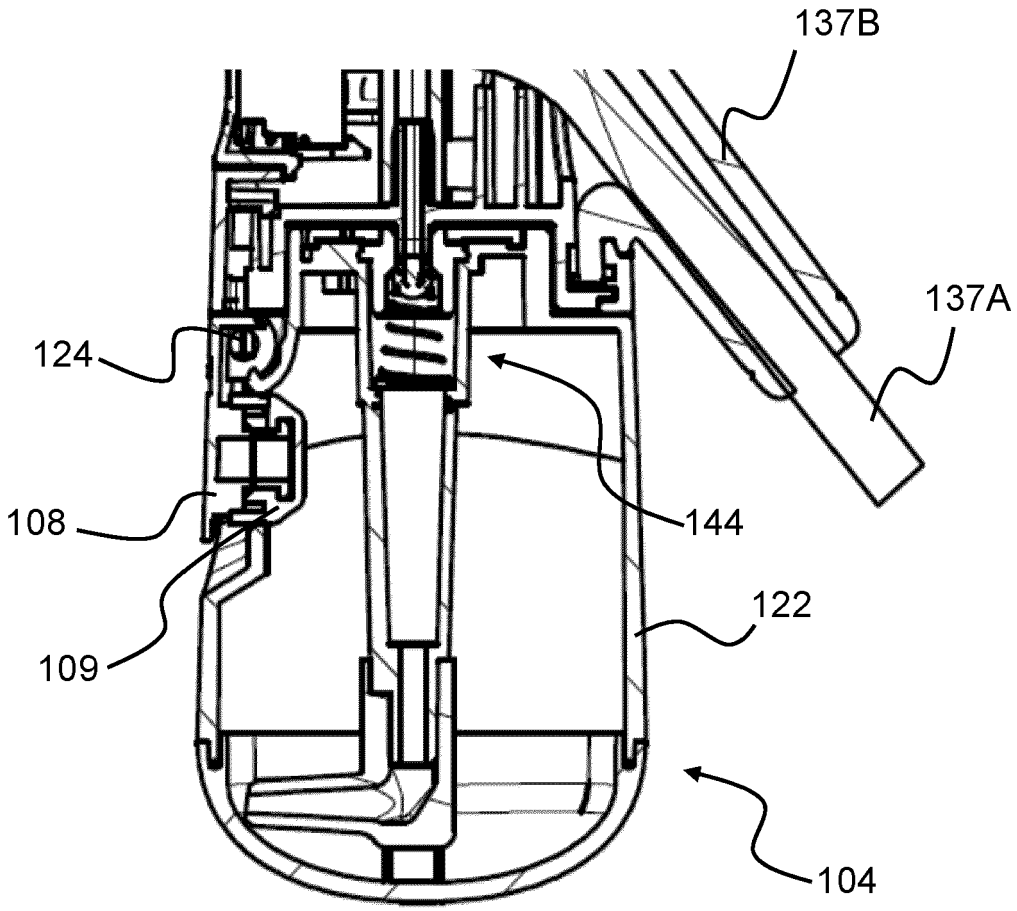
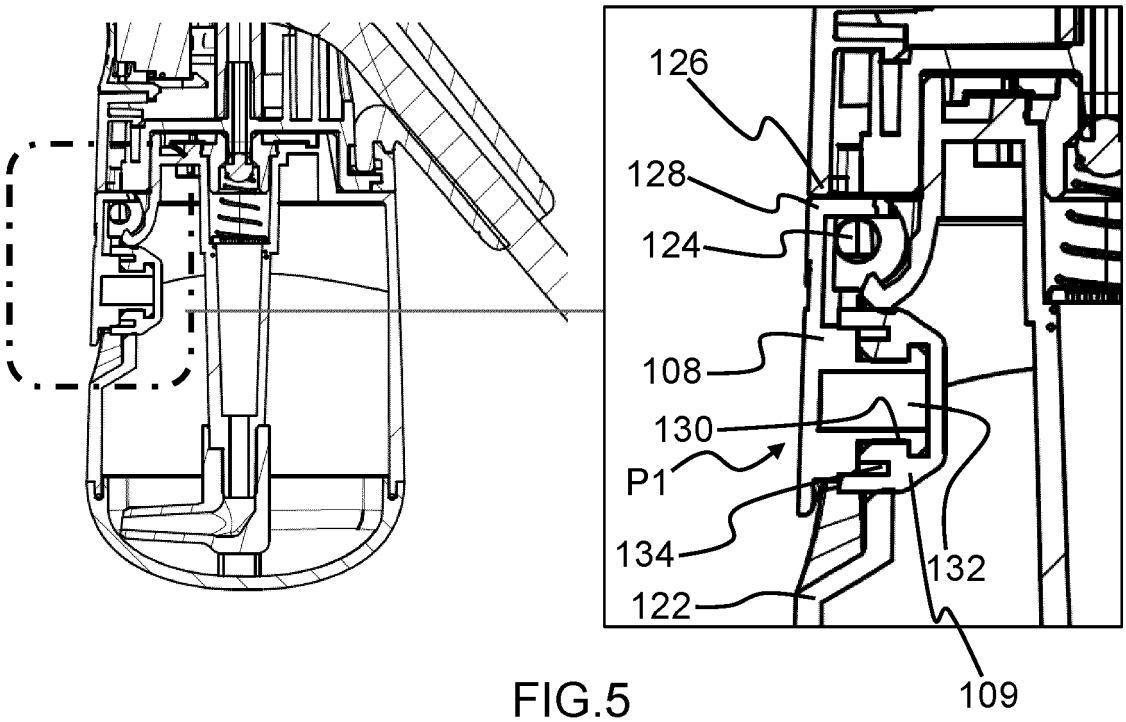


FIG.4B


126
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124
108
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FIG.5

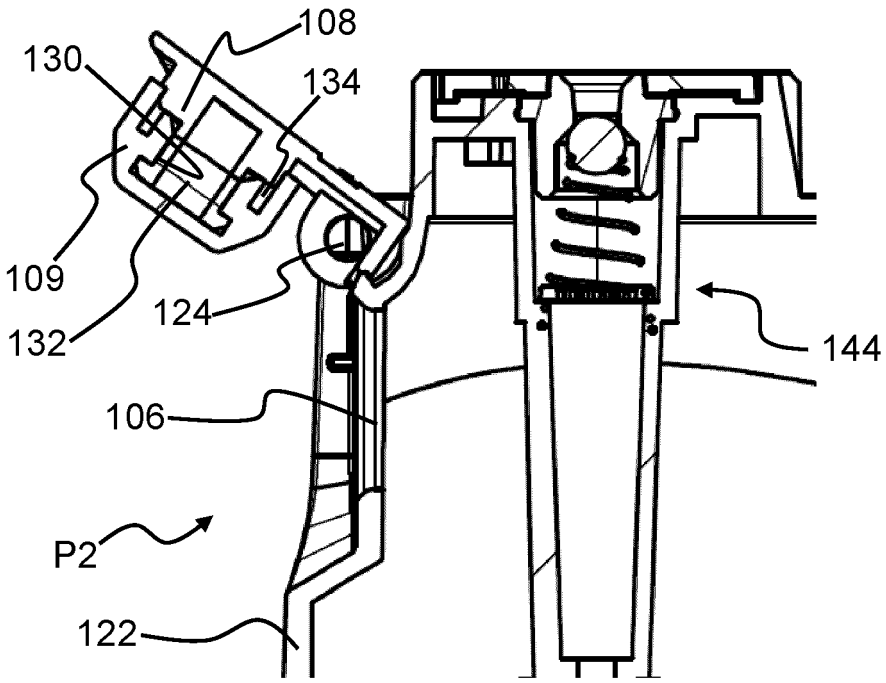
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FIG.6

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EUROPEAN SEARCH REPORT

Application Number
EP 21 19 7067

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Place of search	Date of completion of the search	Examiner
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