

(19)



(11)

**EP 3 116 656 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:

**01.08.2018 Bulletin 2018/31**

(51) Int Cl.:

**B05B 9/01 (2006.01)**

**B05B 12/00 (2018.01)**

(86) International application number:

**PCT/EP2014/054586**

(21) Application number: **14708580.7**

(22) Date of filing: **10.03.2014**

(87) International publication number:

**WO 2015/135568 (17.09.2015 Gazette 2015/37)**

**(54) WATER APPLICATION DEVICE WITH ERGONOMIC ARREST BUTTON**

**WASSERAUFTRAGUNGSVORRICHTUNG MIT ERGONOMISCHEM ARRETIERKNOPF**

**DISPOSITIF D'APPLICATION D'EAU COMPORTANT UN BOUTON D'ARRÊT ERGONOMIQUE**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB  
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO  
PL PT RO RS SE SI SK SM TR**

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(43) Date of publication of application:

**18.01.2017 Bulletin 2017/03**

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(56) References cited:

**EP-A1- 1 563 911**

**DE-A1-102008 000 397**

**JP-A- H07 275 752**

**US-A1- 2013 168 471**

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**Description**

## TECHNICAL FIELD

**[0001]** Example embodiments generally relate to watering equipment and, more particularly, relate to a water applicator that employs an operable member to control flow that is designed for improved ergonomics.

## BACKGROUND

**[0002]** Gardening and yard maintenance, like so many other pursuits, are made easier and more enjoyable when the right tools are available to the gardener for each job. Every garden or yard needs suitable and effective water application. When Mother Nature is not cooperative, or for covered areas, watering equipment may be necessary to provide adequate water supply.

**[0003]** Watering equipment includes such devices as hoses, hose reels, spray guns, spray nozzles, spray lances, water taps (or spigots) and the like. These devices are often used to apply water from the water tap to a garden, plant or other target using the hose along with some form of water application device (e.g., an applicator such as a spray gun, spray nozzle or spray lance). However, gardeners often perceive the need to have different tools for different specific situations. Thus, gardeners desire applicators with different characteristics.

**[0004]** One particular characteristic that is often popular with gardeners is the ability to lock the device in an "on" state so that the user does not have maintain pressure on the trigger, lever or other operable member that must be actuated to turn the device on. To enable gardeners to control the locking of operable members in the on position, many devices have required the gardeners to use two hands. In this regard, one hand often holds the operable member in the desired position, while the other hand is used to engage a lock. Thus, operation of the device becomes more cumbersome and less enjoyable for the gardener.

## BRIEF SUMMARY OF SOME EXAMPLES

**[0005]** Some example embodiments may therefore provide a water application device design that provides an improved locking assembly. In particular, some embodiments may provide a locking member in an ergonomically advantageous location that may enable the user (i.e., the gardener) to operate the operable member and also lock the operable member in a desired position with one hand. Some embodiments may also or alternatively enable the arrest function (i.e., locking and unlocking) of the operable member to be easily engaged and disengaged by simple compression of the operable member. The ergonomics and function of water application devices can therefore be improved and the operator experience may be more enjoyable.

**[0006]** A water application device according to the in-

vention is defined in the appended claims. A water application device according to the preamble of claim 1 is known from document EP 1 563 911.

## 5 BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S)

**[0007]** Having thus described the invention in general terms, reference will now be made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

FIG. 1 illustrates a block diagram of a water application device in accordance with an example embodiment;

FIG. 2 illustrates an exploded side view of a water application device in accordance with an example embodiment;

FIG. 3 shows a cross section view of the water application device in accordance with an example embodiment;

FIG. 4, which includes FIGS. 4A and 4B, illustrates front view of the water application device in accordance with another example embodiment;

FIG. 5 illustrates a close up, exploded view of a locking assembly in accordance with an example embodiment;

FIG. 6 illustrates an isolation view of the locking assembly in accordance with an example embodiment; and

FIG. 7 illustrates another perspective of an isolation view of the locking assembly in accordance with an example embodiment.

## 35 DETAILED DESCRIPTION

**[0008]** Some example embodiments now will be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all example embodiments are shown. Indeed, the examples described and pictured herein should not be construed as being limiting as to the scope, applicability or configuration of the present disclosure. Rather, these example embodiments are provided so that this disclosure will satisfy applicable legal requirements. Like reference numerals refer to like elements throughout. Furthermore, as used herein, the term "or" is to be interpreted as a logical operator that results in true whenever one or more of its operands are true. As used herein, operable coupling should be understood to relate to direct or indirect connection that, in either case, enables functional interconnection of components that are operably coupled to each other.

**[0009]** Some example embodiments described herein provide an improved design for a water application device. In this regard, example embodiments may enable an operator or user to lock a flow control assembly in the on state, often with the same hand that supports the de-

vice. For example, the flow control assembly may be controlled using a locking member that is placed at a convenient and ergonomically advantageous location on the trigger (or operable member) of the device. The locking member may be activated and deactivated by movement in the horizontal direction, which is quite convenient and natural using the index finger of the hand holding the device. Moreover, the locking member may be provided to interact with a locking head via a unique structure that alternately allows the trigger to be switched between locked and unlocked states with each compression when the locking member is in the locked position.

**[0010]** FIG. 1 illustrates a block diagram of a modular water application device 10 in accordance with an example embodiment. The modular water application device 10 includes a main body 20, an operable member 30 and an applicator head 40. The main body 20 is graspable along a portion thereof by an operator. The graspable portion defines a handle portion 22 of the main body 20, and the handle portion 22 may be provided between an outlet portion 24 and an inlet portion 26. The main body 20 houses a flow control assembly 50 configured to enable the device 10 to execute a control function relative to flow of water through the device 10 (e.g., from the inlet portion 26 to the outlet portion 24). In some embodiments, the flow control assembly 50 may include an on/off control assembly 52 and a volume control assembly 54. The operable member 30 is attachable to the main body 20 to interface with the flow control assembly 50 to alternately start and stop flow through the device 10 based on a position of the operable member 30. Thus, in some cases, the operable member 30 may act as an operator to open or close (partially or fully) a valve or other flow control device in the flow control assembly 50. In particular, the operable member 30 may interface with the on/off control assembly 52 of the flow control assembly 50. In some cases, the flow control assembly 50 may further enable a volume control function to be performed so that the flow can not only be turned on and off, but also modulated to at least some degree based on operator control. The volume control assembly 54 may be an example of a structure to perform such a function. However, the volume control assembly 54 may be omitted in some examples.

**[0011]** The applicator head 40 may be attachable to an outlet portion 24 of the main body 20 to apply water passing through the applicator head 40 based on an application characteristic of the applicator head 40. In some cases, the applicator head 40 may be a selected one of a number of different applicator heads and each of the different applicator heads may have a different structure and/or configuration to support different flow application needs or desires.

**[0012]** As indicated above, example embodiments may provide an improved ergonomic design that enables the operator to control the application of water via operation of the operable member 30 and also lock the operable member 30 in an on position with the same hand

(i.e., so that two-handed volume control can be avoided). To facilitate this, a locking assembly 70 is provided, and the locking assembly 70 selectively interacts between the operable member 30 and the main body 20 to lock or unlock the operable member 30 in position relative to the main body 20. In some cases, the locking assembly 70 may provide this service via the inclusion of a locking member on the operable member 30 itself, with the locking member being oriented so that it moves in a direction perpendicular to the direction of extension of the locking member and is provided at a portion of the locking member at which the index finger is normally located. Thus, the index finger may easily push the locking member in a desired position without sacrificing the grip on the device. Alternatively or additionally, the locking assembly 70 itself may be provided to lock and unlock with each subsequent compression of the operable member.

**[0013]** Accordingly, in an example embodiment, the operable member 30 is pivotally attached to the main body 20 to interface with the flow control assembly 50 to alternately provide flow when pivoted to a compressed position and stop flow when pivoted to an extended position. The operable member 30 may further be provided to have a length extending substantially parallel to a longitudinal centerline of the handle portion 22. Meanwhile, the operable member 30 interfaces with a locking member of the locking assembly 70, such that the locking member is disposed at a surface of the operable member 30 that faces away from the main body 20. Moreover, the locking member may be configured to enable the operator to lock the operable member in a flow provision state (i.e., an "on" state) based on positioning the locking member in a locked state. The locking member may also be configured to move between the locked state and an unlocked state via movement along the first surface in a direction substantially perpendicular to the longitudinal centerline of the handle portion (and the direction of extension of the operable member or longitudinal centerline of the operable member).

**[0014]** Alternatively or additionally, either the operable member or the main body may have the locking member provided thereat, and a locking head may be provided at the other. When the locking member is in a locked state (or locked position), compression of the operable member will alternately transition the operable member between a locked state and unlocked state with each compression. However, when the locking member is in an unlocked state (or unlocked position), the operable member will stay in the unlocked state regardless of the compression of the operable member and the locking member may not contact the locking head when the locking member is in the unlocked position. Example structures for achieving the above described functionality will now be described in reference to FIGS. 2-7.

**[0015]** FIG. 2 illustrates an exploded view of a device 100 that forms one example of the device 10 shown in FIG. 1. In this regard, the device 100 includes a main body 110 that is provided as an example of the main body

20 of FIG. 1. Meanwhile, the main body 110 has an outlet portion 112 and inlet portion 114 that serve as examples of the outlet portion 24 and the inlet portion 26, respectively, of FIG. 1. The inlet portion 114 may have a threaded engagement to a quick coupling adaptor 116 that may couple to a hose connector. Meanwhile, the outlet portion 112 may be configured to mate with a selected one of a plurality of different applicators. Applicator 120 is a specific example of the applicator 40 of FIG. 1 and of one of the different applicators that may mate with the outlet portion 112.

**[0016]** The main body 110 may be molded plastic, composite material, metal, or any other suitable material that has sufficient rigidity and can be formed to house chambers, components and/or devices to define a flow channel for water flow from inlet portion 114 to the outlet portion 112. The flow channel may extend along an axis 118 of a handle portion 119 of the main body 110. However, the outlet portion 112 may be formed along an outlet portion axis 113 that forms an angle relative to the axis 118 in some embodiments. Moreover, different main body structures may be selected to define corresponding different angles between the axes 118 and 113.

**[0017]** An attachment portion 132 may be provided at a rear part of the handle portion 119 to receive a cover assembly 150. In examples in which the device 100 is configured to include volume control, a volume control lever 162 may be provided at a receiver 160 of the cover assembly 150. However, it should be appreciated that in some examples, the cover assembly 150 may be provided without the receiver 160 and therefore also without the volume control lever 162 (or any volume control assembly 54).

**[0018]** In an example embodiment, trigger 140 is provided as an example of the operable member 30 of FIG. 1. The trigger 140 is pivotally mounted to the main body 110 between the inlet portion 114 and the intersection between the axes 118 and 113. In the example of FIG. 2, the pivot point of the trigger 140 is at an end of the trigger 140 corresponding or proximate to the inlet portion 114. It should be appreciated, however, that the pivot point could alternatively be placed at the other end of the trigger (i.e., such that the pivot point is located proximate to the intersection of the axis 118 and 113. The end of the trigger 140 opposite the pivot point may alternatively be compressed toward the main body 110 and extended away from the main body 110 to adjust the on/off control assembly 52 to turn the device 100 on and off, respectively.

**[0019]** In an example embodiment, the trigger 140 includes a locking member 144 that may be configured to mate with a locking head 146 disposed on the main body 110. The locking member 144 and locking head 146 may be examples of components that could make up the locking assembly 70 of FIG. 1. However, it should be appreciated that the locking member 144 could alternatively be provided on the main body 110 and the locking head 146 could be provided on the trigger 140.

**[0020]** FIG. 3 illustrates a cross section view of the device 100 of FIG. 2. Referring to FIGS. 2 and 3, when the trigger 140 is compressed toward the main body 110 (as shown by arrow 200), a button or other operator of the on/off control assembly 52 may be actuated to provide flow through the device 100. Meanwhile, when the trigger 140 is released so it can extend away from the main body 110 (in the direction shown by arrow 210), the on/off control assembly 52 may stop flow through the device 100.

**[0021]** As shown in FIG. 3, the locking member 144 and locking head 146 may engage and disengage each other while the locking member 144 is provided in a locked state (or locking position). Meanwhile, when the locking member 144 is in an unlocked state (or unlock position), the locking member 144 and the locking head 146 may not engage each other regardless of the compression of the trigger 140. When the trigger 140 is compressed from the extended state while the locking member 144 is in the locked state, the trigger 140 may be held proximate to the main body 110 and the on/off control assembly 52 may continuously pass water through the device 100 at a volume determined by the volume control assembly 54. If the trigger 140 is compressed again (i.e., from the compressed state while being held there via engagement of the locking member 144 and locking head 146), then the locking member 144 may be released from the locking head 146 so that the flow control is turned off and flow through the device 100 is stopped.

**[0022]** FIG. 4, which includes FIGS. 4A and 4B, illustrates a front view of the device 100 of FIGS. 2 and 3 in accordance with an example embodiment. As can be appreciated from FIG. 4, the longitudinal axis 118 (or centerline) of the handle portion is aligned with the direction of extension (and longitudinal axis) of the trigger 140. Meanwhile, the locking member 144 is provided to move substantially perpendicular to the longitudinal axis 118 as shown by the arrow 220. Movement of the locking member 144 to one side may place the locking member 144 in an unlock state or position, and movement of the locking member 144 to the other side may place the locking member 144 in a locked state or position. The position of the locking member 144 (i.e., in the locked state or unlocked state) may impact the interaction between the locking member 144 and the locking head 146 when the trigger 140 is compressed (i.e., into the page in reference to FIG. 4). The locked state and unlocked state could be provided on either side in alternative embodiments.

**[0023]** As can be appreciated from FIG. 4, when the operator grasps the device 100, the index finger would tend normally to sit at the top portion of the trigger 140. In fact, the location of the locking member 144 may be strategically positioned so that the locking member 144 is in registration with the location upon which the index finger would normally fall when the device 100 is grasped in a comfortable and ergonomically advantageous grip. As such, when the operator determines to change the state of the locking member 144, the operator need only move the index finger from left to right (or vice versa) to

apply a force to move the locking member 144 horizontally (i.e., in the direction of arrow 220) to change the state of the locking member 144. The operator's grip is therefore easily maintained throughout the process.

**[0024]** In some embodiments, the front portion of the trigger 140 may define a first surface 230 (which may be flat or curved). The first surface 230 may face away from the main body 110 and may extend along the longitudinal length of the trigger 140 from an area proximate to the pivot point (e.g., at the bottom of the trigger 140) to a protrusion 235 disposed at a distal end of the trigger 140 relative to the pivot point. The protrusion 235 may serve as a guide to fit the index finger of the operator over the locking member 144 naturally when the operator takes a comfortable grip of the device 100.

**[0025]** The locking member 144 may be provided into a receiving slot 240 formed in the first surface 230. The receiving slot 240 (or at least a portion thereof) may pass entirely through the trigger 140 to enable the locking member 144 to be reachable by the operator at the first surface 230, but also engage with the locking head 146. In some cases, the locking member 144 may define a second surface 244 that may define the visible and accessible portion of the locking member 144. The second surface 244 may have embossing, texture grooves, protrusions, and/or other features thereon to make the second surface 244 distinct from the first surface 230. The second surface 244 may otherwise extend substantially parallel to the first surface 230. Thus, the second surface 244 may also be curved or flat to match or at least be somewhat similar to the contours of the first surface 230. The second surface 244 may form the surface that the index finger of the operator actually contacts.

**[0026]** In some embodiments, the trigger 140 may be a unitary piece of molded plastic having only the receiving slot 240 formed therein (as shown in FIG. 4A). However, in some alternatives, the trigger may include at least two pieces of molded plastic, and each piece may have a different characteristic such as a color, texture, material and/or the like. As shown in FIG. 4B, the trigger 140 may include a first piece 141 of plastic defining an insertion window 143 into which at least a second piece 145 of plastic may be inserted to define the trigger 140.

**[0027]** FIG. 5 illustrates a closer exploded view of the locking member 144 and the locking head 146 in accordance with an example embodiment. As shown in FIG. 5, a side of the locking member 144 that is opposite the second surface 244 may include an engagement portion 300 that may be configured to engage the locking head 146. The engagement portion 300 may include a pincer assembly formed from a first member 310 and a second member 312. The first and second members 310 and 312 may extend inwardly toward the main body 110 and toward the locking head 146. The locking head 146 may be rigidly mounted to the main body 110 or internal components of the device 100, such as components forming the flow channel through the device 100.

**[0028]** The first and second members 310 and 312 may

have a substantially L shape (or J shape) with the short leg of the L (or J) shape forming the distal ends of the first and second members 310 and 312. Moreover, the short legs of the L (or J) shape may be oriented toward each other to form the pincer assembly. Thus, for example, the short legs may form protrusions extending toward each other to define a locking gap 314 bounded by the first and second members 310 and 312, the protrusions (that form the distal ends of the first and second members 310 and 312, and a portion of the locking member 144 that is contacted by the operator to move the locking member 144 between the locked position and the unlocked position. The first and second members 310 and 312 may extend from opposite sides of the back face of the locking member 144 (i.e., a surface opposite the second surface 244) with the first member 310 extending from the top and the second member 312 extending from the bottom of the locking member 144. The first and second members 310 and 312 may extend from positions that are aligned with each other in a line substantially parallel with the longitudinal centerline of the handle portion 119 and axis 118.

**[0029]** In an example embodiment, the locking member 144 may also include guide bars 320 that may enable the locking member 144 to snap fit into the receiving slot 240. The guide bars 320 may also allow the locking member 144 to slide horizontally between the locked and unlocked positions. In some cases, the receiving slot 240 and/or the locking member 144 may have features (e.g., matching protrusions and grooves) to define distinct locked and unlocked positions when such features align. The features may also or alternatively create sufficient friction to keep the locking member 144 in a given position until the operator uses a finger to put sufficient force to overcome the friction and move the locking member 144 to a different position.

**[0030]** When the locking member 144 is provided in the unlocked position (or state), the engagement portion 300 may be misaligned horizontally relative to the locking head 146 and may not contact the locking head 146. Instead, the engagement portion 300 may move alongside the locking head 146 without contacting the locking head 146. In this regard, for example, when the locking member 144 is slid in the direction of arrow 330 and the trigger 140 is compressed, the first and second members 310 and 312 may move alongside the locking head 146 but miss contact with the locking head 146 being spaced apart therefrom in the same direction shown by arrow 330. However, when the locking member 144 is provided in the locked position (or state), the engagement portion 300 may be aligned horizontally relative to the locking head 146 so that each compression of the trigger 140 causes the locking member 144 to move with at least some contact between the engagement portion 300 and the locking head 146. Thus, for example, when the locking member 144 is moved in the direction of arrow 332, the first and second members 310 and 312 may engage an engagement surface 340 of the locking head 146 such

that the first member 310 slides over a top surface of the engagement surface 340 and the second member 312 slides over a bottom surface of the engagement surface 340 to lock the engagement portion 300 to the locking head 146 (as described in greater detail below). Thus, if the trigger 140 is released, the trigger 140 will still be held proximate to the main body 110 and flow will be maintained while the trigger 140 is locked in the compressed state. However, if the trigger 140 is compressed again, the engagement portion 300 will be forced out of engagement with the locking head 146 and the trigger 140 will be unlocked and allowed to move to the extended state.

**[0031]** The details of the locking and unlocking of the trigger 140 will be described in reference to FIGS. 6 and 7 which show an isolated view of the locking member 144 just prior to a trigger 140 compression while the locking member 144 is in the locked state (or position) from different perspectives. In this regard, FIG. 6 shows a view from above the locking member 144 and locking head 146 and FIG. 7 shows a view from the side of the locking member 144 and locking head 146. When the trigger 140 is compressed, the locking member 144 is also advanced in the direction of arrow 342, and the first and second members 310 and 312 correspondingly advance in the direction of arrow 342. Distal ends of the first and second members 310 and 312 split to engage opposite sides of the engagement surface 340 and also get deflected in the direction of arrow 344 slightly as they advance along the side of ramp member 345. The ramp member 345 may have a width in the direction of axis 118 that is similar to the combined width of the first and second members 310 and 312 in the same direction. However, the engagement surface may have a smaller width, but a width that increases long the direction shown by arrow 342.

**[0032]** When the distal ends of the first and second members 310 and 312 reach the platform 350 and pass catch member 352, the distal ends of the first and second members 310 and 312 may move in the direction of arrow 354 (straightening out after the slight deformation caused by the interaction with the ramp member 345) to move to the rest surface 360 where the distal ends of the first and second members 310 and 312 are held to keep the trigger 140 at the locked position. In this position, the ramp member 345 may be held within the locking gap 314.

**[0033]** The rest surface 360 may have a width in the direction of axis 118 (which extends substantially into and out of the page of FIG. 6) that is less than the width of the platform 350. The width of the platform 350 may also be less than the width of the ramp member and the widest point of the engagement surface 340. Due to the fact that the platform 350 is wider than the rest surface 360, an ejection ramp 362 may be formed at the intersection of the platform 350 and the rest surface 360. In the locked position, the catch member 352, the ramp member 345 and the ejection ramp 362 may work together hold the distal ends of the first and second members 310 and 312 stationary at the rest surface 360 and locked

in place relative to the main body 110 (or other anchoring structure for the locking head 146). Thus, the distal ends of the first and second members 310 and 312 may sit on rest surface 360 and be prevented from moving in the direction of arrow 364. This maintains the trigger 140 locked proximate to the main body 110 so that the flow control assembly 50 continues to supply flow through the device 100.

**[0034]** When the trigger 140 is compressed again while the locking member 144 remains in the locked state and the trigger 140 is also initially locked proximate to the main body 110 as described above, the distal ends of the first and second members 310 and 312 may again be urged in the direction of arrow 342. Responsive to this urging, the distal ends of the first and second members 310 and 312 may ride along the ejection ramp 362 to be deflected in the direction of arrow 354 until the distal ends of the first and second members 310 and 312 exit the ejection ramp 362 and compress toward each other to sit alongside ramp member base 365. The distal ends of the first and second members 310 and 312 may then be allowed to ride along the ramp member base 365 and the side of the ramp member 345 that is farthest along in the direction of arrow 354 to return to the state shown in FIG. 6 as the trigger 140 goes to the extended position when the compression is released. Thus, the first and second members 310 traverse each side of the ramp member 345 when transitioning from the trigger unlocked position to the trigger locked position and back to the trigger unlocked position.

**[0035]** When the locking member 144 is in the locked state (or position), as shown in FIG. 6, compression of the trigger 140 causes the distal ends of the first and second members 310 and 312 to move in the directions shown by arrows 342 and 364 during locking and unlocking of the distal ends of the first and second members 310 and 312, but the first and second members 310 and 312 are also deflected in the directions of arrows 344 and 354 as described above. If the locking member 144 is moved to the unlocked state (or position), the locking member 144 generally moves in the direction of arrow 354. Compression of the trigger 140 then causes the distal ends of the first and second members 310 and 312 to move in the directions shown by arrows 342 and 364, but due to the displacement of the locking member 144 in the direction of arrow 354, the first and second members 310 and 312 do not contact the locking head 146 and no locking of the trigger 140 relative to the main body 110 is accomplished by compression of the trigger 140. Thus, no wear or stress is exerted on the first and second members 310 and 312 when the trigger 140 is compressed while the locking member 144 is in the unlocked state. It should also be appreciated that, if the locking member 144 is transitioned to the unlocked state from the locked state, while the trigger 140 is locked, then there is no wear or stress on the first and second members 310 and 312 when the locking member 144 is released and returned to a rest state. In this regard, when

the trigger 140 is locked, the distal ends of the first and second members 310 and 312 are held at the rest surface 360 and are spread apart from each other by the rest surface 360 being disposed between them. Movement of the locking member 144 to the unlocked state will move the distal ends of the first and second members 310 and 312 off of the rest surface 360 in the direction of arrow 354 and allow them to collapse together. Then, when the trigger 140 is released, the first and second members 310 and 312 may move in the direction of arrow 364 without contacting the ramp member 345. Thus, the locking member 144 can be moved to the unlocked position from the locked state of the trigger 140 to release the trigger 140 and also immediately reduce the stress and avoid wear on the first and second members 310 and 312 of the locking member 144 as the trigger 140 returns to the unlocked and extended position. The entire locking mechanism may therefore encounter less wear and stress, so that the mechanism lasts longer.

**[0036]** Accordingly, the ramp member 345 may act as a first guide surface configured to interface with the locking member when the trigger 140 transitions from the unlocked state to the locked state, and the ejection ramp 362 may act as a second guide surface to interface with the locking member 144 when the trigger 140 transitions from the locked state to the unlocked state. In some cases, the first guide surface and the second guide surface may each be bisected by a support member (i.e., the engagement surface 340 for the ramp member 345 and the ramp base member 365 for the ejection ramp 362) that extends in a plane substantially perpendicular to the axis (and therefore also the longitudinal centerline of the trigger 140 and/or the handle portion 119) of the handle portion 119.

**[0037]** A water application device according to the invention is defined in the appended claims.

**[0038]** In some embodiments, the locking member may include a second surface that lies substantially parallel to the first surface of the operable member. The second surface may be configured for contact with an index finger of the operator to enable the operator to reposition the locking member with the index finger while grasping the handle portion. Alternatively or additionally, the engagement portion may include a pincer assembly including a first member and a second member, the first and second members extending toward the main body and aligned with each other in a line substantially parallel with the longitudinal centerline of the handle portion. Alternatively or additionally, the operable member may be a unitary piece of molded plastic. Alternatively or additionally, the operable member may include at least two pieces of molded plastic, and a first piece of plastic defines an insertion window into which at least a second piece of plastic is inserted to define the operable member. Alternatively or additionally, the device may include an applicator head attachable to an outlet portion of the main body to apply water passing through the applicator head based on an application characteristic of the applicator head.

The applicator head may be a selected one of a plurality of different applicator heads having respective different application characteristics.

## Claims

1. A water application device (10/100) comprising:

a main body (20/110) graspable along a handle portion (22/119) thereof by an operator, the main body (20/110) housing a flow control assembly (50) configured to enable the device (10/100) to execute a control function relative to flow of water through the device (10/100); and  
an operable member (30/140) attachable to the main body (20/110) to interface with the flow control assembly (50) to alternately provide flow and stop flow based on a position of the operable member (30/140), the operable member (30/140) having a length extending substantially parallel to an axis (118) of the handle portion (22/119),

wherein the operable member (30/140) interfaces with a locking member (144) disposed at a first surface (230) of the operable member (30/140), the first surface (230) facing away from the main body (20/110),

wherein the locking member (144) is configured to enable the operator to lock the operable member (30/140) in a flow provision state based on positioning the locking member (144) in a locked state by engaging with a locking head (146) via an engagement portion (300), and

wherein the locking member (144) is configured to move between the locked state and an unlocked state via movement relative to the first surface (230) in a direction substantially perpendicular to the axis (118) of the handle portion (22/119) wherein the operable member (30/140) comprises a trigger (140) pivotally attached to the main body (20/110), and wherein the trigger (140) is pivoted toward the main body (20/110) and away from the main body (20/110) in the unlocked state,

and wherein the trigger (140) is pivotally attached to the main body (20/110) at a pivot point that is proximate to an inlet (26/114) of the main body (20/110),

whereby the locking member (144) is disposed proximate to an opposite end of a trigger (140) relative to the pivot point, **characterized in that** the front portion of the operable member (30/140) defines the first surface (230) that faces away from the main body (20/110) and extends along the longitudinal length of the operable member (30/140) from an area proximate to its pivot point to a protrusion (235) disposed at a

- distal end of the operable member (30/140) relative to the pivot point,  
and wherein the locking member (144) is disposed in a receiving slot (240) formed in the operable member (30/140), the receiving slot (240) passing from the first surface (230) entirely through the operable member (30/140) to enable an engagement portion (300) of the locking member (144) to contact a locking head (146) disposed at a portion of the main body (20/110) based on a position of the locking member (144).
2. The device (10/100) of claim 1, wherein the locking member (144) comprises a second surface (244) that lies substantially parallel to the first surface (230) of the operable member (30/140), the second surface (244) being configured for contact with an index finger of the operator to enable the operator to reposition the locking member (144) with the index finger while grasping the handle portion (22/119).
  3. The device (10/100) of claim 1, wherein the engagement portion (300) comprises a pincer assembly including a first member (310) and a second member (312), the first and second members (300, 312) extending toward the main body (20/110) and aligned with each other in a line substantially parallel with the axis (118) of the handle portion (22/119).
  4. The device (10/100) of any preceding claim, wherein the operable member (30/140) is formed from a unitary piece of molded plastic.
  5. The device (10/100) of any preceding claim, wherein the operable member (30/140) comprises at least two pieces of molded plastic, and wherein a first piece (141) of plastic defines an insertion window (143) into which at least a second piece (145) of plastic is inserted to define the operable member (30/140).
  6. The device (10/100) of any preceding claim, further comprising an applicator head (40/120) attachable to an outlet portion (24/112) of the main body (20/110) to apply water passing through the applicator head (40/120) based on an application characteristic of the applicator head (40/120).
  7. The device (10/100) of claim 6, wherein the applicator head (40/120) is a selected one of a plurality of different applicator heads having respective different application characteristics.

#### Patentansprüche

1. Wasserapplikationsvorrichtung (10/100), umfassend:

einen Hauptkörper (20/110), der entlang eines Griffabschnitts (22/119) davon von einem Bediener ergriffen werden kann, wobei der Hauptkörper (20/110) eine Flusssteueranordnung (50) aufnimmt, die so konfiguriert ist, dass sie die Vorrichtung (10/100) eine Steuerfunktion bezüglich des Wasserflusses durch das Gerät (10/100) ausführen lassen kann; und  
ein betätigbares Element (30/140), das an dem Hauptkörper (20/110) anbringbar ist, um mit der Flusssteueranordnung (50) in Verbindung zu treten, um abwechselnd Fluss und Stoppfluss basierend auf einer Position des betätigbaren Elements (30/140) bereitzustellen, wobei das betätigbare Element (30/140) eine Länge aufweist, die sich im Wesentlichen parallel zu einer Achse (118) des Griffabschnitts (22/119) erstreckt,  
wobei das betätigbare Element (30/140) mit einem Verriegelungselement (144) in Verbindung tritt, das an einer ersten Fläche (230) des betätigbaren Elements (30/140) angebracht ist, wobei die erste Fläche (230) von dem Hauptkörper abgewandt ist (20/110),  
wobei das Verriegelungselement (144) so konfiguriert ist, dass es dem Bediener ermöglicht wird, das betätigbare Element (30/140) in einem Flussbereitstellungszustand basierend auf dem Positionieren des Verriegelungselements (144) in einem verriegelten Zustand durch Eingriff mit einem Verriegelungskopf (146) über einen Eingriffsabschnitt (300) zu verriegeln, und  
wobei das Verriegelungselement (144) so konfiguriert ist, dass es sich zwischen dem verriegelten Zustand und einem entriegelten Zustand über eine Bewegung relativ zu der ersten Fläche (230) in einer im Wesentlichen zu der Achse (118) des Griffabschnitts (22/119) senkrechten Richtung, bewegt,  
wobei  
das betätigbare Element (30/140) einen Auslöser (140) umfasst, der schwenkbar an dem Hauptkörper (20/110) angebracht ist, und wobei der Auslöser (140) zu dem Hauptkörper (20/110) hin und im entsperrten Zustand von dem Hauptkörper weg geschwenkt ist (20/110), und wobei der Auslöser (140) schwenkbar an dem Hauptkörper (20/110) an einem Schwenkpunkt angebracht ist, der nahe einem Einlass (26/114) des Hauptkörpers (20/110) ist,  
wobei das Verriegelungselement (144) in der Nähe eines gegenüberliegenden Endes eines Auslösers (140) relativ zu dem Schwenkpunkt angeordnet ist,

**dadurch gekennzeichnet, dass**

der vordere Abschnitt des betätigbaren Elements (30/140) die erste Fläche (230) definiert, die von dem Hauptkörper (20/110) abgewandt



- ist und sich entlang der longitudinalen Länge des betätigbaren Elements (30/140) von einem Bereich in der Nähe seines Schwenkpunkts zu einem Vorsprung (235) erstreckt, der an einem distalen Ende relativ zu dem Schwenkpunkt des betätigbaren Elements (30/140) angeordnet ist, und wobei das Verriegelungselement (144) in einem Aufnahmeschlitz (240) angeordnet ist, der in dem betätigbaren Element (30/140) ausgebildet ist, wobei der Aufnahmeschlitz (240) vollständig von der ersten Fläche (230) durch das betätigbare Element (30/140) verläuft, um einen Eingriffsabschnitt (300) des Verriegelungselements (144) einen Verriegelungskopf (146) berühren zu lassen, der an einem Abschnitt des Hauptkörpers (20/110) basierend auf einer Position des Verriegelungselements (144) angeordnet ist.
2. Vorrichtung (10/100) nach Anspruch 1, wobei das Verriegelungselement (144) eine zweite Fläche (244) umfasst, die im Wesentlichen parallel zu der ersten Fläche (230) des betätigbaren Elements (30/140) liegt, wobei die zweite Oberfläche (244) für den Kontakt mit einem Zeigefinger des Bedieners konfiguriert ist, um es dem Bediener zu ermöglichen, das Verriegelungselement (144) mit dem Zeigefinger neu zu positionieren, während der Griffabschnitt (22/119) ergriffen wird.
  3. Vorrichtung (10/100) nach Anspruch 1, wobei der Eingriffsabschnitt (300) eine Zangenanordnung umfasst, die ein erstes Element (310) und ein zweites Element (312) umfasst, wobei sich das erste und das zweite Element (300, 312) zum Hauptkörper (20/110) hin erstrecken und miteinander in einer im Wesentlichen zur Achse (118) des Griffteils (22/119) parallelen Linie ausgerichtet sind.
  4. Vorrichtung (10/100) nach einem der vorhergehenden Ansprüche, wobei das betätigbare Element (30/140) aus einem einheitlichen Stück aus geformtem Kunststoff gebildet ist.
  5. Vorrichtung (10/100) nach einem der vorhergehenden Ansprüche, bei der das betätigbare Element (30/140) mindestens zwei Teile aus geformtem Kunststoff aufweist und wobei ein erstes Teil (141) aus Kunststoff ein Einsetzfenster (143) definiert, in welches wenigstens ein zweites Teil (145) aus Kunststoff eingefügt ist, um das betätigbare Element (30/140) zu definieren.
  6. Vorrichtung (10/100) nach einem der vorhergehenden Ansprüche, ferner umfassend einen Applikatorkopf (40/120), der an einem Auslassabschnitt (24/112) des Hauptkörpers (20/110) anbringbar ist, um durch den Applikator passierendes Wasser auf-

zutragen (40/120) basierend auf einer Anwendungseigenschaft des Applikatorkopfes (40/120).

7. Vorrichtung (10/100) nach Anspruch 6, wobei der Applikatorkopf (40/120) einer ausgewählt aus einer Vielzahl von unterschiedlichen Applikatorköpfen ist, die jeweils unterschiedliche Anwendungseigenschaften aufweisen.

## Revendications

1. Un dispositif d'application d'eau (10/100) comprenant:

un corps principal (20/110) saisissable le long d'une partie de poignée (22/119) de celui-ci par un opérateur, le corps principal (20/110) logeant un ensemble de contrôle de flux (50) configuré pour permettre au dispositif (10/100) d'exécuter une fonction de contrôle relative au débit d'eau à travers du dispositif (10/100); et

un élément actionnable (30/140) pouvant être fixé au corps principal (20/110) pour s'interfacer avec l'ensemble de contrôle de flux (50) pour alternativement fournir et arrêter un débit sur la base d'une position de l'élément actionnable (30/140), l'élément actionnable (30/140) ayant une longueur s'étendant sensiblement parallèlement à un axe (118) de la partie de poignée (22/119),

dans lequel l'élément actionnable (30/140) s'interface avec un élément de verrouillage (144) disposé sur une première surface (230) de l'élément actionnable (30/140), la première surface (230) faisant face vers la direction d'éloignement à partir du corps principal (20/110),

dans lequel l'élément de verrouillage (144) est configuré pour permettre à l'opérateur de verrouiller l'élément actionnable (30/140) dans un état d'écoulement basé sur le positionnement de l'élément de verrouillage (144) dans un état verrouillé par engagement avec une tête de verrouillage (146) via une partie d'engagement (300), et

dans lequel l'élément de verrouillage (144) est configuré pour se déplacer entre l'état verrouillé et un état non-verrouillé via un mouvement relatif à la première surface (230) dans une direction sensiblement perpendiculaire à l'axe (118) de la partie de poignée (22/119)

dans lequel l'élément actionnable (30/140) comprend un déclencheur (140) fixé de manière pivotante au corps principal (20/110), et dans lequel le déclencheur (140) est pivoté vers le corps principal (20/110) et est éloigné du corps principal (20/110) dans l'état non-verrouillé, et dans lequel le déclencheur (140) est fixé de

- manière pivotante au corps principal (20/110) à un point de pivotement qui est en proximité d'une entrée (26/114) du corps principal (20/110),  
 dans lequel l'élément de verrouillage (144) est disposé en proximité d'une extrémité opposée d'un déclencheur (140) par rapport au point de pivotement,  
**caractérisé en ce que**  
 la partie antérieure de l'élément actionnable (30/140) définit la première surface (230) faisant face vers la direction d'éloignement à partir du corps principal (20/110) et s'étend le long d'une longueur longitudinale de l'élément actionnable (30/140) à partir d'une zone à proximité de son point de pivotement jusqu'à une saillie (235) disposée à une extrémité distale de l'élément actionnable (30/140) par rapport au point de pivotement,  
 et dans lequel l'élément de verrouillage (144) est disposé dans une fente de réception (240) formée dans l'élément actionnable (30/140), la fente de réception (240) passant de la première surface (230) entièrement à travers l'élément actionnable (30 / 140) pour permettre à une partie d'engagement (300) de l'élément de verrouillage (144) de venir en contact avec une tête de verrouillage (146) disposée sur une partie du corps principal (20/110) sur la base d'une position de l'élément de verrouillage (144).
2. Le dispositif (10/100) selon la revendication 1, dans lequel l'élément de verrouillage (144) comprend une deuxième surface (244) qui est sensiblement parallèle à la première surface (230) de l'élément actionnable (30/140), la deuxième surface (244) étant configurée pour venir en contact avec un doigt index de l'opérateur pour permettre à l'opérateur de repositionner l'élément de verrouillage (144) avec le doigt index tout en saisissant la partie de poignée (22/119).
3. Le dispositif (10/100) selon la revendication 1, dans lequel la partie d'engagement (300) comprend un ensemble de pince comprenant un premier élément (310) et un deuxième élément (312), les premier et deuxième éléments (300, 312) s'étendant vers le corps principal (20/110) et étant alignés l'un avec l'autre dans une ligne sensiblement parallèle avec l'axe (118) de la partie de poignée (22/119).
4. Le dispositif (10/100) selon l'une quelconque des revendications précédentes, dans lequel l'élément actionnable (30/140) est formé d'une pièce unitaire en matière plastique moulée.
5. Le dispositif (10/100) selon l'une quelconque des revendications précédentes, dans lequel l'élément actionnable (30/140) comprend au moins deux pièces de plastique moulée, et dans lequel une première pièce (141) de plastique définit une fenêtre d'insertion (143) dans laquelle au moins une deuxième pièce (145) de plastique est insérée pour définir l'élément actionnable (30/140).
6. Le dispositif (10/100) selon l'une quelconque des revendications précédentes, comprenant en outre une tête d'application (40/120) rattachable à une partie de sortie (24/112) du corps principal (20/110) pour appliquer de l'eau traversant la tête d'application (40/120) basé sur une application caractéristique de la tête d'application (40/120).
7. Le dispositif (10/100) selon la revendication 6, dans lequel la tête d'application (40/120) est une sélectionnée parmi une pluralité des différentes têtes d'application ayant des applications caractéristiques respectives différents.

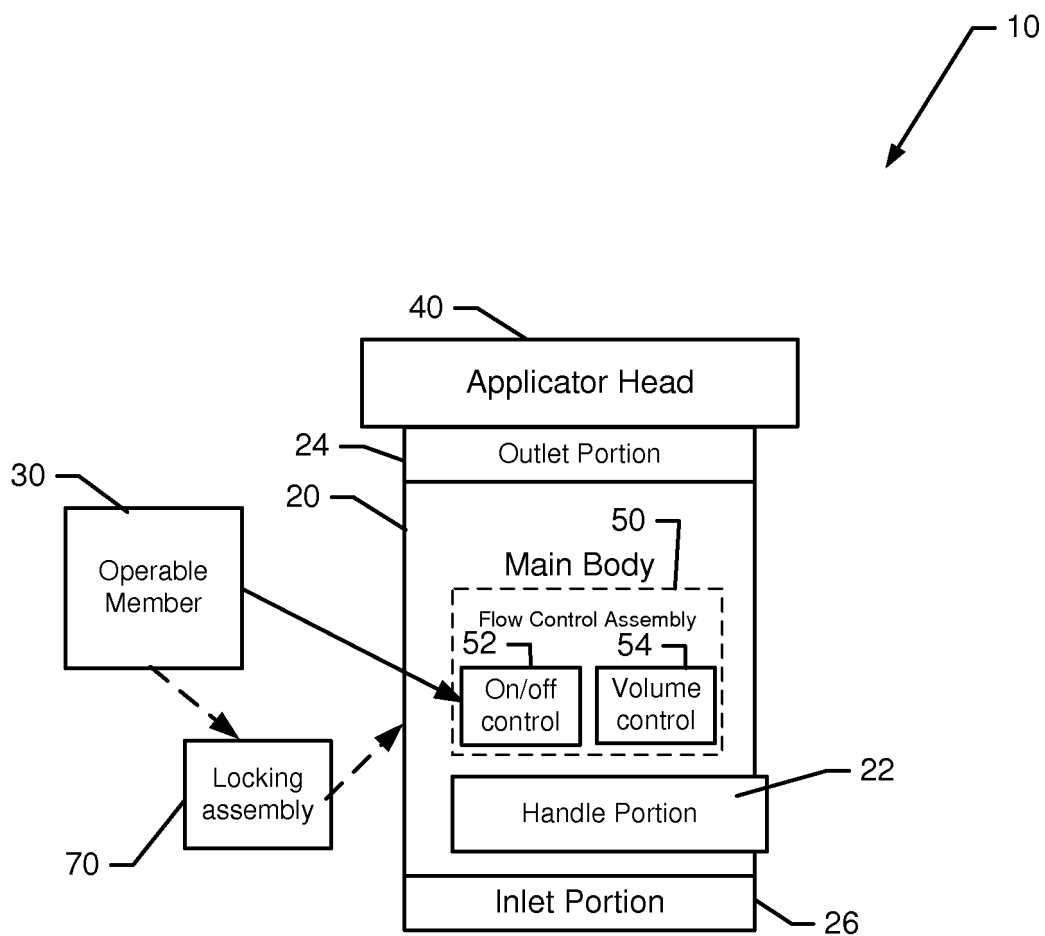


FIG. 1

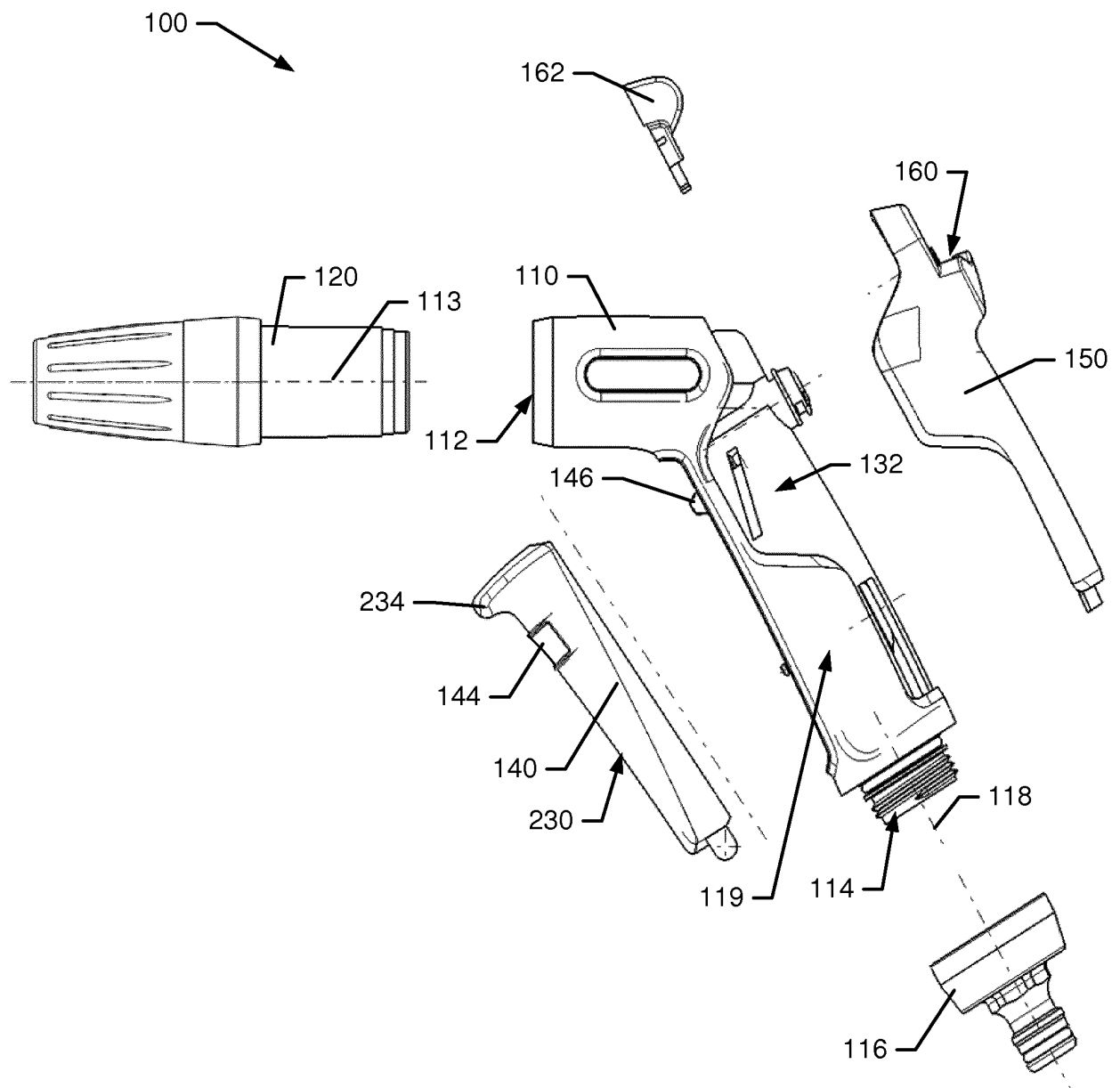


FIG. 2

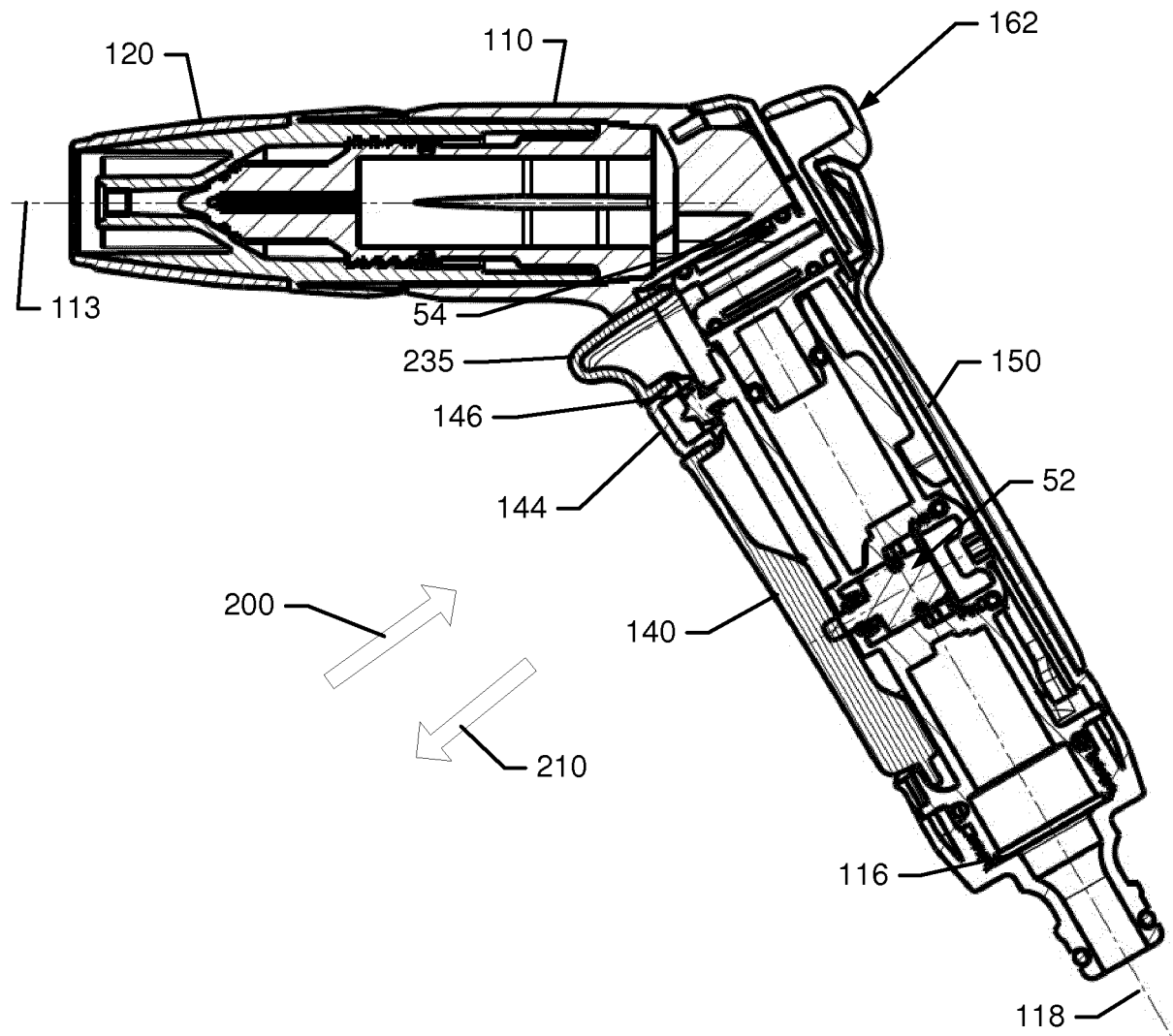
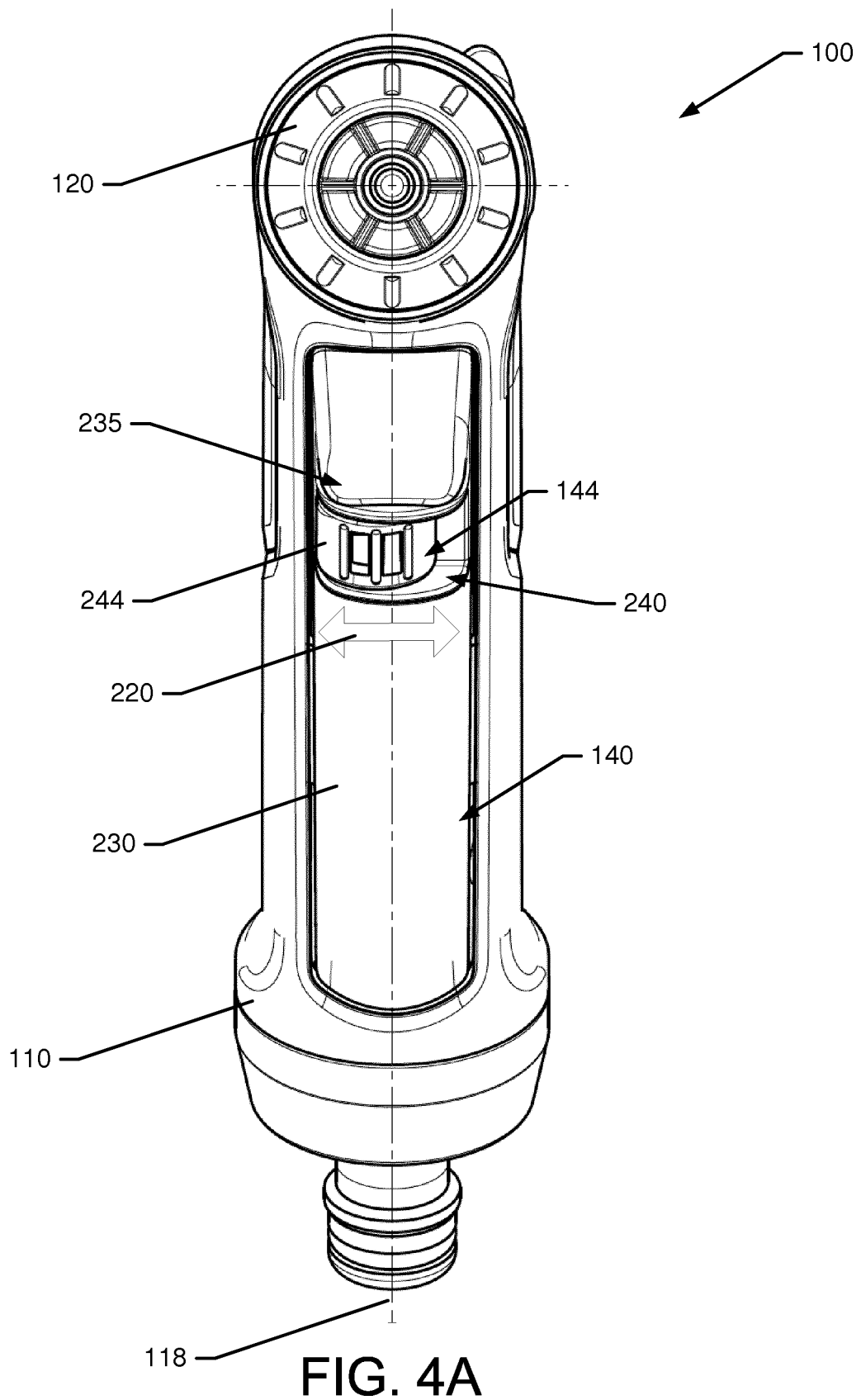


FIG. 3



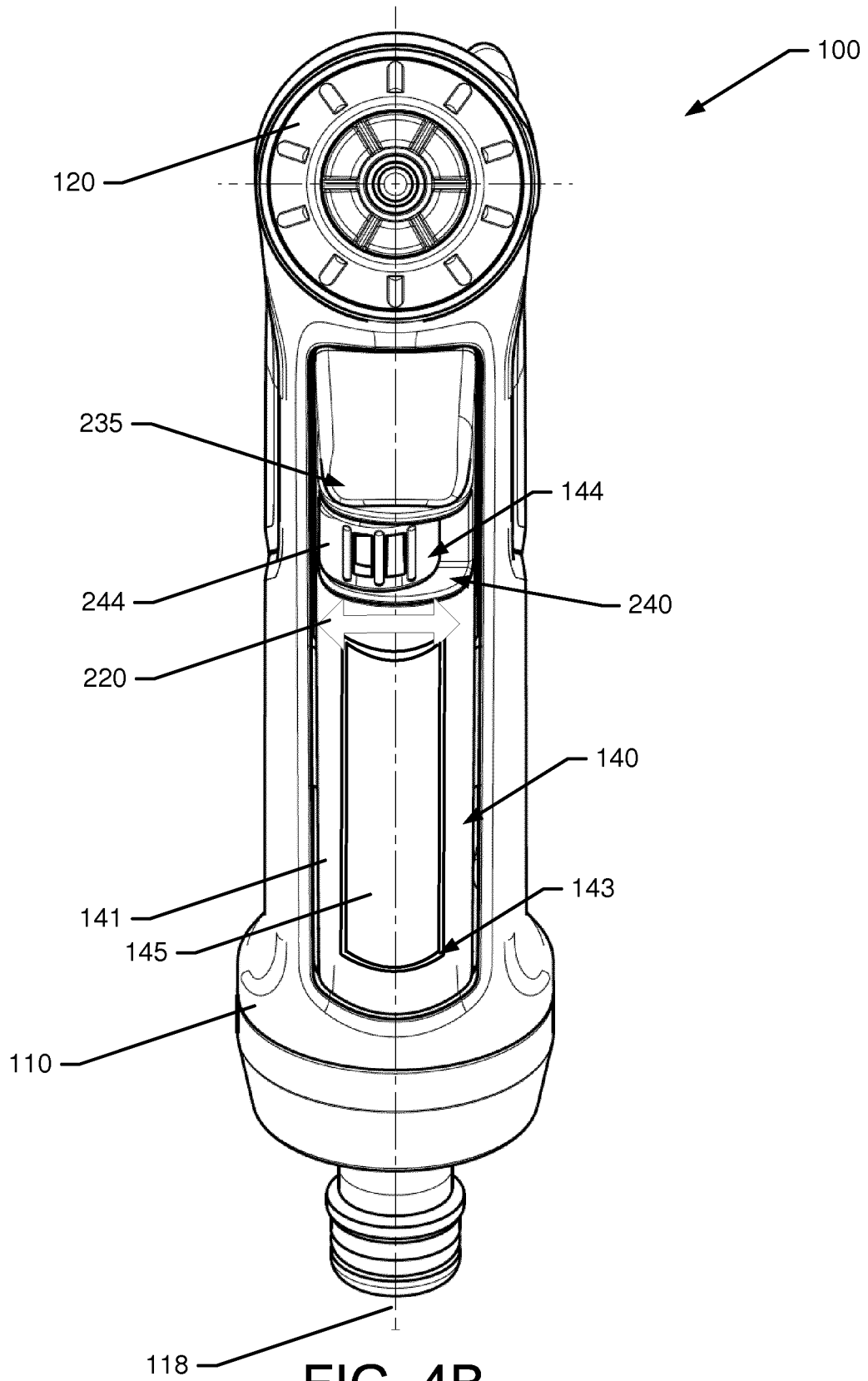


FIG. 4B

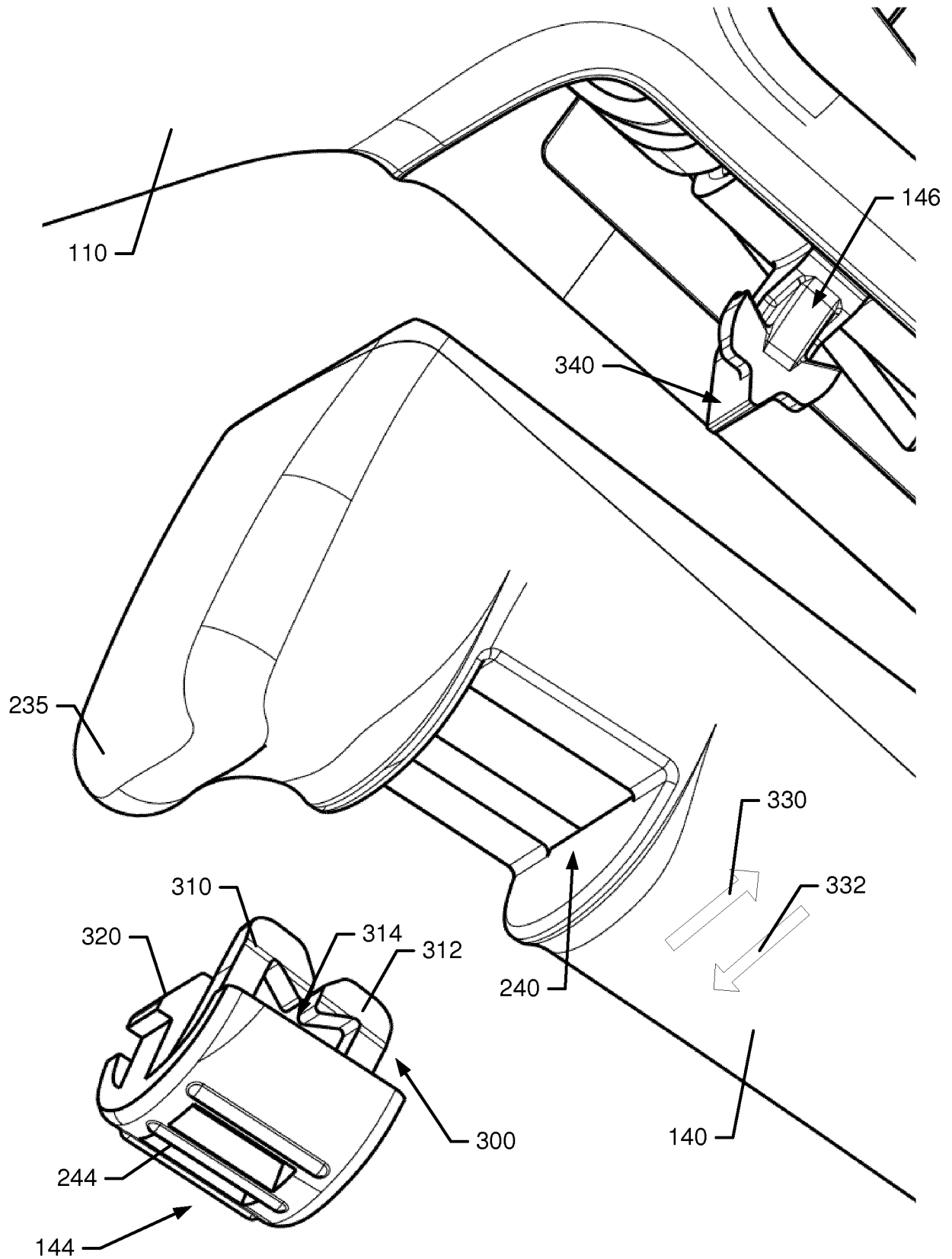


FIG. 5



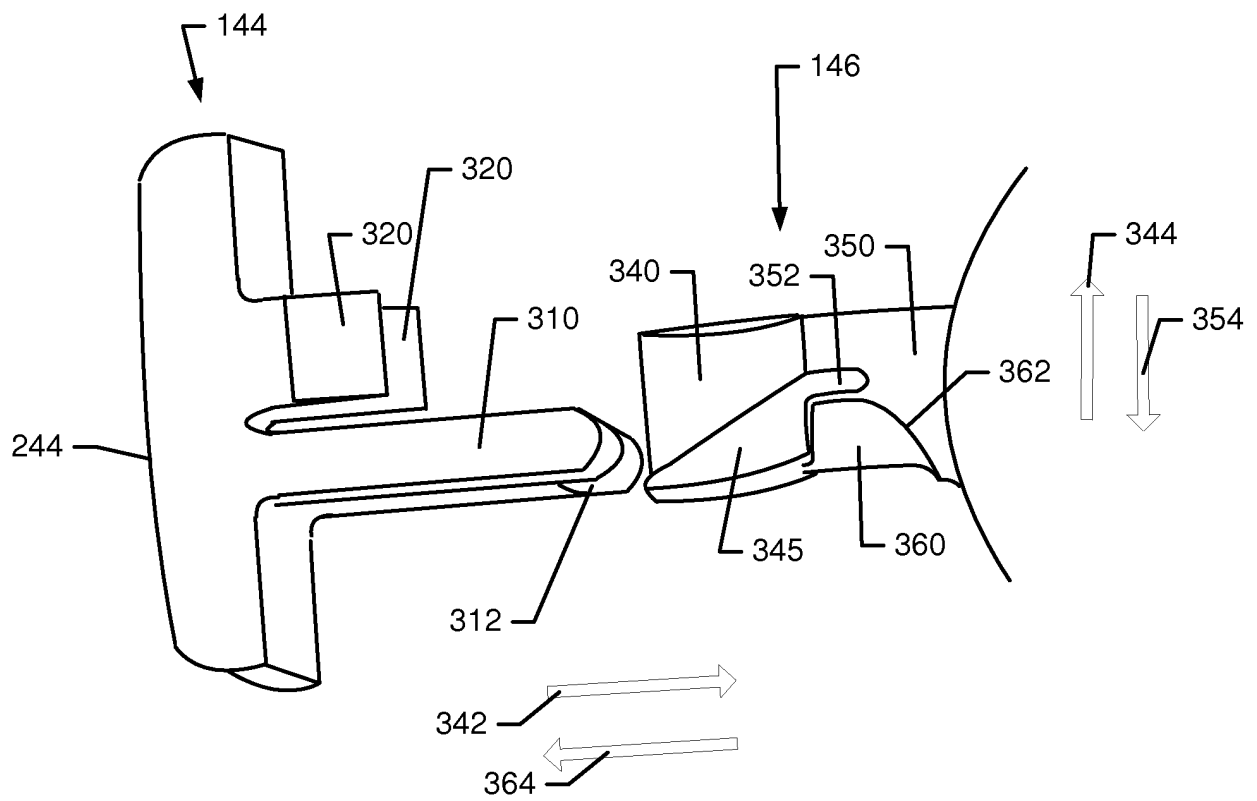


FIG. 6

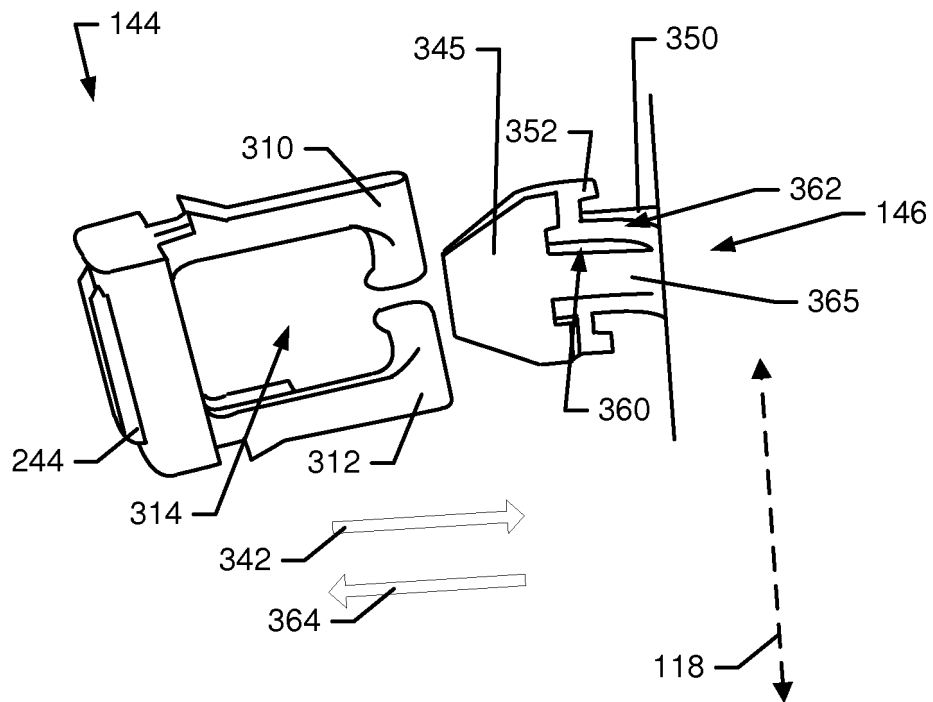


FIG. 7

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- EP 1563911 A [0006]