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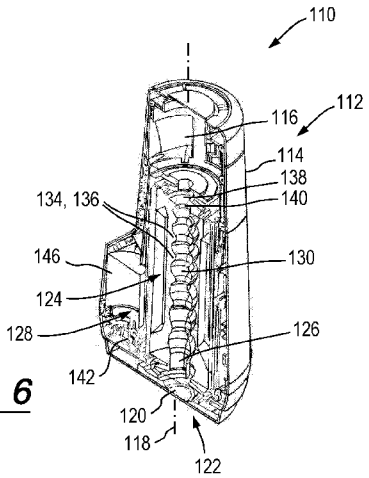


Fig. 6

(57) Abstract: Sensory apparatus 110 for human male stimulation includes a stimulation device 112. The device 112 includes a housing 114 defining a liner assembly receiving space 1 16 which extends along a longitudinal axis 118 to an opening 120 at one end 122. The device 112 includes a liner assembly 124 which in an assembled condition, locates in the liner assembly receiving space 116. The liner assembly 124 defines a member receiving space 126 which extends along the longitudinal axis 118, in which, in use, a member is receivable for stimulation. The device 112 includes an actuator 128, which in an operating condition causes the liner assembly 124 to move with a reciprocating motion relative to the housing 114.

Sensory Apparatus

The present invention relates to sensory apparatus, particularly but not exclusively, sensory apparatus for human male stimulation.

Conventionally, it is known to provide sensory apparatus for human male stimulation. Conventional sensory apparatus suffers a number of drawbacks. It can feel mechanical and difficult to control and can be difficult to clean. The mechanical action can be unrealistic. It can be restricted to use by one user.

According to a first aspect of the present invention, there is provided sensory apparatus for human male stimulation, the apparatus including a stimulation device,

the device including a housing defining a liner assembly receiving space which extends along a longitudinal axis to an opening at one end,

the device including a liner assembly which, in an assembled condition, locates in the liner assembly receiving space,

the liner assembly defining a member receiving space which extends along the longitudinal axis, in which, in use, a member is receivable for stimulation,

the device including an actuator, which, in an operating condition, causes the liner assembly to move with a reciprocating motion relative to the housing.

Possibly, the liner assembly is removable from the liner receiving space. Possibly, the liner assembly includes a liner, which may define the member receiving space. Possibly, the liner assembly includes a liner support.

Possibly, during the reciprocating motion, the liner moves between an expanded condition and a contracted condition.

Possibly, the liner includes a plurality of inwardly directed protrusions. The protrusions may include ridges, which may extend laterally relative to the axis.

Possibly, the liner defines a liquid receiving compartment. Possibly, the liner defines a communication passage which connects the member receiving space to the liquid receiving compartment. Possibly, the communication passage is relatively narrow in comparison with the member receiving space and the liquid receiving compartment.

Possibly, the liner is formed of a flexible material, possibly a resiliently flexible material, and may be formed of a plastics material. Possibly, the liner is formed of thermoplastic elastomer (TPE).

Possibly, the actuator causes the liner assembly to move reciprocally along the axis.

Possibly, the actuator includes a driving mechanism which produces rotary movement. Possibly, the driving mechanism includes a gear train. Possibly, the driving mechanism includes a motor, which may be an electric motor. Possibly, the actuator includes a power supply. Possibly, the power supply includes a power store, which may be a battery.

Possibly, the actuator includes a converter, which converts the rotary movement into reciprocating movement. Possibly, the converter comprises a cam arrangement. Possibly, the cam arrangement includes cam channelling, which may define a cam channel.

Possibly, the actuator includes a plunger. Possibly, the liner assembly is mounted to the plunger, and may be mounted within the plunger.

Possibly, the actuator includes a cam follower, which may be mounted to the plunger, and may be located in the cam channel, and may be driven by the cam channelling.

Possibly, the device includes a guide, which substantially prevents rotational movement of the cam follower about the longitudinal axis. The guide may include guide wheels. The guide may include a guide channel, which may extend along or parallel to the longitudinal axis. The guide channel may be defined by the plunger. The device may include a guide support member, which, in the assembled condition may be fixed relative to the housing, and to which the guide wheels may be rotationally mounted. Possibly, in the assembled condition, the guide wheels locate in the guide channel. Possibly, the guide support member is hollow and in the assembled condition the plunger may be located inside the guide support member.

Possibly, the cam follower includes a cam wheel, which, in the assembled condition, locates in the cam channel, and may include a cam wheel mounting, which may rotationally mount the wheel to the plunger.

Possibly, the device includes a first fixing for the liner assembly which may be located at or towards one end of the housing. Possibly, the device includes a second fixing for the liner assembly which may be located at or towards an end of the plunger away from the opening.

Possibly, the liner includes an energy store, which stores energy in the operating condition.

Possibly, the liner includes a linear expanding and contracting part, which, in the operating condition, expands and contracts along the axis with the reciprocating motion.

Possibly, the linear expanding and contracting part comprises part or all of the energy store.

Possibly, the liner includes a plurality of linear expanding and contracting parts, and may include two linear expanding and contracting parts. Possibly, the linear expanding and contracting parts are located with one linear expanding and contracting part on either side of the liner support.

Possibly, the device includes a local controller, for controlling the actuator. The controller may include a variable speed controller, for varying the speed of the actuator, and may include a local input arrangement which provides an input signal to the variable speed controller to permit a user to select a desired speed of operation.

The apparatus may include a remote input device which permits a remote user to control the speed of the actuator via a communications network. Possibly, the remote input device includes a remote controller. Possibly, the remote input device includes a movement sensor. The apparatus may be arranged so that movement detected by the movement sensor controls the speed of the actuator.

The remote input device may include a transmitter, for transmitting a remote input signal towards the variable speed controller. The device includes a receiver for receiving the remote input signal. The remote input signal may be conveyed by the communications network from the transmitter to the receiver. The communications network may include communication apparatus, which may include any of one or more mobile telephones, computers and/or tablet computers, and may include the internet.

Possibly, the member is a human male reproductive member, ie a penis.

According to a second aspect of the present invention, there is provided a method of human male stimulation, the method including providing sensory apparatus, the apparatus including a stimulation device,

the device including a housing defining a liner assembly receiving space which extends along a longitudinal axis to an opening at one end,

the device including a liner assembly which, in an assembled condition, locates in the liner receiving space,

the liner assembly defining a member receiving space which extends along the longitudinal axis, in which, in use, a member is receivable for stimulation,

and an actuator, which in an operating condition causes the liner assembly to move with a reciprocating motion to the relative to the housing.

Possibly, the apparatus includes any of the features described in any of the preceding statements or following description. Possibly, the method includes any of the steps described in any of the preceding statements or following description.

An embodiment of the present invention will now be described, by way of example only, and with reference to the accompanying drawings, in which:-

Fig. 1 is a perspective view of a stimulation device of a sensory apparatus;

Fig. 2 is a side view of the device;

Fig. 3 is a front view of the device;

Fig. 4 is an exploded perspective view of the device, including reference numerals which relate to the parts list of Table 1;

Fig. 5 is a cross-sectional side view of the device, with a liner of the device shown in a contracted condition;

Fig. 6 is a perspective view of the cross sectional side view of Fig. 5;

Fig. 7 is a side view of a liner assembly and plunger, which is a part of the device, with the liner in the contracted condition;

Fig. 8 is a cross sectional a side view of the liner assembly and plunger of Fig. 7;

Fig. 9 is a perspective view of the device with an end part in a partially disassembled condition;

Fig. 10 is a perspective view of the device with another, opposite end part in a partially disassembled condition;

Figs. 11A, 11B and 11C are perspective schematic views showing sequential stages of a simplified part of the device in an operating condition; and

Figs. 12A and 12B are respectively a block diagram and a schematic diagram of the sensory apparatus.

Figs. 1 to 12 show sensory apparatus 110 for human male stimulation, the apparatus 110 including a stimulation device 112. The device 112 includes a housing 114 defining a liner assembly receiving space 116 which extends along a longitudinal axis 118 to an opening 120 at one end 122.

The device 112 includes a liner assembly 124 which in an assembled condition, locates in the liner assembly receiving space 116.

The liner assembly 124 defines a member receiving space 126 which extends along the longitudinal axis 118, in which, in use, a member (not shown) is receivable for stimulation.

The device 112 includes an actuator 128, which in an operating condition causes the liner assembly 124 to move with a reciprocating motion relative to the housing 114.

Reference is made to Table 1, appended to the end of this description, which is a list of parts shown in Fig. 2, which parts could comprise the device 112. In this description, the features of the apparatus 110 will be referred to with names and reference numerals which can be cross referenced to the part names of Table 1 by reference to Fig. 2.

In one example, the member is a human male reproductive member, ie, a penis.

The liner assembly 124 is removable from the liner receiving space 116. The liner assembly 124 includes a liner 130 which defines the member receiving space 126. The liner assembly 124 includes a liner support 132.

During the reciprocating motion, the liner 130 moves between an expanded condition and a contracted condition.

The liner 130 includes a plurality of inwardly directed protrusions 134. In one example, the protrusions 134 include spaced ridges 136, which extend laterally relative to the axis 118. The ridges 136 increase the sensory effect for the user and mimic a real life situation.

The liner 130 defines a liquid receiving compartment 138 and a communication passage 140 which connects the member receiving space 126 to the liquid receiving compartment 138. The communication passage 140 is relatively narrow in comparison with the member receiving space 126 and the liquid receiving compartment 138.

The liner 130 is formed of a resiliently flexible plastics material. In one example, the liner 130 is formed of thermoplastic elastomer (TPE).

In the operating condition, the actuator 128 causes the liner assembly 124 to move reciprocally along the axis 118.

The actuator 128 includes a driving mechanism 142 which produces rotary movement. The driving mechanism 142 includes a gear train 144. The driving mechanism 142 includes a motor 146, which could be an electric motor. The actuator 128 includes a power supply 150. The power supply 150 could, in one example, include a power store, for example, a battery.

The actuator 128 includes a converter 230, which converts the rotary movement into reciprocating movement. The converter 230 comprises a cam arrangement 152, which includes a cam member 154 and cam channelling

156, which defines a cam channel. In the operating condition, the driving mechanism 142 causes the cam member 154 to rotate around the longitudinal axis 118. The cam channelling 156 follows an elliptical path which forms a continuous loop around and along the longitudinal axis 118.

The actuator 128 includes a plunger 198. The plunger 198 is hollow and the liner assembly 124 is mounted therewithin. The actuator 128 includes a plunger support member 224 in the form of a sleeve, in which the plunger 198 moves telescopically.

The actuator 128 includes a cam follower 158, which is mounted to the plunger 198. The cam follower 158 locates in the cam channel defined by the cam channelling 156, and is driven by the cam channelling 154.

The device 112 includes a guide 196, which substantially prevents rotational movement of the cam follower 158 about the longitudinal axis 118. The guide 196 includes a plurality of guide wheels 204. The guide 196 includes a pair of guide channels 200, defined on opposed sides of the outer surface of the plunger 198. In the assembled condition, the guide channels 200 extend along or parallel to the longitudinal axis 118. In the assembled condition, the guide wheels 204 locate in the guide channel 200.

The guide 196 includes a guide support member 202 in the form of a substantially cylindrical frame (which, in one example, could be formed of a relatively rigid material, such as galvanised steel). Two sets of guide wheels 204 are rotationally mounted to opposite inside walls of the guide support member 202. In the assembled condition, the plunger 198 locates within the guide support member 202, which is fixed relative to the housing 114.

The cam follower 158 includes a cam wheel 160, which in the assembled condition locates in the cam channel 156, and includes a cam wheel mounting 162, which rotationally mounts the cam wheel 160 to the plunger 198.

The liner 130 includes an energy store 170, which stores energy in the operating condition.

The liner 130 includes a linear expanding and contracting part 172A, located towards the one end 122 near the opening 120 and another linear expanding and contracting part 172B located at or towards the other end 168 of the housing 114.

The linear expanding and contracting parts 172 comprise the energy store 170.

The liner support 132 comprises substantially rigid support members 3 which extend over, and are bonded to, a substantially cylindrical mid portion of the liner 130. The liner support 132 includes securing formations 212 which could be in the form of resilient clips, which in the assembled condition locate through securing holes 214 defined by the plunger 198.

The linear expanding and contracting parts 172 are located with one linear expanding and contracting part 172 on either side of the liner support 132.

The device 112 includes a first fixing 164 for the liner assembly 124 which is located at or towards the one end 122 of the housing 114 at the opening 120. Referring to Fig. 10, the first fixing 164 could comprise a metal washer 34 which is glued to a first end flange part 206 of the liner 130 and magnets 33 which are glued to a part 15 of the housing 114. In the assembled condition, the magnetic attraction between the magnets 33 and the washer 34 serves to secure the liner 130 in the assembled condition.

The device 112 includes a second fixing 166 for the liner assembly 124 which is located on an end of the plunger 198 away from the opening. Referring to Fig. 9, the second fixing 166 includes a securing ring 35 which is

located over a second end flange part 208 of the liner 130 to seat on a securing surface 210 of the plunger 198, between the securing surface 210 and the second end flange part 208.

The end cap 18 includes a vent arrangement 220 defining one or more vent holes 222 and including a vent member 17 which is rotatably mounted to the end cap 18 and can be rotated to open or close the vent hole(s) 222.

The device 112 includes a local variable speed controller 174, for varying the speed of the actuator 128. The controller 174 includes a local input arrangement 176, comprising a plurality of buttons 178, which provides an input signal to the variable speed controller 174 to permit a user to select a desired speed of operation.

The apparatus 110 includes a remote input device 180 which permits a remote user to control the speed of the actuator 128 via a communications network 188. The remote input device 180 includes a remote controller 182. The remote input device 180 includes a movement sensor 184. The apparatus 110 is arranged so that movement detected by the movement sensor 184 controls the speed of the actuator 128.

The remote input device 180 includes a transmitter 186, for transmitting a remote input signal towards the variable speed controller 174. The device 112 includes a receiver 190 for receiving the remote input signal. The remote input signal could be conveyed by the communications network 188 from the transmitter 186 to the receiver 190. The communications network 188 could include communication apparatus 192, which could include any of one or more of mobile telephones, computers and/or tablet computers, and could include the internet or a Wi-Fi ® system 194. The communication apparatus 192 could comprise local communication apparatus 192A and remote communication apparatus 192B.

The communications network 188 could include signal connections 228 between the device 112, the local communication apparatus 192A, the internet 194, the remote communication apparatus 192B and the remote input device 180. The signal connections 228 could comprise wireless connections, eg Bluetooth ®.

In one example, the remote input device 180 is in the form of a ring 226, which could be worn on a finger of a remote user.

In use, a user inserts a member into the opening 120 and, in one mode of operation, presses one of the buttons 178 to move the device to the operating condition. In this condition, the motor 146 will drive the driving mechanism 142 which rotates the cam member 154 around the longitudinal axis 118, forcing the cam follower 158 to reciprocate linearly substantially parallel to the longitudinal axis 118, as the cam follower 158 is constrained by both the cam channel 156 and the guide channel 200. The cam follower 158 in turn moves the plunger 198 in a reciprocating movement linearly substantially parallel to the longitudinal axis 118. The plunger 198 moves telescopically within the plunger support member 224.

Figs. 11A, 11B and 11C show stages in the operating condition, showing a simplified representation of the plunger 198, in which the liner support 132 would be located.

As the plunger 198 moves reciprocally the liner 130 is moved sequentially between the expanded and contracted conditions. As the liner support 132 is relatively rigid, the movement of the liner assembly 124 is accommodated by the linear expanding and contracting parts 172, which expand and contract together along the axis 118 with the reciprocating motion. As the linear expanding and contracting parts 172 are stretched and compressed, they act as energy stores, alternately storing and then releasing energy which provides a smoothing effect to the reciprocating action produced by the motor 146 and makes the action feel less mechanical to the user.

In the operating condition, the member may produce liquid (not shown) which is received in the liquid receiving compartment 138 via the communication passage 140.

In one example, the motor could have five speeds. The plunger 198 could have a travel distance of at least 50mm and no more than 100mm. In one example, the travel distance could be between 60 and 90mm and in one example, the travel distance could be approximately 75mm.

To remove the liner assembly 124 for cleaning, the end cap 18 is removed, and the securing ring 35 removed from the liner 130 by deforming the second end flange part 208 so that it fits through the hole defined by the securing ring 35. The liner 130 is moved to the expanded condition so that the end of the plunger 198 is accessible and this permits user access to the securing formations 212 which can be released from the securing holes 214, permitting the liner assembly 124 to be removed from the housing 114 via the opening 120. Reassembly after cleaning is a reversal of this procedure.

In another mode of operation, the speed of the motor 146 is controlled by the movement of the remote input device 180, so that, for example, as a remote user moves the remote input device 180 faster, the speed of the motor 146 correspondingly increases. The local user and the remote user could see and hear each other via the communication apparatus 192A, 192B which could comprise video cameras 216 and display screens 218.

The receiver 190 and transmitter 186 communicate with the communication apparatus 192 by the signal connections 228. One of the buttons 178 could be utilised for pairing between the device 112 and the local communication apparatus 192A.

Various other modifications could be made without departing from the scope of the invention. The devices could be of any suitable size and shape,

and could be formed of any suitable material (within the scope of the specific definitions herein).

The liner assembly 124 could be fixed differently to the housing 114.

The remote input device 180 could be any suitable size and shape. For example, the remote input device 180 might be in the form of a relatively small item of any suitable shape which is held, attached, fastened or mounted to another user's body or clothing or to another movable object. The small item could include any suitable form of attachment, such as adhesive (eg, sticky pad), hook and fleece fastening, a clip, a pin etc.

The remote input device 180 could be waterproof.

Referring to the arrangement shown in Fig. 5, in another example, the apparatus 110 could include one remote input device 180 which communicates with a plurality of stimulation devices 112.

The communication network 188 might not include the internet or Wi-Fi ® 194 but might utilise the wireless signal connections 228 direct between the local and remote communication apparatus 192A, 192B. In another example, both the remote input device 180 and the stimulation devices 112 communicate directly to the same communication apparatus 192A.

There is thus provided sensory apparatus with a number of advantages over conventional arrangements.

Item No	Description	Qty.
1	Shell TPU Left	1
2	TPU Sleeve	1
3	Shell TPU Right	1
4	Moving Cup	1
5	Metal Mount	1
6	Cup Track Cover	1
7	Metal Sleeve	1
8	Roller Sleeve	6
9	Sleeve Shaft	6
10	Housing Left	1
11	Cup Track	1
12	Disk Bracket	1
13	Cup Gear 816	1
14	Base Housing	1
15	Mid Cover	1
16	Base Cover	1
17	Vent Disk	1
18	Cap	1
19	Sleeve Rubber	1
20	Housing Right	1
21	PCB DC Assembly	1
22	PCB Assembly	1
23	Motor TFC3650B2	1
24	Motor TFC3650 Bracket	1
25	Axle Gear 120-15T	1
26	Gear 2_3 280-35T 104-13T	1
27	Gear 4 320-40T	1
28	Gear 4 Shaft	1
29	Gear 3 Shaft	1
30	Pin Shaft	1
31	Roller Cup	1
32	E-ring D1500-2_3	1
33	Magnets	4
34	Metal washer	1
35	PP Disk	1

Table 1: Parts List For Fig. 2

CLAIMS

1. Sensory apparatus for human male stimulation, the apparatus including a stimulation device, the device including a housing defining a liner assembly receiving space which extends along a longitudinal axis to an opening at one end, the device including a liner assembly which, in an assembled condition, locates in the liner assembly receiving space, the liner assembly defining a member receiving space which extends along the longitudinal axis, in which, in use, a member is receivable for stimulation, the device including an actuator, which, in an operating condition, causes the liner assembly to move with a reciprocating motion relative to the housing.

2. Apparatus according to claim 1, in which the liner assembly is removable from the liner receiving space.

3. Apparatus according to claims 1 or 2, in which the liner assembly includes a liner.

4. Apparatus according to any of the preceding claims, in which the liner defines the member receiving space.

5. Apparatus according to claims 3 or 4, in which, during the reciprocating motion, the liner moves between an expanded condition and a contracted condition.

6. Apparatus according to any of claims 3 to 5, in which the liner includes a plurality of inwardly directed protrusions, which may include ridges, which may extend laterally relative to the axis.

7. Apparatus according to any of claims 3 to 6, in which the liner defines a liquid receiving compartment.

8. Apparatus according to claim 7, in which the liner defines a communication passage which connects the member receiving space to the liquid receiving compartment, the communication passage being relatively narrow in comparison with the member receiving space and the liquid receiving compartment.

9. Apparatus according to any of the preceding claims, in which the actuator causes the liner assembly to move reciprocally along the axis.

10. Apparatus according to any of the preceding claims, in which the actuator includes a driving mechanism which produces rotary movement and a converter, which converts the rotary movement into reciprocating movement.

11. Apparatus according to claim 10, in which the converter comprises a cam arrangement.

12. Apparatus according to claim 11, in which the cam arrangement includes cam channelling, which defines a cam channel.

13. Apparatus according to any of the preceding claims, in which the actuator includes a plunger and the liner assembly is mounted to the plunger.

14. Apparatus according to claim 13, in which the liner assembly is mounted within the plunger.

15. Apparatus according to claims 13 or 14 when dependent on claim 12, in which the actuator includes a cam follower, which is mounted to the plunger, and is located in the cam channel, and is driven by the cam channelling.

16. Apparatus according to claim 15, in which the cam follower includes a cam wheel, which, in the assembled condition, locates in the cam channel, and

may include a cam wheel mounting, which may rotationally mount the wheel to the plunger.

17. Apparatus according to claims 15 or 16, in which the device includes a guide, which substantially prevents rotational movement of the cam follower about the longitudinal axis.

18. Apparatus according to claim 17, in which the guide includes guide wheels, which locate in a guide channel, which extends along or parallel to the longitudinal axis.

19. Apparatus according to claim 18, in which the guide channel is defined by the plunger.

20. Apparatus according to claims 18 or 19, in which the device includes a guide support member, which, in the assembled condition, is fixed relative to the housing, and to which the guide wheels are rotationally mounted.

21. Apparatus according to claim 20, in which the guide support member is hollow and wherein, in the assembled condition, the plunger is located inside the guide support member.

22. Apparatus according to claim 13 or any claim dependent thereon, in which the device includes a first fixing for the liner assembly which is located at or towards one end of the housing and a second fixing for the liner assembly which is located at or towards an end of the plunger away from the opening.

23. Apparatus according to claim 3 or any claim dependent thereon, in which the liner includes an energy store, which stores energy in the operating condition.

24. Apparatus according to claim 3 or any claim dependent thereon, in which the liner includes a linear expanding and contracting part, which, in the

operating condition, expands and contracts along the axis with the reciprocating motion.

25. Apparatus according to claim 24 when dependent on claim 23, in which the linear expanding and contracting part comprises part or all of the energy store.

26. Apparatus according to claims 24 or 25, in which the liner includes a plurality of linear expanding and contracting parts.

27. Apparatus according to claim 26, in which the liner includes two linear expanding and contracting parts.

28. Apparatus according to claim 27, in which the liner assembly includes a liner support and the linear expanding and contracting parts are located with one linear expanding and contracting part on either side of the liner support.

29. Apparatus according to any of the preceding claims, in which the device includes a local controller, for controlling the actuator.

30. Apparatus according to claim 29, in which the controller includes a variable speed controller, for varying the speed of the actuator.

31. Apparatus according to claim 30, in which the controller includes a local input arrangement which provides an input signal to the variable speed controller to permit a user to select a desired speed of operation.

32. Apparatus according to claim any of the preceding claims, in which the apparatus includes a remote input device which permits a remote user to control the speed of the actuator via a communications network.

33. Apparatus according to claim 32, in which the remote input device includes a remote controller.

34. Apparatus according to claims 32 or 33, in which the remote input device includes a movement sensor, and the apparatus is arranged so that movement detected by the movement sensor controls the speed of the actuator.

35. Apparatus according to any of claims 32 to 34 when dependent on claim 31, in which the remote input device includes a transmitter, for transmitting a remote input signal towards the variable speed controller, the device includes a receiver for receiving the remote input signal, and the remote input signal is conveyed by the communications network from the transmitter to the receiver.

36. Apparatus according to claim 32 or any claim dependent thereon, in which the communications network includes communication apparatus, which may include any of one or more mobile telephones, computers and/or tablet computers, and may include the internet.

37. Apparatus according to any of the preceding claims, in which the member is a human male reproductive member, ie a penis.

38. A method of human male stimulation, the method including providing sensory apparatus, the apparatus including a stimulation device, the device including a housing defining a liner assembly receiving space which extends along a longitudinal axis to an opening at one end, the device including a liner assembly which, in an assembled condition, locates in the liner receiving space, the liner assembly defining a member receiving space which extends along the longitudinal axis, in which, in use, a member is receivable for stimulation, and an actuator, which in an operating condition causes the liner assembly to move with a reciprocating motion to the relative to the housing.

39. A method according to claim 38, in which the apparatus includes any of the features defined in any of claims 1 to 37.

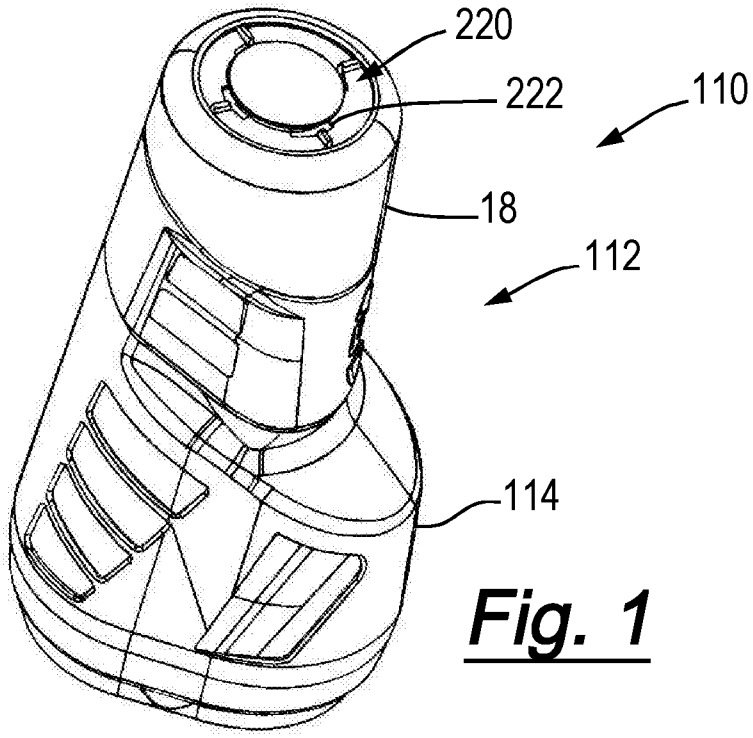


Fig. 1

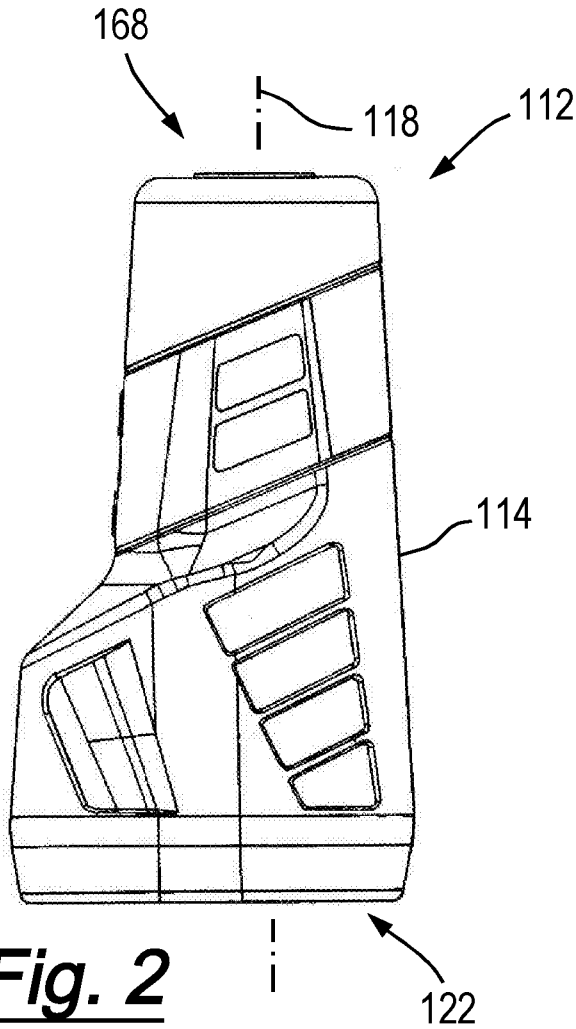


Fig. 2

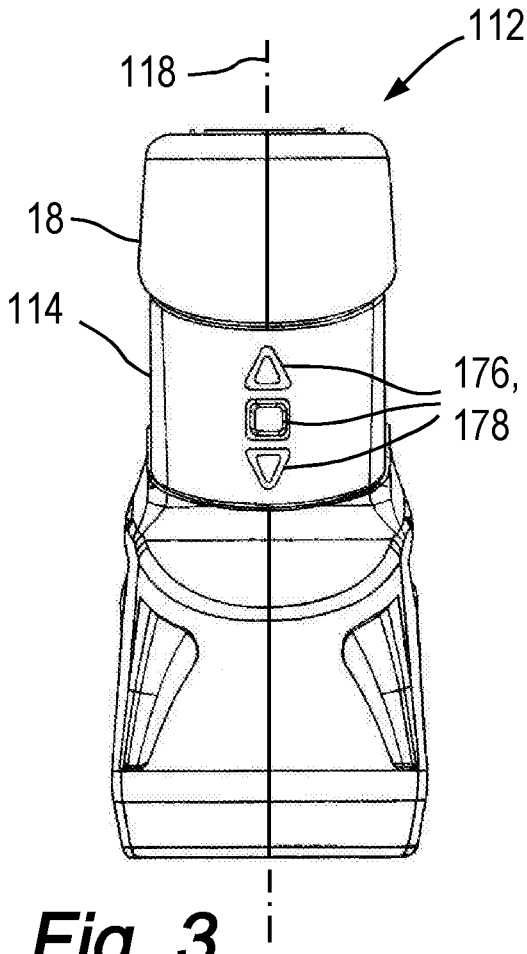
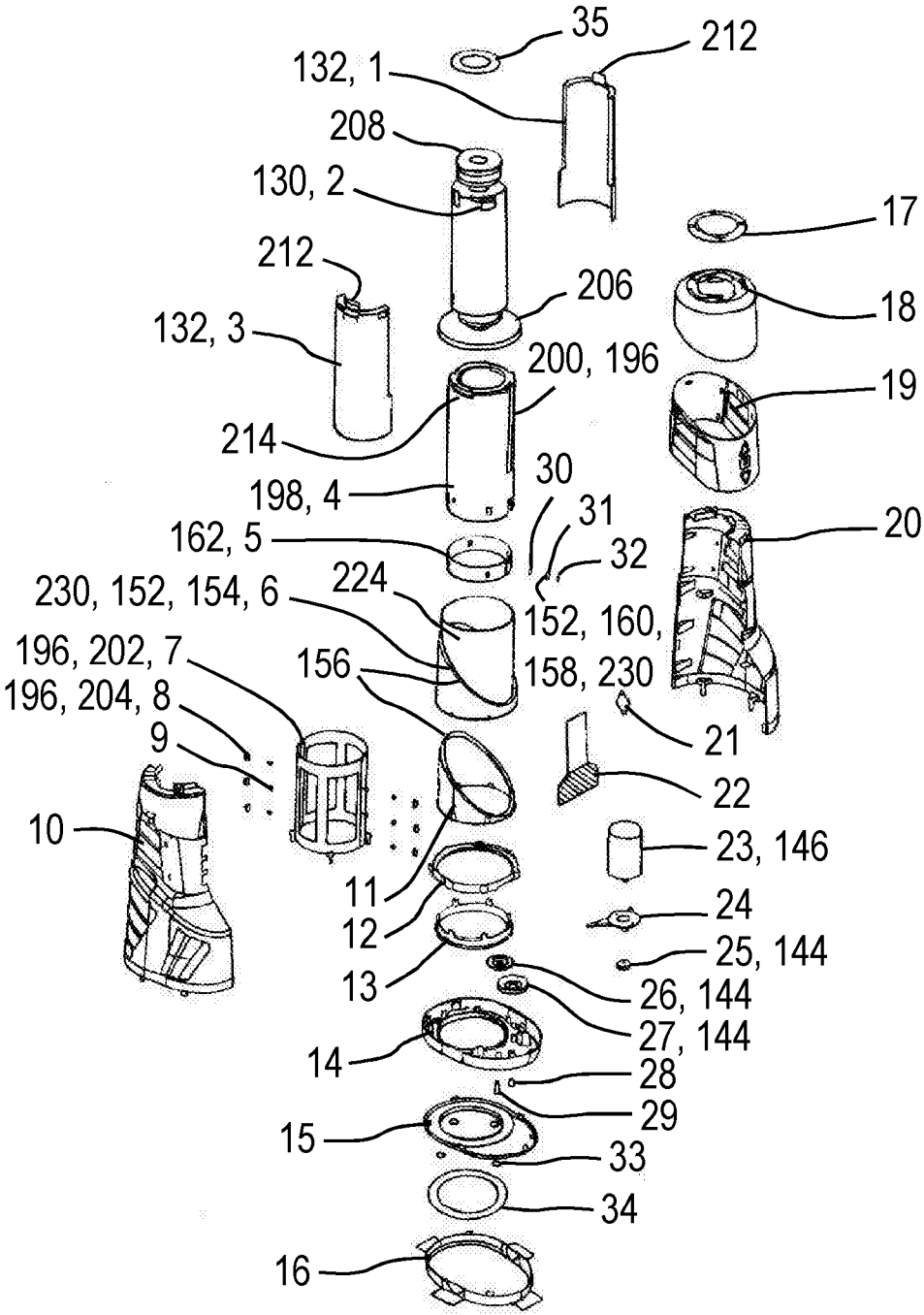


Fig. 3


35
212
132, 1
208
130, 2
17
212
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132, 3
200, 196
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198, 4
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162, 5
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230, 152, 154, 6
152, 160,
196, 202, 7
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158, 230
196, 204, 8
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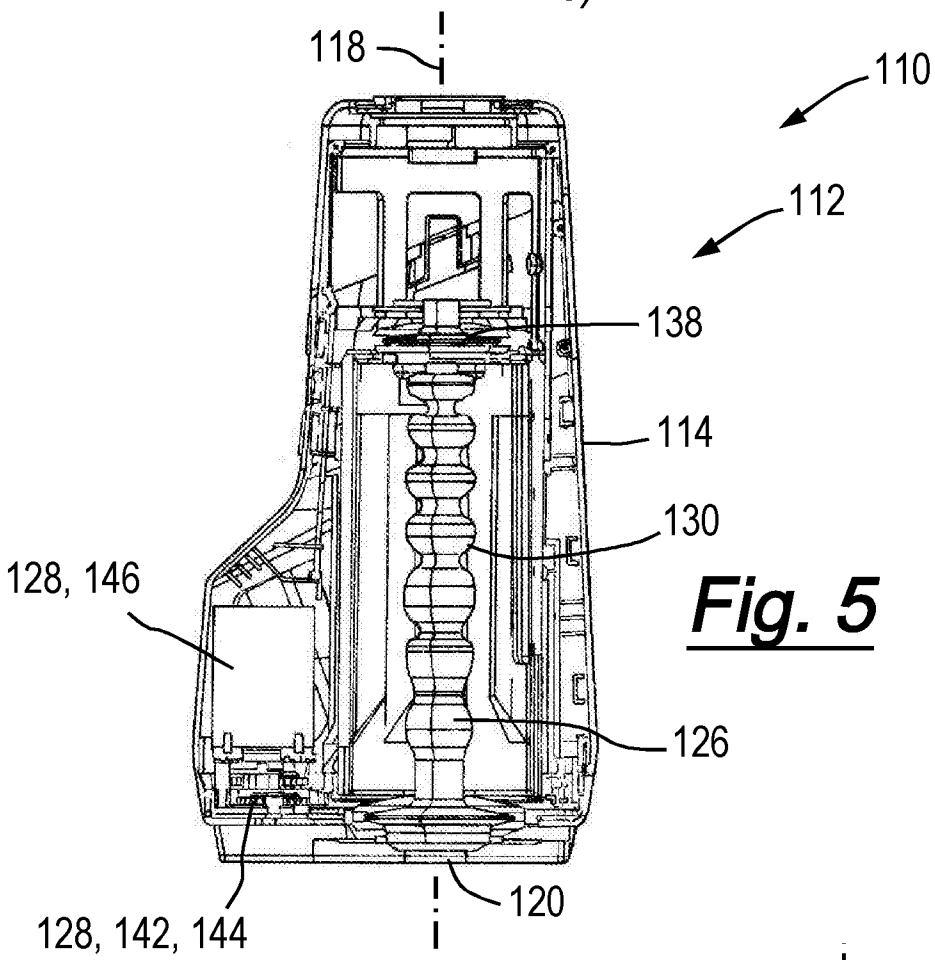
Fig. 4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128, 142, 144

Fig. 5

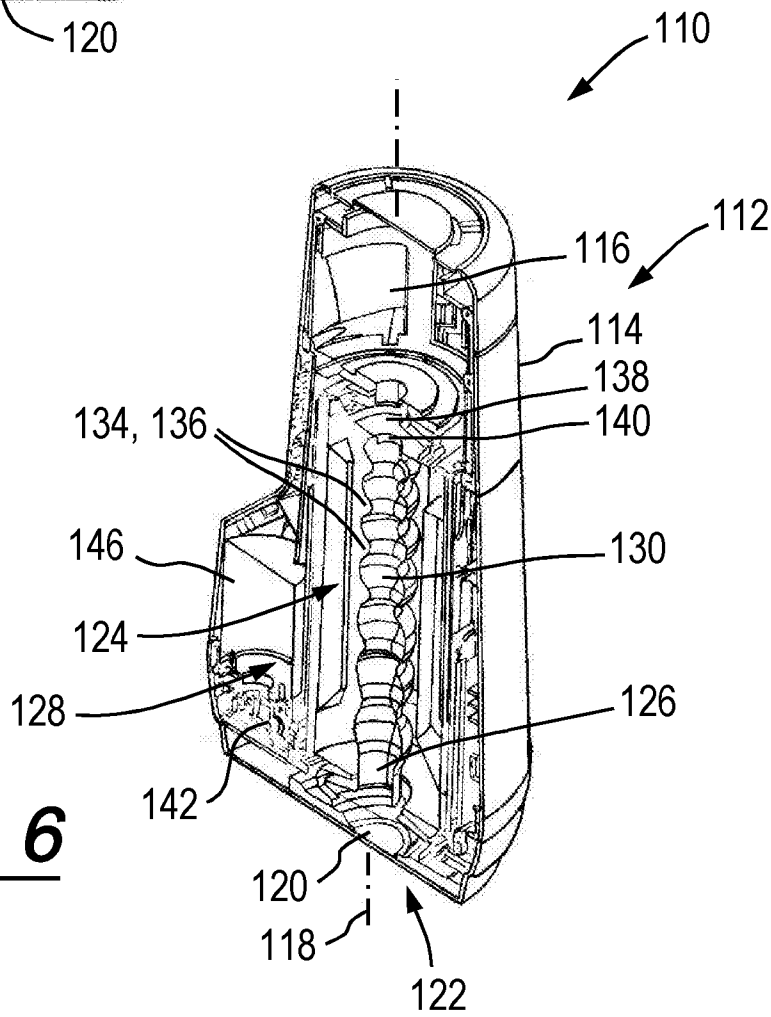
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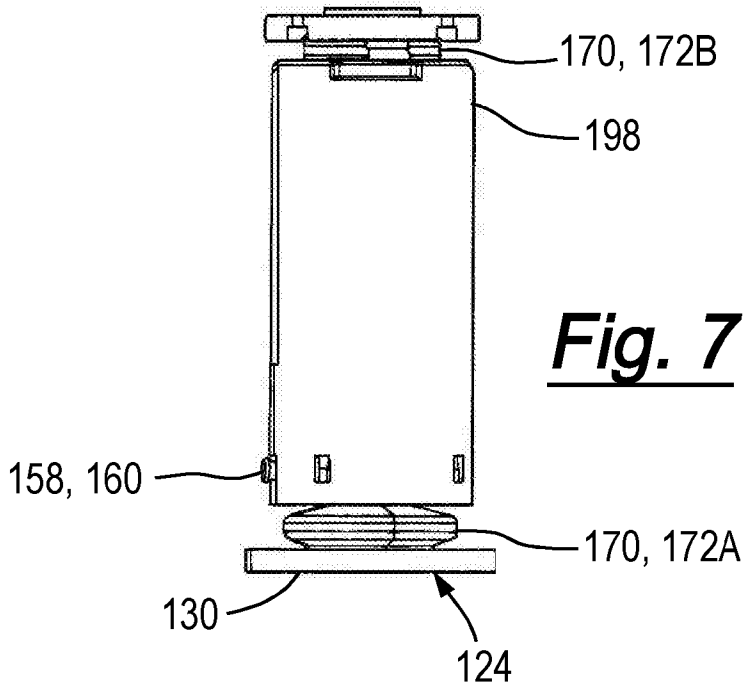
Fig. 6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170, 172A
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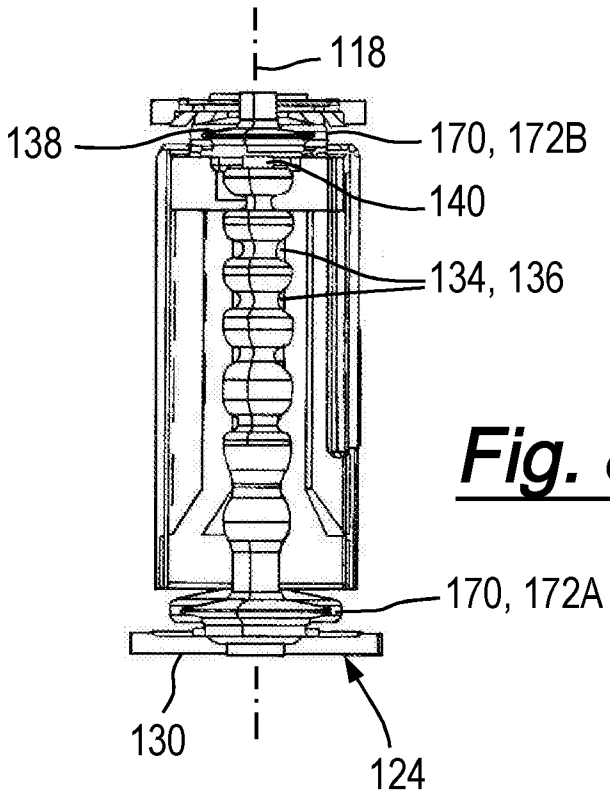
124

Fig. 7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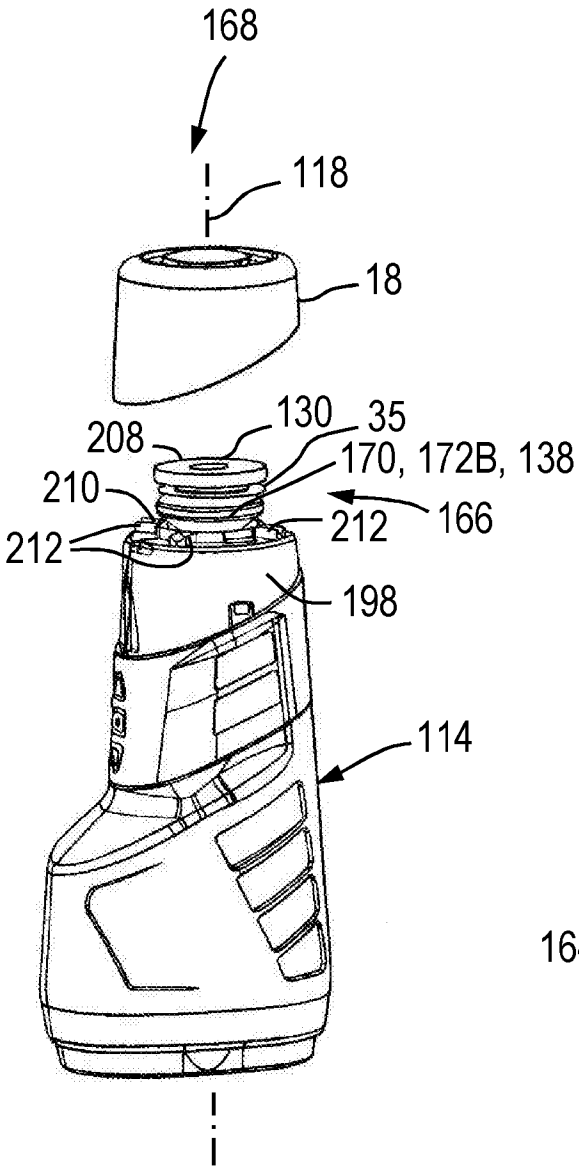
170, 172A
130
124

Fig. 8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170, 172B, 138
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166
212
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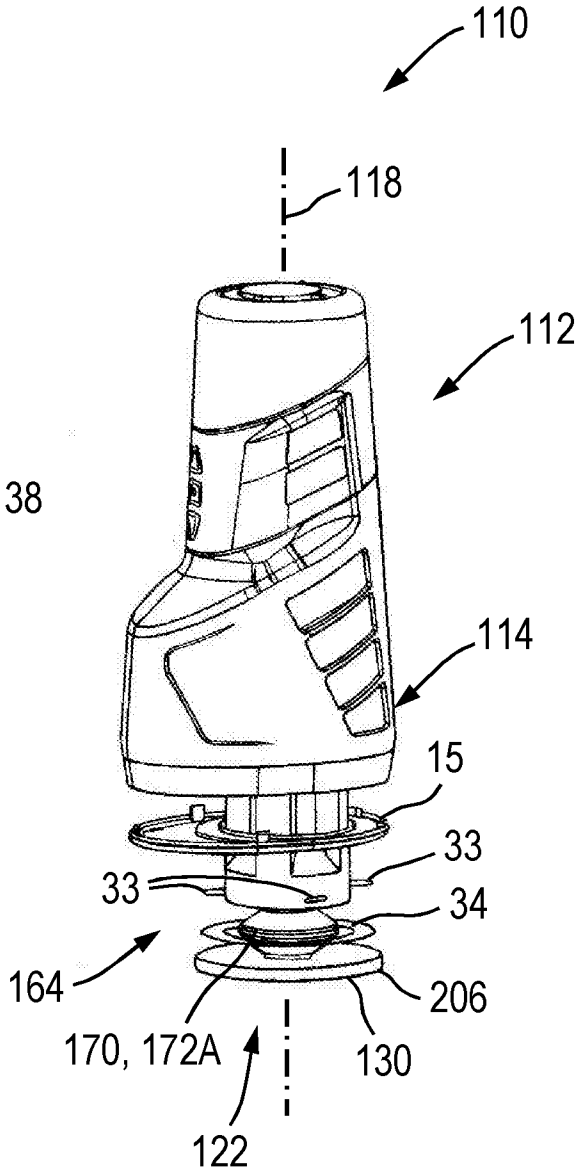
198
114

Fig. 9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122

Fig. 10

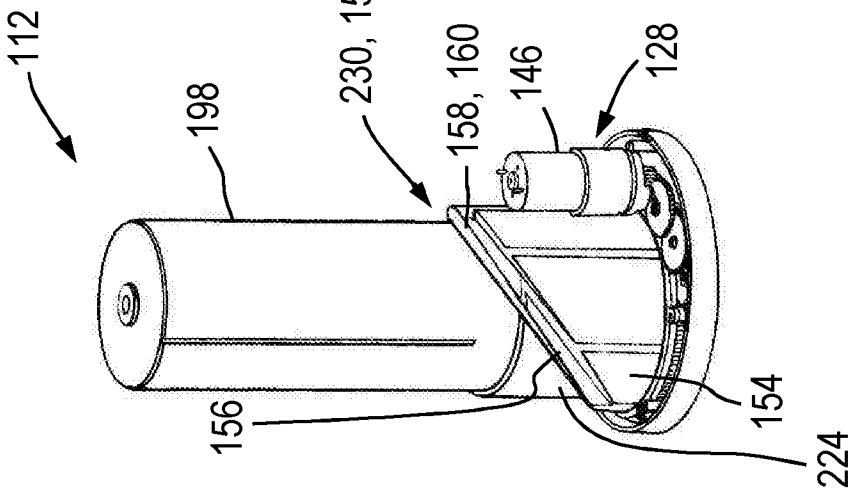

Fig. 11C

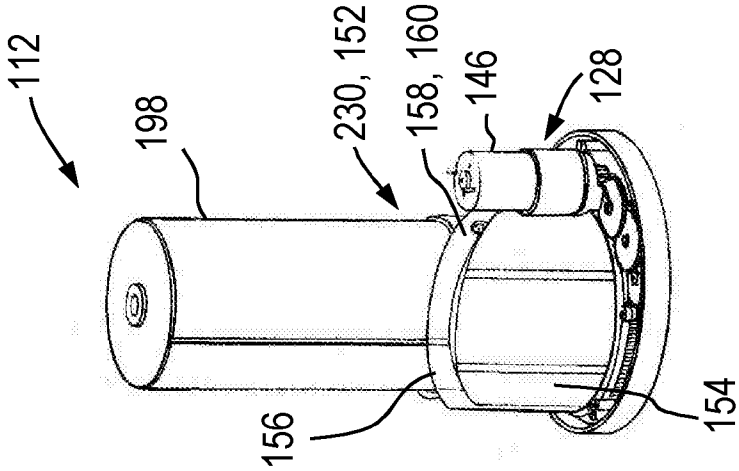

Fig. 11B

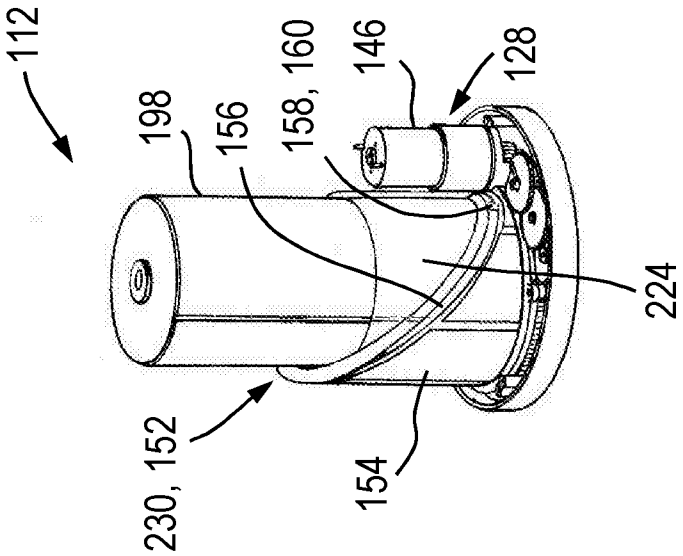

Fig. 11A

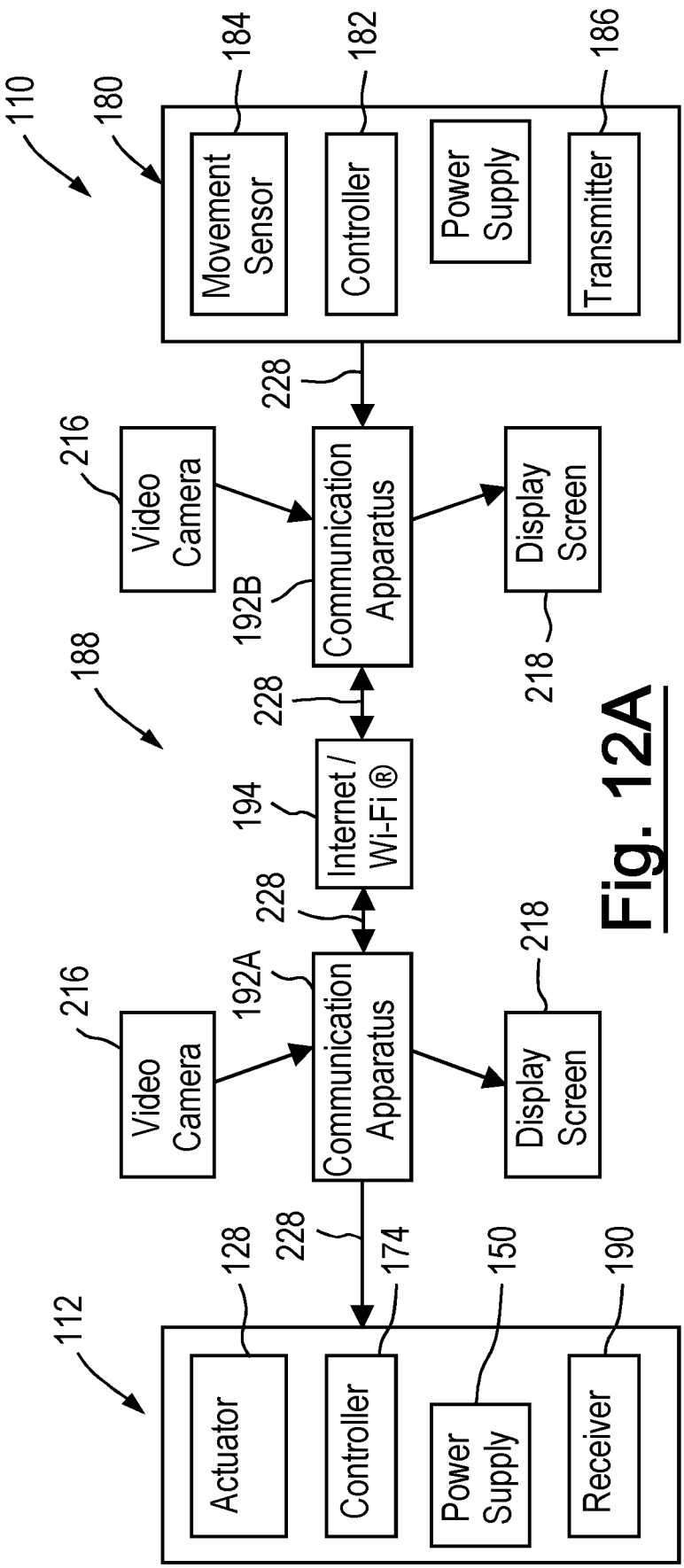

Fig. 12A

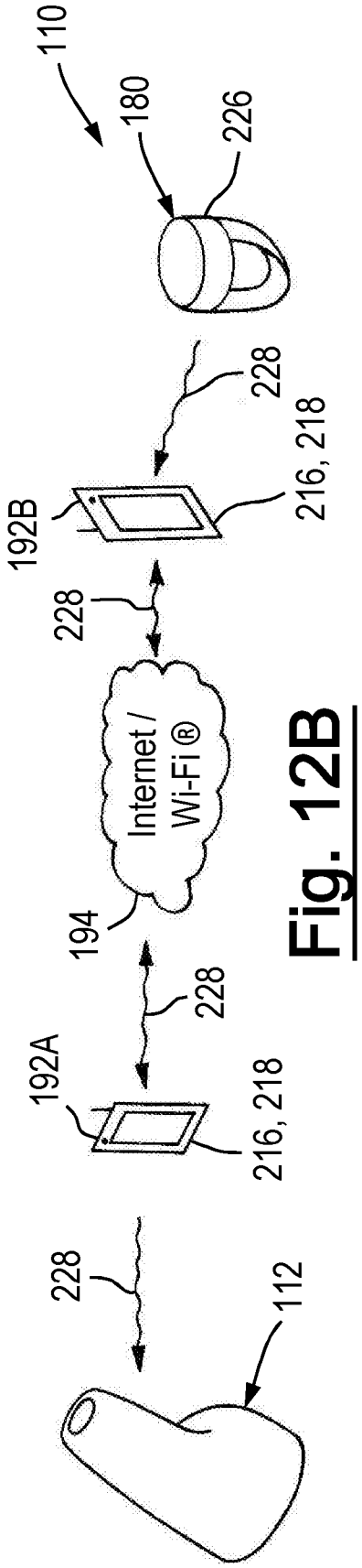

Fig. 12B

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2017/050091

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61H19/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 92 01 194 U1 (.) 21 May 1992 (1992-05-21) page 1, last paragraph - page 2, paragraph 1; figure	1-37
X	DE 10 2013 102280 A1 (GIAMPIETRO GIUSEPPE [VE]; ZANDER RALF [DE]) 11 September 2014 (2014-09-11) paragraphs [0016], [0017], [0025] - [0035]; figures	1-37
X	WO 2005/099366 A2 (KARGULA CHRISTOPHER [US]) 27 October 2005 (2005-10-27) claims 1,6; figures	1-37
X	DE 75 20 052 U (.) 24 June 1976 (1976-06-24) claims 7-9; figure	1-37

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
3 May 2017	15/05/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Fischer, Elmar

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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2017/050091

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/194907 A1 (LIN HSI-FU [TW] ET AL) 14 August 2008 (2008-08-14) paragraphs [0031] - [0033]; figures 11,12	1-37
X	US 2009/099413 A1 (KOBASHIKAWA ALVIN Y [US] ET AL) 16 April 2009 (2009-04-16) claims 12-15,17-20; figures 13-21	1-37

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2017/050091

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.: 38, 39
because they relate to subject matter not required to be searched by this Authority, namely:

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy.In particular, independent claim 38 is directed to a method of human male stimulation, which inevitably encompasses therapeutic effects such as treatment of sexual dysfunctions.

2. [ ] Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

[ ] The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

[ ] No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2017/050091

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 9201194 U1	21-05-1992	NONE	
DE 102013102280 A1	11-09-2014	AU 2014224947 A1	01-10-2015
		CA 2901794 A1	12-09-2014
		CN 105120822 A	02-12-2015
		DE 102013102280 A1	11-09-2014
		EP 2964179 A1	13-01-2016
		HK 1217895 A1	27-01-2017
		JP 2016508802 A	24-03-2016
		KR 20150129763 A	20-11-2015
		SG 11201507139V A	29-10-2015
		TW 201436784 A	01-10-2014
		US 2016008214 A1	14-01-2016
		WO 2014135301 A1	12-09-2014
WO 2005099366 A2	27-10-2005	NONE	
DE 7520052 U	24-06-1976	NONE	
US 2008194907 A1	14-08-2008	NONE	
US 2009099413 A1	16-04-2009	NONE	