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(54) **Dispensing unit for a thin film dispenser and thin film dispenser having the same**

(57) A dispensing unit (20) for a thin film dispenser has a base (21), a wheel assembly (23), a thin film (26) and a locking device (28). The wheel assembly (23) is mounted on the base (21) and has a tape supplying wheel (24) and a used tape collecting wheel (25). The tape supplying wheel (24) and the used tape collecting wheel (25) are mounted rotatably on the base (21). The locking device (28) is resiliently disposed on the base (21) and selectively engages the wheel assembly (23) to prevent the wheel assembly (23) from rotating. Accordingly, the locking device (28) can provide a locking function to the wheel assembly (23) to prevent the thin film (26) from being loosened during the course of packaging, transporting and assembling processes.

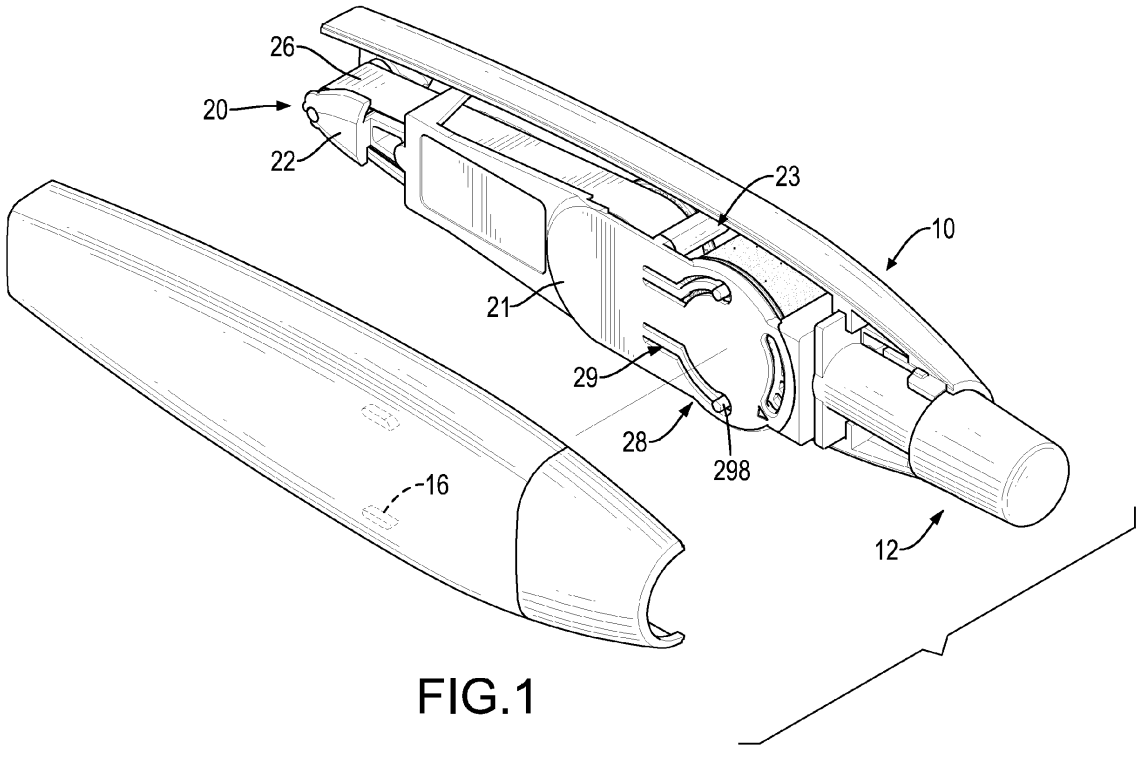

FIG.1

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Description

1. Field of the Invention

[0001] The present invention relates to a dispensing unit and a thin film dispenser having the same, and more particularly to a dispensing unit having a capability of providing a locking effect to a tape wheel.

2. Description of Related Art

[0002] A conventional thin film dispenser, such as a correction tape dispenser or an adhesive tape dispenser, substantially comprises a housing and a dispensing unit mounted in the housing. The conventional dispensing unit comprises a dispensing head, a wheel assembly and a thin film. The dispensing head is mounted on one end of the dispensing unit. The wheel assembly comprises a tape supplying wheel and a used tape collecting wheel driven to rotate with each other. The thin film is mounted around the wheel assembly and the dispensing head. For environmentally friendly purposes and to reduce cost burden of the user, the housing of the thin film dispenser is in a detachable form to allow a user to replace the used dispensing unit with a new one. Therefore, the dispensing unit for a thin film dispenser is usually individually packaged and sold, and a user can buy a new dispensing unit for replacing a used one.

[0003] With reference to Figs. 12 and 13, a securing card 60 is provided to hold the wheel assembly in position to keep the wheel assembly from rotating during the processes of manufacturing, packaging or transporting such that the thin film can be accordingly prevented from loosening from the wheel assembly. The conventional securing card 60 is made of paper and comprises a bottom board 62 and a positioning tab 64. The positioning tab 64 protrudes from the bottom board 62 and engages a wheel axle of the tape supplying wheel 52 of the wheel assembly. Accordingly, the rotation of the tape supplying wheel 52 can be prevented, and the thin film will not be loosened from the wheel assembly.

[0004] However, the conventional securing card 60 can hold the dispensing unit 50 in position only during the course of packaging and transporting. When the dispensing unit 50 is to be assembled in the housing of a thin film dispenser, the securing card 60 has to be taken out of the dispensing unit 50 and the dispensing unit 50 is unlocked. Therefore, the tape supplying wheel 52 is easily rotated and the thin film is easily loosened from the rotating wheel assembly during the assembling of the dispensing unit 50 with the housing. To assemble the conventional dispensing unit is inconvenient. In addition, the correction tape or adhesive gel on the loosened thin film easily adhere onto another object or user's hand, not only contaminating the environment or the user's hand, but also rendering the loosened thin film no longer useable, causing waste of the thin film.

[0005] To overcome the shortcomings, the present invention tends to provide a dispensing unit for a thin film dispenser to mitigate or obviate the aforementioned problems.

[0006] The main objective of the invention is to provide a dispensing unit with a locking function for a thin film dispenser and a thin film dispenser having the same to prevent a thin film from being loosened during the course of packaging, transporting and assembling processes. Consequently, replacing and assembling the dispensing unit is convenient to improve the convenience and versatility of use of the dispensing unit.

[0007] The dispensing unit in accordance with the present invention has a base, a wheel assembly, a thin film and a locking device. The wheel assembly is mounted on the base and has a tape supplying wheel and a used tape collecting wheel. The tape supplying wheel and the used tape collecting wheel are mounted rotatably on the base. The thin film is mounted around the wheel assembly. The locking device is resiliently disposed on the base and selectively engages the wheel assembly to prevent the wheel assembly from rotating.

[0008] The thin film dispenser in accordance with the present invention has a housing and a dispensing unit. The housing has a transmission device disposed in the housing. The dispensing unit is mounted in the housing and has a base, a wheel assembly, a thin film and a locking device. The wheel assembly is mounted on the base and has a tape supplying wheel and a used tape collecting wheel. The tape supplying wheel and the used tape collecting wheel are mounted rotatably on the base. The thin film is mounted around the wheel assembly. The locking device is resiliently disposed on the base and selectively engages the wheel assembly to prevent the wheel assembly from rotating.

[0009] With such an arrangement, the locking device can provide a locking effect to the wheel assembly to prevent the wheel assembly from rotating arbitrarily. Accordingly, the thin film can be prevented from being loosened due to the rotation of the wheel assembly during the course of packaging, transporting and assembling processes. The packaging and transporting processes of the dispensing unit can be simplified and the cost therefore can also be reduced. A user can replace the dispensing unit easily and conveniently, and the assembling process of the dispensing unit is convenient. The waste of the thin film can be avoided to improve the utility of the dispensing unit.

[0010] Other objects, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

IN THE DRAWINGS

[0011]

Fig. 1 is a partially exploded perspective view of a first embodiment of a thin film dispenser with a dis-

pensing unit in accordance with the present invention;

Fig. 2 is a perspective view of the dispensing unit in Fig. 1;

Fig. 3 is an exploded perspective view of the dispensing unit in Fig. 2;

Fig. 4 is an enlarged partial top view of the thin film dispenser in Fig. 1;

Fig. 4A is an enlarged top view of the dispensing unit in Fig. 4;

Fig. 5 is an enlarged operational top view of the thin film dispenser in Fig. 1;

Fig. 5A is an enlarged top view of the dispensing unit in Fig. 5;

Fig. 6 is a perspective view of a second embodiment of a thin film dispenser in accordance with the present invention;

Fig. 7 is an enlarged perspective view of the dispensing unit in Fig. 6;

Fig. 8 is an enlarged partial top view of the thin film dispenser in Fig. 6;

Fig. 9 is an enlarged operational top view of the thin film dispenser in Fig. 6;

Fig. 9A is an enlarged top view of the dispensing unit in Fig. 9;

Fig. 10 is an exploded perspective view of a third embodiment of a thin film dispenser in accordance with the present invention;

Fig. 11 is a perspective view of the dispensing unit in Fig. 10;

Fig. 12 is an exploded perspective of a conventional securing card with a conventional dispensing unit in accordance with the prior art; and

Fig. 13 is an enlarged top view in partial section of the conventional securing card with the dispensing unit in Fig. 12.

[0012] A thin film dispenser in accordance with the present invention may be a correction tape dispenser, an adhesive tape dispenser or the like and includes all kinds of apparatus that can apply coating materials of a thin film onto a desired location. With reference to Fig. 1, the thin film dispenser in accordance with the present invention has a housing 10 and a dispensing unit 20. The housing 10 has a chamber defined in the housing 10 to hold the dispensing unit 20 inside. The housing 10 further has a transmission device. The housing 10 may be composed of at least two casings combined with each other. The casings may be right and left casings as shown in Fig. 1, or front and rear casings, or upper and lower casings or the like. As long as the housing 10 is in a detachable form, the format, number and combination method of the casings are not limited in the present invention. The dispensing unit 20 may be retracted completely into the housing 10 in a normal condition as shown in Fig. 1. In this case, a retracting device 12 is further provided to extend the dispensing unit 20 out of the housing 10 for use. The retracting device 12 may be a button assembly as shown in Fig. 1, a rotatable knob, a pushing assembly or the like. As long as the retracting device 12 has a function of extending the dispensing unit 20 out of the housing 10, the format and structure of the retracting device 12 are not limited in the present invention and the further description of the retracting device 12 is omitted.

[0013] With reference to Figs. 1 to 4, the dispensing unit 20 is retractably mounted in the housing 10, is connected to the retracting device 12 to enable the dispensing unit 20 to be pushed to extend out of or be retracted into the housing 10. The dispensing unit 20 comprises a base 21, a dispensing head 22, a wheel assembly 23, a thin film 26 and a locking device 28. The base 21 may be in a detachable form and is connected with the retracting device 12. The dispensing head 22 is disposed on one end of the base 21 and can be pushed to extend out of the housing 10. The wheel assembly 23 is mounted on the base 21 at an end opposite to the dispensing head 22 and comprises a tape supplying wheel 24 and a used tape collecting wheel 25. The tape supplying wheel 24 and the used tape collecting wheel 25 are respectively mounted rotatably on the base 21 and are connected to and driven by the transmission device in the housing 10 to enable the tape supplying wheel 24 and the used tape collecting wheel 25 to rotate simultaneously. The tape supplying wheel 24 has multiple concave-convex teeth 242 disposed alternately, formed on a side of the tape supplying wheel 24 and arranged in a circle.

[0014] The thin film 26 is mounted around the wheel assembly 23 and the dispensing head 22 and has an unused end mounted around the tape supplying wheel 24 and a used end that is mounted first over and via the dispensing head 22 and then around the used tape collecting wheel 25.

[0015] The locking device 28 is resiliently disposed on the base 21 to prevent the wheel assembly 23 from rotating and selectively engages the wheel assembly 23. Preferably, the locking device 28 engages the tape supplying wheel 24 and may engage one of the concave-convex teeth 242 on the tape supplying wheel 24. With the arrangement of the locking device 28, arbitrary rotation of the wheel assembly 23 is prevented, and the thin film 26 can be kept from being loosened and escaping from the wheel assembly 23. The locking device 28 comprises at least one resilient engaging arm 29 formed on the base 21. Preferably, two resilient engaging arms 29 are implemented. Each resilient engaging arm 29 comprises a straight segment 292 and a curved segment 294. The straight segment 292 is integrally and resiliently connected with the base 21 and has a free end opposite to the base 21. The curved segment 294 is connected with the straight segment 292 and has a connecting end and an engaging end. The connecting end is integrally connected with the free end of the straight segment 292. The engaging end is opposite to the connecting end, and an engaging element 296 is formed on the engaging end of the curved segment 294 and selectively engages one of the concave-convex teeth 242 on the tape supplying

wheel 24. The engaging element 296 may be a protruding element and engaging one of the concave teeth among the concave-convex teeth 242. Alternatively, the engaging element 296 may be a cavity element and engaging one of the convex teeth among the concave-convex teeth 242. With the engagement between the engaging element 296 and the concave-convex teeth 242, the tape supplying wheel 24 can be prevented from rotating. In addition, a pushed protrusion 298 is formed on and protrudes from the engaging end of the curved segment 294 and is distal from the wheel assembly 23.

[0016] In addition, each resilient engaging arm 29 may only comprise a straight segment 292 integrally and resiliently connected with the base 21 and having an engaging end opposite to the base 21. An engaging element 296 is formed on the engaging end of the straight segment 292 and selectively engages one of the concave-convex teeth 242 on the tape supplying wheel 24. A pushed protrusion 298 is formed on and protrudes from the engaging end of the straight segment 292.

[0017] Alternatively, each resilient engaging arm 29 may only comprise a curved segment 294 integrally and resiliently connected with the base 21 and having an engaging end opposite to the base 21. An engaging element 296 is formed on the engaging end of the curved segment 294 and selectively engages one of the concave-convex teeth 242 on the tape supplying wheel 24. A pushed protrusion 298 is formed on and protrudes from the engaging end of the curved segment 294.

[0018] Further, each resilient engaging arm 29 may comprise two ends integrally and resiliently connected with the base 21 and an engaging segment formed between the ends. An engaging element 296 is formed on the engaging segment and selectively engages one of the concave-convex teeth 242 on the tape supplying wheel 24. A pushed protrusion 298 is formed on and protrudes from the engaging segment.

[0019] With such an arrangement, for a manufacturer, during the processes of packaging and transporting the dispensing unit 20, a conventional securing card additionally disposed for holding the dispensing unit 20 is unnecessary. The processes of packaging and transporting the dispensing unit 20 can be simplified and the cost thereof can also be reduced. For a user, when a user buys a new dispensing unit 20 for replacing a used dispensing unit 20, the wheel assembly 23 can be kept at a locked condition with the locking effect provided by the locking device 28 during the whole assembling process of the dispensing unit 20 with the housing 10. The thin film 26 can be prevented from being loosened, so to assemble the dispensing unit 20 with the housing 10 is convenient and the waste of the thin film 26 caused by loosening can also be prevented. The utility of the dispensing unit 20 is improved.

[0020] In addition, an unlocking device is further disposed on the housing 10 and corresponds to the locking device 28 on the dispensing unit 20 to unlock the wheel assembly 23 from the locking device 28. With reference to Figs. 1, 4, 4A, 5 and 5A, the unlocking device is disposed on an inner surface of the housing 10 and comprises at least one guiding block 16 corresponding respectively to the at least one resilient engaging arm 29. Each guiding block 16 is spaced from and respectively aligns with each resilient engaging arm 29 after the housing 10 is closed. Accordingly, when the dispensing head 22 is pushed to extend out of the housing 10 by the operation of the retracting device 12, the guiding blocks 16 can abut and press on the pushed protrusions 298 on the resilient engaging arms 29. Consequently, the engaging elements 296 on the resilient engaging arms 29 disengage from the concave-convex teeth 242 on the tape supplying wheel 24 and the tape supplying wheel 24 is unlocked and is capable of rotating. Thus, the dispensing unit 20 is in a normal use condition to provide a thin film dispensing function. When the dispensing head 22 of the dispensing unit 20 is retracted into the housing 10 by the operation of the retracting device 12, the pushed protrusions 298 on the resilient engaging arms 29 leave the position where the pushed protrusions 298 abut on the guiding blocks 16. With the resilience of the resilient engaging arms 29, the engaging elements 296 will reengage the concave-convex teeth 242 on the tape supplying wheel 24 to lock the wheel assembly 23 again.

[0021] With reference to Figs. 6 to 9A, in the second embodiment in accordance with the present invention, the housing 10A can be composed of three casings combined with one another and has an unlocking device with the guiding blocks 16A mounted on one of the casings. The casing with the guiding blocks 16A could be opened. The dispensing unit 20A permanently extends out of the housing 10A in a normal condition, and a cap 14 is provided to cover the protruding portion of the dispensing unit 20A out of the housing 10A to keep the dispensing unit 20A from contacting another object while not in use. In this embodiment, the guiding blocks 16A of the unlocking device will directly abut against the pushed protrusions 298A on the resilient engaging arms 29A when the open casing of the housing 10A is closed. Accordingly, the engaging elements 296A on the resilient engaging arms 29A will disengage from the concave-convex teeth 242A on the tape supplying wheel 24A, and the wheel assembly 23A can be unlocked to enable the dispensing unit 20A to be used in a normal condition and provide a thin film dispensing function.

[0022] Furthermore, the locking device 28,28A can engage the used tape collecting wheel 25 of the wheel assembly 23,23A and comprises at least one resilient engaging arm engaging the used tape collecting wheel 25. The at least one resilient arm may have a structure same as those shown in Figs. 1 and 6, but is disposed in a direction reverse to that shown in Figs. 1 and 6. Accordingly, the at least one resilient engaging arm can engage the used tape collecting wheel 25.

[0023] With reference to Figs. 10 and 11, in the third embodiment in accordance with the present invention, the thin film dispenser comprises a housing 10B and a

dispensing unit 20B having structures similar to or same with those in the aforementioned embodiments. Only the substantial differences between the structures of this embodiment and the aforementioned embodiments are described as follows.

[0024] The dispensing head 22B is mounted on the housing 10B and is provided for connecting with the dispensing unit 20B. When the dispensing unit 20B is mounted in the housing 10B, an end of the base 21B of the dispensing unit 20B is combined with the dispensing head 22B. The thin film 26B that is mounted around the wheel assembly 23B is mounted around the dispensing head 22B after the dispensing unit 20B is assembled in the housing 10B. The dispensing head 22B will tighten the thin film 26B to enable the thin film 26B to be used in a normal condition.

[0025] The locking device 28B is resiliently disposed on the base 21B to prevent the wheel assembly 23B from rotating. The structure and operation of the locking device 28B is the same as those of the aforementioned embodiments and description thereof are omitted.

[0026] Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

Claims

1. A dispensing unit (20) for a thin film dispenser, **characterized in that** the dispensing unit (20) comprises:

   a base (21);
   a wheel assembly (23) mounted on the base (21) and comprising
   a tape supplying wheel (24) mounted rotatably on the base (21); and
   a used tape collecting wheel (25) mounted rotatably on the base (21);
   a thin film (26) mounted around the wheel assembly (23); and
   a locking device (28) resiliently disposed on the base (21) and selectively engaging the wheel assembly (23) to prevent the wheel assembly (23) from rotating.

2. The dispensing unit as claimed in claim 1, wherein the locking device (28) engages the tape supplying wheel (24).

3. The dispensing unit as claimed in claim 2 further comprising a dispensing head (22) disposed on one end of the base (21).

4. The dispensing unit as claimed in claim 2 or 3, wherein
   the tape supplying wheel (24) has multiple concave-convex teeth (242) disposed alternately, formed on a side of the tape supplying wheel (24) and arranged in a circle; and
   the locking device (28) comprises at least one resilient engaging arm (29) formed on the base (21) and engaging one of the concave-convex teeth (242) on the tape supplying wheel (24).

5. The dispensing unit as claimed in claim 1, wherein the locking device (28) engages the used tape collecting wheel (25); and
   the locking device (28) comprises at least one resilient engaging arm (29) formed on the base (21) and engaging the used tape collecting wheel (25).

6. The dispensing unit as claimed in claim 4 or 5, wherein each one of the at least one resilient engaging arm (29) comprises
   a straight segment (292) integrally and resiliently connected with the base (21) and having a free end opposite to the base (21);
   a curved segment (294) connected with the straight segment (292) and having
   a connecting end connected with the free end of the straight segment (292); and
   an engaging end opposite to the connecting end;
   an engaging element (296) formed on the engaging end of the curved segment (294) and selectively engaging the wheel assembly (23); and
   a pushed protrusion (298) formed on and protruding from the engaging end of the curved segment (294).

7. The dispensing unit as claimed in claim 4 or 5, wherein each one of the at least one resilient engaging arm (29) comprises
   a straight segment (292) integrally and resiliently connected with the base (21) and having an engaging end opposite to the base (21);
   an engaging element (296) formed on the engaging end of the straight segment (292) and selectively engaging the wheel assembly (23); and
   a pushed protrusion (298) formed on and protruding from the engaging end of the straight segment (292).

8. The dispensing unit as claimed in claim 4 or 5, wherein each one of the at least one resilient engaging arm (29) comprises
   a curved segment (294) integrally and resiliently connected with the base (21) and having an engaging end opposite to the base (21);
   an engaging element (296) formed on the engaging end of the curved segment (294) and selectively engaging the wheel assembly (23); and
   a pushed protrusion (298) formed on and protruding from the engaging end of the curved segment (294).

9. The dispensing unit as claimed in claim 4 or 5, wherein each one of the at least one resilient engaging arm (29) comprises
two ends securely connected with the base (21);
an engaging segment formed between the ends;
an engaging element (296) formed on the engaging segment and selectively engaging the wheel assembly (23); and
a pushed protrusion (298) formed on and protruding from the engaging segment.

10. A thin film dispenser, **characterized in that** the thin film dispenser comprises:

a housing (10) having a transmission device disposed in the housing (10);
a dispensing unit (20) mounted in the housing (10) and comprising
a base (21);
a wheel assembly (23) mounted on the base (21), connected with the transmission device and comprising
a tape supplying wheel (24) mounted rotatably on the base (21); and
a used tape collecting wheel (25) mounted rotatably on the base (21);
a thin film (26) mounted around the wheel assembly (23);
a locking device (28) resiliently disposed on the base (21) and selectively engaging the wheel assembly (23) to prevent the wheel assembly (23) from rotating;
a dispensing head (22) connected with the dispensing unit (20) and capable of extending out from the housing (10); and
an unlocking device disposed on the housing (10) and corresponding to the locking device (28) to unlock the wheel assembly (23) from the locking device (28).

11. The thin film dispenser as claimed in claim 10, wherein the locking device (28) engages the tape supplying wheel (24).

12. The thin film dispenser as claimed in claim 11, wherein the dispensing head (22) is disposed on one end of the base (21) of the dispensing unit (20).

13. The thin film dispenser as claimed in claim 12, wherein
the tape supplying wheel (24) has multiple concave-convex teeth (242) formed on a side of the tape supplying wheel (24) and arranged in a circle; and
the locking device (28) comprises at least one resilient engaging arm (29) formed on the base (21) and engaging one of the concave-convex teeth (242) on the tape supplying wheel (24).

14. The thin film dispenser as claimed in claim 10, wherein the locking device (28) engages the used tape collecting wheel (25); and
the locking device (28) comprises at least one resilient engaging arm (29) formed on the base (21) and engaging the used tape collecting wheel (25).

15. The thin film dispenser as claimed in claim 13 or 14, wherein each one of the at least one resilient engaging arm (29) comprises
a straight segment (292) integrally and resiliently connected with the base (21) and having a free end opposite to the base (21);
a curved segment (294) connected with the straight segment (292) and having
a connecting end connected with the free end of the straight segment (292); and
an engaging end opposite to the connecting end;
an engaging element (296) formed on the engaging end of the curved segment (294) and selectively engaging the wheel assembly (23); and
a pushed protrusion (298) formed on and protruding from the engaging end of the curved segment (294).

16. The thin film dispenser as claimed in claim 13 or 14, wherein each one of the at least one resilient engaging arm (29) comprises
a straight segment (292) integrally and resiliently connected with the base (21) and having an engaging end opposite to the base (21);
an engaging element (296) formed on the engaging end of the straight segment (292) and selectively engaging the wheel assembly (23); and
a pushed protrusion (298) formed on and protruding from the engaging end of the straight segment (292).

17. The thin film dispenser as claimed in claim 13 or 14, wherein each one of the at least one resilient engaging arm (29) comprises
a curved segment (294) integrally and resiliently connected with the base (21) and having an engaging end opposite to the base (21);
an engaging element (296) formed on the engaging end of the curved segment (294) and selectively engaging the wheel assembly (23); and
a pushed protrusion (298) formed on and protruding from the engaging end of the curved segment (294).

18. The thin film dispenser as claimed in claim 13 or 14, wherein each one of the at least one resilient engaging arm (29) comprises
two ends securely connected with the base (21);
an engaging segment formed between the ends;
an engaging element (296) formed on the engaging segment and selectively engaging the wheel assembly (23); and
a pushed protrusion (298) formed on and protruding from the engaging segment.

19. The thin film dispenser as claimed in any one of claims 13 to 18,
wherein the unlocking device is disposed on an inner surface of the housing (10) and comprises
at least one guiding block (16) corresponding respectively to the at least one resilient engaging arm (29) and spaced from and respectively aligning with the at least one resilient engaging arm (29) after the housing (10) is closed.

20. The thin film dispenser as claimed in any one of claims 13 to 18, wherein the unlocking device is disposed on an inner surface of the housing (10A) and comprises
at least one guiding block (16A) corresponding respectively to the at least one resilient engaging arm (29A) and abutting respectively against the at least one resilient engaging arm (29A) after the housing (10A) is closed.

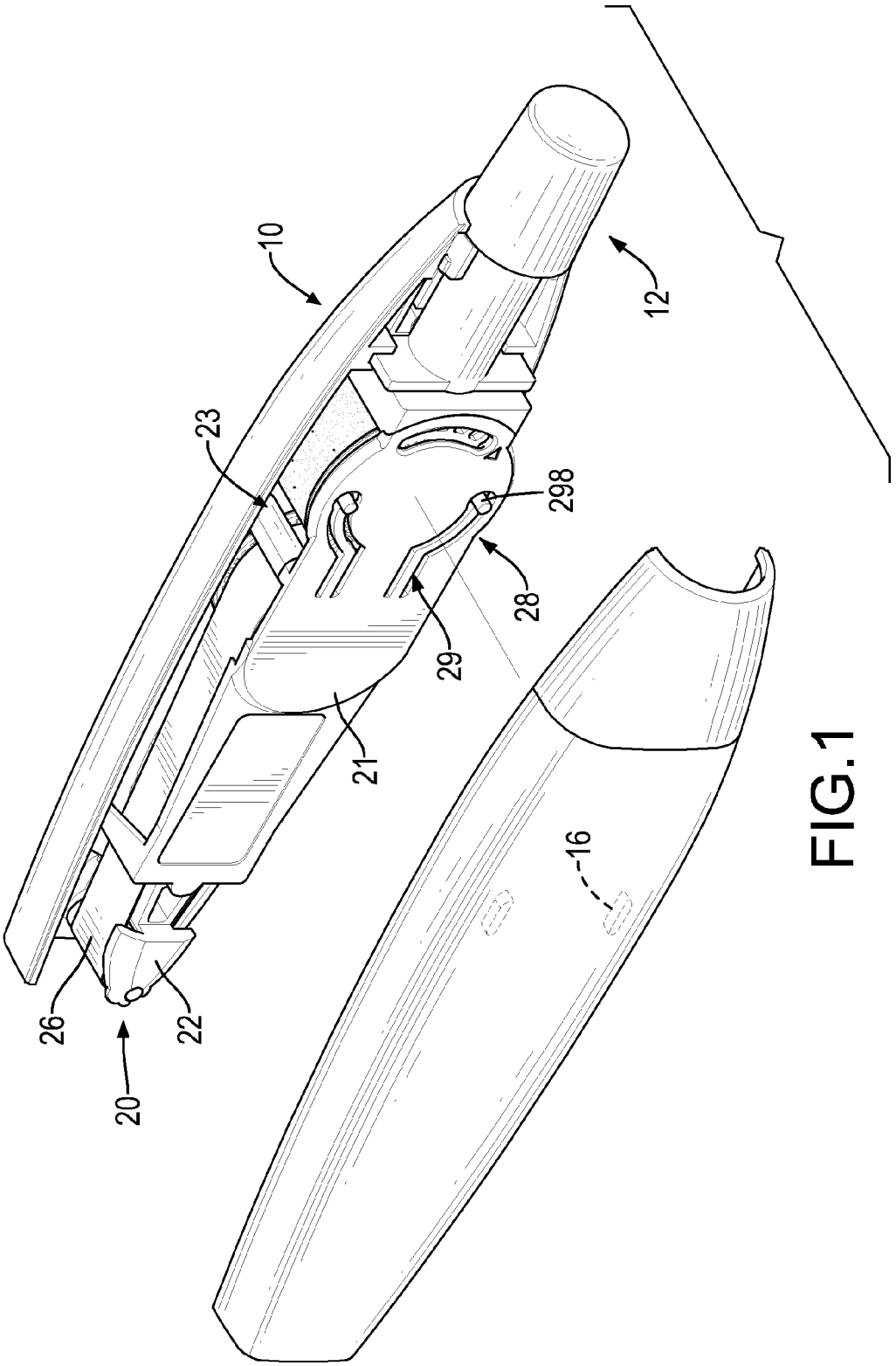

FIG.1

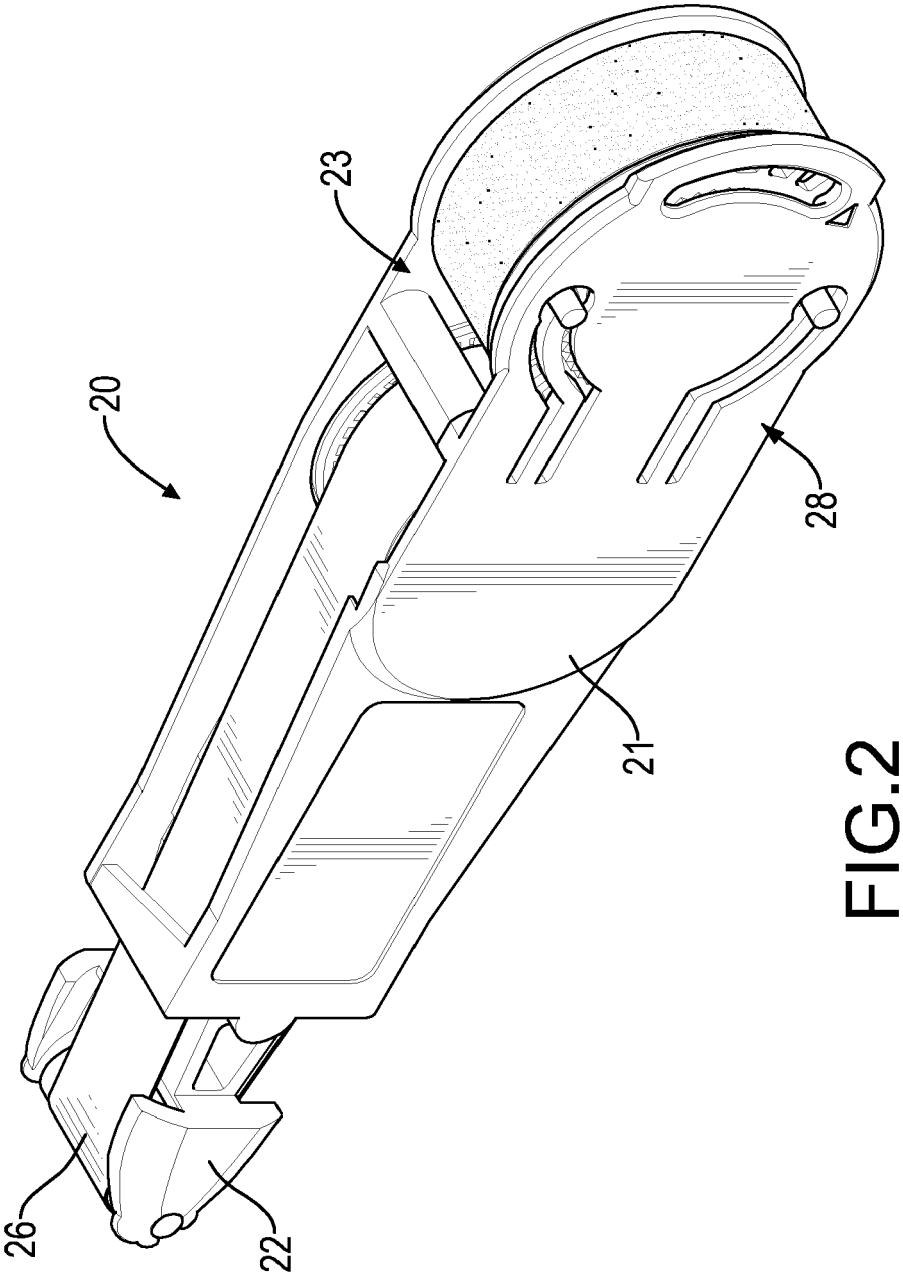

FIG.2

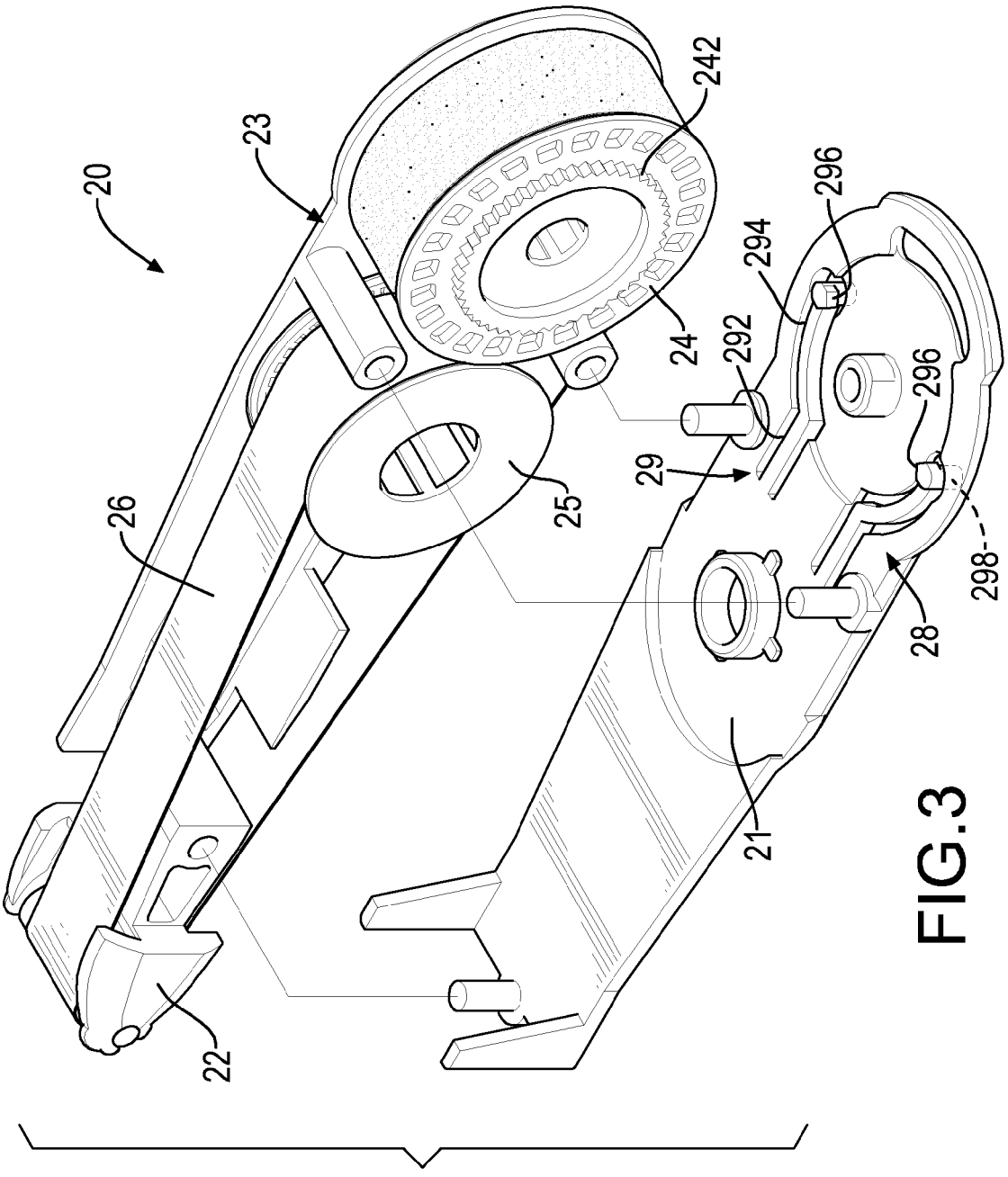

FIG.3

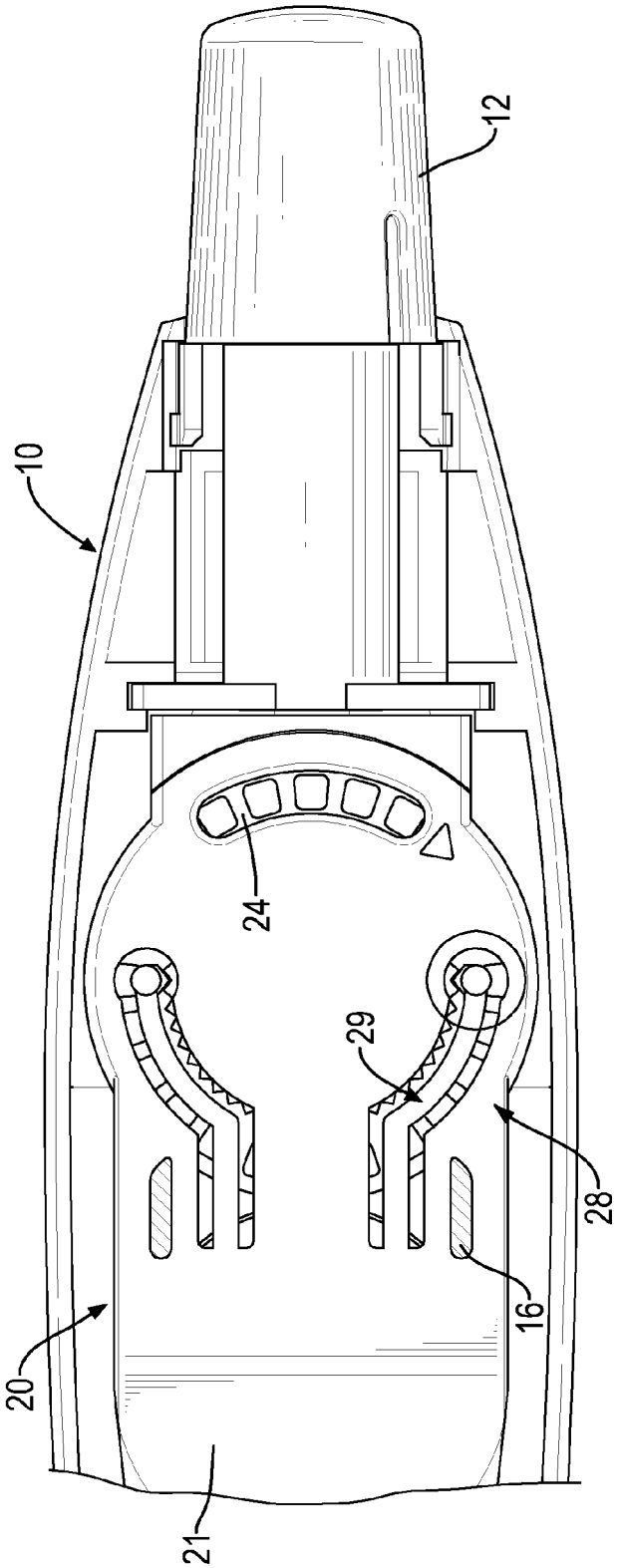

FIG.4

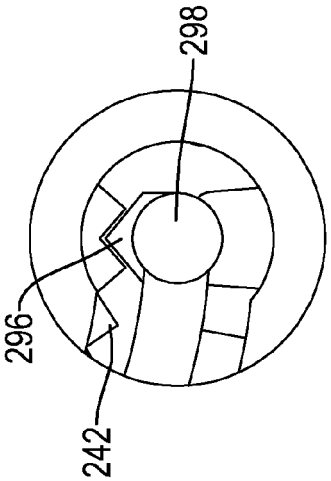

FIG.4A

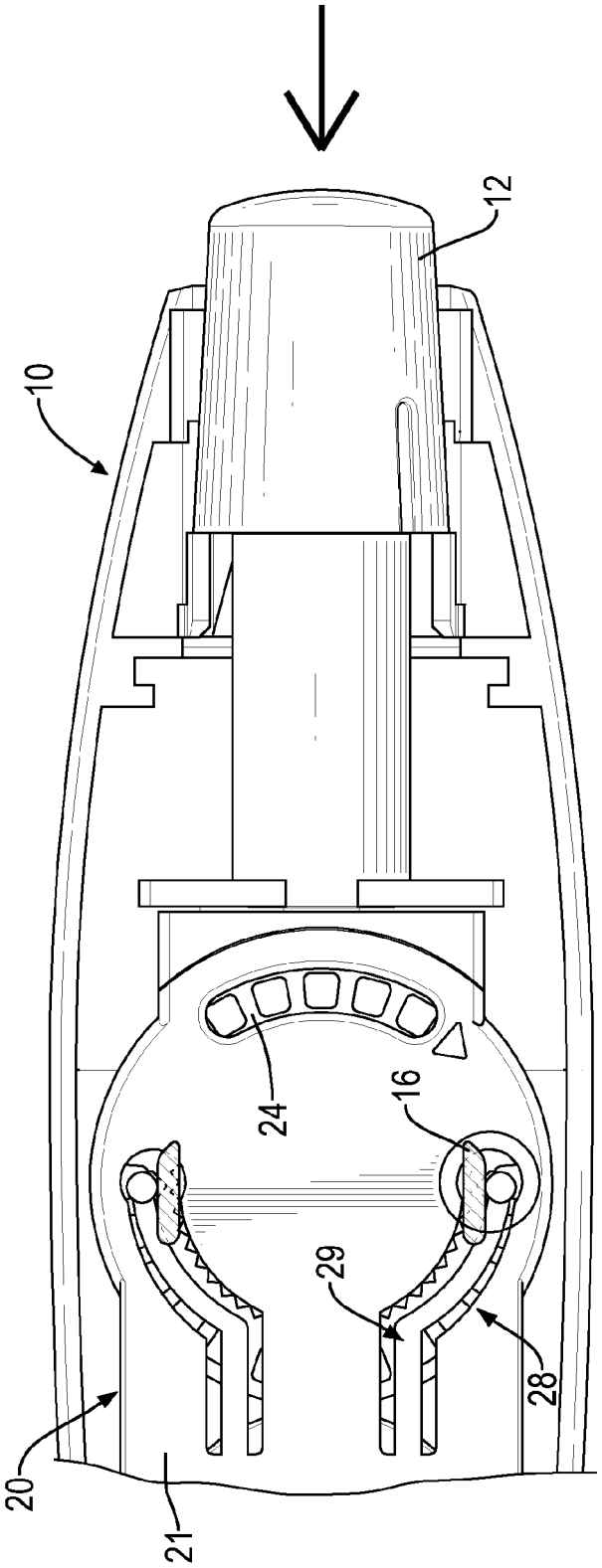

FIG.5

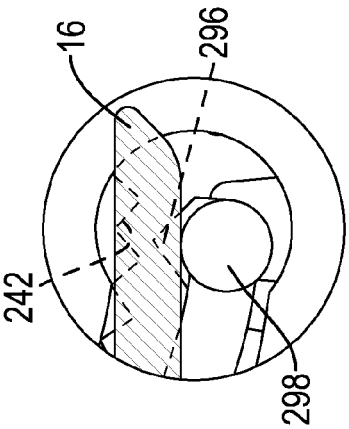

FIG.5A

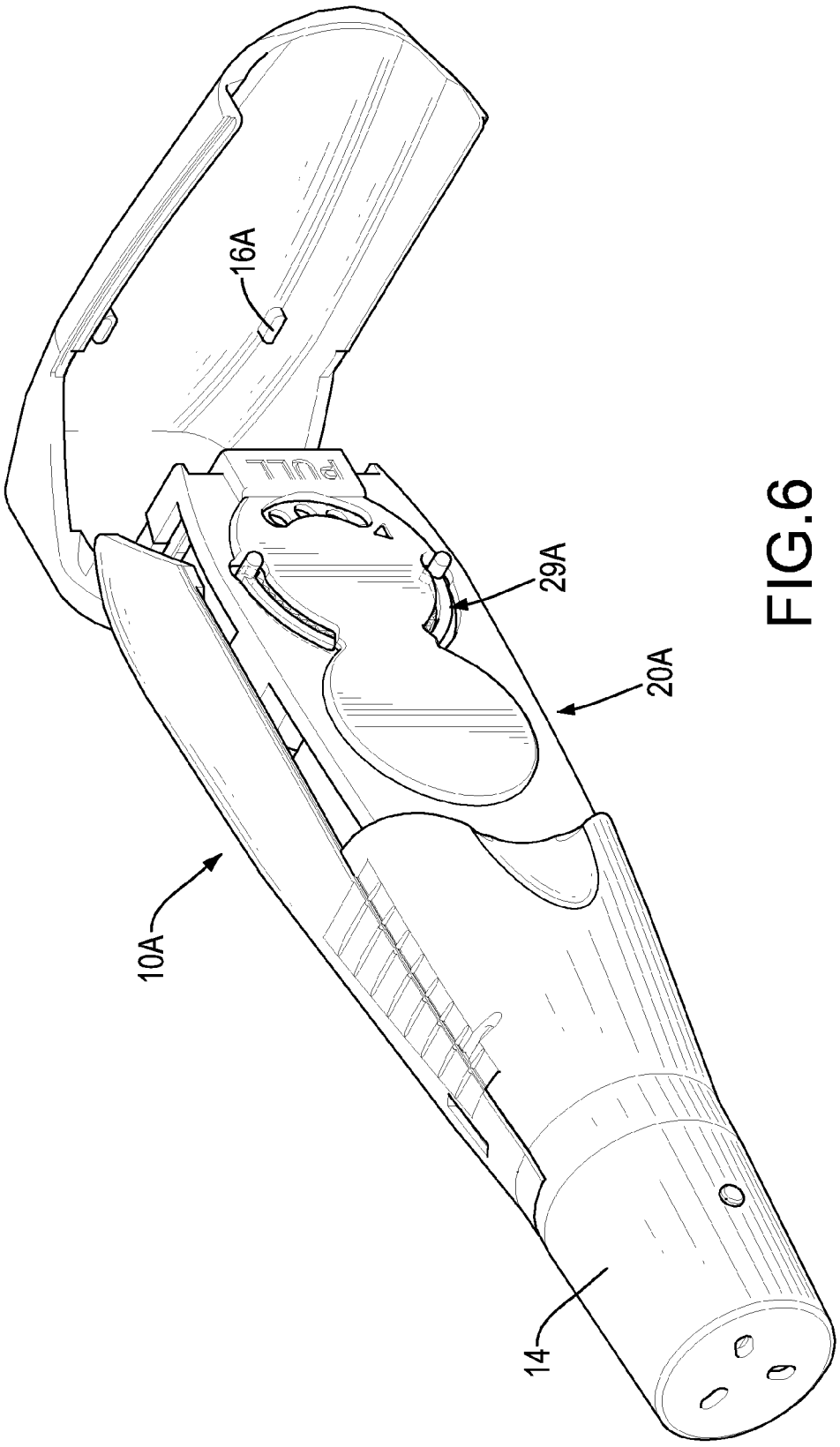

FIG.6

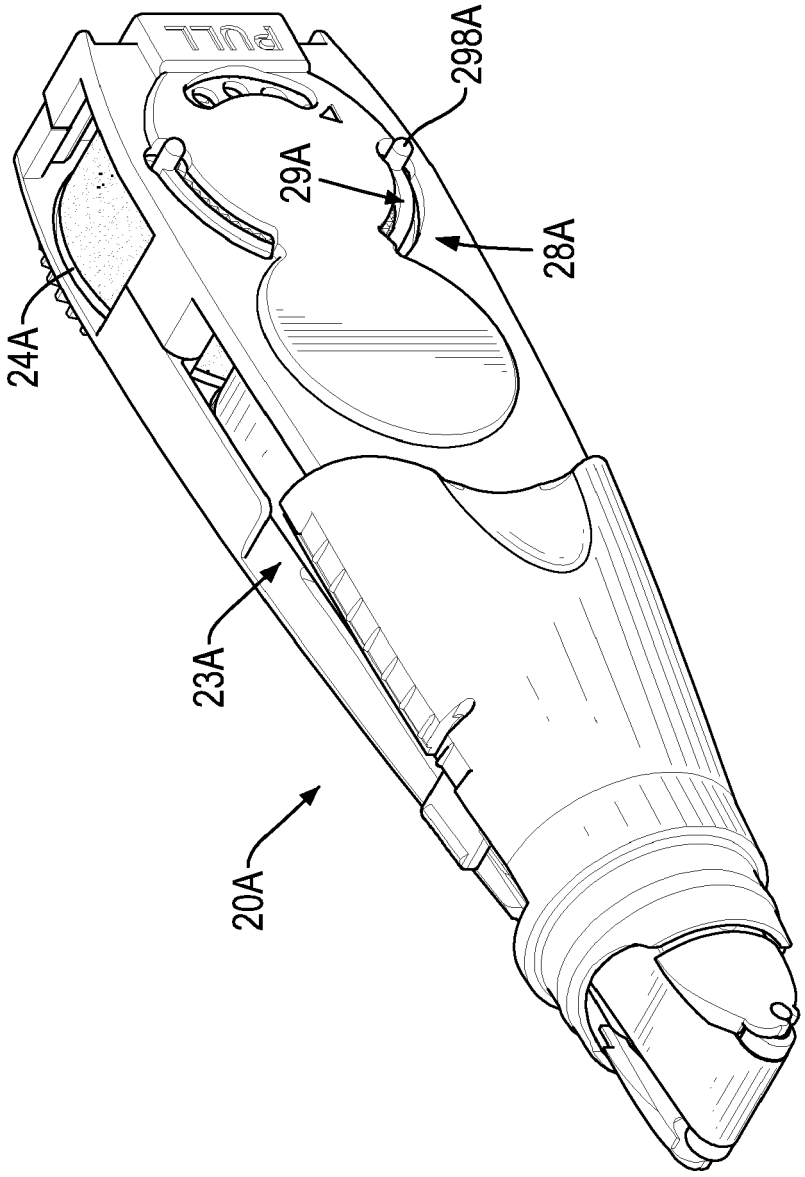

FIG.7

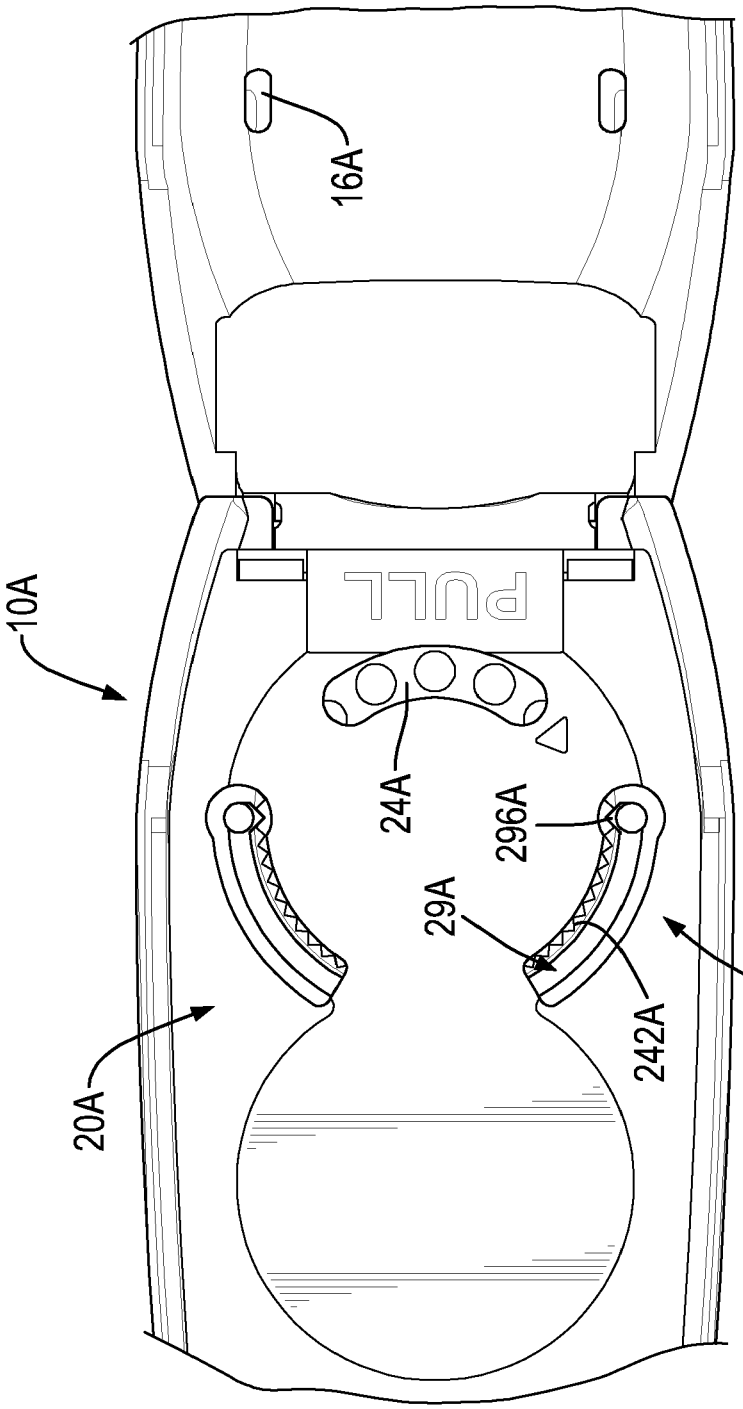

FIG.8

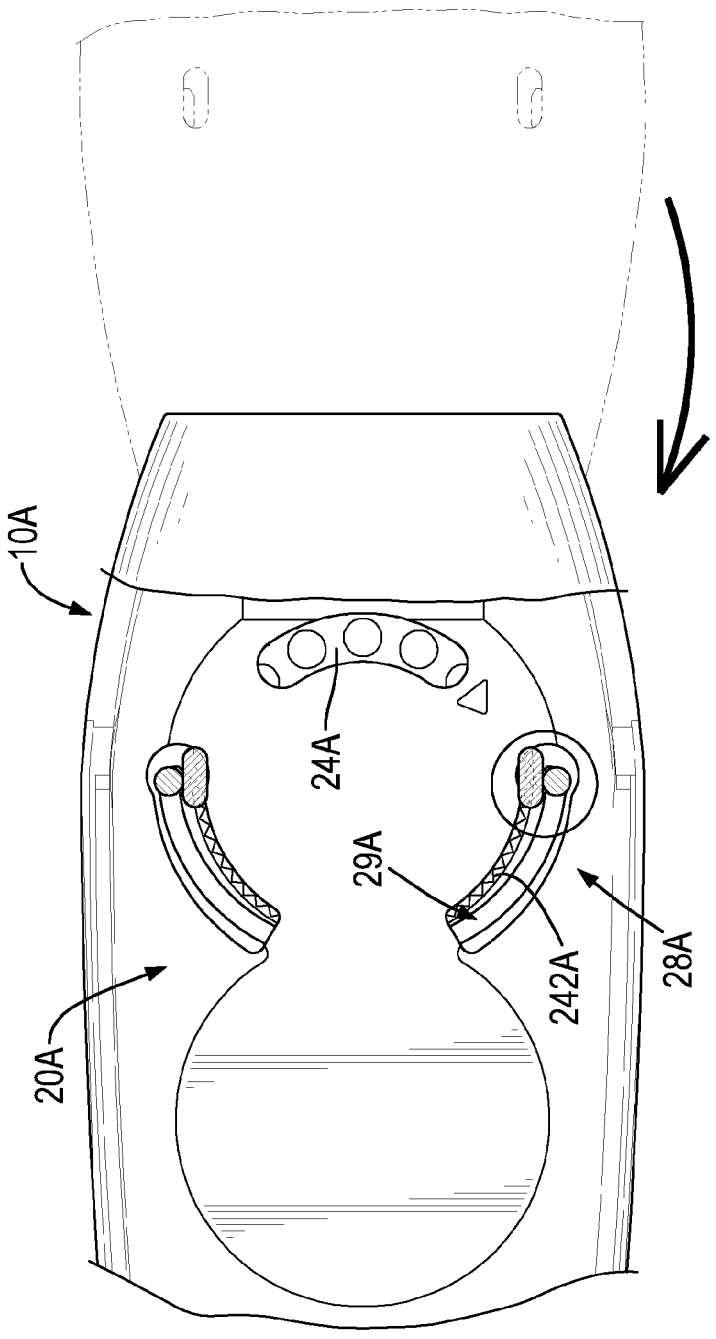

FIG.9

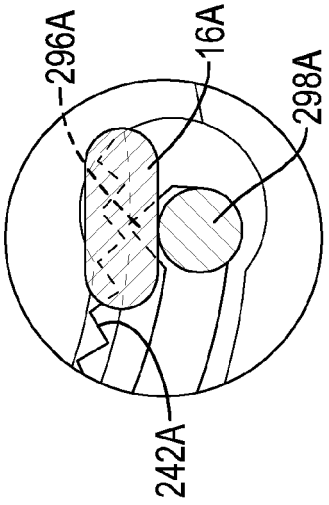

FIG.9A

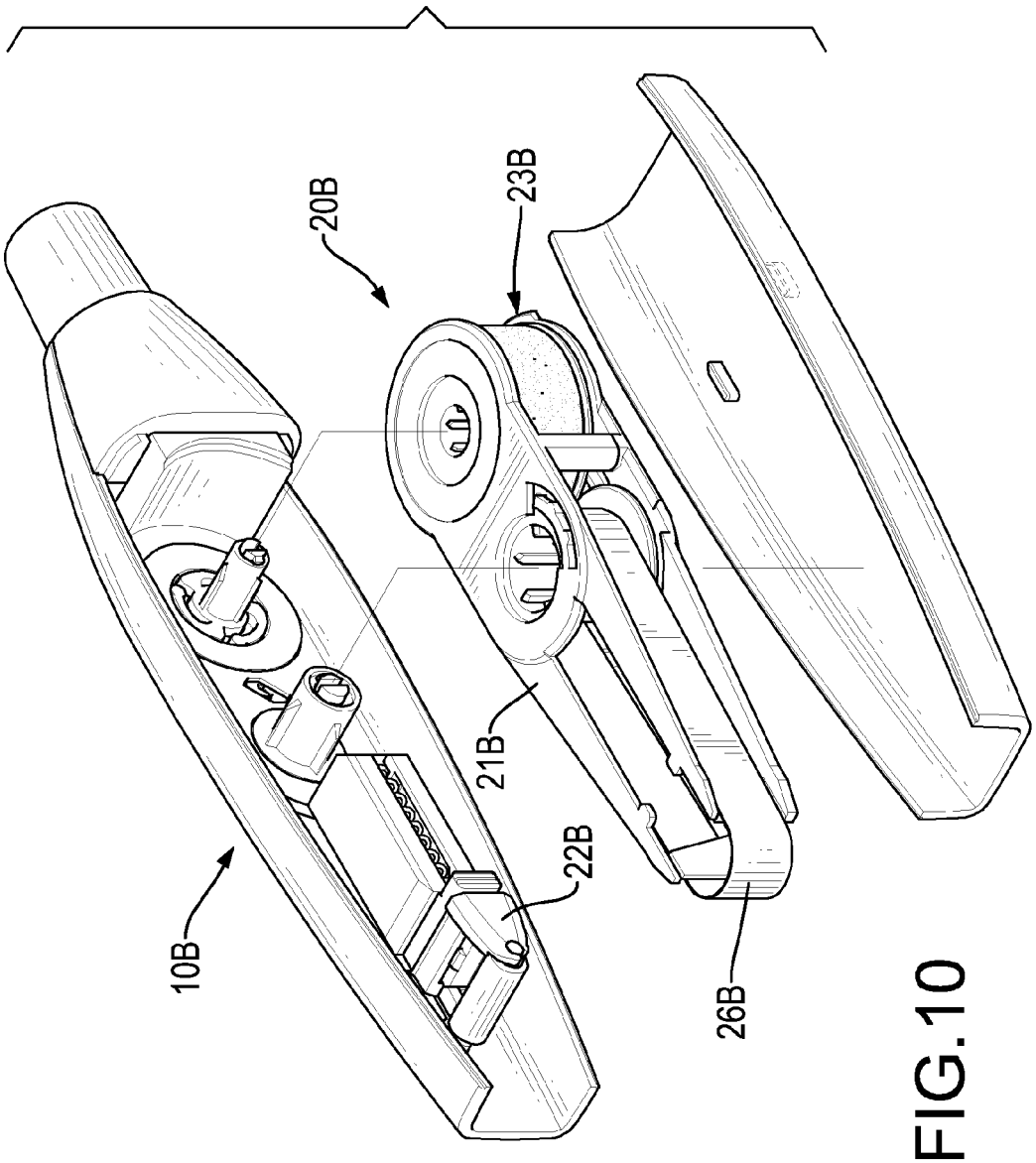

FIG.10

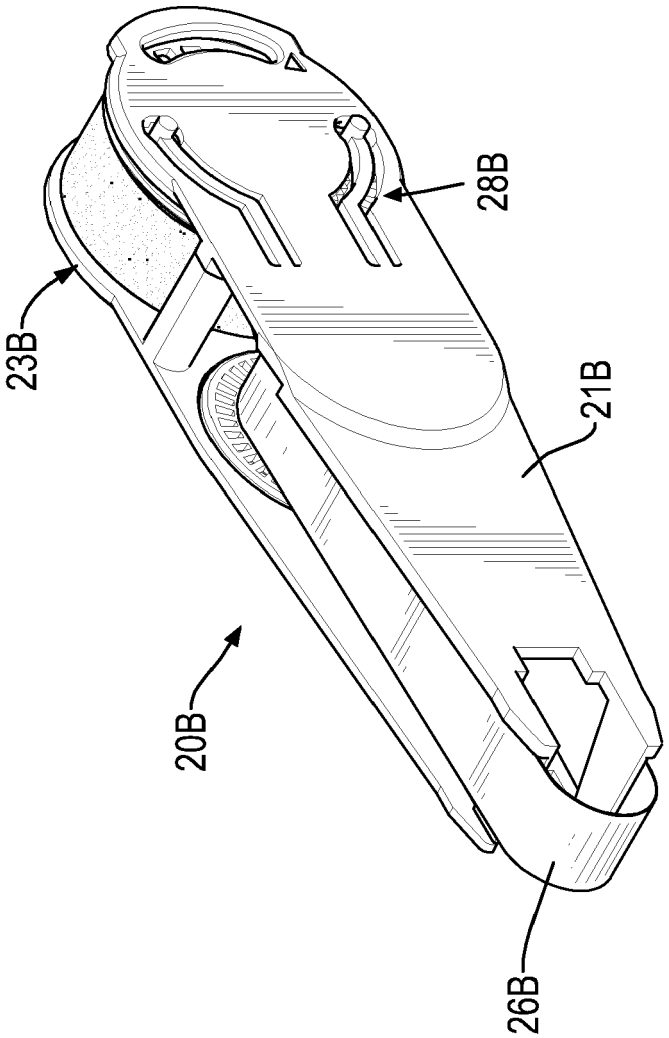

FIG.11

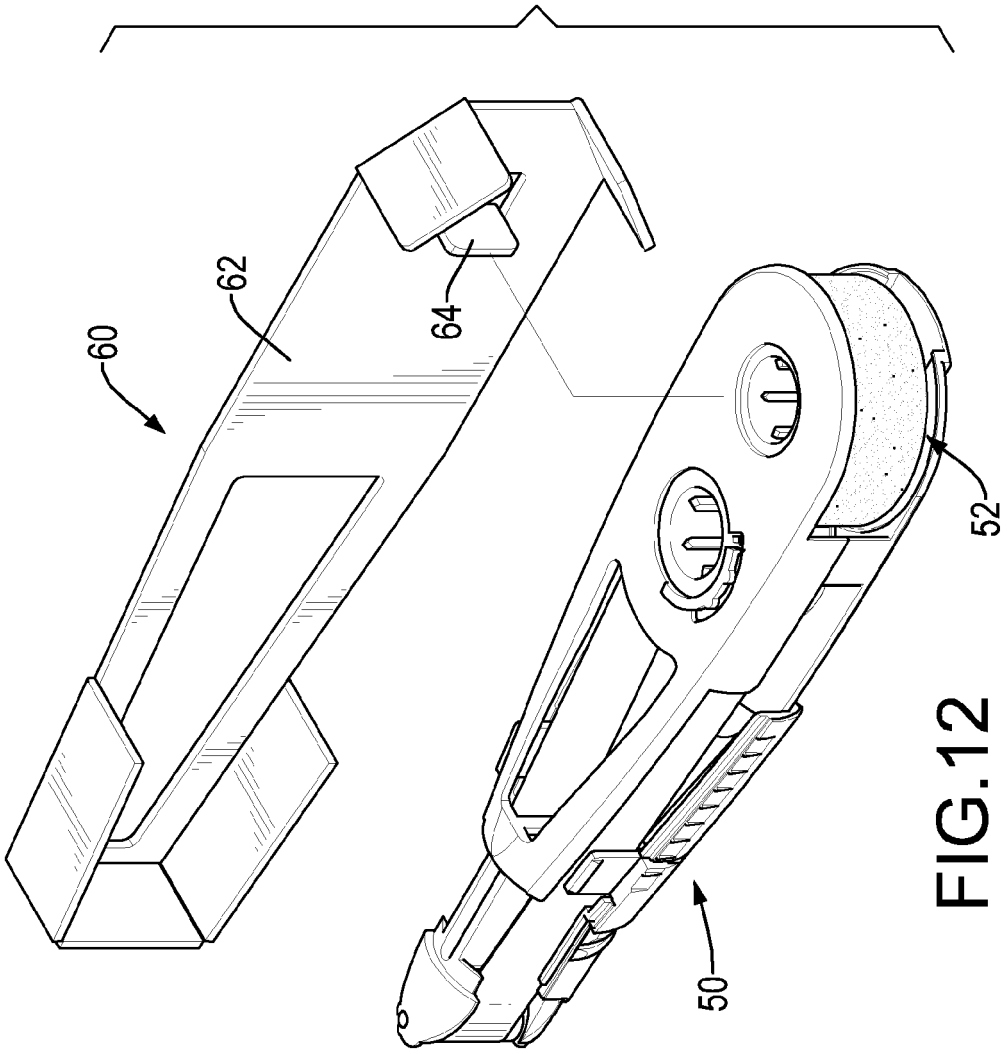

FIG.12
PRIOR ART

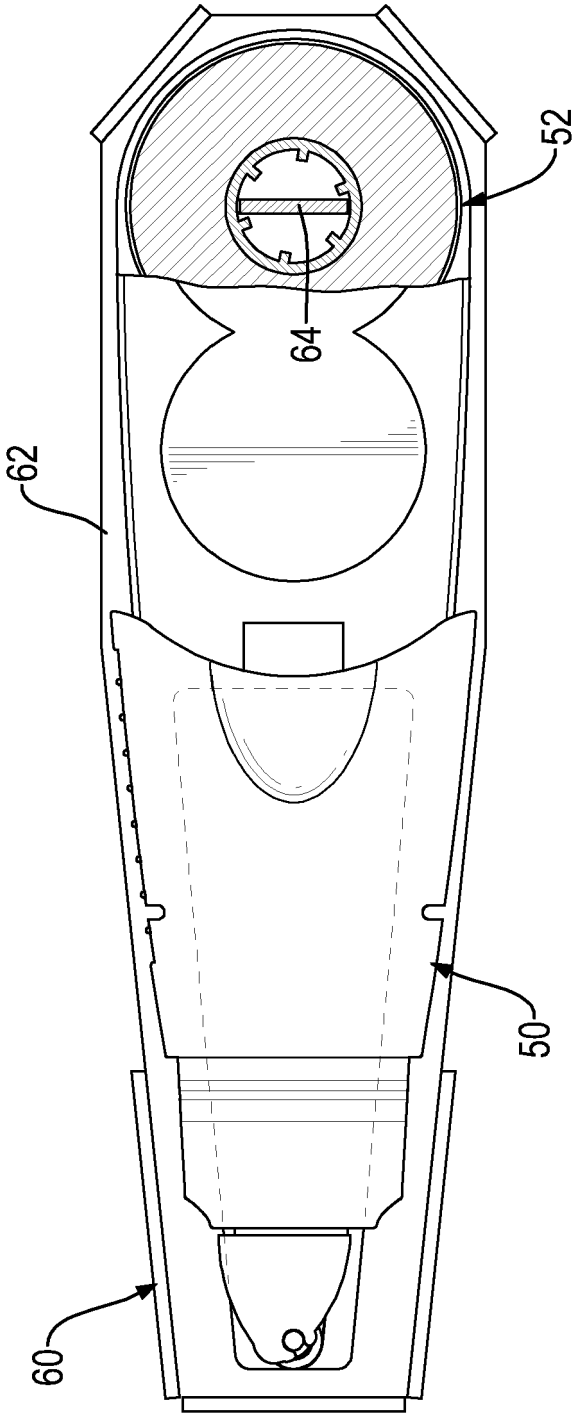

FIG.13
PRIOR ART

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EUROPEAN SEARCH REPORT

Application Number
EP 13 15 0774

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	6 May 2013	Raven, Peter

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