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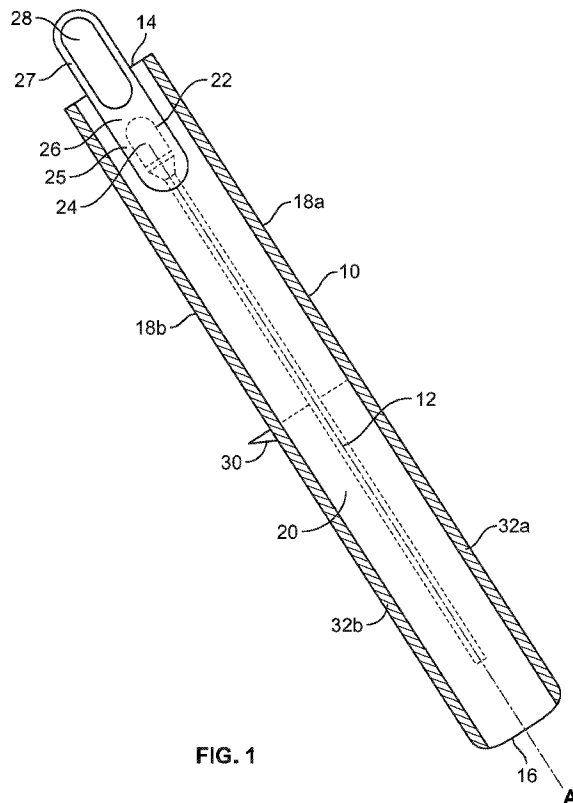


FIG. 1

(57) Abrégé/Abstract:

A package (10, 34) having an opening tab (26, 48) that extends beyond the perimeter of the package.



## Medical Device Package

The present application claims the benefit and priority of U.S. Provisional Patent Application No. 62/770,342, filed November 21, 2018, which is hereby  
5 incorporated herein by reference.

### Field of the Disclosure

**[0001]** The present disclosure is generally related to medical device packaging and more particularly to a package for urinary catheters.

### Background

10 **[0002]** Intermittent catheterization is a good option for many people who suffer from various abnormalities of the urinary system. Those with such abnormalities often find it desirable to use individually-packaged, sterile catheters designed for a single use. An important criteria for such a single use product includes the cost and ease of use in performing intermittent catheterization. With  
15 regard to both cost and ease of use, these factors apply to both the catheter itself and the package for the catheter. It is desirable that end users find the package acceptable to enhance the chances of successful intermittent catheterization. In this regard an important factor in catheter package design is recognition that some catheter users will have limited manual dexterity, which can make it difficult for  
20 them to open a conventional package.

**[0003]** Traditionally, flow wrap catheter packages are formed with end seals running across the narrow width of the package and a fin seal running the length of the package. This type of catheter package is shown in U.S. Patent Application No. 2016/0325903. Other package designs use an opening tab that when pulled,  
25 reveals an opening in the package. This type of opening is shown in U.S. Patent Application No. 2011/0056852. In this package the entire tab is placed within the perimeter of the package which could be difficult for users with poor dexterity to grip the opening tab.

**[0004]** Therefore, there is still a need for improved easy to open catheter  
30 packaging.

### Summary

**[0005]** In one aspect the present disclosure is directed to a package formed of an elongated sheet material wrapped about a product such as a catheter. The package has a top edge, a bottom edge and opposing side edges defining a perimeter. The package also has a front panel that includes a perforation line defining an opening flap. An opening tab has a first portion that is adhered to the front panel and overlays the opening flap and a second free portion that extends beyond the perimeter of the package. The second free portion of the opening tab includes a gripping portion.

**[0006]** In another aspect, a catheter product including a catheter and a package containing the catheter, wherein the package is formed from a sheet material having first and second fin forming sections, first and second back forming sections, and a front forming section. The package having a top edge, a bottom edge and opposed side edges. The first and second back forming sections of the sheet material defining a back panel of the package. The front forming section of the sheet material defining a front panel of the package. The front and back panels being sealed together to form opposed side seals that extend along the opposed side edges of the package. The first and second fin forming sections of the sheet material sealed together to form a fin seal that extends between the opposed side seals and is perpendicular to a longitudinal axis of the catheter. Optionally, the fin seal may include a sealed portion and first and second free end portions wherein the first and second free end portions may be pulled apart to open the sealed portion.

### Brief Description of the Drawings

**[0007]** Fig. 1 is a perspective view of one embodiment of a package in accordance with the present disclosure.

**[0008]** Fig. 2 is a perspective view of another embodiment of a package in accordance with the present disclosure.

**[0009]** Fig. 3 is a top plan view of the sheet material used to form the package of Fig. 1.

[00010] Fig. 4 is a top plan view of another embodiment of a package in accordance with the present disclosure.

[00011] Fig. 5 is a side view of the package of Fig. 4.

[00012] Fig. 6 is a front perspective view of the package of Fig. 4.

5 [00013] Fig. 7 is a front perspective view of the package of Fig. 4 in an opened configuration.

[00014] Fig. 8 is a schematic illustration of one process for manufacturing a medical device product having the package shown in Fig. 4.

10 Detailed Description of the Embodiments

[00015] Fig. 1 shows one embodiment of a package 10. The package may be formed by wrapping an elongated sheet material around a catheter 12. The wrapped sheet includes a top edge 14, bottom edge 16 and opposed side edges 18a and 18b which define a perimeter of the package 10. The package 10 has a front panel 20 including a perforation line 22 defining an opening flap 24. An opening tab 26 has a first portion 25 that is adhered to the front panel 20 and overlies the opening flap 24. A second free portion 27 of the opening tab 26 extends beyond the perimeter of the package and has a finger hole 28 to assist with gripping the opening tab 26.

20 [00016] The package 10 may be sealed by a fin seal 30 that runs perpendicular to the longitudinal axis A of the catheter 12 and across the package 10 between side edge seals 32a and 32b. In the illustrated package 10, the width between edge seals 32a and 32b may be shorter than the length between top edge 14 and bottom edge 15. The fin seal 30 extends in the direction of the width between edge seals 32a and 32b. As will be more fully explained below, the fin seal 30 may be formed by two confronting fin panels of the wrapped sheet material, while the side edge seals are formed by adhering a first and second back panel placed in confronting relation to the front panel.

30 [00017] Fig. 2 illustrates another embodiment of a package 34. The package 34 may be formed by wrapping an elongated sheet material around a catheter. Once wrapped, the package 34 includes a top edge 36, a bottom edge 38 and opposing side edges 40a and 40b. The front panel 42 of the package 34 includes

a perforation line 44 defining an opening flap 46. An opening tab 48 is adhered to the front panel 42 and has a first portion 45 that overlies the opening flap 46 and a second free portion 47 that extends beyond the perimeter of the package 34. The second free portion of the opening tab 48 that extends beyond the perimeter of the package 34 includes a finger hole 50 that assists with gripping the opening tab 48.

**[00018]** Turning now to Fig. 3, a representation of the sheet material 52 is shown prior to any forming steps. To assist in understanding how the sheet material 52 is folded and sealed, the sheet material is shown having five sections which are divided by imaginary demarcation lines. The panels may be designated as fin forming sections 54a and 54b, back forming sections 56a and 56b and front forming section 58. The sheet material 52 of course has top and bottom surfaces, which will become inside and outside surfaces of the package. All or a portion of the inside surfaces may have an adhesive coating or heat seal layer thereon. Typically this is a heat-activated adhesive that will adhere to at least other similarly coated surfaces when pressed against such surfaces and heated. Other types of adhesives could be used.

**[00019]** Also, while Figs. 1 and 2 show just a single package, it will be understood that the manufacturing process described below is advantageously performed in a continuous manner. That is, a continuous roll of sheet material is fed successively to a series of forming stations, (e.g., stations for wrapping, fin sealing, pinching, end sealing, punching, etc.), with individual packages not being separated from the continuous roll until they have passed through all of the stations.

**[00020]** It is known to form catheter packages by flow wrapping a sheet material. This process forms a package with end seals that run across the narrow width of the package and a fin that runs the entire length of the package. Formation of the package shown in Fig. 1 involves a reverse flow wrap package wherein the fin runs across the narrow width of the package and end seals run the entire length of the package.

**[00021]** Package formation may begin by unrolling the sheet material into a flat, generally horizontal condition with a front or leading edge 60 that will be fed to

successive forming stations or zones. At a loading station, a catheter (not shown) is placed on the inside surface of the sheet material 52, at or near center of the front forming section 58. The sheet material, with the catheter on its inside surface, is then advanced to a wrapping station or zone wherein the fin forming sections 54a and 54b of the sheet 52 are wrapped or folded up and around the catheter. The inside surfaces of just the fin forming sections 54a and 54b are placed in confronting relation. This creates the three dimensional package 10.

**[00022]** Next the confronting fin forming sections 54a and 54b pass through a sealing station where rollers or the like create the fin seal 30. Typically the fin seal is created by heated rollers that activate the adhesive on portions of the inside surfaces of fin forming sections 54a and 54b.

**[00023]** Once the three dimensional body of package 10 and fin seal 30 have been formed, the next step in the manufacturing process is preparation for creation of the opposing side edge seals 32a and 32b. This is done at a pinching zone where portions of the back forming sections 56a and 56b and front forming section 58 of the sheet material 52 are folded in at the upper fold line 59 and lower fold line 61 and are placed in a generally flat condition, with the back forming sections 56a and 56b and front forming section 58 confronting one another. Since the packages are ideally made of a continuous roll of sheet material, the side edge seal of the front or leading edge 60 is formed simultaneously with the immediately-adjacent side edge seal of an end or trailing edge 62 of a successive, leading package. That is, both of the side edge seals are created at a single pinching and side edge sealing zone but the single sealing zone creates side edge seals for what will become separate packages. The leading and trailing packages are subsequently separated from one another at a final severing station. In the pinching zone, portions of the back forming sections and front forming section are pinched together into a generally horizontal condition. Also, in connection with the pinching operation the fin seal 30 is folded down into a generally horizontal condition. Folding of the fin seal may be done either before, during or after the pinching operation of the back forming sections and the front forming section.

**[00024]** Once pinching and folding operations are complete, the sheet enters the side edge seal station. Here hot, transverse rollers contact the pinched portions to form the end or trailing side edge seal 32b of a leading package and the front or leading side edge seal 32a of a trailing package. The side edge seals  
5 32a and 32b are shown in Fig. 1 by the cross-hatching.

**[00025]** It is pointed out that since the outside surfaces of the sheet material do not have an adhesive on them, the side edge sealing operation does not result in fastening the fin seal to the outside surface of the package. After side edge sealing the fin 30 is free to fold back up, out of the plane of the side edge seals,  
10 as shown by Fig. 1.

**[00026]** While the package is held taught during the end sealing operation, it is an advantageous time to perform the slitting and punching operations needed to form the perforation line 22 of the opening flap 24, if this was not already done during fin seal formation. The perforation line 22 may be made by laser cutting or  
15 mechanical cutting. Furthermore, when the package is formed from a laminate sheet, the cutting of the line 22 may be through one or more layers.

**[00027]** The finger hole 28 on the opening tab 26 can also be formed at this time. The opening tab 26 and finger hole 28 can be cut out of a sheet material separate from the continuous roll used to create the package. The opening tab 26  
20 and finger hole 28 can be cut simultaneously or separately by a simple punching operation, laser cutting or any other any other way known in the art. Once the opening tab 26 and finger hole 28 are created, the opening tab 26 can be adhered to the front panel 20 in an orientation wherein the finger hole 28 extends beyond the top edge 14 of the package 10 and the remainder of the opening tab overlies  
25 the perforation line 22 of the opening flap 24.

**[00028]** The final step in the manufacturing process is severing the finished, leading package off the front end of the sheet material. The severing action separates the side edge seal of the leading package from the side edge seal of a trailing package. Severing leaves a finished package 10 in the condition generally  
30 shown in Fig. 1.

**[00029]** To open the package, a user may engage the package 10 in two places, the opening tab 26 (via the finger hole 28 extending beyond the perimeter

of the package 10) and anywhere else on the package 10. The user will then open the package 10 by pulling the opening tab down towards the bottom edge 16 of the package 10. As this is done the perforation line 22 will tear to reveal an end of the catheter 12. The user can then easily remove the catheter 12 from the package 10 via the opening flap 24. Using the finger hole 28 on the opening tab 26 that extends beyond the perimeter of the package allows users to more easily grip the opening tab of the package. This contrasts with present packages that are opened by an opening tab that is placed completely within the perimeter of the package.

10 **[00030]** The flow wrap packaging disclosed herein is one example of a package wherein the opening tab extends beyond the boundary. Such opening tabs may be used with other packages, such as three-sided and four-sided sealed packages that include an opening flap in the front panel.

15 **[00031]** Figs. 4-7 show a package 110 in accordance with the present disclosure. The package 110 may be formed by wrapping an elongated sheet material around a catheter 112. Package 110 has many similarities to package 10 shown in Fig. 1 and may be formed by the above described process described in relation to Fig. 3. As will be described in more detail below, package 110 includes a fin seal 130 that extends between the side edge seals and generally  
20 perpendicular to the longitudinal axis B of catheter 112. The fin seal 130 may be a peelable seal and opening of the package 110 may be initiated by peeling apart the fin seal 130.

**[00032]** The package includes a top edge 114, bottom edge 116 and opposed side edges 118a and 118b. The package 110 has a front panel 120 and a back panel 122. The package 110 may be sealed by a fin seal 130 that is located in  
25 the back panel 122 of the package 110. The fin seal 130 may be formed by two confronting fin panels of the wrapped sheet material. The fin seal 130 runs perpendicular to the longitudinal axis B of the catheter 112 and across the back panel 122 of the package 110 between side edge seals 132a and 132b.

30 **[00033]** In the illustrated package 110, the width between edge seals 132a and 132b may be shorter than the length between top edge 114 and bottom edge 115. The side edge seals 132a and 132b are formed by adhering the back panel

122 to the front panel 124 along sheet edges 118a and 118b. The side edge seals 132a and 132b also are peelable seals that may be peel apart to open the package. As shown in Fig. 4, the side edge seals 132a and 132b each may include a top segment 133a and 133b, respectively, and a bottom segment 135a and 135b, respectively. The top and bottom segments may be divided or delineated by the fin seal 130.

**[00034]** As mentioned above, the fin seal 130 may be a peel-apart seal that is peeled apart to initiate opening of the package. Optionally, the fin seal 130 may be offset between the top edge 114 and the bottom edge 116 of the package. That is, the fin seal may be closer to one of the top and bottom edges. In the illustrated embodiment, the fin seal 130 is closer to top edge 114. The fin seal 130 includes a sealed portion 140 and free end portions 142a and 142b that extend from the sealed portion 140. The free end portions 142a and 142b define tabs that may be grasped by the user and pulled apart to open the package 110. The free end portions 142a and 142b may include holes 144 therethrough or cut-outs 146 along the edges that may assist the user in separating and/or grasping the free end portion portions.

**[00035]** Referring to Figs. 6 and 7, to open the package, the user may grasp one or both of the free end portions/tabs 142a and 142b of fin seal 130 and pull the free end portions 142a and 142b apart. As the user pulls the free end portions apart, the sealed portion 140 of the fin seal 130 peels apart initiating opening of the package. As the user continues to pull the free end portions 142a and 142b apart, the side seals 132a and 132b peel apart to continue opening of the package. For example, as the user pulls free end 142a (which may be a top tab), the top segments 133a and 133b of the side seals 132a and 132b peel apart. The user may peel apart the top segments 133a and 133b of the side seals until a desired size opening is formed. The user may peel apart the top segments 133a and 133b of the side seals all the way to the top edge 114. The user may also pull free end 142b (which may be a bottom tab) to peel the bottom segments 135a and 135b of the side seals 132a and 132b apart. The user may peel apart the bottom segments 135a and 135b of the side seals until a desired size opening is formed. Optionally, the side seals 132a and 132b may include peel stops 148a

and 148b (Fig. 6) which prevent or hamper the peeling of the seals such that the user is only able to open the seals a desired amount. The peel stops may include but are not limited to strongly sealed portion adjacent the side seals and/or cut-outs in the side seals.

5 **[00036]** Fig. 8 shows a schematic illustration of one embodiment of a manufacturing process for making a medical product. In step 1, a web 150 of material may be into a flow-wrap apparatus. The web may be a laminate film that includes a polymer and a metal. For example the web may be layers of polyethylene and aluminum. In step 2, the free ends/tabs 142a and 142b, holes 10 144 and cut-outs 146 of the fin seal 130 may be punched in the web 150. In step 3, the catheter 112 may be placed on the web. In step 4, the web 150 is folded about the catheter 112 and fin seal 130 is formed. In step 6, the side seals are formed and a perforation or cut 152 is made between the individual catheter packages 110.

15 **[00037]** It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modification can be made without departing from the spirit and scope of the invention disclosed herein. For example, the arrangement of the opening tab could be other than as shown. The opening tab 20 could extend from anywhere on the front panel 20.

Claims:

1. A catheter assembly, comprising:
  - a catheter;
  - a package containing the catheter, the package having a top edge, a bottom edge and opposed side edges defining a perimeter of the package;
  - 5 the package having a front panel including a perforation line defining an opening flap;
  - an opening tab having a first portion overlying the opening flap and attached to the front panel; and
  - 10 the opening tab having a second free portion extending beyond the perimeter of the package wherein the free portion provides a gripping portion for opening the package.
2. The catheter assembly of claim 1, wherein the package is formed from a sheet material having first and second fin forming sections, first and second back forming sections, and a front forming section.
- 15 3. The catheter assembly of claim 2, wherein the sheet material is wrapped around a catheter into a three-dimensional configuration wherein the first and second fin forming sections are placed in confronting relation and adhered to each other to define a fin seal.
- 20 4. The catheter assembly of claim 3, wherein the fin seal is perpendicular to an axis of the catheter.
5. The catheter assembly of claim 2, wherein the first and second back forming sections are folded at an upper and lower fold line and placed in confronting relation to the front panel.
- 25 6. The catheter assembly of claim 5, wherein the first and second back forming sections are adhered to the front forming section along the opposing side edges of the package to define side edge seals.
7. The catheter assembly of claim 5, wherein the upper and lower fold lines define the upper and lower edges of the perimeter of the package.
- 30 8. The catheter assembly of claim 1, wherein the gripping portion comprises a ring.

9. A catheter product, comprising:  
a catheter;  
a package containing the catheter, wherein the package is formed from a sheet material having first and second fin forming sections, first and second back forming sections, and a front forming section; and  
5 the package having a top edge, a bottom edge and opposed side edges, the first and second back forming sections of the sheet material defining a back panel of the package, the front forming section of the sheet material defining a front panel of the package, the front and back panels being sealed together to form opposed side seals that extend along the opposed side edges of the package and the first and second fin forming sections of the sheet material sealed together to form a fin seal that extends between the opposed side seals and is perpendicular to a longitudinal axis of the catheter.
10. The catheter product of claim 9 wherein the top edge, bottom edge and opposed side edges define a perimeter of the package and the front panel includes a perforation line defining an opening flap, the package further including an opening tab having a first portion overlying the opening flap attached to the front panel and a second free portion extending beyond the perimeter of the package wherein the free portion provides a gripping portion for opening the package.
11. The catheter product of claim 9 wherein the fin seal includes a sealed portion and first and second free end portions extending therefrom, the sealed portion being peelable to open the package and the first and second free end portions being configured to be pulled apart to peel open the sealed portion of the fin seal.
12. The catheter product of claim 9 wherein the fin seal is offset between the top edge and bottom edge of the package.
13. The catheter product of any one of claims 11 and 12 wherein the side seals are peelable and are configured to be peeled open a selected amount when the package is opened.
14. The catheter product of claim 13 wherein the side seals include peel stops.

15. The catheter product of any one of claims 11-14 wherein the first and/or second free end portions includes holes and/or cutouts.

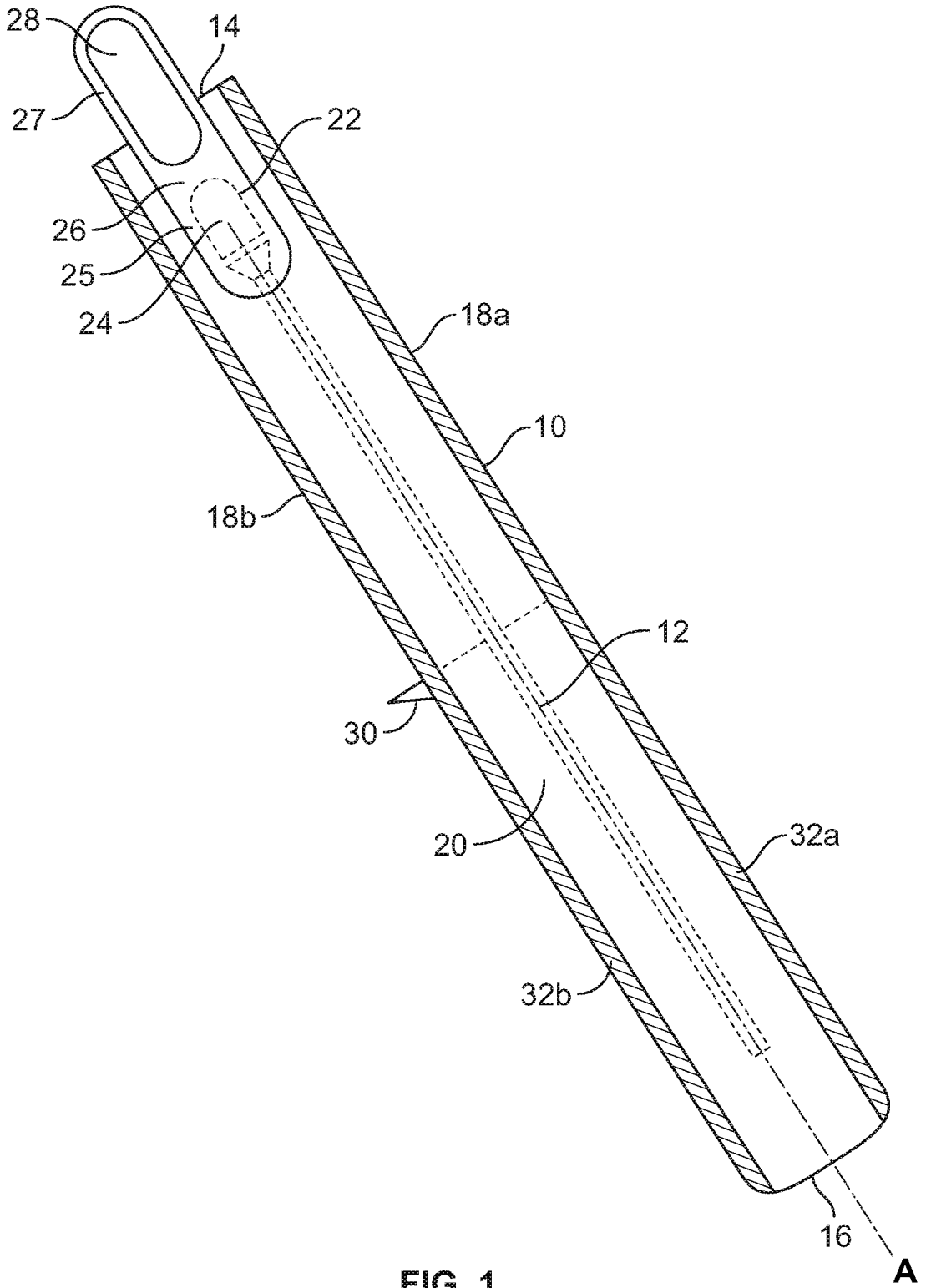


FIG. 1

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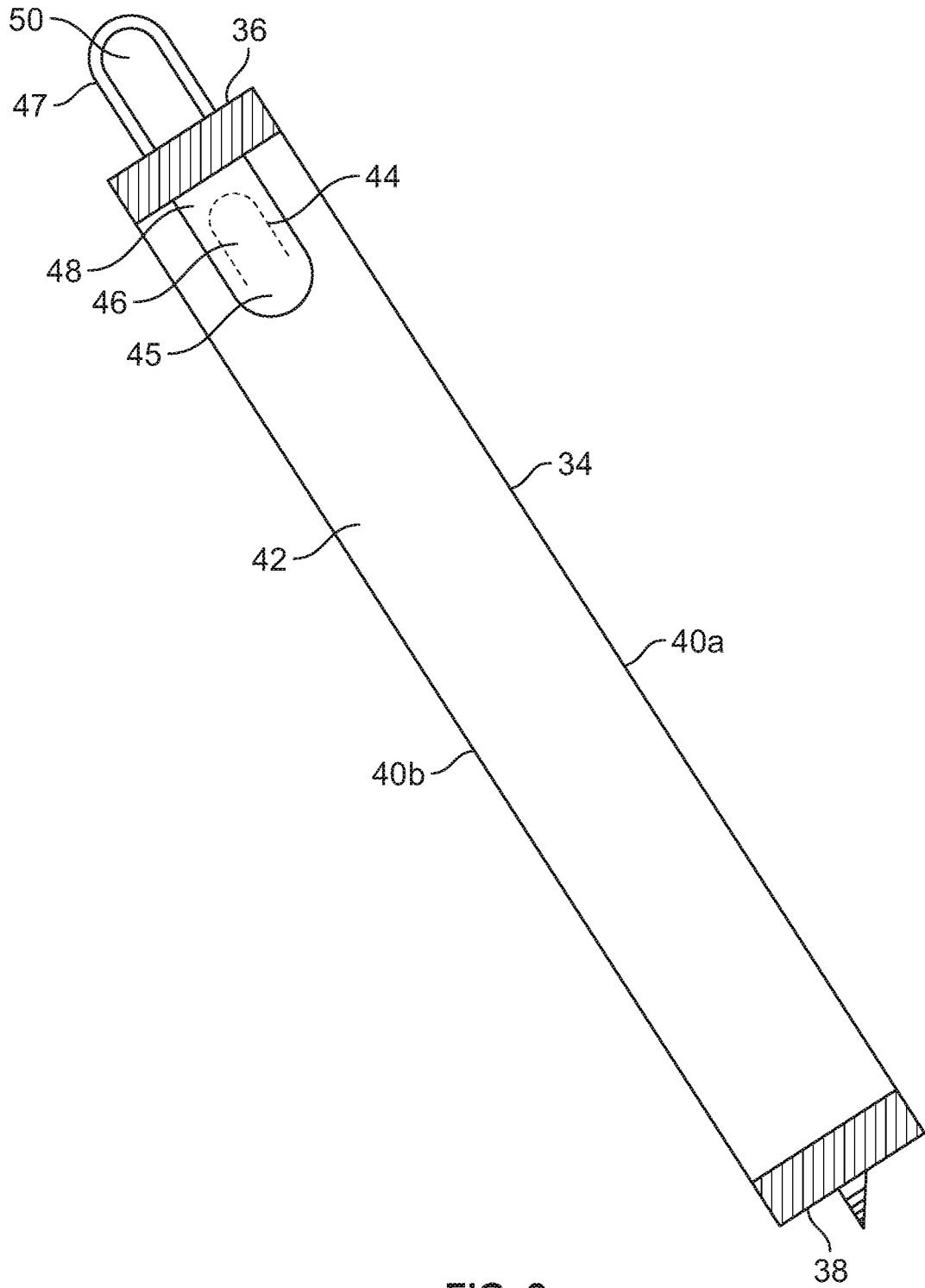


FIG. 2

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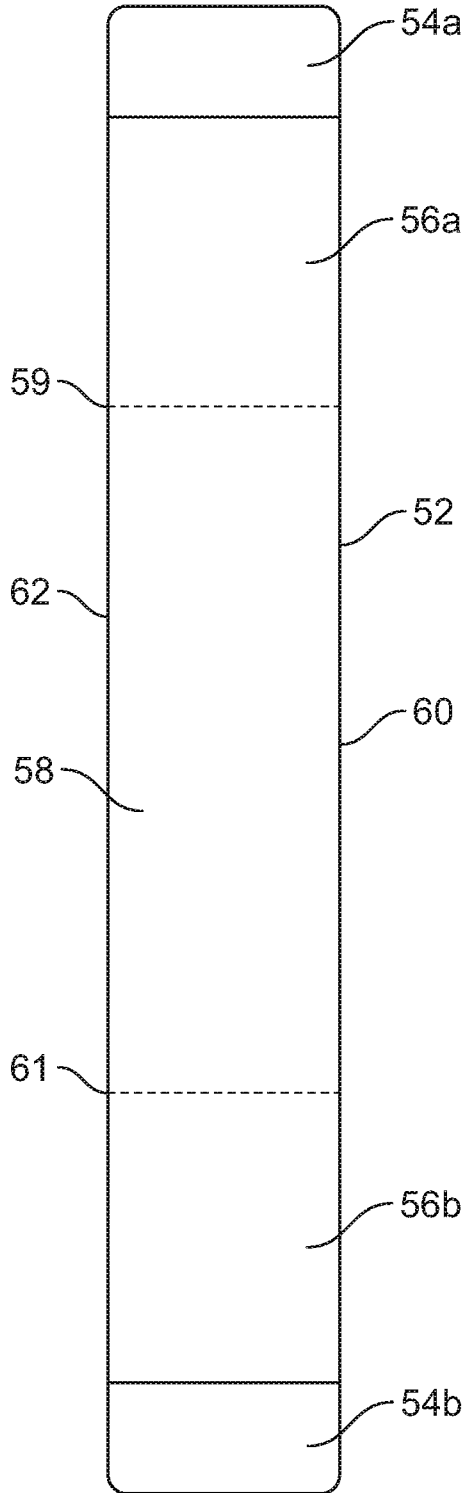


FIG. 3

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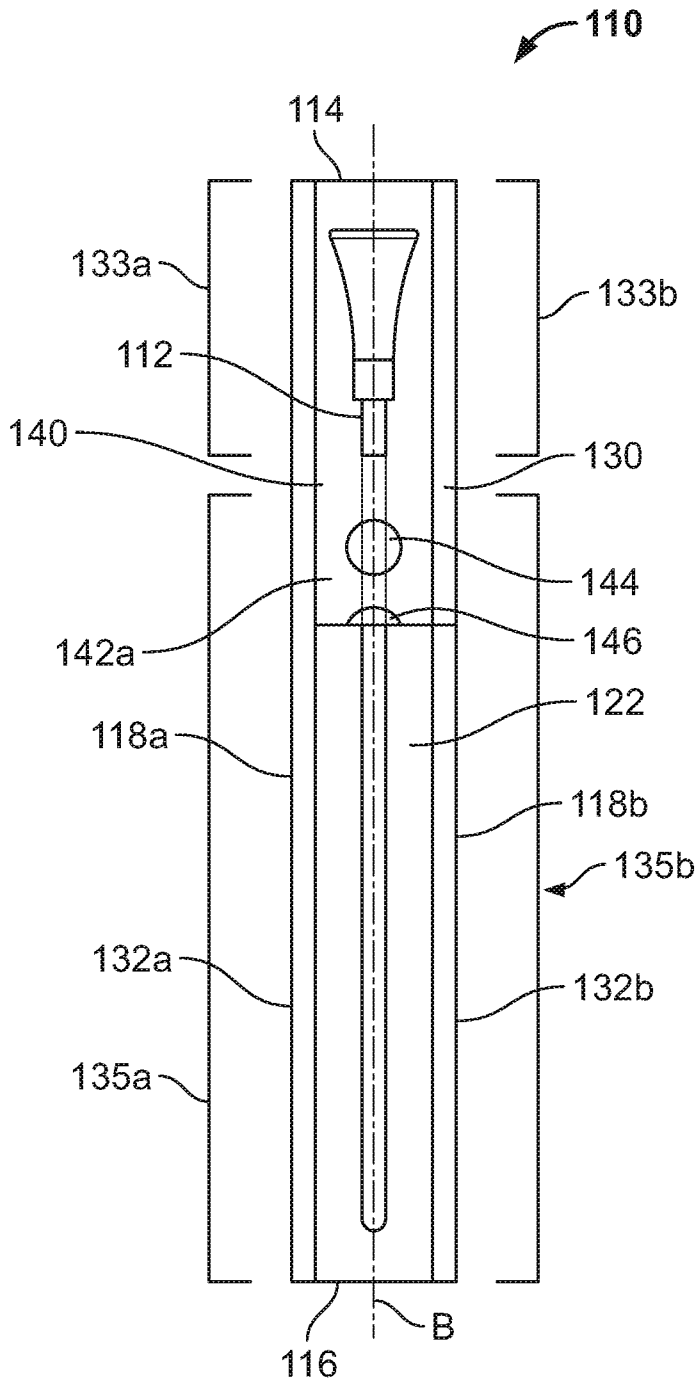


FIG. 4

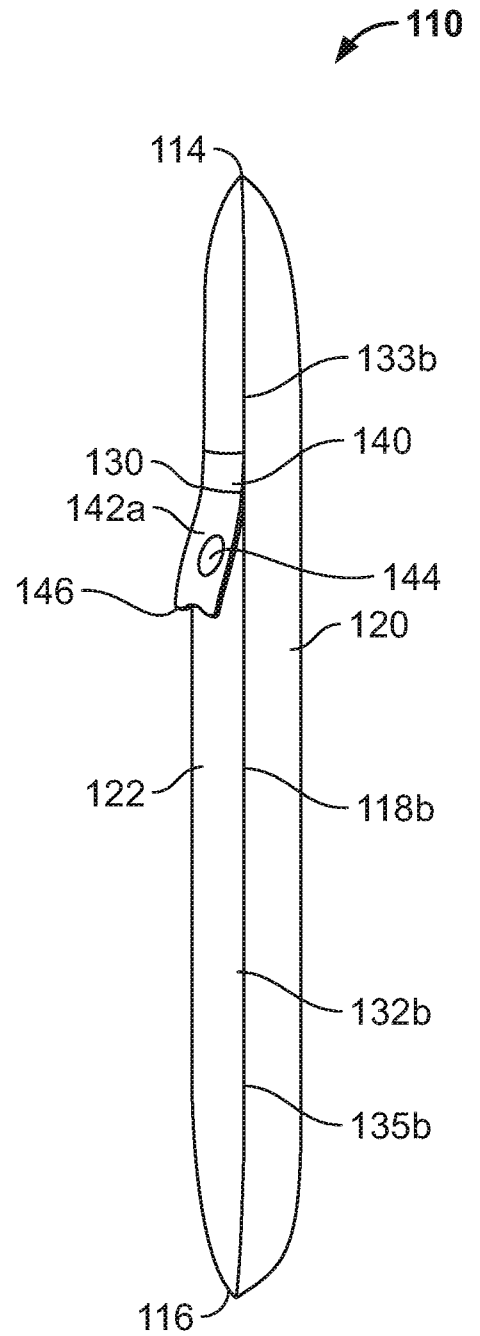


FIG. 5



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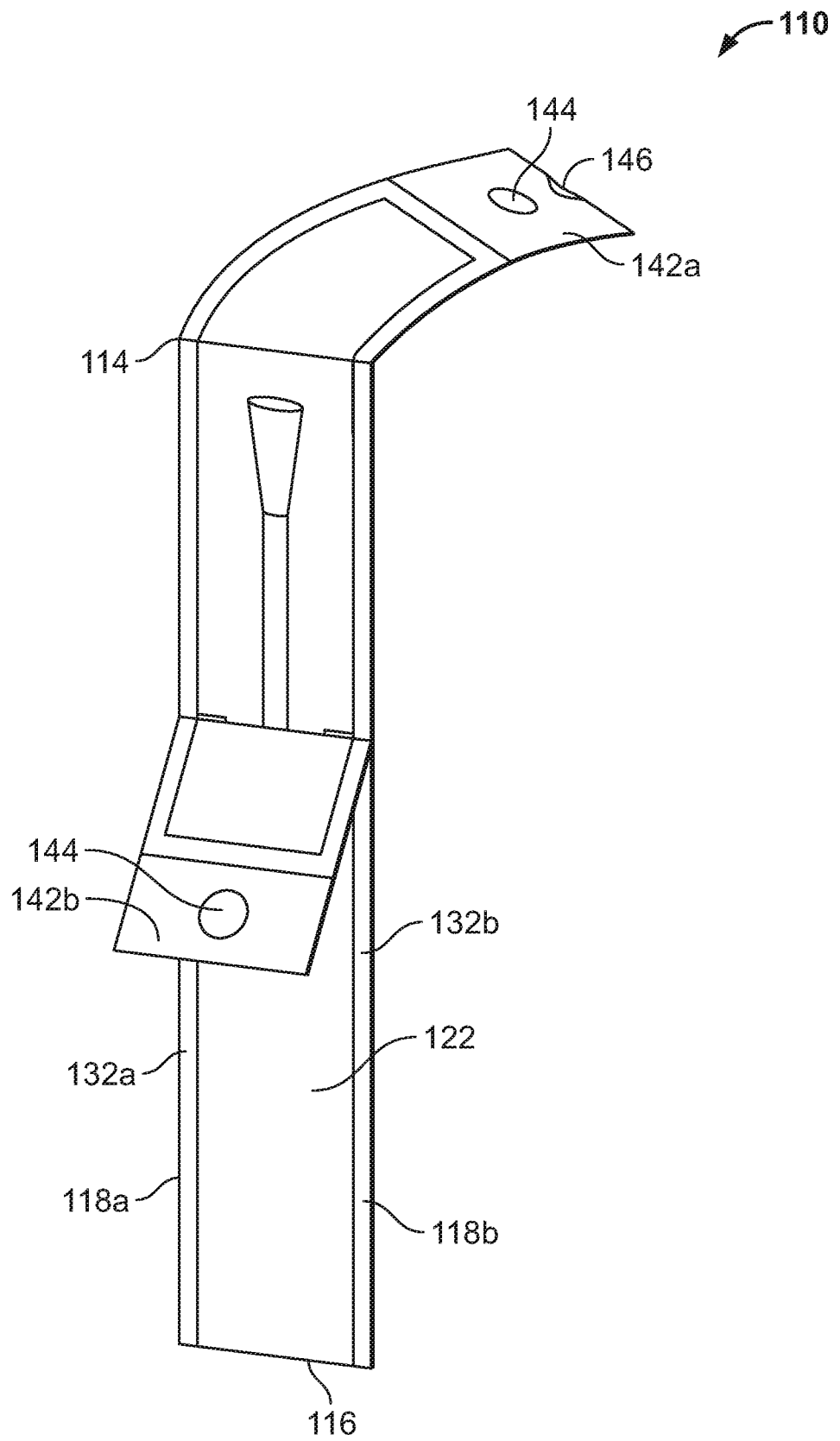


FIG. 7

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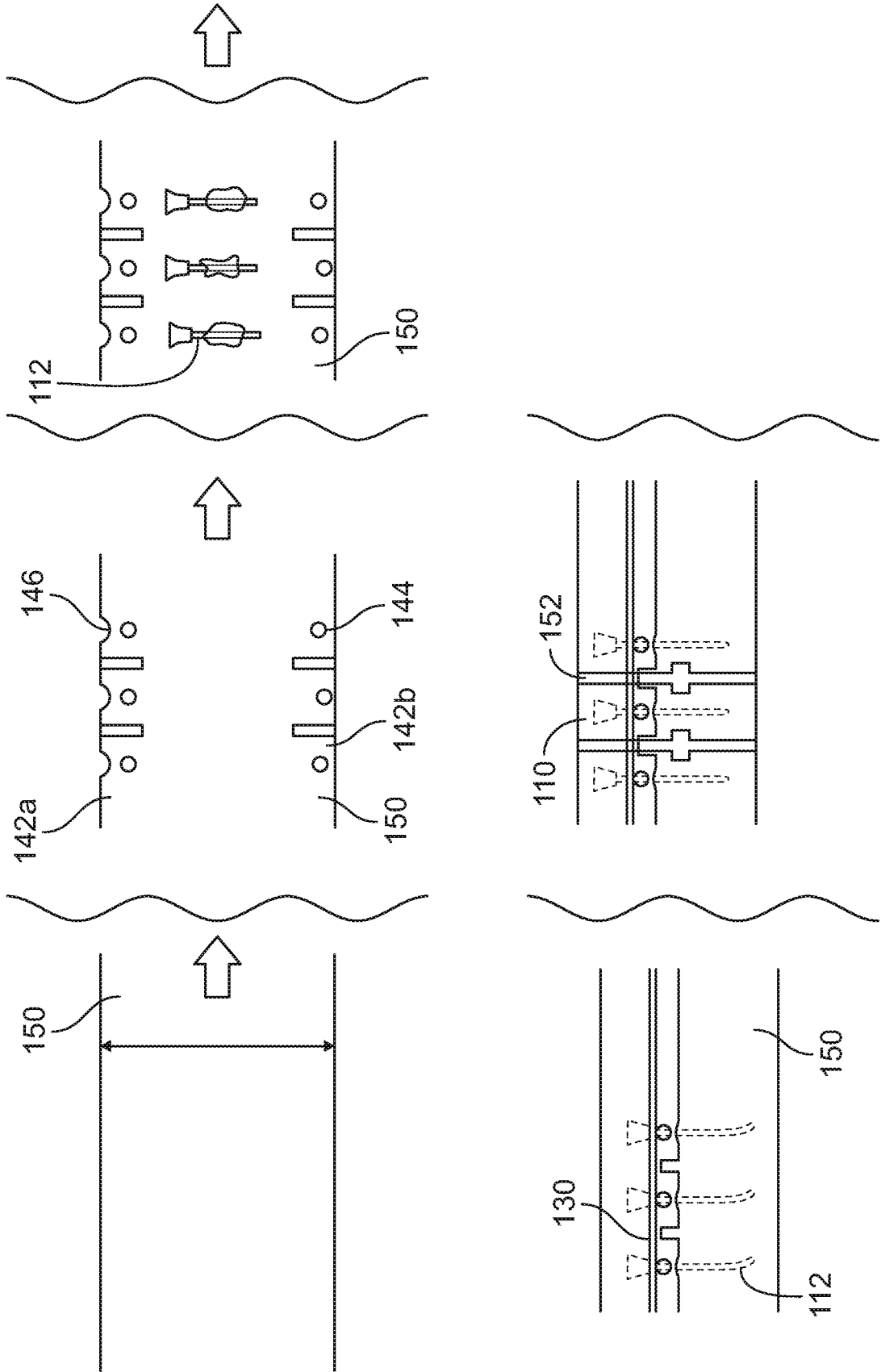


FIG. 8

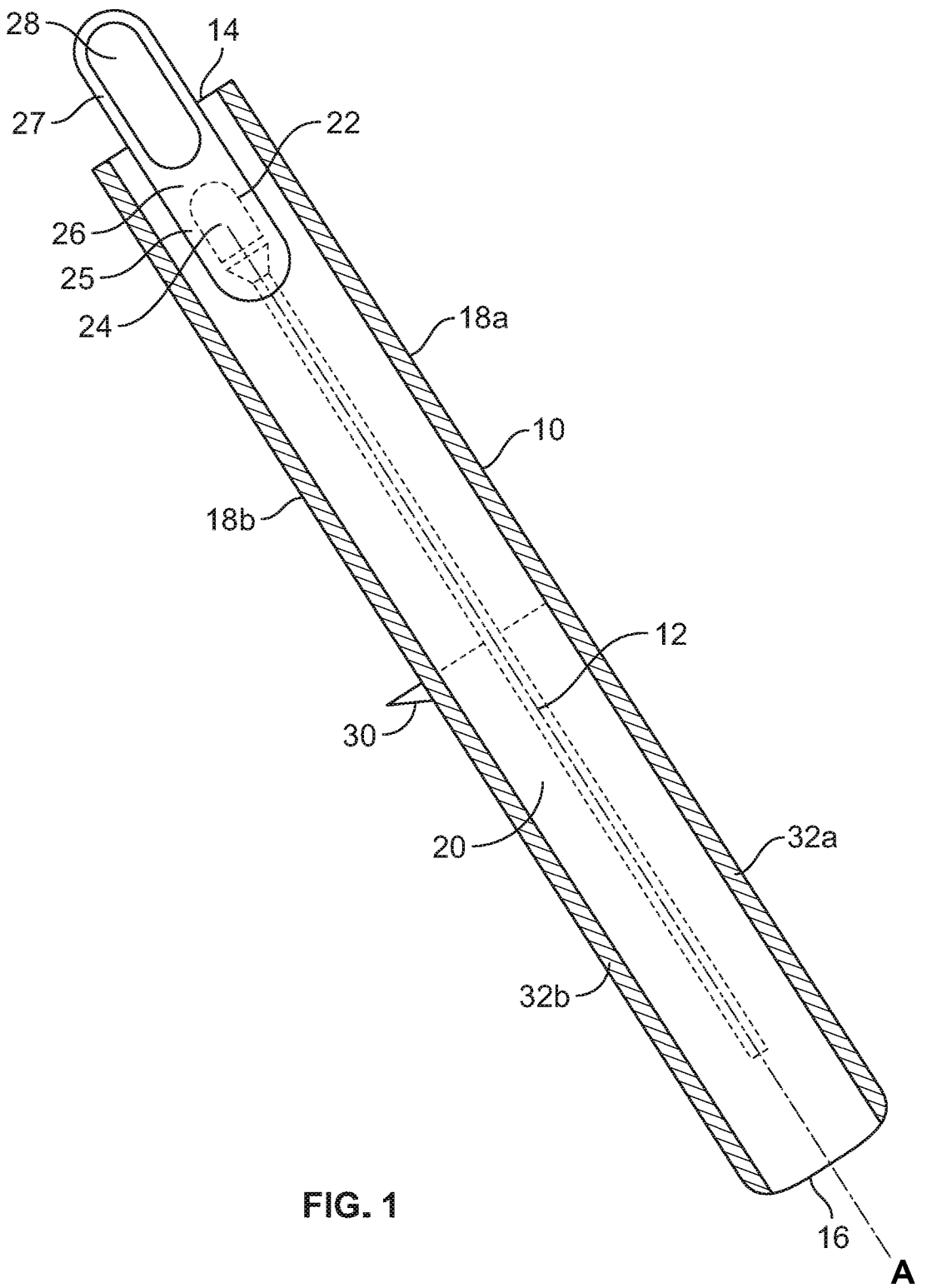


FIG. 1