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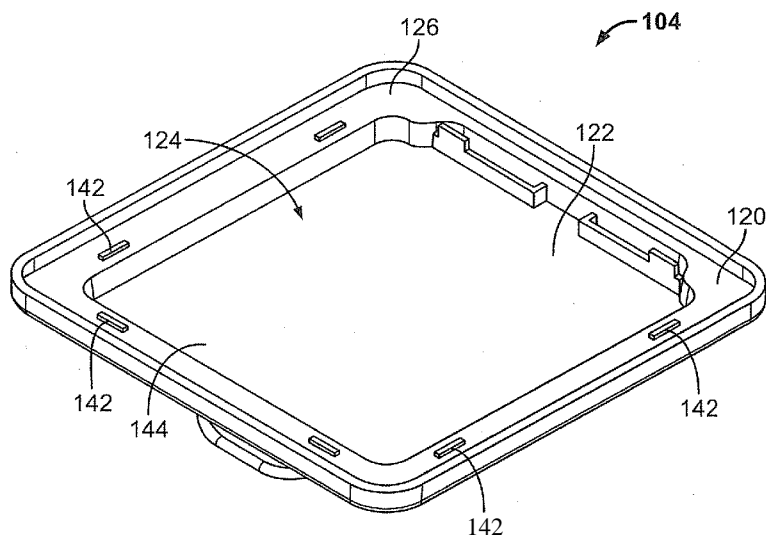


FIG. 3

(57) **Abstract:** A dispenser includes a base with a plurality of ribs for supporting a peripheral flange of a cartridge having a volatile material containing reservoir. A first removable cover is attached to the base and has at least one aperture and a first regulating plate. The first cover may be removed and replaced by at least a second cover that has at least one aperture and a second, different regulating plate.



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TITLE

VOLATILE MATERIAL DISPENSER

REFERENCE REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0001] Not applicable

SEQUENTIAL LISTING

[0002] Not applicable

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0003] The present disclosure relates generally to a volatile material dispensing system and, more specifically, to a dispenser capable of controlling the dispensing of a volatile material from a cartridge.

2. Description of the Background of the Invention

[0004] Adjustable passive dispensers are popular worldwide and, as such, consumers' demands as to the capabilities and aesthetics of such dispensers are diverse. It is therefore desirable to create a dispensing system that can easily and inexpensively be adapted to conform to local market demands and user preferences. For example, common passive dispensers utilize a volatile material refill cartridge disposed therein, however, various localities use different sized refill cartridges. It would be beneficial to manufacturers to manufacture a single dispenser that can be sold in various markets regardless of the size of the refill cartridges sold in that market. It is also beneficial to consumers to not have to worry about inserting the properly sized refill cartridge within the appropriate dispenser.

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Thus, there is a need for a dispenser that can receive various sized refill cartridges without compromising the performance of the dispenser.

[0005] In addition to the above-noted technical capabilities, the aesthetic appearance and size of such dispensers is also an important issue, especially with dispensers that are used and displayed in a user's car or home. Dispensers that are used in an automobile are often attached to a visor or some other visible location, in which the design of the dispenser may be readily observed. Larger, bulkier dispensers are less aesthetically pleasing and take up more visual space in the vehicle. Thus, it is important to minimize the visual weight of the dispenser. Further, while prior art dispensers are designed with current market preferences in mind, the appearance of these dispensers is not easily and inexpensively modifiable, such that manufacturers and consumers can change the appearance of the dispenser to keep up with current market trends and evolving preferences. Rather, manufacturers have to currently redesign and manufacture new dispensers to keep up with the changing market and consumers must buy a completely new dispenser in response to their changing preferences.

[0006] Therefore, there exists a need for a dispenser that is adaptable to different market specifications, both technically and aesthetically, while still providing users with an easy to use adjustable passive dispenser.

SUMMARY OF THE INVENTION

[0007] In one aspect of the present invention, a dispenser includes a base with a plurality of ribs for supporting a peripheral flange of a cartridge having a volatile material containing reservoir. A first removable cover is attached to the base and has at least one aperture and a first regulating plate. The first cover may be removed and replaced by at least a second cover that has at least one aperture and a second, different regulating plate.

[0008] In a different aspect of the present invention, a method of replacing a refill cartridge for a dispenser includes the step of removing an impermeable laminate from a cartridge to expose a permeable membrane extending over a reservoir containing a volatile

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material. The cartridge includes a peripheral flange and is indicated as being usable with a particular dispenser. An additional step includes inserting the cartridge within the dispenser and having a portion that exerts a force upon a bottom of the reservoir to deflect same inwardly.

[0009] In yet another aspect of the present invention, a base holds a cartridge having a permeable membrane. A cover is attached to the base having at least one aperture and a first regulating plate. A distance H, which is a line that is perpendicular to a plane defined by the permeable membrane and is measured between an inner surface of the most distal portion of the regulating plate and the plane defined by the permeable membrane, is between about 0.25 mm to about 10 mm.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is an isometric view of a front, top, and side of a volatile material dispenser;

[0011] FIG. 2 is a side elevational view of the volatile material dispenser of FIG. 1;

[0012] FIG. 3 is an isometric view of a base of the volatile material dispenser of FIG. 1;

[0013] FIG. 4 is a side elevational view of the base of FIG. 3;

[0014] FIG. 5 is a sectional view of a cartridge for use in the dispenser;

[0015] FIG. 6 is a sectional view of the volatile material dispenser of FIG. 1 taken generally along the line 6-6 of FIG. 1;

[0016] FIG. 7 is a sectional view of the volatile material dispenser of FIG. 1 taken generally along the line 7-7 of FIG. 1;

[0017] FIG. 7A is a sectional view of the volatile material dispenser similar to FIG. 7, having a different cartridge therein;

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[0018] FIG. 8 is an isometric view of an alternative base for the volatile material dispenser of FIG. 1;

[0019] FIG. 9 is a sectional view similar to that of FIG. 7, having the base of FIG. 8;

[0020] FIG. 9A is a sectional view of the volatile material dispenser of FIG. 9, with a different cartridge therein;

[0021] FIG. 10 is an exploded bottom isometric view of the volatile material dispenser of FIG. 1;

[0022] FIG. 11 is a bottom isometric view of the volatile material dispenser of FIG. 1, with a different clip;

[0023] FIG. 12 is a top isometric view of an alternative cover for a volatile material dispenser;

[0024] FIG. 12A is a bottom isometric view of the cover shown in FIG. 12;

[0025] FIG. 13 is a top isometric view of a further alternative cover for a volatile material dispenser;

[0026] FIG. 13A is a bottom isometric view of the cover shown in FIG. 13;

[0027] FIG. 14 is a top isometric view of a still further embodiment of a cover for a volatile material dispenser;

[0028] FIG. 14A is a bottom isometric view of the cover shown in FIG. 14;

[0029] FIG. 15 is a top plan view of another embodiment of a cover for a volatile material dispenser;

[0030] FIG. 15 A is a top plan view of a regulating plate for the cover of FIG. 15; and

[0031] FIG. 16 is a sectional view similar to that of FIG. 7, with a different base and cartridge therein.

DETAILED DESCRIPTION

[0032] Referring to FIGS. 1-10, a volatile material dispensing system 100 includes a dispenser 102, which generally includes a base 104 and an interchangeable cover 106. The cover 106 attaches to the base 104 to define a chamber 108 therebetween. A refill cartridge 110 is held within the chamber 108 (see FIGS. 6-7A) and includes a reservoir 112 having a volatile material therein. The dispenser 102 also includes a regulating plate 114 mounted under the cover 106 such that the regulating plate 114 is movable relative to the cover 106.

[0033] Referring to FIGS. 3 and 4, the base 104 generally includes an upper body portion 120 and a lower body portion 122. The lower body portion 122 depends from the upper body portion 120 and defines a recess 124 therein. The upper body portion 122 includes a shelf 126 that extends about an upper perimeter of the lower body portion 122. The base 104 therefore comprises a stepped-in profile, which creates the illusion that the dispenser 102 has a lower visual weight than prior art dispensers. Specifically, the visual weight when viewed from the sides about an axis Y, or at an angle thereto, is greatly decreased. For example, as shown in FIG. 1, the base 104 is not visible when the dispenser 102 is viewed at an angle from above and to the side. The lighter appearance of the dispenser 102 is more aesthetically pleasing to users than prior, bulkier appearing dispensers.

[0034] The refill cartridge 110 is similar to those described in U.S. Patent No. 7,441,360. As shown in FIGS. 5-7A, the cartridge 110 includes a flange 136 surrounding the reservoir 112. A permeable membrane 138 is adhered to the flange 136 to cover the reservoir 112 and extends across the cartridge 110. As noted above, the reservoir 112 is filled with a volatile material, which may comprise an active ingredient for diffusion into the surrounding atmosphere, such as a fragrance, air freshener, odor eliminator, or insect repellent. It is contemplated that any type of volatile material suited for dispersal through the permeable membrane 138 may be used with the present embodiments described herein. An impermeable laminate 140 is releasably adhered to the cartridge 110 over the permeable membrane to prevent release of the volatile material prior to use. Although the cartridge of

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the present embodiment has a single reservoir 112, it is contemplated that cartridges having two or more reservoirs filled with the same or different volatile materials may be used.

[0035] In use, as best illustrated in FIGS. 6-7A, the cartridge 110 is inserted within the base 104 such that the reservoir 112 aligns within the recess 124 in the lower portion 122 of the base 104. The flange 136 rests on a plurality of ribs 142 disposed on the shelf 126 around the recess 124. The ribs 142 assist in maintaining the proper alignment of the cartridge 110 within the dispenser 102, such that a portion of the refill cartridge 110 is retained at a constant distance H from a distal most portion of the regulating plate 114. In the present embodiment, the distance H is a line that is perpendicular to a plane defined by the permeable membrane 138 and is measured between an inner surface of the most distal portion of the regulating plate, i.e., the portion(s) of the regulating plate farthest from the cartridge 110, and the plane defined by the permeable membrane 138. In some embodiments, the distance H may be constant about the entirety of the cartridge or reservoir, whereas in other embodiments, e.g., such as the one shown in FIGS. 1-10, the distance H may be measured at a discrete point, e.g., the apex of the domed regulating plate shown in FIGS. 7 and 7A. Preferably, the distance H is between about 0.25 mm to about 10 mm, and more preferably between about 0.5 mm to about 3 mm.

[0036] Turning to FIG. 7, a 12 gram refill cartridge 110 is depicted, in which the reservoir 112 rests on a bottom surface 144 of the recess 124 such that the permeable membrane 138 of the refill cartridge 110 is maintained a distance H from the distal most portion of the inner surface of the regulating plate 114. However, if a smaller refill cartridge 110 is used, such as the 8 gram refill cartridge 110 shown in FIG. 6A, the reservoir 112 of the cartridge 110 would be too small to rest on the bottom surface 144 of the recess 124 and still maintain the same distance H between the cartridge 110 and the cover 106 without the ribs 142. Thus, the ribs 142 allow different sized refill cartridges 110 to be used within the same dispenser 102. The ribs 142 also raise the flange 136 above the shelf 126, thereby creating a

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gap 146 between the shelf 126 and the flange 136 to provide a user with a way to grasp the flange 136 and remove the cartridge 110 from within the base 104.

[0037] In a preferred embodiment, the flange 136 is captured between the ribs 142 and an inner surface of one or more of the cover 106 and the regulating plate 114 to securely retain the cartridge 110 within the dispenser 102. In another preferred embodiment, the flange 136 is loosely retained between the ribs 142 and the cover 106 and/or regulating plate 114, so that the cartridge 110 may move within the dispenser 102. However, the distance H in either embodiment is measured, as noted above, when the flange 136 is resting on the ribs 142.

[0038] In the present embodiment, the reservoir 112 of the cartridge 110 has a similar shape as the recess 124 of the base 104, which provides improved refill cartridge orientation within the dispenser 102 by providing a clear indication to the user of the proper way to insert the refill cartridge 110. Further, having a similarly shaped cartridge 110 and recess 124 also prevents the refill cartridge 110 from substantially moving when the dispenser 102 is assembled and being used. However, it is contemplated that refill cartridges 110 with reservoirs 112 shaped differently than the recess 124 may be used in alternative embodiments.

[0039] Referring to FIGS. 8-9A, the base 104 is shown to optionally include a domed portion 148 disposed on the bottom surface 144 of the base 104. The domed portion 148 assists in the proper placement of the refill cartridge 110 within the dispenser 102 and in managing any size variations between different refill cartridges 110. In use, the domed portion 148 contacts a bottom portion of the reservoir 112 to prevent the cartridge 100 from resting too low within the recess 124. The domed portion 148 thereby assists in holding the cartridge 100 at the preferred distance H from the cover 106, regardless of the size of the refill cartridge 110 (see FIGS. 9 and 9A). The domed portion 148 also provides a force F against the reservoir 112 of the cartridge 110, which causes the reservoir 112 to deflect inwardly. The deflection of the reservoir 112 assists in transferring the volatile material within the refill cartridge 110 toward the permeable membrane 136 to aid in the diffusion of

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the volatile material from the cartridge 102. Additionally, the force F from the domed portion 148 against the reservoir 112 also assists in distributing the volatile material to peripheral portions of the reservoir 112 to prevent pooling of the volatile material within the center of the cartridge 110.

[0040] In an alternative embodiment, rather than deflecting inwardly, the reservoir 112 may include a corresponding domed recess 148' (see alternative domed recess 148' in FIG. 10) that aligns with the domed portion 148 of the base 104. The corresponding domed portions 148, 148' provide an indication to the user of the proper orientation of the refill cartridge 110 during insertion. Further, the corresponding domed portions 148, 148' may act as a lock and key mechanism to prevent improper refill cartridges 110 from being inserted into the dispenser 102, which could damage the dispenser 102 or cause the dispenser to work improperly. Alternatively, the domed portions 148, 148' may be provided in any complementary shape.

[0041] After the refill cartridge 110 is inserted into the base 104 and the impermeable laminate 140 is removed, the cover 106 is then mounted onto the base 104 over the cartridge 110. The cover 106 includes two wings 160 depending from opposing ends of the cover 106. The wings 160 include inwardly extending flanges 162 that attach below the upper body portion 120 of the base 104 to achieve a releasable attachment of the cover 106 to the base 104 by way of a snap-fit connection. Alternatively, the flanges 162 may be attached by friction fit to the base 104 or the cover 106 may be alternatively secured to the base by any other means known to one of ordinary skill.

[0042] A user can separate the cover 106 from the base 104 by applying sufficient force to portions of the wings 160 extending below the flanges 162, which cause the flanges 162 to deflect out from below the upper body portion 120 of the base 104. The cover 106 may thereafter be removed from the base 104. After separation of the cover 106 from the base 104, a user may replace an exhausted refill cartridge 110 with a new cartridge. Additionally, the user may remove the cover 106 and replace it with an alternative cover 106 depending on

user preferences as relates to aesthetics and performance. Further, the symmetry between the base 104 and the cover 106 allows the user to attach the cover 106 to the base 104 in any orientation.

[0043] Referring now to FIGS. 1, 2, and 10, the cover 106 comprises a first portion 164 that includes bores, holes, or apertures and a second portion 166 that does not include any bores, holes, or apertures. In one particular embodiment, the first portion 164 may include any number of apertures 168, e.g., one or more. The apertures 168 may comprise any geometric shape or size. Preferably, the apertures 168 comprise between about 2% to about 50% and more preferably between about 5% to about 25% of the total surface area A of a top surface 170 of the cover 106.

[0044] In the present embodiment, the cover 106 has a plurality of circular apertures 168 disposed in a generally half-moon arrangement within the first portion 164. The present embodiment also includes a plurality of decorative circles 172 indented into the second portion 166 of the cover 106. As shown in FIGS 7-7A, the cover 106 also includes a post 174 depending from an underside thereof. The post 174 is designed to receive the regulating plate 114 thereon and defines an axis of rotation X of the regulating plate 114. The regulating plate 114 is circular with a generally half-moon shaped window 178 disposed in a first half 180 thereof. The cover 106 further includes an arc-shaped opening 182 within the second portion 166 of the cover 106. In the present embodiment, the cover 106 and the regulating plate 114 are both slightly domed, however, it is contemplated that the cover 106 and the regulating plate 114 may be flat to minimize the internal and/or external volume of the dispensing system 100. Indeed, the cover 106 and the regulating plate 114 may have varying shapes so long as the regulating plate 114 is disposed adjacent to the cover 106 when attached.

[0045] When the regulating plate 114 is attached to the cover 106, a peripheral portion 184 of the regulating plate 114 extends through the arc-shaped opening 182 in the cover 106. The peripheral portion 184 allows the user to adjust the diffusion of the volatile material as

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discussed below. The peripheral portion 184 of the regulating plate 114 may also include a plurality of grooves 186 to assist the user in locating and adjusting the regulating plate 114.

[0046] In use, the regulating plate 114 rotates around the axis of rotation X between an open position and a closed position when the peripheral portion 184 of the regulating plate 114 is moved by a user within the arc-shaped opening 182. The regulating plate 114 is in the closed position when the window 178 is aligned with the second portion 166 of the cover 106. Thus, all of the apertures 168 are covered when the regulating plate 114 is in the closed position, thereby preventing the volatile material of the cartridge 110 from being released through the apertures 168 into the surrounding atmosphere. In the open position, the window 178 is completely aligned with the apertures 168 in the cover 106. Thus, in the open position the volatile material from the cartridge 110 can be dispensed through the apertures 168 into the surrounding atmosphere. Additionally, the regulating plate 114 can be located in a partially open position, which is somewhere between the open and closed positions. When the regulating plate 114 is in a partially open position, a portion of the window 178 is aligned with the apertures 168 in the cover 106. When the regulating plate 114 is in a partially open position, the dispensing rate of the volatile material is somewhere between the rates of dispensing found in the open position and the closed position due to the partial coverage of the first portion 164. Aligning a greater portion of the window 178 with the apertures 168 will increase the dispensing rate of the volatile material from the dispenser 102. As such, the user can control the amount of volatile material being released from the dispenser 102 by rotating the regulating plate 114.

[0047] The dispenser 102 may also include a mounting clip 190, which allows the dispenser 102 to be attached to a visor of a car. The mounting clip 190 may be made of a bent wire, a formed wire, formed plastic, and the like. In the present embodiment, the mounting clip 190 is a bent wire that is releasably inserted into apertures 192 disposed in a bottom of the base 104. The mounting clip 190 can be removed from the base 104 so that the dispenser 102 may rest flat on a surface. In one particular embodiment, the mounting clip

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190 comprises a conventional visor clip, which is commonly used in connection with securing a garage door opener to a car visor (see FIG. 11). Indeed, any type of clip may be used in connection with any of the dispensing system embodiments disclosed herein.

[0048] The base 104 of the present dispensing system 100 is not limited to use with the cover 106 shown in FIGS. 1-10. Rather, the base 104 may be used with a variety of interchangeable covers such as those shown in FIGS. 12-15A. FIGS. 12 and 12A illustrate one alternative cover 200 for use in the dispensing system 100. The cover 200 includes a single half-moon shaped aperture 202. A circular regulating plate 204 is rotatably attached to the cover 200 and is capable of rotating around a centrally located axis of rotation X. The regulating plate 204 includes two arc-shaped windows 206 and an adjustment tab 208 extending through the cover 200. The adjustment tab 208 provides the user with the ability to adjust the dispensing rate of the dispenser 102 and provides a visual break between the windows 206 and the remainder of the regulating plate 204. A user can control the dispensing rate of the dispenser 102 by rotatably moving the adjustment tab 208 and regulating plate 204 around the axis of rotation X between an open position, in which the windows 206 completely align with the aperture 202, and the closed position, in which the aperture 202 is completely covered by the regulating plate 204. As seen in FIG. 12A, the regulating plate 204 also includes a semi-circular guide slot 210 disposed around the axis of rotation X. The guide slot 210 receives a tab 212 depending from the cover 200. The combination of the tab 212 and the guide slot 210 assists in guiding the rotation of the regulating plate 204. Additionally, the tab 212 and guide slot 210 also acts as a stop that informs the user when the dispenser 102 is in the fully open or closed positions, i.e., the tab 212 abuts against distal portions of walls defining the slot 210 in the open and closed positions.

[0049] In an alternative embodiment shown in FIGS. 13 and 13A, a cover 220 includes a regulating plate 222. The regulating plate 222 has an axis of rotation X located adjacent a corner 224 of the cover 220. The cover 220 includes three curved apertures 226. The

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regulating plate 222 is fan-shaped and includes an adjustment tab 228 extending through an arc-shape guide slot 230 in the cover 220. The regulating plate 222 is rotatable between an open position, in which the adjustment tab 228 is located at a first end 232 of the guide slot 230, and a closed position, in which the adjustment tab 228 is located at a second end 234 of the guide slot 230. In the closed position, the apertures 226 are covered by the regulating plate 222 (see FIG. 13).

[0050] Yet another embodiment of a cover 240 is illustrated in FIGS. 14 and 14A. The cover 240 includes a rectangular regulating plate 242 that does not rotate relative to the cover 240. Rather, the plate 242 slides in a substantially straight line relative to the cover 240, as illustrated by arrow B. The cover 240 includes a plurality of generally rectangular apertures 244 disposed within one half of the cover 240. Guide slots 246 are provided within an underside 248 of the cover 240, which allows the regulating plate 242 to slide between open and closed positions. The regulating plate 242 also includes an adjustment tab 250 that extends through a guide slot 252 in the cover 220 to allow the user to easily move the regulating plate 242 between the open and closed positions.

[0051] FIGS. 15 and 15A illustrate another embodiment of a cover 260 and regulating plate 262. The cover includes a plurality of sections 264 containing circular apertures 266 therein. The circular regulating plate 262 is rotatably attached to the cover 260 and includes a plurality of windows 268 disposed therein. The number of windows 268 in the regulating plate 262 corresponds to the number of sections of apertures 264 in the cover, such that each window 268 aligns with a section of apertures 264 in an open position. A user may rotate the regulating plate 262 from the open position to a closed position, in which the apertures 266 are covered by the regulating plate 262. Moving the plurality of windows 268 concurrently, as opposed to a single window within a regulating plate as shown above, increases the ratio of the opening speed of the dispenser in relation to the distance the regulating plate 262 moves. As such, the user is able to open and/or close the dispenser with less effort. Further,

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the plurality of windows 268 increases the strength of the regulating plate 262 compared to regulating plates that include one large window or hole therein.

[0052] Turning to FIG. 16, another alternative embodiment is shown that is similar to FIG. 7, except for the inclusion of a first magnetic element disposed within the base 104. The first magnetic element 270 may be provided on an inside, outside, or within a portion of the base 104 and is adapted to functionally interact with a second magnetic element 272 on or within the cartridge. For example, various possible exemplary embodiments and descriptions of the functional interaction of magnetic elements within dispensers and cartridges are shown in U.S. App. Ser. No. 12/896,583. For example, in the present embodiment the first magnetic element 270 is disposed within the bottom surface 144 of the base 104 and the second magnetic 272 element is disposed within the reservoir 112 of the cartridge 110. The first and second magnetic elements 270, 272, respectively, shown in FIG. 16 may be utilized in connection with any of the embodiments disclosed herein.

[0053] It is contemplated that other covers and regulating plates having any combination of apertures and windows may be used with any of the dispensers shown herein.

[0054] It is also contemplated that one or more of the base, the cover and the regulating plate may be made from an injection molded plastic, e.g., polypropylene. However, they may also be made of other materials, such as metal, glass, paperboard, co-polyester resins, or any other known material. Further, the base, the cover, and the regulating plate may be made of the same or different materials.

[0055] It is still further contemplated that the base, the cover, and the regulating plate may be provided with similar or different colors or surface indicia to impart varying aesthetic appearances. Further, a variation in color or surface indicia between one or more of the base, the cover, and the regulating plate may assist the user in properly aligning, securing, and/or operating various portions of the dispensers shown herein.

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[0056] It is also contemplated that the various covers and bases described herein may have varying shapes and sizes. For example, the dispenser may be provided with a square cross-section, a circular cross-section, a hexagonal cross-section, or any other geometric cross-section. It is preferred that the base and the cover have a symmetrical shape such that the cover can be attached to the base regardless of its orientation. Further, it is preferable to include a plurality of covers that may be interchanged and provided with one or more bases to provide users the ability to choose a desired cover that is both functionally and aesthetically pleasing.

[0057] All documents cited in the Detailed Description of the Invention are, in relevant part, incorporated herein by reference; the citation of any document is not to be construed as an admission that it is prior art with respect to the present invention.

INDUSTRIAL APPLICABILITY

[0058] Numerous modifications to the present invention will be apparent to those skilled in the art in view of the foregoing description. Accordingly, this description is to be construed as illustrative only and is presented for the purpose of enabling those skilled in the art to make and use the invention and to teach the best mode of carrying out same. The exclusive rights to all modifications which come within the scope of the appended claims are reserved.

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WE CLAIM:

1. A dispenser, comprising:
a base including a plurality of ribs for supporting a peripheral flange of a cartridge having a volatile material containing reservoir; and
a first removable cover attached to the base having at least one aperture and a first regulating plate, wherein the first cover may be removed and replaced by at least a second cover having at least one aperture and a second, different regulating plate.
2. The dispenser of claim 1 further including a cartridge having a peripheral flange and a reservoir, wherein the reservoir contains a volatile material and is covered by a permeable membrane.
3. The dispenser of claim 1, wherein the second cover includes a sliding regulating plate for alternatively covering or exposing the at least one aperture thereof.
4. The dispenser of claim 1, wherein the second cover includes a rotatable regulating plate for alternatively covering or exposing the at least one aperture thereof.
5. The dispenser of claim 1, wherein the first regulating plate of the first removable cover includes at least one window, and wherein the second regulating plate includes at least one of a differently sized and shaped window.
6. The dispenser of claim 5, wherein the second regulating plate includes at least one of a sliding regulating plate and a rotatable regulating plate.

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7. The dispenser of claim 1, wherein the first and second covers may be removed and replaced by at least a third cover having at least one aperture and a third, different regulating plate.

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8. A method of replacing a refill cartridge for a dispenser, comprising the steps of:
removing an impermeable laminate from a cartridge to expose a permeable membrane extending over a reservoir containing a volatile material, wherein the cartridge includes a peripheral flange and is indicated as being usable with a particular dispenser; and
inserting the cartridge within the dispenser having a portion that exerts a force upon a bottom of the reservoir to deflect same inwardly.
9. The dispenser of claim 8, wherein the indication that the cartridge is usable with a particular dispenser is provided on packaging retaining the cartridge.
10. The dispenser of claim 8 further including the step of removing the cartridge and inserting a second, different cartridge.

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11. A dispenser, comprising:
a base holding a cartridge having a permeable membrane; and
a cover attached to the base having at least one aperture and a first regulating plate,
wherein a distance H, which is a line that is perpendicular to a plane defined by the permeable membrane and is measured between an inner surface of the most distal portion of the regulating plate and the plane defined by the permeable membrane, is between about 0.25 mm to about 10 mm.
12. The dispenser of claim 11, wherein the distance H is uniform about the entirety of the cartridge.
13. The dispenser of claim 11, wherein the distance H is not uniform about the entirety of the cartridge.
14. The dispenser of claim 11 further including a plurality of ribs provided on the base and in engagement with a flange of the cartridge.
15. The dispenser of claim 14, wherein the distance H between the regulating plate and the permeable membrane of a first cartridge having a reservoir with a first volume of volatile material and the regulating plate and the permeable membrane of a second cartridge having a reservoir with a second, different volume of material, is the same.
16. The dispenser of claim 14, wherein a bottom surface of a reservoir of the cartridge is in engagement with a portion that exerts a force thereupon to deflect the bottom surface inwardly.
17. The dispenser of claim 16, wherein the portion comprises a domed portion.

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18. The dispenser of claim 14, wherein a bottom surface of a reservoir of the cartridge includes a dome shaped recess that is complementary to a domed portion extending from the base.

19. The dispenser of claim 11, wherein the cartridge includes a reservoir, and wherein the reservoir contains a volatile material that is covered by the permeable membrane.

20. The dispenser of claim 11, wherein the cover may be removed and replaced by at least a second cover having at least one aperture and a second, different regulating plate.

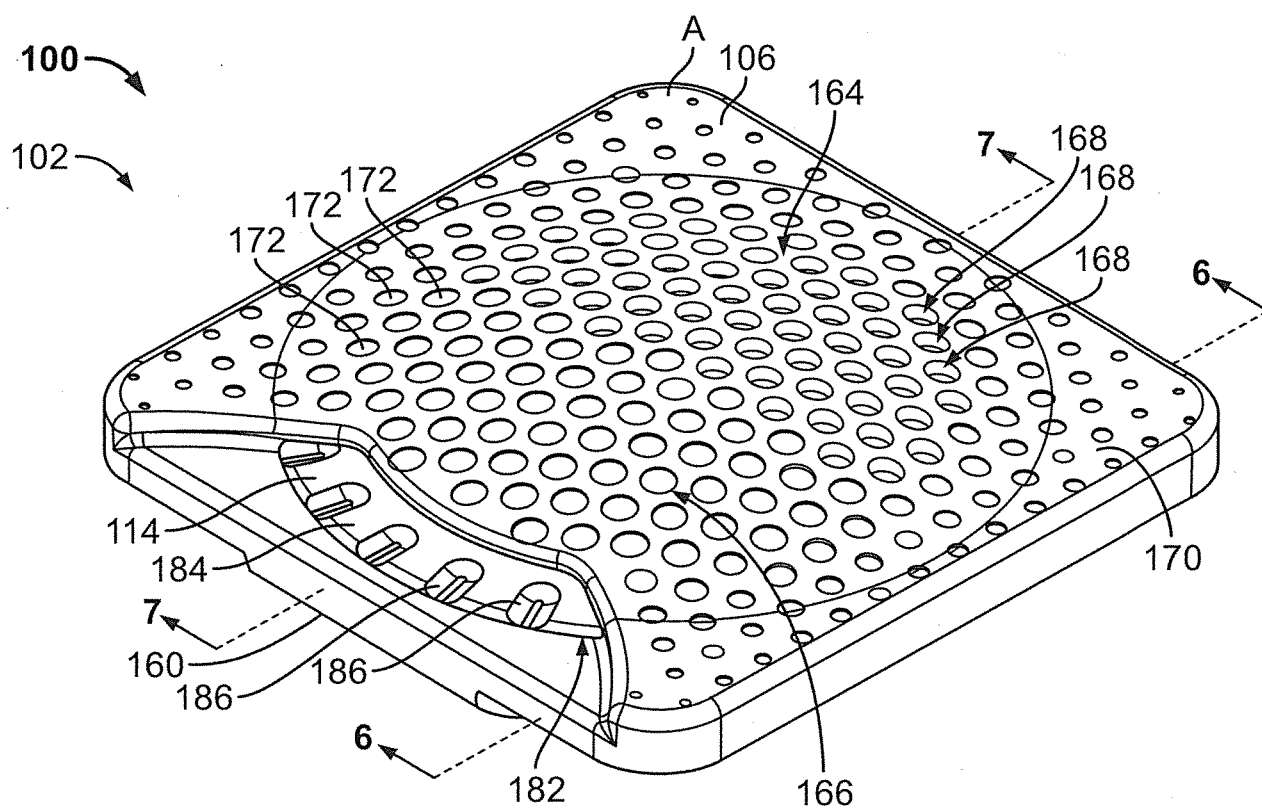


FIG. 1

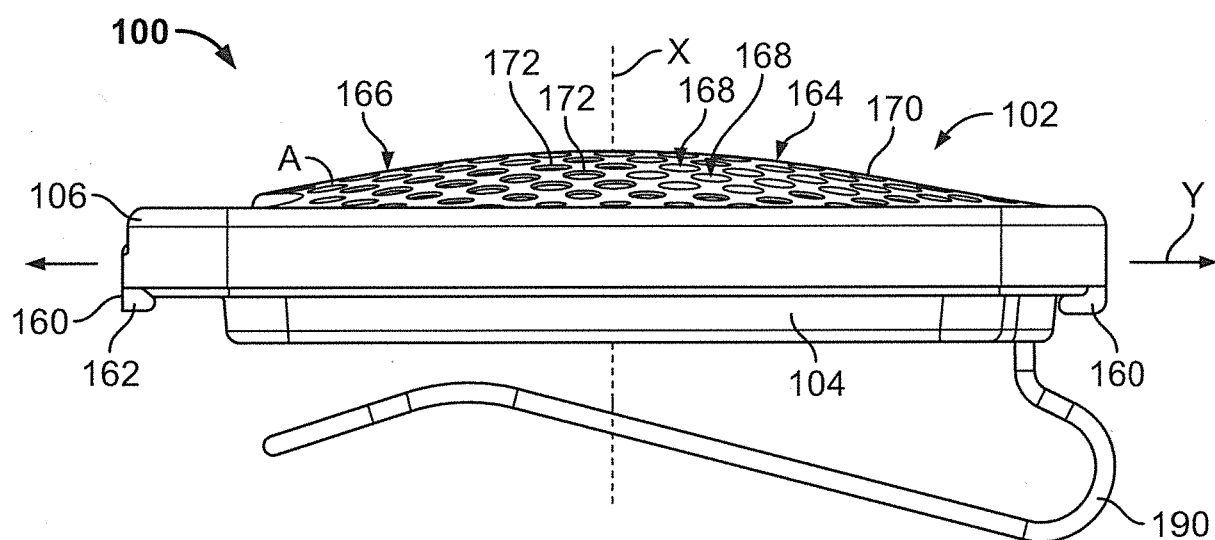


FIG. 2

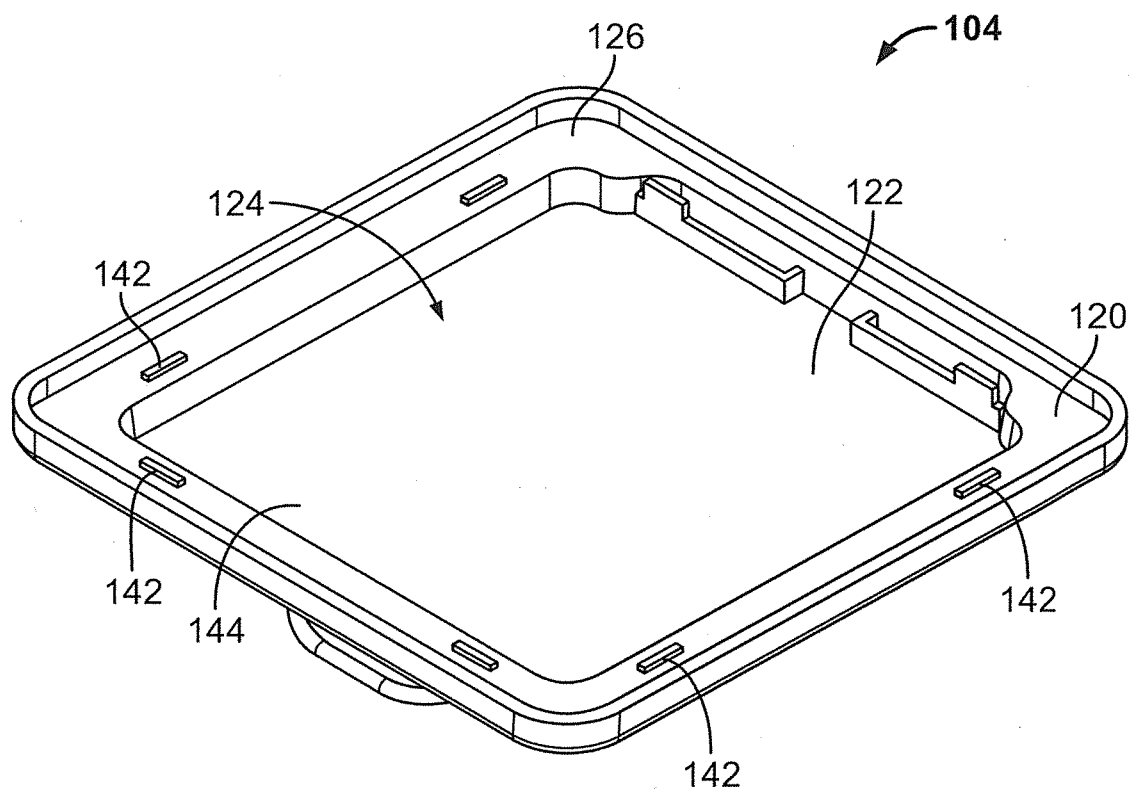


FIG. 3

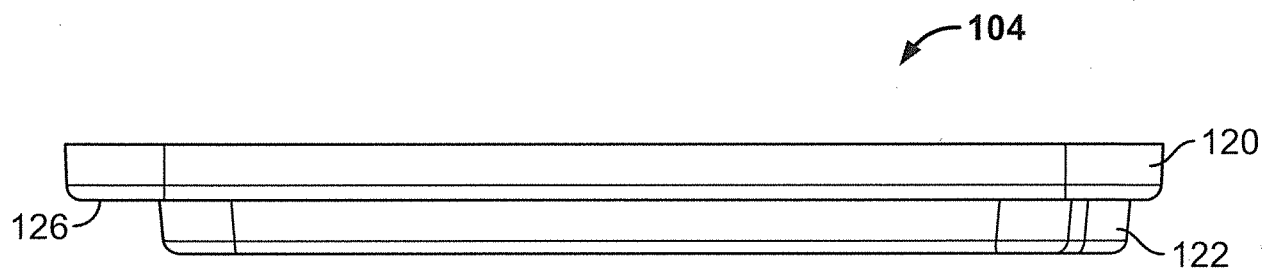


FIG. 4

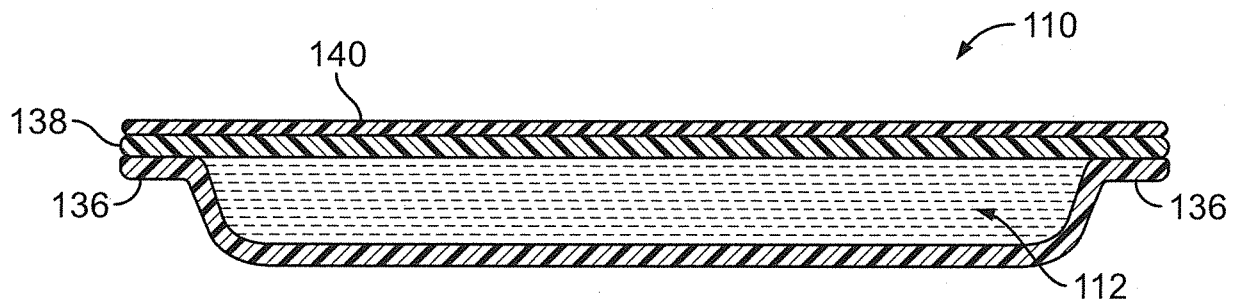


FIG. 5

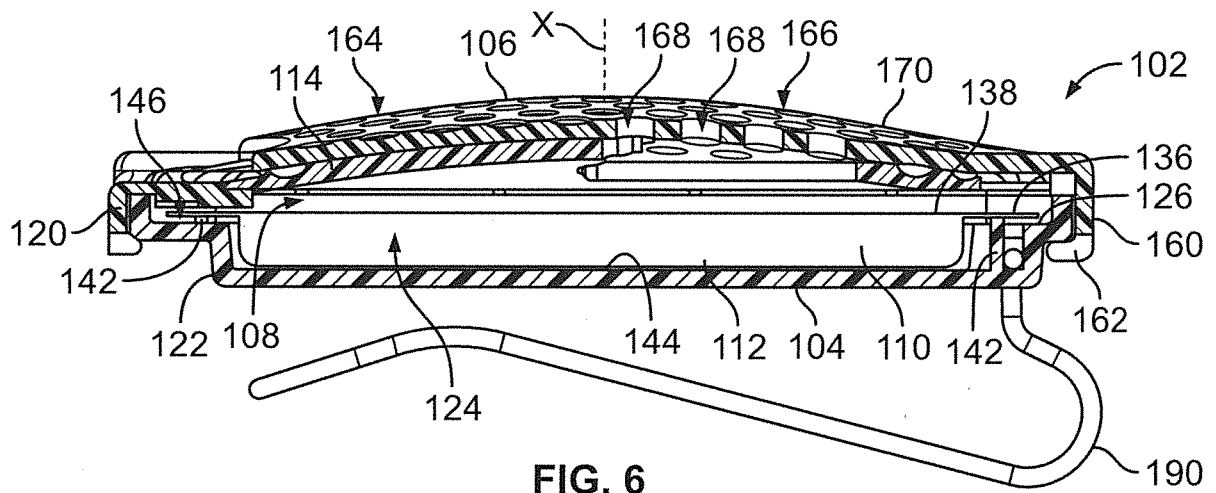


FIG. 6

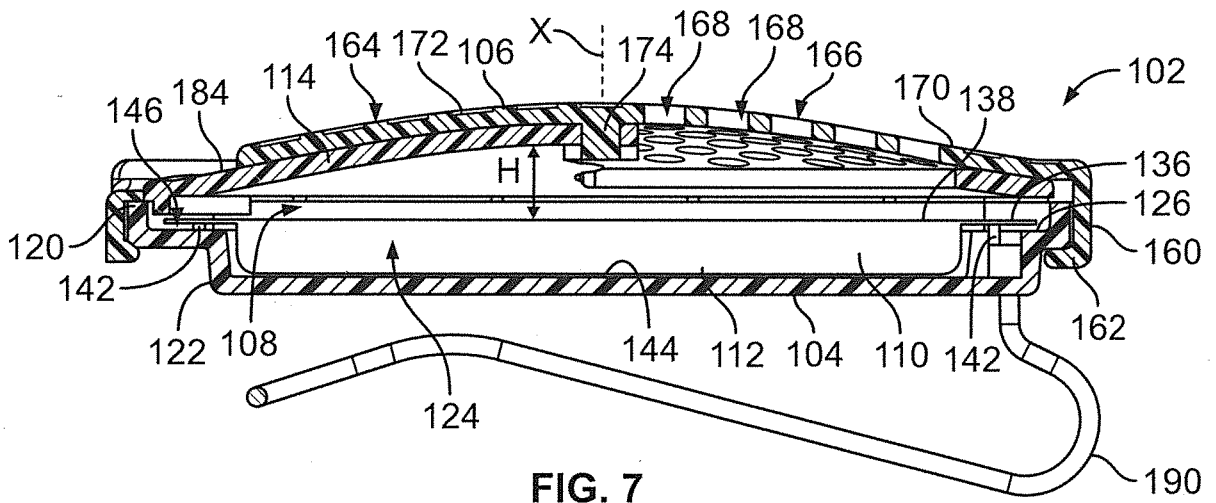


FIG. 7

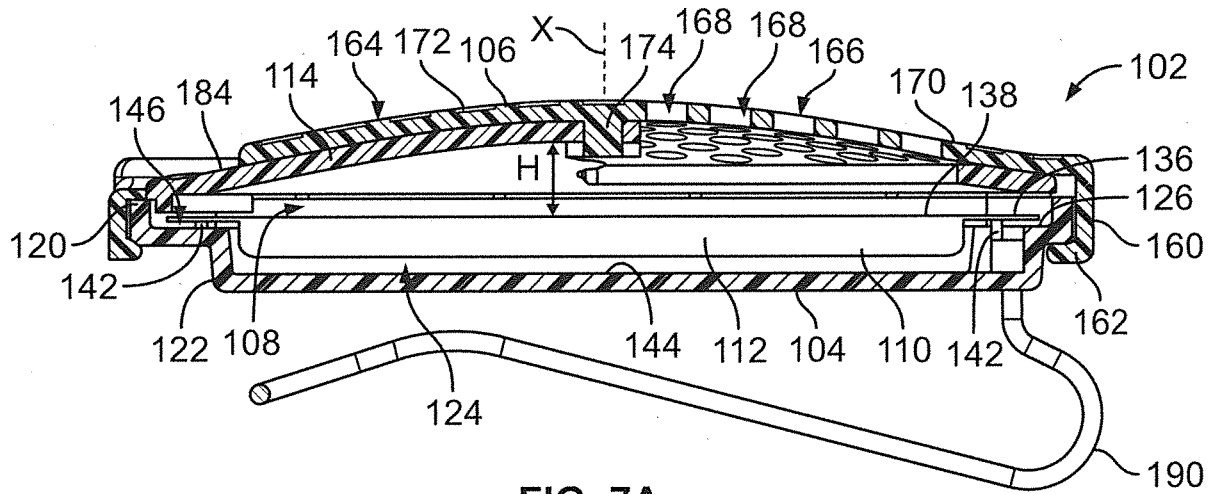


FIG. 7A

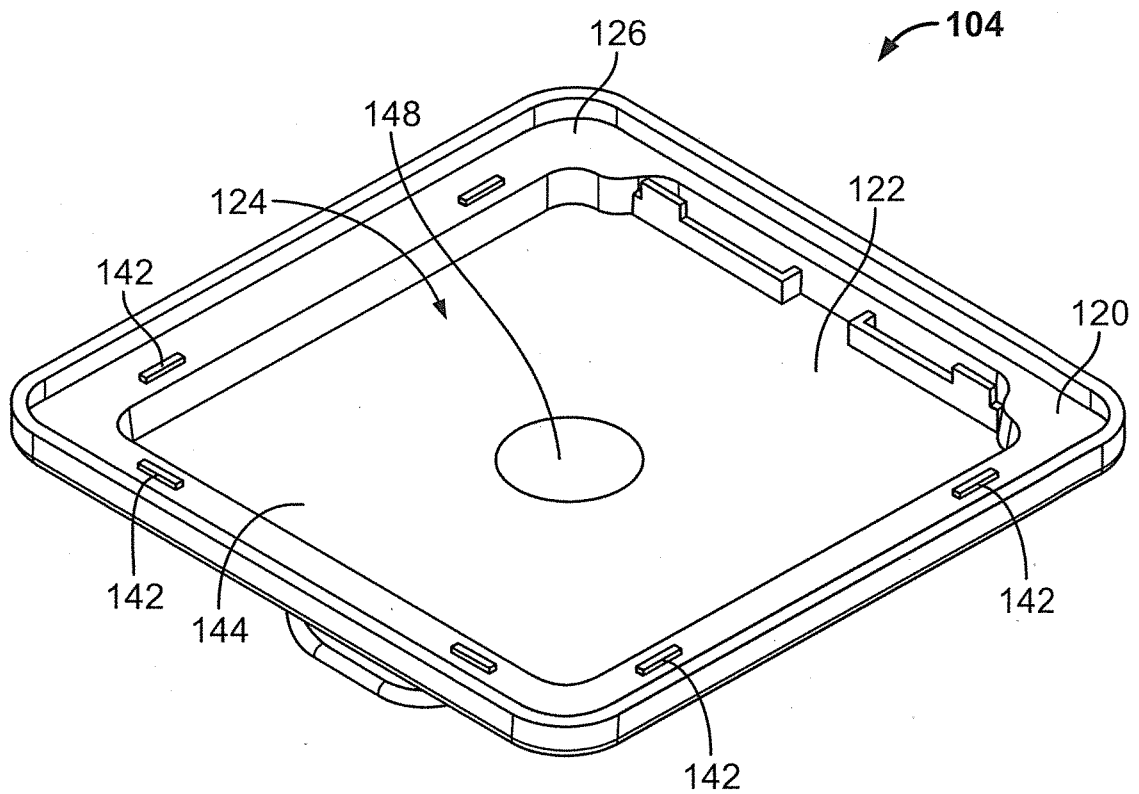


FIG. 8

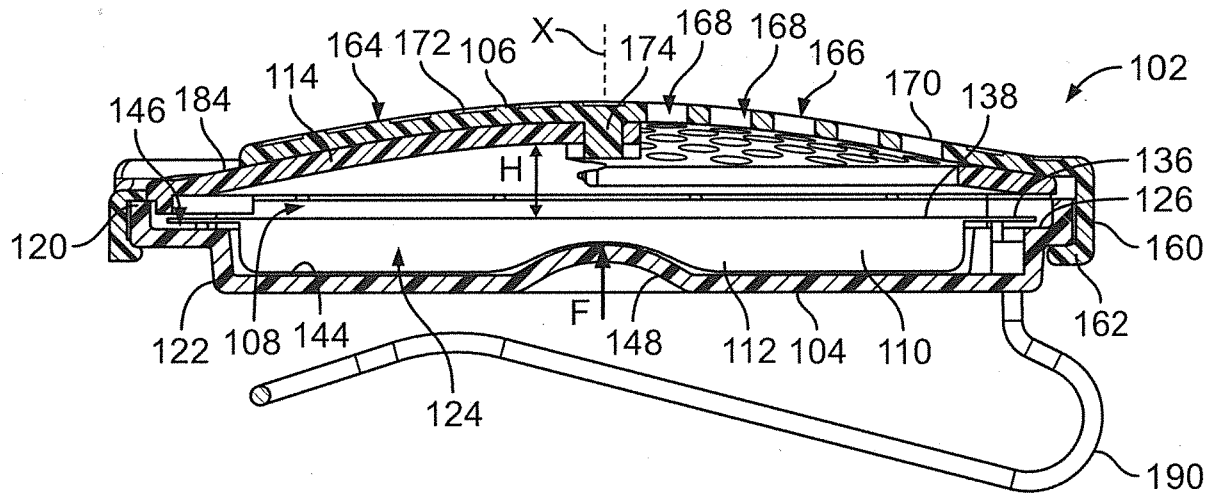


FIG. 9

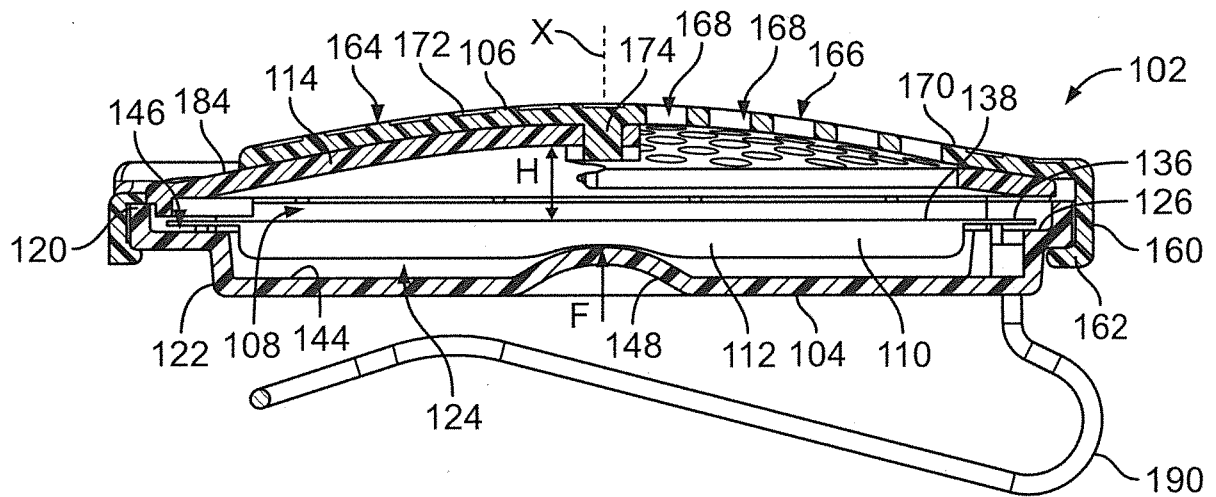


FIG. 9A

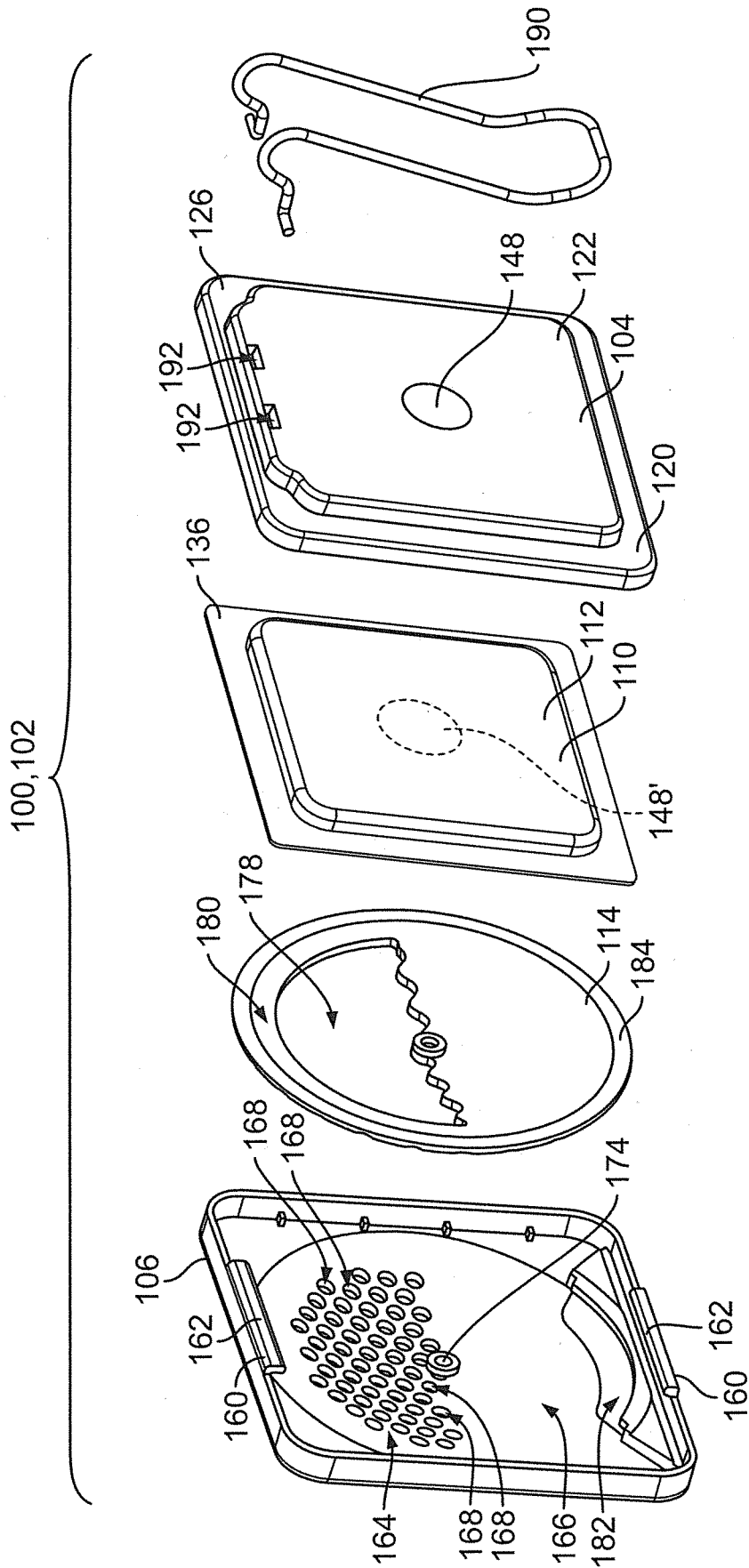


FIG. 10

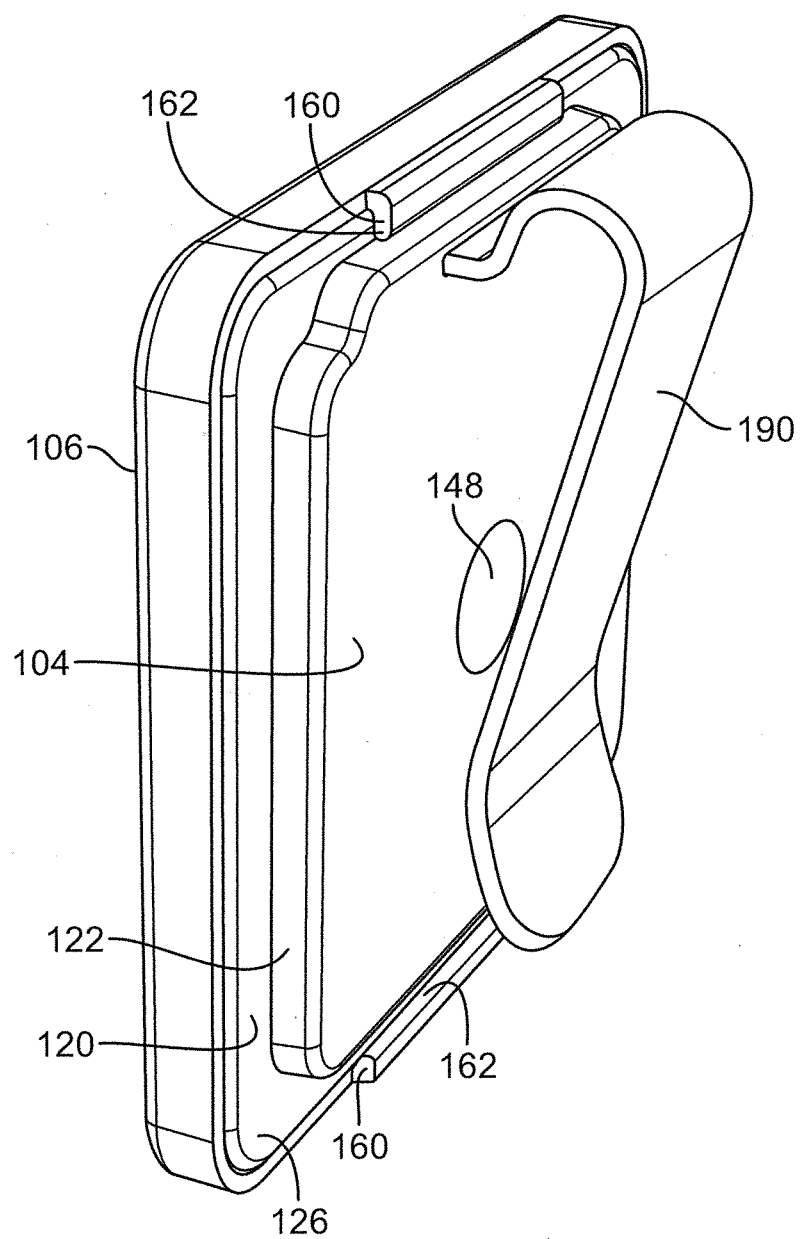


FIG. 11

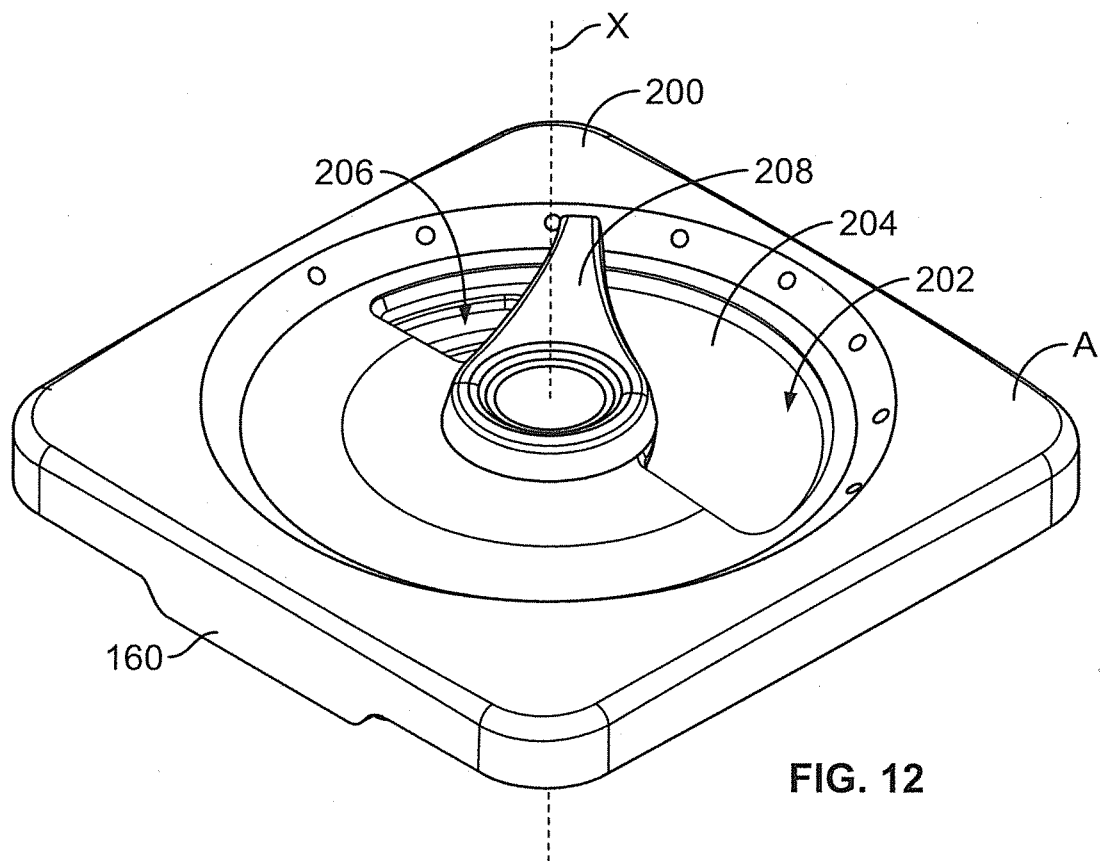


FIG. 12

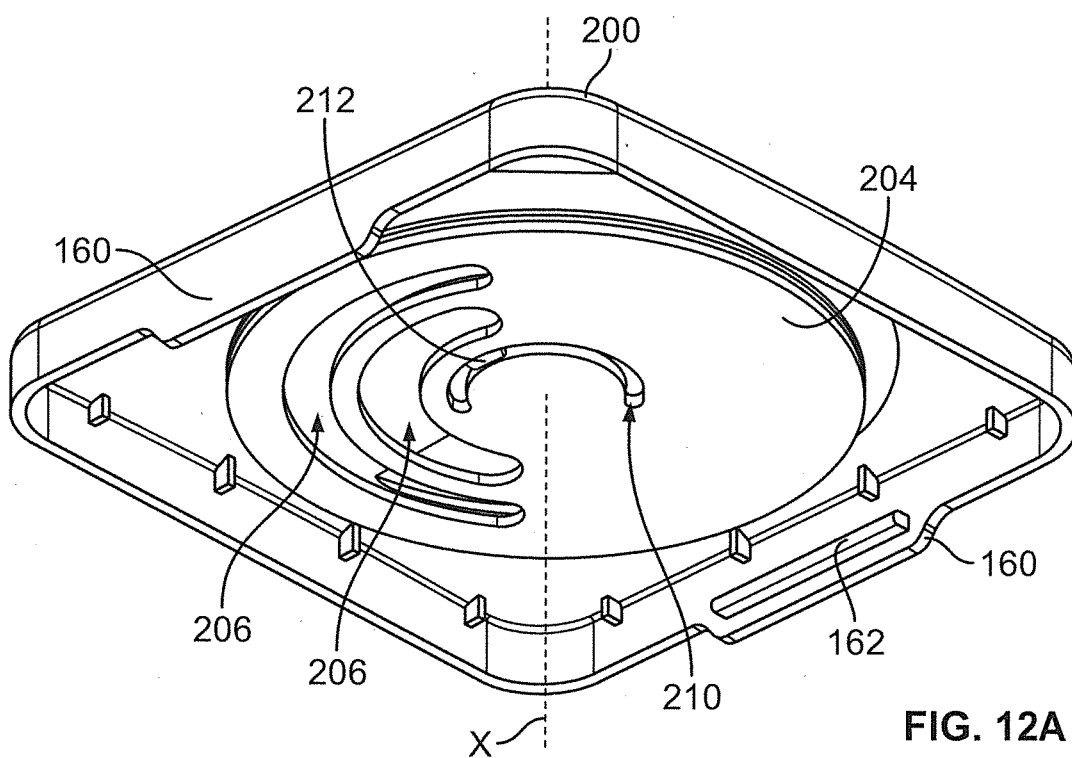


FIG. 12A

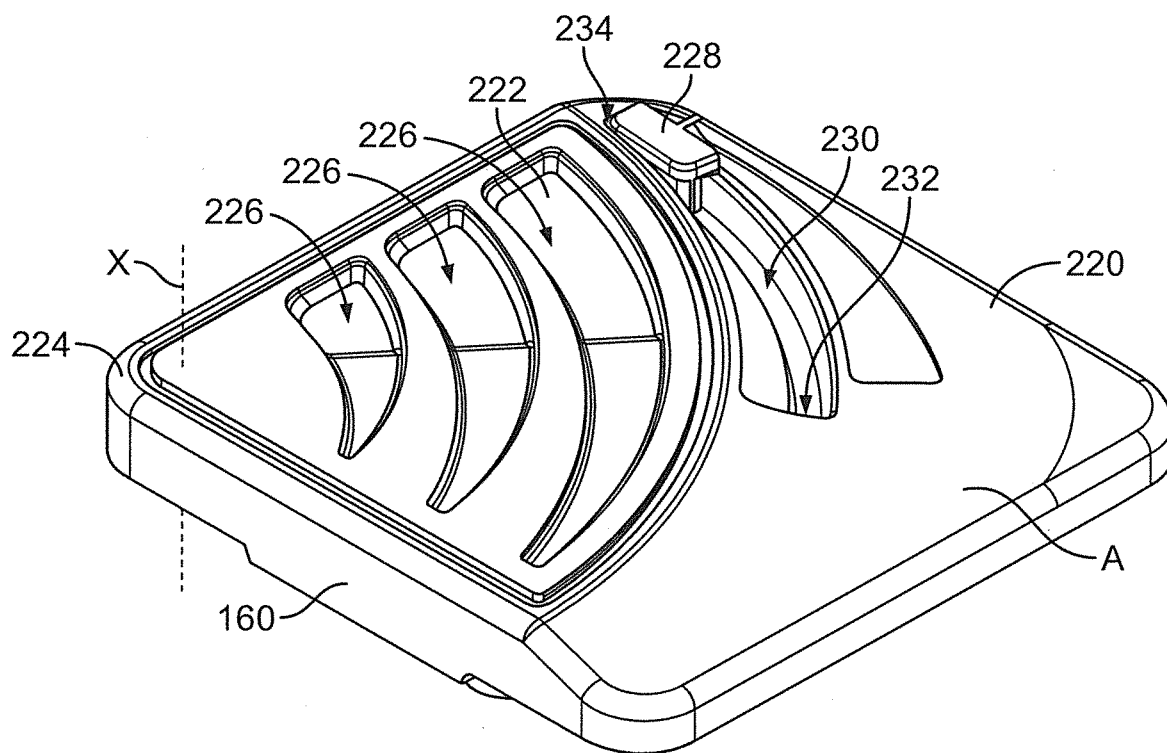


FIG. 13

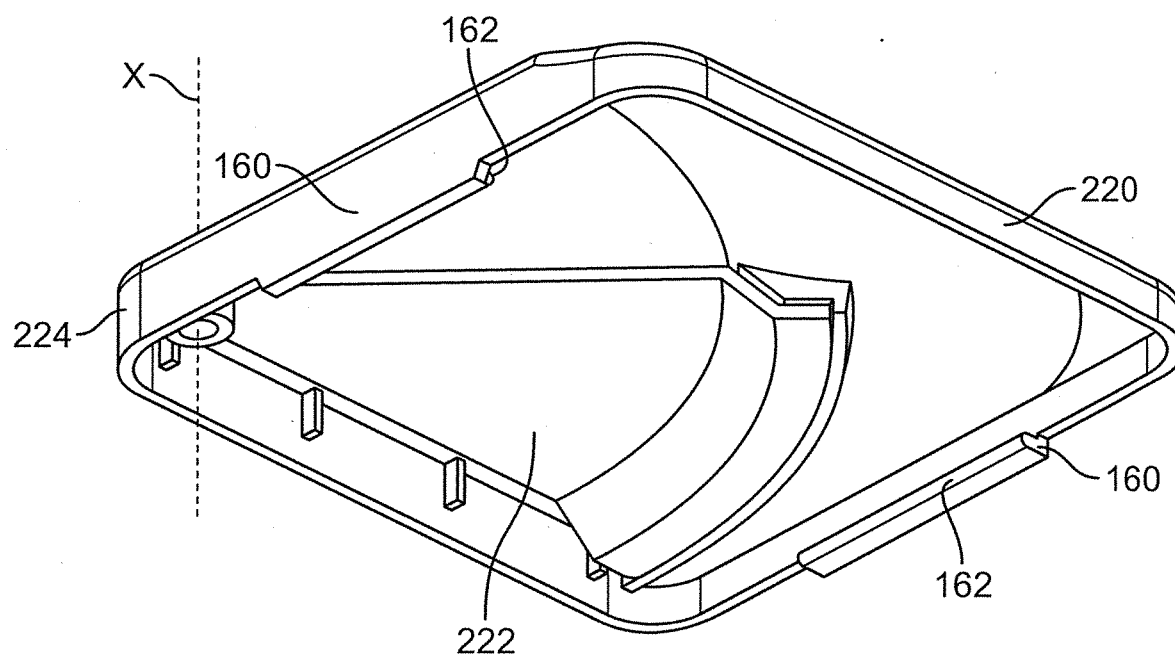


FIG. 13A

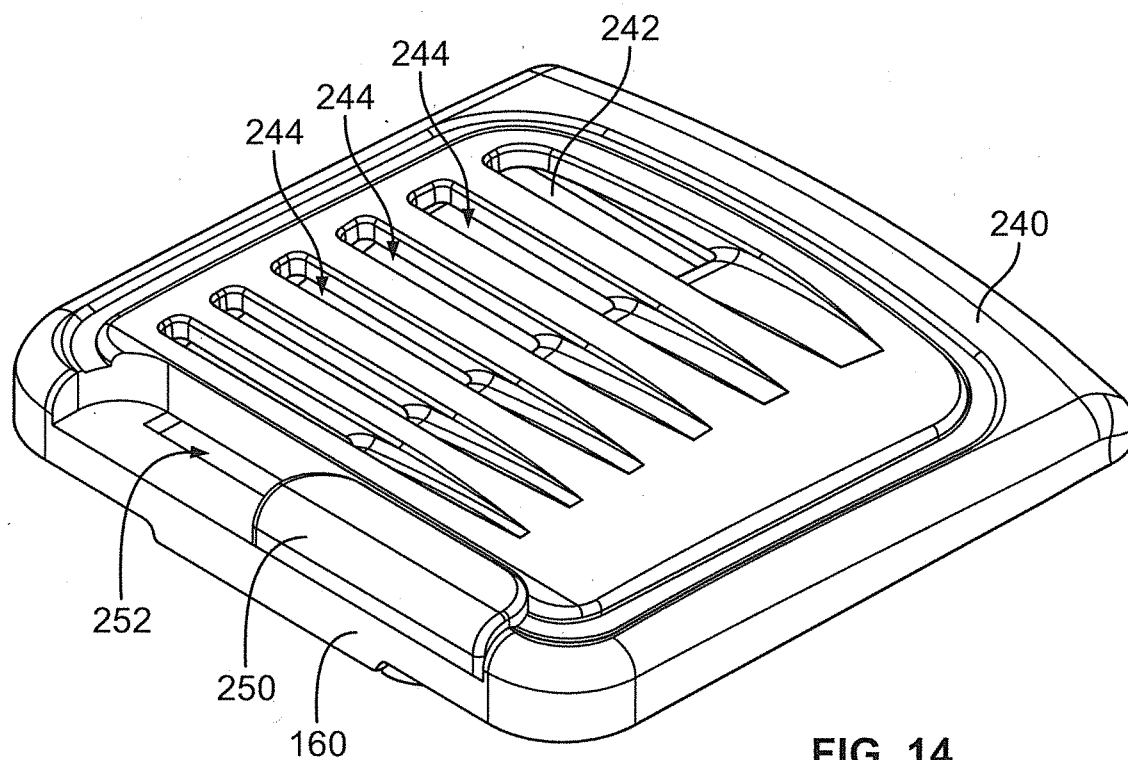


FIG. 14

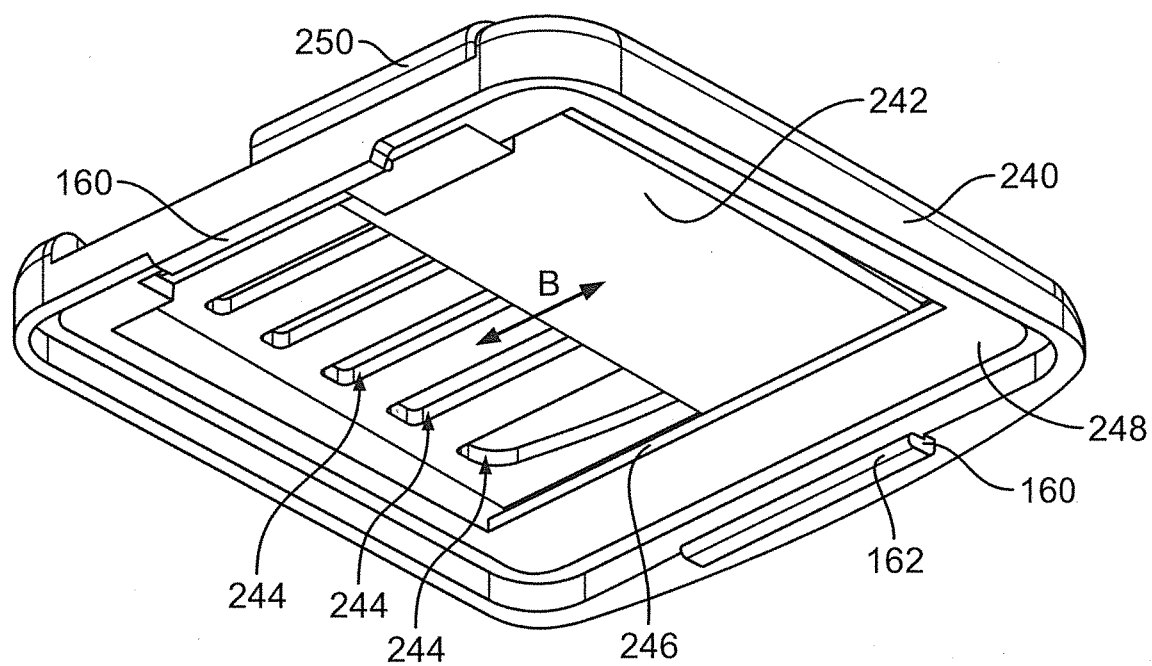


FIG. 14A

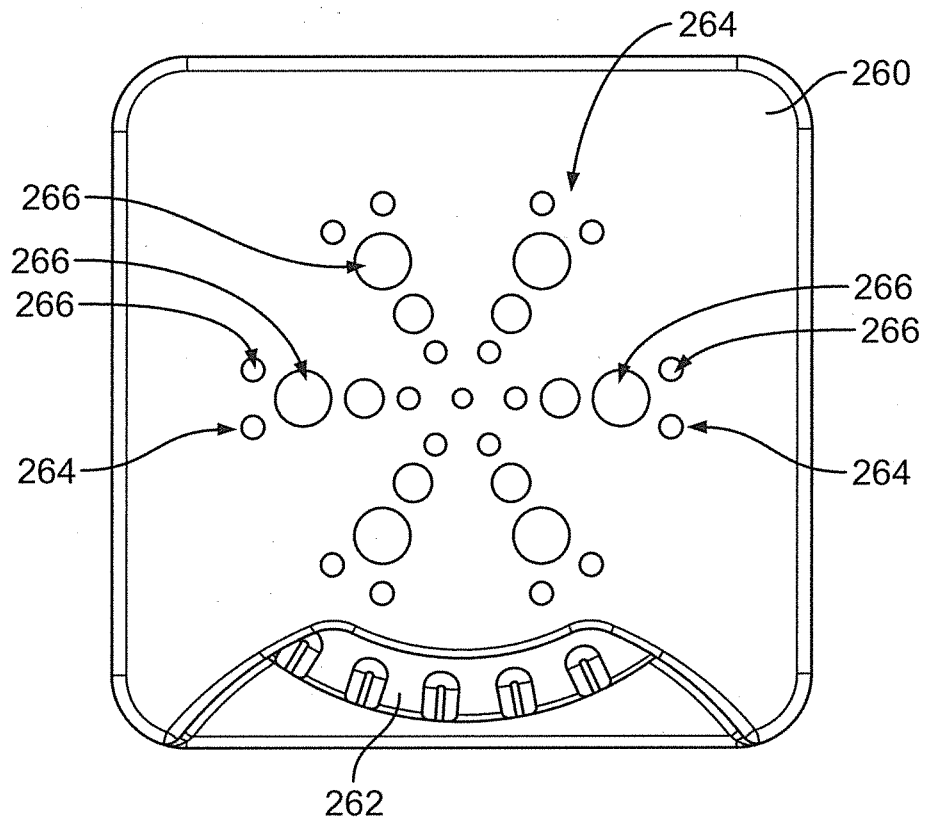


FIG. 15

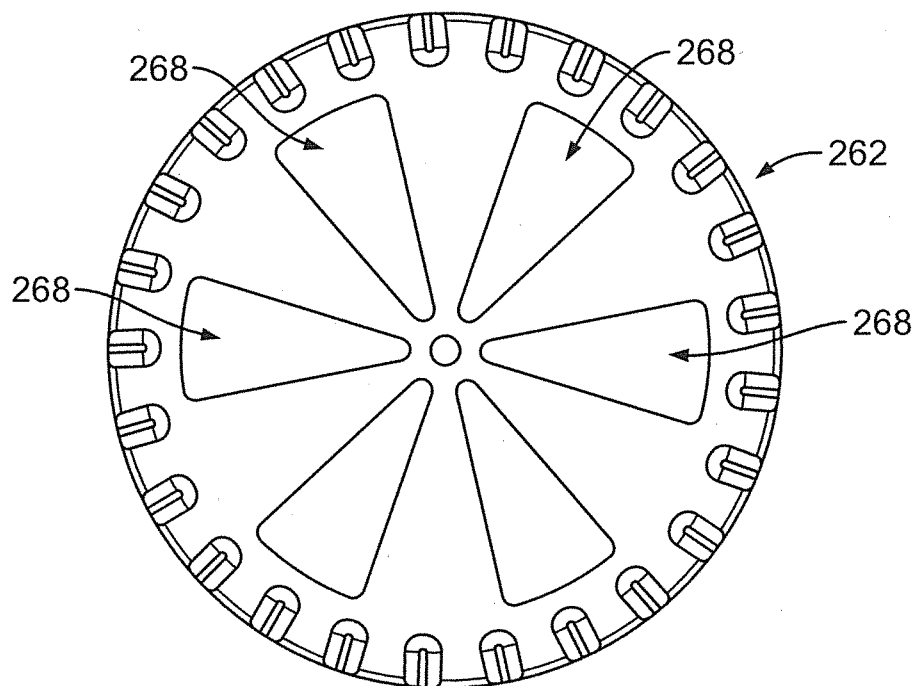


FIG. 15A

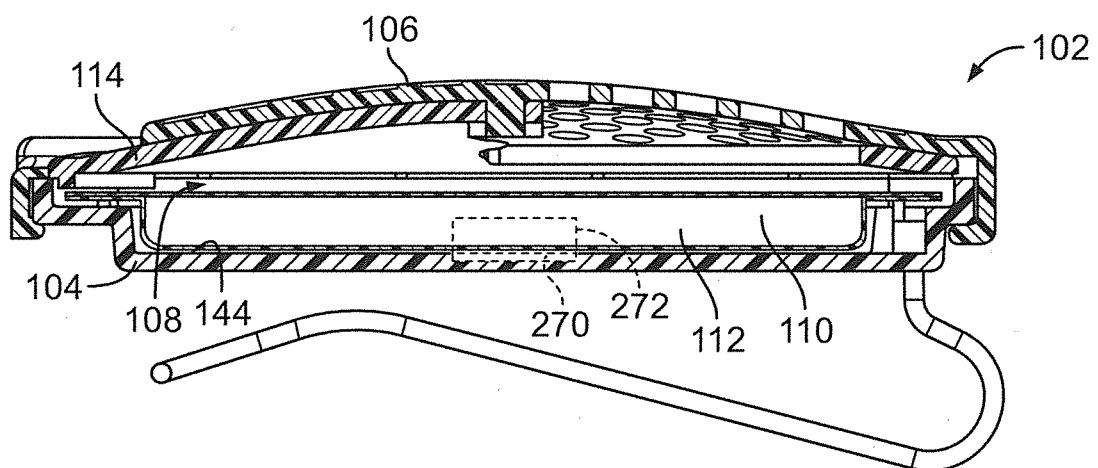


FIG. 16

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2013/071865

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A61L9/12 A47G1/06
 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)

A61L A47G

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	US 5 240 487 A (KUNG KIRK [CA]) 31 August 1993 (1993-08-31) column 5, line 43; figure 4 -----	1-7
X	US 5 361 522 A (GREEN DENNIS E [US]) 8 November 1994 (1994-11-08) claim 1; figure 7 -----	1-7
X, P	WO 2013/012442 AI (GAMMON FREDERICK A [US]; KOULERMOS MICHAEL [US]; ZEMBR0DT ANTHONY R [U] 24 January 2013 (2013-01-24) figure 5 -----	1-7
X	US 4 944 455 A (HAUST WILHELM M H [CA] ET AL) 31 July 1990 (1990-07-31) figures 3-6 ----- -/--	1-7



Further documents are listed in the continuation of Box C.



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

25 March 2014

Date of mailing of the international search report

01/04/2014

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
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 Fax: (+31-70) 340-3016

Authorized officer

Fi scher, Mi chael

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/071865

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. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

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:

see additional sheet

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

International application No
PCT/US2013/071865

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 23 22 717 AI (KELLNER FRI EDRICH) 13 December 1973 (1973-12-13) page 6, paragraph 4; figures 1,5 -----	1
X	US 2012/153038 AI (WILLERT BRYAN BRUCE [US]) 21 June 2012 (2012-06-21) paragraph [0022]; figure 2 abstract -----	8-10
X	EP 2 055 322 AI (ZÖBELE HOLDING SPA [IT]) 6 May 2009 (2009-05-06) paragraphs [0042], [0043] figure 11A68 abstract paragraph [0069] -----	8-20
X	WO 2006/004899 AI (JOHNSON & SON INC S C [US]; MARTENS EDWARD J III [US]; LEONARD STEPHEN) 12 January 2006 (2006-01-12) paragraph [0037]; figure 1 -----	8-10
X	WO 91/02549 AI (RECKITT & COLMANN PROD LTD [GB]) 7 March 1991 (1991-03-07) page 6, paragraph 3; figure 5 page 10, lines 25-31 page 4, paragraph 2 -----	1-20
X	US 5 782 409 A (PAUL LEONARD [US]) 21 July 1998 (1998-07-21) abstract; figures 12, 13 -----	8-10
E	WO 2014/014920 A2 (TAKASAGO INTERNAT CORP USA [US]) 23 January 2014 (2014-01-23) figure 5 -----	8-10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/071865

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5240487	A	31-08-1993	NONE
US 5361522	A	08-11 -1994	NONE
Wo 2013012442	AI	24-01 -2013	US 2012018529 AI 26-01 -2012 Wo 2013012442 AI 24-01 -2013
US 4944455	A	31-07 -1990	NONE
DE 2322717	AI	13-12 -1973	CH 560143 A5 27-03 -1975 DE 2322717 AI 13-12 -1973 DE 7316936 U 08-11 -1973 IT 955749 B 29-09 -1973
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/071865

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5782409	A	21-07-1998	NONE
Wo 2014014920	A2	23-01-2014	EP 2687237 A2 22-01-2014
			US 2014048614 A1 20-02-2014
			Wo 2014014920 A2 23-01-2014

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7

A dispenser, comprising:
 a base including a plurality of ribs for supporting a peripheral flange of a cartridge having a volatile material containing reservoir; and
 a first removable cover attached to the base having at least one aperture and a first regulating plate, wherein the first cover may be removed and replaced by at least a second cover having at least one aperture and a second, different regulating plate.

2. claims: 8-10

A method of replacing a refill cartridge for a dispenser, comprising the steps of:
 removing an impermeable laminate from a cartridge to expose a permeable membrane extending over a reservoir containing a volatile material, wherein the cartridge includes a peripheral flange and is indicated as being usable with a particular dispenser; and
 inserting the cartridge within the dispenser having a portion that exerts a force upon a bottom of the reservoir to deflect same inwardly.

3. claims: 11-20

A dispenser, comprising:
 a base holding a cartridge having a permeable membrane; and
 a cover attached to the base having at least one aperture and a first regulating plate,
 wherein a distance H, which is a line that is perpendicular to a plane defined by the permeable membrane and is measured between an inner surface of the most distal portion of the regulating plate and the plane defined by the permeable membrane, is between about 0.25 mm to about 10 mm.
