(19) DANMARK

(10) DK/EP 3504128 T3

(12) Oversættelse af europæisk patentskrift

Patent- og Varemærkestyrelsen

(51) Int.Cl.: *B 65 D 41/00 (2006.01)* *B 65 D 41/04 (2006.01)* *B 65 D 41/10 (2006.01)* *B 65 D 41/16 (2006.01)* *B 65 D 41/30 (2006.01)* *B 65 D 41/60 (2006.01)* *B 65 D 47/08 (2006.01)* *B 65 D 50/04 (2006.01)*

(45) Oversættelsen bekendtgjort den: **2021-12-13**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2021-10-20**

(86) Europæisk ansøgning nr.: **17844386.7**

(86) Europæisk indleveringsdag: **2017-08-24**

(87) Den europæiske ansøgnings publiceringsdag: **2019-07-03**

(86) International ansøgning nr.: **US2017048336**

(87) Internationalt publikationsnr.: **WO2018039413**

(30) Prioritet: **2016-08-24 IN 201611028842**

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

(73) Patenthaver: **GlaxoSmithKline Consumer Healthcare Holdings (US) LLC, 251 Little Falls Drive, Wilmington, DE 19808, USA**

(72) Opfinder: **SABHERWAL, Amit, 184 Liberty Corner Road, Waren, NJ 07059, USA**

(74) Fuldmægtig i Danmark: **Zacco Denmark A/S, Arne Jacobsens Allé 15, 2300 København S, Danmark**

(54) Benævnelse: **Låsbart lukke- og beholdersystem**

(56) Fremdragne publikationer:
EP-A1- 0 773 172
WO-A2-2012/050949
DE-U1-202013 001 751
US-A- 3 295 726
US-A- 4 790 442
US-A- 5 427 260
US-A1- 2016 009 463

DESCRIPTION

TECHNOLOGY FIELD

[0001] Aspects of the present invention are directed to a child-resistant closure and, in particular, a child-resistant closure that is more easily manipulated by adults with manual dexterity issues.

BACKGROUND

[0002] Child-resistant closures designed to prevent children from ingesting potentially dangerous substances are a priority to companies selling products that may be dangerous to children if ingested without adult supervision. This is particularly true for pharmaceutical and consumer healthcare companies. Current statistics show that almost a third of reported pediatric exposures to toxic substances were due to inadvertent drug ingestion. Further, over seventy percent of resulting pediatric fatalities are due to unintended exposure to dangerous substances.

[0003] Thus, child-resistant packaging has been an area of significant research over the past several decades. Known child-resistant closures include apparatuses that require the user to: line up indicators on the cap with the bottle, push down the cap while turning, squeeze the sides of the cap, squeeze the tabs and then turn the cap, or push the tab while lifting the lid. These types of closures meet the standard of being child-resistive, and they are effective at reducing the risk of inadvertent pediatric drug exposure. However, child-resistant closures can be problematic for adults with manual dexterity issues.

[0004] Consumers with arthritis and people with disabilities have a higher per capita rate of consumption of both OTC and prescription drugs. Opening medicine bottles with child-resistant closures may cause painful strain on the intercarpal joints of users with arthritis and similar conditions. Difficulty opening child-resistant closures has been given as a reason for deviating from prescribed drug dosing regimens. Consequently, a child-resistant closure member that is easily manipulated by adults with manual dexterity issues would be highly desirable.

[0005] EP0773172A1 discloses a closure with a lockable lid, and DE202013001751U1 discloses a container with an integral lockable lid.

SUMMARY

[0006] Aspects of the present invention are directed to a child-proof closure comprising: a lid and a lid base. The lid base has an inner annular wall defining an opening, a base skirt

extending around at least a portion of the inner annular wall, and a moveable locking member having a bottom portion affixed to the lid base and a top portion with a lip extending above the annular wall for securing the lid to the lid base. The lid is in a closed position when the lid and lid base are mated and the moveable locking member lip is engaged with and above at least a portion of the lid. The top portion of the moveable locking member is displaceable outwardly away from the lid to disengage the lip from the lid thereby allowing the lid to be opened.

[0007] The lid may further comprise an inner lid wall and a lid skirt extending around at least a portion of the inner lid wall. The lid skirt may be mateable to the base skirt when the lid and lid base are in the closed position. In some embodiments, the lid and lid base are connected by a hinge. The inner lid wall may fit within the inner annular wall when the closure is in the closed position. In some embodiments, the inner annular wall and the inner lid wall form a seal. The seal may be a resealable seal. The seal may also me moisture-tight seal.

[0008] In certain embodiments, the lid base may be connected to a container. The lid base may be integrally connected to a container. In some embodiments, the cap of the present invention may further comprise a tamper-evident tab.

[0009] Additional aspects of the present invention comprise a child-proof container system comprising a lid and a container. The container has a distal end and a proximal end having an inner annular wall defining an opening, a base skirt extending around at least a portion of the inner annular wall, and a moveable locking member having a bottom portion affixed to the base skirt and a top portion with a lip extending above the annular wall for securing the lid to the container. The lid is in a closed position when the lid and container are mated and the moveable locking member lip is engaged with and above at least a portion of the lid. The top portion of the moveable locking member is displaceable outwardly away from the lid to disengage the lip from the lid thereby allowing the lid to be opened. The lid may further comprise an inner lid wall and a lid skirt extending around at least a portion of the inner lid wall. The lid skirt may be mateable to the base skirt when the lid and container are in the closed position. In certain embodiments, the lid and container are connected by a hinge. In some embodiments, the inner lid wall fits within the inner annular wall when the closure is in the closed position and may form a seal. The seal may be resealable. The seal may be moisture-tight. Systems of the present invention may further comprise a tamper evident tab.

BRIEF DESCRIPTION OF DRAWINGS

[0010]

FIG. 1 is a top perspective view of an embodiment of the present invention in the closed position;

FIG. 2 is a top perspective view of an embodiment of the present invention in the opened position;

FIG. 3 is a bottom perspective view of an embodiment of the present invention in the opened position;

FIG. 4 is a side view of an embodiment of the present invention in the closed position;

FIG. 5 is a side view of an embodiment of the present invention in the opened position;

FIG. 6 is a front view of an embodiment of the present invention in the closed position;

FIG. 7 is a top view of an embodiment of the present invention in the closed position;

FIG. 8 is a cross sectional front view of an embodiment of the present invention in the closed position;

FIG. 9 is a cross sectional side view of an embodiment of the present invention in the opened position;

FIG. 10 is a top perspective view of an alternative embodiment of the present invention in the closed position;

FIG. 11 is a top perspective view of an alternative embodiment of the present invention in the opened position;

FIG. 12 is a top perspective view of an alternative embodiment of the present invention in the closed position;

FIG. 13 is a top perspective view of an alternative embodiment of the present invention in the opened position; and

FIG. 14 is a top perspective view of an embodiment of the present invention in the closed position;

FIG. 15 is a top perspective view of an embodiment of the present invention in the opened position; and

FIG. 16 is a schematic of a method of using an embodiment of the present invention.

DETAILED DESCRIPTION

[0011] Aspects of the present invention are directed to a child-proof cap that is easier to open for adults than traditional child-resistant closures, yet remains resistant to opening by children. The child-proof cap may be opened in a pull-and-flip motion with a single hand. The cap may comprise a lid and a lid base. The lid base may have an inner annular wall defining an opening and a base skirt extending around at least a portion of the inner annular wall, and a flexible locking member. The flexible locking member may have a bottom portion affixed to the lid base

and a top portion with a lip extending above the inner annular wall for securing the lid to the lid base. When the lid is in a closed position the lid and lid base may be mated and the flexible locking member lip is engaged with and above at least a portion of the lid. To open the lid, the top portion of the flexible locking member is displaced outwardly away from the lid to disengage the flexible locking member lip from the lid, thereby allowing the lid to be opened.

[0012] Caps of the present invention may be suitable for opening with a single hand in a "pull-and-flip" motion. A user can pull on the moveable locking member with their thumb to disengage the flexible locking member lip from the lid and then push up or flip the lid with their thumb in a single motion.

[0013] Child-proof caps of the present invention may be connected to a container either integrally or non-integrally. If the cap is integrally connected to the container, the cap and the container may be formed of a blow-molded material or injection molded using methods known to one skilled in the art. Those non-integrally connected may be connected, for example, by screw on with external or internal thread or snap fit with annular ring. Preferably, the cap is permanently fixed to the interior wall of the container body after or before the container is filled, thereby rendering the container body and cap into a connected system. The cap may be permanently fixed to the container body by any suitable manner known in the art. For example, the cap and the container body may be sized so as to provide a friction fit for the cap. Alternatively the cap may be permanently attached via a mechanical snap. Although it is preferable to permanently fix the cap to the container body after the container is filled with product, it will be appreciated by those of skill in the art that such permanent fixture may not be necessary.

[0014] Additionally, the lid base may be integrally formed with the container and the lid is attached non-integrally, such as, for example, with a strap or a removable hinge. In other embodiments, the lid may not be attached to the container.

[0015] Caps of the present invention in combination with containers are suitable for storage of components that are dangerous to children if consumed without adult supervision. Exemplary contents include, for example, pharmaceutical medicines, consumer healthcare products, toxic material, caustic materials, among others.

[0016] Caps and containers of the present invention may typically be made of a polymer material that provides adequate protection for the product packaged in the container. The container and cap may be made from the same or different polymer material. Depending on the requirements of the pharmaceutical product, barrier materials such as polyvinyl chloride, polyethylene vinyl acetate, polyethylene, polypropylene, and poly vinylidene chloride may be used. In another embodiment, non-barrier materials may also be used. Non-barrier thermoplastic materials include polystyrene, polycarbonate, polyester terephthalate, polybutylene, metallocene catalyzed poiyolefins and poly maleic anhydride.In a particular embodiment, the material may be high-density polypropylene. In another embodiment, the material may be polyethylenevinylacetate.

[0017] In one embodiment, the container is moisture-tight and is resealable to maintain the moisture tight properties. As used herein, the term "resealable" means that the container can be opened/reopened and closed or reclosed a numerous amount of times (e.g. more than 5 times) and still retain its moisture-tight properties. As used herein, the term "moisture tight" means the moisture ingress of the container is less than about 1500 micrograms of water/day, determined by the following test method: (a) place approximately one gram of molecular sieve in the container and record the weight; (b) close the resealable mechanism; (c) place the sealed container in an environmental chamber at conditions of 80% relative humidity and 22°C (72°F); (d) after one day, weigh the container containing the molecular sieve; (e) after approximately two weeks, weigh the container; and (f) subtract the first day sample from the value obtained and divide by the number of days to calculate the moisture ingress of the container in units of micrograms of water/day.

[0018] In another embodiment, the container includes a desiccant. The desiccant may be entrained within the polymer material making up the container, or the desiccant may be coated along the interior surface of the container, or the desiccant may be included in a compartment either inside the container or on the interior portion of the cap.

[0019] Containers of the present invention may be of varied shapes and sizes.

[0020] FIGS. 1 to 9 show various views of a child-resistant cap of the present invention. FIG 1 shows an exemplary child-resistant cap in closed position. Cap 10 includes lid 100 and lid base 200. Lid 100 includes top 101, top rim 102, lid skirt 103, and inner lid wall 104. Top 100 is circular and is surrounded by top rim 102. Lid skirt 103 extends downward from top rim 102. Lid base 200 includes base skirt 201 and moveable locking member 202. Moveable locking member 202 is seamlessly connected to base skirt 201. Moveable locking member 202 extends upward to moveable member top 203. Moveable locking member top 203 includes lip 204. In the closed position, lid skirt 103 and base skirt 201 are mateable and lip 204 overlays a portion of top 101 to secure lid 100 to base 200.

[0021] FIG. 2 shows closure 10 in opened position. Lid 100 includes inner lid wall 104, attached to lid top 101 and is circular and interior to lid skirt 103. Lid base 200 further includes inner annular wall 205 interior to lid base skirt 201 and defines opening 400. Lid 100 and lid base 200 are connected by hinge 300.

[0022] FIG. 8 shows a cross section view of the closure 10 in closed position. In the closed position, inner lid wall 104 is positioned interior to inner annular wall 205 of base 200. In closed position, lid skirt 103 and base skirt 201 are mateable.

[0023] FIGS. 10-13 show various views of container systems of the present invention. FIGS. 10 and 11 show container system 20 with cap 10 in combination with container 500. In this embodiment, closure 10 and container 500 are non-intergrally connected.

[0024] FIG. 12 and 13 show container system 30 with closure 10 in combination with container 600. In this embodiment, cap 10 is integrally connected to container 600.

[0025] FIG. 14 and 15 shows an alternative enclosure embodiment having tamper evident tab 206 attached to base skirt 201. To open top 101, tamper evident tab 206 must be removed from base skirt 201. After removal of tamper evident tab 206, moveable locking member 202 can be displaced outwardly away from top 101 to disengage moveable locking member top 203 from top 101 and subsequently moving top 101 in an upward direction to open container.

[0026] FIG. 16A to FIG. 16E shows a method of opening, dispensing from, and closing a cap of the present invention. Tamper evident tab 206 is removed from cap 10 (FIG. 16A), moveable locking member 202 is moved so that moveable locking member top 203 is moved away from the top 101 and so that lip 204 is disengaged from top 101 (FIG. 16B). Top 101 is then moved in an upward direction about hinge 300 to allow access to opening 400 (FIG. 16C). Material can then be dispensed from opening (FIG. 16D) and cap 10 can then be reclosed (FIG. 16E).

REFERENCES CITED IN THE DESCRIPTION

Cited references

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP0773172A1 **[0005]**
- DE202013001751U1 **[0005]**

Patentkrav

1. Børnesikret hætte (10) omfattende:
et låg (100); og
en lågbase (200) med en indvendig ringformet væg (205), der definerer en åbning (400), et baseskørt (201), der strækker sig omkring mindst en del af den indvendige ringformede væg (205), og et bevægeligt låseelement (202) med en bunddel fastgjort til lågbasen (200) og en topdel (203) med en læbe (204), der strækker sig over den ringformede væg (205) til at fastgøre låget (100) til lågbasen (200);
hvor låget (100) er i en lukket position, når låget (100) og lågbasen (200) forenes, og den bevægelige låseelementlæbe (204) går i indgreb med og er over mindst en del af låget (100); og
topdelen (203) af det bevægelige låseelement (202) er forskydeligt udad væk fra låget (100) for at løsgøre læben (204) fra låget (100) og dermed gøre det muligt, at låget (100) kan åbnes.

2. Hætte (10) ifølge krav 1, hvor låget (100) endvidere omfatter en indvendig lågvæg (104) og et lågskørt (103), der strækker sig omkring mindst en del af den indvendige lågvæg (104).

3. Hætte (10) ifølge krav 2, hvor lågskørtet (103) er foreneligt med baseskørtet (201), når låget (100) og lågbasen (200) er i den lukkede position.

4. Hætte (10) ifølge krav 3, hvor låget (100) og lågbasen (200) er forbundet med et hængsel (300).

5. Hætte (10) ifølge krav 2, hvor den indvendige lågvæg (104) passer inden i den indvendige ringformede væg (205), når låget er i den lukkede position.

6. Hætte (10) ifølge krav 5, hvor den indvendige ringformede væg (205) og den indvendige lågvæg (104) danner en tætning.

7. Hætte (10) ifølge krav 5, hvor den indvendige ringformede væg (205) og den indvendige lågvæg (104) danner en udløselig tætning.

8. Hætte (10) ifølge krav 5, hvor den indvendige ringformede væg (205) og den indvendige lågvæg (104) danner en fugttæt tætning.

9. Hætte (10) ifølge krav 1, hvor lågbasen (200) er forbundet med en beholder (500).

10. Hætte (10) ifølge krav 6, hvor lågbasen (200) er integreret forbundet med en beholder (600).

11. Hætte (10) ifølge krav 1, yderligere omfattende en manipulationssikker tap (206).

12. Børnesikret beholdersystem (30), omfattende:
et låg (100); og
en beholder (600) med en distal ende og en proksimal ende med en indvendig ringformet væg (205), der definerer en åbning (400), et baseskørt (201), der strækker sig omkring mindst en del af den indvendige ringformede væg, og et bevægeligt låseelement (202) med en bunddel fastgjort til baseskørtet (201) og en topdel (203) med en læbe (204), der strækker sig over den ringformede væg (205) til at fastgøre låget (100) til beholderen (600);
hvor låget (100) er i en lukket position, når låget (100) og beholderen (600) forenes, og den bevægelige låseelementlæbe (204) går i indgreb med og er over mindst en del af låget (100); og
topdelen (203) af det bevægelige låseelement (202) er forskydeligt udad væk fra låget (100) for at løsgøre læben (204) fra låget (100) og dermed gøre det muligt, at låget (100) kan åbnes.

13. System (30) ifølge krav 12, hvor låget (100) endvidere omfatter en indvendig lågvæg (104) og et lågskørt (103), der strækker sig omkring mindst en del af den indvendige lågvæg (104).

14. System ifølge krav 13, hvor lågskørtet (103) er foreneligt med baseskørtet (201), når låget (100) og beholderen (600) er i den lukkede position.

15. System ifølge krav 12, hvor låget (100) og beholderen (600) er forbundet med et hængsel (300).

16. System ifølge krav 13, hvor den indvendige lågvæg (104) passer inden i den indvendige ringformede væg (205), når låget er i den lukkede position.

17. System ifølge krav 16, hvor den indvendige ringformede væg (205) og den indvendige lågvæg (104) danner en tætning.

18. System ifølge krav 16, hvor den indvendige ringformede væg (205) og den indvendige lågvæg (104) danner en udløselig tætning.

19. System ifølge krav 16, hvor den indvendige ringformede væg (205) og den indvendige lågvæg (104) danner en fugttæt tætning.

20. System ifølge krav 12, yderligere omfattende en manipulationssikker tap (206).

DRAWINGS

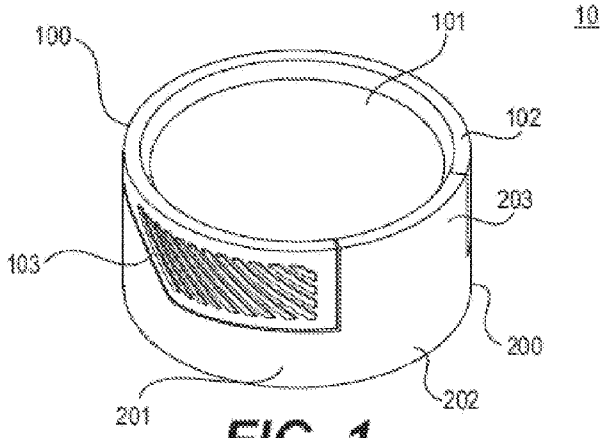


FIG. 1

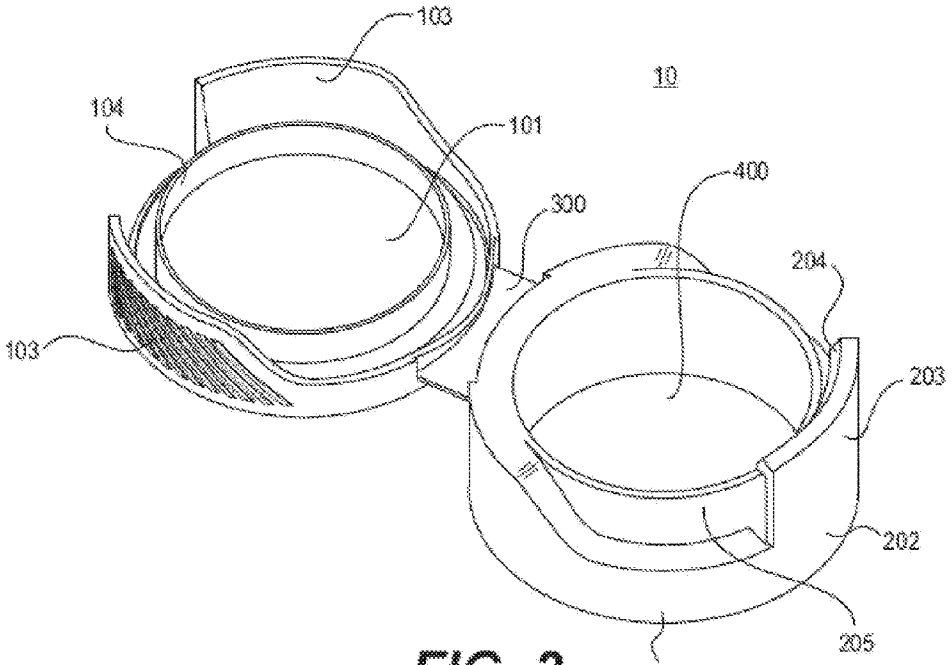


FIG. 2

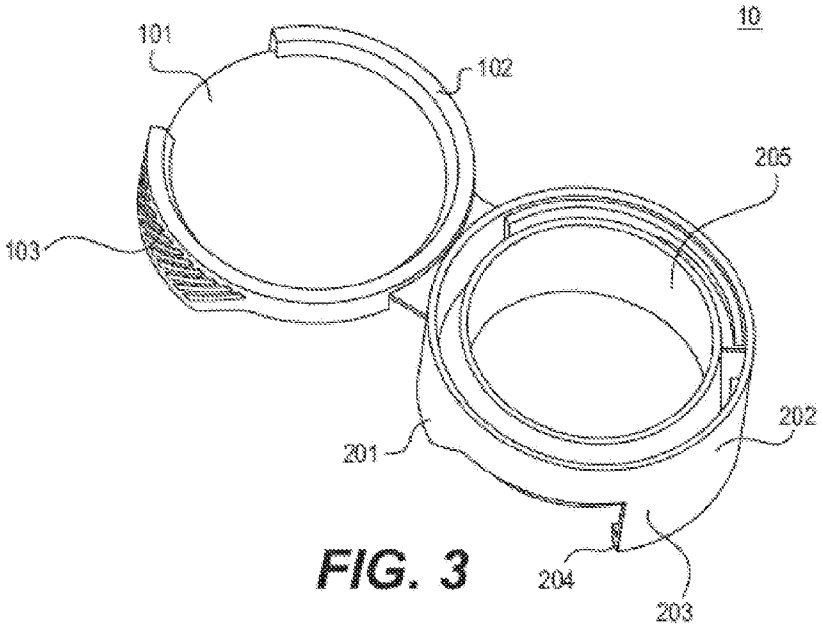


FIG. 3

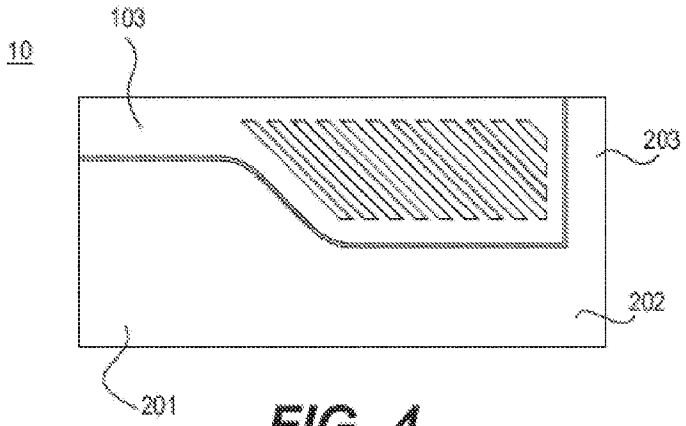


FIG. 4

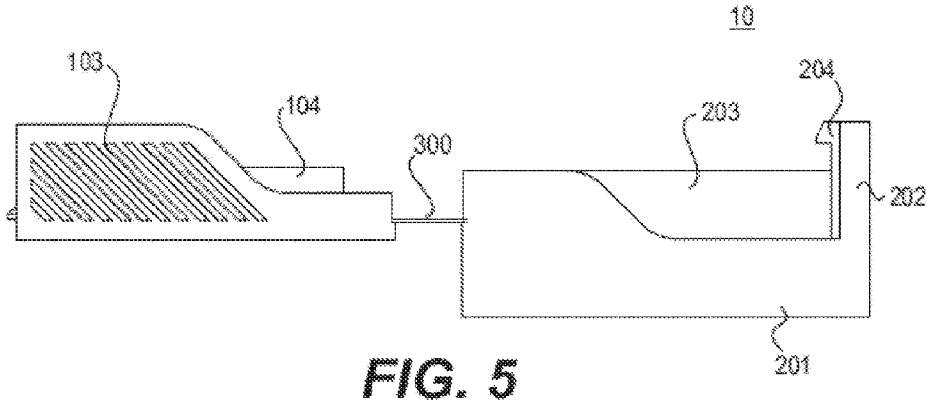


FIG. 5

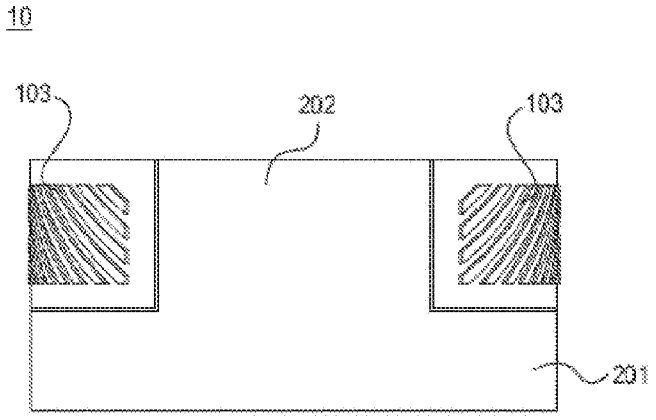


FIG. 6

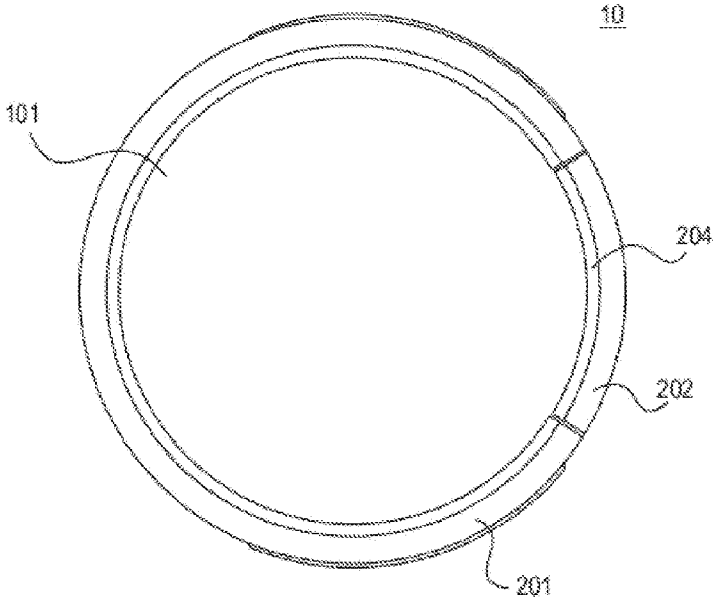


FIG. 7

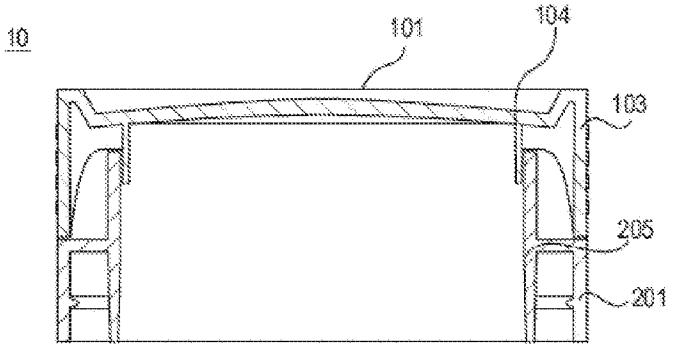


FIG. 8

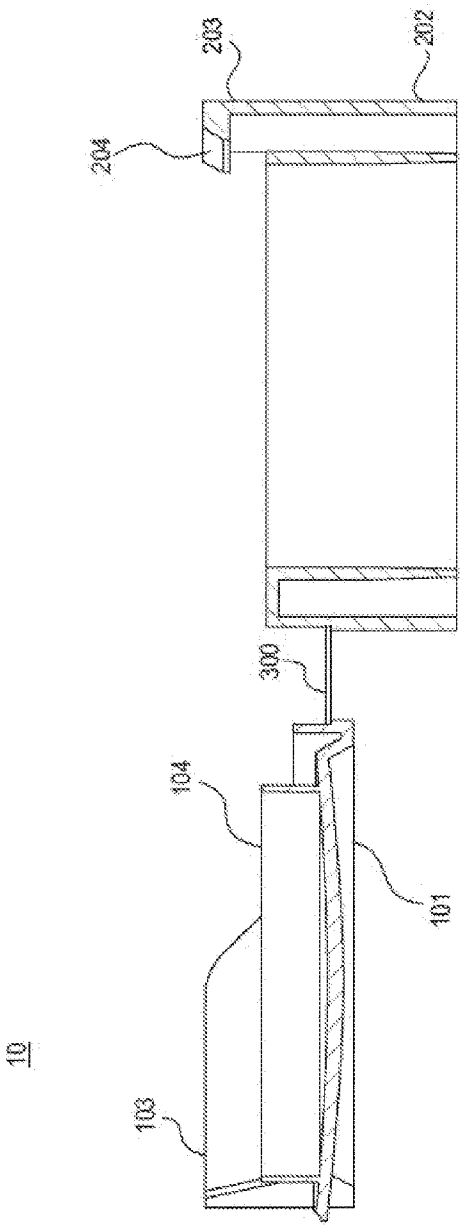


FIG. 9

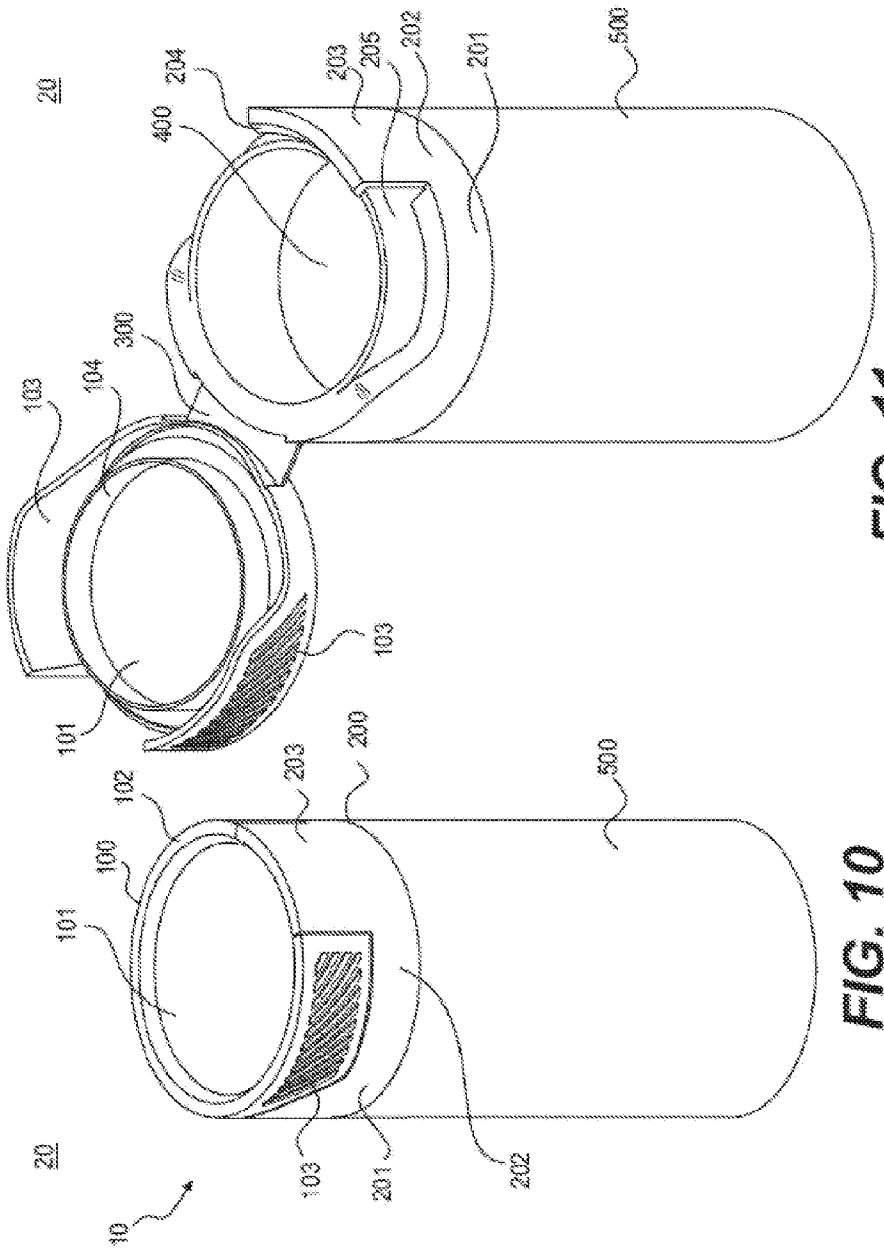
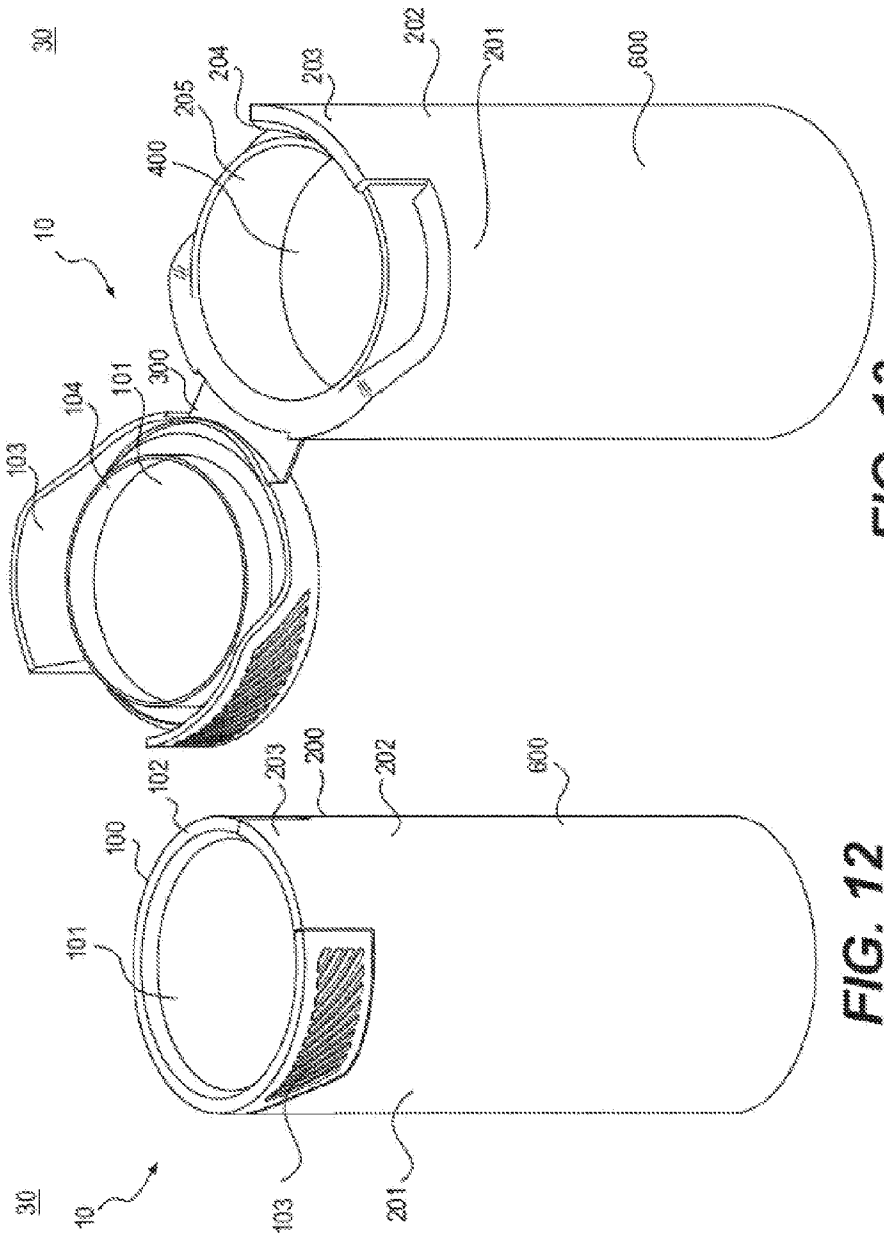

20
204
400
203
205
202
201
500
300
103
104
101
103
20
102
100
101
203
200
500
10
103
201
202

FIG. 11

FIG. 10


30
10
103
104
101
300
400
205
204
203
202
201
600
FIG. 13
30
10
102
100
101
103
200
203
202
201
600
FIG. 12

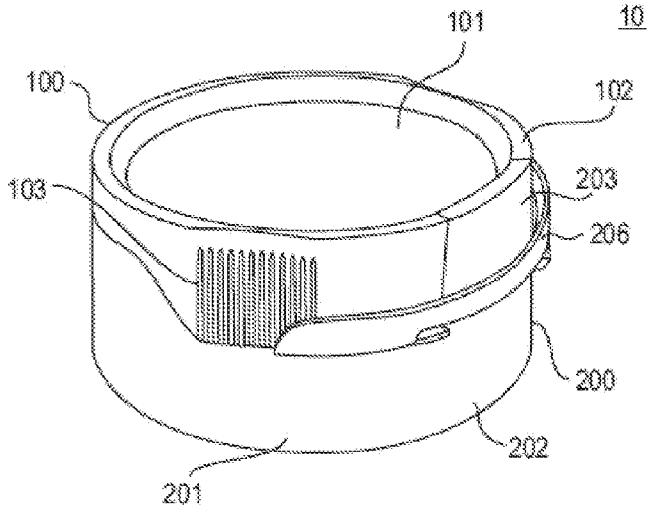

101
10
100
102
103
203
206
200
202
201

FIG. 14

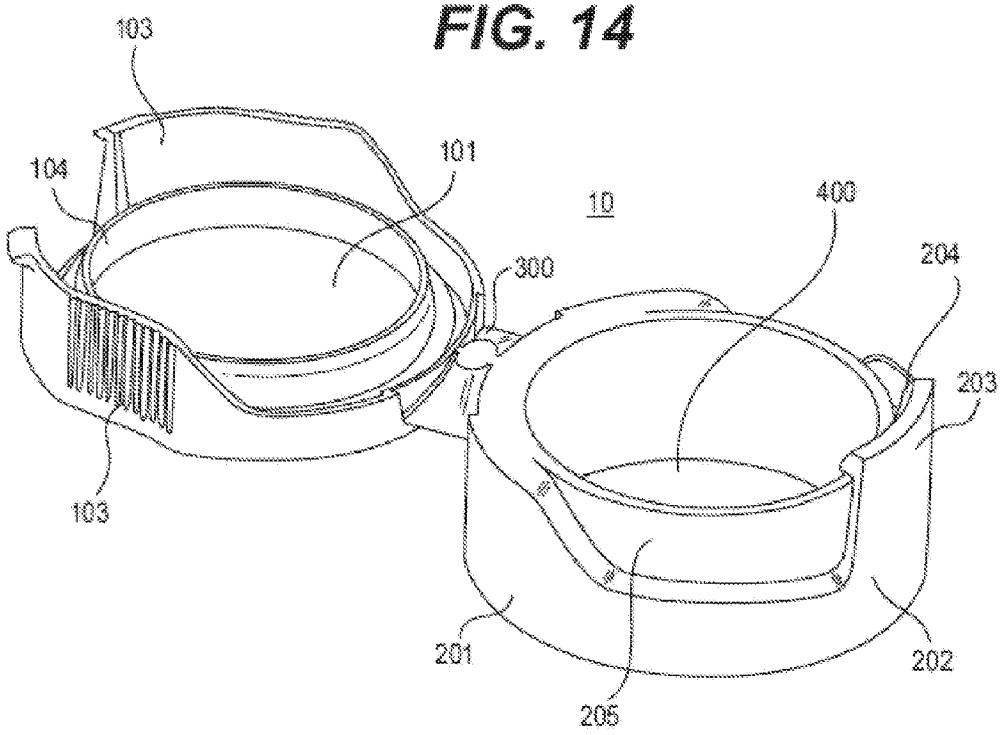

103
104
101
10
400
300
204
203
103
201
202
205

FIG. 15

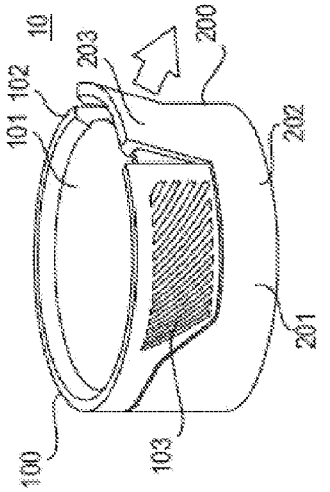


FIG. 16B

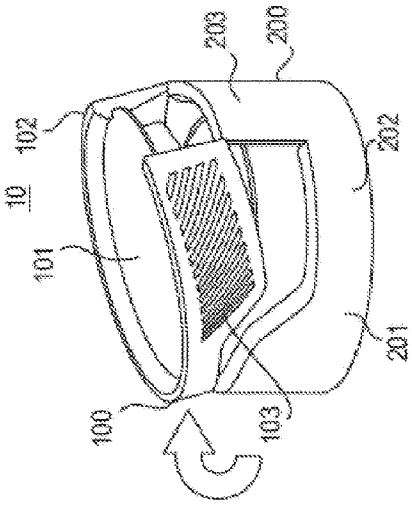


FIG. 16E

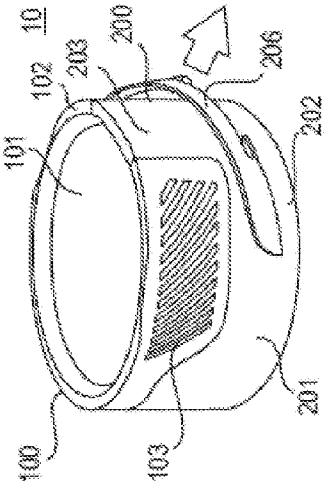


FIG. 16A

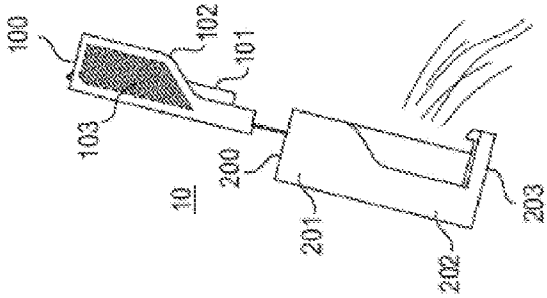


FIG. 16D

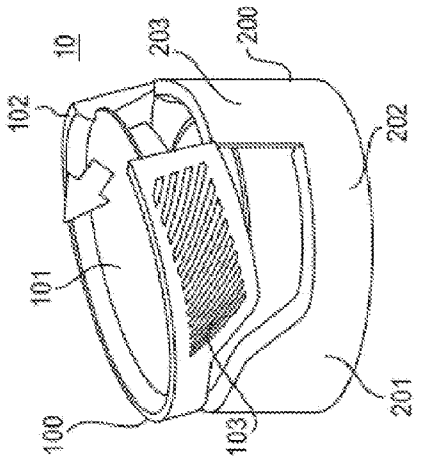


FIG. 16C