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(54) **PLASTIC PREFORM AND CONTAINER**

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(60) Provisional application No. 62/844,956, filed on May 8, 2019, provisional application No. 62/652,977, filed on Apr. 5, 2018.

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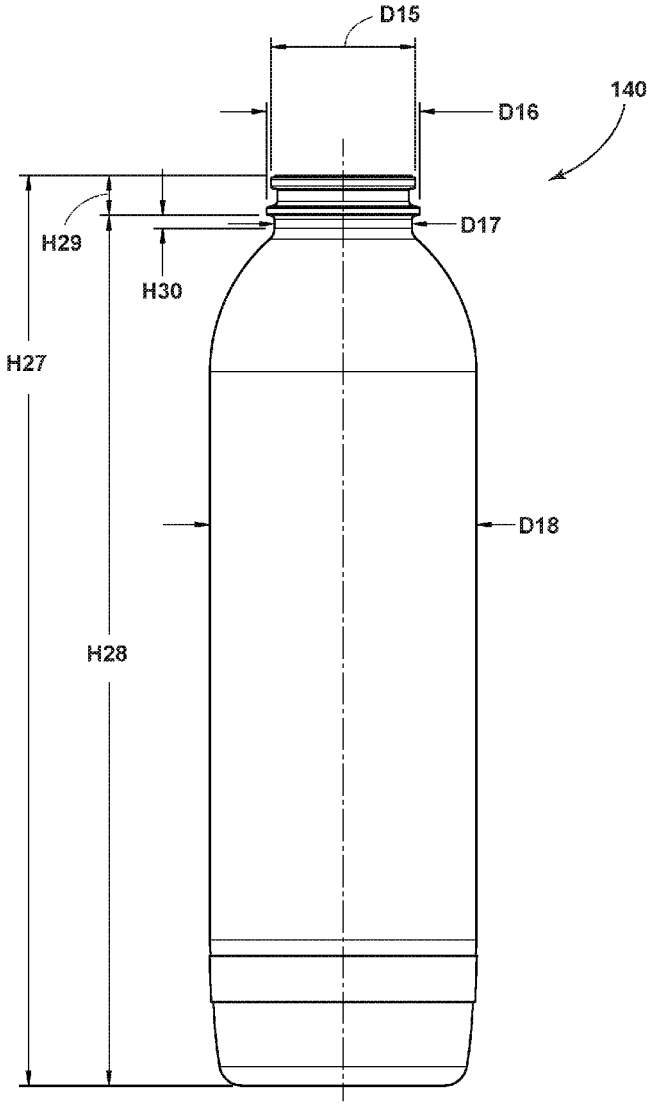
(57) **ABSTRACT**

A container assembly suitable for holding pressurized content includes a plastic container and a base cup. The plastic container may include a including a rounded base portion, and the base cup may be connected to the container and configured to support the plastic container. In embodiments the plastic container and the base cup are comprised of plastic, and may be comprised of substantially the same recyclable plastic material. In embodiments, the base cup may be thermoformed, and/or the container assembly may be comprised of 80% or more, by weight, of PET.



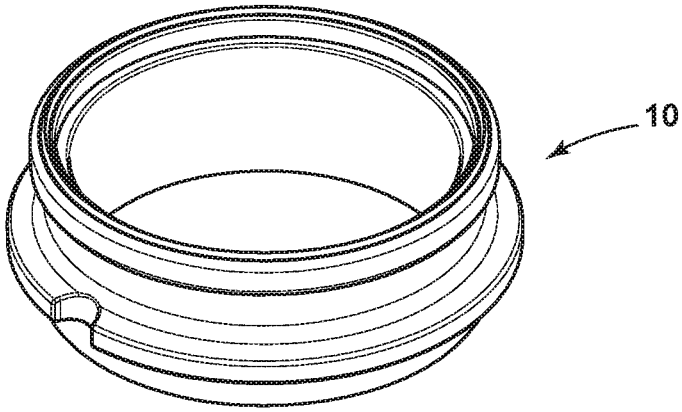


FIG. 1

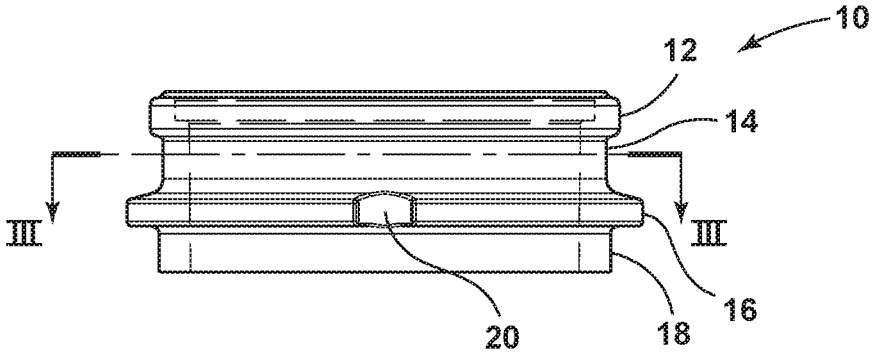


FIG. 2

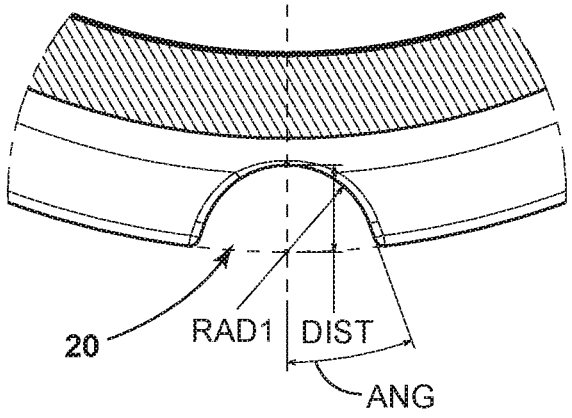


FIG. 3

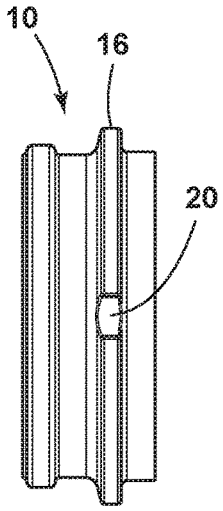


FIG. 4A

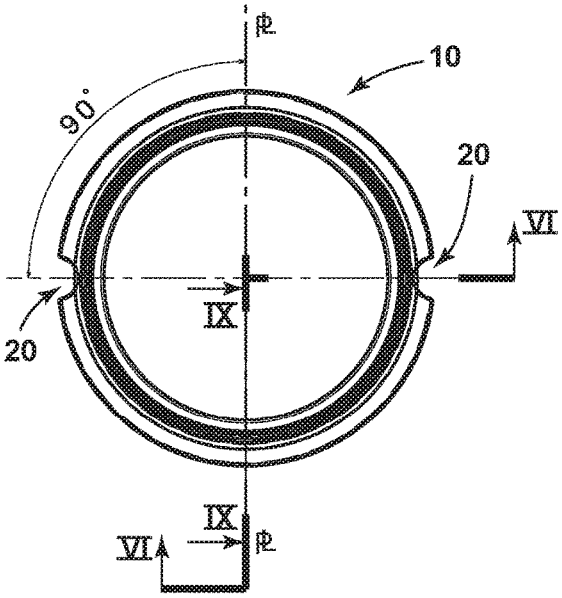


FIG. 5

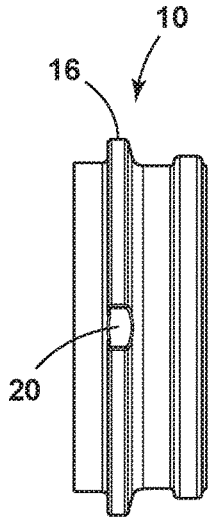


FIG. 4B

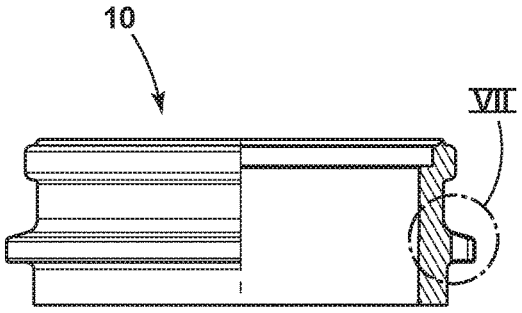


FIG. 6

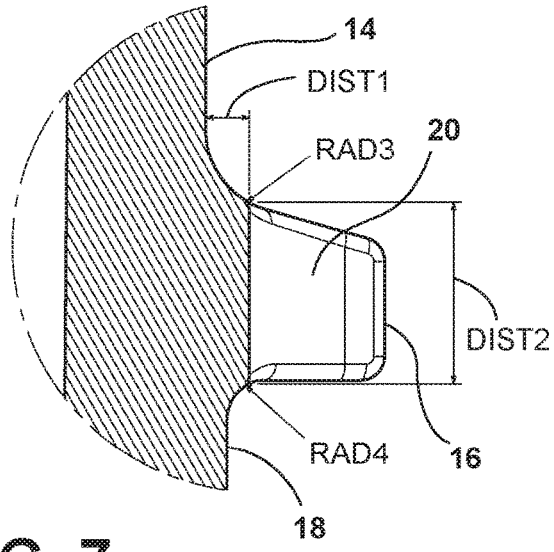


FIG. 7

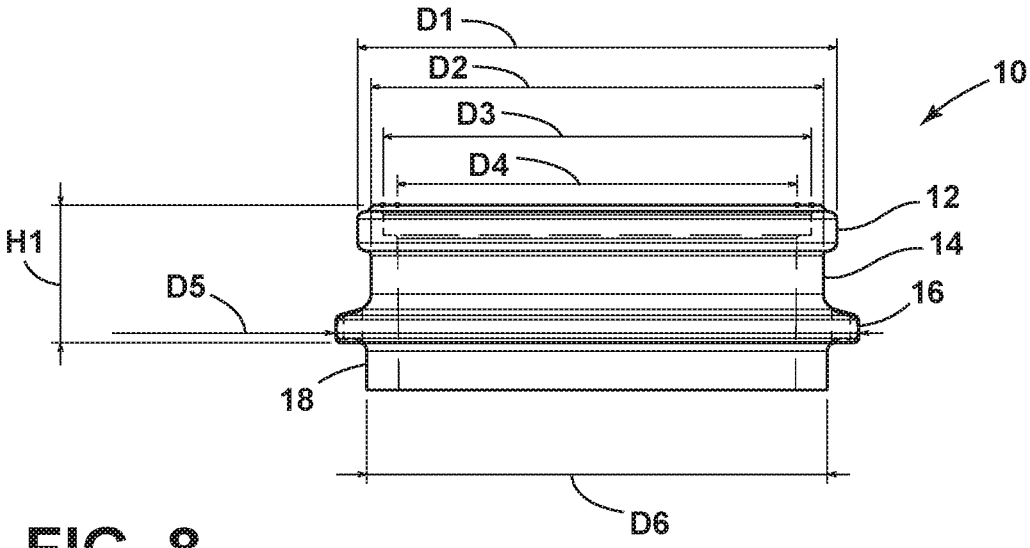

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FIG. 8

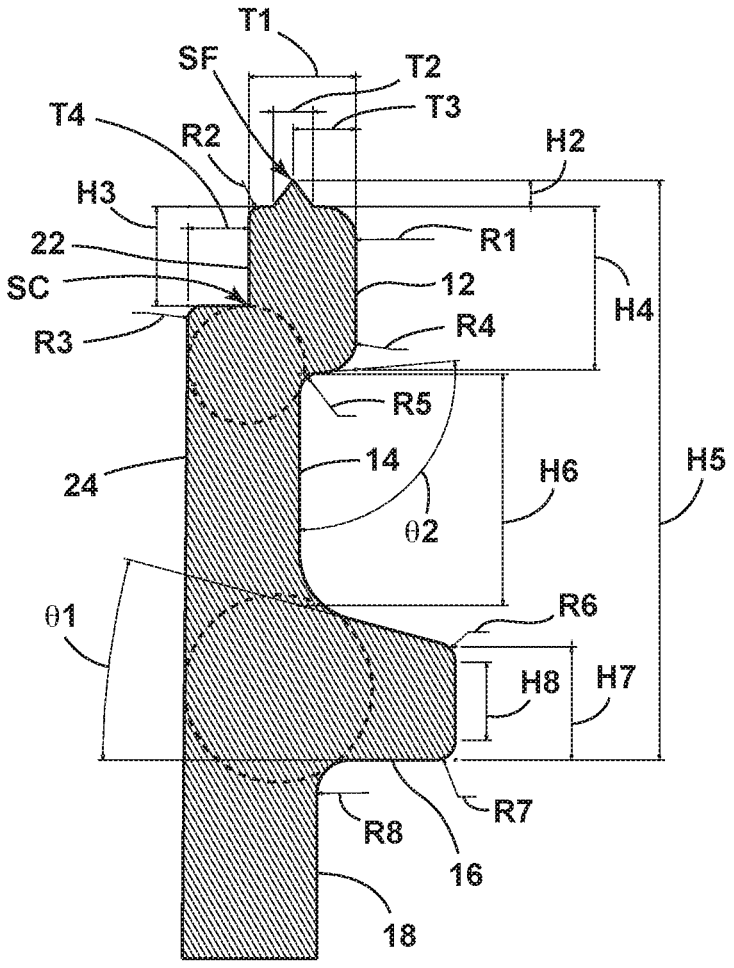
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FIG. 9

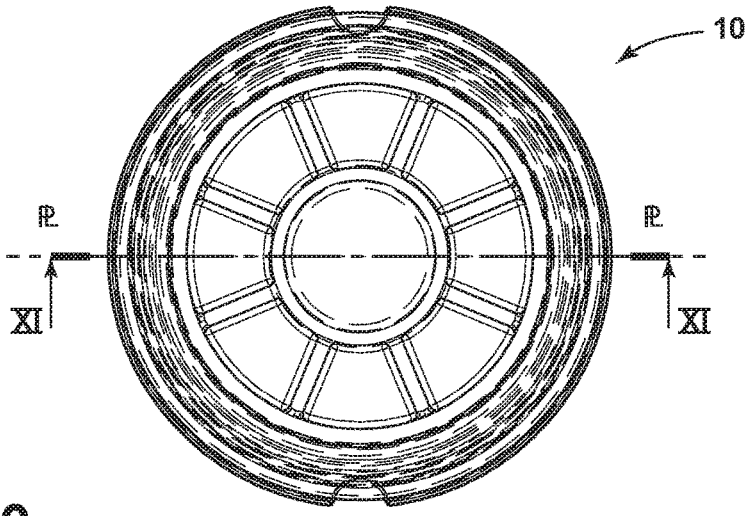

FIG. 10

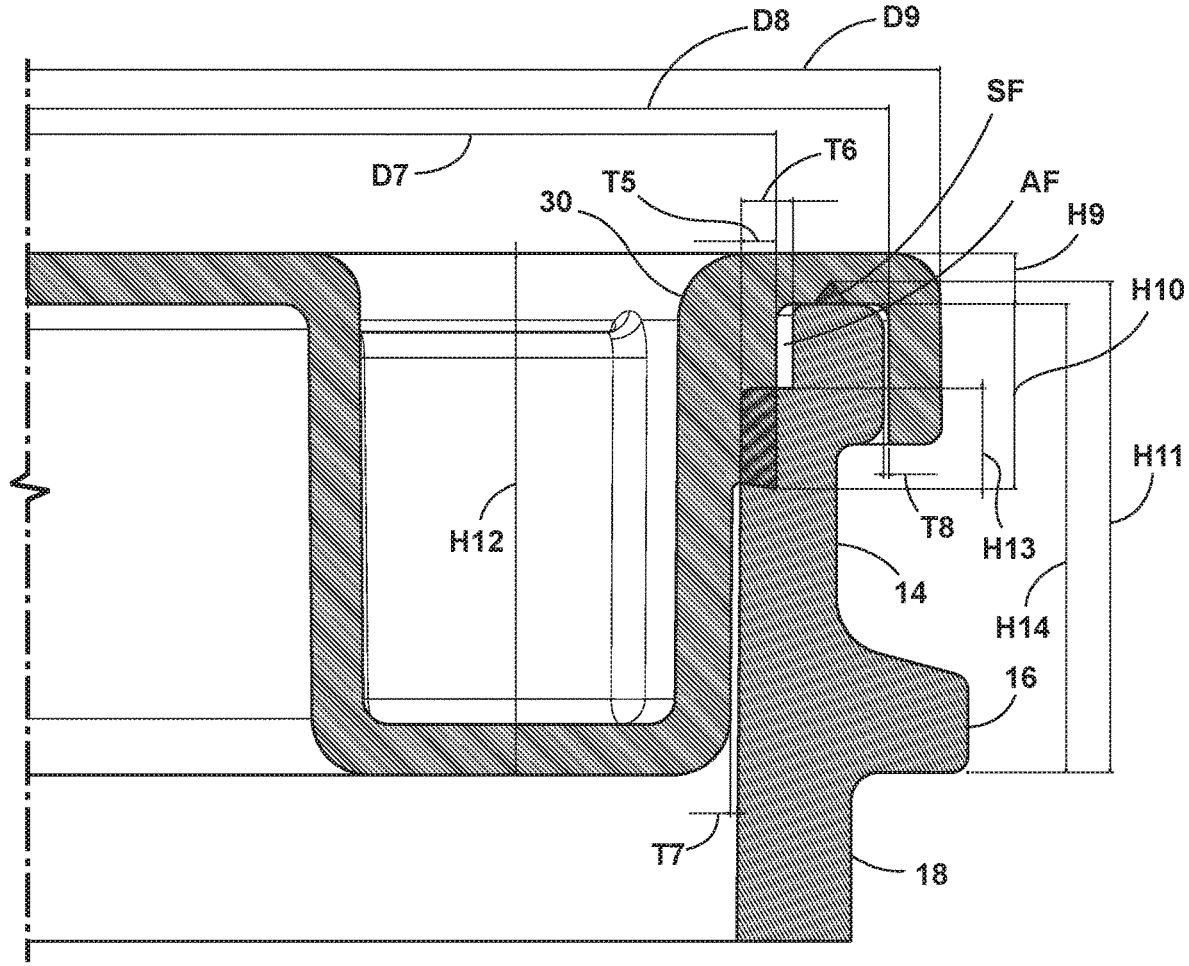

FIG. 11

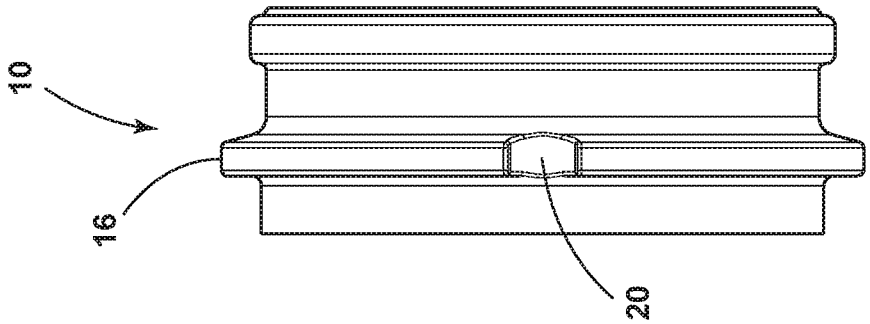

FIG. 12B

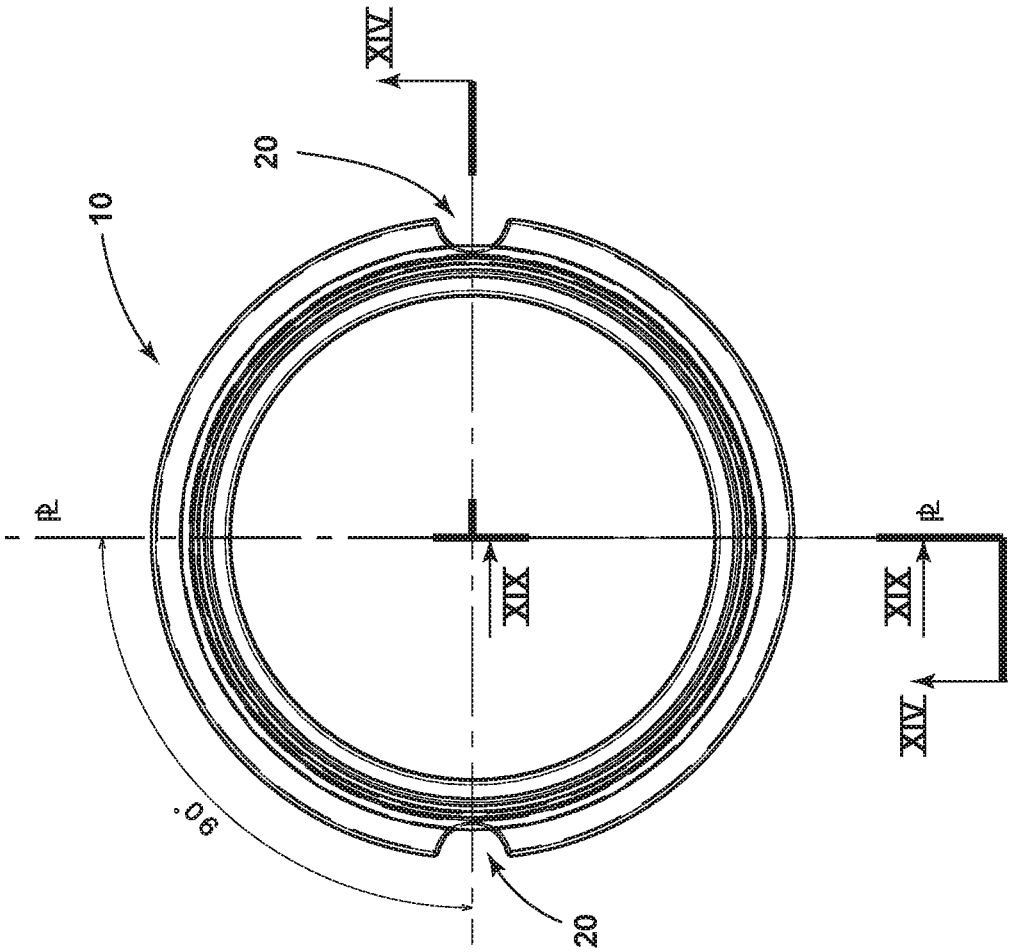

FIG. 12

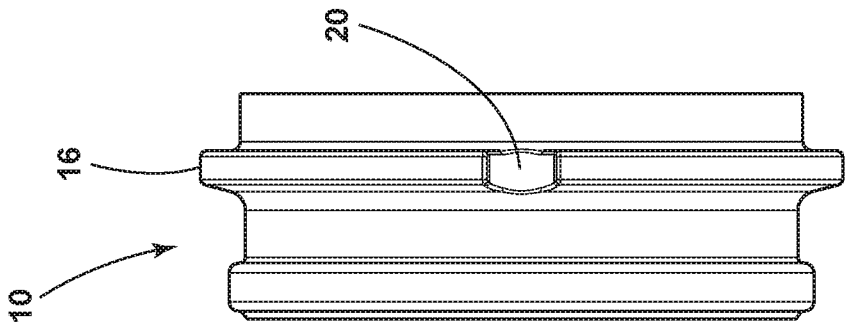

FIG. 12A

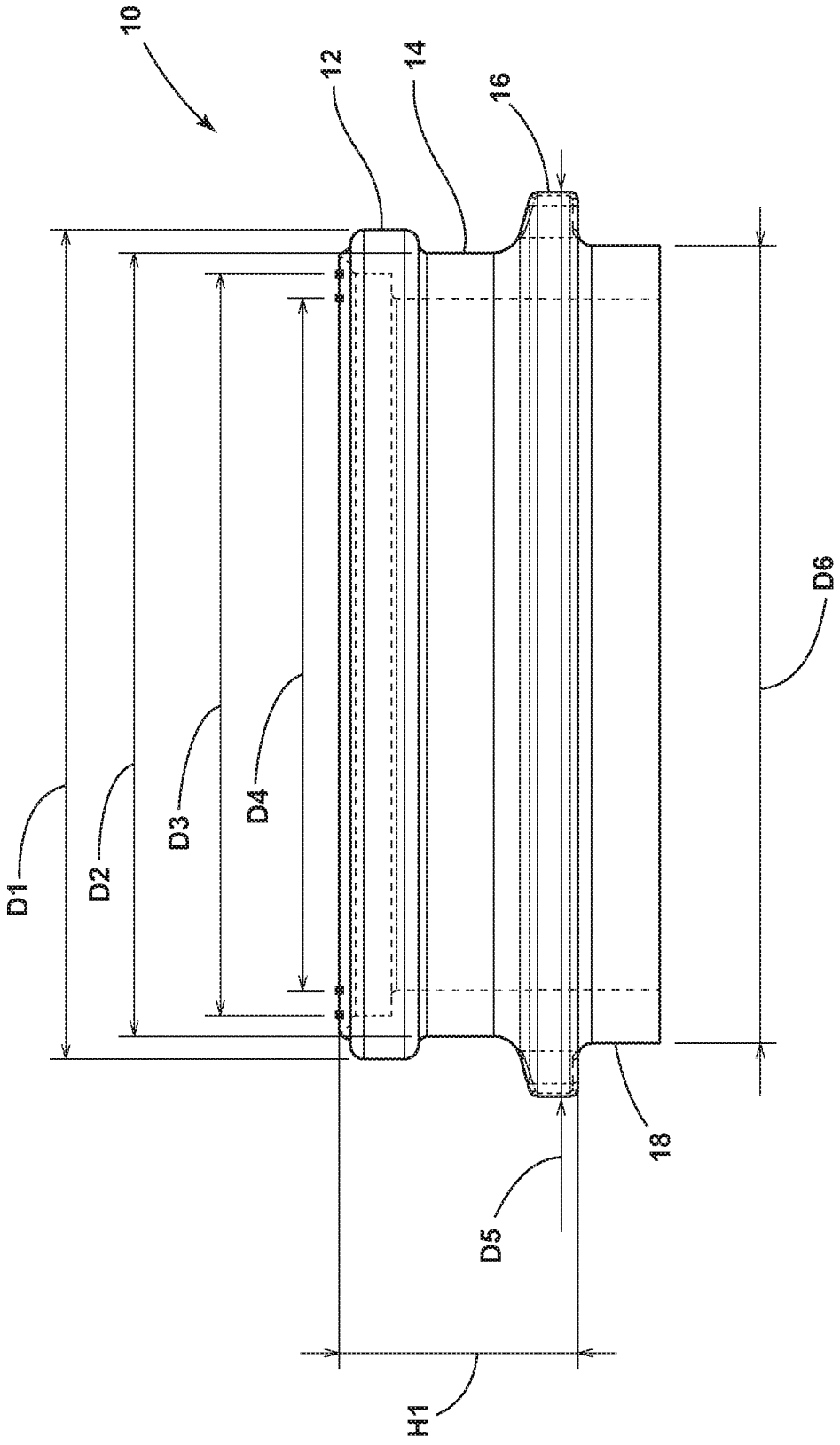

FIG. 13

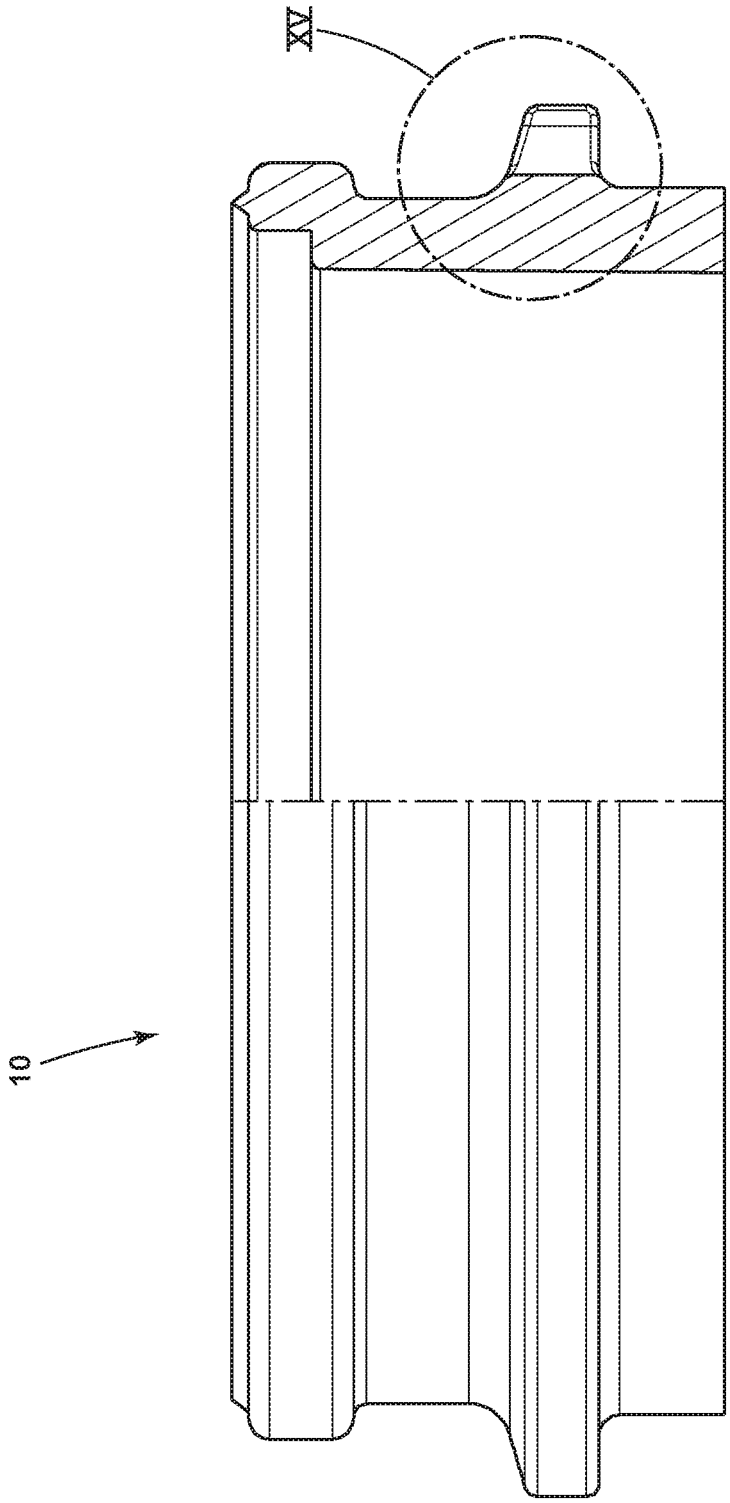

FIG. 14

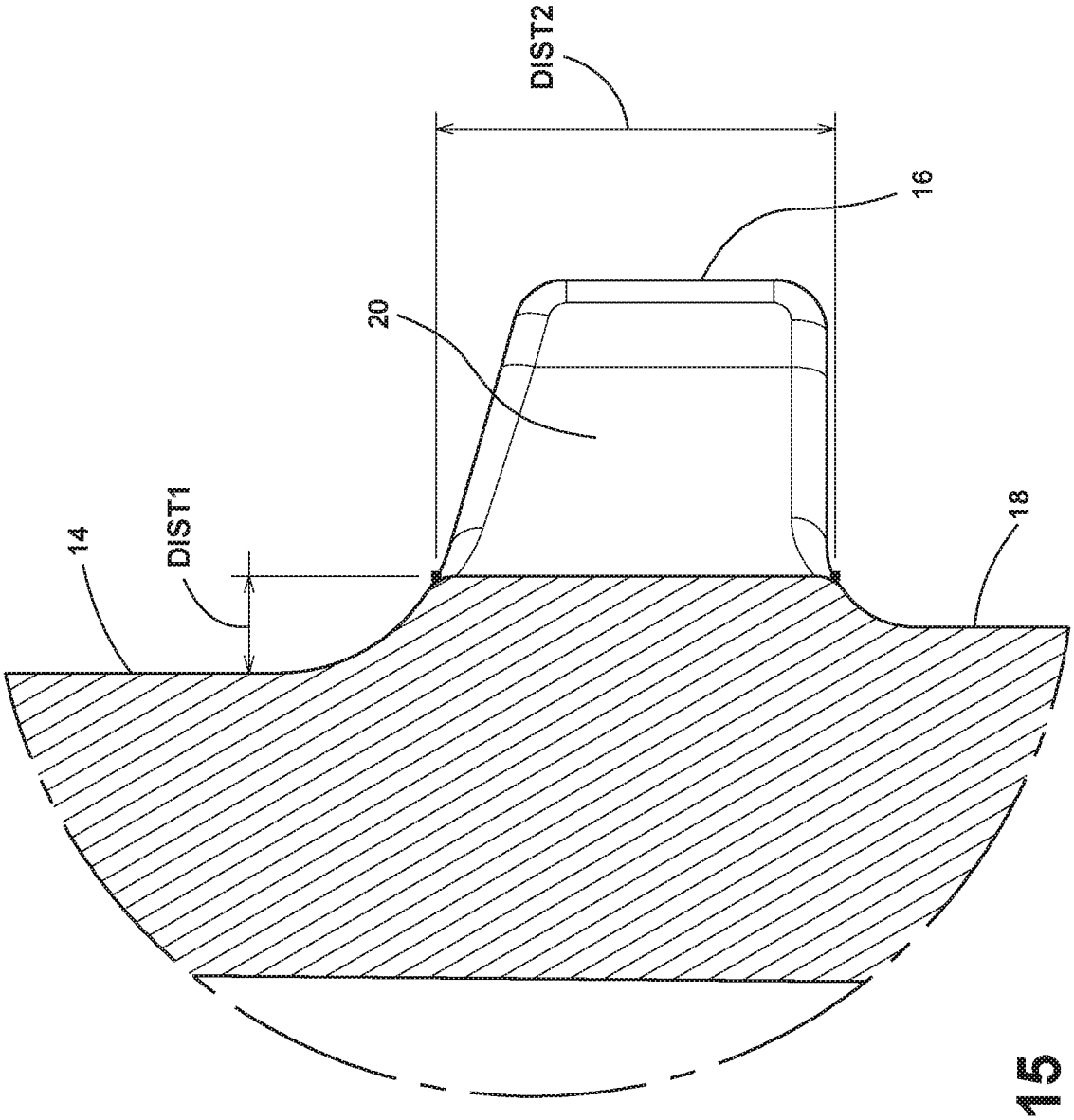

FIG. 15

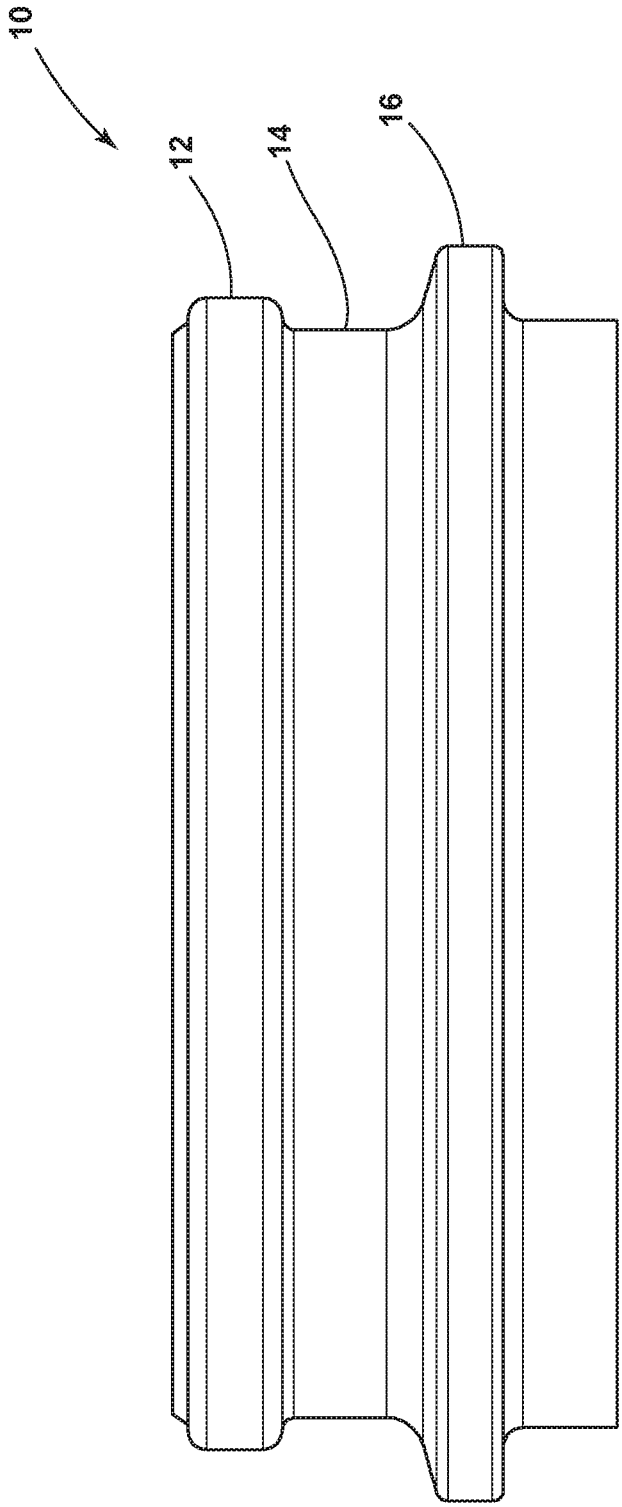

FIG. 16

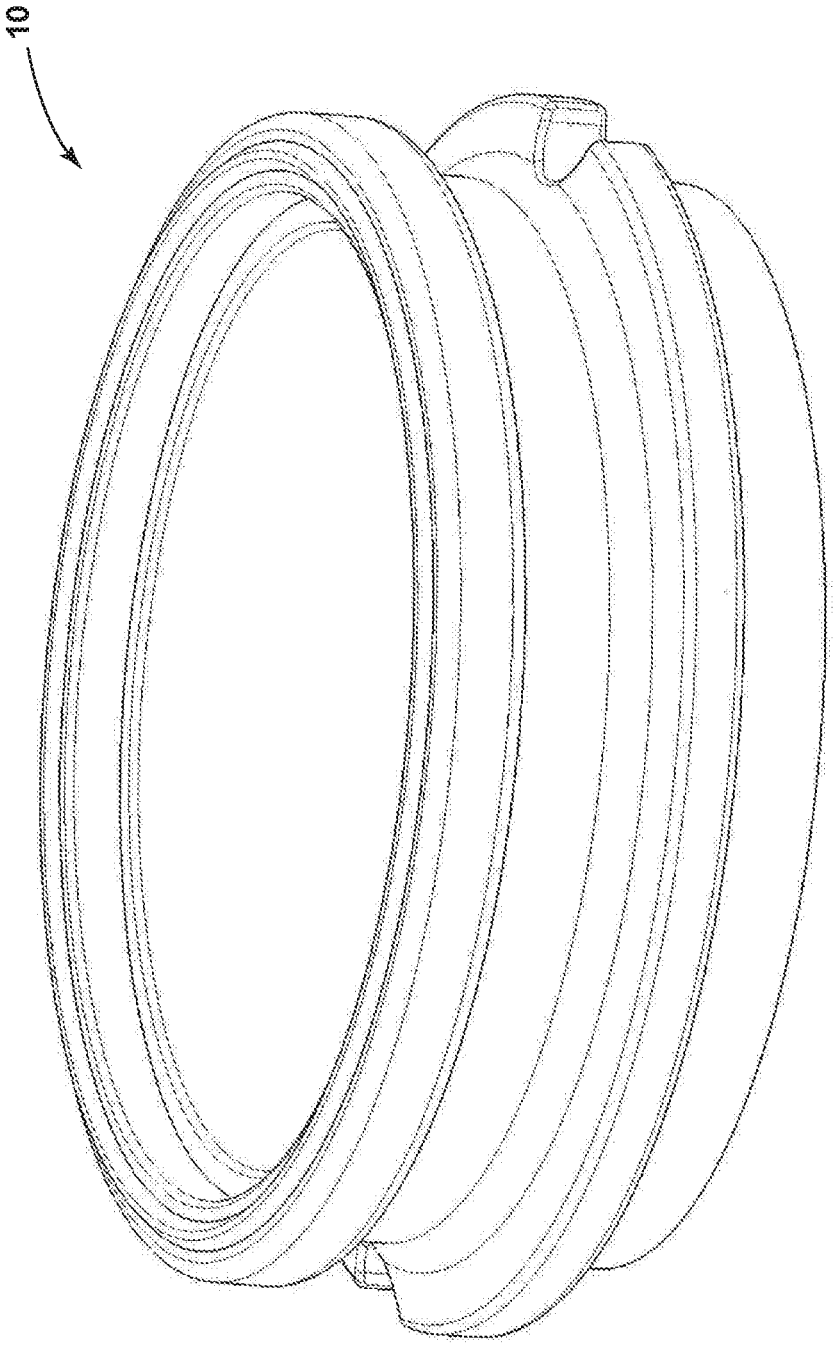

FIG. 17

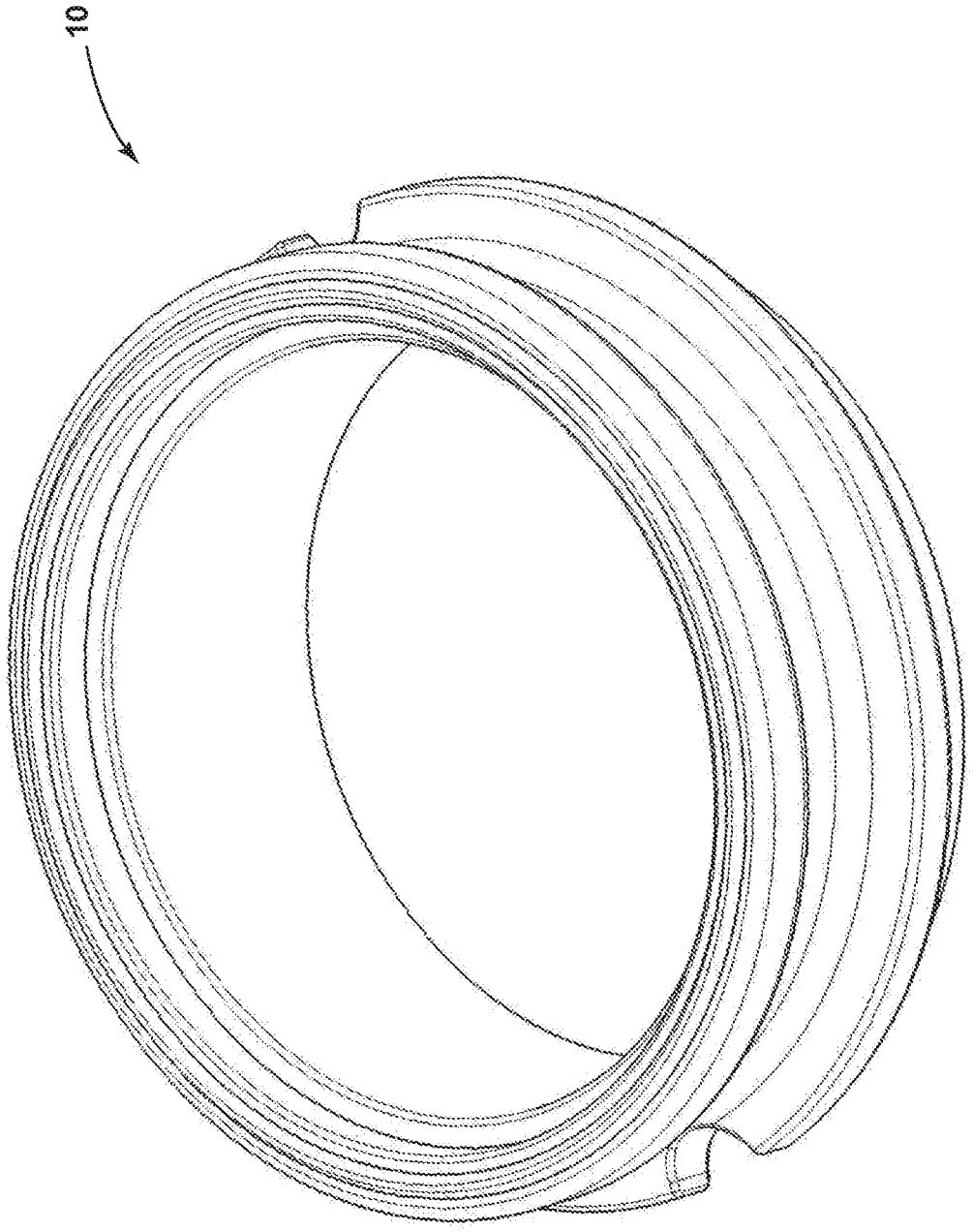

FIG. 18

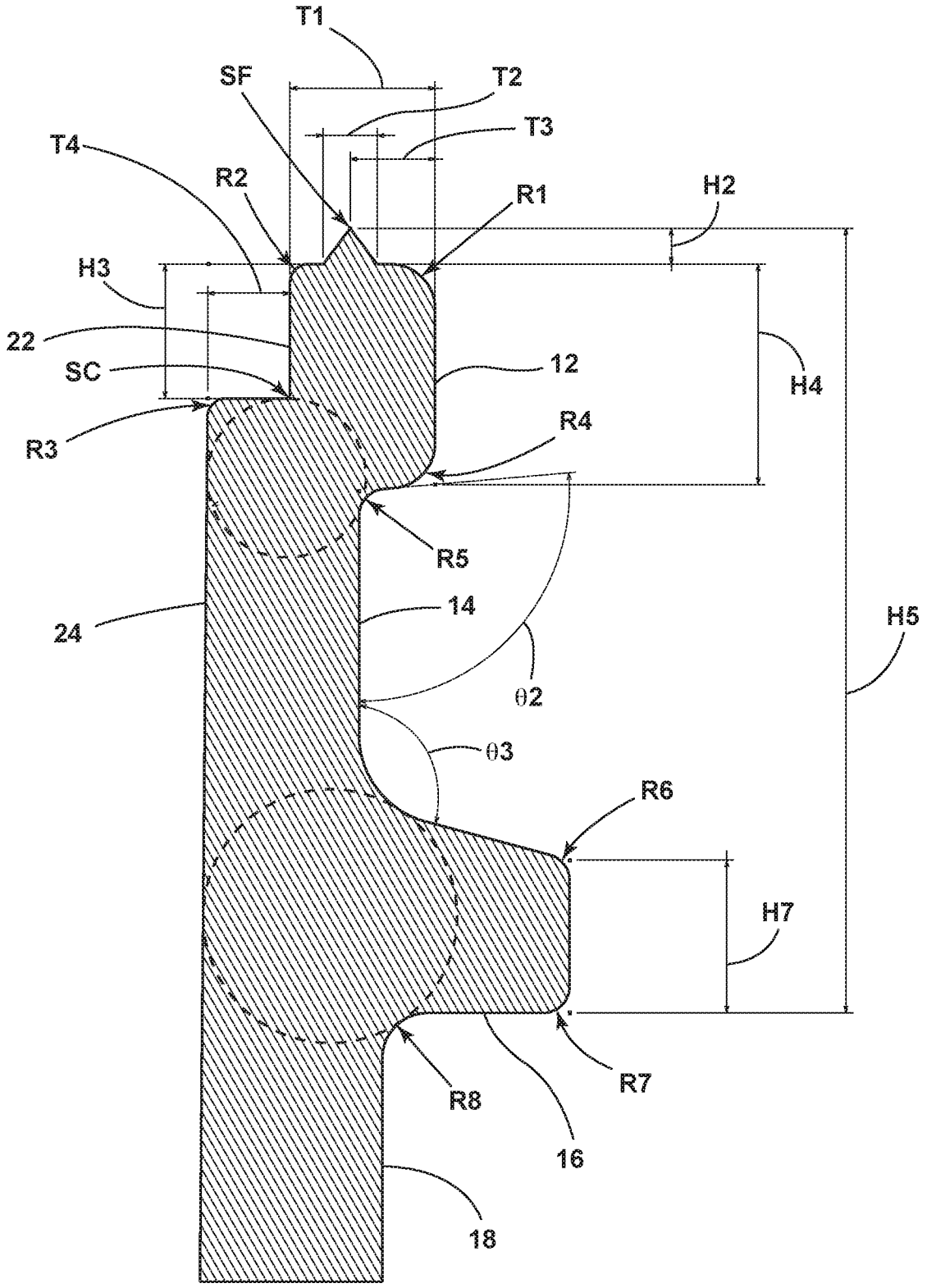
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FIG. 19

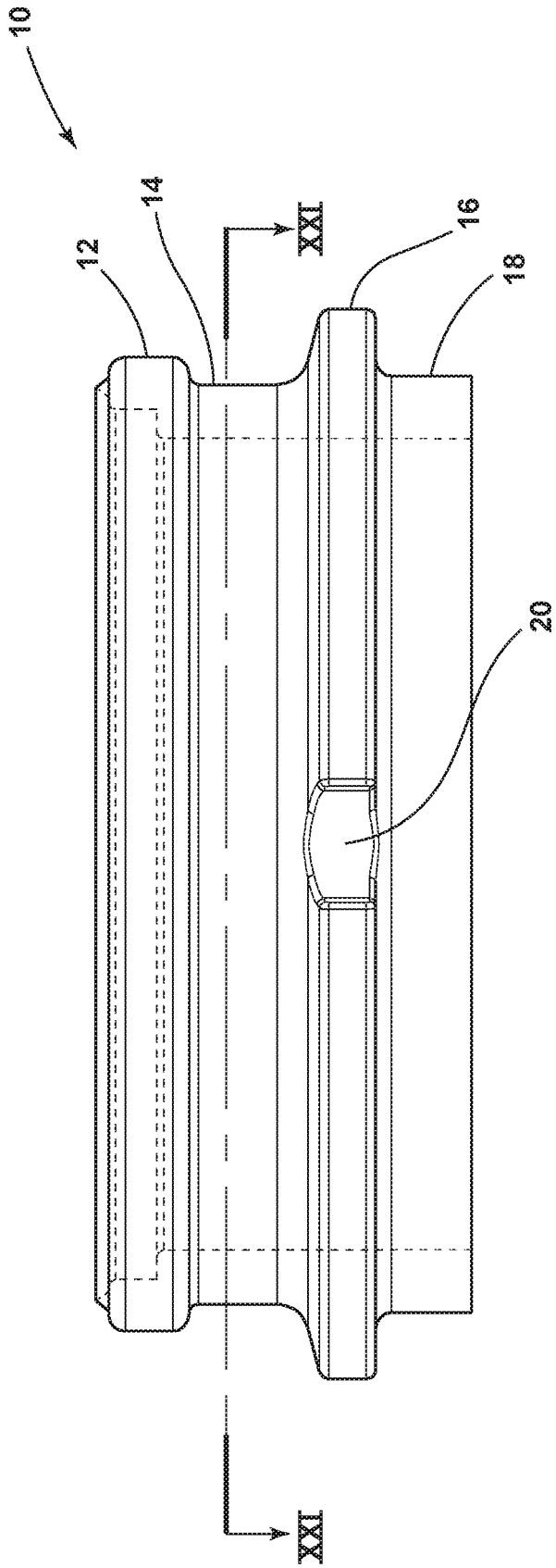

FIG. 20

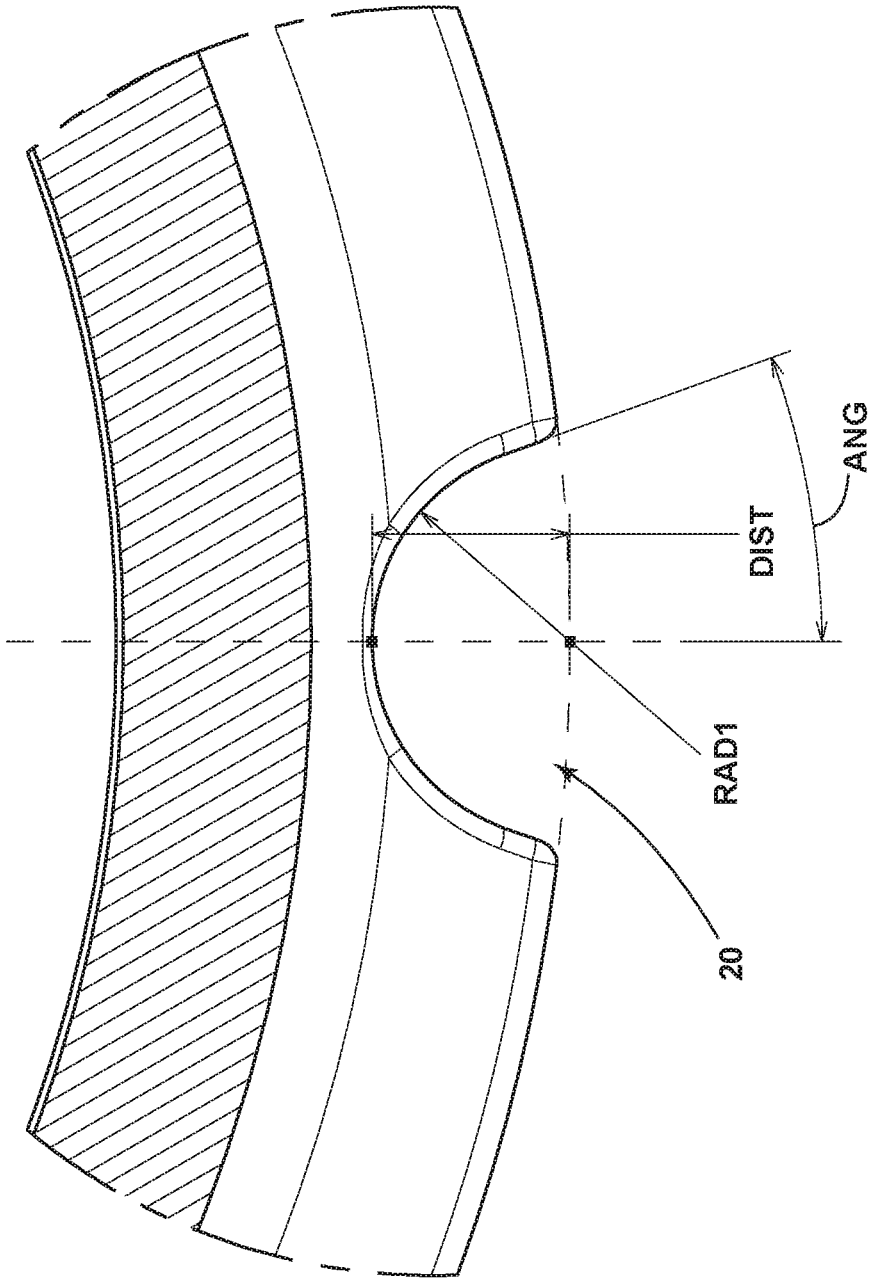

FIG. 21

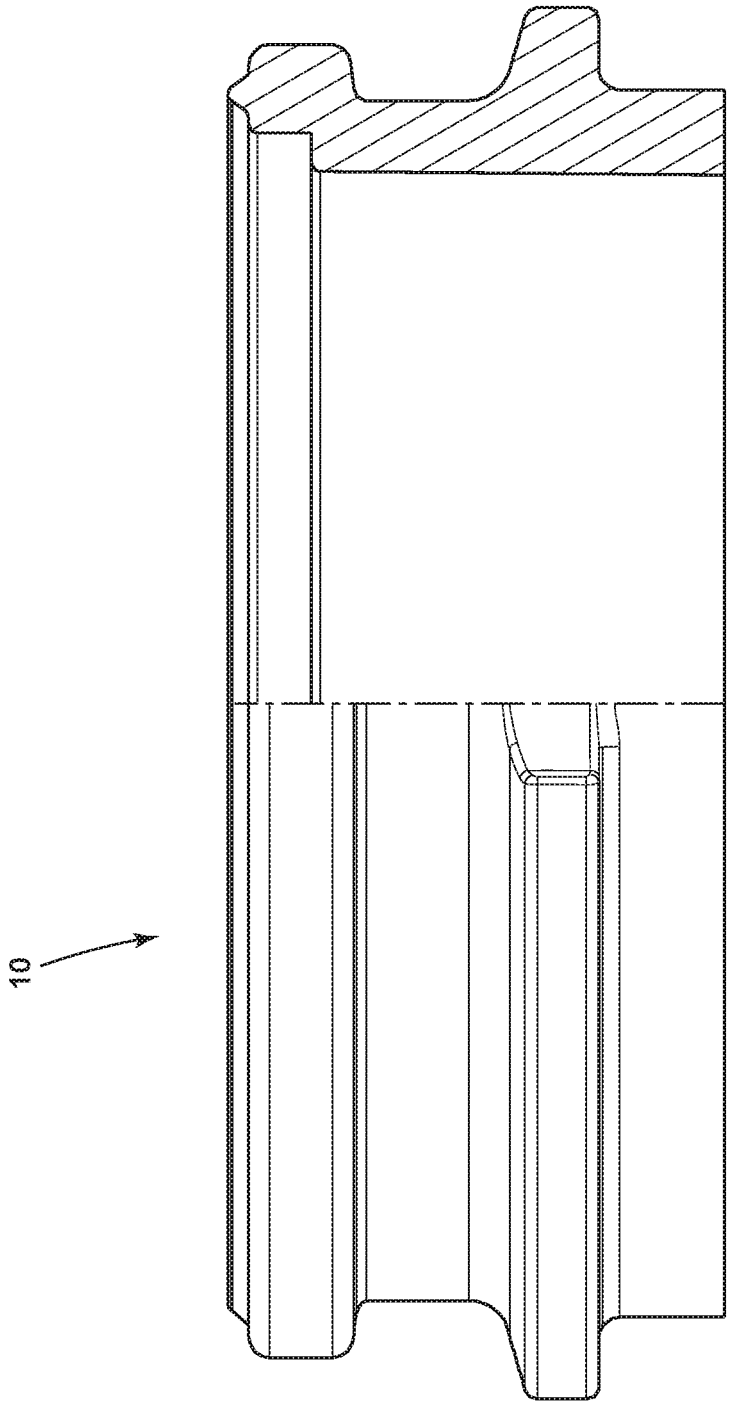

FIG. 22

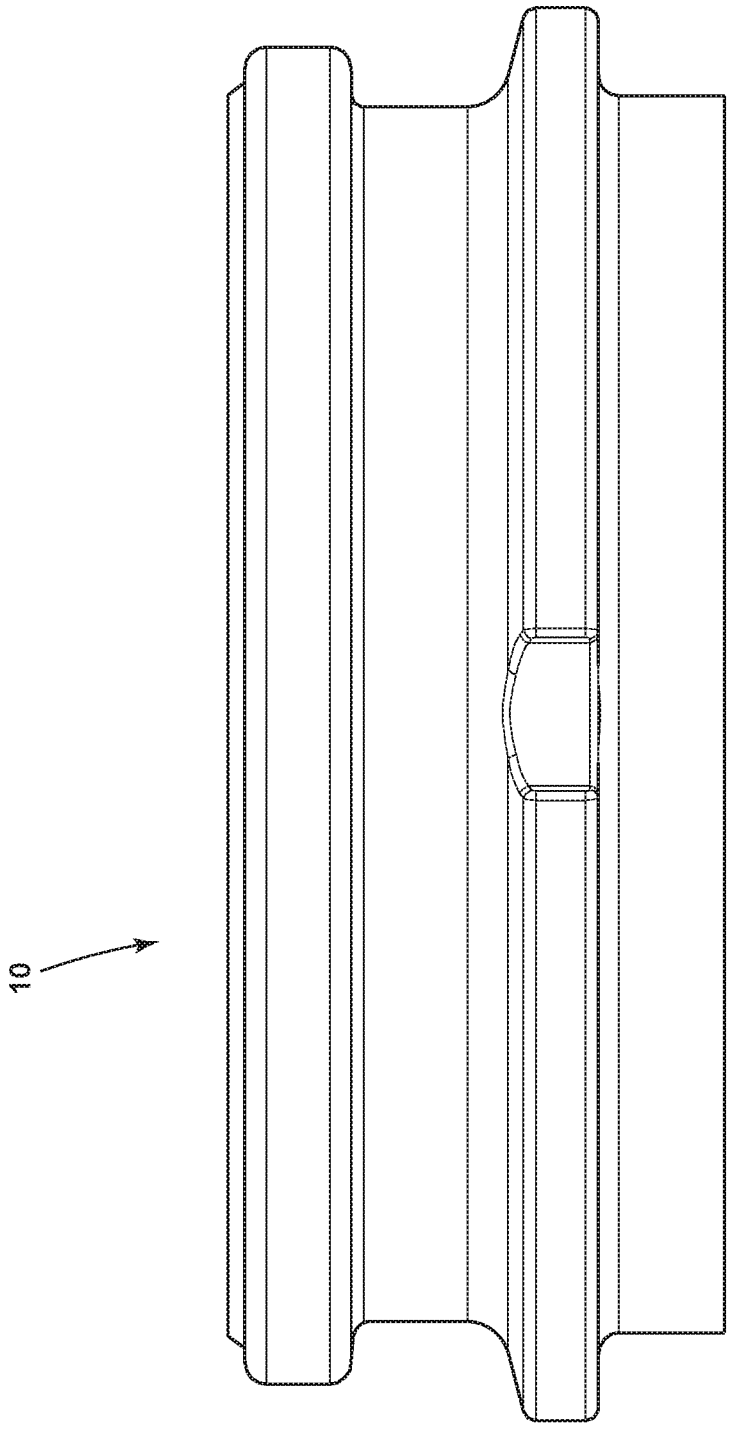

FIG. 23

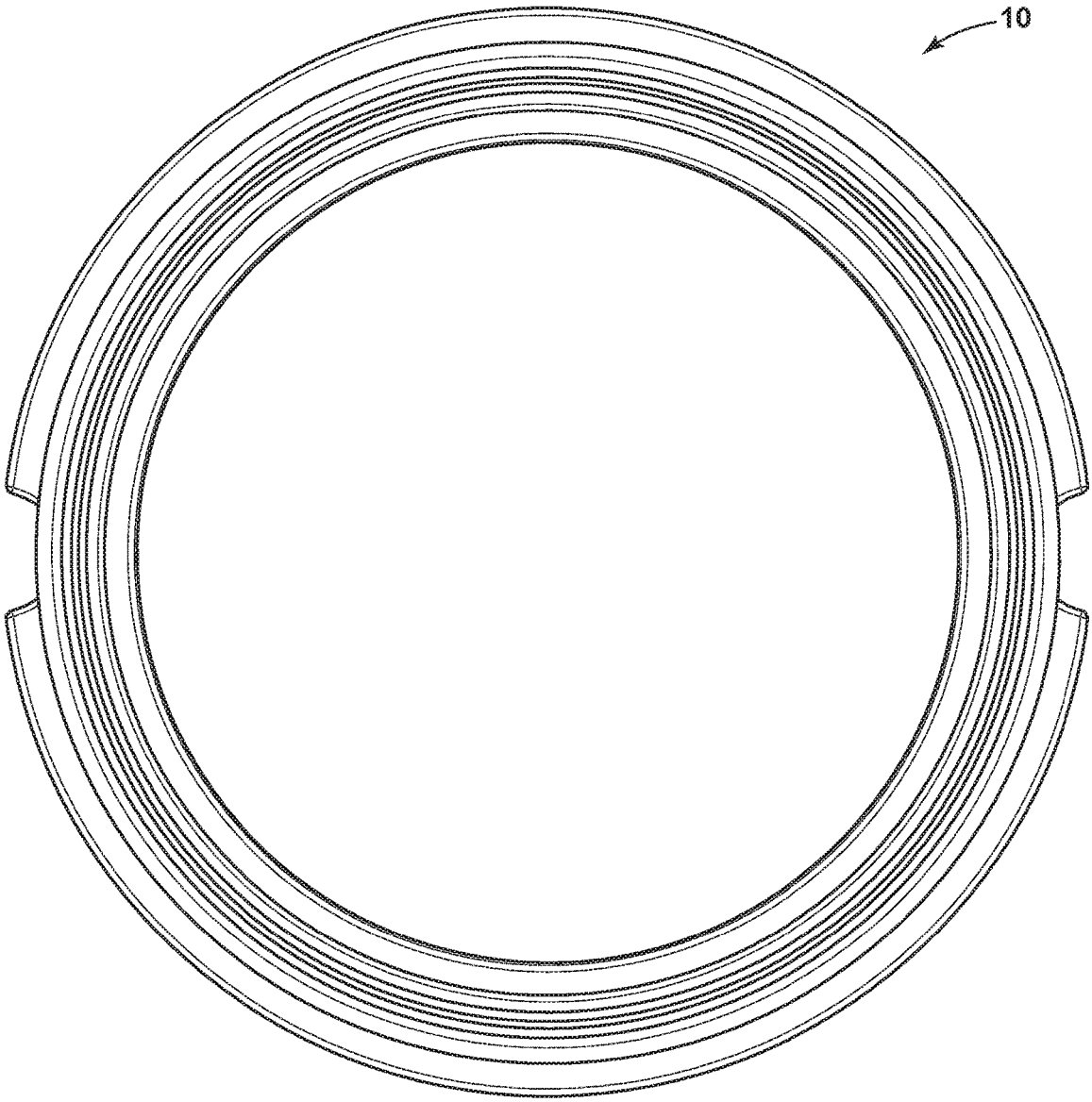

FIG. 24

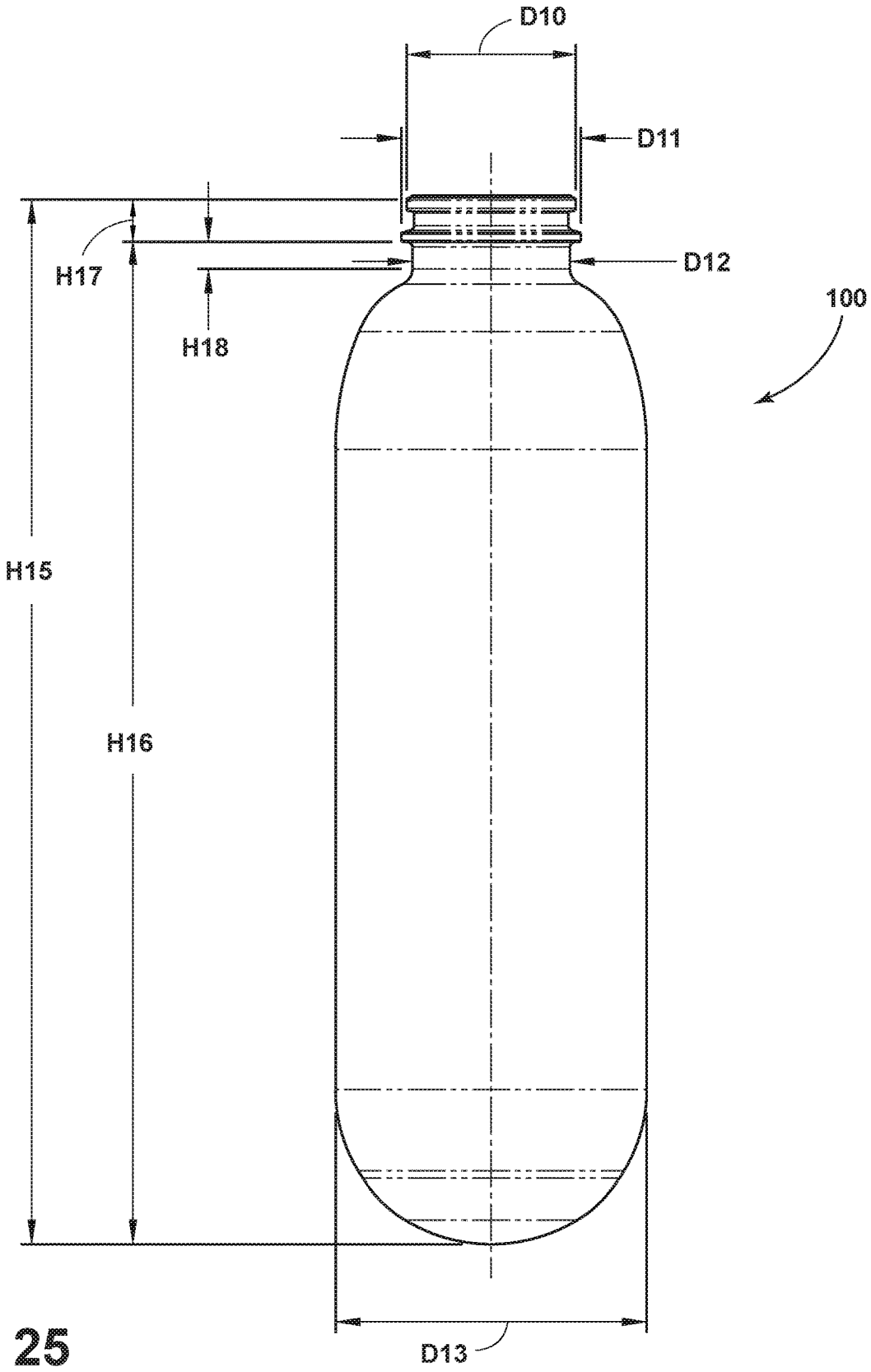

FIG. 25

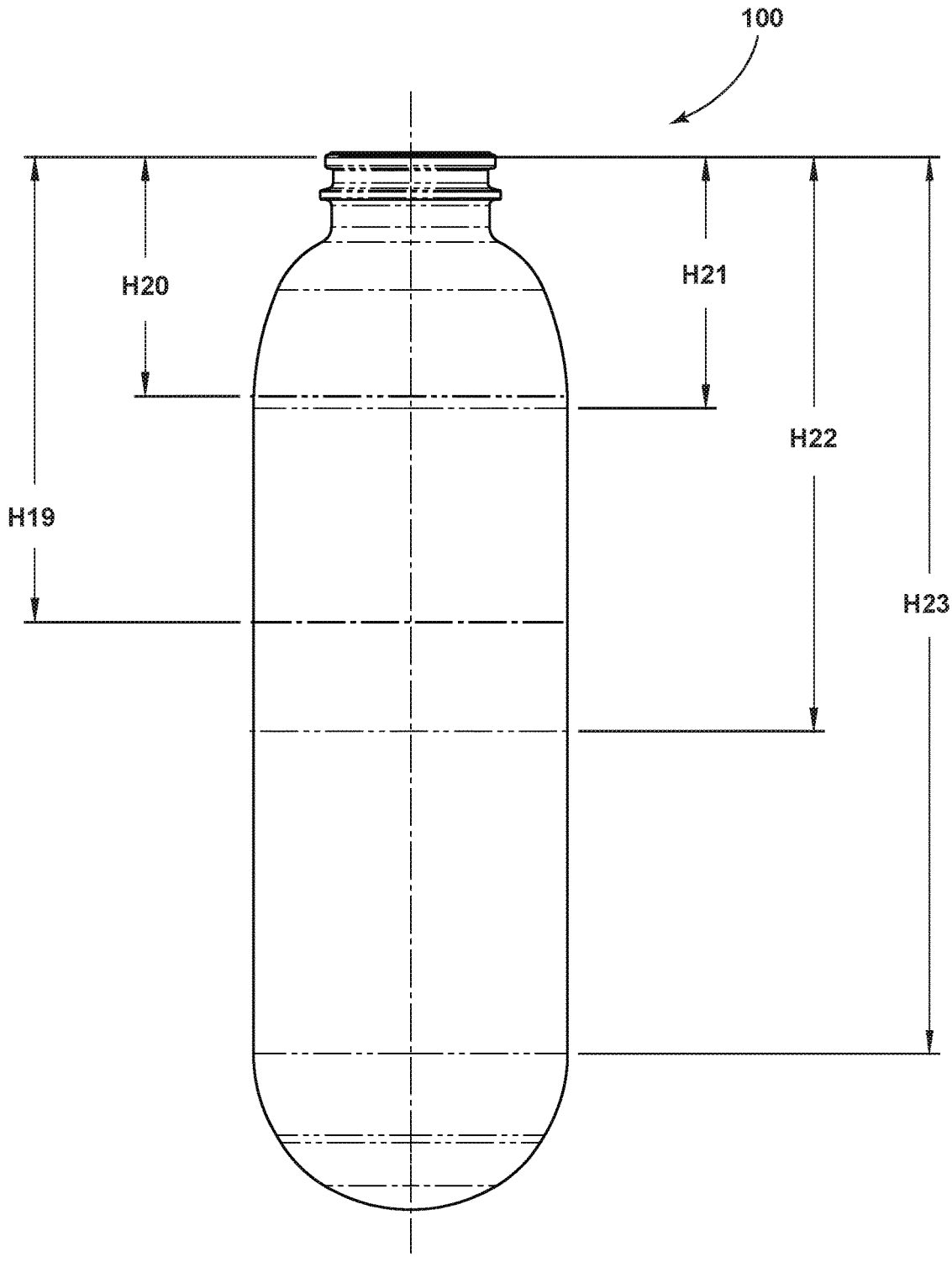

FIG. 26

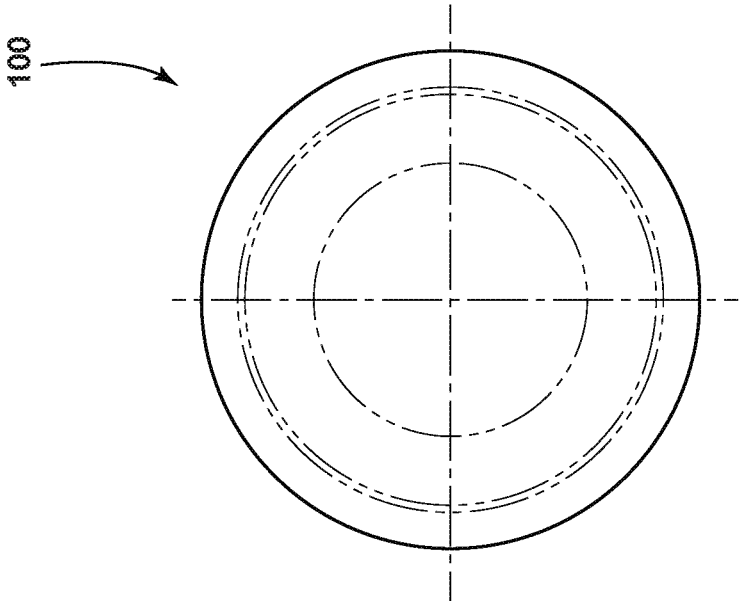

FIG. 28

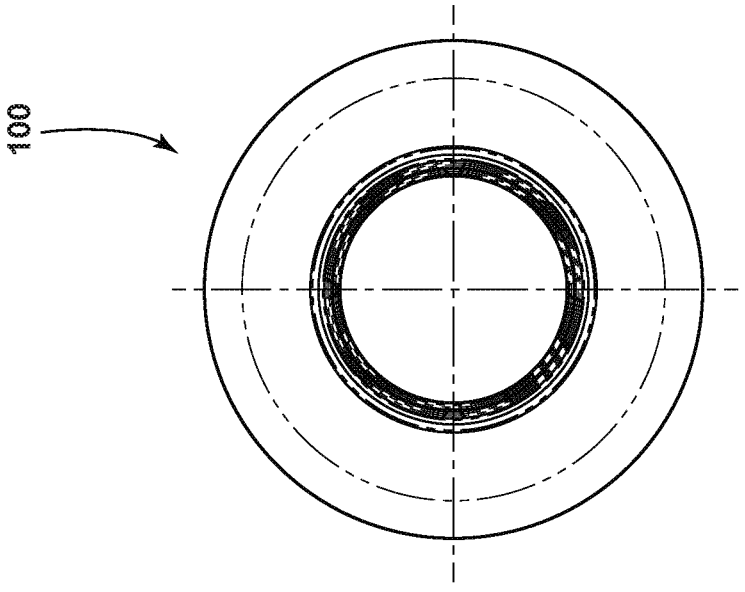

FIG. 27

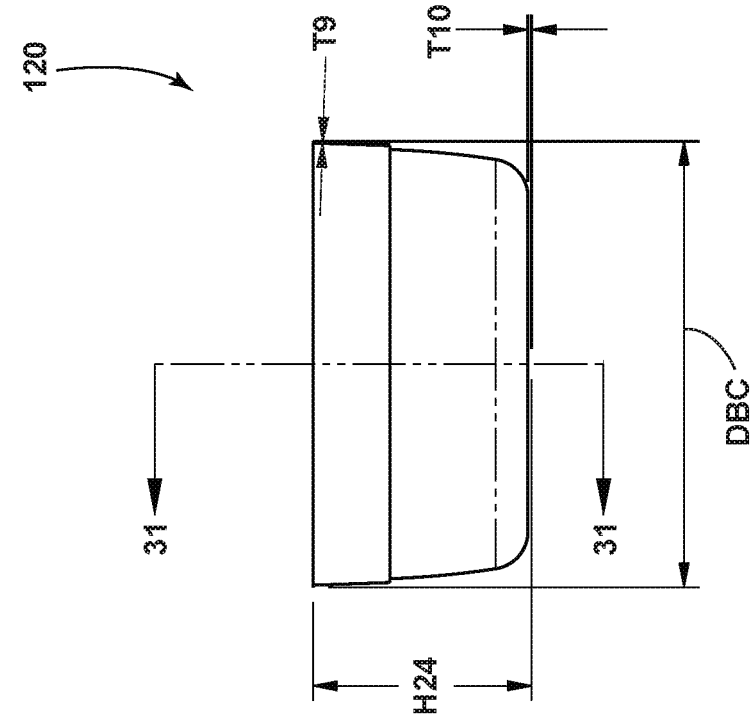

FIG. 30

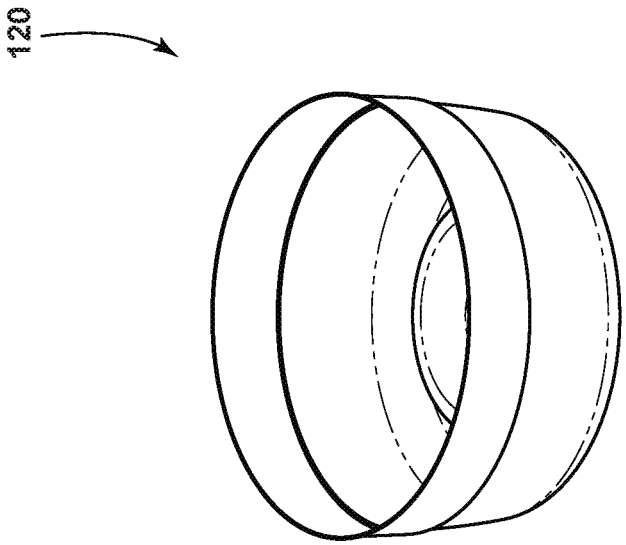

FIG. 29

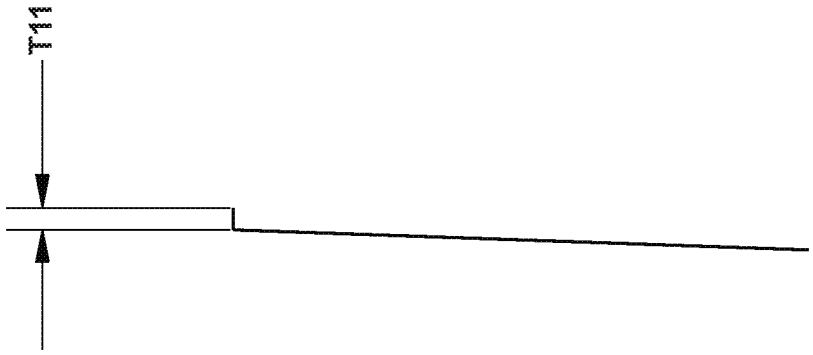

FIG. 32

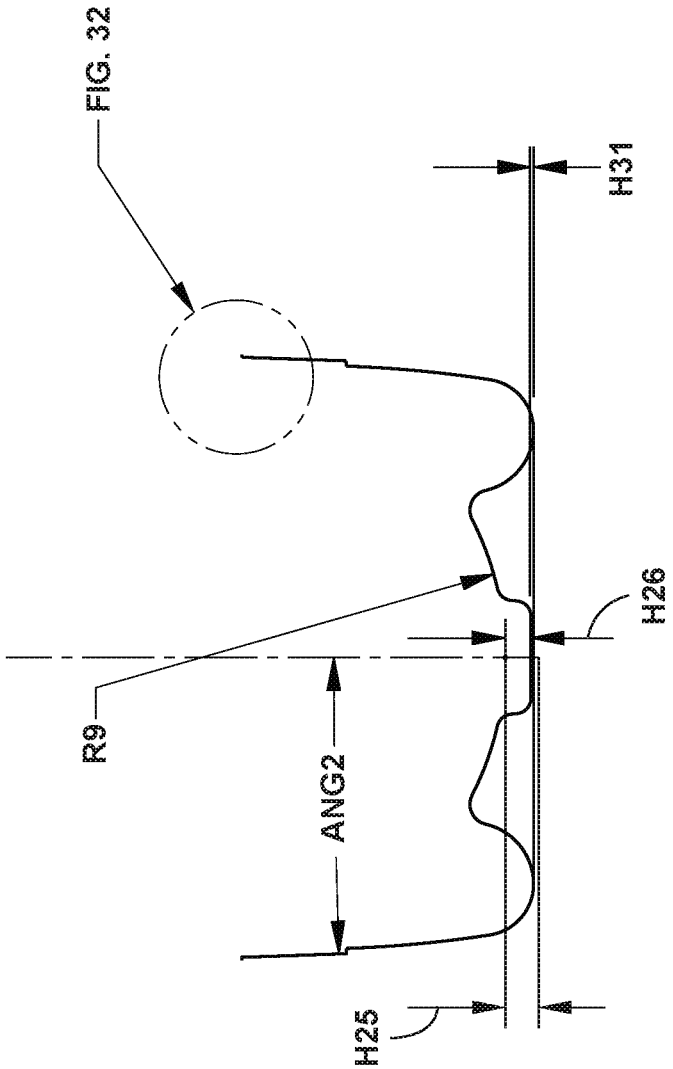

FIG. 31

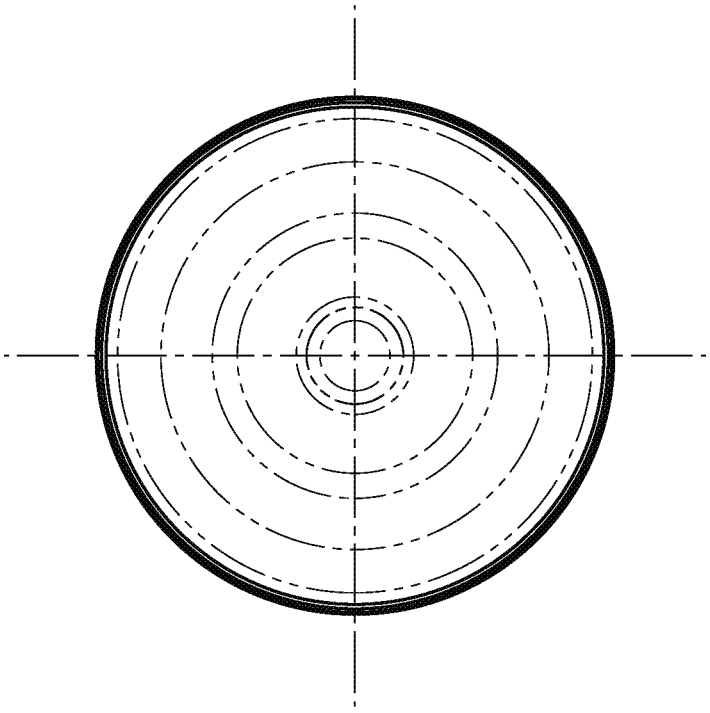

FIG. 34

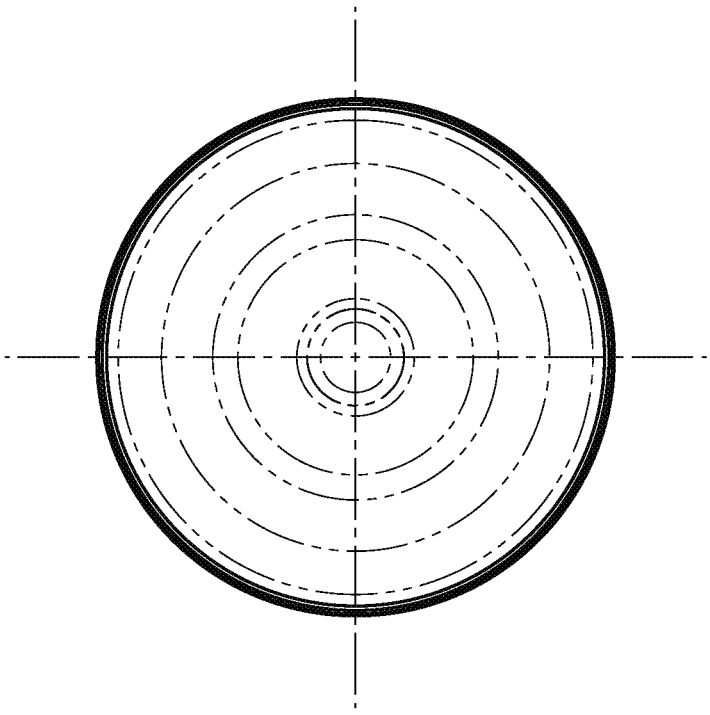

FIG. 33

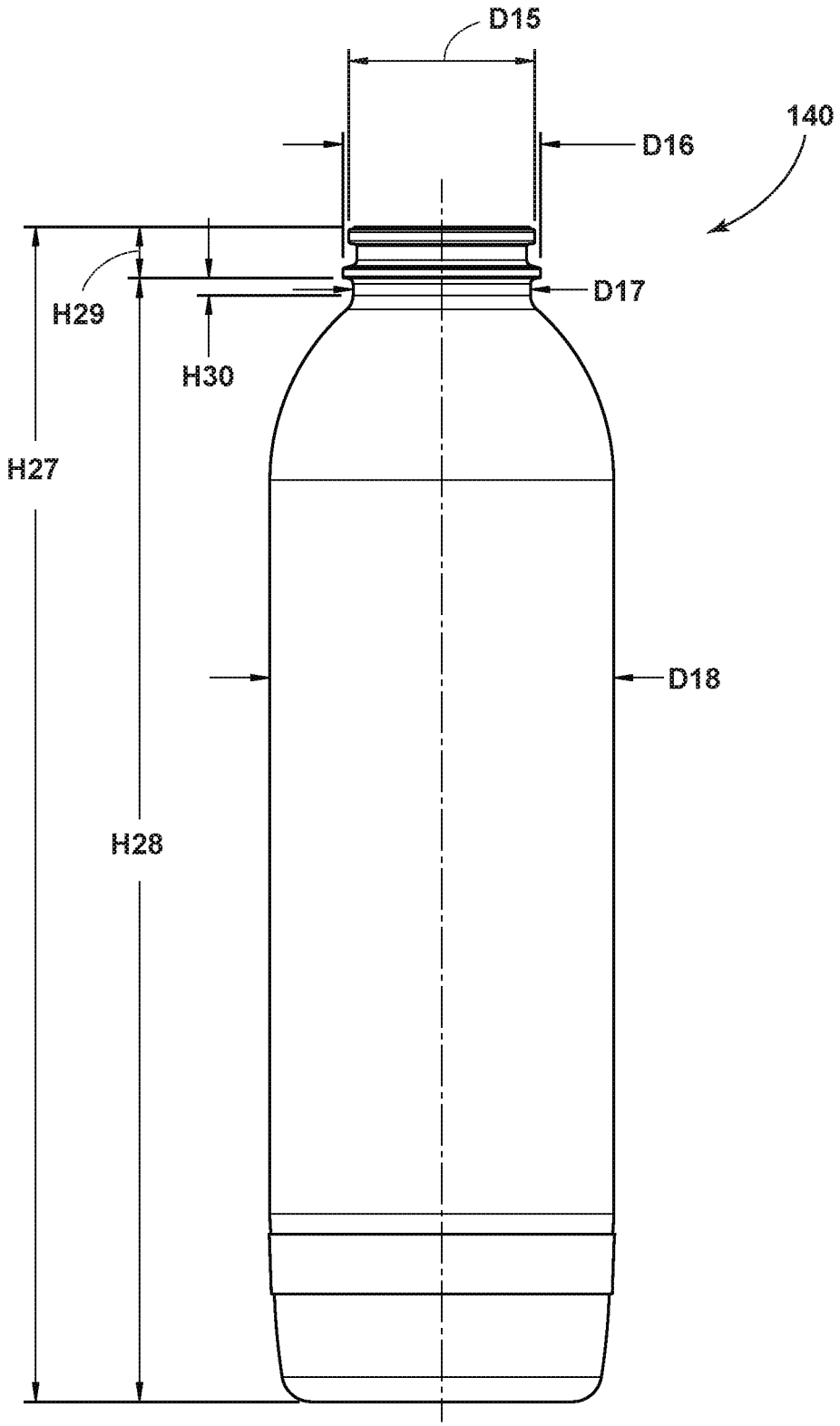

FIG. 35

PLASTIC PREFORM AND CONTAINER

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation-in-part of U.S. patent application Ser. No. 16/376,269, filed Apr. 5, 2019, and claims priority to U.S. Provisional Application Ser. No. 62/652,977, filed Apr. 5, 2018, and also claims the benefit of U.S. Patent Ser. No. 62/844,956, filed May 8, 2019, which are all fully incorporated herein by reference.

TECHNICAL FIELD

[0002] The present invention relates to modified neck portions for plastic preforms and containers, and plastic containers with a modified neck that can retain and dispense pressurized contents (e.g., aerosol compositions).

BACKGROUND

[0003] Containers for holding and dispensing pressurized contents are known in the art. Such containers have commonly been formed of metal to help withstand internal pressures associated with the contents. An example of such containers includes those intended to retain and dispense aerosol contents. It has been desirable to provide plastic containers that are suitable for retaining and dispensing pressurized contents, including aerosol compositions. There are advantages and challenges associated with providing plastic containers, including possibly all-plastic containers, that may be suitable for such applications. Advantages of plastic containers can include, inter alia, cost reductions and savings, increased design flexibility, ease of manufacture, and aesthetic features and options. Challenges can, however, include dealing with material characteristics (e.g., material effects under pressures and/or temperature changes) and material distributions and configurations, including those associated with neck portions of such containers.

[0004] Among other things, it can be desirable to provide a plastic container with an improved or modified neck that is suitable for holding and dispensing pressurized contents.

SUMMARY

[0005] An improved neck for a plastic preform and container that is suitable for holding pressurized contents. The neck includes a ring, an upper segment, a flange, and a lower segment. In embodiments the upper segment is disposed vertically between the ring and the flange and the lower segment is disposed vertically below the flange. In embodiments an inner radial wall segment of the ring of a neck is radially offset outwardly from an inner radial wall segment of the upper segment. In embodiments, the plastic container includes a closure, and may be configured to retain and dispense pressurized contents.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Embodiments of the disclosure will now be described, by way of example, with reference to the accompanying drawings, wherein:

[0007] FIG. **1** is a perspective view of an embodiment of a neck of a plastic container or preform according to aspects or teachings of the present disclosure;

[0008] FIG. **2** is a side elevation view of an embodiment of a neck of a plastic container or preform as generally illustrated in FIG. **1**;

[0009] FIG. **3** is partial section view along of the embodiment of a neck of a plastic container or preform shown in FIG. **2**;

[0010] FIGS. **4**A and **4**B are rotated side elevation (engraving) views shown from an operator side and an opposing (non-operator) side, respectively;

[0011] FIG. **5** is top plan view of an embodiment of a neck as generally illustrated in FIGS. **4**A and **4**B;

[0012] FIG. **6** is a partial cross-sectional side elevation view (of the top view of FIG. **5**) of an embodiment of a neck portion;

[0013] FIG. **7** is an enlarged view of portion VII shown in FIG. **6**;

[0014] FIG. **8** is front elevation view of an embodiment of a neck of a plastic container or preform according to aspects or teachings of the present disclosure;

[0015] FIG. **9** is a cross-sectional view of a portion of an embodiment of a neck of a plastic container or preform according to aspects or teachings of the present disclosure;

[0016] FIG. **10** is a plan view of an embodiment of a neck of a plastic container or preform according to aspects or teachings of the present disclosure;

[0017] FIG. **11** is cross-sectional view of a portion of an embodiment of a plastic container or preform according to aspects or teachings of the present disclosure;

[0018] FIG. **12** is top plan view of an embodiment of a neck of a plastic container or preform according to aspects or teachings of the present disclosure; left and right side views of the neck are included as FIGS. **12**A and **12**B, respectively;

[0019] FIG. **13** is a side elevation view of an embodiment of a neck of a plastic container or preform as generally illustrated in FIG. **12**;

[0020] FIG. **14** is a partial cross-sectional front view of a neck of a plastic container or preform as generally illustrated in FIG. **12**;

[0021] FIG. **15** is an enlarged section view of a portion of a neck of a plastic container or preform as generally illustrated in FIG. **14**;

[0022] FIG. **16** is a front elevation view of an embodiment of a neck of a plastic container or preform as generally illustrated in FIG. **12**;

[0023] FIG. **17** is a perspective view of an embodiment of a neck of a plastic container or preform as generally illustrated in FIG. **12**;

[0024] FIG. **18** is a perspective view of an embodiment of a neck of a plastic container or preform as generally illustrated in FIG. **12**;

[0025] FIG. **19** is a cross-sectional view of an enlarged portion of a neck of a plastic container or preform as generally illustrated in FIG. **12**;

[0026] FIG. **20** is a side elevation view of a neck of a plastic container or preform as generally illustrated in FIG. **12**, including broken lines illustrating internal portions thereof;

[0027] FIG. **21** is a top plan view of a portion of the neck generally illustrated in FIG. **20**;

[0028] FIG. **22** is a partial cross-sectional side view of a neck of a plastic container or preform as generally illustrated in FIG. **20**;

[0029] FIG. **23** is a side elevation view of a neck of a plastic container or preform as generally illustrated in FIG. **20**;

[0030] FIG. **24** is a top plan view of a neck of a plastic container or preform as generally illustrated in FIG. **20**;

[0031] FIG. **25** is a perspective view of an embodiment of a plastic container according to aspects or teachings of the present disclosure;

[0032] FIG. **26** is a section view of the container illustrated in FIG. **25**;

[0033] FIG. **27** is a top plan view of the container illustrated in FIG. **25**;

[0034] FIG. **28** is a bottom plan view of the container illustrated in FIG. **25**;

[0035] FIG. **29** is a perspective view of an embodiment of a base cup according to aspects or teachings of the present disclosure;

[0036] FIG. **30** is a front view of the base cup illustrated in FIG. **29**;

[0037] FIG. **31** is a section view of the base cup illustrated in FIG. **30**;

[0038] FIG. **32** is a detail view of the section of the base cup illustrated in FIG. **31**;

[0039] FIG. **33** is a top plan view of the base cup illustrated in FIG. **30**;

[0040] FIG. **34** is a bottom plan view of the base cup illustrated in FIG. **30**; and

[0041] FIG. **35** is a front elevation of an embodiment of a container assembly, including a container and base cup.

DETAILED DESCRIPTION

[0042] Reference will now be made in detail to embodiments of the present disclosure, examples of which are described herein and illustrated in the accompanying drawings. While the invention will be described in conjunction with embodiments, it will be understood that they are not intended to limit the invention to these embodiments. On the contrary, the invention is intended to cover alternatives, modifications and equivalents, which may be included within the spirit and scope of the invention as defined herein and by appended claims.

[0043] With reference to FIGS. **1** and **2**, and without limitation, an embodiment of a container or preform neck **10** in accordance with aspects and teachings of the present disclosure is generally illustrated. The neck **10** may be the neck of a plastic preform (such as those disclosed further herein) that may be molded using various methods to form a resulting plastic container. Such preforms may be formed, for example and without limitation, by injection or compression molding and may be subjected to molding processes, such as two-stage blow molding (e.g., injection stretch blow molding (ISBM)), to form a plastic container.

[0044] As generally illustrated in FIG. **2**, the neck **10** may include a rim portion or ring **12**, an upper segment **14**, a support portion or flange **16**, and a lower segment **18**. The flange **16** may extend radially outwardly from the neck and may be disposed between the upper segment **14** and the lower segment **18**. A partial sectional view of the neck **10** is shown in FIG. **3**. As generally illustrated, a portion of the flange **16** may include a formation or locator **20**, which in embodiments may have a generally semi-circular shape or form. By way of example only, and without limitation, a neck **10** such as illustrated in FIGS. **1** and **2** may have a finish weight of about 2.34 grams. With other embodiments, for example and without limitation, a desirable or target weight of the neck may be 6.0 grams±0.3 grams. Further, with reference to FIG. **3**, by way of example and without limitation, an embodiment of a partial portion of a neck in accordance with aspects or teachings of the present disclosure may have the following dimensions (which may be considered as having stated or standard tolerances encountered within the field):

[0045] RAD**1** (radius)—1.8 mm

[0046] DIST (distance)—1.8 mm

[0047] ANG (angle)—20 degrees

[0048] Embodiments of necks that are formed in accordance with aspects and teachings of the present disclosure may comprise thermoplastic material(s) such as, without limitation, polyethylene terephthalate (PET), polyethylene naphthalate (PEN), polycarbonate, polypropylene, PET-PEN copolymers, and other polymers or thermoplastic material that may be formed into the desired preforms and containers. In embodiments, containers (and their neck portions) may be formed by ISBM processing with extrusion grade PET (or EPET). Extrusion grade PET, or EPET, will generally have a comparatively (relative to non-extrusion grade PET) or sufficiently high intrinsic viscosity (IV, which may involve units of dl/g), and may be solid stated. In embodiments, a high IV will be above "bottle grade" IV of about 0.78-0.85 for carbonated soft drink grade applications) and may be about 0.96 to about 1.2, or higher, and may involve low crystallinity. Generally, EPET will need to have a high enough IV to hold up through the intended processing. With some embodiments, the IV may be about 1.1, and may be higher. With a lower IV, in some cases the container may not perform as well as desired in some testing, such as drop testing. However, if an IV is too high, challenges can be encountered, such as with associated hot bath testing. Consequently, it was found that for some embodiments there is a desirable range (or "sweet spot") in which the material will perform well for both drop testing and hot bath testing.

[0049] Additionally, others in the field have commonly sought to add material thickness to neck portions to provide local reinforcement in the neck, including local reinforcement at or about a flange and/or lower segment of the neck. However, it has been found that with some neck configurations, such as disclosed herein, providing less material thickness associated with the flange and/or lower segment of the neck can provide equivalent or even better strength than reinforced containers with increased thickness that lack other aspects/teachings of the present disclosure.

[0050] In providing containers that embody aspects or teachings of the present disclosure that are suitable for retaining and dispensing pressurized contents, one or more (even all) of the following may be adjusted or controlled: (i) IV, (ii) wall thickness(es) and profiles, and/or (iii) associated processing. As noted, for applications a suitable IV may be employed. For embodiments, wall thickness(es) and distributions may be tightly controlled. For example and without limitation, various portions or segments of a container may be varied to help handle or address anticipated internal pressure (e.g., such as pressurization associated with aerosol contents). Additionally, with embodiments, associated processing may involve additional cooling, which may provide extra or added crystallization (e.g., boosted through cooling). With embodiments, the amount of crystallization may be increased beyond (e.g., at least 1-2% beyond) what is

typically associated with the conventional crystallization of a plastic (e.g., PET) container.

[0051] FIGS. **4**A, **4**B, and **5** generally illustrate a neck **10** shown from different views. FIG. **6** generally illustrates a partial sectional view of the neck **10** such as shown in FIG. **5**. An enlarged portion thereof is generally illustrated in FIG. **7**. Transitions from an upper segment **14** to an upper portion of flange **16** (with locator **20** included) and from a lower portion of the flange **16** to a lower segment **18** are generally illustrated in FIG. **7**. With reference to FIG. **7**, by way of example and without limitation, an embodiment of a portion of a neck in accordance with aspects or teachings of the present disclosure may have the following dimensions (which may be considered as having stated or standard tolerances encountered within the field):

[0052] DIST**1** (distance)—0.55 mm
[0053] DIST**2** (distance)—2.26 mm
[0054] RAD**2** (radius)—0.2 mm
[0055] RAD**4** (radius)—0.2 mm

[0056] With reference to FIG. **8**, several dimensions associated with an embodiment of a neck **10** having aspects/features of the present disclosure are generally illustrated. By way of example, and without limitation, an embodiment of a neck in accordance with aspects or teachings of the present disclosure may have the following dimensions (which may be considered as having stated or standard tolerances encountered within the field):

[0057] D**1** (diameter)—30.5 mm
[0058] D**2** (dia.)—28.8 mm
[0059] D**3** (dia.)—27.26 mm
[0060] D**4** (dia.)—25.46 mm
[0061] D**5** (dia.)—33.5 mm
[0062] D**6** (dia.)—29.32 mm
[0063] H**1** (distance)—8.76 mm

[0064] With reference to FIG. **9**, dimensions associated with wall profiles and wall thicknesses associated with an embodiment of a neck **10** are generally illustrated. The illustrated embodiment additionally depicts a formation (e.g., sharp formation SF) extending vertically upward from an upper portion of the ring **12**, and a sharp corner SC associated with an interior surface of the ring **12**. In embodiments, the sharp corner SC may provide a transition that is at or about 90°. By way of example, and without limitation, an embodiment of a neck in accordance with aspects or teachings of the present disclosure may have the following dimensions (which may be considered as having stated or standard tolerances within the field):

[0065] T**1** (thickness)—1.62 mm
[0066] T**2** (thickness)—0.6 mm
[0067] T**3** (thickness)—0.95 mm
[0068] T**4** (distance)—0.92 mm
[0069] H**2** (distance)—0.4 mm
[0070] H**3** (distance)—1.5 mm
[0071] H**4** (distance)—2.46 mm
[0072] H**5** (distance)—8.76 mm
[0073] H**6** (distance)—3.49 mm
[0074] H**7** (distance)—1.71 mm
[0075] H**8** (distance)—1.18 mm
[0076] Ø**1**—15°
[0077] Ø**2**—95°
[0078] R**1** (radius)—0.5 mm
[0079] R**2** (radius)—0.2 mm
[0080] R**3** (radius)—0.2 mm
[0081] R**4** (radius)—0.5 mm
[0082] R**5** (radius)—0.3 mm
[0083] R**6** (radius)—0.3 mm
[0084] R**7** (radius)—0.3 mm
[0085] R**8** (radius)—0.5 mm

[0086] Further, as generally illustrated in FIG. **9**, a ring **12** may be radially offset (e.g., outwardly) from a portion of the upper segment **14**. In embodiments, an inner radial wall segment **22** of a ring **12** may be radially offset outwardly from an inner radial wall segment **24** of an upper segment **14**. In an embodiment, for example and without limitation, the radial offset may be at least 0.90 mm, may be at least about 0.92 mm, or may be equal to or about 0.92 mm.

[0087] FIGS. **10** and **11** illustrate top view and a sectional view of a portion of a neck **10** for a plastic container. With reference to FIG. **11**, a cover or closure **30** is included and dimensions associated with wall profiles and wall thicknesses associated with an embodiment of a neck **10** are generally illustrated. A closure **30** may be configured to cover an opening associated with the neck **10** of a plastic container. The cover **30** may include additional elements or component, such as a valve for dispensing container contents. As generally shown, a portion of the closure **30** may extend over and around a portion of the ring **12** of the neck **10**. It is noted that embodiments of necks in accordance with the teachings of the present invention may be compatible with metal and plastic valves. Additionally, in embodiments, a valve may comprise a valve that is spin-welded.

[0088] The illustrated embodiment in FIG. **11** additionally includes a formation (e.g., sharp formation SF) extending vertically upward from an upper portion of the ring **12**, and an area for filling or decompression AF (shown radially interior to ring **12** between the ring **12** and a portion of the closure **30**). By way of example, and without limitation, an embodiment of a neck in accordance with aspects or teachings of the present disclosure may have the following dimensions (which may be considered as having stated or standard tolerances within the field):

[0089] T**5** (thickness)—0.61 mm
[0090] T**6** (thickness)—0.92 mm
[0091] T**7** (thickness)—0.15 mm
[0092] T**8** (thickness)—0.0.1 mm
[0093] H**9** (distance)—0.9 mm
[0094] H**10** (distance)—3.3 mm
[0095] H**11** (distance)—8.76 mm
[0096] H**12** (distance)—9.3 mm
[0097] H**13** (distance)—1.8 mm
[0098] H**14** (distance)—8.36 mm
[0099] D**7** (dia.)—26.65 mm
[0100] D**8** (dia.)—30.7 mm
[0101] D**9** (dia.)—32.51 mm

[0102] FIGS. **12** through **24** generally illustrate additional views and/or features associated with other embodiments of a neck for a preform or container.

[0103] FIG. **12** is top plan view of an embodiment of a neck of a plastic container or preform according to aspects or teachings of the present disclosure. A left side view of the neck shown in FIG. **12** is illustrated in FIG. **12**A, and a right side view of the neck is illustrated in FIG. **12**B.

[0104] FIG. **13** generally illustrates a side elevation view of an embodiment of a neck of a plastic container or preform, such as generally illustrated in FIG. **12**. With reference to FIG. **13**, several dimensions associated with an embodiment of a neck **10** having aspects/features of the present disclosure are generally illustrated. By way of

example, and without limitation, an embodiment of a neck in accordance with aspects or teachings of the present disclosure may have the following dimensions (which may be considered as having stated or standard tolerances encountered within the field):

[0105] D**1** (diameter)—31.6 mm
[0106] D**2** (dia.)—28.8 mm
[0107] D**3** (dia.)—27.26 mm
[0108] D**4** (dia.)—25.42 mm
[0109] D**5** (dia.)—33.25 mm
[0110] D**6** (dia.)—29.32 mm
[0111] H**1** (distance)—8.76 mm

[0112] While, FIG. **14** generally illustrates a partial cross-sectional front view of a neck of a plastic container or preform as generally illustrated in FIG. **13**. FIG. **15** depicts an enlarged section view of a portion of a neck of a plastic container or preform such as generally illustrated in FIG. **14**. With reference to FIG. **15**, by way of example, and without limitation, an embodiment of a portion of a neck in accordance with aspects or teachings of the present disclosure may have the following dimensions (which may be considered as having stated or standard tolerances encountered within the field):

[0113] DIST**1** (distance)—0.55 mm
[0114] DIST**2** (distance)—2.26 mm

[0115] FIG. **16** is a front elevation view of an embodiment of a neck of a plastic container or preform, such as generally illustrated in FIG. **12**. FIG. **17** is a perspective view of an embodiment of a neck of a plastic container or preform as generally illustrated in FIG. **12**. FIG. **18** is another perspective view of an embodiment of a neck of a plastic container or preform, such as generally illustrated in FIG. **12**.

[0116] FIG. **19** is a cross-sectional view of an enlarged portion of an embodiment of a neck of a plastic container or preform, such as generally illustrated in FIG. **12**. With reference to FIG. **19**, dimensions associated with wall profiles and wall thicknesses associated with an embodiment of a neck **10** are generally illustrated. The illustrated embodiment additionally depicts a formation (e.g., sharp formation SF) extending vertically upward from an upper portion of the ring **12**, and a sharp corner SC associated with an interior surface of the ring **12**. By way of example, and without limitation, an embodiment of a neck in accordance with aspects or teachings of the present disclosure may have the following dimensions (which may be considered as having stated or standard tolerances within the field):

[0117] T**1** (thickness)—2.17 mm
[0118] T**2** (thickness)—0.8 mm
[0119] T**3** (thickness)—1.2 mm
[0120] T**4** (thickness)—0.91 mm
[0121] H**2** (distance)—0.4 mm
[0122] H**3** (distance)—1.5 mm
[0123] H**4** (distance)—2.46 mm
[0124] H**5** (distance)—8.76 mm
[0125] H**7** (distance)—1.71 mm
[0126] H**8** (distance)—1.18 mm
[0127] Ø**2**—95°
[0128] Ø**3**—105°
[0129] R**1** (radius)—0.5 mm
[0130] R**2** (radius)—0.2 mm
[0131] R**3** (radius)—0.2 mm
[0132] R**4** (radius)—0.5 mm
[0133] R**5** (radius)—0.3 mm
[0134] R**6** (radius)—0.3 mm
[0135] R**7** (radius)—0.3 mm
[0136] R**8** (radius)—0.5 mm

[0137] FIG. **20** is a side elevation view of a neck of an embodiment of a plastic container or preform, such as generally illustrated in FIG. **12**, and including broken lines illustrating internal portions thereof. FIG. **21** is a top plan view of a portion of the neck generally illustrated in FIG. **20**. FIG. **22** is a partial cross-sectional side view of a neck of a plastic container or preform, such as generally illustrated in FIG. **20**. FIG. **23** is a side elevation view of a neck of an embodiment of a plastic container or preform, such as generally illustrated in FIG. **20**, and FIG. **24** is a top plan view of an embodiment of a neck of a plastic container or preform, such as generally illustrated in FIG. **20**.

[0138] Additionally, in embodiments associated with the disclosure, a plastic container **100** may be formed/configured to have a shape such as generally illustrated in FIGS. **25** and **26**. In embodiments, such a plastic container **100** may be blow molded from a plastic preform, may be comprised of polyethylene terephthalate (PET), and/or may include a neck that, for embodiments, may be configured as previously described and generally illustrated in connection with FIGS. **1-24**. Such a plastic container may be configured, for example and without limitation, to have a weight of about 34.5±0.6 g, a capacity of about 425 ml (14.37 fl. oz.), and/or an overflow of ±11 ml (0.37 fl. oz.).

[0139] By way of example, and without limitation, an embodiment of a container **100**, such as generally illustrated in FIGS. **25** and **26**, and in accordance with aspects or teachings of the present disclosure, may have the following dimensions (which may be considered as having stated or standard tolerances within the field):

[0140] D**10** (diameter)—32 mm
[0141] D**11** (dia.)—33.5 mm
[0142] D**12** (dia.)—29.39 mm
[0143] H**15** (distance)—195.75 mm
[0144] H**16** (distance)—187.73 mm
[0145] H**17** (distance)—8.02 mm
[0146] H**18** (distance)—5.00 mm
[0147] H**19** (distance)—86.46 mm
[0148] H**20** (distance)—44.45 mm
[0149] H**21** (distance)—46.76 mm
[0150] H**22** (distance)—106.76 mm
[0151] H**23** (distance)—166.74 mm

[0152] However, the present concept is not limited to such a size, shape, and capacity, and such plastic containers may, for example, be configured for containers that have different weights, different overflow volumes, and/or are greater or less than about 425 ml. Plastic containers having a lower portion with a rounded, hemispherical shape (in cross section, such as shown in FIG. **26**) may physically accommodate contents with higher comparative pressures than, for example, a footed base configuration.

[0153] Further, a plastic container, such as generally illustrated in FIGS. **25** and **26**, may be combined with a base cup. A base cup may be configured to attach to and support a container—for example, it may support a container in a standing position on a surface. Embodiments of a base cup **120**, are generally illustrated in FIGS. **29-34**.

[0154] With embodiments, a base cup **120** may, for example, be comprised of a plastic, which may comprise a recyclable plastic material. For example and without limitation, a base cup may be comprised of polyethylene terephthalate (PET) and, for some applications, the base cup

may be thermoformed. In embodiments, a plastic container **100** and an associated plastic base cup may both be comprised of the same or substantially similar material—which may be commonly recyclable. In embodiments where the base cup is comprised of PET, the base cup may be marked or designated with an appropriate recyclability symbol. In embodiments, a base cup may, for example and without limitation, have a weight of about 3.0±0.6 grams and/or a capacity of about 9.7 fl. oz. In embodiments, a base cup may have a champagne-type base configuration. In embodiments the base cup may be formed by thermoforming (e.g., thermoformed PET) and, for some applications, the walls of the base cup may be comparatively thinner (less thick) than walls that might be formed by other processing methods, such as injection molding. With the formation of embodiments of the plastic container, base cup, and/or container assembly, the plastic material (e.g., PET) may be biaxially oriented. Embodiments of such containers or preforms, base cups, and/or related assemblies, can, inter alia, demonstrate improved drop impact testing results. Moreover, with containers that are intended to hold contents that are about 220 ml or larger, the inclusion of a base cup can commonly provide significantly superior results to containers that have a unitary freestanding base (without a base cup).

[0155] By way of example, and without limitation, an embodiment of a base cup **120**, such as generally illustrated in whole or in part in FIGS. **29** through **32**, and in accordance with aspects or teachings of the present disclosure, may have the following dimensions (which may be considered as having stated or standard tolerances within the field):

[0156] DBC (diameter)—59.01 mm

[0157] H**24** (distance)—28.90 mm

[0158] H**25** (distance)—3.25 mm

[0159] H**26** (distance)—2.5 mm

[0160] H**31** (distance)—0.25 mm

[0161] R**9** (radius)—29.50 mm

[0162] T**11** (thickness)—0.25 mm

[0163] ANG**2** (angle)—2°

[0164] A base cup **120** may be attached or otherwise connected to a container **100** to form a container assembly. For example and without limitation, an embodiment of a container assembly **140** is generally illustrated in FIG. **35**. In embodiments, the container **100** and base cup **120** may be connected via an adhesive.

[0165] By way of example, and without limitation, an embodiment of a container assembly **140**, such as generally illustrated in whole or in part in FIG. **35**, and in accordance with aspects or teachings of the present disclosure, may have the following dimensions (which may be considered as having stated or standard tolerances within the field):

[0166] D**15** (diameter)—32 mm

[0167] D**16** (diameter)—33.50 mm

[0168] D**17** (diameter)—29.39 mm

[0169] D**18** (diameter)—58.29 mm

[0170] H**27** (distance)—199.35 mm

[0171] H**28** (distance)—191.39 mm

[0172] H**29** (distance)—7.96 mm

[0173] H**30** (distance)—5.00 mm

[0174] With embodiments of a container assembly, such as disclosed above, 80% or more (by weight) of the container assembly may be comprised of PET—with 20% or less of the container assembly comprising other materials. For example, an actuator, an overcap, a valve, a label, and possibly one or more other components may be comprised of a material other than PET. In embodiments, a valve associated with a container assembly may be comprised of plastic (e.g., PET) and may include a metal or a non-plastic (e.g., non-PET) spring.

[0175] The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and various modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to explain the principles of the invention and its practical application, to thereby enable others skilled in the art to utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the claims and their equivalents.

What is claimed is:

1. A container assembly suitable for holding pressurized content, the assembly comprising:

a plastic container, the container including an upper segment, a support flange, a sidewall portion, and a rounded base portion;

a plastic base cup, the base cup is connected to the rounded base portion of the container and configured to support the plastic container;

wherein the plastic container and the plastic base cup are comprised of the same or substantially the same plastic material.

2. The container of claim **1**, wherein the plastic material comprises polyethylene terephthalate (PET).

3. The container of claim **1**, wherein the plastic container and the plastic base cup are comprised of recyclable plastic material.

4. The assembly of claim **1**, wherein the base cup is thermoformed.

5. The assembly of claim **1**, wherein the container assembly is comprised of 80% or more, by weight, of PET.

6. The assembly of claim **1**, wherein the support flange includes a formation or locator.

7. The assembly of claim **2**, wherein the formation or locator has a generally semi-circular shape.

8. The assembly of claim **1**, wherein the plastic base cup is formed from a recyclable plastic material and includes a symbol indicating recyclability.

9. The assembly of claim **1**, wherein the plastic base cup has a weight of about 3.0±0.6 grams.

10. The assembly of claim **1**, wherein the plastic base cup has a capacity of about 9.7 fl. oz.

11. The assembly of claim **1**, wherein the plastic container includes a ring and an inner radial wall segment of the ring that is offset outwardly from an inner radial wall segment of the upper segment.

12. The assembly of claim **11**, wherein the offset is at least 0.90 mm.

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