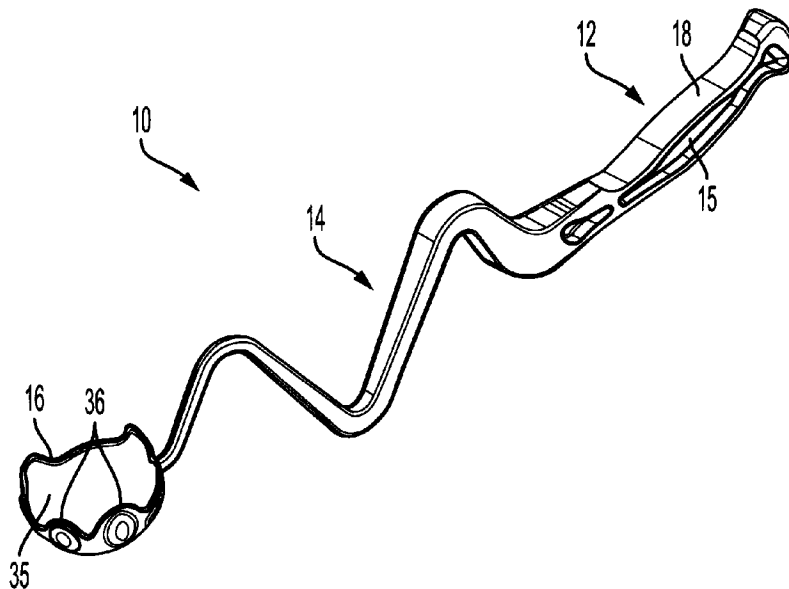




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 (54) Title: BALL THROWING DEVICE



(57) Abrégé/Abstract:

A ball throwing device including a lower handle portion, a middle lever portion, and a head portion. The middle lever portion may include a plurality of latitudinal bends positioned between the lower handle portion and the head portion. Additionally and/or alternatively, the head portion may include a half-spherical cup configured to releasably retain a ball, the half-spherical cup having a plurality of edge lobes configured to flex over an outside diameter of the ball.

## ABSTRACT

A ball throwing device including a lower handle portion, a middle lever portion, and a head portion. The middle lever portion may include a plurality of latitudinal bends positioned between the lower handle portion and the head portion. Additionally and/or alternatively, the head portion may include a half-spherical cup configured to releasably retain a ball, the half-spherical cup having a plurality of edge lobes configured to flex over an outside diameter of the ball.

# BALL THROWING DEVICE

## RELATED APPLICATIONS AND CLAIM OF PRIORITY

**[0001]** This patent document claims priority to U.S. Provisional Patent Application No. 62/824,469, filed March 27, 2019.

## FIELD OF THE INVENTION

**[0002]** The present disclosure relates generally to throwing devices and, more particularly, to ball throwing devices having a lever with a plurality of latitudinal bends for increased strength, efficiency, and energy.

## BACKGROUND

**[0003]** Ball throwing devices have long been used for play with pets, sports training, etc. Many of these throwing devices utilize an elongated, slightly-curvilinear lever arm having a handle portion at a proximal end and a ball attachment cup a distal end. Due to the elongated nature of the lever arm, the throwing device becomes an extension of the user's own arm, enabling the user to throw the ball a greater distance and/or at a greater speed without the need for increased speed or power on their conventional throwing motion.

**[0004]** However, in conventional throwing devices, the throwing distance of the ball is in direct relation to the length of the elongated lever arm. Thus, in order for the user to achieve greater throwing distances, they may need to purchase throwing devices having long lever arms, which are inconvenient to transport and more difficult to control.

**[0005]** Accordingly, devices that are intended to address the issues discussed above and/or other issues are disclosed herein.

## SUMMARY

**[0006]** In accordance with one aspect of the disclosure, a ball throwing device is disclosed. The ball throwing device may include a lower handle portion, a middle lever portion, and a head portion. The middle lever portion may include a plurality of latitudinal bends. The plurality of latitudinal bends may be positioned between the lower handle portion and the head portion.

**[0007]** A ball throwing device in accordance with another aspect of the disclosure is disclosed. The ball throwing device may include a lower handle portion, a middle lever portion, and a head portion. The head portion may include a half-spherical cup. The half-spherical cup may be configured to releasably retain a ball. The half-spherical cup may also include a plurality of edge lobes configured to flex over an outside diameter of the ball.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0008]** FIG. 1 is a bottom perspective view of the ball throwing device in accordance with an aspect of the disclosure;

**[0009]** FIG. 2 is a top perspective view of the ball throwing device of FIG. 1;

**[0010]** FIG. 3 is a front elevation view of the ball throwing device of FIG. 1;

**[0011]** FIG. 4 is a side elevation view of the ball throwing device of FIG. 1;

**[0012]** FIG. 5A is a cross section view of the ball throwing device of FIG. 4 at point A-A;

**[0013]** FIG. 5B is a cross section view of the ball throwing device of FIG. 4 at point B-B;

**[0014]** FIG. 5C is a cross section view of the ball throwing device of FIG. 4 at point C-C;

**[0015]** FIG. 6 is a top perspective view of the head of the ball throwing device holding a ball in accordance with an aspect of the disclosure; and

**[0016]** FIG. 7 is a bottom perspective view of the head of the ball throwing device holding a ball in accordance with an aspect of the disclosure.

#### DETAILED DESCRIPTION

**[0017]** The following description is made for the purpose of illustrating the general principles of the present apparatus and is not meant to limit the inventive concepts claimed in this document. Further, particular features described in this document can be used in combination with other described features in each of the various possible combinations and permutations.

**[0018]** Unless otherwise specifically defined in this document, all terms are to be given their broadest possible interpretation including meanings implied from the specification as well as meanings understood by those skilled in the art and/or as defined in dictionaries, treatises, etc.

**[0019]** It must also be noted that, as used in the specification and the appended claims, the singular forms "a," "an" and "the" include plural referents unless otherwise specified. Unless defined otherwise, all technical and scientific terms used herein have the same meanings as commonly understood by one of ordinary skill in the art. Nothing in this document is to be construed as an admission that the embodiments described in this document are not entitled to antedate such disclosure by virtue of prior invention. As used herein, the term "comprising" means "including, but not limited to". Additionally, use the term "couple", "coupled", or "coupled to" may imply that two or more elements may be directly connected or may be indirectly coupled through one or more intervening elements.

**[0020]** In this document, position-identifying terms such as "vertical", "horizontal", "front", "rear", "side", "top", and "bottom" are not intended to limit the invention to a particular direction or orientation, but instead are only intended to denote relative positions, or positions corresponding to directions shown when a ball throwing device is oriented as shown in the Figures.

**[0021]** Referring to FIGS. 1-4, a ball throwing device **10** in accordance with an aspect of the disclosure is illustrated. Ball throwing device **10** includes an integral lower handle portion **12**,

a middle lever portion **14**, and a head portion **16**. As is shown in FIGS. 1-7, head portion **16** may be configured as a substantially half-spherical cup, as will be described in further detail below. In some embodiments, ball throwing device **10** is formed of a flexible, high-impact plastic material capable of returning to shape when bent such as, e.g., polypropylene, nylon, polycarbonate, etc. However, it is to be understood that ball throwing device **10** may be formed of any appropriate material or combination of materials.

**[0022]** The lower handle portion **12** includes an upper handle segment **17** and a lower handle segment **18**. In some embodiments, both upper handle segment **17** and lower handle segment **18** are individual components formed of a thermoplastic elastomer (TPE) and over-molded onto the lower handle portion **12** of the ball throwing device **10**, with upper handle segment **17** and lower handle segment **18** being contoured and shaped so as to provide an ergonomically pleasing grip for a user's hand. Additionally, the TPE used to mold the upper handle segment **17** and lower handle segment **18** may serve to provide a comfortable, non-slip grip of the ball throwing device **10**. In some embodiments, the length of the lower handle portion **12** may range from 3 to 6 inches. Furthermore, in some embodiments, lower handle portion **12** may include recessed pockets **15** one or both sides, which may reduce the weight of the ball throwing device **10** and enable the ball throwing device **10** to be manufactured with less material.

**[0023]** Referring still to FIGS. 1-4, the middle lever portion **14** of the ball throwing device **10** extends from the lower handle portion **12**. Middle lever portion **14** may include a rectangular cross-section **20** which reduces in area as it nears the head portion **16**, as shown in FIGS. 5A-5C. For improved strength and rigidity, the longer end of the rectangular cross-section **20** may be positioned latitudinally in-line with the overall length of the ball throwing device **10**.

**[0024]** As is shown in FIG. 4, a plurality of latitudinal bends are provided along the length of middle lever portion **14**. A first latitudinal bend **22** that begins to define the middle lever portion **14** profile may be located just above the lower handle portion **12**. In some embodiments, the angle of the first latitudinal bend **22** may range from, e.g., 30 to 60 degrees,

and may include a radius **23** that provides strength and enables the middle lever portion **14** to flex along the first latitudinal bend **22** while still retaining memory of the starting angle.

**[0025]** A second latitudinal bend **24** that continues to define the middle lever portion **14** profile may be located, e.g., 1 to 3 inches in distance from the first latitudinal bend **22**. In some embodiments, the angle of the second latitudinal bend **24** may range from, e.g., 10 to 50 degrees, and may include a radius **25** that also provides strength and allows the middle lever portion **14** to flex along the second latitudinal bend **24** but retain memory of the starting angle.

**[0026]** The middle lever portion **14** profile may extend from the second latitudinal bend **24** a distance of, e.g., 3 to 6 inches to a third latitudinal bend **26**. The angle of the third latitudinal bend **26** may range from, e.g., 10 to 50 degrees, and may include a radius **27** that, like radius **23** and radius **25**, provides strength and allows the middle lever portion **14** to flex along the third latitudinal bend **26** while retaining memory of the starting angle.

**[0027]** The middle lever portion **14** profile may also extend from the third latitudinal bend **26** a distance of, e.g., 3 to 6 inches to a fourth latitudinal bend **28**. The angle of the fourth latitudinal bend **28** may range from, e.g., 10 to 50 degrees, and may include a radius **29** that may provide increased strength and allow the middle lever portion **14** to flex along the fourth latitudinal bend **28** while retaining memory of the starting angle.

**[0028]** Additionally, the middle lever portion **14** profile may extend from the fourth latitudinal bend **28** a distances of, e.g., 1 to 3 inches to a fifth latitudinal bend **30**. The fifth latitudinal bend **30** may range from, e.g., 30 to 60 degrees, and may be configured to adjust the profile of the middle lever portion **14** so that the angle of a longitudinal axis **31** of the lower handle portion **12** is perpendicular to an axis **33** of the head portion **16**. As with the other latitudinal bends described above, the fifth latitudinal bend **30** may include a radius **37** that provides strength and allows the middle lever portion **14** to flex along the bend but retain memory of the starting angle.

**[0029]** As the radii at each consecutive angle of the middle lever portion **14** flex and return to their original shape, the cumulative movement may provide additional energy to the ball throwing device **10** that has traditionally been achieved by increasing length of the middle

lever portion. The overall length of the middle lever portion **14** may measure, e.g., 8 to 16 inches from the end of the lower handle portion **12** to the head portion **16**, which is significantly shorter than many devices designed for long-distance ball throwing. In this way, ball throwing device **10** is capable of throwing a ball longer distances due to the curving, spring-like profiles of the latitudinal bends, as opposed to simply relying upon an elongated overall length of a lever arm, as has been done previously.

**[0030]** While FIGS. 1-4 illustrate middle lever portion **14** as having five latitudinal bends, it is to be understood that the ball throwing device **10** may utilize more or fewer latitudinal bends in accordance with the disclosure. Additionally, the latitudinal bends may vary in angular range as opposed to that which is described above with respect to FIGS. 1-4.

**[0031]** Next, referring to FIGS. 6-7, the head portion **16** is integrally formed to the middle lever portion **14**. For added strength and resistance to wear over time, reinforcement gussets **32** may be provided at or near the location where the middle lever portion **14** integrally connects to the head portion **16**. In some embodiments, the inside diameter of the substantially half-spherical head portion **16** is sized to receive a ball **34** via an open end **35**. The ball **34** may be, e.g., a standard tennis ball. However, it is to be understood that head portion **16** may be sized to fit balls larger or smaller than a standard tennis ball.

**[0032]** Referring still to FIGS. 6-7, a series of edge lobes **36** extend from the inside diameter of the open end **35** of half-spherical head portion **16**. One or more of the edge lobes **36** may extend slightly past center, which may aid in containing the ball **34** within the head portion **16**. The edge lobes **36** are configured to flex over the outside diameter of the ball **34**, allowing the ball **34** to be contained and held in place. Additionally and/or alternatively, while not shown in FIGS. 1-7, it is to be understood that the head portion **16** may further include one or more slots formed along a radial surface of the head portion **16**. The one or more slots may extend any appropriate distance (e.g., 1 inch, 1.5 inches, etc.), terminating, for example, at one or more locations between edge lobes **36**. The one or more slots may provide for additional flex in the head portion **16** when a ball **34** is secured therein, allowing for head portion **16** to more loosely grip the ball **34**, while still allowing the head portion **16** to flex over the outside of the ball **34**, thereby holding the ball **34** in place.

[0033] During use, the user may swing the ball throwing device 10 in a back-to-forward direction along its longitudinal axis, abruptly stopping the throwing motion when the open end 35 of head portion 16 is facing forward. Accordingly, as described above, the energy of the middle lever portion 14 is released into the ball 34, effectively propelling ball 34 through the air with more force that is possible when throwing the ball by hand and/or by a substantially-straight or slightly curvilinear ball throwing device of a similar length.

[0034] The descriptions of the various embodiments of the present disclosure have been presented for purposes of illustration, but are not intended to be exhaustive or limited to the embodiments disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope and spirit of the disclosure. The terminology used herein was chosen to best explain the principles of the embodiment, the practical application or technical improvement over technologies found in the marketplace, or to enable others of ordinary skill in the art to understand the embodiments disclosed herein.

**CLAIMS:**

1. A ball throwing device comprising:

a lower handle portion;

a middle lever portion; and

a head portion,

wherein the head portion comprises a half-spherical cup configured to releasably retain a ball, the half-spherical cup having a plurality of edge lobes configured to flex over an outside diameter of the ball,

wherein:

the middle lever portion comprises a plurality of latitudinal bends positioned between the lower handle portion and the head portion and comprises a first latitudinal bend, a second latitudinal bend, a third latitudinal bend, a fourth latitudinal bend, and a fifth latitudinal bend;

the angle of each of the first and fifth latitudinal bends is between 30 and 60 degrees; and

the angle of each of the second, third, and fourth latitudinal bends is between 10 and 50 degrees.

2. The ball throwing device of claim 1, wherein one or more of the lower handle portion, the middle lever portion, and the head portion are formed of polypropylene, nylon, or polycarbonate.

3. The ball throwing device of claim 1 or 2, wherein the lower handle portion further comprises an upper handle segment and a lower handle segment to form a grip for a user of the ball throwing device.

4. The ball throwing device of claim 3, wherein the upper handle segment and the lower handle segment are formed of a thermoplastic elastomer.
5. The ball throwing device of any one of claims 1 to 4, wherein the lower handle portion further comprises one or more recessed pockets.
6. The ball throwing device of any one of claims 1 to 5, wherein a rectangular cross-section of the middle lever portion reduces in area between the lower handle portion and the head portion.
7. The ball throwing device of any one of claims 1 to 6, further comprising one or more reinforcement gussets positioned between the middle lever portion and the head portion.
8. The ball throwing device of any one of claims 1 to 7, wherein the half-spherical cup further comprises one or more slots formed along a radial surface thereof.

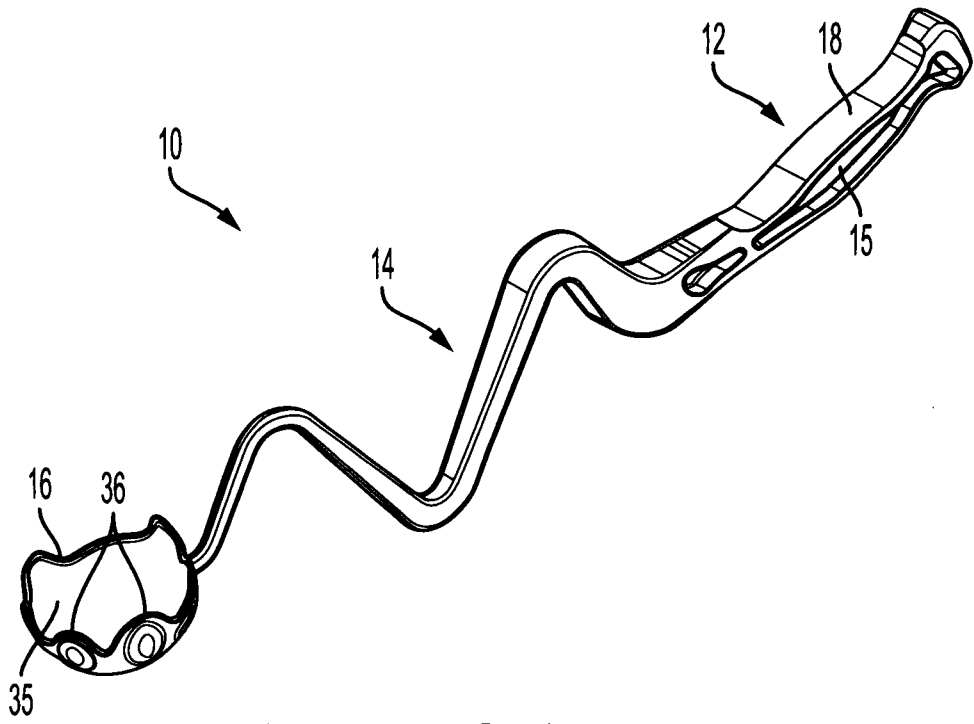


FIG. 1

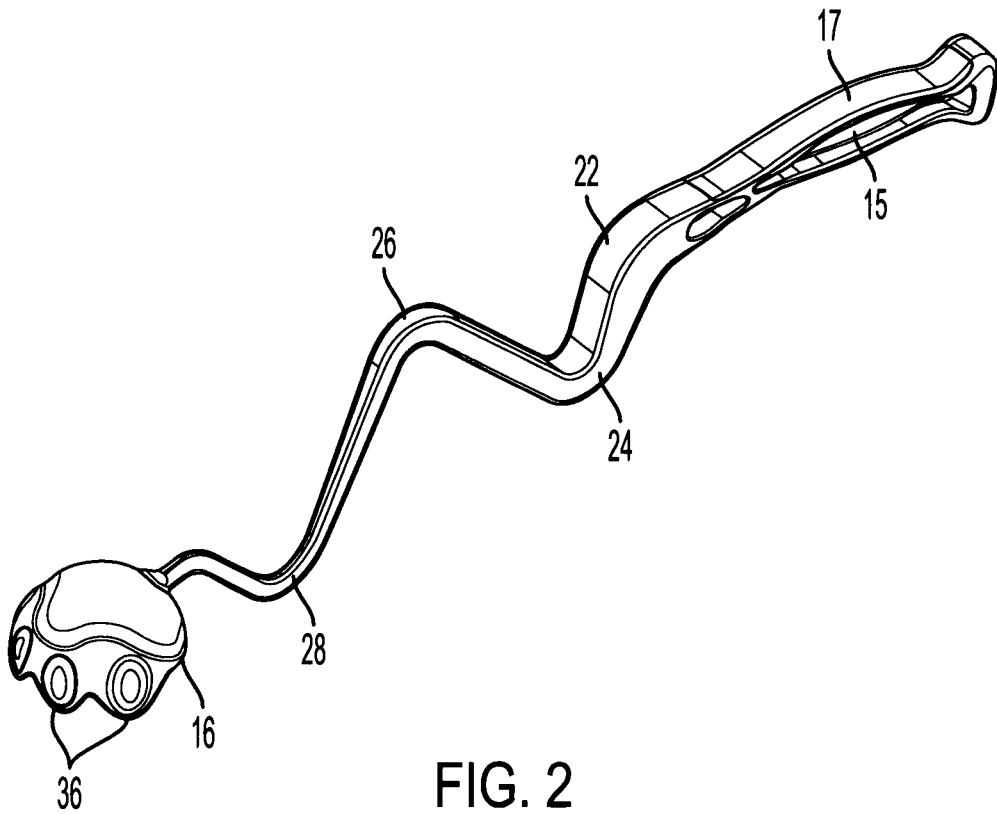


FIG. 2

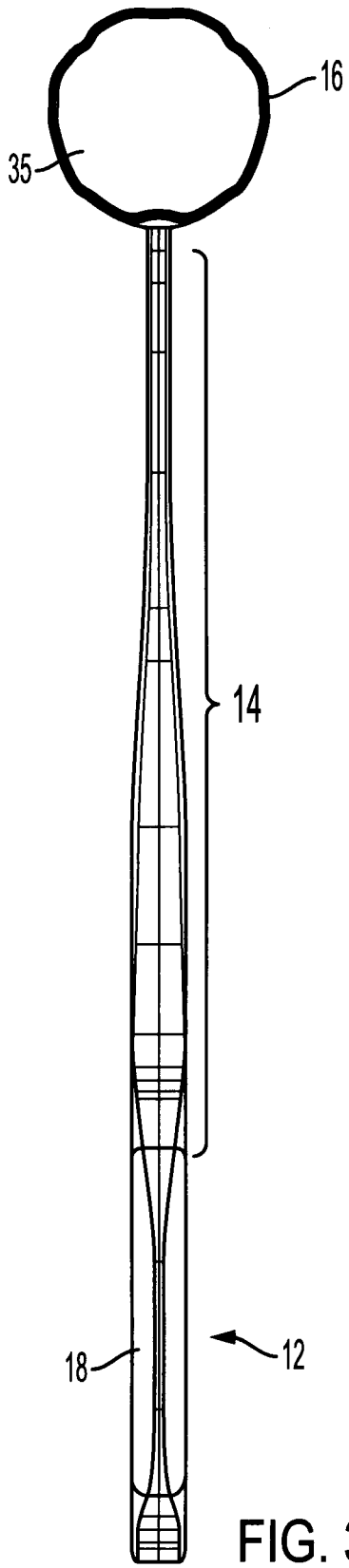


FIG. 3

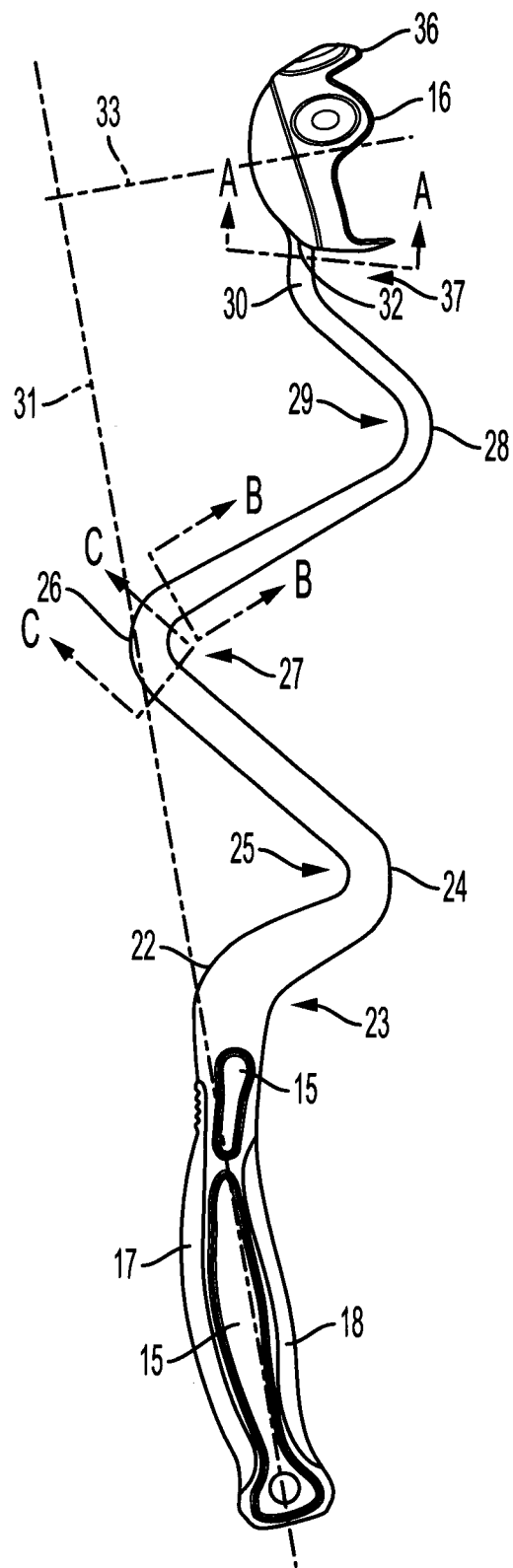


FIG. 4

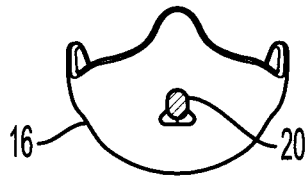


FIG. 5A

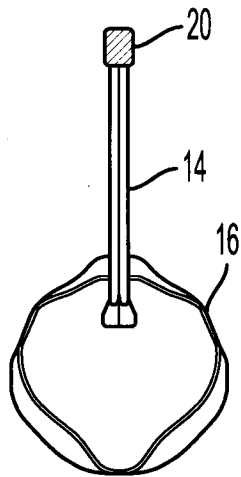


FIG. 5B

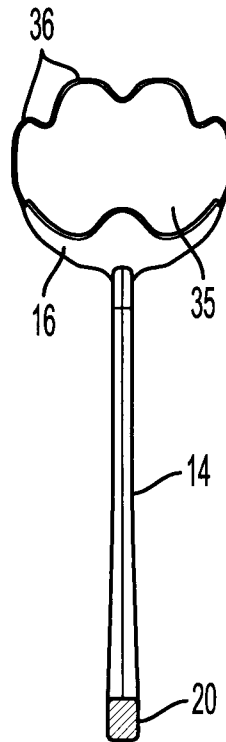


FIG. 5C

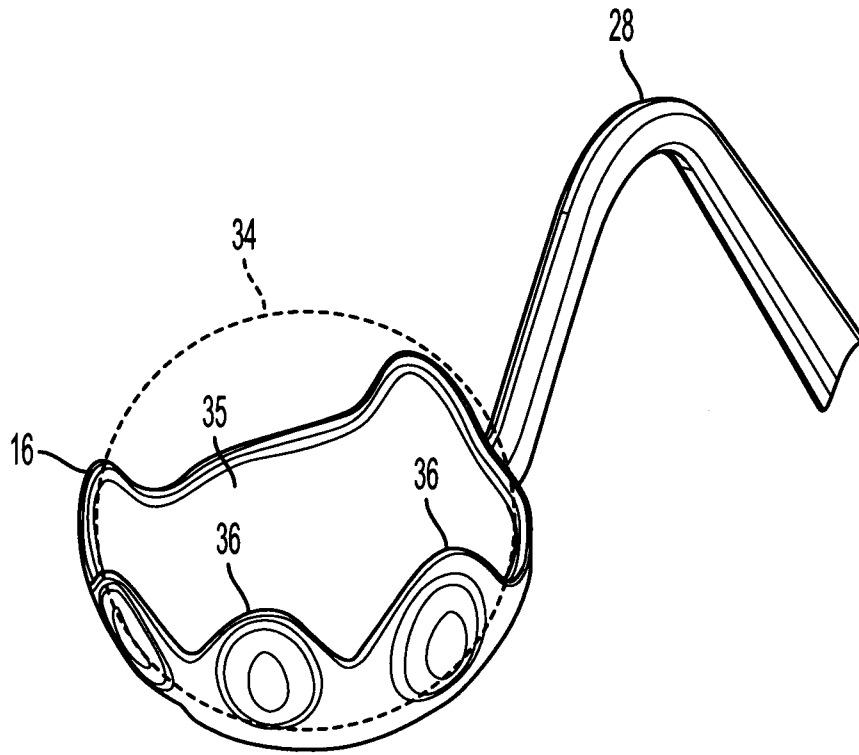


FIG. 6

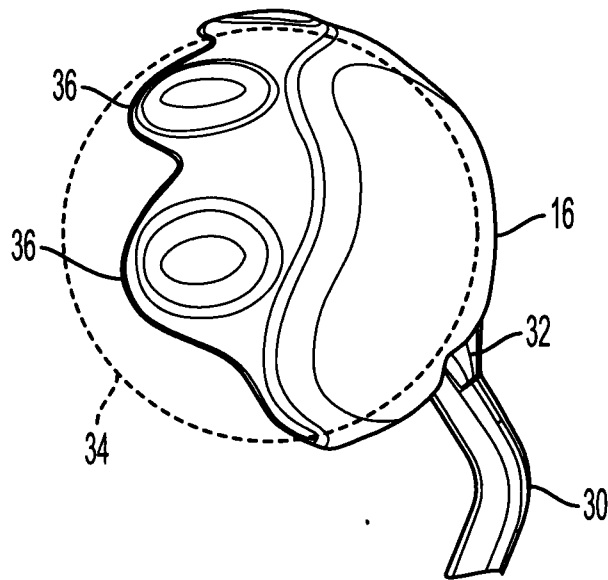


FIG. 7

