(CONVENTION. By one or more persons and/or a Company.) Form 4

609272

COMMONWEALTH OF AUSTRALIA

Patents Act 1952-1969

CONVENTION APPLICATION FOR A PATENT

(1) Here insert (in full) Name or Names of Applicant or Applicants, followed by Address (es).

I/~~We~~ (1) PRESSERS INTERNATIONAL PRODUCTS INC.,
of 5510 Ambler Drive, Unit 2,
Mississauga, Ontario, Canada, L4W 2VI/

(2) Here insert Title of Invention.

hereby apply for the grant of a Patent for an invention entitled: (2)
BALL WITH SWINGABLE INTERNAL WEIGHT

(3) Here insert number(s) of basic application(s)

which is described in the accompanying complete specification. This application is a Convention application and is based on the application numbered (3)
562.984

(4) Here insert Name of basic Country or Countries, and basic date or dates

for a patent or similar protection made in (4) Canada on
30th March, 1988.

APPLICATION ACCEPTED AND AMENDMENTS ALLOWED 31.1.91

~~My~~/Our address for service is Messrs. Edwd. Waters & Sons, Patent Attorneys, 50 Queen Street, Melbourne, Victoria, Australia.

DATED this 28th day of March, 19 89

(5) Signature (s) of Applicant (s) or Seal of Company and Signatures of its Officers as prescribed by its Articles of Association.

(5)

PRESSERS INTERNATIONAL PRODUCTS INC.
By:
Stephen K. Plymin
Registered Patent Attorney

M007 29/03/89

COMMONWEALTH OF AUSTRALIA

THE PATENTS ACT 1952

DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT

AUSTRALIA CONVENTION STANDARD & PETTY PATENT DECLARATION SFP4

In support of the Convention Application made for a patent for an invention entitled:

Title of Invention

BALL WITH SWINGABLE INTERNAL WEIGHT

Full name(s) and address(es) of Declarant(s)

I/~~We~~ Gordon K. Russell

of 1 Richview Road, Apt. 1101
Islington, Ontario, CANADA M9A 4M6

do solemnly and sincerely declare as follows:-

Full name(s) of Applicant(s)

~~1. I am/We are the applicant(s) for the patent (or, in the case of an application by a body corporate)~~

1. I am/~~We~~ are authorised by

Pressers International Products Incorporated

the applicant(~~s~~) for the patent to make this declaration on its/~~their~~ behalf.

2. The basic application(~~s~~) as defined by Section 141 of the Act was/~~were~~ made

Basic Country(ies) in CANADA

Priority Date(s) on March 30, 1988

Basic Applicant(s) by Pressers International Products Incorporated

~~3. I am/We are the actual inventor(s) of the invention referred to in the basic application(s) (for where a person other than the inventor is the applicant)~~

Full name(s) and address(es) of inventor(s)

3. Gordon K. Russell

of 1 Richview Road, Apt. 1101
Islington, Ontario, CANADA M9A 4M6

(respectively)

is/~~are~~ the actual inventor(~~s~~) of the invention and the facts upon which the applicant(~~s~~) is/~~are~~ entitled to make the application are as follows:

Set out how Applicant(s) derive title from actual inventor(s) e.g. The Applicant(s) is/are the assignee(s) of the invention from the inventor(s)

The applicant is the assignee of the invention from the inventor.

4. The basic application(s) referred to in paragraph 2 of this Declaration was/were the first application(s) made in a Convention country in respect of the invention(s) the subject of the application.

Declared at Toronto CANADA this 28th day of April 1989

Gordon K. Russell

Signature of Declarant(s)

SFP4 To: The Commissioner of Patents 11/81

(12) PATENT ABRIDGMENT (11) Document No. AU-B-31771/89
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No 609272

(54) Title
BALL WITH SWINGABLE INTERNATIONAL WEIGHT

International Patent Classification(s)
(51)[4] **A63B 043/04** **A63B 041/04**

(21) Application No. : **31771/89** (22) Application Date : **29.03.89**

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562984	**30.03.88**	**CA CANADA**

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(56) Prior Art Documents
US 2635387
US 4609196
US 4448418

(57) Claim

1. A ball comprising an outer chamber having an outer skin and a first centre of volume, and an inner chamber, the inner chamber being substantially smaller than the outer chamber and being contained therein, the inner chamber having a second center of volume displaced from said first center of volume, the inner chamber having a body portion and a neck portion, the neck portion extending between the body portion and the outer skin, the neck portion being the only connection between said inner and outer chambers and being flexible for permitting said inner chamber to swing back and forth within said outer chamber about said connection between said inner and outer chambers when said ball is in use, said outer chamber containing air and said inner

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chamber containing a selected amount of a medium much denser than air, whereby said ball has eccentric and unpredictable flight characteristics in use.

8. The ball of claim 1 wherein said outer chamber is inflatable, generally spherical and includes a first resealable orifice and said inner chamber includes a second resealable orifice located in said outer skin of said outer chamber, said inner chamber comprising a bulbous body portion and a hollow flexible tubular neck, said inner chamber being attached to said outer skin at said second resealable orifice by said flexible neck, wherein the amount of said denser medium in said inner chamber is adjustable through said second resealable orifice.

609272

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952-69

Form 10

COMPLETE SPECIFICATION

(ORIGINAL)

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Application Number: 31771/89
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Related Art :

Name of Applicant : PRESSERS INTERNATIONAL PRODUCTS INC.

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50 QUEEN STREET, MELBOURNE, AUSTRALIA, 3000.

Complete Specification for the invention entitled:

BALL WITH SWINGABLE INTERNATIONAL WEIGHT

The following statement is a full description of this invention, including the best method of performing it known to :- us

FIELD OF THE INVENTION

This is a continuation of United States patent application S.N. 175,979 filed 04/01/88, allowed as amended.

This invention relates to a ball, and in particular to an inflatable ball of the type that is used as a toy, for recreational purposes. This particular invention relates to an inflatable ball that is capable of having eccentric and unpredictable flight characteristics to enhance the excitement of playing with the ball.

BACKGROUND OF THE INVENTION

Balls, and in particular inflatable balls, are known and have been used extensively as a toy for the playing of various games, such as catch, soccer, volleyball and the like. Such balls are typically constructed in such a manner that their bounce and flight characteristics are those of a perfectly symmetrical sphere; actions and reactions involving such balls are predictable.

However, in order to increase the excitement and pleasure of various such ball games, attempts have been made in the past to develop balls that have eccentric and unpredictable flight and bounce characteristics.

For example, in CCCP patent no. 704,632 dated 25.12.79 entitled PLAYBALL, there is disclosed a ball which has two chambers, a main and additional chamber, the latter containing a weight to create a rapid play situation variation when the ball is in use.

Essentially, the ball of patent 704,632, is one having an outer cover, surrounding the two adjacent chambers. The main chamber is relatively larger than the other chamber. In the smaller chamber a weight is attached by a rubber plate to the inside surface of the smaller chamber, adjacent the larger chamber. Each of the main and smaller chambers may be inflated by separate nipples which extend through the outer cover.

Another ball is disclosed in German patent 829,109 dated January 21, 1952, entitled AIR FILLED THIN WALLED GAME BALL which suggests suspending a weight, by means of three chords or tapes inside of an air filled ball. In this device there is only one inflatable chamber. The patent suggests that the weight can be eccentrically suspended in the chamber, so there is no control over the bounce (ie the bounce is unpredictable).

However, there are a number of undesireable limitations associated with each of

the two above discussed balls. In each case, the weight is fixed inside the ball, and is not removeable without destroying the ball. In other words, such balls can only be used in the eccentric bounce and flight modes. Further, the ball of patent 704,632 requires two inner chambers, and an outer covering, as well as the weight and rubber securing flap for the weight. This is a large number of components which makes the ball awkward and expensive to manufacture. Also, the construction of the ball of German patent 829,109 is hazardous, as the attachment of the tapes or chords to the inner surface of the ball will create points of high stress when the ball is in use, increasing the likelihood that the ball would tear at such points and subsequently deflate.

What is desired, is a ball which is simple and inexpensive to manufacture, and which can be used in a regular way, as an ordinary playing ball, or if desired as an eccentrically weighted ball having unpredictable bounce and flight characteristics. What is also desired, is a ball having a secure construction, which will stand up to the rigours of hardy play. Such a ball would preferably provide for a limited degree of freedom for any eccentric weighting means, to further add to the unpredictable and exciting flight and bounce characteristics.

BRIEF SUMMARY OF THE INVENTION

According to the present invention there is disclosed a ball comprising an outer chamber having an outer skin and a first center of volume, and an inner chamber, the inner chamber being substantially smaller than the outer chamber and being contained therein, the inner chamber having a second center of volume displaced from said first center of volume, the inner chamber having a body portion and a neck portion, the neck portion extending between the body portion and the outer skin, the neck portion being the only connection between said inner and outer chambers and being flexible for permitting said inner chamber to swing back and forth within said outer chamber about said connection between said inner and outer chambers when said ball is in use, said outer chamber containing air and said inner chamber containing a selected amount of a medium much denser than air, whereby said ball has eccentric and unpredictable flight characteristics.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an isometric view of an inflatable ball according to the present invention;

Fig. 2 is a view in the direction of arrow 2 of a portion of the ball of Fig. 1;

Fig. 3 is an enlarged view in part section of another portion of the ball of Fig. 1 showing an outer inflatable chamber and an inner fillable chamber;

Fig. 4 is a view showing the inner fillable chamber in more detail.

Referring to Fig. 1, there is shown an inflatable ball according to the present invention and indicated generally at 10. The inflatable ball 10 is formed from an outer inflatable chamber 14 comprising a first sealable orifice 16 and an outer skin 18. An inner fillable chamber 20 is also shown having a second sealable orifice 22. The second sealable orifice 22 is located in the outer skin 18 of the outer inflatable chamber 14.

As is apparent from Figure 1, the inner fillable chamber 20 is substantially smaller than the outer inflatable chamber 14 and is contained therein. The inner fillable chamber 20 is located generally adjacent the outer skin 18 of the outer inflatable chamber 14 and is attached to the outer skin 14 at the second sealable orifice 22. The outer skin 18 of the outer inflatable chamber 12

is integrally formed, with the exception of the first and second sealable orifices 16, 22. Similarly the inner fillable chamber 20 consists of an integral inner skin 24. The inner fillable chamber 20 includes a bulbous body portion 26 and a neck portion 28. The neck portion extends between the bulbous body portion 26 and the second sealable orifice 22.

In the preferred embodiment, as depicted in Fig. 1, the outer inflatable chamber 18 is generally spherical, and has a first center of volume, indicated at 29. The inner fillable chamber 20, may be of any shape, although for ease of construction the bulbous body portion 26 with the neck portion 28 is preferred. The inner fillable chamber 20 has a second center of volume 21, as shown. As will be appreciated from Fig. 1, the first center of volume 29 is distant from the second center of volume 21; in other words, the inner fillable chamber 20 is not co-centric with the outer inflatable chamber 18.

Also, in the preferred embodiment, the first sealable orifice 16 is located diametrically opposite the second sealable orifice 22. It will be appreciated by those skilled in the art that it is not necessary to locate the first and second sealable orifices 16, 22 in this manner, but it is

preferrable, for the reasons described below. The outer skin 18 of the inflatable ball 10 is formed from a plurality of panels, indicated as 30, which are fastened along each side edge 31 of adjacent panels 30 to form the generally spherical outer inflatable chamber 14. The side edges preferrably follow great circles which pass through poles centered on first and second sealable orifices 16, 22. The panels can be fastened by any suitable means such as thermal welding.

It has been found that 8 millimeter thick polyvinyl plastic is appropriate for the outer skin 18. This gauge of plastic is also suitable for the integral inner skin 24 of inner fillable chamber 20. This type of plastic is suitable because it is soft and flexible, as well as being slightly elastic. However, it will be appreciated that the elastic properties of the inner skin 24 cannot be such as to allow the inner skin 24 to expand to fill the outer inflatable chamber 12, because this would cause the first center of volume 29 to become co-centric with the second center of volume 21, which is undesirable.

Referring to Figure 2, a close up of the first sealable orifice 16 is shown. As shown, there is an outer reinforcing plate 32 which has a valve structure 34 located at its middle. The

valve structure includes a generally conical base 36 and a first tubular portion 38. A first plug 40 is dimensioned to be snuggly received within the inner diameter of the first tubular portion 38. To assist in the fit, the first plug 40 may include a hollowed out channel 42. The first plug 40 may also be attached the valve structure by a retaining flap 44. A lifting extension 46 of the retaining flap 44 provides an easy gripping surface whereby the first plug 40 can be removed from the first tubular portion 38. The outer reinforcing plate 32 and the valve structure 34 are centered over the joined points of the panels 30. The outer reinforcing plate 32 therefore provides, in addition to a base for the valve structure 34, a reinforcement of the closely spaced joints converging at the location of the valve structure 34 of the panels 30. The outer reinforcing plate can be attached to the outer skin 18 in any suitable manner such as gluing or thermal welding.

It will be appreciated that upon insertion of the plug 40 into the tubular portion 38, an airtight seal will be formed. However, to prevent the plug 40 from being accidentally removed, during play, the valve structure can be pushed into the ball. This is accomplished by causing the conical base 36 to invert. This

results in the valve structure 34 being substantially flush with the outer skin 18 of the ball 10.

Turning to Figure 3 there is shown a close up of the second sealable orifice 22 in part section. Again, an outer reinforcing plate 50 is provided for a valve structure 52. However, the valve structure 52 is somewhat differently configured than the valve structure 34.

As shown in Figure 3, the valve structure 52 includes an inwardly projecting second tubular portion 54 having an outer flange 56 which lies adjacent to the reinforcing plate 50. A retaining flap 58 is formed in the flange 56 to which is attached a second plug 60. The second plug 60 is generally cylindrical and is designed to snuggly fit within the second tubular portion 54.

Located on the inner surface of second tubular portion 54 are inwardly projecting ridges 62. Located on the second plug 60 is an outwardly projecting ridge 64. The second plug 60 may also have a hollow channel 66 formed therein to assist in a snug fit between the plug 60 and the tubular portion 54. When it is desired to seal the second sealable orifice 22, the second plug 60 is inserted into the second tubular portion 54 in the

manner indicated by arrow 68. The ridge 64 passes by one or both ridges 62 thereby securely locking the second plug 60 in place. The mating locking ridges 62, 64 form a means for locking the second plug 60 securely within the second tubular portion 54.

Also shown in Figure 3 is a lifting extension 70 having a tab 72. Upon insertion of the second plug 60 fully into the second tubular portion 54, the retaining flap 58 rests against the flange 56 as shown in Figure 1. To enable the second plug 60 to be easily removed from the second tubular portion 54, the tab 72 is provided so that the lifting extension 70 is spaced apart somewhat from the flange 56. It will be appreciated by those skilled in the art that the components of the valve structure 52 can be integrally formed from a mouldable plastic. The mouldable plastic is preferrably flexible, but has a sufficient memory to accomplish the locking described above.

As shown in Figure 4, the inner fillable chamber 20 includes a flared top portion 80 attached to the neck portion 28. Flared top portion 80 includes generally circular lips 82. The inner fillable chamber may be a flat formed member, which expands to a more rounded shape upon

being filled with a denser medium, as described below. It may be moulded in one piece or it may be formed from a number of pieces, attached together to form the integral skin 24.

Referring back to Figure 3, the construction of the second sealable orifice 22 can now be understood. The outer skin 18 forms the inner most layer as indicated in Figure 3. The next outer layer is the lips 82 of the flared top 80 of the inner fillable chamber 20. The next outer layer is the reinforcing plate 50. The final outer layer is the flange 56 of the valve structure 52. All of these layers can be secured together by appropriate bonding, such as by gluing or thermal welding or the like. It will be appreciated by those skilled in the art that the location of the second sealable orifice strengthens the confluence of the points of the panels 30 which form the outer skin 18. Therefore, it will now be appreciated why it is preferrable to locate the sealable orifices 16, 22 diametrically opposite, namely, to reinforce the two weakest portions of the inflatable ball 10, where the points of the panels 30 meet.

It can now be appreciated how the inflatable ball 10 of the present invention may be used. In one mode, the inflatable ball 10 operates

as an ordinary inflatable ball. The inflatable ball 10 would be inflated by blowing through the first sealable orifice 16. Provided the second sealable orifice 22 was open, the pressure inside the outer skin 18, created by inflating the ball 10, would cause any air or other material in the inner inflatable chamber 20 to be expelled out of the second sealable orifice 22. When the inflatable ball was inflated to the desired pressure, the first sealable orifice 16 can be sealed, in the manner described above by inserting the first plug 40 into first tubular portion 38, then the second sealable orifice 22 can be sealed by inserting the second plug 60 into second tubular portion 54, and the ball is ready for use. Because the inner fillable chamber 20 has been emptied, the ball acts as an ordinary ball having predictable flight and bounce characteristics.

Alternatively, in another mode, the inflatable ball 10 can be used as a ball having exciting and eccentric bounce and flight characteristics. In this mode, one would need to start with ambient pressure in the outer inflatable chamber 12. This would be accomplished by removing the first plug 40 from the first tubular portion 38 of the first sealable orifice 16. Then, the second sealable orifice 22 can be opened, by pulling on the lifting extension 70 to

pull second plug 60 out of the second tubular portion 54. Then, the inner fillable chamber 20 could be filled with any desired medium having a density greater than air. Examples of such media would be water, sand, or even dirt, depending upon what was readily available. However, water would be preferrable. Upon filling the inner fillable chamber 20 with for example water the second sealable orifice 22 can then be sealed in the manner described above. Then, the outer inflatable chamber 12 can be inflated and the first sealable orifice sealed.

In this mode, the ball 10 will have eccentric and unpredictable flight characteristics. It will tend to gyrate wildly about its centre of gravity, which will be located relatively near the second center of volume 21 by reason of the denser medium filling the inner fillable chamber 20. In this manner, the center of gravity of the ball 10 will not be at the first center of volume 29, which will cause the ball 10 to gyrate eccentrically when in use. In addition, the flexible neck portion 28 of the inner fillable chamber 20 allows the centre of gravity to gyrate somewhat even in the ball 10. This will further add to the eccentric flight characteristics. In this manner an unpredictable and interesting ball can be used to play any traditional games such as soccer, volleyball and the like.

It will now be appreciated why the means for locking the second sealable orifice 22, comprising the locking ridges 62, 64 is provided. Because the inner fillable chamber 22 is filled with a relatively denser medium than air, there will be greater stresses on the valve structure 52. Further, in the case of the inner fillable chamber being filled with an incompressible fluid, such as water, a blow to the inner fillable chamber, as may be expected to happen when the ball is in use, will create considerable pressure outwardly on the plug 60. The locking means is to inhibit any unwanted unsealing of the plug 60 from the tubular portion 62.

It has been found that satisfactory results are obtained where the volume of the inner fillable chamber 20 is 8 fluid ounces for a 20" diameter ball 10. Also, a 10 fluid ounce inner fillable chamber 20 yields satisfactory results for a 24" diameter ball 10. Of course, variations in the volume proportion can be made, providing that the inner fillable chamber 20 does not become so large or so small as to eliminate the variable and eccentric bounce and flight characteristics of the ball 10.

It will be of course be appreciated that the preceding description relates to a particular

preferred embodiment of the invention and that many modificiations are possible within the broad scope of the invention. Some of those modifications have been indicated above and others will be apparent to a person skilled in the art. For example, while the invention is defined in reference to a ball having two valves diametrically opposed, there is no limitation to this particular configuration. For example, provided adequate reinforcing was provided, the valves could be adjacent one another or in any other position on the surface of the outer skin 18.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A ball comprising an outer chamber having an outer skin and a first centre of volume, and an inner chamber, the inner chamber being substantially smaller than the outer chamber and being contained therein, the inner chamber having a second center of volume displaced from said first center of volume, the inner chamber having a body portion and a neck portion, the neck portion extending between the body portion and the outer skin, the neck portion being the only connection between said inner and outer chambers and being flexible for permitting said inner chamber to swing back and forth within said outer chamber about said connection between said inner and outer chambers when said ball is in use, said outer chamber containing air and said inner chamber containing a selected amount of a medium much denser than air, whereby said ball has eccentric and unpredictable flight characteristics in use.

2. The ball of claim 1 wherein said outer chamber is inflatable.

3. The ball of claim 1 or 2 wherein said outer chamber includes a first resealable orifice.

4. The ball of claim 1 wherein said outer chamber includes a first resealable orifice and said inner chamber includes a second resealable orifice, the second resealable orifice being in

said outer skin of said outer chamber, said inner chamber being attached to said outer skin at said second resealable orifice and wherein the amount of said denser medium in said inner chamber is adjustable through said second resealable orifice.

5. The ball of claim 4 wherein said outer chamber is inflatable.

6. The ball of claim 1, 4 or 5 wherein said outer chamber is generally spherical.

7. The ball of claim 3, 4 or 5 wherein said outer chamber is spherical and said first resealable orifice is located diametrically opposite said connection between said inner and outer chambers.

8. The ball of claim 1 wherein said outer chamber is inflatable, generally spherical and includes a first resealable orifice and said inner chamber includes a second resealable orifice located in said outer skin of said outer chamber, said inner chamber comprising a bulbous body portion and a hollow flexible tubular neck, said inner chamber being attached to said outer skin at said second resealable orifice by said flexible neck, wherein the amount of said denser medium in said inner chamber is adjustable through said second resealable orifice.

9. The ball of claim 1, 4 or 8 wherein said outer chamber is inflatable, and said outer skin of said outer chamber is formed from a plurality of panels, formed from polyvinyl plastic, each of said panels being fastened along their respective side edges to adjacent panels whereby said outer inflatable chamber is generally spherical.

10. The ball of claim 4 or 8 wherein said outer chamber is inflatable and said ball further includes a first plug for sealing said first resealable orifice and a second plug for sealing said second resealable orifice.

11. The ball of claim 10 wherein each of said first and second plugs includes a lifting extension and a retaining flap and said second resealable orifice and said second plug further include a locking means.

12. The ball of claim 11 wherein said second resealable orifice includes a tubular portion, and said locking means includes at least one locking ridge on each of said second plug and said tubular portion of said second orifice.

13. The ball of claim 12 wherein both said first and second resealable orifices are circular, and have tubular portions for snuggly receiving said plugs and said second resealable orifice has at least one inwardly projecting locking ridge in said tubular portion for engaging an outwardly projecting locking ridge of said second plug.

14. The ball of claim 1, 4 or 8 wherein said inner and outer chambers are formed of thin flexible plastic material.

DATED this 28th day of March 1989.

PRESSERS INTERNATIONAL PRODUCTS INC.

WATERMARK PATENT & TRADEMARK ATTORNEYS
50 QUEEN STREET
MELBOURNE. VIC. 3000.

I certify that this and the preceding 19 pages are a true copy of pages of the specification originally lodged.

J. A. Bar...

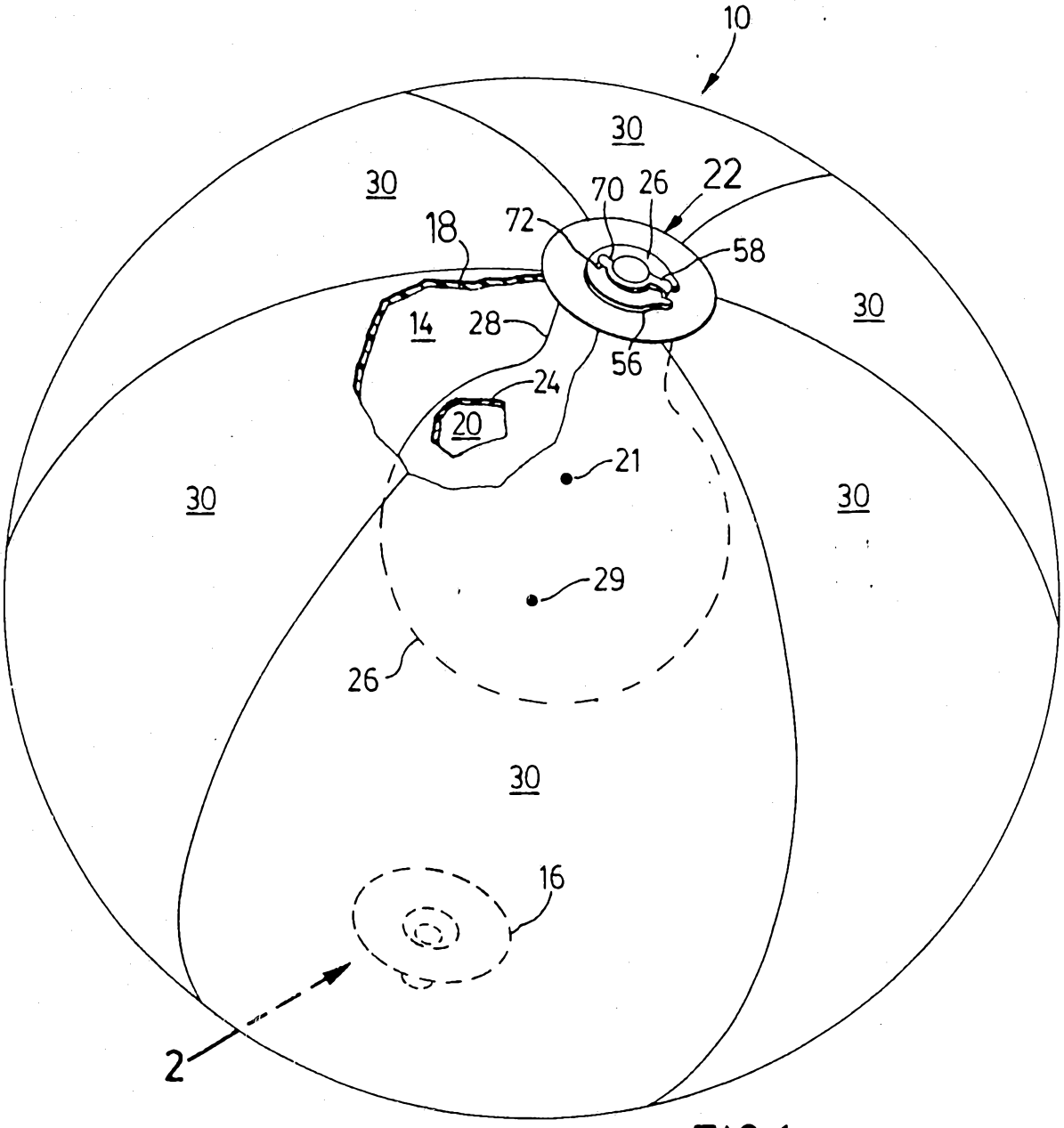
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FIG. 1

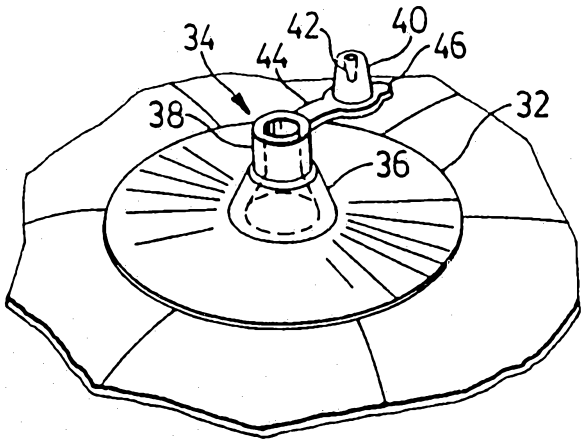
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FIG. 2

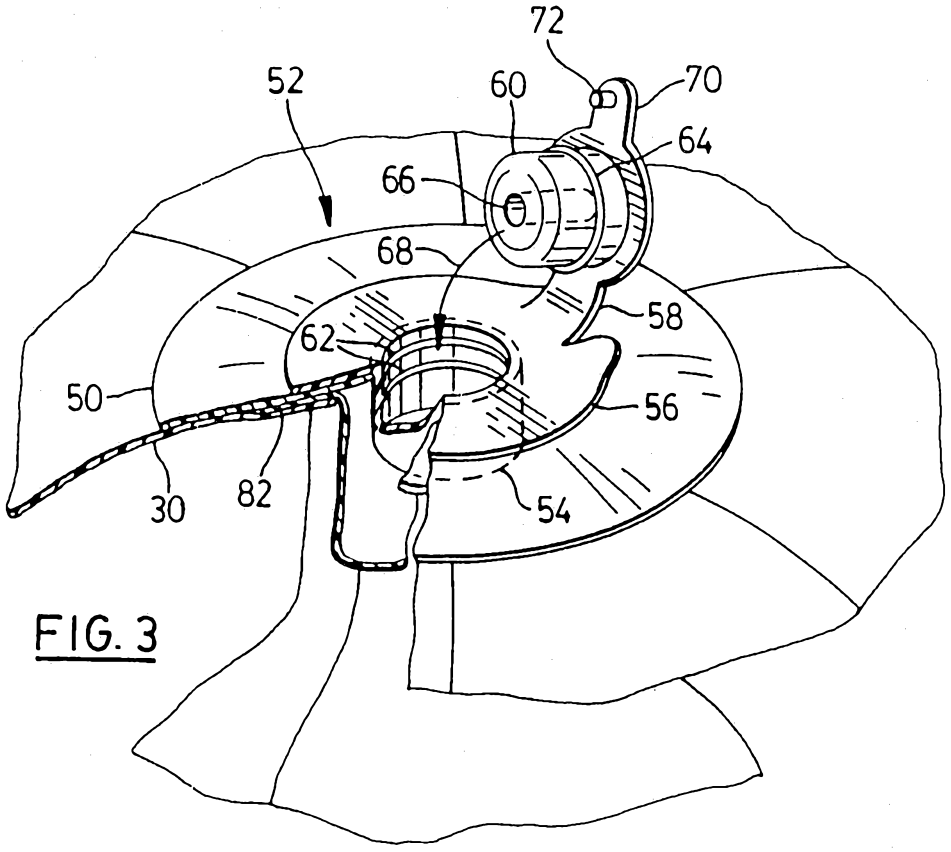

FIG. 3

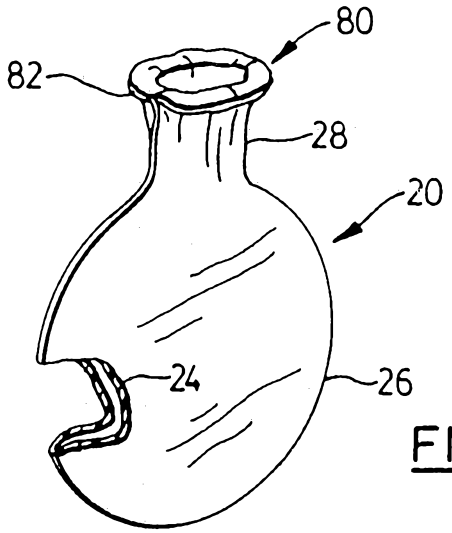

FIG. 4