Dec. 16, 1958 R. G. LEISE 2,864,201

INFLATED DISCUS

Filed Jan. 16, 1956 2 Sheets-Sheet 1

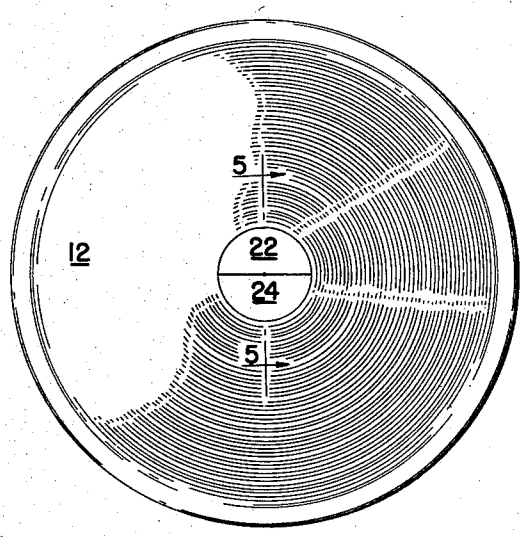

FIG. 1

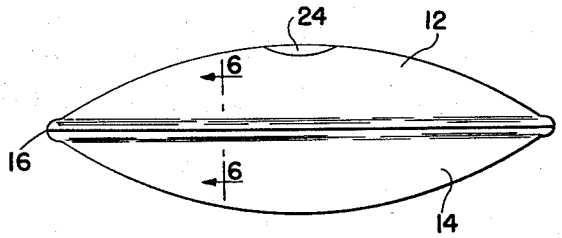

FIG. 2

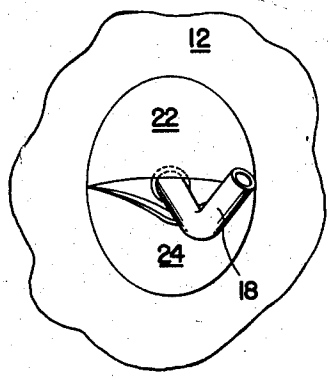

FIG. 3

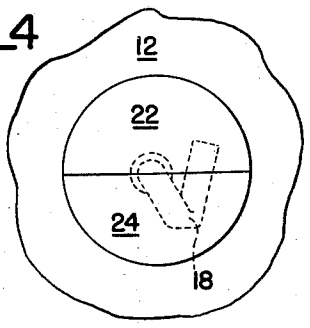

FIG. 4

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INFLATED DISCUS

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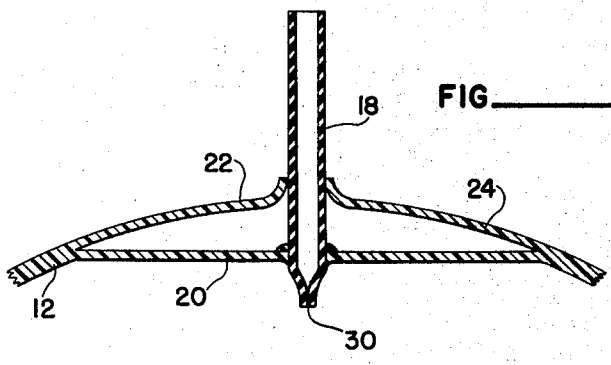

FIG. 5

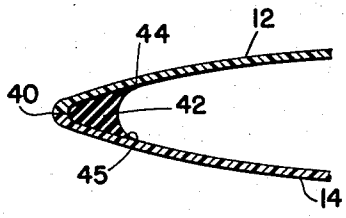

FIG. 6

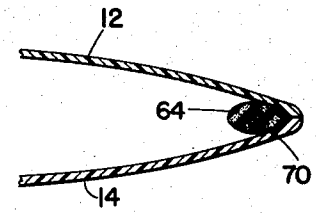

FIG. 9

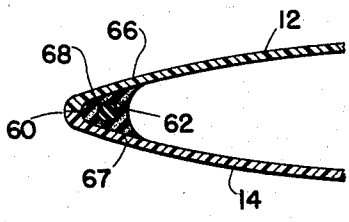

FIG. 7

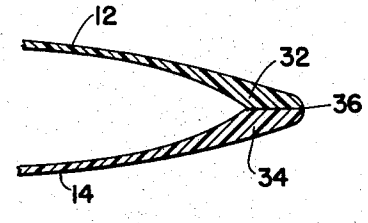

FIG. 10

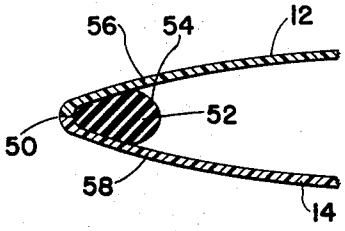

FIG. 8

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United States Patent Office 2,864,201
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2,864,201

INFLATED DISCUS

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Application January 16, 1956, Serial No. 559,404

4 Claims. (Cl. 46—90)

This present invention relates to equipment primarily intended for water sports and more especially to a discus that is intended for throwing in the same general manner that a full weight sport's discus is thrown. Special means are provided to insure that the disc will retain the general shape of a discus without being unduly distorted by low pressure inflation and at the same time the margins of the disc must be so constructed that even though they are reinforced to retain their disc-like shape they must never be hard in the sense that they might injure a person struck by the same in water sports.

Swimmers throughout the country have been provided with and seem to enjoy a wide variety of inflated items. These items take on the form of various animals and the like but most generally the sphere or ball is enjoying the widest use. The ball admits of certain games and it is in this same general category that my present invention is believed to offer a real appeal. The discus is one of our oldest sport elements, being popularized by the Grecian games at a very early date. When provided however in a unit of reduced weight and reasonably soft, yet retaining the disc-like shape, the discus provides an unusual item of interest. This present device, while it may be made in a variety of sizes to suit children or adults is intended to be thrown as a discus and it is interesting to note the wide variety of entertaining games that can be played with such a device when it is realized that the discus can be spun and will take on unusual skipping-like actions when landing on the water. It is quite different from a ball in that it can be skipped on the water, it can be twirled so as to make it deflect at wide angles when it meets the water substantially flat and then when inclined so as to meet the water on its edge a wide variety of actions can be obtained and these all develop skills and skill, after all, is the basis for lasting enjoyment in any game device.

It is intended that this present disc-like device be inflated with, preferably, just the pressure that can be exerted by one's lungs blowing into the device. The device is preferably given considerable weight with the bulk of the weight occurring in the actual wall thickness of the inflatable member. Further, it has been found desirable to provide a relatively heavy enforced peripheral margin to the end that there will be no distortion of the discus when inflated. The device may be made of any moldable or fusible sheet material such as rubber or its various derivatives in the field of synthetic rubbers or many of the various plastics that are pliable and lend themselves to bonding and the like from sheet stock may be used in the construction of the device. It is important that the inflation pressure be kept to a minimum to the end that the device itself can safely be made reasonably heavy to provide skipping properties when landing on the water. Also considerable weight is required if the device is going to be thrown any distance. By way of determining weight, the standard discus weighs 4 pounds 6.4 ounces and this should be considered a maximum for the larger adult sizes of say 24 inch diameter, as satisfactory weight for the 12 inch diameter is approximately 2 pounds. It is desirable however that the type of material used in the device be relatively resilient by its natural properties and that inflation be kept to a low enough level so that the

device, while reasonably heavy, will not be able to injure a person who is accidentally hit as by the edge of the device while in flight.

The principal object of this invention therefore is to provide a game device of inflated discus form for use in water sports.

A further object of this invention is to provide a discus-like inflated form which is peripherally reinforced so as to assist in preserving the discus-like form when the device is inflated.

A further object of this invention is to provide a discus-like water sport device which is characterized by having heavy walls to the end that it will greatly resist any tendency to distort the discus-like shape when the device is inflated and will also permit throwing the same a considerable distance.

A further object of this present invention is to provide an inflated water game device in the general form of a discus which is characterized by constructions which render it at all times pliant and yieldable to the end that it will not become a hazard when thrown at a person in the water.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

In the drawings:

Figure 1 is a plan view of an inflated water sport device of discus form which is the subject of this present application;

Figure 2 is a side elevation of the device of Figure 1;

Figure 3 illustrates the air filling opening employed in this device;

Figure 4 illustrates the air filling tube folded in under the protecting over-lay covers;

Figure 5 is a fragmentary cross sectional view taken along the line 5—5 of Figure 1 and showing the air filling tube and valve arrangement;

Figures 6, 7, 8, 9 and 10 are views taken as along the line 6—6 of Figure 2 and showing the variant forms of the peripheral reinforcement for this device.

Referring more particularly to the disclosure in the drawings, the numerals **12** and **14** designate respectively the two half disc members making up my inflatable discus. These two members are secured together by appropriate means on their abutting surfaces, as **16**, which adds to the strength and rigidity of the unit. Each of the half members, as **12** and **14** is preferably preformed as by molding from suitable moldable material. This material should have basic characteristics such that when completed it will be yieldable and definitely soft to the touch. This is an important characteristic of this device in that it needs to retain its discus form when inflated but at the same time it must not present a solid edge otherwise it will be hazardous for use particularly in water sports, as someone might be injured by the same being thrown through the air and hitting them.

One half member, as **12**, is provided with the filling tube **18**. This tube passes through and is fixedly secured to a continuous web, as **20**, which is formed as part of portion **12**. Disposed above membrance **20** are two cover portions, as **22** and **24**. These may be parted after the showing of Figure 3 so that tube **18** may be withdrawn through the distorted slit and air introduced into the discus, preferably being supplied by the lung power of a person. Tube **18** is secured together at its lowermost end and flattened as at **30**, and then the flattened portion is slit so as to provide a working Thomas type valve. This admits air into the device but normally resists air being forced out. Means are provided however so that the tube **18** can be pulled up far enough, by distorting membrane **20**, so that the finger and thumb of one hand may be used

to distort the slitted portion **30** and thus the device can be deflated, as for carrying or storing.

In view of the fact that there are many materials from which this device can be made, it therefore becomes desirable to have a peripheral rim effect that will stiffen the discus and tend to cause it to retain its disc-like form yet it must not present a hard firm peripheral rim. If the device were to be made of relatively soft rubber then the form shown in Figure 10 would be appropriate, here the outer margins of both of the formed portions **12** and **14** are thickened as at **32** and **34** and then the two pieces are joined as on the line **36** by preferably vulcanizing the same in place.

Where neoprene and like materials are employed then it is desirable to use the general form as illustrated in Figures 6 and 8 in which the outer margins of members **12** and **14** are but slightly thickened so as to provide the joining lines **40** and **50** respectively. The neoprene normally is much firmer than rubber but less firm than the plastics that have been found suitable for this type of equipment. However, it is desirable to reinforce the periphery of the discus and two forms of reinforcement are illustrated. The form in Figure 6 wherein a rubber insert **42** is provided which is also provided with what is, in effect, an annular groove that results in the feathering out of insert **40** as at **44** and **45**. This insert should be cemented in place so that it is a fixed component of the device. In such instances where somewhat denser materials are used but are of the same general family, the insert may preferably be formed with a convex inner face, as is illustrated in Figure 8 where the modified insert, as **52**, is provided with a rounded surface as **54** so that the margins of members **12** and **14**, as at **56** and **58**, may tend to wrap around the curved surface **54** and thus provide a softer arrangement which, in view of the denser material used in members **12** and **14**, will give or yield about the same and will provide as satisfactory deflection as will the form in Figure 6.

In Figures 7 and 9 a third species of reinforcement has been illustrated. Here the material of which members **12** and **14** are made, it is assumed to be the newer plastics of the polyethylene type which are pliable but in any appreciable thickness become quite firm due to the density of the plastic material itself. Under these conditions it is not desirable to particularly thicken the peripheral edges of members **12** and **14**, but rather to have only the minimum juncture as at **60** and then to use fillers as **62** and **64** of sponge rubber. This will permit the maximum deflection of the near peripheral portions of members **12** and **14** as are indicated at **66** and **67**. As in the showing of Figures 6 and 8, two forms of this insert, as **62** and **64**, are shown one with the concave inner surface and the other with the convex inner surface. The form shown in Figure 9 is comparable to Figure 8 and permitting the maximum deflection of the stock forming members **12** and **14** out near the outer margins. It has been found that in this form of treatment that the sponge rubber itself is not a strength giving member for this device and it is therefore desirable to employ an additional strengthening member. In the form shown in Figure 7 this is provided by having a rubber ring similar to an O-ring or the type of rings that are employed as drive belts on certain low powered electrical units. This is illustrated at **68**. In the form shown in Figure 9 the strengthening cord is indicated as a continuous metal wire, as **70**. This wire or wire strands should, however, be of sufficiently reduced size with respect to the rubber cord **68**, that it will not, in itself, give rigidity to the peripheral edge but rather will be yieldable and can be distorted and then have sufficient resilience to restore itself.

To obtain a weight of the discus comparable to the standard discus, i. e., about 4 pounds 6.4 ounces in a 24 inch diameter and about 2 pounds in a 12 inch diameter, it has been discovered that, with most of the materials discussed and considering the thickened rim the wall thicknesses should range between about 1/16 of an inch and 1/8 of an inch, e. g., the minimum thickness for the maximum diameter discus and the maximum thickness for the minimum diameter thickness. The materials should have sufficient strength and thickness to tend to normally hold their molded concavity in the absence of external forces. To approximate a true discus shape and considering the flight characteristics of this inflated discus and associated problems, it has been discovered that disc members **12**, **14** preferably should form spherical segments inside of their rim margins and that the ratio between thickness and diameter of the discus preferably should be approximately 1:3.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of an inflated discus.

Having thus disclosed my invention, I claim:

1. An inflated discus, comprising: a hollow body having substantially the shape of a discus which is circular in outline and has considerable thickness in its center, said body being formed of resilient mateiral and said body having a thickened rim which thereby has a greater resistance to distortion than the remainder of said body, said thickened rim being formed by an interior annular insert secured in place and shaped to hold the body walls in the desired rim-like disposition, the material forming the insert being less dense than the material from which the body is formed and the inner face of said insert being concave and being feathered out along said body walls, and manually controllable valve means governing ingress and egress of air to and from said hollow body.

2. An inflated discus, comprising: a hollow body having substantially the shape of a discus which is circular in outline and has considerable thickness in its center, said body being formed of resilient material and said body having a thickened rim which thereby has a greater resistance to distortion than the remainder of said body, and manually controllable valve means governing ingress and egress of air to and from said hollow body, in which said thickened rim is formed by an annular insert of sponge-like material secured in place and shaped to hold the body at the rim in proper disposition, said insert having a concave inner face with the edges feathered against the body roll and a central annular member imbedded in that insert rod-shaped and having a higher density than the material from which said body is formed.

3. An inflated discus, comprising: a hollow body having substantially the shape of a discus which is circular in outline and has considerable thickness in its center, said body being formed of resilient material and said body having a thickened rim which thereby has a greater resistance to distortion than the remainder of said body, and manually controllable valve means governing ingress and egress of air to and from said hollow body, in which said thickened rim is formed by an annular insert of sponge-like material secured in place and shaped to hold the body at the rim in proper disposition, said insert having a convex inner face and having an annular wire member embedded therein.

4. The subject matter of claim 1, in which said insert has an inner margin shaped to support the walls of the discus and insure that, under distortion, the walls will take on smooth curves instead of showing a sharp line of support.

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