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2,640,699 6/1953 Garbo 273/106(2)
 2,864,201 12/1958 Leise 273/106X
 3,009,701 11/1961 Goldfarb 273/106(2)X
 3,183,002 5/1965 Opdaw 273/106X
 3,403,907 10/1968 Keller 273/106(2)UX

[54] **SET OF DISCS HAVING DIFFERENT FLOATATION CHARACTERISTICS**
 7 Claims, 12 Drawing Figs.

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 273/126

[51] Int. Cl. **A63b 65/10,**
 A63b 67/06

[50] Field of Search 273/106,
 106(2), 126; 272/59(B), 1

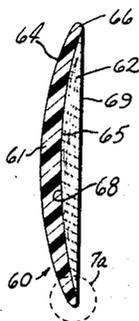
FOREIGN PATENTS

361,673 1921 Germany 272/59(B)
 616,951 1961 Italy 273/126

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[56] **References Cited**
UNITED STATES PATENTS
 2,410,845 11/1946 Snell et al. 273/106(2)UX

ABSTRACT: A set of disc assembly members. At least one disc assembly member sinks when stopped in water. A second disc assembly member floats when stopped in water, and a third disc assembly member sinks at a controlled rate when stopped in water. The buoyancy of the floating and controlled sinking members is varied by changing a structural characteristic of the body assembly.



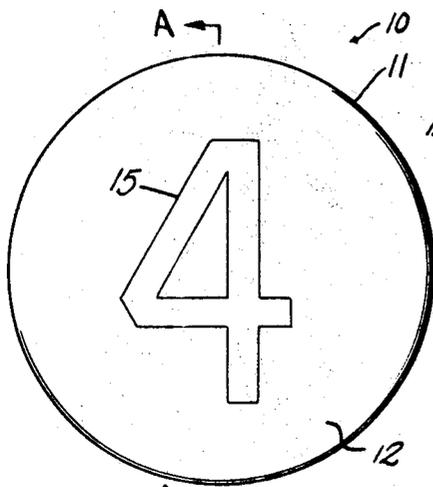


FIG. 1



FIG. 2

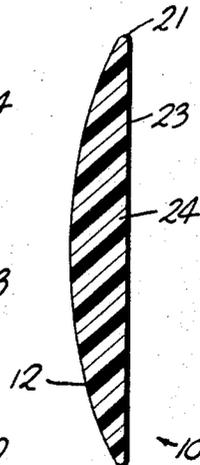


FIG. 3

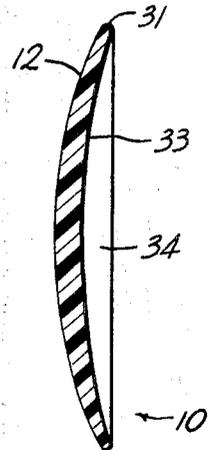


FIG. 4

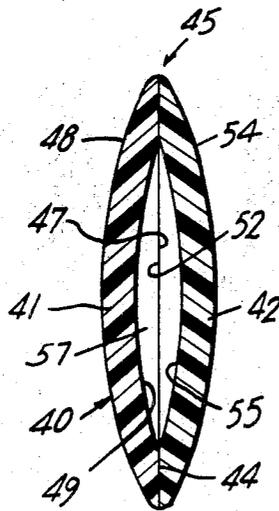


FIG. 5

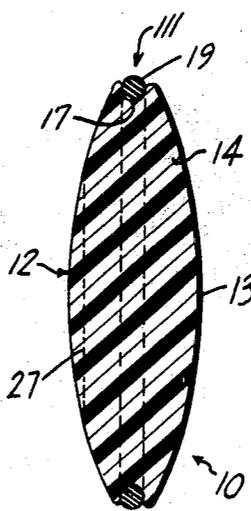


FIG. 6

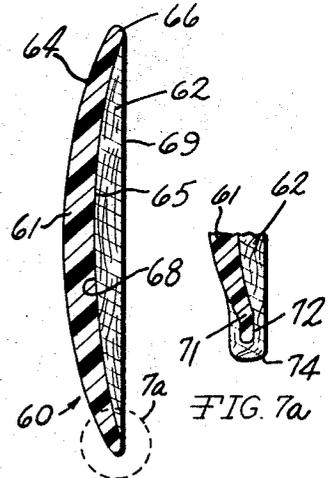


FIG. 7

FIG. 7a

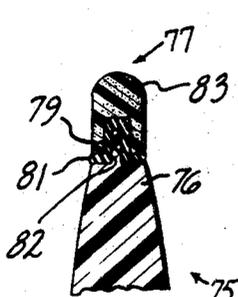


FIG. 8

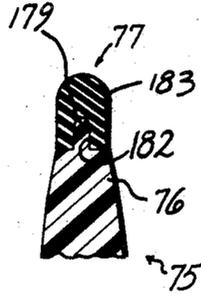


FIG. 9

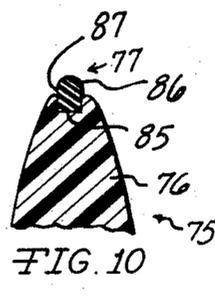


FIG. 10

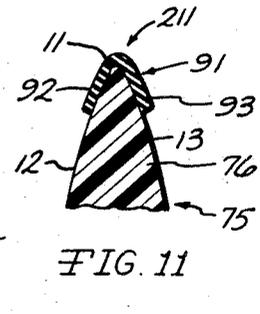


FIG. 11

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SET OF DISCS HAVING DIFFERENT FLOATATION CHARACTERISTICS

This invention relates broadly to a disc structure, and more specifically to a disc assembly member capable of skipping across various surfaces.

Game sports and group athletic programs are continually increasing as more time has become available to the mass of world citizens for recreational activities. Along with the time increase there has been tremendous facility increases for persons to participate in various recreational activities and facilities. A result of the total phenomenon of more time and more game and athletic facilities has been that the recreational activities have started at an earlier age and lasted to a later age so that continual effort and searching is taking place to stimulate the enjoyment of leisure time for all age groups.

The swimming and water activities have experienced a substantial increase in reference to the citizens of the total community. This has taken place because of the addition of municipal and other public swimming facilities, private swim clubs, neighborhood swimming pools, and private home-owned swimming pools, along with more extensive public and private beach swimming at the lakes and seashores in countries all over the world. Games for entertainment and improving the swimming skills are highly received when associated with this industry.

In the annexed drawings:

FIG. 1 is a top plan view of a disc assembly member encompassing the principles of the present invention.

FIG. 2 is a cross-sectional view of the body disc assembly member showing the body member taken along line A-A of FIG. 1.

FIG. 3 is a cross-sectional view of an alternate disc assembly member illustrating an alternate embodiment of the body member taken along line A-A of FIG. 1.

FIG. 4 is a cross-sectional view of the disc assembly member showing an alternate embodiment of the body member taken along line A-A of FIG. 1 and illustrating the principles of the present invention.

FIG. 5 is a cross-sectional view of the disc assembly member showing an alternate embodiment of the body member taken along line A-A of FIG. 1.

FIG. 6 is a cross-sectional view of the disc assembly member showing an alternate body member similar to FIG. 2 and illustrating an outer cushion ring.

FIG. 7 is a cross-sectional view of the disc assembly member showing an alternate sectional view of a body assembly member having a buoyant member connected to a body member.

FIG. 7a is an alternate edge connecting structure for the body assembly member and the buoyant member illustrating an alternate attaching structure from the illustrated circle 7a of FIG. 7.

FIG. 8 is a partial cross-sectional view of an alternate outer cushion ring illustrated in FIG. 6.

FIG. 9 is an alternate partial cross-sectional view of an outer cushion ring assembly similar to the outer cushion ring illustrated in FIG. 6.

FIG. 10 is a partial cross-sectional view of an alternate cushion ring structure similar to FIG. 6.

FIG. 11 is a partial cross-sectional view illustrating an alternate outer cushion ring attachment to a body member similar to FIG. 6.

Following is a complete description of a disc assembly member capable of performing the objectives of the present invention. This disc assembly member is provided with various outer surfaces to enhance its ability to be bounced or skipped across liquid surfaces. The disc assembly member can be provided with various structural means to effect alternate embodiments so that it will readily sink upon stopping, will float upon stopping, or will be provided with means to sink gently down into the water upon stopping. Also, the disc assembly member can be provided with protective cushioned outer edges to prevent damage or harm to participants and other

persons in the area. Various outer surface shapes can be provided on the disc assembly member to enhance its bouncing or skipping action when going across the water before its forward movement is terminated.

5 Generally referring to FIGS. 1 and 2, a disc assembly member 10 is illustrated having an outer edge 11, an upper convex surface 12 and a lower convex surface 13 surrounding the outer surface perimeter of a body member 14. It can be made of various materials having generally a solid rigid characteristic with a plastic material being illustrated. Illustrated in FIG. 1 is a FIG. member generally referred to as 15. For the present embodiment a number "4" has been illustrated as FIG. member 15. Various numbers or letters can be provided to enhance the playing of water games, as will be explained in more detail below. Also, various color combinations for the body member could be provided to further generate interest in the play of water games using a combination of the disc assembly members with various characteristics.

20 Referring generally to FIG. 3, I have illustrated an alternate embodiment of the disc assembly member 10. This alternate embodiment includes a body member 24 with an upper convex surface 12 and a lower surface in the form of a flat surface 23 having a rounded outer edge 21. The body member 20 could be made of various materials with generally a solid rigid material being utilized in the preferred embodiment with plastic being illustrated. However, hard rubber could also be utilized.

30 Generally referring to FIG. 4, a disk assembly member 10 is illustrated and this member disc assembly member has a rounded outer edge member 31 which joins the upper convex surface 12 to a lower surface in the form of a concave surface 33. The body member 34 is provided with surfaces 12 and 33 to illustrate an alternate embodiment of the disc assembly member 10. The body member 34 could be made out of various materials. The material presently illustrated is a plastic material; however, hard rubber or various metals could be utilized.

40 Generally referring to FIGS. 6 and 2, the disc assembly member 10 and its body portion 14 are provided with an alternate edge structure in the form of outer edge 111. The alternate outer edge 111 has a receiving slot 17 which connects the upper convex surface 12 with the lower convex surface 13. An outer cushion ring 19 is positioned within receiving slot 17. This outer cushion ring 19 could be made of various materials. One type of material would be a resilient soft rubber or plastic which could be used to cushion any blow which a person, animal, structure or article would receive if struck with the disc assembly member 10 when it was thrown. The upper and lower convex surfaces 12 and 13 could be altered in various manners to help the skipping characteristics of the disc assembly member. All the alternate methods of changing the surface will not be enumerated here, but a control surface 27 is illustrated in phantom extending across upper convex surface 12. This surface could alternately be on lower convex surface 13 or on both surfaces 12 and 13, and in place of being flat as illustrated could be convex at a various degree than convex surface 12, concave or irregular, as persons skilled in the art could well anticipate.

The disc assembly members 10 illustrated in FIGS. 1 through 4 would generally be provided with structural means to cause the members to sink and therefore be classified as sinkable members indicating they would sink after they had been thrown to skip across the water surface and then stop. The various outer surface configurations of the disc assembly members would provide different bouncing, skipping and moving characteristics. Also, their movement characteristics would be dependent upon the surface which was up or down when the disc assembly was thrown. The reference to the upper and lower surfaces as described above is merely for illustrative purposes.

75 Referring to FIG. 5, we have disc assembly member 40 which has a body assembly made up of upper body member 41

and lower body member 42. Body member 41 and body member 42 are joined at contact area 44 and they form a rounded outer edge section 45. The body member 41 has a sealing surface 47, an outer convex surface 48 and an inner concave surface 49. The body member 42 has a sealing surface 52 which acts with sealing surface 47 of body member 41 to form the contact area 44. Body member 42 has an outer convex surface 54 and an inner concave surface 55. The body members 41 and 42 form an air pocket 57 defined by inner concave surfaces 49 and 55, respectively, and sealing edges 52 and 47, respectively, forming contact area 44. In a preferred embodiment, the air pocket 57 would be airtight. The size of the air pocket in proportion to the weight of the body members 41 and 42 determines if the disc assembly member 40 would float or sink. Generally, this type of structure includes a structural means to cause the body member to sink when stopped in water and therefore would be used to provide a floating disc assembly member but a controlled sink disc assembly member could also be provided using the principles illustrated and discussed above.

Generally referring to FIG. 7, a disc assembly member 60 has a body member 61 and a buoyant member 62. In the present illustration the body member 61 has an outer convex surface 64 and an inner concave surface 65. The body member 61 is provided with a rounded outer edge member 66. The buoyant member 62 is provided with an inner convex face 68 which conforms to the inner concave face 65. The buoyant member 62 also is provided with an outer flat surface 69 for the present illustration. The buoyant member, as shown in FIG. 7, is made of wood. In various embodiments this could be made of various materials such as foam plastic, et cetera, to give a buoyant effect if desired. The disc assembly member 60 can either be of the sinking, floating or of the controlled descent type as mentioned when referring to the disc assembly members above. The buoyant member 62 could be joined to the body member 61 in various manners well known in the art. Bonding glue could be used or independent securing members such as screws (not illustrated) could be used. These methods are well known to persons skilled in the art.

Referring to FIG. 7a, we illustrate an alternate method of joining the body member 61 with the buoyant member 62. In this illustration the body member 61 has a locking tip 71 which is received by a receiving slot 72 of a rounded outer edge portion 74 which is part of the buoyant member 62. The buoyant member 62 if made of some type of resilient material could then inherently provide a protecting cushion by its rounded outer edge portion 74.

Referring generally to FIGS. 8, 9, 10 and 11, we have specific illustrations of alternate embodiments of the structure and the securing of the outer cushion ring to the body assembly. In these FIGS. the body assembly is illustrated as being one piece. However, it can be easily appreciated that these alternate embodiments could be adapted to the two-piece disc assembly member such as illustrated in FIGS. 5, 7 and 7a, for example.

A disc assembly member 75 is illustrated in FIG. 8 which has a body assembly 76 and an edge section 77. The body assembly 76 has a locking tip 79. The edge section 77 contacts the body assembly 76 by a hard center ring 81 which has a receiving slot 82 acting with the locking tip 79. An outer cushion ring 83 is mounted on the hard center ring 81 and can act as a resilient member extending substantially around the outer circumference of the disc assembly member 75. The hard center ring can be secured to the body assembly 76 in various manners. One manner would be to have an adhesive or cementing material securing it to the locking tip 79 or the resilient characteristics of the edge section 77 could provide the securing or holding force.

FIG. 9 illustrates the disc assembly member 75 with a body assembly 76 having a locking tip 179 which is similar to locking tip 79 of FIG. 8. The edge section 77 has an outer cushion ring 183 which is provided with a receiving slot 182 to act in conjunction with the locking tip 179. The outer cushion

ring 183 can be made of various types of material; generally, a material having a resilient characteristic would be desirable in a preferred embodiment. As stated in reference to edge section 77 of FIG. 8, the cushion ring 183 could be held in position by its inherent resilient characteristic or cement or a bonding adhesive could be utilized to positively secure it in place on the locking tip 179.

Referring to FIG. 10, the disc assembly member 75 is provided with a body assembly 76. The body assembly 76 has a receiving slot 85 as part of its edge section 77. An outer cushion ring 86 which is provided with a locking tip 87 fits into the receiving slot 85 and acts as the outer protective edge for the disc assembly member 75. The outer cushion ring 86 can be similar in characteristics to outer cushion rings 83 and 183 of FIGS. 8 and 9, respectively. Thus, it could be held in its mounted position by its inherent resilient characteristics or it could be held in position by a cement or bonding adhesive.

Referring generally to FIG. 11 we are provided with a disc assembly member 75 having a body assembly 76 which has an edge section 211 which includes a body assembly edge 11, same as outer edge 11 in FIG. 2 with an outer cushion ring 91 acting on the body assembly edge 11. The outer cushion ring 91 has a contact leg 92 and a contact leg 93. The contact leg 92 contacts the upper convex surface 12 and the contact leg 93 contacts the lower convex surface 13. The outer cushion ring 91 can be made of resilient material, if necessary, which acts to hold it in place by its resilient characteristics, or outer cushion ring 91 can be positively secured in place by a cement or adhesive bonding agent.

Various combinations of disc assembly members having a variety of floating, sinking, and controlled sinking characteristics could be utilized into a game set. A first portion of the members would include structural means which sinks at a first rate when stopped in water. A second portion of the members would include structural means which sinks at another rate when stopped in the water. In this illustration, each player or team could swim after the disc assembly members after they have been tossed out. The floating discs could be designated at lower numerical numbers such as 1 through 5; the controlled sinking discs could be designated at intermediate numbers such as 6 through 10; and the sinking discs could be designated at higher numbers such as 11 through 15. Thus, when the players swim out and retrieve these disc assembly members, they would not only be swimming for the amount of disc assembly members they could collect, but also the type of disc assembly members which would enhance the activity of the game and create a challenge for them to develop their swimming skills.

The characteristics of the disc assembly members can take the various forms and shapes talked about and discussed in the specification and the FIG. member 15 could be present or not, depending upon the particular needs and applications of the game or exercise performed with this disc assembly member. As mentioned earlier, various colors and various figure member combinations could be worked out as to numerals or alphabetical letters without changing the scope of the invention.

It has been seen from the above that simple and inexpensive yet practical and durable means have been disclosed for obtaining and meeting the desired ends. Attention is again invited, however, to the possibility of making variations within the spirit and scope of the invention set forth. Also, directional terms such as "inwardly," "lower," "outer," "upper," et cetera, have been used to facilitate explaining the invention in the position shown in the drawings and are not to be considered as limiting the scope of the invention.

Other modes of applying the principles of my invention may be employed, instead of those explained, change being made as regards the article and combinations herein disclosed, provided the features stated by any of the following claims or the equivalent of such stated features be employed.

I claim:

1. A set of disc assembly members used for throwing across a water surface comprising:

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- a. at least one first body assembly having an upper convex surface and a lower surface;
- b. said first body assembly including structural means to cause the first body assembly to sink when stopped in water;
- c. said first body assembly structural means comprises a solid material which sinks in water;
- d. at least one second body assembly having an upper convex surface and a lower surface;
- e. said second body assembly includes structural means to cause the second body assembly to float on the surface of the water when stopped therein; and
- f. said second body assembly structural means comprises a solid material which floats in water.
2. A set of disc assembly members as defined in claim 1 wherein said solid material of said first body assembly is rigid.
3. A set of disc assembly members as defined in claim 1 wherein said solid material of said second body assembly is rigid.
4. A set of disc assembly members as defined in claim 1 wherein:
- there is a plurality of said first body assemblies;
- a first portion of said plurality includes a first structural means which sinks at a first rate when stopped in the water; and
- a second portion of said plurality includes a second structural means which sinks at another rate when stopped in the water.
5. A set of disc assembly members as defined in claim 4 wherein:
- each said body assembly has an outer edge portion located along the periphery thereof; and
- each said body assembly includes securing means to mount outer cushion rings on said outer edge portions.

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6. A set of disc assembly members used for throwing across a water surface comprising:
- a. a plurality of first body assemblies, each said assembly having an upper convex surface and a lower surface;
- b. a first portion of said plurality including a first structural means which sinks at a first rate when stopped in the water;
- c. a second portion of said plurality including a second structural means which sinks at another rate when stopped in the water;
- d. at least one second body assembly having an upper convex surface and a lower surface; and
- e. said second body assembly includes structural means to cause the second body assembly to float on the surface of the water when stopped therein.
7. A set of disc assembly members used for throwing across a water surface comprising:
- a. at least one first body assembly having an upper convex surface and a lower surface;
- b. said first body assembly including structural means to cause the first body assembly to sink when stopped in water;
- c. said first body assembly structural means comprises a solid material which sinks in water;
- d. at least one second body assembly having an upper convex surface and a lower surface;
- e. said second body assembly includes structural means to cause the second body assembly to float on the surface of the water when stopped therein; and
- f. said second body assembly structural means consists of a solid material which floats in water including a buoyant portion to effect the flotation of said second body assembly.

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