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(54) **FLOATING COLLAPSIBLE PLAY STRUCTURES**

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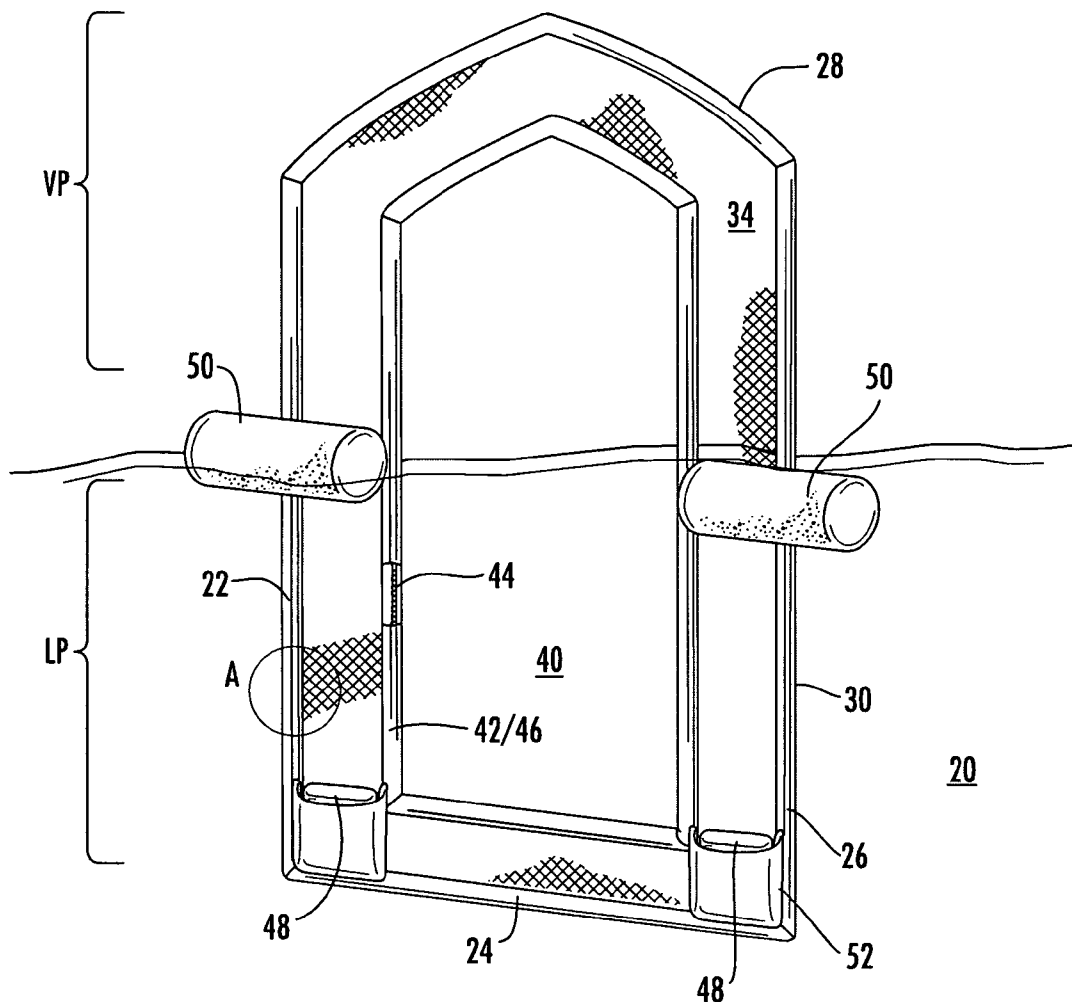
tion No. 09/792,992, filed on Feb. 26, 2001, now abandoned, which is a continuation of application No. 09/294,268, filed on Apr. 19, 1999, now Pat. No. 6,192,635.

**Publication Classification**

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(57) **ABSTRACT**

A collapsible structure has a foldable frame member having a folded and an unfolded orientation, with a sheet material covering interior portions of the frame member to form a panel when the frame member is in the unfolded orientation, the panel having a top side and a bottom side. The structure also includes a weight coupled to the panel, and a floatation device coupled to the panel. The floatation device can be coupled to the panel at a location adjacent the top side of the panel, or between the top side and the bottom side of the panel.



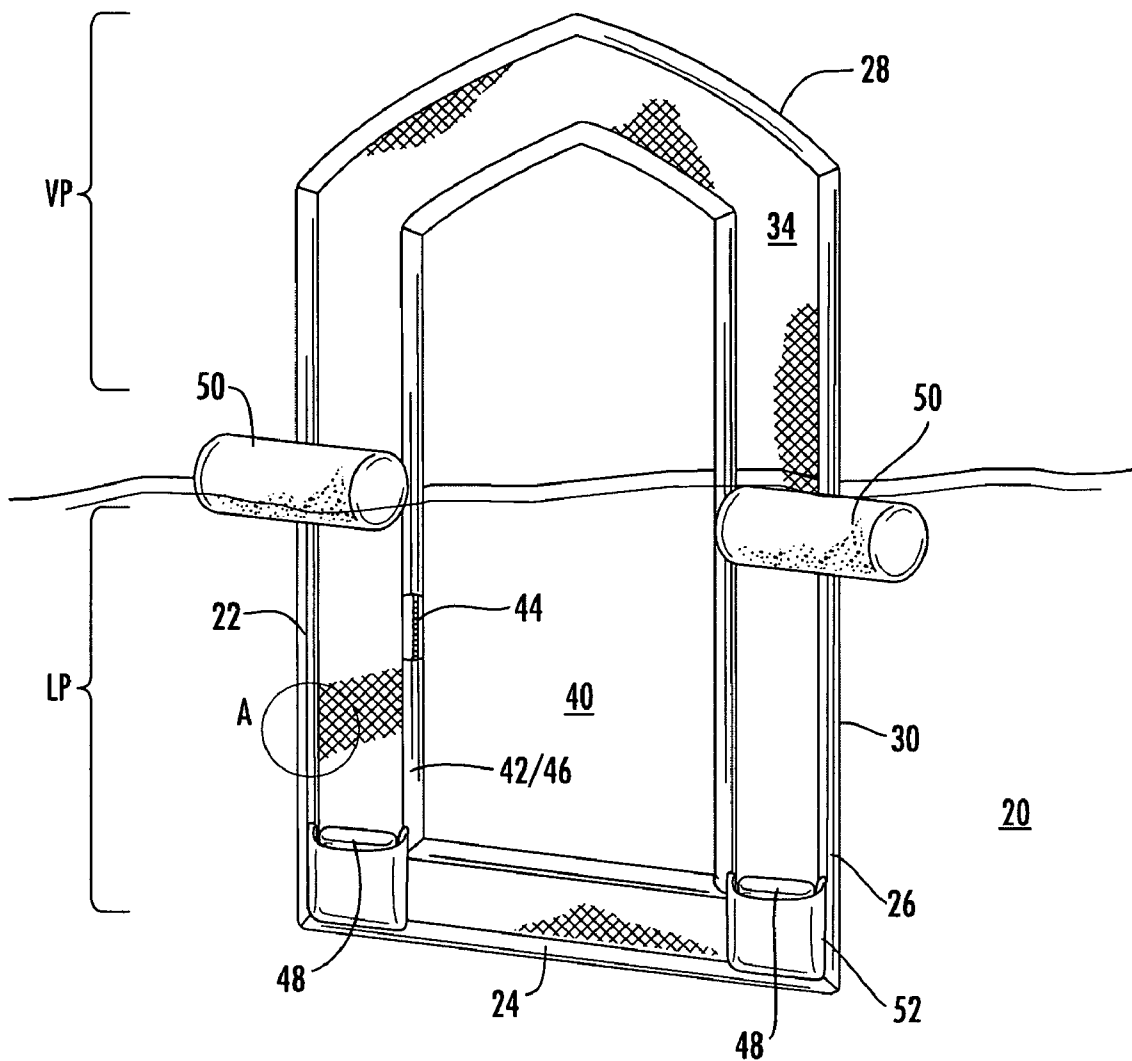
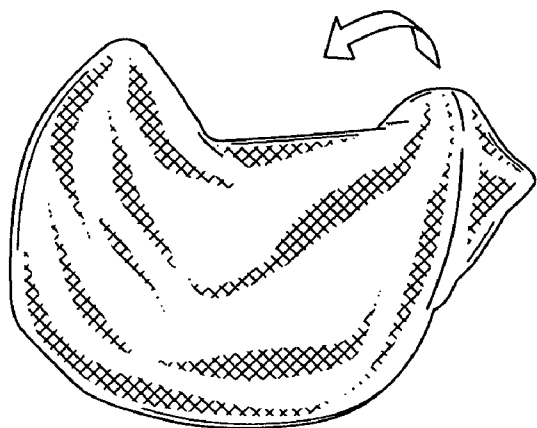
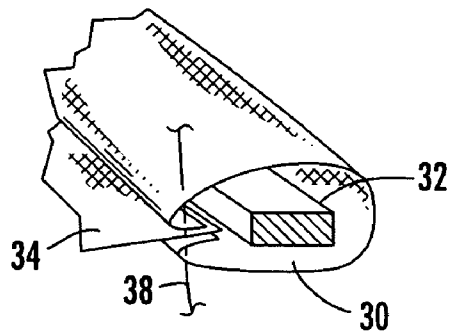


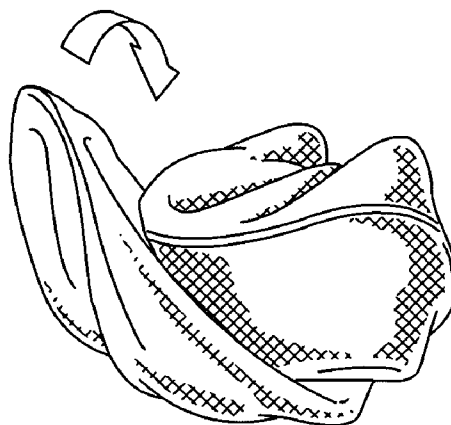
FIG. 1



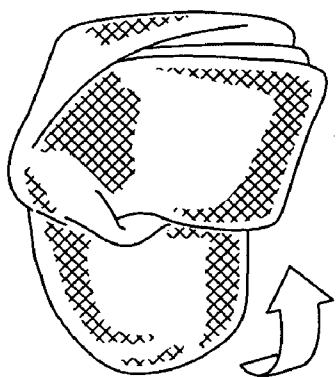
**FIG. 3A**



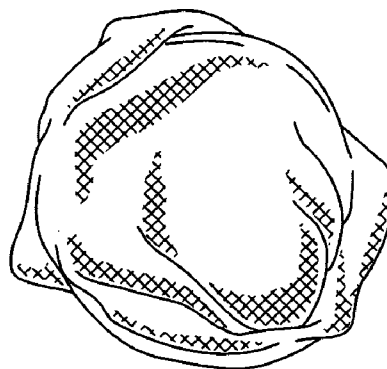
**FIG. 2**



**FIG. 3B**



**FIG. 3C**



**FIG. 3D**

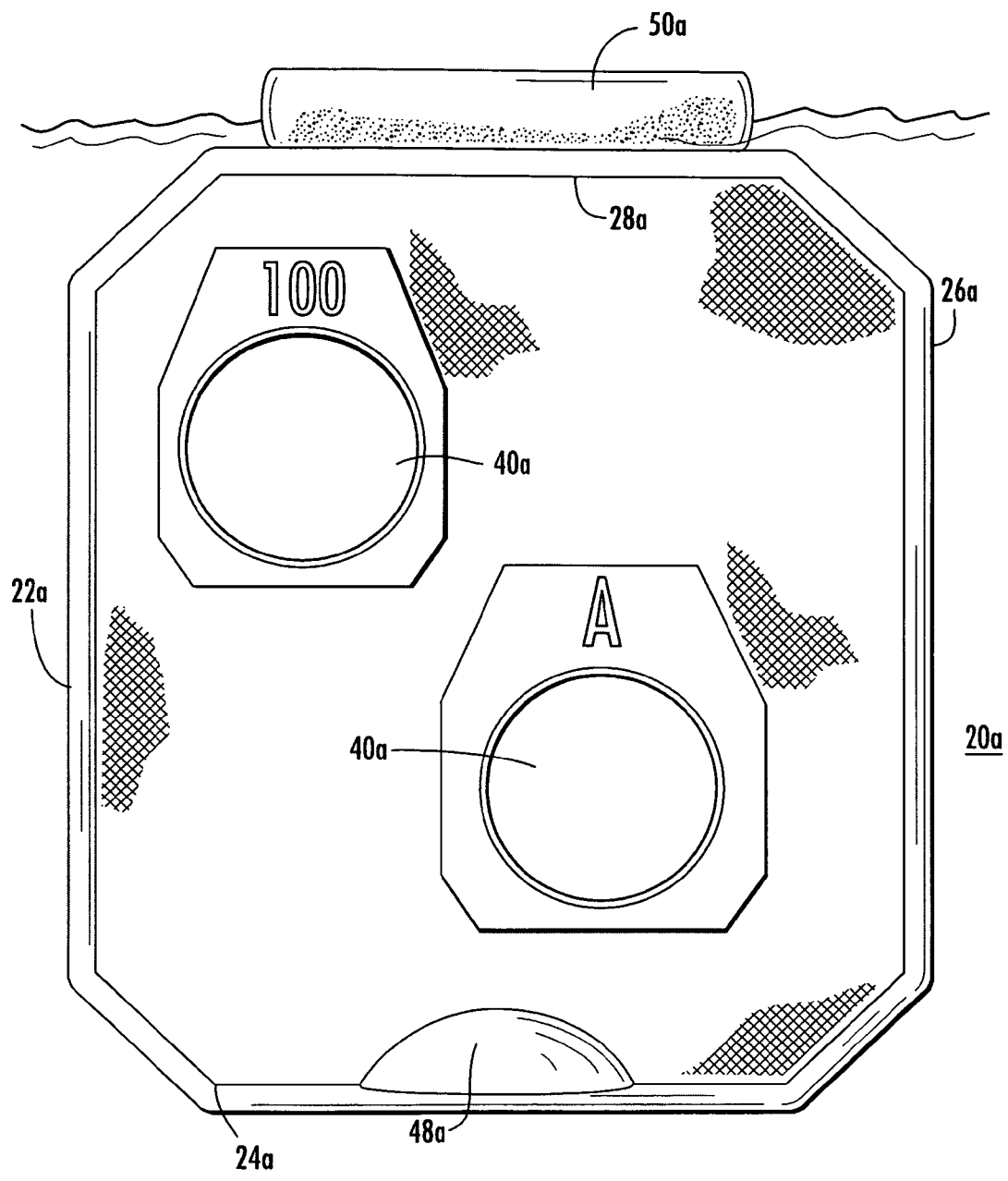


FIG. 4

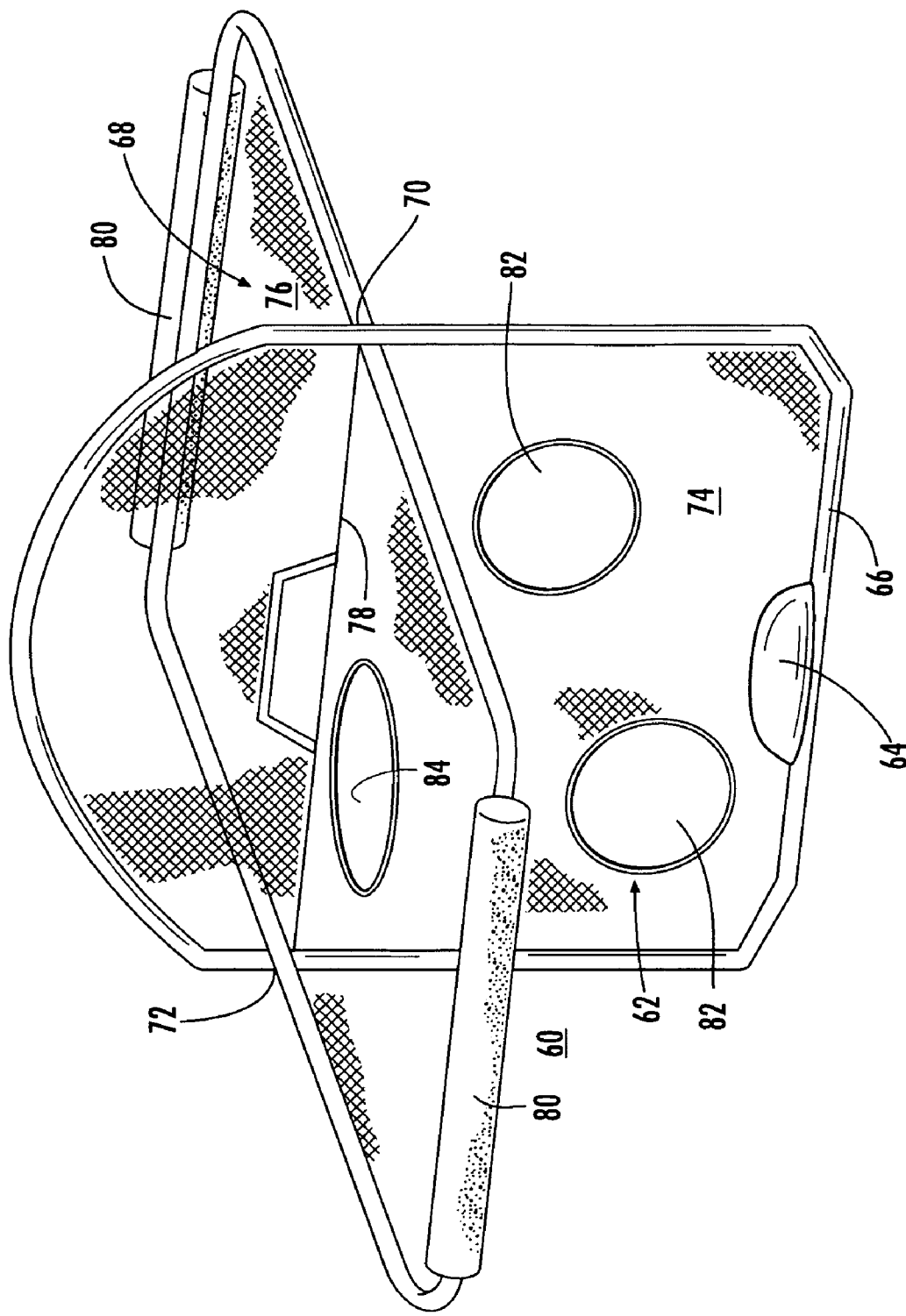


FIG. 5

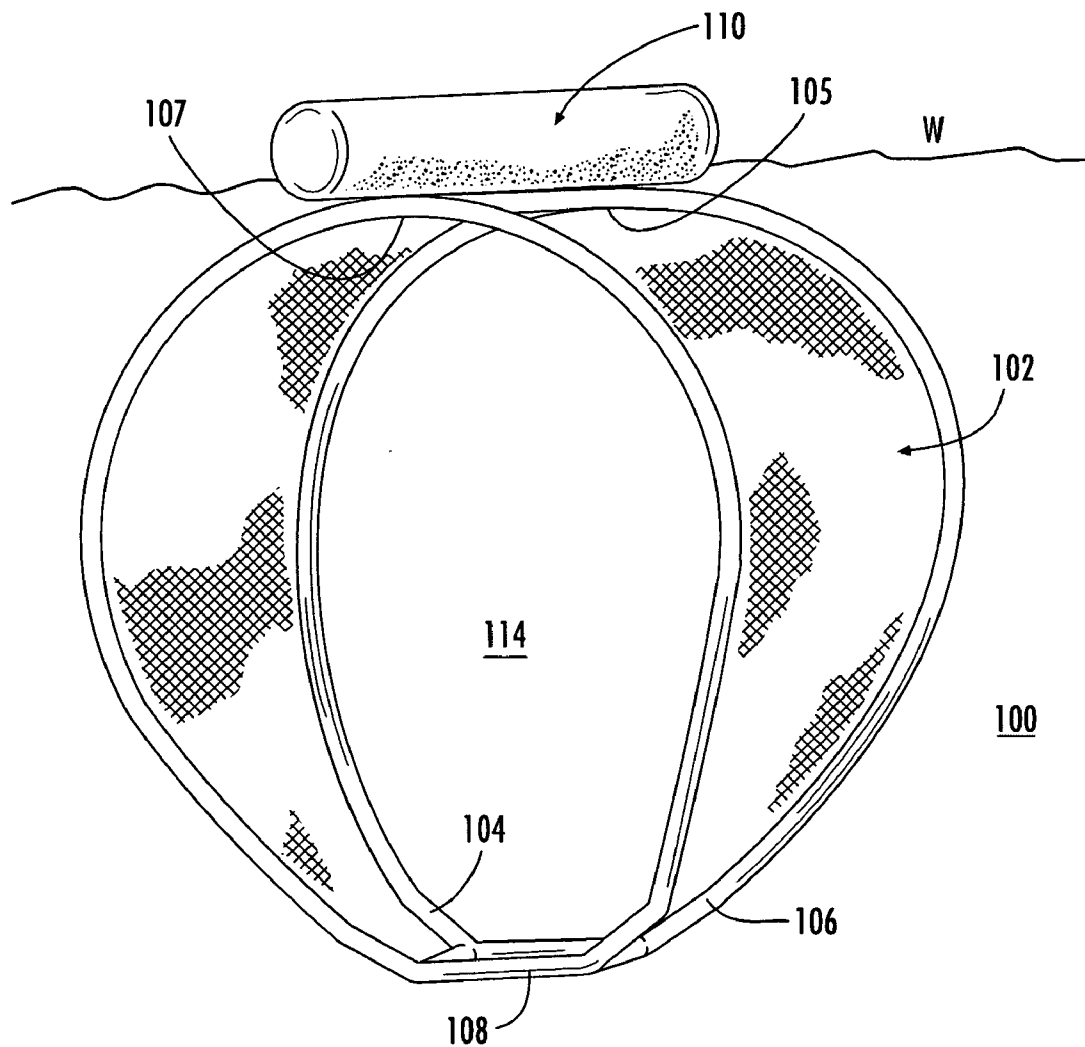
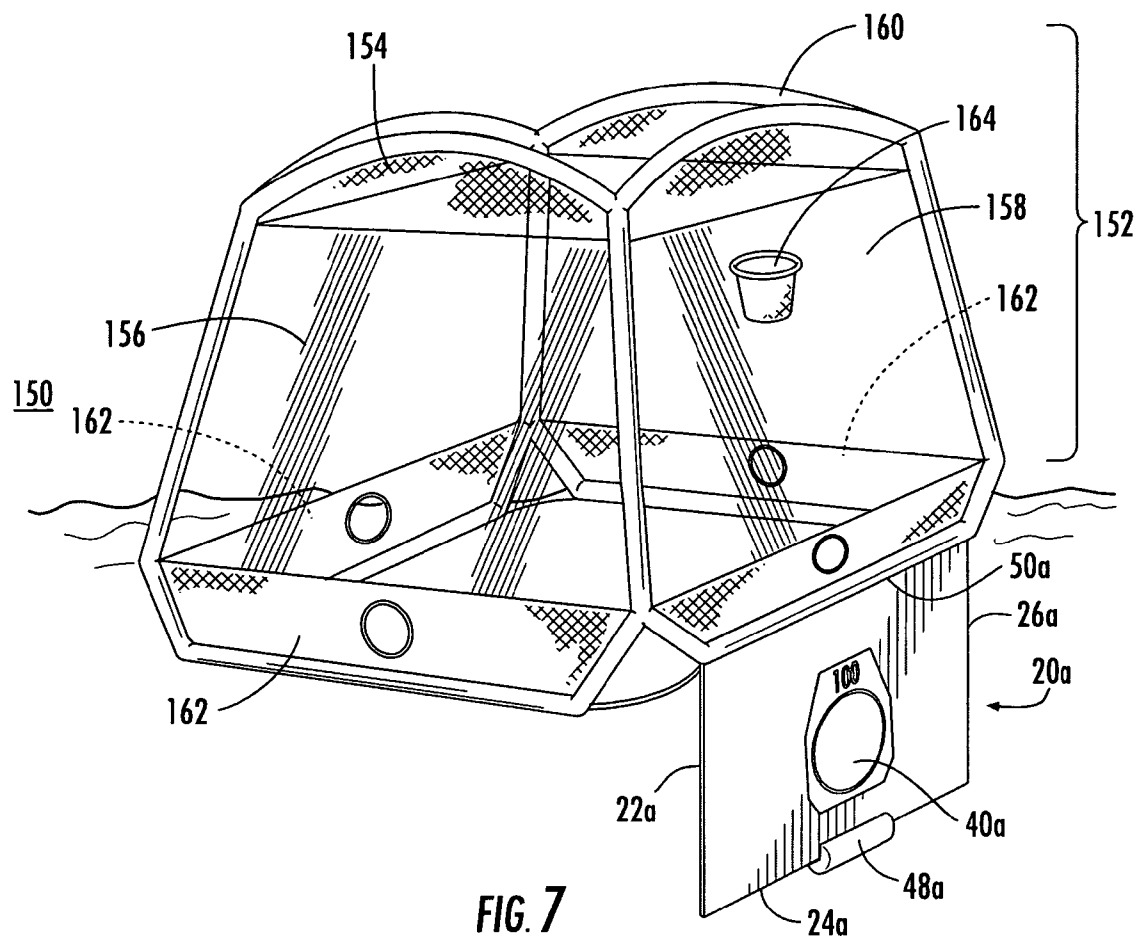


FIG. 6



**FLOATING COLLAPSIBLE PLAY STRUCTURES**

**RELATED CASES**

[0001] This is a continuation-in-part of co-pending Ser. No. 10/044,142, filed Jan. 11, 2002, which is a continuation of Ser. No. 09/792,992, filed Feb. 26, 2001, now abandoned, which is a continuation of Ser. No. 09/294,268, filed Apr. 19, 1999, now U.S. Pat. No. 6,192,635, whose disclosure is incorporated by this reference as though fully set forth herein.

**BACKGROUND OF THE INVENTION**

[0002] 1. Field of the Invention

[0003] The present invention relates to collapsible structures, and in particular, to collapsible floating play structures having portions that can be submerged under the surface of the water. The collapsible structures incorporate one or more collapsible panels that may be twisted and folded to reduce the overall size of the panels to facilitate convenient storage and use.

[0004] 2. Description of the Prior Art

[0005] Collapsible objects have recently become popular with both adults and children. Examples of such collapsible objects are shown and described in U.S. Pat. Nos. 5,038,812 (Norman), 5,467,794 (Zheng) and 5,560,385 (Zheng) in the form of collapsible structures. These structures can be used as play structures, shelters, tents, and storage structures, among other uses. These structures may be twisted and folded to reduce the overall size of the structures to facilitate convenient storage and use. As such, these structures are being enjoyed by many people in many different applications.

[0006] Other examples of collapsible objects include blanket, mat and floating assemblies as illustrated in one or more of U.S. Pat. Nos. 6,073,283 (Zheng), 6,030,300 (Zheng), 6,170,100 (Le Gette et al.), 6,485,344 (Arias) and 6,343,391 (Le Gette et al.). These assemblies can be used as blankets, floor mats, and floating mats. These blankets and mats may be twisted and folded to reduce the overall size of the blanket or mat to facilitate convenient storage and use.

**SUMMARY OF THE DISCLOSURE**

[0007] It is an object of the present invention to provide collapsible structures that provide increased variety of play, entertainment value, and utility.

[0008] In order to accomplish the objects of the present invention, the present invention provides a collapsible structure having a foldable frame member having a folded and an unfolded orientation, with a sheet material covering interior portions of the frame member to form a panel when the frame member is in the unfolded orientation, the panel having a top side and a bottom side. The structure also includes a weight coupled to the panel, and a floatation device coupled to the panel. The floatation device can be coupled to the panel at a location adjacent the top side of the panel, or between the top side and the bottom side of the panel. Additional panels can be operationally coupled to the panel for increasing the play variety and functions of the collapsible structure.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0009] FIG. 1 is a perspective view of a collapsible structure according to one embodiment of the present invention.

[0010] FIG. 2 is a partial cut-away view of the section A of the structure of FIG. 1 illustrating a frame member retained within a sleeve.

[0011] FIGS. 3A through 3D illustrate how the collapsible structure of FIG. 1 may be twisted and folded for compact storage.

[0012] FIGS. 4-7 are perspective views of collapsible structures according to separate embodiments of the present invention.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

[0013] The following detailed description is of the best presently contemplated modes of carrying out the invention. This description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating general principles of embodiments of the invention. The scope of the invention is best defined by the appended claims.

[0014] The collapsible structures according to the present invention are configured in the form of one or more panels. These structures can be folded and collapsed into a compact configuration for convenient storage and transportation.

[0015] Referring to FIG. 1, according to one embodiment of the present invention, a structure is provided in the form of a single panel 20 having a left side 22, a bottom side 24, a right side 26, and a top side 28. The top side 28 can be straight, curved, or angled (as shown in FIG. 1). A continuous frame retaining sleeve 30 is provided along and traverses the edges of the sides 22, 24, 26, 28. As shown in FIG. 2, a continuous frame member 32 is retained or held within the frame retaining sleeve 30 to support the panel 20.

[0016] The continuous frame member 32 may be provided as one continuous loop, or may comprise a strip of material connected at both ends to form a continuous loop. The continuous frame member 32 is preferably formed of flexible coilable steel having a memory, although other materials such as plastics may also be used. The frame member 32 should be made of a material which is relatively strong and yet is flexible to a sufficient degree to allow it to be coiled. Thus, the frame member 32 is capable of assuming two positions or orientations, an open or expanded position such as shown in FIG. 1, or a folded position in which the frame member 32 is collapsed into a size which is much smaller than its open position (see FIG. 3D).

[0017] A sheet material 34 extends across the interior of the panel 20, and is held taut by the frame member 32 when in its open position. The sheet material 34 can extend completely across the panel 20 to entirely cover the enclosed space defined by the frame member 32, or can extend across selected portions of the enclosed space defined by the frame member 32. The term sheet material is to be given its broadest meaning and should be made from strong, lightweight materials and may include woven fabrics, sheet fabrics or even films.

[0018] Referring to FIG. 2, the sheet material 34 is stitched at its edges by a stitching 38 to the sleeve 30. The sleeve 30 may be formed by folding a piece of fabric, and then applying the stitching 38 to connect the sleeve 30 to the sheet material 34. Alternatively, the frame retaining sleeve 30 may be formed by merely folding over the sheet material 34 and applying the stitching 38. The frame member 32 may be merely retained within the frame retaining sleeve 30 without being connected thereto. Alternatively, the frame retaining



sleeve 30 may be mechanically fastened, stitched, fused, or glued to the frame member 32 to retain it in position.

[0019] An opening 40 can be provided in the sheet material 34. The opening 40 can be sized and configured to allow a person to swim therethrough. The opening 40 can be defined by an internal sleeve 42 which has a frame member 44 retained therein. The frame member 44 can be identical in construction to the frame member 32. Alternatively, the opening 40 can be defined merely by a border 46.

[0020] One or more weights 48 can be provided adjacent the bottom side 24 by attaching the weights 48 to the sleeve 30 and/or the sheet material 34. For example, the weights 48 can be retained inside bags 52 that are stitched to the sleeve 30 and/or the sheet material 34. The weights 48 can be embodied in the form of plastic, metal, rocks or other similar weighted objects. The weights 48 function to pull the panel 20 downward inside the water.

[0021] One or more floatation devices 50 can be provided on the sheet material 34 to counter the sinking forces of the weights 48 so as to cause the panel 20 to be oriented in a vertical manner (i.e., perpendicular to the surface of the water W), as shown in FIG. 1. The floatation devices 50 can be embodied in any desirable structure, including but not limited to one or more foam pieces, or one or more inflatable bags or inflatable tubes. The structure in FIG. 1 has two separate floatation devices 50 that are attached to the sheet material 34 between the sleeves 30 and 46 adjacent the sides 22 and 26. In addition, the floatation devices 50 are positioned between the top and bottom sides 28 and 24, respectively, and aligned at the same vertical elevation, so that a lower portion LP of the panel 20 can be below the surface of the water, and an upper portion UP of the panel 20 can be above the surface of the water.

[0022] Thus, the panel 20 can be used in a swimming pool. The user can place the panel 20 in a swimming pool, and the weights 48 will pull the bottom side 24 of the panel 20 towards the bottom of the pool. The floatation devices 50 will suspend the rest of the panel 20 at the surface of the water, thereby causing the panel 20 to orient itself in a vertical manner. Once deployed in the manner shown in FIG. 1, a child or an adult can swim through the opening 40.

[0023] FIGS. 1 and 3A through 3D describe the various steps for folding and collapsing the panel 20 of FIG. 1 for storage. In FIG. 1, two opposing sides (e.g., 24 and 28) of the panel 20 are folded in opposite directions to collapse the frame member 32 with the panel 20. As shown in FIGS. 3A-3C, the panel is twisted and folded to continue the collapsing so that the initial size of the panel is reduced. FIG. 3D shows the frame member 32 and panel 20 collapsed on each other to provide for a small essentially compact configuration having a plurality of concentric frame members so that the collapsed panel 20 has a size which is a fraction of the size of the initial panel 20.

[0024] To re-open the panel 20 to its expanded configuration, the panel 20 is unfolded. The memory (i.e., spring-load) of the frame member 32 will cause the frame member 32 to uncoil on its own and to quickly expand the panel 20 to its expanded configuration shown in FIG. 1. The same principles can be applied to collapse, and to re-open, all the other embodiments of the present invention described above.

[0025] FIG. 4 illustrates a panel 20a that has the same construction as the panel 20. The elements of the panel 20a that are the same as the elements of the panel 20 are provided with the same numeral designations except that an "a" has

been added to the numeral designations in FIG. 4. There are two primary differences between the embodiments in FIGS. 1 and 4. First, the openings 40a in FIG. 4 are smaller than the opening 40 in FIG. 1, and can also be used as game targets through which balls or objects can be thrown. Second, one or more floatation devices 50a are provided along the top side 28a of the panel 20a, so that the entire panel 20a is intended to be submerged below the surface of the water. The panel 20a can be collapsed using the same principles illustrated in FIGS. 3A-3E.

[0026] The panel 20a can also be used in a swimming pool. The user can place the panel 20a in a swimming pool, and the weights 48a will pull the bottom side 24a of the panel 20a towards the bottom of the pool. The floatation devices 50a will suspend the top side 28a of the panel 20a at the surface of the water, thereby causing the panel 20a to orient itself in a vertical manner. Once deployed in the manner shown in FIG. 4, a child or an adult who is swimming in the pool can throw objects or balls through the openings 40a, or even swim through the openings 40a (if the openings 40a are large enough).

[0027] FIG. 5 illustrates another structure 60 having a first panel 62 that can have the same construction as the panels 20, 20a, and having one or more weights 64 provided along its bottom side 66. In addition, a second panel 68 (which can have the same construction as the panels 20, 20a) is provided in a manner such that it crosses or overlaps the first panel 62 at overlapping points 70 and 72. The overlapping or crossing of the two panels 62 and 68 can be the same as that described in connection with U.S. Pat. No. 6,684,894 (Zheng), whose entire disclosure is incorporated by this reference as though set forth fully herein. As a result of the crossing or overlapping of the panels 62, 68, the sheet materials 74 and 76 of the panels 62 and 68, respectively, cross each other as well. Floatation devices 80 can be provided on one panel (e.g., 68) or both panels 62, 68, or can be completely omitted.

[0028] The panels 62, 68 are oriented such that the panel 62 is vertical with respect to the surface of the water, and the other panel 68 can be pivoted with respect to the panel 62 about the line 78 defined by the overlapping points 70, 72. When placed in the water, the weight 64 will pull the bottom side 66 of the panel 62 towards the bottom of the pool, while the floatation devices 80 will cause the panel 68 to float on the surface of the water in a manner where the panel 68 is horizontal with respect to the surface of the water. Even if no floatation devices are provided with the structure 60, the panel 68 can align itself horizontally with respect to the surface of the water, and if the correct weight is selected, the panel 68 might itself act as a floatation device to suspend the structure 60 with the panel 68 floating horizontal with respect to the surface of the water. Once deployed in the manner shown in FIG. 5, a child or an adult who is swimming in the pool can throw objects or balls through the openings 82 in the panel 62, or even swim through these openings 82. Openings 84 can also be provided in the panel 68 for other play and amusement purposes.

[0029] FIG. 6 illustrates another structure 100 having two panels 102, 103 that can have the same construction as the panels 20, 20a. Each panel 102 and 103 can be bent to a curved orientation, with the top sides 105 and 107, respectively, attached to each other (e.g., by stitching the frame retaining sleeve), and with the bottom sides 106 and 104, respectively, attached to each other (e.g., by stitching the frame retaining sleeve), to form a tunnel 114 therethrough.

One or more floatation devices **110** can be provided at the top of the structure **100** (i.e., at the connection of the top sides **105, 107**), and a weight **112** can be attached to the bottom of the structure **100** (e.g., at the connection of the sides **104, 106**).

[0030] The structure **100** can also be used in a swimming pool. The user can place the structure **100** in a swimming pool, and the weight **108** will pull the bottom of the panels **102, 103** towards the bottom of the pool. The floatation device **110** will suspend the rest of the panels **102, 103** at the surface of the water **W**, thereby causing the panels **102, 103** to orient themselves in a vertical manner. Once deployed in the manner shown in FIG. 6, a child or an adult can swim through the tunnel **114**.

[0031] The structure **100** can be collapsed using the same principles illustrated above in FIGS. 3A-3D after the panels **102, 103** are pressed against each other to form a stack of two panels.

[0032] The principles of the present invention can also be applied to structures that have more than one panel (e.g., see FIGS. 5 and 6). For example, FIG. 7 illustrates a structure **150** that builds upon the principles illustrated in FIG. 4. Specifically, the structure **150** can have a panel **20a** that is identical or substantially similar to the panel **20a** in FIG. 4. In addition, a collapsible enclosure **152** can be provided above the panel **20a** and its floatation device(s) **50a**. The enclosure **152** can include a plurality of (e.g., four) panels **154, 156, 158, 160** that are hingedly connected to each other to form a ring of panels. Each of these panels **154, 156, 158, 160** can have the same construction as the panels **20, 20a**, and the enclosure **152** can be the same as the module shown in FIG. 1 of U.S. Pat. No. 6,390,111 (Zheng), whose entire disclosure is incorporated by this reference as though set forth fully herein. In addition, one or more floatation devices **162** can be provided at the bottom side of each panel **154, 156** and **160**. The floatation device(s) **50a** is attached to the bottom side of the panel **158**, and to the top side of the panel **20a**.

[0033] When the structure **150** is placed in the water, the weight **48a** will pull the bottom side **24a** of the panel **20a** towards the bottom of the pool, while the floatation device(s) **50a** will cause the panel **20a** to float on the surface of the water in a manner where the panel **20a** is vertical with respect to the surface of the Water. The floatation devices **50a** and **162** will support the panels **154, 156, 158, 160** above the surface of the water so that the enclosure **152** floats above water. Once the structure **150** has been deployed in the manner shown in FIG. 7, a child or an adult who is swimming in the pool can throw objects or balls through the opening(s) **40a** in the panel **20a**, or even swim through the opening(s) **40a**, while other adults or children can be simultaneously playing inside or around the enclosure **152**. For example, a basket hoop **164** can be attached to the external side of one of the panels (e.g., **158**) so that a ball can be tossed through the hoop **164**. Other amusement devices can be attached to the interior or the exterior of the enclosure **152** to provide additional fun and games.

[0034] The enclosure **152** can be collapsed using the same principles illustrated above in FIGS. 3A-3D after the four panels **154, 156, 158, 160** have been placed one on top of each other to form a stack of four panels (such as shown in FIGS. 8A and 8B of U.S. Pat. No. 6,390,111), and after the panel **20a** has been folded on top of this stack of four panels to form a stack of five panels. In addition, the panel **50a** can be hingedly

with respect to the panel **158** and used as a floor if the structure **150** is used on land as a tent or play structure.

[0035] Even though FIGS. 1 and 4-7 show structures having certain numbers of panels, it is possible to change the number of panels for each structure without departing from the scope of the present invention. For example, a longer tunnel can be formed by attaching a plurality of the structures of FIG. 6 in an aligned manner. As another example, the panels in FIGS. 1 and 4 can be combined (e.g., removably coupled to each other along adjacent sides by VELCRO™ pads, hooks or other similar mechanisms), and two or more vertical panels similar to panel **62** in FIG. 5 can be provided to support the horizontal panel **68**. Also, the structure **150** can be modified so that the enclosure **152** can have any number of panels, and any number of underwater panels (such as **20a**) can be provided under the enclosure **152**. For example, each panel of the enclosure **152** can be connected to a separate underwater panel **20a**. As yet another example, the enclosure **152** does not need to enclose a space, and can be comprised of one panel (e.g., **158**) or two panels (e.g. **156** and **158**) to define an upper structure.

[0036] Thus, the embodiments of the present invention increase the applications and use single panels to provide the user with an unlimited source and variety of fun and entertainment. The panels can be combined to increase the variety of fun and use. The shapes and sizes of the panels and the resulting structures can be varied or combined, as well as the entertainment features. These embodiments further illustrate the versatility of the panels of the present invention, in that these panels can be used to form the basis for numerous structures that offer an unlimited variety of entertainment and other purposes.

[0037] While the description above refers to particular embodiments of the present invention, it will be understood that many modifications may be made without departing from the spirit thereof. The accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention.

1-19. (canceled)

20. A collapsible structure comprising:

- a lower panel comprising a foldable frame member having a folded and an unfolded orientation, with a sheet material covering interior portions of the frame member, the lower panel having a top side and a bottom side wherein said lower panel is oriented vertically when the collapsible structure is submerged in water;
  - a weight coupled to the lower panel;
  - an upper structure coupled to the top side of the lower panel, the upper structure having at least one panel that has a second foldable frame member having a folded and an unfolded orientation, with a sheet material covering interior portions of the second frame member of the panel of the upper structure; and
  - a floatation device coupled to the top side of the lower panel such that the upper structure is maintained above the surface of water when the lower panel is submerged inside a body of water;
- wherein each frame member is twisted and folded to form a plurality of concentric ring members when in the folded orientation.

21. The structure of claim 20, wherein the upper structure includes a plurality of panels, with each panel of the upper structure having a foldable frame member having a folded

and an unfolded orientation, with a sheet material covering interior portions of the corresponding frame member of the panel of the upper structure; and

wherein the plurality of panels of the upper structure are connected together to form a ring of panels for the upper structure.

**22.** The structure of claim **21**, further including an opening provided in the sheet material of the lower panel.

**23.** The structure of claim **21**, further including an amusement item attached to the panel of the upper structure.

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