

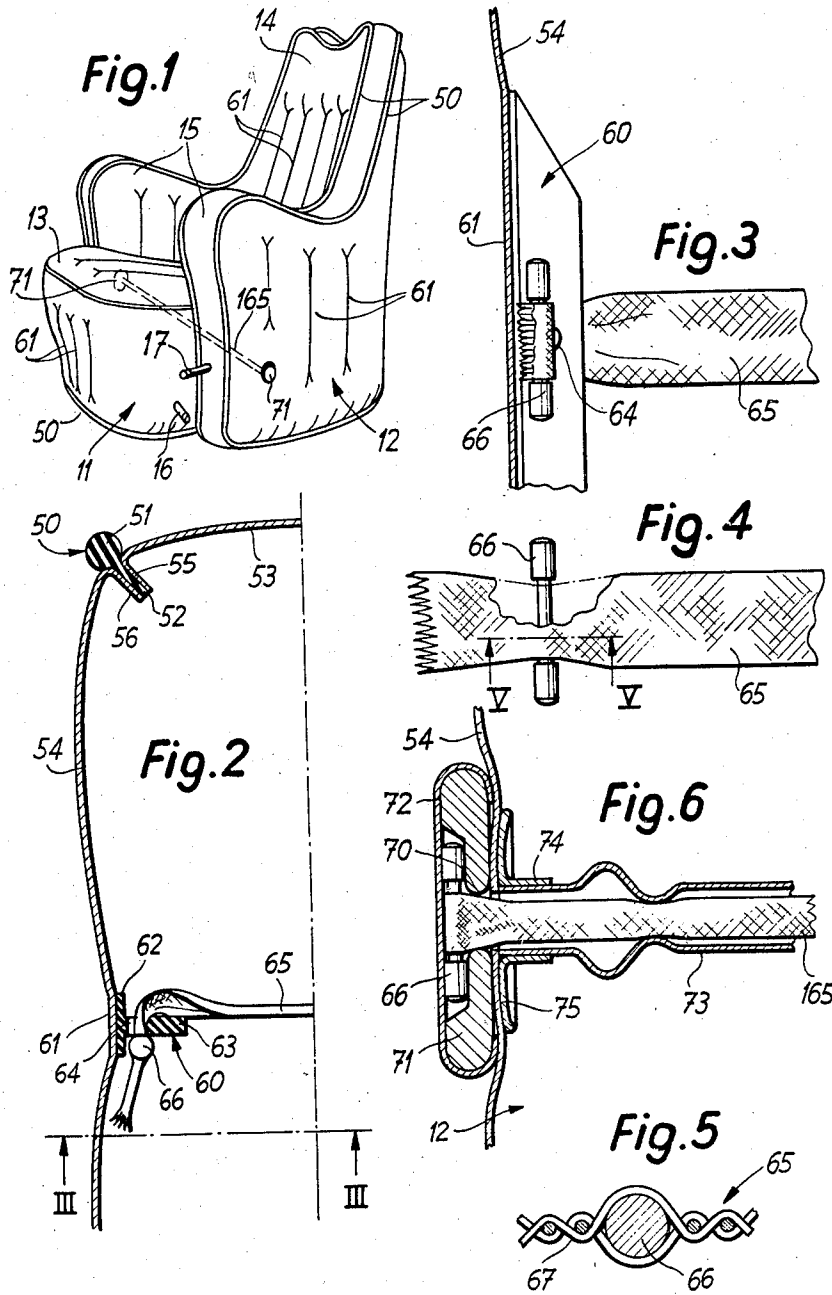
May 2, 1961

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2,982,341

FOLDING OBJECT INCLUDING AT LEAST ONE INFLATABLE HOLLOW BODY

Filed Nov. 28, 1958



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FOLDING OBJECT INCLUDING AT LEAST ONE INFLATABLE HOLLOW BODY

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Filed Nov. 28, 1958, Ser. No. 777,091

Claims priority, application Switzerland May 6, 1958

9 Claims. (Cl. 155—178)

This invention relates to a folding object which includes at least one inflatable hollow body of pliable material and has in its interior at least one tensile-stressed brace interconnecting oppositely disposed walls of the hollow body. The purpose of the brace is to give the inflated hollow body a desired form and to prevent it from ballooning out in an undesirable manner.

The folding object according to the invention is principally characterized in that the brace passes through apertures in the anchoring members on the respective walls of the hollow bodies.

Further features of the invention will appear from the following description and claims, taken in conjunction with the accompanying drawing, wherein there is shown by way of example one preferred form incorporating the invention.

Fig. 1 is a perspective view of a chair as inflated and designed in accordance with the invention;

Fig. 2 is a sectional view of a portion of the chair, on a larger scale;

Fig. 3 shows a section taken on the line III—III of Fig. 2;

Fig. 4 is a view of one end portion and of the pertinent crossbar of one of the braces or stays provided within the inflatable chair;

Fig. 5 is a diagrammatic representation of a section taken on the line V—V of Fig. 4;

Fig. 6 shows another detail of the chair in a representation similar to Fig. 3.

Referring to Fig. 1, the chair shown comprises two inflatable hollow bodies 11, 12, one of them forming the seat part 13, and the other the back 14 with two armrests 15. The unit has the shape of a so-called easy chair. Both hollow bodies 11, 12 are inflatable independently of one another and have each an air inlet and outlet connection 16 and 17 respectively, which can be closed airtight by a plug or in some other way known per se.

The walls of the hollow bodies 11, 12 are formed by sheet-like parts cut out of flat squares, which are pliable and impermeable to air. Preferably the walls consist of thermoplastic material.

The two hollow bodies 11, 12 have beads 50 coextensive with their edges, serving on the one hand for decoration and on the other hand for connecting the wall parts of the respective hollow body, as visible more particularly from Fig. 2. The bead 50 is a pliable sectioned piece having a head portion 51 of, say, substantially circular cross-section, with a single adjoining web 52 extending substantially radially thereto. Preferably the bead 50 consists of thermoplastic material. In Fig. 2, two wall parts connected to each other by the bead 50 are designated 53 and 54. A marginal portion 55 and 56 respectively of each wall part fits with its outer side the web 52 of the bead, being connected thereto airtight by thermal or chemical welding. The web 52 and the

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marginal portions 55 and 56 secured thereto project into the interior of the respective hollow body, the head portion 51 of the bead 50 lying outside.

In order to ensure the desired shape of the hollow bodies 11, 12 as inflated and to prevent the walls from bulging out, some transverse connections are provided within each of the hollow bodies 11 and 12. For this purpose, the oppositely disposed hollow body walls, which extend substantially parallel to each other, have attached to their inwardly-facing sides anchoring members in the form of sectioned pieces or anchor members 60 (Figs. 2 and 3) which consist of thermoplastic material and are connected to the respective hollow body wall. Said pieces 60 are pliable and of substantially T-section, as shown in Fig. 2. The cross member 62 of each sectioned piece lies against the inner side of the respective hollow body wall, being thermally or chemically welded thereto. The leg 63 of the sectioned pieces 60 has at least one aperture 64 through which to pass one end portion of a pliable stay 65 of textile ribbon, as shown in Figs. 2 and 3. For anchoring to the respective sectioned piece 60, the end portion of the ribbon 65 includes a crossbar 66 which is worked in and extends parallel to the weft threads 67 of the textile ribbon, as diagrammatically shown in Fig. 5. The end portions of the crossbar 66 which extend beyond the selvages of the ribbon 65 are thicker than the intermediary section, as distinctly shown in Fig. 4. This prevents the crossbar 66 from slipping out endwise of the textile ribbon 65. The ends of the crossbar 66 which extend beyond the ribbon 65 engage behind the edges of the apertures 64 to ensure the required anchoring of the ribbon 65. The other end portion of the ribbon 65 is anchored to the opposite hollow body wall in exactly the same manner by means of a sectioned piece 60.

On one and the same sectioned piece 60 several apertures 64 may be arranged in spaced relation so that ends of a plurality of stays 65 may be anchored to one common sectioned piece 60.

In inflated condition of the hollow bodies 11, 12, and especially when somebody sits on the chair, the stays 65 become tensile-stressed and thus tensed. The stays 65 determine the maximum permissible distance apart of the hollow body walls opposite each other and provide increased stability of the chair in tensed condition.

To ensure holding together of the two hollow bodies 11, 12 there is provided an additional stay 165 which, according to Fig. 1, passes through the two side parts of the hollow body 12 and through the hollow body 11. The extremities of the stay 165 which is also pliable and consists of a textile ribbon, are provided with a crossbar 66 (Fig. 6) in exactly the same manner as the stays 65. The stay 165 protrudes through central apertures 70 of two disk-shaped anchoring members 71, one of which is shown in Fig. 6. The ends of the crossbars 66 which extend beyond the selvedge of the stay 165 engage behind the edges of the apertures 70. Both disks 71 are situated on the outwardly-facing side of the neighboring hollow body walls 54 and are each fitted with a removable cap 72 covering the respective selvedge portion of the stay 165 and the pertinent crossbar 66. As may be seen from Fig. 6, the crossbar 66 seats in a recess of the disk 71.

The stay 165 is surrounded by three pliable tubes 73, only one of which is visible in Fig. 6. The first tube 73 is located within one side part of the hollow body 12, the second tube is located within the hollow body 11, and the third tube within the other side part of the hollow body 12. The ends of each tube 73 are connected airtight with the oppositely disposed walls of the respective hollow body 11 or 12. For this purpose, each

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end of the tubes 73 is connected airtight with a central socket 74 of a flanged piece 75 being in turn fixed airtight to the inward-facing side of the respective hollow body wall 54, as shown in Fig. 6. Preferably, the tubes 73 and the flanged pieces 75 with their sockets 74 consist of thermoplastic material. The airtight connection of the flanged pieces 75 with the neighboring hollow body walls 54 as well as the airtight connection of the sockets 74 with the tubes 73 may be made by thermal or chemical welding. The length of the tubes 73 altogether is greater than the maximum distance apart, permitted by the stay 165, of the outermost walls of the hollow body 12. Each single tube 73 is also longer than the distance apart, permitted by the stay 165, of the hollow body walls connected to the respective tube 73. Thereby it will be achieved that upon inflation of the bodies 11 and 12, the stay 165 becomes tensed and tensile-stressed, but the tubes 73 will not be subjected to tensile stress.

It is understood that also more than one stay 165 with disk-shaped anchoring members may be provided on the chair. The stays 65 and 165 need not in each case be textile ribbons, and the crossbars 66 may also be secured in any other suitable manner to the end portions of the stays 65 and 165.

When assembling the aforescribed chair, the crossbars 66 are pushed endwise respectively through the apertures 64 and 70 and through the tubes 73. But it may also be conceivable to have the crossbars 66 mounted subsequently on the ends of the stays 65 and 165 when these have already been pushed through the respective apertures and tubes.

Alternatively, it is possible to have the hollow body walls, sectioned pieces 60, tubes 73 and flanged pieces 75 made of rubber or similar material instead of thermoplastic synthetic substances, in which case said parts could be connected to one another by vulcanizing.

The described chair has the advantage that, when inflated, it maintains substantially its shape as comparatively steady, even on being sat upon. When not in use, the hollow bodies 11 and 12 may be deflated, whereupon the whole structure may be folded together in a relatively small space.

Obviously, the invention is not limited to chairs of the type, but covers the most varied collapsible objects comprising at least one inflatable hollow body of pliable material and having within it at least one pliable stay capable of being tensile-stressed, which interconnects oppositely disposed walls of the hollow body. Such objects may be, for instance, air mattresses, tent roofs, etc.

In the claims, the term "symmetrically" means that the ends of bar 66 protrude substantially the same distance beyond the sides or selvedge of the ribbon 65. Also, the claims are to be interpreted with respect to the articles or cushion when inflated and the elements 65 and/or 165, under tension.

What I claim is:

1. In an inflatable object having opposed flexible walls, a tension connection between said walls comprising a pair of apertured anchor members fixed with said walls, respectively, in opposed relation, a pair of bars each spanning a respective aperture and having its ends overlying its anchor member, and a ribbon of woven fabric having each end passing through a respective aperture and secured to a respective one of said bars, each said bar being interwoven with the warp of said ribbon transversely thereof and having a length greater than the width of said ribbon.

2. An inflatable article having opposed flexible walls, first and second anchor members each having an aperture therethrough and each fixed with a respective one of said walls in opposed relation, a tension ribbon of woven fabric, first and second bars each having a length greater than the width of said ribbon, each said bar

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spanning a respective one of said apertures, and having its ends in contact with and overlying its anchor member, said ribbon being disposed with each end passing through a respective aperture and secured to a respective bar, each bar being interwoven with the warp of said ribbon and disposed transversely and symmetrically with respect thereto.

3. An inflatable article as defined in claim 2, the ends of said bars protruding beyond the selvedge being enlarged to prevent axial movement with respect to said ribbon.

4. An inflatable object including first and second opposed flexible walls, first and second anchor members each integrally united with the inner surface of a respective one of said walls in opposed relation, each said anchor member having an aperture therethrough entirely within said object, a flexible tension ribbon, first and second rigid bars each having a length greater than the width of said ribbon and each spanning a respective one of said apertures with its ends overlying and contacting its anchor member, said ribbon being disposed with each end passing through a respective aperture and secured to a respective one of said bars, each bar being fixed to said ribbon transversely thereacross and symmetrically thereof.

5. An inflatable article of personal use, having a pair of opposed flexible walls, a pair of anchor members T-shaped in cross section and each having its head secured to the inner surface of a respective flexible wall, there being an aperture through the leg of each said anchor member, a pair of rigid bars, each spanning a respective aperture with its ends overlying and in contact with its anchor member, and a ribbon of flexible material disposed with each end passing through a respective aperture and secured to a respective bar, each said bar having a length greater than the width of said ribbon and secured transversely and symmetrically thereacross.

6. An inflatable article as in claim 5, said ribbon being of woven fabric, each said bar being interwoven with the warp of said ribbon and having enlarged ends to prevent axial movement with respect to said ribbon.

7. In an inflatable article having opposed flexible walls, a pliable stretchable tube extending between said walls, means sealing each end of said tube in pressure-tight relation with its respective wall, a pair of apertured anchor members each disposed exteriorly of a respective wall over the corresponding end of said tube, a pair of rigid bars each spanning the aperture of a respective anchor member and having its ends overlying the same, and an elongated flexible element passing through said tube and having its ends secured to a respective one of said bars, each said bar being secured to said element transversely thereof.

8. The article of claim 7, the extended length of said tube being greater than the effective length of said element.

9. In an inflatable article having opposed walls, at least one said wall being flexible, a stretchable tube extending between and connecting said walls, a flanged sleeve secured to one end of said tube, said flange being secured to the inner surface of said flexible wall to form a pressure tight connection between said wall and tube, an apertured anchor member positioned over said end of said tube exteriorly of said flexible wall and having aligned recesses at opposite edges of said aperture, a rigid bar spanning said aperture and having its ends seated in respective ones of said recesses, a ribbon of woven fabric passing through said tube and having one end passing through said flexible wall and secured to said bar, said bar being secured to said ribbon transversely thereof and having a length greater than the width of said ribbon, and means securing the other end of said tube and ribbon to the other of said opposed walls.

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