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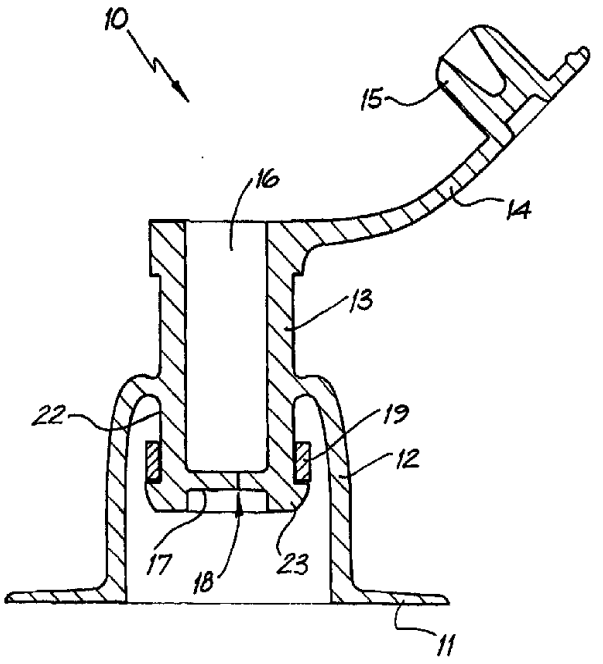
(54) Title: VALVE FOR AN INFLATABLE ARTICLE

(57) Abstract

A valve (10) for an inflatable article has a flexible housing (12) having a stem (13) formed integrally therewith such that in one configuration of the housing the stem projects outwardly of the inflatable article, whereas in another configuration of the housing, the stem resides substantially within the inflatable article. The stem has a passage (16) therethrough. The valve also comprises a wall (17) situated across the passage (16) and having a slit (18) thereacross, the slit being openable upon compression of the stem in a direction transverse of the direction of the passage to allow the passage of fluid through the stem. An elastic ring (19) is situated about the stem at or nearby the wall (17) and is adapted to bear upon the stem to bias the slit into a closed position.



VALVE FOR AN INFLATABLE ARTICLE

The following invention relates to a valve. More particularly, though not exclusively, the invention relates to a valve for an inflatable article such as a beach ball, inflatable mattress, inflatable boat, toy, swimming aid such as a "floatee" or other inflatable plastics objects.

Known valves for such objects comprise a plastics molding having a stem with a passage therethrough closeable by a stopper. Known valves also comprise a flap element formed by cutting the stem off the valve and adapted to block off the passage of air through the stem. The plastics moulding in these valves is flexible to the extent required to allow the housing to be project from the inflatable object for the purpose of inflation and to then be pushed by hand so as to invert and penetrate into the object after inflation, so as to provide a substantially projection-free external surface.

Known valves often leak without the stopper in place within the passage, resulting in deflation of the article, or the inability to properly inflate the article since some time is required to place the stopper into the passage, during which time air escapes from the article.

Object of the Invention

It is the object of the present invention to overcome or substantially ameliorate the above disadvantages and/or more generally to provide an improved valve for inflatable articles.

Disclosure of the Invention

There is disclosed herein a valve for an inflatable article, the valve having:

a flexible housing,

a stem formed integrally with the housing such that in one configuration of the housing the stem projects outwardly of the inflatable article, whereas in another configuration of the housing, the stem resides substantially within the inflatable article, the stem having a passage therethrough,

a wall situated across the passage and having a slit thereacross, the slit being openable upon compression of the stem in a direction transverse to the direction of the passage to allow the passage of fluid through the stem, and

an elastic ring situated about the stem at or nearby the wall and adapted to bear upon the stem to bias the slit into a closed position.

Preferably, the stem is substantially cylindrical, with the wall being substantially circular.

Preferably, the slit is offset from the centre of the wall.

Preferably, the stem comprises a substantially cylindrical outer surface, though having a flat landing portion spaced from the slit and against which the elastic ring bears to bias the slit into the closed position.

Preferably, the valve further comprises a stopper member hingedly affixed to the stem and adapted to close off the passage.

Preferably, the valve further comprises a base by which the valve can be adhered to the inflatable article.

Preferably, the valve and ring are fabricated from flexible, elastic plastics material.

Preferably, the valve further comprises an annular flange about the stem and/or wall presenting an obstacle to the elastic ring thus preventing detachment of the ring from the stem.

Brief Description of the Drawings

Preferred forms of the present invention will now be described by way of example with reference to the accompanying drawings, wherein:

Fig. 1 is a schematic cross-sectional elevational view of a valve,

Fig. 2 is a schematic inverted plan view of the valve of Fig. 1, and

Fig. 3 is a schematic cross-sectional elevational view of another valve.

Description of the Preferred Embodiment

In Figs. 1 and 2 of the accompanying drawings there is depicted a valve 10, typically fabricated from flexible, elastomeric material such as PVC or silicone. The valve may be clear or opaque or anything therebetween.

The valve 10 comprises an annular base 11 by which the valve 10 may be glued, plastics welded or otherwise secured to an inflatable article. Alternatively, the annular base 11 may be laminated between a pair of layers of the skin of an inflatable article.

Extending upwardly and molded integrally with the base 11 is a housing 12 from which a stem 13 extends. Stem 13 has a passage 16 therethrough through which fluid such as air may pass. The upper end of passage 16 may be closed off by a stopper 15 situated near the distal end of a hinge 14 integrally molded as part of the valve.

At the lower end of stem 13 there is provided a transverse wall 17 having a slit 18 cut therein. The slit 18 as shown in Fig. 2 extends across the wall 17, though is offset slightly from the centre of the wall 17.

The outside, substantially cylindrical surface 22 of stem 13 inside the housing 12 comprises a substantially flat landing 20, the flat surface of which is substantially parallel to the slit 18 in wall 17. The flat landing 20 has a pair of edges 21.

Situated about the lower part of the stem 13 is an elastomeric ring 19. The relaxed state diameter of the inside surface of the ring 19 is slightly less than the relaxed state outside diameter of the stem 13 within housing 12. The ring 19 is also fabricated from elastomeric material such as silicone. The internal surface of the ring 19 bears against the external periphery of the stem 22 adjacent to the wall 17. The ring 19 bears upon the edges 21 of the landing 20 to assist in biasing the slit 18 into a closed position.

In use, the housing 12 may be squeezed between say the thumb and index finger such that the internal surface of the housing 12 bears against the ring 19 which in turn distorts the stem 13 and opens the slit 18 to allow inflation of the article by breathing through the passage 16. Alternatively, a football type inflation pump comprising a metallic needle may be passed through the passage 16 and forced through the slit 18 to allow inflation.

Once inflated, the ring 19 biases the slit 18 into the closed position to prevent leakage of fluid from the article. As a secondary sealing measure, the stopper 15 can be inserted into the opening of the passage 16. The stem 13 can now be pushed downwardly into the inflatable article by application of pressure to the exposed surface of the stopper 15. Thus the housing 12 will flex such that the stem 13 resides substantially within the inflatable article.

Fig. 3 depicts a further embodiment, substantially the same as that as depicted in Figs. 1 and 2, though with the additional feature of an annular flange 23 molded integrally with the stem 13 and providing an obstacle preventing detachment of the elastic ring 19 from the stem 13. In this embodiment, the wall 17 can be in the position depicted, or alternatively, situated slightly higher, or slightly lower so as to be substantially co-planer with the flange 23. In assembling the valve, the elastic ring 19 is stretched over the flange 23 into the positioned depicted.

It should be appreciated that modifications and alterations obvious to those skilled in the art are not to be considered as beyond the scope of the present invention. For example, a pair of crossed slits may be provided in the wall 17.

CLAIMS:

1. A valve for an inflatable article, the valve having:

a flexible housing,

a stem formed integrally with the housing such that in one configuration of the housing the stem projects outwardly of the inflatable article, whereas in another configuration of the housing, the stem resides substantially within the inflatable article, the stem having a passage therethrough,

a wall situated across the passage and having a slit thereacross, the slit being openable upon compression of the stem in a direction transverse to the direction of the passage to allow the passage of fluid through the stem, and

an elastic ring situated about the stem at or nearby the wall and adapted to bear upon the stem to bias the slit into a closed position.

2. The valve of claim 1 wherein the stem is substantially cylindrical, with the wall being substantially circular.

3. The valve of claim 1 wherein the slit is offset from the centre of the wall.

4. The valve of claim 3 wherein the stem comprises a substantially cylindrical outer surface, though having a flat landing portion spaced from the slit and against which the elastic ring bears to bias the slit into the closed position.

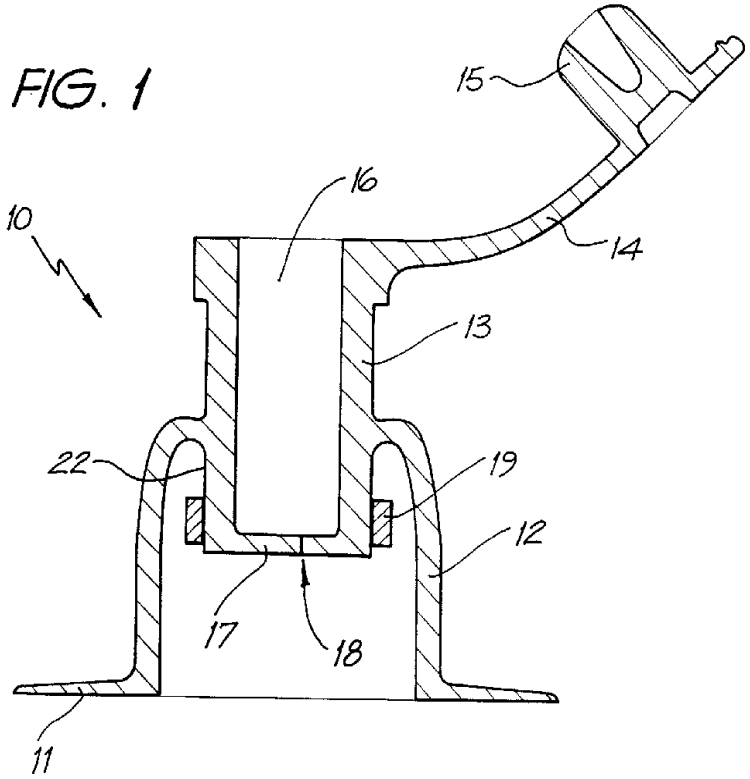
5. The valve of claim 1 further comprising a stopper member hingedly affixed to the stem and adapted to close off the passage.

6. The valve of claim 1 further comprising a base by which the valve can be adhered to the inflatable article.

7. The valve of claim 1 wherein the valve and ring are fabricated from flexible, elastic plastics material.

8. The valve of claim 1 further comprising an annular flange about the stem and/or wall presenting an obstacle to the elastic ring thus preventing detachment of the ring from the stem.

FIG. 1



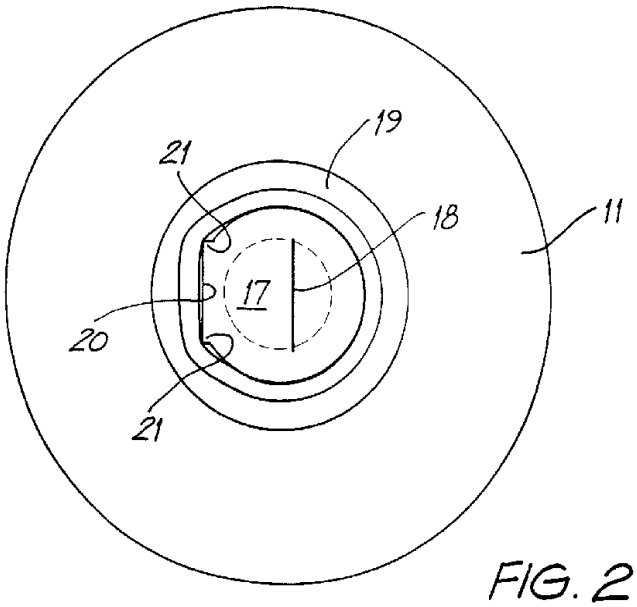


FIG. 2

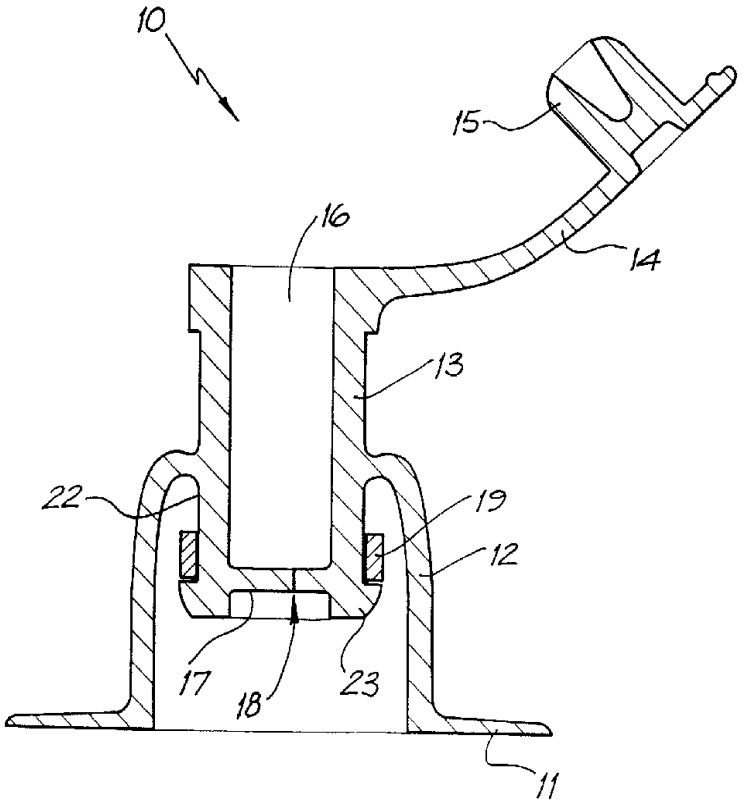


FIG. 3