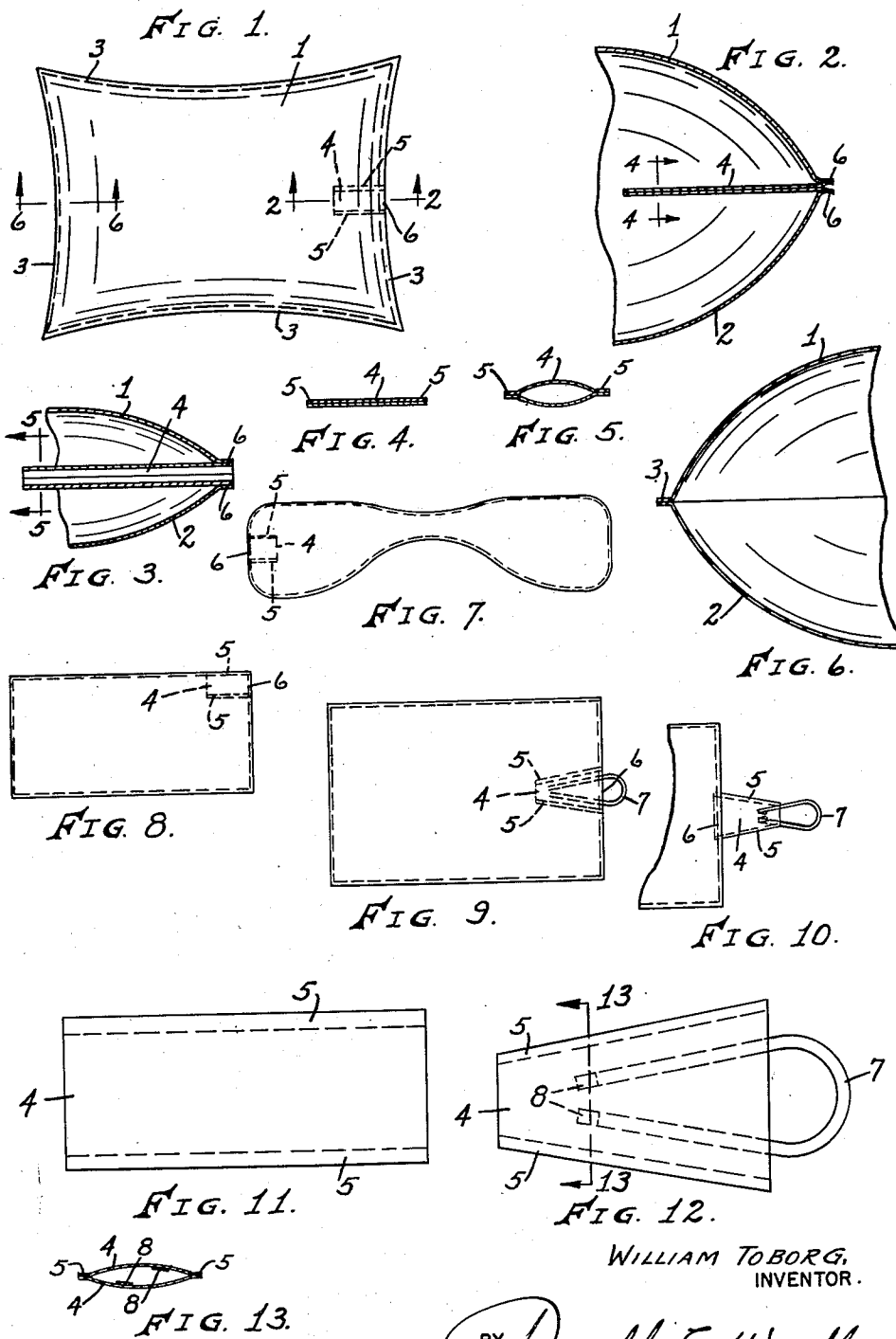


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VALVE STRUCTURE

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VALVE STRUCTURE

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This invention relates generally to valve structures and more particularly to that type of valve structure which is used in connection with such articles as inflatable pillows, toy balloons, mattresses, and water wings, and is readily adaptable to packaging of merchandise in liquid, semi-liquid, or granular form.

The principal object of the invention is the provision of a valve structure which is of simple form and is readily adaptable to the articles enumerated above.

A second object is the provision of a valve structure which is easily, quickly, and permanently secured to the article to which it is applicable.

A third object is the provision of a valve structure which is formed of "plastic" film material and is adapted to be securely attached by fusing to like materials by means of the application of heat to the parts to be secured together.

Still another object is the provision of a valve structure which is effectively sealed against the loss of pressure from the free end thereof by means of firm pressure applied thereto and is adapted to be opened by means of an instrument inserted into it.

Further objects of the invention and the various advantages and characteristics of the present valve structure will become apparent in the course of the following description, and that which is new will be pointed out in the appended claims.

The most satisfactory manner of carrying out the principles of the invention is shown in the accompanying drawing, in which:

Figure 1 is a plan view of a pillow which is made of plastic film material and has in combination therewith a valve structure embodying the invention.

Figure 2 is a cross section taken on the line 2—2 of Figure 1 and showing the valve structure in sealed condition.

Figure 3 is a section similar to Figure 2 but with the valve structure being shown in opened condition.

Figure 4 is a cross section taken on the line 4—4 of Figure 2, and showing the valve structure in sealed condition.

Figure 5 is a cross section taken on the line 5—5 of Figure 3 and showing the valve structure in opened condition.

Figure 6 is a section taken on the line 6—6 of Figure 1, and showing the heat sealed seam that is formed by the juncture of the edges of the upper and lower members of the pillow.

Figure 7 shows the application of the valve structure to water wings.

Figure 8 shows a corner application of the valve structure to a container for packaging.

Figure 9 is a plan view showing a valve structure in connection with a package device, and with means attached to the valve structure for reversing the valve with relation to the package device.

Figure 10 is a detail similar to Figure 9 but with the valve structure being shown in reversed condition and forming a pouring spout for the contents of the package device.

Figure 11 is a plan view of the valve structure per se.

Figure 12 is a plan view of a valve structure provided with means for reversing the same with relation to the package to which the valve is attached.

Figure 13 is a cross section on the line 13—13 of Figure 12.

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Like numerals of reference designate like parts throughout the several views.

In order that the advantages of the invention may be more fully understood and appreciated, I will now take up a detailed description thereof in which the same will be more fully set forth.

Referring now to the drawing, numerals 1 and 2 designate respectively, the upper and lower parts of a pillow which is made of flexible plastic film material and has the edges of its upper and lower parts fused together and indicated by numeral 3. The edges of the upper and the lower parts 1 and 2 are fused together by means of heat applied thereto and hence they are marginally connected by heat seals.

The valve structure is designated by the reference numeral 4 and is formed of two like normally flat elongated members which are formed of flexible, heat sealable "plastic" film and are laid together, the longitudinal edges 5 of the two members being fused together by means of applied heat in order that they are in heat sealed relation. As shown in Figures 1, 2, and 3, certain portions of the upper and lower parts of the pillow are not heat sealed together in order that they form or define a small sized mouth, and the valve structure 4 is disposed wholly within the pillow and has one end thereof disposed adjacent to the mouth. The inner and outer ends of the two members that constitute the valve structure are separate or disconnected from one another in order that the valve structure is open ended to the end that when it is in its open position material may flow lengthwise therethrough. The valve structure is positioned so that the members thereof are in flat or parallel relation with the upper and lower parts of the pillow when the pillow is in its collapsed or deflated condition. The outer end of the uppermost member of the valve structure fits flatly against, and is fused or heat sealed to, the edge of the upper pillow member that defines the upper portion of the aforementioned small sized mouth and the outer end of the lowermost member of the valve structure is fused or heat sealed to the edge of the lower pillow member that defines the bottom portion of the mouth. The heat seals whereby the outer ends of the uppermost and lowermost members of the valve structure are connected to the mouth defining portions of the upper and lower parts of the pillow are designated in the drawing by the reference numeral 6. In order to prevent sealing or closing of the outer end of the valve structure during formation of the heat seals 6, a non-fusible member (not shown) is placed between the outer ends of the two members while they are fused to the mouth defining edge portions of the upper and lower pillow parts 1 and 2.

Because the members constituting the valve structure are formed of flexible, comparatively thin, "plastic" film material, the valve structure is capable of being pressed together by a slight, firm pressure to exclude air from between the members and thereby form a check valve which is tightly sealed against the escape of pressure through the free or outer end thereof. As shown in Figs. 1, 2 and 3 and also in Figs. 7, 8 and 11 the valve structure as a whole is materially longer than it is wide. As a result of this the valve structure is so proportioned that when the body is filled and then subjected to external pressure the material under pressure in the body will not force the valve structure to turn inside out and move through the mouth into a position wherein it is disposed exteriorly of the body.

In Figure 8 of the drawing is shown a container-like device which differs from the pillow of Figures 1 to 3, inclusive, in that the unitary tube type valve structure, instead of being located midway between the side edges of the upper and lower parts, is positioned within one corner. As shown in Figure 8, the outer ends of the members 4 of the valve structure are connected by heat seals to the mouth defining portions of the adjacent edges of the upper and lower parts of the device and the side margins or longitudinal edges of the members 4 are connected together by heat seals. The outermost heat sealed side margins of the members 4 are interposed between, and are heat sealed to, the adjacent side edges or margins of the upper and lower parts of the device. By

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having the outermost side margins of the members 4 heat sealed to the adjacent side edges of the upper and lower parts of the device the valve structure as a whole is positively locked in place and cannot be forced outwards through the mouth of the device when the device is in an inflated condition. As shown in dotted lines in Fig. 1 the outer end portions of the heat seals between the side margins of the upper and lower members of the valve structure are in registering relation with the end portions of the heat seals 6. As the result of this, the outer end portions of the heat seals between the side margins of the upper and lower members of the valve structure serve when the mouth and the outer end of the valve structure are opened to their fullest extent to prevent strain or tension on the marginal parts of the upper and lower parts 1 and 2 that are between the ends of the heat seals 6 and the adjacent ends of the heat seals between the edges of said upper and lower parts.

The valve structure which is shown in Figures 9, 10, 12, and 13 is formed similarly to the valve structure that is shown in Figures 1, 2, 3, 4, 5, 7, 8 and 11 except the profile thereof is such to facilitate the filling of a package. The valve structure, as shown in Figures 9, 10, 12, and 13, provides a modified funnel-shaped member through which material can enter the package, after which a firm pressure excluding the air from between the members 4 causes the members to lie tightly together with the sealing thereof being augmented by pressure from within the package.

The last mentioned valve structure is provided with a loop 7 which is preferably formed of the same material as the members 4 and has its ends fused at 8 to the valve members. It will be noted, particularly by reference to Figure 13 that one end of the loop is fused to one of the valve members while the other end of the loop is fused to the other of the valve members.

When it is desired to remove the contents of a package to which the valve structure of Figures 9, 10, 12 and 13 is attached, the loop 7 provides means of reversing the position of the valve structure from the position shown in Figure 9 to that shown in Figure 10, and with the valve structure providing a spout through which the contents of the package may be emptied.

When the valve structure is used in connection with an inflatable member such as a pillow (Figures 1, 2 and 3), toy balloon, water wings (Figure 7), or the like, air under pressure is introduced into the inflatable member through the valve structure. After sufficient air has been introduced into the member, the valve structure is closed or sealed by pressing its members together so as to exclude air therebetween. The sealing of the valve structure by means of exclusion of the air from between the members is accentuated by means of the air pressure within the inflated member. Such air pressure functions to hold the members of the valve structure firmly together and hence no air is permitted to escape from the interior of the inflatable member. When it is desired to release pressure from within the air inflated member, a pencil or other instrument is inserted longitudinally through the valve structure thereby breaking the seal formed by the pressure in the inflatable member, after which the pressure is released from the member through the opened valve structure. Instead of using a pencil or like instrument to open the valve structure, a tube may be inserted through the valve structure and the air will be permitted to escape therethrough.

The valve structure is almost imperceptible and permits of ready folding of the member to which it is secured without any bulge resulting therefrom. It is capable of being produced at an extremely low cost and, due to its particular construction, effectively and efficiently fulfills its intended purpose.

I desire that it be understood that I am not to be limited to the precise form of the valve structure, and that minor changes may be made therein, insofar as the changes therein may fall within the scope of the appended claims.

Having now shown and described the invention, what I claim, and desire to secure by Letters Patent of the United States, is:

1. As a new article of manufacture, a container-like object adapted to be filled with fluid material and comprising a hollow body formed of flexible, heat sealable "plastic" film and consisting of coextensive upper and

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lower parts with the margins thereof connected together except at one location in order to form a small size mouth, a tube-like open ended valve structure disposed normally substantially entirely within the body in alignment with the mouth, formed entirely of flexible heat sealable "plastic" film and consisting of coextensive separately formed normally flat wedge shaped upper and lower members having the side margins at each side thereof projecting outwards, positioned in direct contact with one another and heat sealed together and having their large end margins disconnected from one another at all times but heat sealed directly and respectively to the mouth defining portions of the upper and lower parts of the hollow body, said valve structure being so designed that it is adapted, when the portions of its members between the heat sealed side margins are forced away from one another into an open position, to have filling material introduced through it into the body and is further adapted after filling of the body to have the upper and lower parts thereof pressed firmly and flatly together by the pressure of the material in the body in order to form a seal which serves positively to prevent egress of the material from the body through the valve structure until such time as the aforesaid portions of its members are forced away from one another into their said open position, said valve structure being of materially greater length than width and so proportioned that when the body is filled and then subjected to external pressure the material under pressure in the body will not force the valve structure to turn inside out and move through the mouth into a position wherein it is disposed exteriorly of the body, and an elongated strip-like element formed of the same type of film as the valve structure, having its central portion disposed externally of the body and valve structure and its ends extending into the valve structure and heat sealed one to one member and the other to the other member, and adapted to form a handle whereby when it is desired to discharge the material from the body interior the valve structure may be pulled inside out and also out of the body to form a pouring spout.

2. As a new article of manufacture, a container-like object adapted to be filled with fluid material and comprising a hollow body formed of comparatively thin, flexible, heat sealable "plastic" film and consisting solely of coextensive, single thickness, upper and lower parts with the margins thereof extending outwards, positioned adjacent one another and connected directly together by heat seals of appreciable width except at one location in order to form a small sized mouth, and a tube-like open ended valve structure disposed within the interior of the body and in alignment with the mouth, formed entirely of comparatively thin, flexible, heat sealable "plastic" film, and consisting solely of coextensive, single thickness, separately formed, normally flat, upper and lower members, said upper and lower members having the side margins at each side thereof projecting outwards, positioned in face contact with one another and connected together throughout their entire length by heat seals of appreciable width, said upper and lower members having their outer end margins fitting flatly and directly against all portions of the parts of the margins of the upper and lower parts of the hollow body that define said mouth and connected thereto by full length heat seals of appreciable width, said valve structure being materially of greater length than width and adapted when in an open position to have the filling material introduced through it into the body and when in a closed position wherein all portions of its members are in face contact due to the pressure of the filling material in said body to form a check valve for preventing egress of said filling material from the body, the outer end portions of the second mentioned heat seals extending across, and being arranged in registering relation with, the end portions of the third mentioned heat seals and serving when the mouth and the outer end of the valve structure are opened to their fullest extent to prevent strain or tension on the marginal parts of the said upper and lower parts that are between the ends of said third mentioned heat seals and the adjacent ends of the first mentioned heat seals.

3. A container-like object according to claim 2 wherein the valve structure has the external configuration thereof tapered in the direction of its inner end and the heat seals between the side margins of the members of

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the valve structure are each of uniform width from end to end in order that the interior of the valve structure is tapered conformably to the external configuration of said valve structure.

4. As a new article of manufacture, a container-like object adapted to be filled with fluid material and comprising a hollow body formed of comparatively thin, flexible, heat sealable "plastic" film and consisting solely of rectangular, coextensive, single thickness, upper and lower parts with the margins thereof extending outwards, positioned adjacent one another and connected directly together by heat seals of appreciable width except along one side of one corner thereof in order to form a small sized mouth and also along the other side of said one corner, and a tube-like open ended valve structure disposed within the interior of the body and positioned adjacent said one corner and in alignment with the mouth, formed entirely of comparatively thin, flexible, heat sealable "plastic" film and consisting solely of coextensive, single thickness, separately formed, normally flat, upper and lower members said upper and lower members having the side margins at each side thereof projecting outwards, positioned in face contact with one another and connected together throughout their entire length by heat seals of appreciable width, said upper and lower members having their outer end margins fitting flatly and directly against all portions of the parts of the margins of the upper and lower parts of the hollow body that define said mouth and connected thereto by full length heat seals of appreciable width, said valve structure being of materially greater length than width and adapted when in an open position to have the filling material introduced through it into the body and when in a closed po-

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sition wherein all portions of its members are in face contact due to the pressure of the filling material in the body to form a check valve for preventing egress of the filling material from said body, the outermost heat sealed margins of the upper and lower members of the valve structure being interposed between all portions of the parts of the margins of the upper and lower parts of the body that define said other side of said one corner and connected thereto by heat seals of appreciable width in order positively to anchor the valve structure in place within the hollow body, the outer end portions of the second mentioned heat seals extending across, and being arranged in registering relation with, the end portions of the third mentioned heat seals and serving when the mouth and outer end of the valve structure are opened to their fullest extent to prevent strain or tension on the marginal parts of said upper and lower parts that are between the ends of said third mentioned heat seals and the adjacent ends of the first mentioned heat seals.

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