

Jan. 7, 1936.

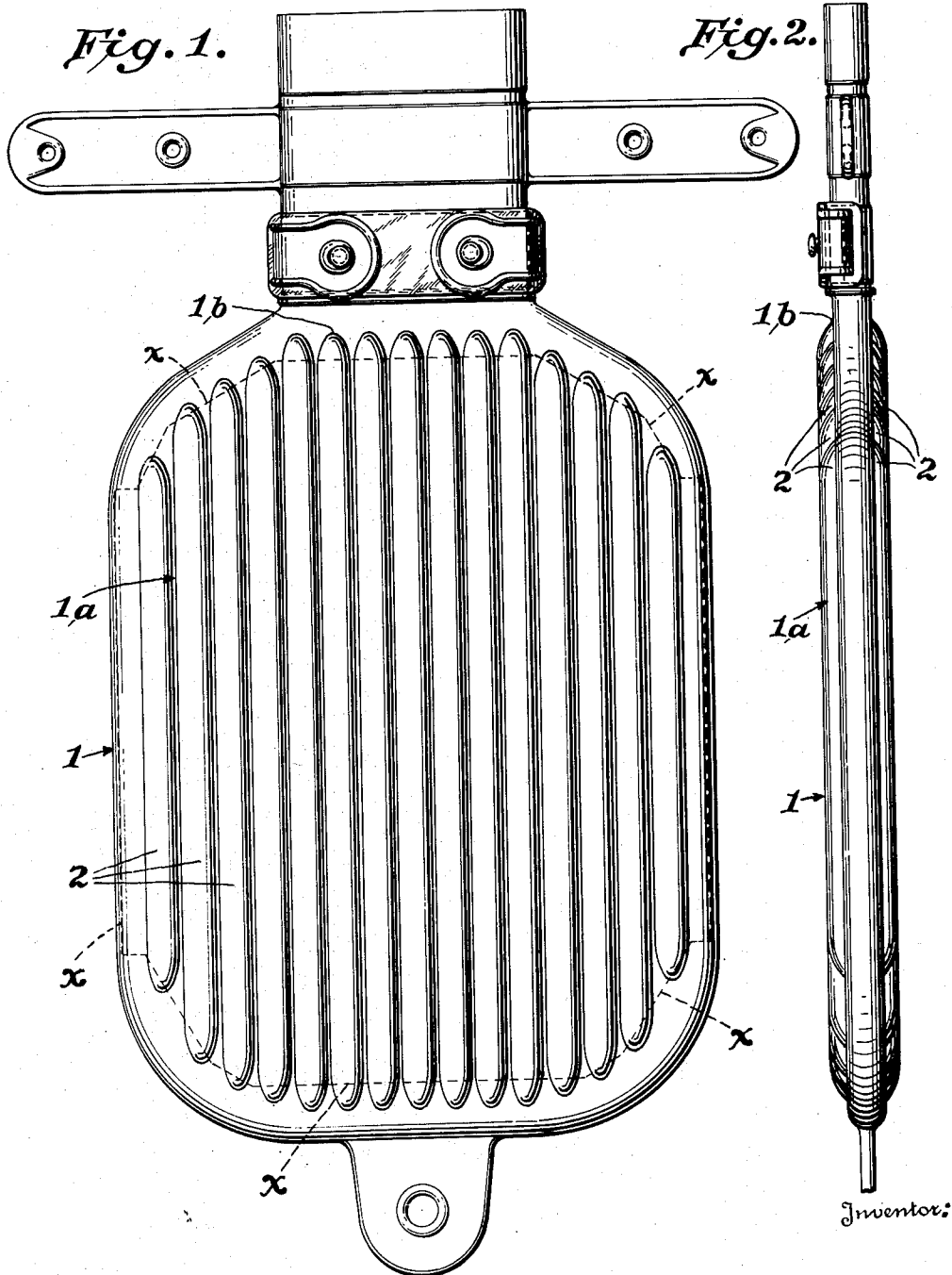
M. B. REACH

2,027,290

WATER BOTTLE

Filed July 2, 1935

2 Sheets-Sheet 1



Milton B. Reach,

By *Spencer Donaldson & Fall*
Attorneys

Jan. 7, 1936.

M. B. REACH

2,027,290

WATER BOTTLE

Filed July 2, 1935

2 Sheets-Sheet 2

Fig. 3.

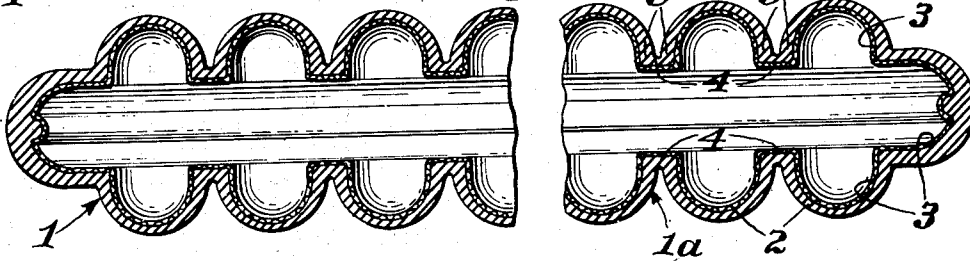
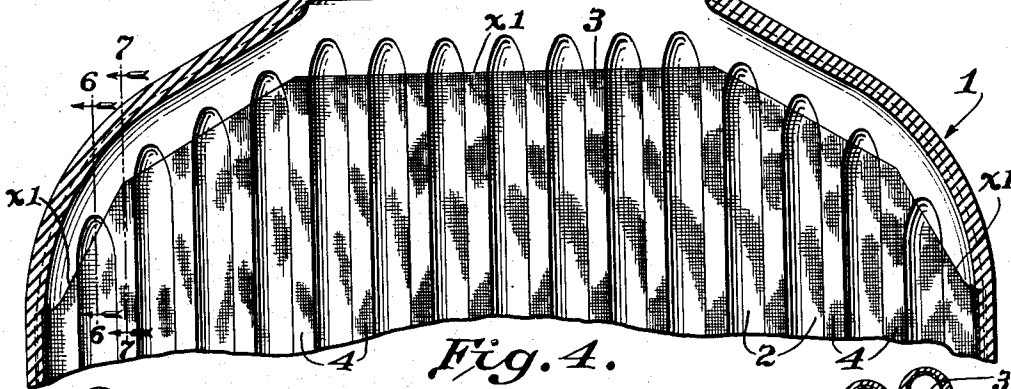
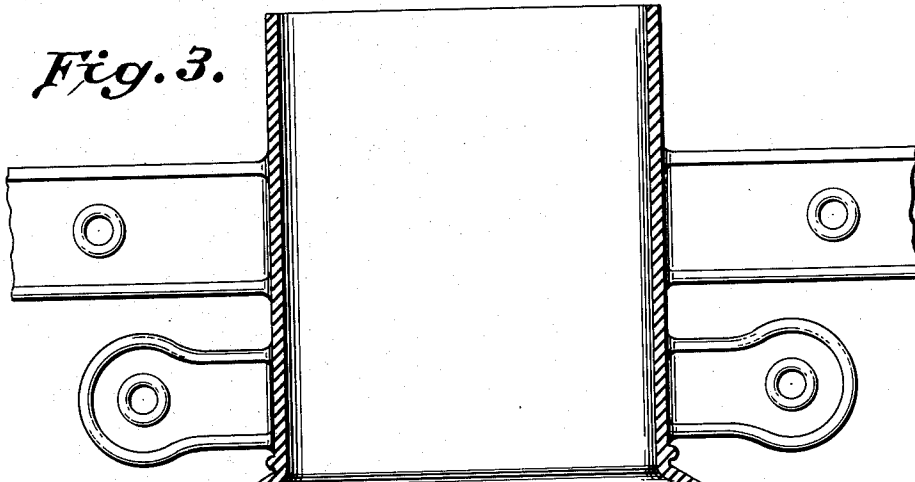
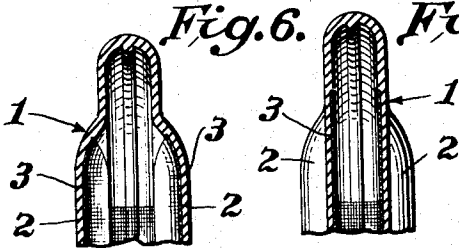


Fig. 6.

Fig. 7.



Inventor:

Milton B. Reach,

By Spear, Donaldson & Hall
Attorneys.

UNITED STATES PATENT OFFICE

2,027,290

WATER BOTTLE

Milton B. Reach, Springfield, Mass.

Application July 2, 1935, Serial No. 29,573

11 Claims. (Cl. 128—258)

The invention has for one of its objects the provision of a bag of rubber or the like the body walls of which are reinforced with fabric, the wall of the bag being so constructed as to permit of lateral extension thereof at the shoulder portion of the bag to provide for removal of the core through the rubber neck without stretching or subjecting the fabric in the body wall to undue strain.

By reinforcing the body of the bottle with fabric the bursting of the bottle will be avoided, together with the attendant danger of seriously injuring the patient by scalding.

Another object is to provide such an extensible wall construction of water bag as will permit of the use of a relatively non-stretchable fabric as a reinforcing means.

Another object of the invention is to provide a wall construction which will increase the radiating surface of the water bag within a given area.

A further object is to provide a wall construction such as will increase the internal capacity of the water bottle.

Other objects are to provide a wall construction with form fitting characteristics having intermittent or spaced contact with the body of the user which will not slip or roll in the bed, and the walls of which cannot stick or freeze together when not in use.

Other objects will appear hereinafter.

The invention consists in the features, combination and arrangement of parts hereinafter described and particularly pointed out in the claims.

In the drawings:

Figure 1 is a face view of a water bag embodying my invention and Fig. 2 is an edge view of the same.

Fig. 3 is a view showing the inside face of the bag.

Fig. 4 is a section showing the wall construction.

Fig. 5 is a diagram enlarged of a cross section of the bag.

Fig. 6 is a cross section on line 6—6 of Fig. 3.

Fig. 7 is a cross section on line 7—7 of Fig. 3.

Fabricated water bottles of rubber and fabric have been made by hand and attempts have been made to manufacture them in molded form through the use of stockinet or a knitted elastic base, the problem being to introduce an extensible element in the wall of rubber that will permit the core to be withdrawn through the stretched neck opening. Attempts along this line have not been very successful because the amount of stretch which it is necessary to impose at this

narrow part of the bottle to withdraw the core is so great as to frequently cause a fracture or tearing of the fabricated material, thus defeating the purpose of its use.

I contemplate avoiding the necessity of using an elastic or stretchable fabric and at the same time provide a construction by which the walls of the bottle may be extended for removing the core by introducing mechanical stretching means adjacent the neck of the bottle.

Instead of molding the body of the bottle in the usual flat form, I mold said body in fluted or accordion form, the core being of corrugated pattern with seats for the corrugations cut in the mold. After molding, the stretching tool is placed within the neck of the bottle for stretching said neck and the corrugated or fluted body wall extends itself to a point where the core can be withdrawn without imposing any breaking strain on the fabric base.

Referring to the drawings, 1 represents the water bag of my invention, and in the embodiment shown in Fig. 1, the wall 1a of the body of the bag is corrugated substantially throughout the full length of the bag from a point adjacent the shoulder 1b below the neck.

The corrugations, as in the embodiment shown, may consist of raised wall portions comprising ribs or flutes 2 substantially semi-circular in cross section extending longitudinally of the bag wall. These flutes are of convex exterior form and correspondingly concaved on the inner side. These may extend substantially the full length of the bag as shown, but it will be understood that the invention is not limited in respect to the length of the flutes from the shoulder downwardly as these flutes may terminate at points more or less distant from the lower edge of the bag.

The wall of the bag is a combination of rubber and fabric, the fabric being provided to safeguard the bottle against rupture.

It is not desired that the corrugation of the bag wall be carried on up into the neck of the bag, since the fabric does not extend up into the said neck portion. The fabric in the form illustrated is provided substantially throughout the walls of the bag body, but the fabric reinforcement terminates at a level below the lower end of the neck portion, said neck portion being made of rubber without fabric and being readily stretchable to permit removal of the core after molding the bag.

The most important place for the provision of the extensible corrugated wall is adjacent the shoulder portion of the bag to enable the removal

of the core by extending the corrugated wall without any undue stretching of the wall or strain on the fabric portion thereof. The corrugated rubber and fabric wall is simply extended or flattened out in the manner of an accordion, flattening out the flutes or corrugations and thereby widening the wall to provide ample room for removal of the core past the area of the fabric without subjecting the fabric in the wall to undue strain.

The area covered by the fabric 3 is outlined by the dotted line x in Fig. 1 and in Fig. 3 representing the inside face of the bag the extent of the fabric is indicated at x' . This line generally approximates the area preferably covered by the fabric which is molded in the wall of the rubber, although it will be understood that this may be varied without departing from the scope of the invention as may also the location of the corrugations of the wall be varied within the scope of the invention.

Specifically stated it may be said that the fabric reinforcement terminates within the margin of the shoulder or in other words, spaced apart therefrom as indicated by the line x in Fig. 1 and the line x' in Fig. 3. These lines coincide substantially with the ends of the flutes so that substantially the whole fluted area is covered with the fabric which is molded to the inner face of the rubber wall.

The fabric 3 which is molded in the rubber is preferably a closely woven non-extensible fabric, such for instance, as the fabric known as balloon cloth. A sufficient area of this fabric is used to be coextensive with the area of the corrugated rubber wall of the bag so as to fit the high and low surfaces of these corrugations without puckering and without having any tendency to distort the corrugations.

In the preferred embodiment of the invention shown in Fig. 1, I have provided the flutes or corrugations 2 extending substantially the full length of the bottle, but as above stated, the invention is not limited in this regard.

In any case, the flutes or corrugations are sufficiently long and sufficiently close to the neck of the bottle to provide the mechanical extension or expansion of the wall to clear the core at this point without subjecting the non-extensible fabric in the wall to undue strain.

The core faces are corrugated and the outer mold sections are provided with cooperating corrugations so that the bag wall is shaped into the desired fluted or corrugated form.

After the bottle has been molded a pair of mechanically operable stretching members or arms may be slid down within the non-fabricated rubber neck into the fabricated and fluted body of the bottle and these arms are then subjected to an opening or separating movement which stretches the rubber neck of the bottle until its edge walls substantially coincide with the side edges of the body of the bottle, the fluted or corrugated fabric containing walls which are extended or widened without stretching, thus permitting the easy removal of the core.

In addition to providing for the increase in the width of the bag wall with the use of a relatively non-stretchable fabric, the radiating surface of the bottle is increased; the capacity of the bottle in comparison with one of the same area is increased; the bottle has form-fitting characteristics, will not slip and roll in the bed; has spaced apart contacts with the body; and the sides of the bottle cannot freeze together,

that is, the rubber panels cannot stick in prolonged disuse as frequently happens with the ordinary water bottle.

A bag constructed according to my invention will give approximately 25% more heating surface than a bottle of the same size constructed with plane unfluted walls.

The flutes or corrugations in the walls of my improved water bag will also serve, as will be readily apparent, to permit extension or widening of the walls in filling the bottle with fluid so that the walls and the fabric therein are thus relieved of strain incident to the weight or pressure of the fluid therein and are consequently longer lived.

The flutes or corrugations have their walls specially constructed to be thicker at their base portions as indicated at y than at their crests. This formation prevent cutting through of the rubber stock at the bases of the corrugations, which might otherwise occur during the molding operation. The core used in the molding apparatus is what may be termed a floating core in the sense that it is supported only at one end, the part within the bottle having no support. During the molding operation the flow of the rubber may be slightly irregular and as a result a slight shifting of the core sideways may take place. The flutes are made heavier in cross section at their base to compensate for this slight irregularity in the molding operation and thus the cutting through of the stock will not take place even though this slight movement occurs.

In building up the fabricated portion of the bottle the closely woven, non-stretchable or non-elastic fabric is died out to the proper shape and cemented to the metallic core, said cement being of such a character as will not vulcanize the fabric to said core. Each half of the mold is then supplied with its complement of sheeted rubber. These mold sections are then assembled with the core, the mold is then closed and subjected to standard hydraulic press molding and vulcanizing operations, which unites the fabric and rubber.

So far as the fluted construction is concerned, this may be embodied in a rubber water bottle having no fabric reinforcement. In such case the flutes in addition to being composed of walls which are stretchable within themselves would have the capacity to deform or flatten out more or less and thus provide for the enlargement of the space within the shoulder of the bottle for the removal of the core therefrom, and for other purposes mentioned.

While I have stressed herein the use of closely woven non-stretchable fabric such as balloon cloth, it will be understood that the fluted formation in whole or in part of the body of the bag lends itself to the extensibility of the bag by the deformation or flattening out of the flutes whether the bag is reinforced or not. By the use of the closely woven non-stretchable fabric of the balloon cloth type substantially all the extension of the outside dimensions of the bag is due to the more or less flattening out or deformation of the flutes.

The adjoining flutes are arranged in close proximity to each other, the rubber wall 4 between them being relatively narrow in width. This connecting wall portion between the flutes is substantially flat on the inner side of the bag. This construction contributes to the large interior capacity of the bag as compared with a bag if made with its wall of sinuous cross sec-

tion in which latter construction the low parts of the wall would be substantially the reverse of the outer high parts of the corrugations.

The flutes near the side edges of the bag are of different length to conform to the rounded contour of corners of the bag.

The opposing walls of the bag are entirely free from each other in the sense that they are not connected together except at their edges, and therefore they are free to be extended laterally or flattened out more or less from their fluted form without buckling up.

While I have shown a closure for the bottle neck, involving folding and clamping the neck, the invention may be used with any desired form of closure or stopper.

The non-stretchable woven fabric may consist of a band wrapped around the body portion of the core at the point below the shoulder as described above, said band being long enough to overlap slightly at its ends.

I claim:

1. A rubber water bottle having flutes in its wall, said flutes lying only outwardly in relation to the plane of said wall, substantially as described.

2. The method hereindescribed comprising cementing a fabric layer to the face of a corrugated core with said fabric conforming to said face and molding rubber upon said fabric covered core to form a wall conforming in shape to said corrugations and thereby uniting the rubber to the fabric to provide a fabric lined wall upon removal from the mold and core, substantially as described.

3. The hereindescribed method comprising molding a rubber water bottle upon a core having corrugations extending lengthwise of said core and then stretching the wall of the neck of the water bottle and widening the corrugated wall by applying lateral pressure to said walls in a direction outwardly from the longitudinal axis of the bottle for removal of the core through the neck of the bottle and in the lengthwise direction of the corrugations.

4. In a water bottle or the like, a neck portion, a rubber body portion connected with the neck portion and comprising front and back walls

normally lying substantially face to face in planes respectively on opposite sides of the axis of the neck portion, said front and back walls being wider than the neck, joined edge to edge, and having flutes extending in the general direction of the length of the bottle, permitting said walls to be extended or widened in their own planes in a direction substantially transverse to the lengthwise dimension of the bottle, substantially as described.

5. A water bottle according to claim 4 in which a fabric layer is united with the inner surface of the rubber and conforms to the shape of the flutes.

6. A water bottle according to claim 4 in which a fabric layer is united with the inner surface of the rubber and conforms to the shape of the flutes, said fabric layer substantially resisting widening of the front and back walls beyond that permitted by the flattening down of the flutes.

7. A water bag according to claim 4 in which said pair of walls are narrowed at their upper portion to provide shoulders of the body of the bag, and fabric in said walls including an area in the region of said narrowed or shouldered portions, said flutes extending throughout the extent of the fabric in said pair of walls.

8. A water bottle having a face wall formed in a series of flutes of substantially semi-circular arc form convex outwardly, each flute being separated from its adjacent flute by a flat wall section.

9. A water bottle according to claim 4 in which the wall in said flutes is thicker at the base of the flutes than at the crest of said flutes.

10. A water bottle according to claim 4 in which the wall in said flutes is thicker at the base of the flutes than at the crest of said flutes, and said flat wall sections adjoining the base of the flutes are substantially thinner than the wall of the base of said flutes.

11. The method of making a water bottle comprising placing a layer of fabric upon a fluted core and molding a wall of rubber about said core and fabric, thereby producing a fluted wall and uniting the fabric layer to the rubber in conformity to the flutes of the core.

MILTON B. REACH.