R. W. SAMPSON.

FLEXIBLE CONTAINER.

APPLICATION FILED MAY 21, 1920.

1,433,304.

Patented Oct. 24, 1922.

4 SHEETS—SHEET 1.

Fig. 2

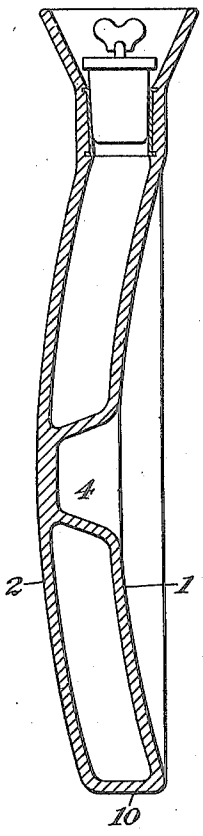


Fig. 1

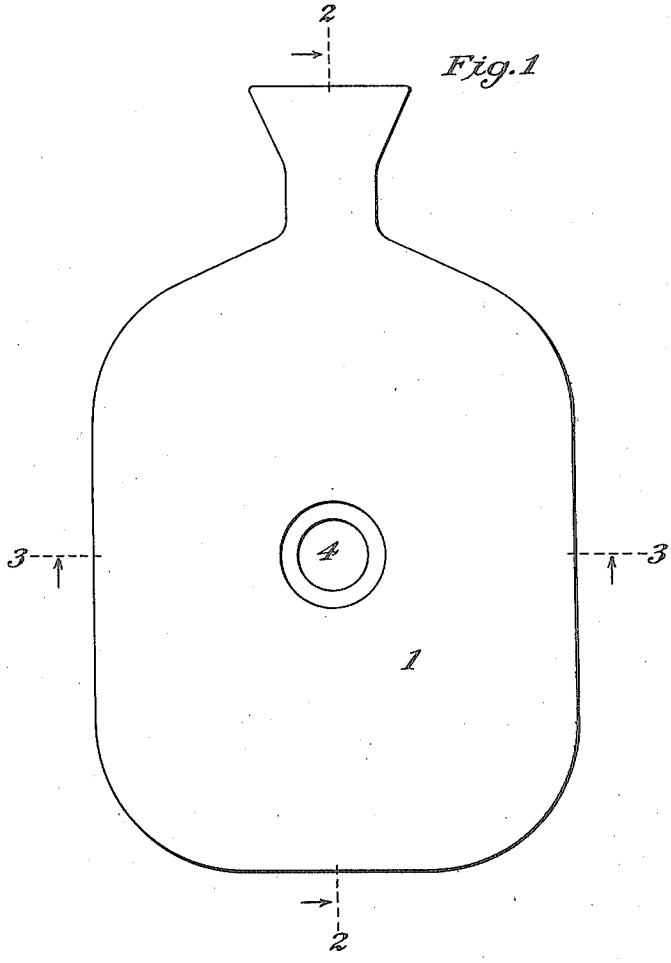
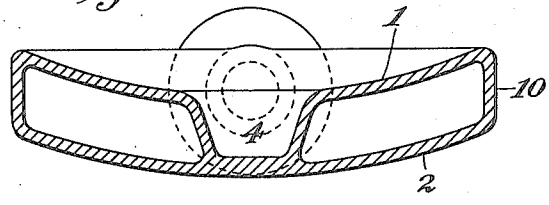


Fig. 3



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4 SHEETS—SHEET 2.

Fig. 4

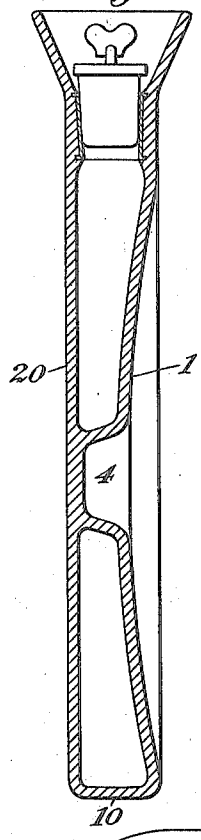


Fig. 5

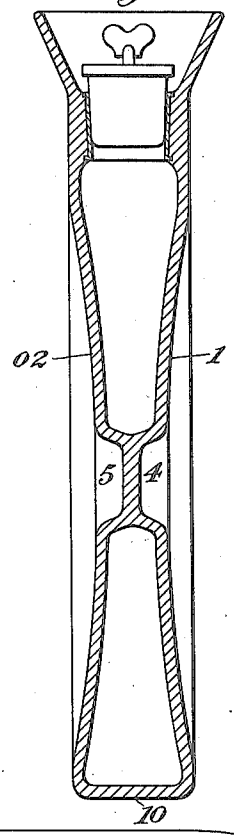


Fig. 6

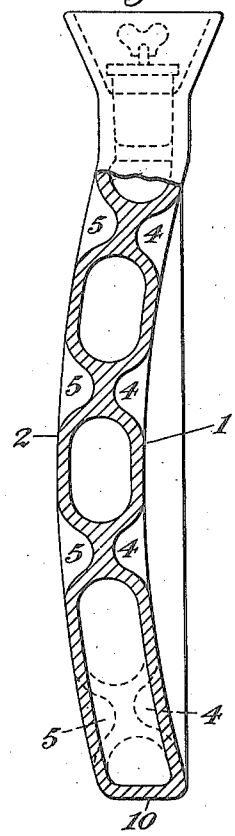
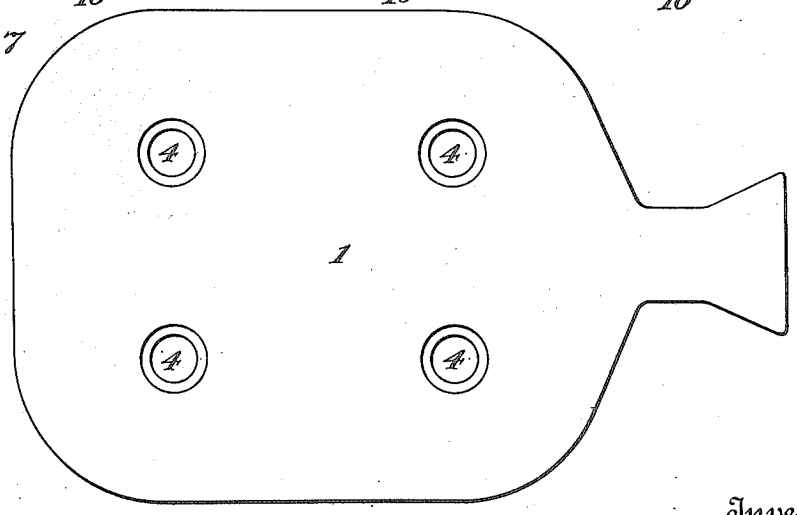


Fig. 7



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4 SHEETS—SHEET 3.

Fig. 8

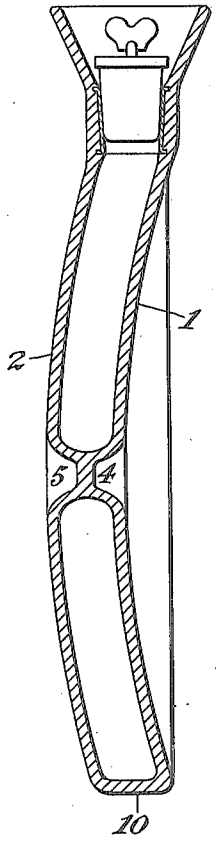


Fig. 9

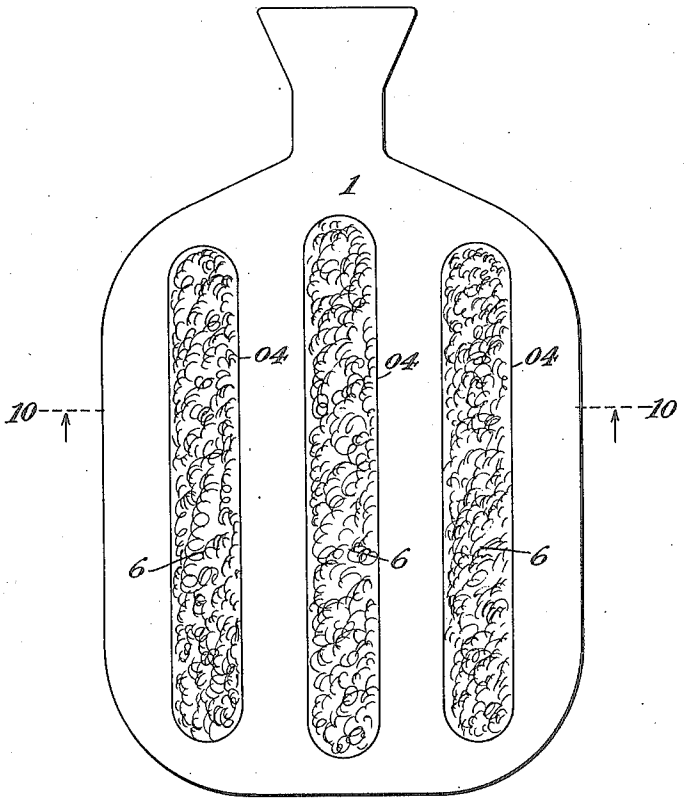
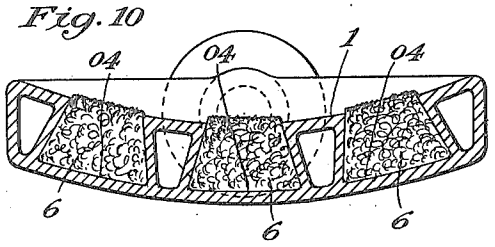


Fig. 10



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4 SHEETS—SHEET 4.

Fig. 12

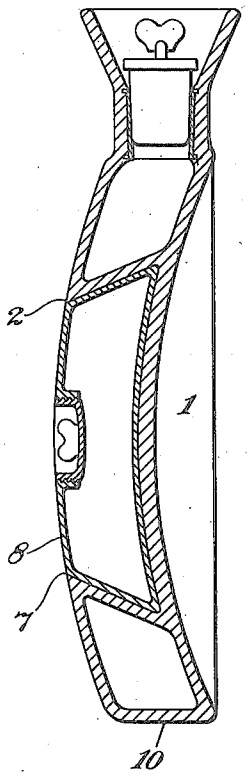


Fig. 11

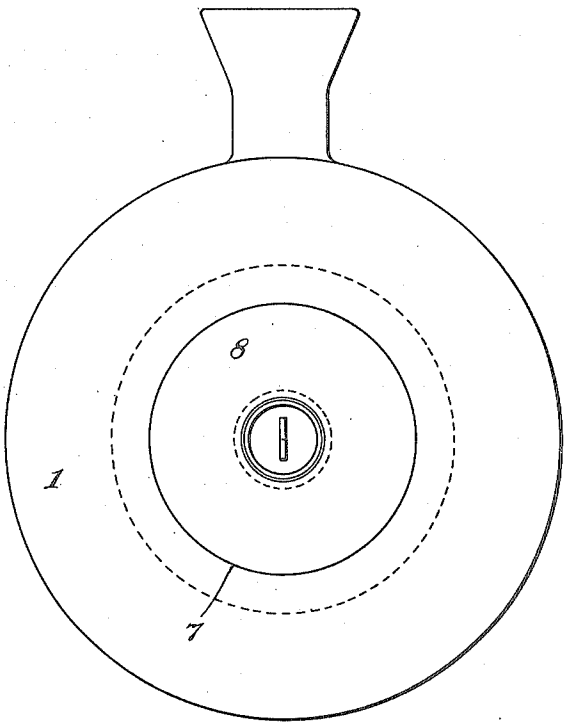
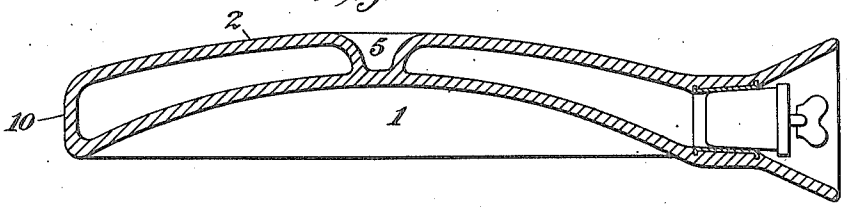


Fig. 13



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UNITED STATES PATENT OFFICE.

ROBERT WILLIAM SAMPSON, OF MALBA, NEW YORK.

FLEXIBLE CONTAINER.

Application filed May 21, 1920. Serial No. 383,117.

To all whom it may concern:

Be it known that I, ROBERT WILLIAM SAMPSON, a subject of the King of Great Britain, and resident of Malba, Queens County, Long Island, New York, have invented certain new and useful Improvements in Flexible Containers, of which the following is a specification.

My invention relates to flexible containers such, for instance, as are intended to hold liquids, of which containers the hot water bottle may be taken as an illustrative type, and my improvements are directed to means whereby the container may be so constructed that the volume of the contained liquid may be substantially evenly distributed through the receptacle and out to the edges thereof instead of being gathered principally in the central portion of the container, and also to means whereby the container is adapted to conform to a receptive surface so as to distribute its weight evenly thereupon, and also to means whereby pockets for air or for receiving suitable auxiliary articles may be formed in the body of the container, for such purposes as are hereinafter indicated, and the like. These and other novel and useful features of my invention will be understood by reference to the following description and to the accompanying drawings in which Fig. 1 is a side view of a hot water bag embodying my improvements: Fig. 2 is a vertical sectional view of the same taken on line 2—2 of Fig. 1 looking to the right; Fig. 3 is a cross sectional view of the same taken on the line 3—3 of Fig. 1 looking up; Figs. 4, 5, 6, 8 and 13 are vertical sectional views of modifications; Fig. 7 is a side view of another modification; Fig. 9 is a side view and Fig. 10 is a cross sectional view on the line 10—10 of Fig. 9 looking up, of another modfication; and Figs. 11 and 12 are respectively a side view and vertical sectional view of still another modification. Similar parts are designated by similar reference numerals in all the figures.

The bodies of the bags illustrated in the drawings are made of sheet rubber, and are preferably so proportioned that the thickness of the bag at the edge is as great as in the central portions. One or both sides 1 and 2 of the bag are curved, preferably so as to form outwardly a dishing concavity on one side and a complementary convexity on the other side, and this conformation is preserved by uniting the material of the sides at one or more points, so that it will resist the tendency to bulge out centrally when filled with liquid.

In Figs. 1, 2, and 3 a cup like recess 4 is formed opening out through the concaved side of the bag, its bottom uniting with the convexed side of the bag, and forming a homogeneous layer of material at that point which is preferably of substantially increased thickness as compared with the material of the other portions of the bag.

In Fig. 8 a cup 4 is shown, opening in from the concave side of the bag, and a cup 5 opening in from the convex side, their bottoms being formed by the same layer of material. A plurality of such cups are shown in Fig. 6; while Figs. 4 and 5 show modifications wherein bags having one concaved side 1 and one flat side 20 and two concaved sides 1 and 02 are shown.

The side walls of the depressions 4, 4 and 5, 5 perform not only the function of yieldably holding in the opposed sides of the container, but they also act to yieldably resist the collapsing of the container under outside pressure. This will be appreciated if, for instance, the circumferential wall and the cross wall or diaphragm of a pair of recesses 4, 5, are considered as a unitary structure, when they will be seen to constitute an elastic side-spacing and supporting element, the center of which is held against material distortion by the diaphragm, while, the outwardly flaring shape of the recesses gives stability to their side walls, and yet permits them to yield moderately to interior and to exterior pressure, so as to avoid undue rigidity in the container.

This is particularly advantageous when weight, as of bedding or of a part of the body, is placed upon the container, for, because of the described character of the side-spacing and supporting elements, the container will maintain its shape and carry its load much better and with less danger of injury than it would if there were no such elements and the sides depended for support upon the contained fluid, which frequently may not fill it completely.

I prefer to form the recesses in the sides with curved walls, of which the circular forms shown in the drawings may be considered types; thereby avoiding angular corners or recesses, which might constitute points of weakness as well as gathering

places for foreign substances, and utilizing, also, a conformation which is adapted to adjust itself well to both exterior and interior strains.

I prefer for most purposes, also, to taper the recesses from their open ends toward their bottoms, as illustrated in Figs. 1 to 8 and 13 of the drawings, as I find that this is, in practice, an efficient and desirable conformation.

But I wish it to be understood that similar, and substantially equivalent forms may be used, and that other details of my invention may be modified without departing from the spirit of my invention as claimed.

The forms of the cups or recesses may be varied, as also may be their uses. Thus in Figs. 9 and 10 I have illustrated the recesses 04 as being elongated and undercut, and adapted to receive and hold absorbent or other material 6 which it may be desirable to employ in connection with the bag. And in Figs. 11 and 12 I have shown a recess 7 adapted to retain a substantially rigid container 8 which may be used, for instance, to hold either a heating or a cooling medium which by contact through its sides affects the temperature of the contents of the bag.

In all these illustrations the same principle is embodied. That is the receptacle is so constructed as to carry at its outer edges a volume of liquid of substantial thickness as compared with that toward its central portions, and, also, to present a side which is adapted to conform evenly to the surface to which it is intended to be applied, for instance the human abdomen, against which the concave side of the bag may rest evenly, thus distributing its weight and temperature instead of concentrating them at a central point, as is the case when the ordinary, bulging, hot water bag is placed against the abdomen or other curved surface of the body.

The forms of these bags having as they do an edge web 10 of substantial width extending from one side to the other but holding the sides apart, also avoid the presence of only a thin layer of liquid at the edges of the bag, as in the case where the bag is made flat with the edges of the sides united flatwise to each other in the usual way, which results in forming a sort of fin or flange of outstanding material around the body of the bag behind which the liquid holding cavity gradually expands, in use, towards a bulging central portion. Such bags when filled with liquid, bulge out in the center and become substantially lanceolate in cross section, and are, hence, ill adapted for application to the human body, most of the outer surfaces of which are convex; and the advantages of so forming the bags as to contact evenly with the body and distribute their weight and temperature with substantial uniformity will be at, once obvious to any one familiar with the requirements of hospitals and sick rooms.

Furthermore, the hot water bags, as heretofore made, present against the body a uniformly impervious surface which affords no air space between itself and the portion of the body upon which it rests. This prevents ventilation, and tends to condense moisture from perspiration or other sources against the body, with a consequent unsanitary and uncomfortable condition. But the cups or recesses, which I form in my improved bags, alleviate these objectionable conditions, by forming air spaces in which vapors or moisture may gather away from the surface of the body, while the transmission of heat or cold from the bag to the body is not materially interfered with.

Furthermore, when a material, such as absorbent cotton, is placed in the recesses it will gather up the moisture, to the relief and benefit of the user of the bag. Besides which, when it is desired to apply moisture to the body, moist packings may be placed in the cavities in the face of the bag, and kept warm or cool by the influence of the contents of the bag.

The advantages of this arrangement will be evident to all those who are familiar with the difficulties of keeping hot or cold moist applications at the desired temperature when in use.

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

1. A flexible container having opposed sides, an integral, marginal element uniting and spacing the sides, and an integral, medial, side spacing element, extending between and separating the sides, and having a hollow body closed at its bottom and opening at its top through one of the sides, and forming, interiorly, a recess with a comparatively abrupt wall.

2. A flexible container having opposed sides, an integral, marginal element uniting and spacing the sides, and an integral, medial, side-spacing element, extending between and separating the sides, and having a tapered, hollow body closed at its bottom and opening at its top through one of the sides, and forming, interiorly, a recess with a comparatively abrupt wall.

3. A flexible container having opposed sides, an integral, marginal element uniting and spacing the sides, and an integral, medial, side-spacing element, extending between and separating the sides, and having a circumferentially curved, hollow body closed at its bottom and opening at its top through one of the sides, and forming, interiorly, a recess with a comparatively abrupt wall.

4. A flexible container having opposed

sides, an integral, marginal element uniting and spacing the sides, and a plurality of integral, medial, side-spacing elements each extending between and separating the sides, and having a hollow body closed at its bottom and opening at its top through one of the sides, and forming, interiorly, a recess with a comparatively abrupt wall.

5. A flexible container having opposed sides, an integral, marginal element uniting and spacing the sides, and an integral, medial, side-spacing element, extending between and separating the sides, and having a pair of opposed, hollow bodies closed by a common bottom and each opening at its top through one of the sides, and forming, interiorly, a recess with a comparatively abrupt wall.

6. A flexible container having one side dishingly concaved and the other side complementarily convexed, a substantially flat, integral, edge wall uniting and spacing the sides, and an integral, medial, side-spacing element, extending between and separating the sides and having a hollow body, closed at its bottom and opening at its top through one of the sides, and forming, interiorly, a cup-like recess with a comparatively abrupt wall.

7. A flexible container having one side dishingly concaved and the other side complementarily convexed, a substantially flat, integral, edge wall uniting and spacing the sides, and a plurality of integral, medial, side-spacing elements, extending between and separating the sides and each having a hollow body closed at its bottom and opening at its top through one of the sides, and forming, interiorly, a cup-like recess with a comparatively abrupt wall.

8. A flexible container having one side dishingly concaved and the other side complementarily convexed, a substantially flat, integral, edge wall uniting and spacing the sides, and a plurality of integral, medial side-spacing elements extending between and separating the sides, and each embodying a pair of opposed hollow bodies having a common, closed bottom and opening at their respective tops through the opposite sides, and forming, interiorly, an opposed pair of cup-like recesses with comparatively abrupt walls.

ROBERT WILLIAM SAMPSON.