

[54] **LIGHT-WEIGHT MINIMUM VOLUME
WATER PAD WITH INTEGRAL WATER
CONTAINER SECUREMENT MEANS**

[75] Inventor: **Sidney Tobinick**, Oldbridge, N.J.

[73] Assignee: **Aqua Therm Products Corporation**,
Rahway, N.J.

[22] Filed: **Oct. 26, 1972**

[21] Appl. No.: **300,917**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 199,853, Nov. 18,
1971, Pat. No. 3,702,484.

[52] U.S. Cl. 5/348 WB, 5/91

[51] Int. Cl. A47c 27/08

[58] Field of Search.. 5/348, 349, 350, 348 WB, 91;
150/1; 128/112, 117, 118

[56] **References Cited**

UNITED STATES PATENTS

3,736,604	6/1973	Carson.....	5/348 WB
3,702,484	11/1972	Tobinick.....	5/348 WB
3,308,491	3/1967	Spence	5/348 WB

Primary Examiner—Bobby R. Gay

Assistant Examiner—Andrew M. Calvert

Attorney, Agent, or Firm—Ostrolenk, Faber, Gerb
& Soffen

[57] **ABSTRACT**

A low liquid volume, low weight liquid or water pad for use as a mattress comprised of a lower cellular foamed material flexible pad, which is hollowed out for receiving a flexible material, liquid filled container. The lower pad has an unhollowed extension portion for a user's head, upper body, or the like, which the liquid container does not rest on. The liquid container includes edge flaps which are wrapped around edges of the lower foam pad to secure the liquid container in position. Extending across the lower pad, the hollow therein and the liquid container is an upper flexible pad of the same cellular foamed material. The entire aforesaid structure is enclosed within a flexible, water impervious sheath which is loaded with the structure through openings in the ends of the sheath. The end openings are secured closed.

11 Claims, 3 Drawing Figures

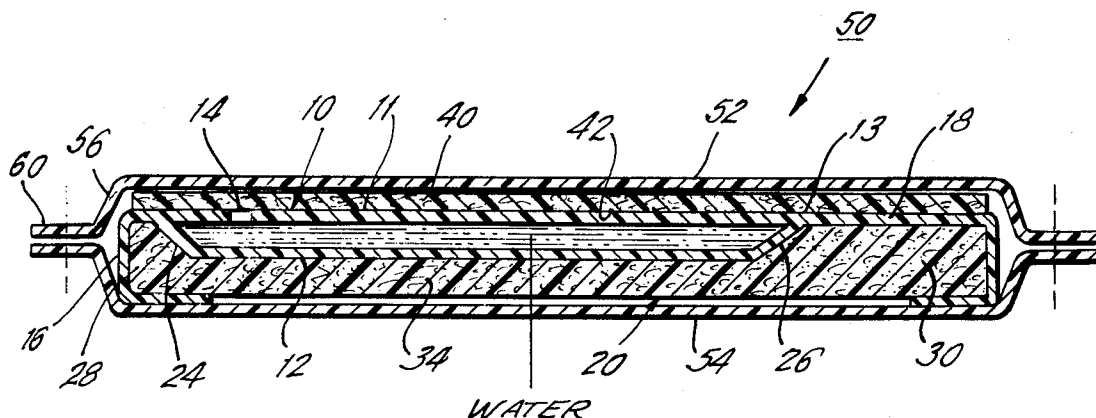


FIG. 1

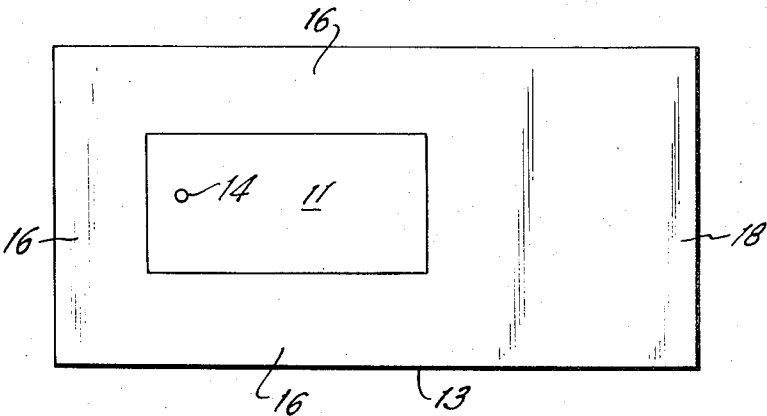


FIG. 2

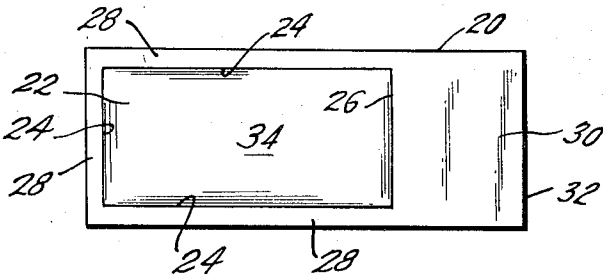
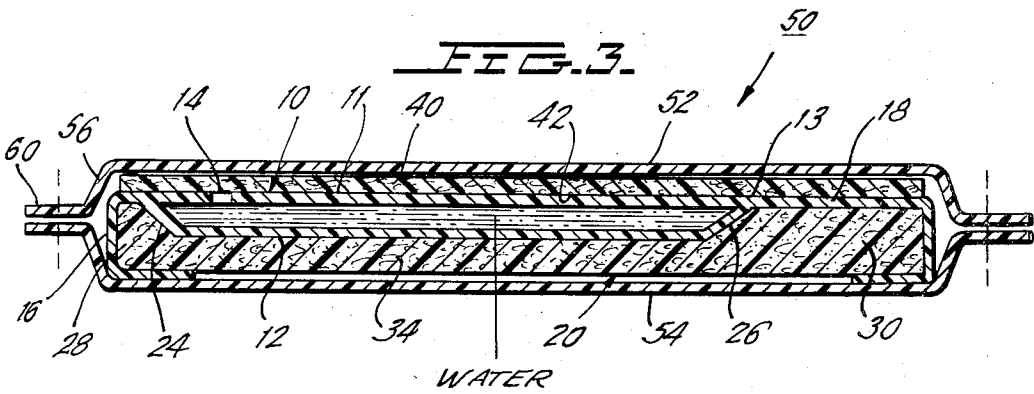


FIG. 3



LIGHT-WEIGHT MINIMUM VOLUME WATER PAD WITH INTEGRAL WATER CONTAINER SECUREMENT MEANS

RELATED APPLICATIONS

This is a continuation-in-part of application Ser. No. 199,853, filed Nov. 18, 1971, now U.S. Pat. No. 3,702,484.

BACKGROUND OF THE INVENTION

This invention relates to water or liquid filled pads and mattresses, and more particularly relates to a low volume, liquid filled pad, including a liquid filled container that is supported between flexible cellular foamed material protective pads.

The prior art in the liquid filled mattress field is discussed in aforesaid application Ser. No. 199,853. The structure disclosed in that application principally comprises upper and lower cellular foamed rubber pads between which is sandwiched a liquid filled container. The length and breadth of the container is substantially coextensive with those dimensions for both of the neighboring foamed pads.

In certain medical or hospital applications, it is only a certain portion of the body of the patient, rather than his whole body, which is benefited by the evenly distributed pressure resulting from being supported by the fluid medium provided by a liquid container. There is no need for the entire surface of the mattress to be supported by the liquid container. A portion of that mattress may be of a conventional non-liquid filled material.

As discussed in application Ser. No. 199,853, in normal usage, water mattresses or pads may be tilted from horizontal, e.g. to raise the head of a bedridden patient, or to cover an entire chair including the seat back. Because a portion of the mattress is tilted out of a horizontal orientation, the liquid in the liquid filled container will shift downward, causing an undesirable bulge in the mattress and/or requiring stiffening elements to cause the mattress to retain its shape, which elements at the same time decrease the ability of the liquid in the liquid container to flow and decrease the effectiveness of the water mattress. If the portion of the mattress that is tilted from the horizontal does not have the liquid filled container in it, there will be no undesirable shifting of liquid in the liquid container.

BRIEF SUMMARY OF THE INVENTION

In the present invention, there are two outside pads of a cellular foamed material, e.g. foamed urethane rubber. The liquid filled container is comprised of a flexible, water impervious, plastic material. The foamed pads and the liquid container are positioned in an external, flexible, water impervious, plastic sheath, which may be of the same material as the liquid container, and which itself defines a container having sufficient height, width and length to contain the entire volume of the foam layers, the liquid container and the liquid within that container if the container should rupture or leak. The sheath has insertion openings at its ends which may be closed by flaps.

In at least one of its lengths or breadth dimensions, the liquid container is smaller than the neighboring foamed pads, whereby those pads extend beyond at least one preselected edge of that container. At least one, the lower, pad and also perhaps the other, upper,

pad is sculpted or hollowed out to define a cavity for receiving and walls for surrounding the liquid container. The cavity has such dimensions that it will comfortably receive the container when it has been filled to the desired capacity with liquid without causing the mattress to have a bulge coextensive with the filled container. The foam pads are not sculpted out beyond the edge of the liquid container. The combined height of the pads where they do not sandwich the container is the same as the height of the pads and container where the pads sandwich the container.

The contacting portions of the foam pads which do not have the liquid container between them can easily be tilted from the horizontal, folded or otherwise manipulated to support those portions of the patient's body which do not require the therapeutic benefit of evenly distributed fluid support.

The liquid container has flaps or tabs extending beyond at least two of its edges for extending over and being wrapped about the edge of the sculpted lower pad, which secures the liquid container in position in the cavity.

The lower foam pad equalizes pressure distribution over the bottom of the liquid container to reduce the possibility of puncture of this container by irregularities, broken springs or the like on the support surface carrying the mattress.

The upper foam pad is relatively thin and has as its principal purpose the provision of thermal insulation between the body of the user and the liquid filled container, so that the user will not become chilled and so that it is not necessary to heat or temperature control the liquid. This layer also acts as a safety liner preventing puncturing of the mattress from sharp objects or other damage due to contact from above.

The entire mattress can be shaped to any desired form, including the shape of a conventional bed mattress, and the liquid container can have any shape needed for particular therapeutic purposes, supporting particular portions of a body, etc.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a liquid filled container used in the present invention;

FIG. 2 is a stop plan view of a lower foamed material pad, which is used in conjunction with the liquid container of FIG. 1; and

FIG. 3 is a side elevation view in cross-section through a mattress in accordance with the present invention which includes the liquid container of FIG. 1 sandwiched between the lower pad of FIG. 2 and an upper pad, and the entire assemblage being disposed within a sheath.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring to FIGS. 1 and 3, the liquid filled container 10 of the mattress 50 is generally flat and is comprised of upper surface 11 and lower surface 12, joined to one another along their entire periphery 13 by a heat seal. A conventional valve 14 is provided in sheet 11 to permit a liquid, such as water, to be introduced into the interior of container 10. Container 10 has a single chamber and does not include any internal compartments or webs designed to maintain the container in a particular shape. Container 10 is illustrated in FIG. 1 as having a regular rectangular shape, which is merely an example of mattress shapes that may be adopted in accordance

with particular applications of the invention. Other shapes may be employed, e.g. circular, oval, irregular or cut out contour, etc.

In a typical embodiment of the invention, the entire mattress 20 has an overall length defined by the length of the foamed pads, of about 72 inches and an overall width defined by the width of the foamed pads of about 36 inches. The liquid container 10 is substantially shorter in length and is slightly smaller in width. Container 10 is adapted to receive sufficient liquid to inflate the container to a thickness of about 2 inches. A container in the shape of that illustrated in FIG. 1 would receive about 20 gallons of water and would weigh substantially less than conventional waterbeds, which may weigh as much as 2,000 lbs. when fully inflated.

Container 10 is provided with elongated, flexible positioning end flaps 16, 18 which extend from the ends thereof around the entire container.

The material of container 10 and its flaps 16, 18 must be able to be manufactured in the desired shape, to maintain a seal, to be flexible and to have the strength necessary for use as a mattress. Good results have been obtained with a polyvinyl chloride material having a thickness of about 20 mils.

Referring to FIGS. 2 and 3, lower pad 20 is comprised of conventional foamed urethane rubber material. It extends the full length and breadth of the mattress, and its dimensions are greater than those of the liquid container 10 it supports. Lower pad 20 has a sculpted cutout 22 with interior walls 24 on three sides and interior wall 26 on the remaining side. The walls are shaped to conform to the shape of container 10.

Adjacent to walls 24, lower pad 20 is provided with thin width, elevated shelves 28 which engage upper pad 40, described below. Adjacent to wall 26, lower pad 20 has an elevated shelf 30 that engages upper pad 40 and extends a substantial distance away from wall 26 to the end 32 of lower pad 20. It is the portion of mattress 50 that includes shelf 30 which supports, for example, the upper torso of the user of the mattress. This shelf is thus of sufficient length so that the upper torso can be supported on it. If it is intended that the mattress be folded in use, it is this portion that can be folded because it does not contain any liquid container. It is apparent that shelf 30 may be positioned at other locations on lower pad 20 and have other dimensions in connection with different applications of the mattress.

In FIG. 3, the walls 28 of lower pad 20 are four inches in height and cutout 22 is about 2 inches in depth to correspond to the height of container 10 positioned therein. Consequently, the main portion 34 of foamed pad 20, which is beneath container 10, has a thickness of about 2 inches. This is sufficient to protect container 10 against typical sharp objects.

In FIG. 3, only lower pad 20 is sculpted to receive liquid container 10. It is apparent that both the upper 40 and lower 20 pads may be sculpted to together provide a combined cavity of sufficient size for receiving the container.

Container flaps 16, 18 are passed over end shelves 28, 30 of lower pad 20 and wrap around these shelves and beneath lower pad 20. When the entire mattress is assembled, end flaps 16, 18 are squeezed tightly against the exterior sheath 51 by the expansion of the material within the sheath and the weight of the mattress itself,

thereby holding container 10 securely in the proper position.

An upper pad 40 of the same foamed material as lower pad 20 and of the same length and breadth dimensions extends across lower pad 20 and encloses cutout 22 to form a cavity for container 10. Lower surface 42 of upper pad 40 contacts container 10 and also rests against and contacts shelves 28, 30 beyond the edges of container 10. As a result, upper pad 40 is supported across its entire length and breadth. When container 10 is inflated, the depth of the cavity therefor is such that mattress 50 has generally uniform height across the entire length and breadth of upper pad 40. The peripheral portions of upper pad 40 that are supported by lower pad shelves 28, 30 are not elevated above nor depressed beneath the remainder of pad 40, which might cause the mattress to have a peculiar appearance or be uncomfortable to use.

Upper pad 40 is preferably about 1 inch thick and serves to provide thermal insulation between the user's body and the relatively colder upper surface of container 10. It has been found that upper pad 40 could have a thickness of up to about 3 inches before it would begin to damp the movement of water through container 10 and before it would begin to be sufficiently unyielding to mask the effect of using a liquid filled container 10 in a waterbed. In other embodiments of the invention, it is apparent that upper pad 40 may be sculpted or scooped out in a fashion complementary to lower pad 20 for receiving the container 10 and providing a cavity of sufficient depth for that container.

The entire sandwich of container 10 and upper and lower pads 20, 40 is loaded into an exterior protective sheath 51, which acts both as a safety liner against leakage and puncture and a frame for the mattress. Sheath 51 may be formed of the same vinyl material as container 10. Sheath 51 has a top layer 52, a bottom layer 54 and sides 56 which are normally sealed together to join upper and lower layers 52, 54.

Sheath 51 is of sufficient volume to contain all of the components of mattress 50 and to contain and hold the contents of container 10 in the event that it should burst or leak. Surfaces 52, 54 and walls 56 are so dimensioned as to closely confine the elements within and to hold the elements within the sheath in proper position.

Along at least one and possibly two sides 56 of sheath 51, the sheath is provided with elongated opening 60 through which the various components of the mattress may be inserted and through which the liquid supply may be connected with valve 14 for filling container 10. When it is no longer necessary to have access to the interior of sheath 51, opening 60 may be sealed shut by a tape, or by a conventional vinyl zipper integrally formed at the end of the opening.

There has just been described a novel liquid filled mattress having a liquid medium supportive capacity and having a section with no liquid medium support, which latter section can be readily folded or manipulated.

Although the present invention has been described in connection with a preferred embodiment thereof, many variations and modifications will now become apparent to those skilled in the art. It is preferred, therefore, that the present invention be limited not by the specific disclosure herein, but only by the appended claims.

I claim:

1. A water or other liquid mattress, comprising:
a generally flat, sealed liquid container, having upper
and lower surfaces, and being comprised of flexible,
liquid impervious material; said container being adapted
to receive and hold liquid; said container having predeter-
mined length and breadth dimensions;
at least one pad of sculpted material; said pad having
at least one of its dimensions selected so as to cause
at least one section of said one pad to extend be-
yond at least one edge of said container when said
container is positioned adjacent to said one pad;
said one pad being sculpted to define a cavity hav-
ing generally said predetermined length and breadth
dimensions;
said container being removably fitted in said cavity
and one of said container surfaces faces into said
cavity;
a second pad also having at least one of its dimen-
sions selected so as to form at least one section of
said second pad to extend beyond said at least one
edge of said container when said second pad is po-
sitioned adjacent to said container; said second pad
extending across and closing said cavity with said
container therein;
the said at least one sections of both said pads being
oriented to contact each other, thereby to prevent
the mattress from having unevenness to an undesir-
able extent across the entire mattress.
2. The mattress of claim 1, wherein said container
has a plurality of edges; flexible flaps attached to said
container extend past a plurality of said container
edges and are of sufficient length to be and are
wrapped around the ends of and then under one of said
pads for holding said container in position in said cav-
ity.
3. The mattress of claim 2, further comprising an en-
closed sheath of a flexible, water impervious material,
and enclosing and closely fitting around the assembly
of said container and said pads;
said sheath having at least one elongated opening at
one end thereof to permit loading of said pads and
container therein and to permit filling of said con-

tainer.

4. The mattress of claim 3, further comprising fasten-
ing means on said sheath for fastening shut said sheath
elongated opening.
5. The mattress of claim 1, wherein both of said pads
have all dimensions selected such that both said pads
extend beyond all peripheral edges of said container;
said cavity being formed inward from the edges of
said at least one pad; the portions of said at least
one pad that extend beyond said edges of said con-
tainer are in engagement with the correspondingly
positioned portions of the other said pad.
6. The mattress of claim 5 wherein said cavity is
formed in only one of said pads.
7. The mattress of claim 5, wherein the said at least
one sections of both said pads has sufficiently large di-
mensions that they may be folded and shifted away
from a horizontal orientation.
8. The mattress of claim 7, wherein said pads are
comprised of flexible, resilient, cellular, foamed mate-
rial.
9. The mattress of claim 8, wherein said container
has a plurality of edges, flexible flaps attached to said
container extend past a plurality of said container
edges and are of sufficient length to be and are
wrapped around the ends of and then under one of said
pads for holding said container in position in said cav-
ity.
10. The mattress of claim 9, wherein said cavity is
formed in only one said pad; that said pad has a thick-
ness of about 4 inches and said cavity has a depth of
about 2 inches therein; said container, when filled, has
a thickness of about 2 inches; and the other said pad
has a thickness of about 1 inch.
11. The mattress of claim 10, further comprising an
enclosed sheath of a flexible, water impervious mate-
rial, and enclosing and closely fitting around the assem-
bly of said container and said pads;
said sheath having at least one elongated opening at
one end thereof to permit loading of said pads and
container therein and to permit filling of said con-
tainer.

* * * * *

45

50

55

60

65