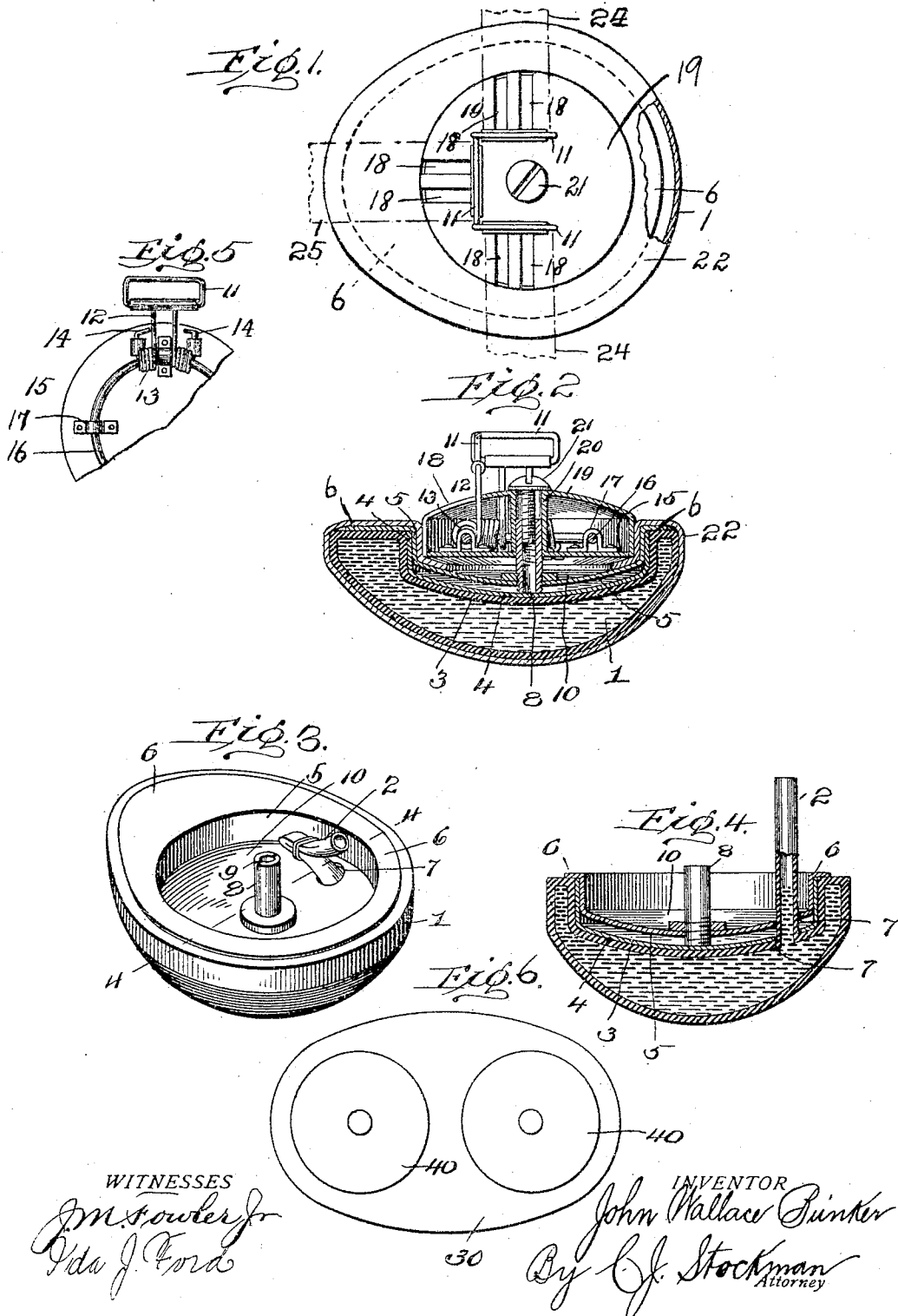


J. W. BUNKER.
HERNIAL TRUSS.

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WITNESSES
Jm. Sowler Jr.
Ida J. Ford

INVENTOR
John Wallace Bunker
By C. F. Stockman
Attorney

UNITED STATES PATENT OFFICE.

JOHN WALLACE BUNKER, OF NEW YORK, N. Y., ASSIGNOR TO BUNKER TRUSS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

HERNIAL TRUSS.

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To all whom it may concern:

Be it known that I, JOHN WALLACE BUNKER, a citizen of the United States, residing in the borough of Bronx, in the city of New York and State of New York, have invented new and useful Improvements in Hernial Trusses, of which the following is a specification.

This invention relates to certain improvements in trusses designed for the treatment of hernia and particularly to that type thereof wherein the pad is filled with fluid such as water or air.

It is well known in the treatment of hernia that pads exerting a yielding pressure upon the rupture are advantageous under certain circumstances, but when a sudden strain upon the part is imposed such as may occur when the wearer coughs or bends forward, the wound more than at any other time, requires a strong support and in such event the pad should be rigid or approximately so in order that protrusion may be prevented.

Pads filled with air or water have some recognized advantages in that they are comfortable to wear under ordinary circumstances and will satisfactorily sustain the rupture except when a sudden or extra muscular exertion is imposed thereon by the coughing or stooping of the wearer. Such pads, however, frequently break or become deflated and whereby the wearer is deprived of the benefit thereof at a time when their use is important.

To produce a truss pad having the advantages of the water or air filled pads, and also capable of sustaining the wound under all conditions of use, and of supporting the rupture even when the water pad or air pad becomes deflated and useless from any cause, is a leading purpose of the present invention.

A second important object of the invention is to provide a truss having its pad provided with spring mechanism for pressing it to the rupture and said pad adjustable pivotally relatively to the pressing mechanism so as to cover the rupture and to accord with the direction of its protrusion, which differs in different cases.

Further objects and advantages possessed by the construction disclosed in the accompanying drawings will appear in the following description.

The invention consists in certain peculiari-

ties in the construction of parts and in certain novel combinations and arrangements of elements substantially as hereinafter described and particularly pointed out in the subjoined claims.

In the accompanying drawings illustrating the invention and in which like numerals of reference indicate like parts in the several figures, Figure 1 is a plan view of a truss pad embodying my several improvements. Fig. 2 is a longitudinal vertical section through the center of said pad. Fig. 3 is a detail view of the pad, with the spring mechanism thereof omitted. Fig. 4 is a transverse section on the line 4—4 of Fig. 3. Fig. 5 is a detail view showing the detail construction of one of the spring devices preferably employed. Fig. 6 is a diagrammatic view of a double truss, embodying my improvements.

1 designates a chamber composed of rubber or other suitable flexible material and filled with air or preferably water. This chamber forms a water or air pad which is oval, or of other suitable shape suited to the particular hernia which it is intended to treat, and is provided with a flexible or other suitable tube 2 through which it is filled. Its rear side is formed with a depression 3 within which is located the spring mechanism hereinafter described, and the wall of said depression is reinforced by a backing which is adapted to support the rupture when the chamber 1 is deflated and which backing preferably comprises a metallic cup-shaped cap 4 upon which there is mounted a second cap 5 having a central depression or chamber 10 and a circumferential flange 6, said chamber being seated within the cap 4 and said flange bearing upon the rear wall of the chamber 1 surrounding said depression 3 and reinforcing said portion of said rear wall.

The tube 2 through which the pad 1 is filled with water or air extends through registered perforations 7 in the caps 4 and 5, and when the truss is ready for use and the pad has been filled with water or air said tube is doubled upon itself and tied, as shown in Fig. 3.

The cap 5 is formed with a bushed opening within which is threaded a post 8, the inner end of which bears upon the cap 4 and the outer end of which is slotted as shown at 9, or is otherwise rendered capable

of being adjusted relatively to the cap 4. This post serves when adjusted in one or other direction to increase or decrease the pressure exerted by the water pad on the rupture and it will be observed that as it bears upon the cap 4, which has a large area of surface in engagement with the water pad a very slight inward adjustment of the post 8 will perceptibly increase the pressure of the water pad on the wearer. In addition to the male thread at the inner end of said post, which, as just explained, adapts it to be adjusted within the bushed opening in the cap 4, said post is preferably hollow and is also formed with a female thread in its outer end for a purpose which will be hereinafter set forth.

Mounted in the chamber 10 formed in the cap 5 is the spring mechanism hereinabove referred to. The spring mechanism of the truss shown in the accompanying drawings and preferably employed in conjunction with the water pad, comprises a series of loops 11 each of which is adapted to be engaged by the waist belt or crotch strap and is provided with side arms 12 the lower ends of which are coiled to form springs 13, which springs terminate in arms 14 which bear upon a bottom plate 15. This spring mechanism is secured to said plate 15 preferably by a ring 16 which extends through the coils thereof and through staples 17 mounted on said plate 15. The arms 12 extend through elongated slots 18 in a cover 19 which cover, together with the bottom plate 15, form an inclosed casing for the springs. The cover 19 is formed with a central opening and with a tube 20 projecting inwardly from said central opening and mounted upon the post 8 hereinabove described, and the spring mechanism with the inclosing plate 15 and cover 19 thereof are secured to said post removably by means of a screw 21 which extends through said tube into the post 8 and engages the female thread in the outer end of said post.

The water pad 1 is preferably inclosed in a cover 22 formed of suitable fabric, or of leather or rubber or other suitable material, made in pouch form, and having its edge provided with a draw string or other suitable means for securing it removably thereon. Said cover also projects over the circumferential flange 6 of the cap 5 into the chamber 10 formed in the latter, as shown in Fig. 2.

In assembling the parts the cap 4 is pressed into the chamber 3 and the cap 5 is then pressed into the cap 4, with the tube 2 projecting through the registered openings 7 in said caps. The pad 1 is then filled with air or preferably water and the free end of the tube 2 is doubled upon itself in the chamber 10 and tied or otherwise secured so as to prevent egress or said air or water.

The cover 22 is then placed around said parts and its edges gathered together in the center leaving an opening through which said post 8 extends. The spring mechanism with the plate 15 and cover 19 are then mounted upon the post 8 and the screw 21 is adjusted to hold said spring mechanism in place, the tube 20 preventing collapse of the cover while said nut is being screwed to tightly hold the parts together.

In practice the waist belt and crotch straps 24 and 25 are secured to the loops 11 and are drawn sufficiently tight to incline said loops so as to place the springs 13 under tension.

It will be observed that a truss thus constructed may be worn with comfort to the wearer and that if for any reason the water or air pad collapses or becomes deflated, the truss is not rendered useless thereby, but the spring mechanism will act upon the backing elements of the pad and efficiently hold the rupture and with respect to the particular spring mechanism employed its action will be such that a firm pressure is imposed on the ruptured parts at all times, which pressure increases when the abdominal wall is expanded for instance when the wearer stoops or bends forward during which time the tendency of the rupture to protrude is increased and thus efficiently holds the rupture against protrusion at all times. It will also be observed that the pressure of the water pad upon the rupture may be increased or diminished which is a very important advantage, and further it will be seen that the truss may be worn with a minimum of discomfort.

In Fig. 6 there is shown diagrammatically a truss pad wherein the inflated chamber (designated 30) is longer than the one above described and is provided at each end with one of the spring devices (designated 40) above set forth. Such pad may be preferred in the treatment of certain characters of hernia. It will be understood that the spring devices and the caps employed in the form of pad shown in Fig. 6, are or may be duplicates of each other and similar in construction to the corresponding parts shown in the other figures of the drawings.

The second part of the invention, relates to the provision of a truss having a pad and pressing means therefor, said pad and pressing means being so related to each other that they may be relatively adjusted pivotally to properly cover the ruptured part and exert inward pressure thereon in either an upward or a downward direction to accord with the tendency of protrusion of the particular case under treatment, which tendency of protrusion is sometimes in an upward and sometimes in a downward direction. This is accomplished by pivotally connecting the pressure mechanism and the pad with each other and by arranging

said pressure mechanism off the center of the pad, that is to say, for example, by mounting the plurality of spring devices on a pivoted support, bearing such relation to each other and to the pad that the pressure exerted by them will be unequal with respect to the center of the pad, instead of providing the pad with a spring device which bears on the center thereof, or with a series of such devices arranged equidistant from the center of the pad. The preferred arrangement of the parts, is shown in the drawings, wherein the pad is of oval or other elongated shape, and a plurality of spring devices are employed, which are mounted on a support provided by the plate 15, which plate is mounted to turn on the pad proper around the pivotal post 8, which constitutes the axis of such turning movement and is arranged off the center of the pad while the series of spring devices are arranged around said post and equidistant therefrom. It will be apparent that when the screw 21 is slackened an adjustment of the chamber 1, with its reinforcing cap 5, relative to the plate 15, cover 19 and spring devices, is permitted, and that the character of pressure which the device exerts on the wound may thus be varied: and that when said screw is tightened the parts are fixed thereby. While this feature of my invention is preferably embraced in a construction of truss which also embodies means for carrying into practice the other objects of the invention, it will be apparent that neither its usefulness nor the present invention is restricted thereto.

Having thus described the invention what I believe to be new and desire to secure by Letters Patent, and what I, therefore, claim, is:—

1. A truss pad comprising an inflatable chamber, a chambered reinforcement therefor, and spring tension devices arranged in the chamber in the reinforcement and adapted to press the pad to the rupture, said mechanism having means for attachment to the means by which the pad is attached to the wearer.

2. A truss pad comprising two parts mounted one on the other and each capable of supporting the rupture, the first of said parts comprising an inflatable chamber and the second of said parts constituting a supplemental pad which supports the rupture when said first part is deflated and comprising a cap provided with a spring mechanism adapted to be connected with the straps which attach the pad to the wearer.

3. A truss pad comprising a plurality of parts each capable of supporting the rupture, one of said parts being adapted to be filled with an inflating fluid and having a depression in its rear surface and a cup-shaped cap mounted in said depression, and

the other of said parts being mounted on said cap and provided with means for engaging the straps by which the pad is attached to the wearer.

4. A truss pad comprising a plurality of parts each capable of supporting the rupture, one of said parts being adapted to be filled with an inflating fluid and having a depression in its rear surface and a cup-shaped cap mounted in said depression, and the other of said parts being mounted on said cap and provided with springs having means for engaging the straps by which the pad is attached to the wearer.

5. A truss pad comprising an inflatable chamber, a backing therefor and means for adjusting the backing to determine the pressure of the pad on the wearer.

6. A pad for the treatment of hernia, comprising an inflatable chamber, a cap mounted thereon, and means for adjusting said cap to determine the pressure of the pad on the rupture.

7. A pad for the treatment of hernia, comprising an inflatable chamber, a cap mounted thereon, and means for adjusting said cap to determine the pressure of the pad on the rupture, said means comprising a threaded post engaging said cap.

8. A pad for the treatment of hernia, comprising an inflatable chamber provided with a depression in its rear side, a cup-shaped cap mounted in said depression, and means for holding said cap adjustably in said depression to adjust the pressure of said pad on the rupture, said means comprising a second cap having a chamber and a circumferential flange and seated in the first mentioned cap and engaging the rear wall of said inflatable chamber, and an adjustable post bearing upon the first-mentioned cap and having a threaded engagement with said second cap.

9. A pad for the treatment of hernia comprising an inflatable chamber having reinforcing means and a pressure means mounted in said reinforcing means and comprising a plate, and spring devices mounted on said plate and having projections engaging the same and loops to engage the straps which attach the pad to the wearer.

10. A pad for the treatment of hernia, comprising an inflatable chamber having a depression in its rear side and a reinforcing means fitted to said rear side of the chamber, and a pressure means mounted in said reinforcing means and comprising a plate, and spring devices mounted on said plate and having projections engaging the same and loops to engage the straps which attach the pad to the wearer.

11. A pad for the treatment of hernia, comprising an inflatable chamber, a cap mounted on the rear wall thereof, an adjustable post bearing on said cap and by

its pressure thereon determining the pressure exerted by said chamber on the rupture, and a pressure means mounted rearward of said cap and having a screw which has a threaded engagement with the outer end of said post, said pressure means comprising a plate, and spring devices secured to said plate and provided with means to engage the straps which attach the pad to the wearer.

12. A pad for the treatment of hernia, comprising an inflatable chamber, a cap mounted on the rear wall thereof, a second cap mounted rearward of the first mentioned cap, said caps reinforcing said rear wall, a post having a threaded engagement with said second cap and having its inner end engaged with the first-mentioned cap, and a pressure means mounted rearward of said cap and having a screw which has a threaded engagement with the outer end of said post, said pressure means comprising a plate and spring devices secured to said plate and provided with means to engage the straps which attach the pad to the wearer.

13. A pad for the treatment of hernia, comprising an inflatable chamber, a cap mounted on the rear wall thereof, a second cap mounted rearward of the first mentioned cap, said caps reinforcing said rear wall, a post having a threaded engagement with said second cap and having its inner end engaged with the first-mentioned cap, and a pressure means mounted rearward of said cap and having a screw which has a threaded engagement with the outer end of said post, said pressure means comprising a plate and spring devices secured to said plate and provided with means to engage the straps which attach the pad to the wearer and with projections which bear on said plate.

14. A pad for the treatment of hernia, comprising an inflatable chamber having a depression in its rear side, a cup shaped cap mounted in said depression, a second cap, having a chamber and a circumferential flange respectively seated in the first-mentioned cap and engaging the rear wall of said inflatable chamber, an adjustable post bearing upon the first mentioned cap and having a threaded engagement with said second cap, and a pressure means mounted in the chamber of said second cap and having a screw which has a threaded engagement with the outer end of said post, said pressure means comprising a plate and spring devices secured to said plate and provided with means to engage the straps which attach the pad to the wearer.

15. A truss pad comprising an inflatable chamber, reinforcing means therefor, an inclosed chamber mounted rearward of said reinforcing means, and spring devices

mounted in said inclosed chamber and having outwardly projecting means to be engaged by the straps which secure the pad to the wearer.

16. A truss pad comprising an inflatable chamber, reinforcing means therefor, an inclosed chamber mounted rearward of said reinforcing means and detachably secured thereto, and spring devices mounted in said inclosed chamber and having outwardly projecting means to be engaged by the straps which secure the pad to the wearer.

17. A truss pad comprising an inflatable chamber having a depression in its rear side, reinforcing means fitted to said rear side, an inclosed chamber mounted in said reinforcing means and spring devices mounted in said inclosed chamber and provided with means projecting outwardly through the same to be engaged by the straps which secure the pad to the wearer.

18. A truss pad comprising an inflatable chamber and a casing mounted upon the inflatable chamber and provided with spring devices adapted to be attached to the part which secures the pad to the wearer and to press the pad inward, as described.

19. A truss pad comprising an inflatable chamber provided with a movable backing, a movable post engaging the backing, a casing mounted rearward of said backing and provided with spring devices adapted to be attached to the part which secures the pad to the wearer and to press the pad inward, and adjustable securing means for the casing, engaging said post.

20. A truss pad, comprising a plurality of parts one mounted on the other and each capable of supporting the rupture, the first of said parts comprising an inflatable chamber and the second of said parts being mounted on said first part and constituting a supplemental pad which supports the rupture when said first part is deflated, and means interposed between said parts and adjustable to determine the pressure of said inflatable chamber on the wearer.

21. A truss pad provided with a plurality of means mounted one on the other and each capable of supporting the rupture, said pad comprising an inflatable chamber, a device having means by which it is adjusted to determine the pressure of said inflatable chamber on the wearer, and means comprising spring mechanism adapted to be connected with the straps which attach the pad to the wearer.

22. In a truss, a pad and means for holding the pad to the rupture with a variable upward or downward tendency, said holding means comprising a support, pivotally connected with the pad and provided with a plurality of spring tension devices adapted to press the pad inward and to be attached to the means for securing the pad

to the wearer, said devices being so arranged that the pressure exerted by them will be unequal with respect to the center of the pad.

23. In a truss, a pad, and means for holding the pad to the wearer with a variable upward or downward tendency, said holding means comprising a support, pivotally connected with the pad off the center of the latter and provided with a plurality of spring tension devices which are arranged around the pivot and approximately equidistant therefrom, said spring tension devices being adapted to press the pad inward and to be attached to the means for attaching the pad to the wearer.

24. In a truss, a pad, a plate and a cover mounted thereon and arranged to form an inclosed chamber; a pivot around which said chamber and pad are relatively adjustable, said pivot located off the center of said pad; a series of spring devices mounted in said chamber and around said pivot and supported on said plate, said spring devices being adapted for connection with the means which attaches the truss to the wearer and to press said pad toward the wearer when pressure is imposed on said means; and means for fixing the parts in adjusted position.

25. In a truss; an elongated pad, a plate and a cover arranged to form an inclosed chamber; a pivotal post around which said chamber and pad are relatively adjustable on an axis which is nearer one side of the pad than the other, said pivotal post being located off the center of said pad; a series of spring devices mounted in said chamber and around said post and supported on said plate, said spring devices being adapted for connection with the means which attaches the truss to the wearer and to press said pad toward the wearer when pressure is imposed on said means; and a screw engaging said cover and threaded into said post and fixing the parts in adjusted position.

26. In a truss, a pad and a pressing mechanism arranged on one side of said pad and off the center of the same, said pad and pressing mechanism having a relative pivotal adjustment and said pressing mechanism comprising a plate and a cover arranged to provide a chamber, and spring devices having outwardly extending parts to engage the means which attaches the truss to the wearer and inwardly extending parts which press the truss to the wearer

when pressure is imposed on the attaching means.

27. In a truss, a pad, a plate and a cover mounted thereon and arranged to form an inclosed chamber, a pivotal post located off the center of said pad, a series of spring devices mounted in said chamber around said post and supported on said plate, said spring devices comprising outwardly projecting parts which extend through said cap, inwardly projecting parts which bear on said plate and intermediate coiled springs, a screw extending from the outer side of said cap and threaded into said post, and waist and crotch straps attached to said outwardly projecting parts of the spring mechanism.

28. In a truss, a pad comprising an inflatable chamber and means for pressing the same to the wearer with either an upward or downward tendency, said means comprising a support connected with the chamber and spring tension devices arranged to exert an unequal pressure with respect to the center of the pad and adapted for attachment to means by which the pad is secured to the wearer.

29. In a truss, a pad comprising an inflatable chamber and means for pressing the same to the wearer with either an upward or downward tendency, said means comprising a support which is pivotally connected with the chamber off the center of the latter and a plurality of spring tension devices carried by said support and arranged on different sides of the pivot and approximately equidistant therefrom.

30. In a truss, a pad having an inflatable chamber, a backing adapted to support said chamber and also to support the rupture when said chamber is deflated, means mounted on said backing and adapted to provide a chamber outside said backing, a pivotal post extending through the latter chamber and arranged off the center of the pad and around which said backing and latter chamber are adapted to turn relatively to each other, and spring devices in said chamber, having outwardly projecting parts adapted to be connected with means which attach the pad to the wearer.

In testimony whereof I affix my signature, in presence of two subscribing witnesses.

JOHN WALLACE BUNKER.

Witnesses:

HORACE G. PECK,

WILLIAM H. McSOLEY.