

Nov. 6, 1923.

1,473,539

T. BEASLEY

SURGICAL TRUSS AND THE LIKE

Filed March 5, 1923

3 Sheets-Sheet 1

FIG. 1.

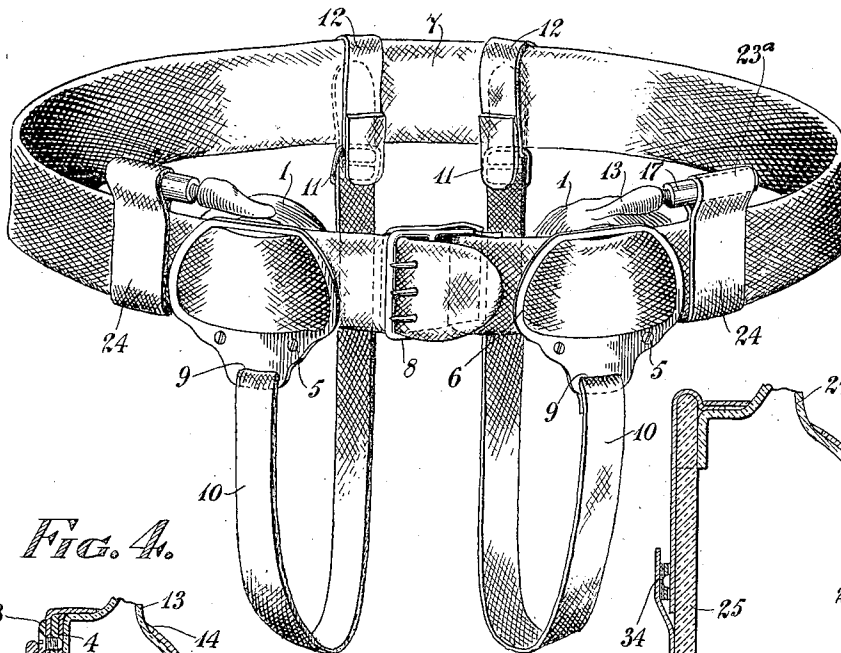


FIG. 4.

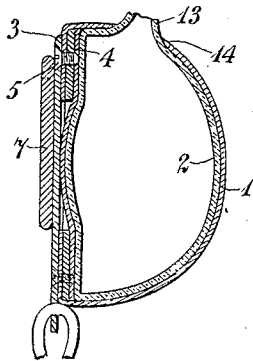


FIG. 8.

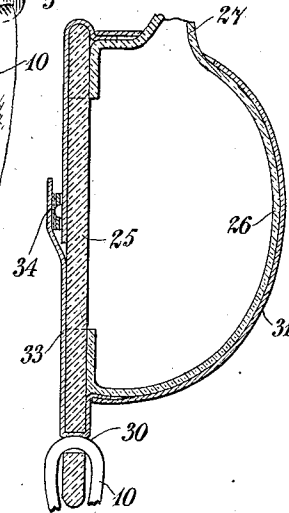
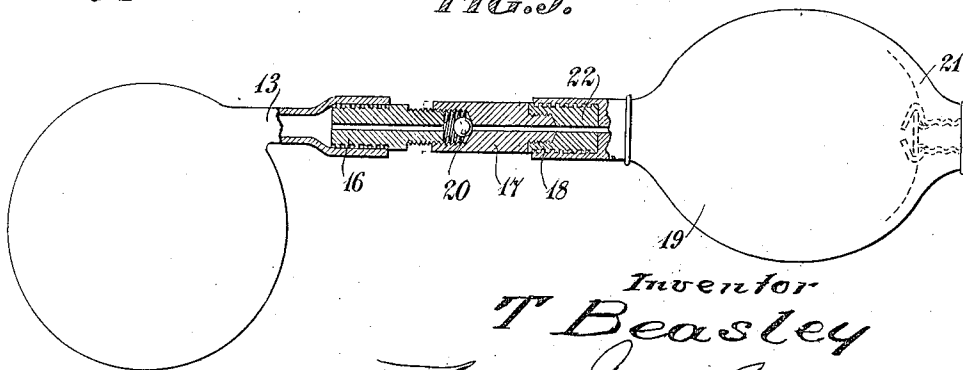


FIG. 5.



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FIG. 9.

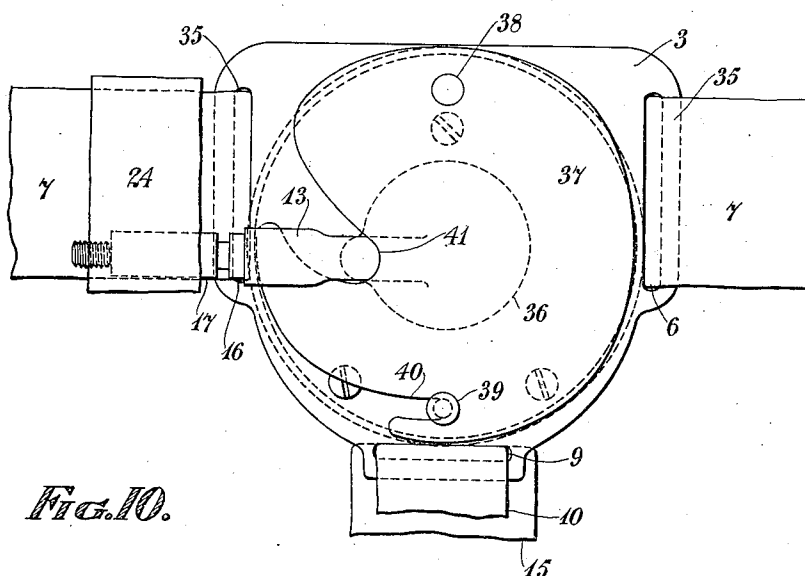


FIG. 10.

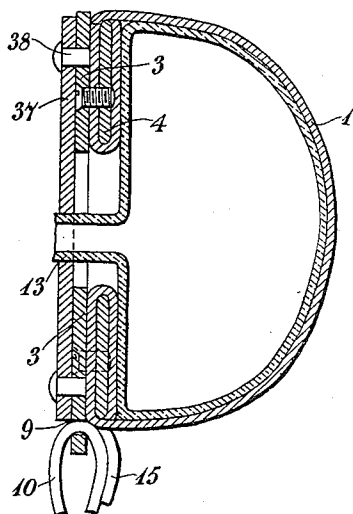
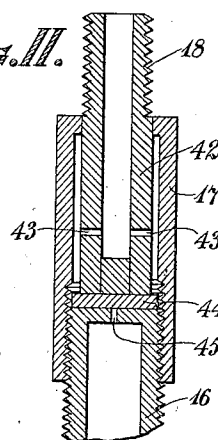


FIG. 11.



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UNITED STATES PATENT OFFICE.

THOMAS BEASLEY, OF MERTON, ENGLAND.

SURGICAL TRUSS AND THE LIKE.

Application filed March 5, 1923. Serial No. 622,995.

To all whom it may concern:

Be it known that I, THOMAS BEASLEY, a subject of the King of Great Britain, residing at 36 Meadow Road, Merton, in the county of Surrey, in the Kingdom of England, have invented certain new and useful Improvements in or Relating to Surgical Trusses and the like, of which the following is a specification.

This invention relates to improvements in surgical trusses and the like of the type in which detachable and adjustably inflatable pads are adapted to be adjustably secured on a belt or the like.

The object of this invention is to provide an improved surgical truss of the above type which can be worn with the greatest comfort by the weakest and most sensitive persons to obviate the objections of rupture or act as a preventative of such complaints.

A further object is to provide a device of the above character in which the means for regulating the pressure in the inflatable pads is such that the parts may be adjusted and the pressure may be regulated to suit the wearer, for instance, whilst the device is being worn.

A further object is to provide inflatable pads with a backing of substantially non-resilient material so shaped that it can be readily placed on any desired body belt, such as belts of webbing, leather or rubber, thus providing a truss which can be adapted to be worn at any time for instance by day, night or during bathing.

According to this invention a screw adjustable valve is connected by a flexible connection to a pad which is fitted or formed on a plate or backing so shaped, such as by having substantially vertically arranged slots, that the said pad may be slidably arranged on and be automatically secured to a body belt or the like so that the pads can be readily fitted and adjusted on the said belt and the pressure of the pads can be regulated whilst in use.

The invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view of one form of double truss constructed according to this invention;

Figure 2 is a front elevation of one of the pads and part of the securing belt drawn to a larger scale;

Figure 3 is an elevation of the inner side of the pad shown in Figure 2;

Figure 4 is a cross section taken substantially on the line *a—*a** of Figure 3;

Figure 5 is a sectional elevation of one of the interior bladders showing my preferred form of valve and pump attached thereto;

Figure 6 is an elevation of a modified form of pad;

Figure 7 is an elevation of the pad shown in Figure 6 looking in the reverse direction;

Figure 8 is a vertical section thereof;

Figure 9 is a view similar to Figure 2 of a further modified construction;

Figure 10 is a vertical section thereof;

Figure 11 is a sectional detail of a modified form of valve;

Fig. 12 is a sectional view illustrating a slightly modified form of pad.

As shown, more particularly in Figures 1 to 4, each pad member comprises a casing member 1 for a bladder or the like 2 which casing member is adapted to be secured around its edges between a flat back or base plate 3 and a clamping ring 4. The base plate 3 is of any suitable material preferably metal such as aluminum, but it will be understood that it may be formed with any non-resilient or partly resilient material, such as leather, wood or any suitable composition. The edges of the casing member 1 are firmly clamped between the plates 3 and 4, by means of screws 5 adapted to screw into the said ring 4. The back plate 3 is preferably of substantially circular shape and is provided at opposite sides with slots 6 preferably of arcuate shape for the reception of the body belt 7 which is threaded therethrough. This body belt 7 which may be of the usual construction and of webbing or elastic material is fitted with a buckle 8 whereby it can be adjusted in the usual manner. Each back plate 3 is also formed with an intermediately arranged slot 9 for the reception of one end of the belt 10 which is adapted to pass around the hips in the usual manner. One end of this hip belt 10 is secured to the plate 3 preferably by hemming over the end of the belt and the other end is secured by means of a buckle 11 to a loop-strap 12 preferably slidably arranged on the body belt 7. The bladder or the like 2, which is adapted to fit within the hemispherically or otherwise shaped casing 1 of each pad member is preferably con-

5 constructed of rubber and formed or provided
 with a resilient tube 13. This resilient tube
 13 which is arranged at any convenient part
 of the bladder 2 is adapted to project
 10 through a hole 14 in the casing 1 which lat-
 ter is preferably constructed of washleather
 or the like. If desired, the casing 1 may be
 provided with a washleather or like flap 15
 to prevent the rubbing of the lower end of
 15 the plate 5 against the wearer. The outer
 end of each resilient tube 13 is fitted with a
 valve of any convenient form. In this in-
 stance the valve comprises a pair of thread-
 20 edly connecting members 16 and 17 con-
 structed of vulcanite or other suitable mate-
 rial. The member 16 is adapted to be se-
 cured in any convenient manner to the re-
 silient tube 13 and the member 17 is pro-
 25 vided with a threaded nipple 18 on which is
 adapted to be screwed any convenient form
 of pump indicated at 19, in Figure 5. Be-
 tween the members 16 and 17 is arranged a
 30 ball valve 20 which is adapted to operate in
 the manner to be hereinafter described. The
 pump 19 is constructed of resilient mate-
 rial and is formed with a bulb portion in
 one end on which is fitted a suitable non-
 35 return valve 21, the other end being fitted
 with a vulcanite threaded extension 22
 adapted to screw on the threaded nipple 18.
 If desired, the bladder or the like 2 may be
 40 formed with an enlargement 23 adjacent to
 the back plate 3 so that should the bladder 2
 become accidentally deflated, the pad would
 not wholly collapse and still be, to a certain
 45 extent, effective. The appliance is adapted
 to be worn in the usual manner and may be
 provided with either one or two pads ac-
 cording to whether it is required for a single
 50 or double rupture. The desired pressure in
 the pads is obtained by screwing the pump
 19 on to the threaded nipple 18 and squeez-
 ing the spherical portion of the pump in the
 55 well known manner, after the member 17 is
 given a certain rotation to bring the parts
 into the position indicated in full lines in
 Figure 5. This rotation of the member 17
 will allow the ball 20 to be free between the
 60 orifices in the parts 16 and 17 and act as a
 valve in the well known manner. The air
 entering the valve 21 in the pump 19 will
 pass the valve 20 into the bladder or the
 like 2. When sufficient air is forced into the
 65 bladder 2 to obtain the required pressure,
 the member 17 is screwed up on the member
 16 so as to lock the ball 20 in the position
 shown in dotted lines in Figure 5. The
 pump 19 can now be unscrewed and removed
 from the member 17 until again required.
 Should the pressure of the pad be more than
 desired, the member 17 can be unscrewed
 slightly to allow a quantity of air to escape
 from the bladder 2. The member 17 being
 again screwed up to prevent leakage. The
 pressure of air in the bladder 2 will press

the pad outwardly and against the body of
 the wearer and the back plate 3 will form
 an effective seating for the pneumatic pres-
 sure in the casing 1. The member 17 of the
 valve connected to the resilient extension 13
 70 of the bladder 2 is adapted to be tucked
 into a suitable pocket 23^a arranged on the
 body portion of the belt. This pocket 23^a is
 formed by hemming over a portion of a loop
 75 24 which is adapted to slide on the body
 belt 7. The sliding loop on the belt may be
 made of any suitable material such as web-
 bing or velvet.

In a modified construction as shown in
 Figures 6, 7 and 8, the pad members or the
 80 like are constructed entirely of rubber. The
 portion 25 taking the place of the back plate
 is of substantially thick rubber or other
 suitable material such as metal reinforced
 85 rubber. To this rubber plate 25 is vulcan-
 ized or secured in any other convenient
 manner a substantially hemispherical thin
 rubber bag 26 which is adapted to provide
 a resilient pneumatic pad. This pad is in-
 90 tegrally formed with the resilient tubular
 connection 27 which is fitted with a suitable
 valve 28 adapted to act in the manner pre-
 viously described. The back plate 25 is pro-
 95 vided with a pair of vertical slots 29 for the
 reception of the body belt or the like which
 in this case may be made of rubber or of such
 material that the truss can be worn during
 bathing or at night. The back plate 25 is
 also provided with a horizontal slot 30 for
 100 the reception of the hip belt 10. Each pad
 member 26 is preferably covered with a
 piece of washleather or other suitable flex-
 ible material 31 of substantially hemispher-
 ical shape. To the washleather 31 is sewn
 105 or otherwise secured four pieces of tape or
 the like to provide two pairs of securing
 members 32 and 33. The ends of the op-
 positely arranged tapes 32 and 33 are pro-
 vided with co-operating fastening devices
 110 34 such as press-button fasteners so that
 each pair of members can be detachably
 connected together. The side tape members
 32 are adapted to pass through the vertical
 slots 29 in the base member 25 and be de-
 115 tachably connected to each other at the rear
 of the base 25 and the two vertical tapes
 33 are adapted to be detachably connected
 to each other at the rear of the base member
 25 in a similar manner. The lower tape is
 120 adapted to pass through the horizontal ar-
 ranged slot 30 in the base member 25. Thus
 the washleather covering or the like 31 can
 be readily removed from the pad member 26
 when desired. The body belt is adapted to
 125 be threaded through the vertical slots 29 as
 in the previous construction, and this belt
 may be provided with loops having pockets
 for the valves 28 as before mentioned. The
 pressure of the air in the pads is obtained by
 130 means of the pump previously described and

this pressure may be relieved by unscrewing or partly unscrewing the valves. In use and assuming it is desired to wear, for instance, a waterproof truss and that the pads are arranged on a belt of webbing or like material, the pad members can be readily removed from the belt, the hip straps 10 and the washleather portions 31 of the pads may also readily be removed. The two rubber pad members of, for instance, a double truss can be readily placed on a leather or rubber body belt which may or may not be provided with hip straps. In this instance, the loop members 24 forming the pockets for the valves of the pad members may be constructed of rubber or like waterproof material or they may be omitted. Thus the truss can be readily converted so that it may be worn at any time. It is also unnecessary to alter the pressure of the air in the pads when they are taken off one belt and placed upon another.

In a further modified construction as shown in Figures 9 and 10, the hemispherical pad members 1 are secured around their peripheral edges between plates 3 and 4 of metal preferably aluminum. This back plate 3 is provided at opposite sides with slots 6 of substantially rectangular shape for the reception of the ends of the body belt 7 of any suitable material, such as webbing or elastic material. In this instance, the ends 35 of the belt 17 are hemmed over to provide loops to secure the back plate 3 thereto. The hip belt 10 is passed through the horizontal slot 9 and hemmed over as in the previous construction. The back plate 3 is formed with a central aperture 36 of substantially circular shape and this circular shaped aperture 36 is adapted to be closed by the cover plate 37 pivotally mounted at 38 on the said base plate 3. This rotatably mounted cover plate 37 is of substantially circular shape and is adapted to be locked in position on the base plate 3 by a pin 39 on the said base plate 3 engaging in a cam shaped slot or recess 40 formed in the cover plate 37. Within the resilient casing 1 of the pad member which is preferably constructed of washleather or other suitable material is adapted to be placed a bladder or the like 2. This bladder 2 is adapted to be inserted in the casing through the hole 36 provided in the back plate 3. The resilient extension 13 carrying the portions 16 and 17 of the valve member is adapted to project through a suitable slot 41 cut in the hinged cover plate 37 and the valve is adapted to be retained in position against the belt 7 by means of a sliding loop 24 arranged thereon. In this instance, the bladder 2 can be readily removed and replaced by partially rotating the pivoted plate 37 on its pivot to permit of the bladder 2 to be drawn out through the opening in the said plate 3.

It will be understood that any form of valve may be employed for use in connection with the above described pads or bladders, the most convenient form is shown in Figure 5. In the modified construction, shown in Figure 11, the valve comprises a pair of cooperating threaded members, the member 16 being secured to the flexible connection 13 of the bladder 2 as previously described and the other member 17 being formed with a nipple 18 on which is adapted to be screwed any suitable form of pump. The member 17 is formed with an interior tubular extension 42 and is provided with a plurality of air inlet openings 43. Between the extension 42 and the portion 16 is arranged a suitable form of resilient washer 44 which is adapted to prevent the exit of air through an aperture 45 in the member 16 when the said washer 44 is screwed up tightly between the said extension 42 and the portion 16. When it is desired to pump air into the bladder 2 the portion 17 is partly unscrewed from the portion 16 connected to the bladder to permit the air to pass through the orifices 43 around the threads of the member 17 past the washer 44 and through the orifices 45 into the bladder. When sufficient air is pumped into the bladder the member 17 is screwed upon the member 16 to secure the washer 44 therebetween and close the orifice 45.

What I claim is:—

1. In a surgical truss or the like, a backing plate formed with belt receiving edge slots, a flexible casing removably secured to said backing plate, an inflatable pad arranged in said casing, and means projecting through said casing and communicating with said inflatable pad to permit the connection of an inflating means thereto for inflating the pad at will.

2. In a surgical truss or the like, a backing plate, an inflatable pad, said backing plate being formed with an opening through which the pad may be bodily inserted, an inflating tube carried by and projecting from the pad, and a cover plate carried by the backing plate to close the opening in the latter, said cover plate being formed with a slot to permit the passage of the inflating tube.

3. In a surgical truss or the like, a backing plate formed with belt receiving edge slots, an inflatable pad removably secured to said backing plate, inflating means carried by and communicating with said pad, and means adapted to be mounted on the belt to receive and support said inflating means.

4. In a surgical truss or the like, a backing plate formed with belt receiving edge slots, an inflatable pad removably secured to said backing plate, a flexible tube carried by and communicating with said pad, a valved nipple projecting from said tube and adapted to receive inflating means, and a

pocket to receive and support said nipple, said pocket being adapted for connection with the belt.

5 5. In a surgical truss or the like, a backing plate formed with belt receiving edge slots, a flexible pad cover removably secured to the backing plate, an inflatable pad ar-

ranged within said cover, an inflating tube carried by and communicating with said pad, and means cooperating with the body belt 10 to receive and support said inflating tube.

In testimony whereof I have hereunto signed my name.

THOMAS BEASLEY.