

April 29, 1941.

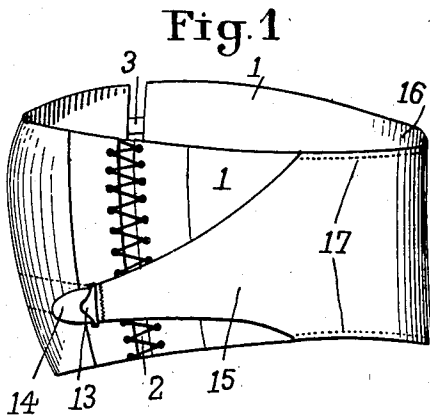
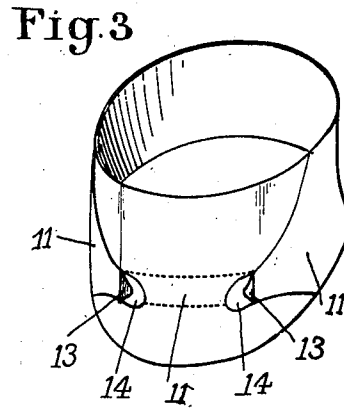
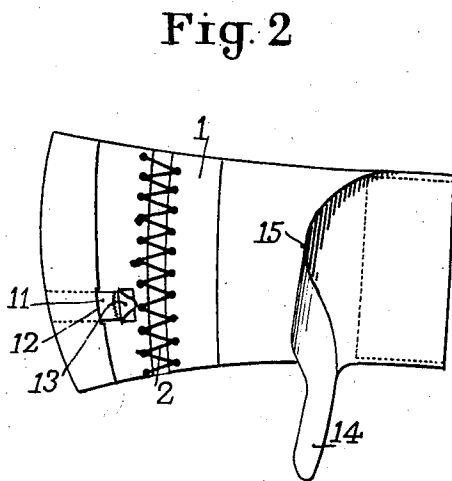
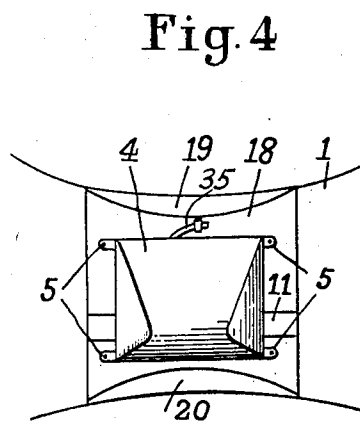
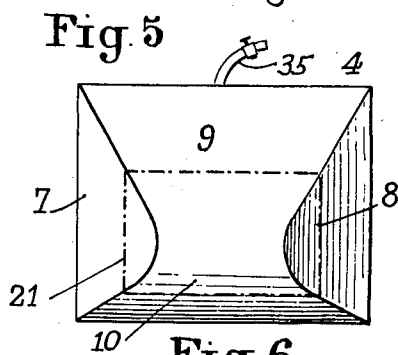
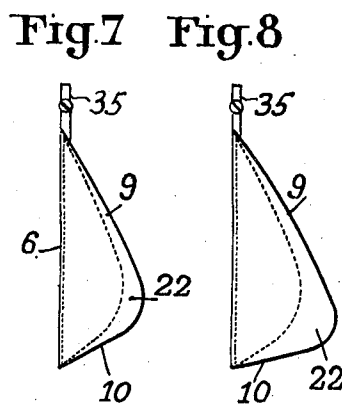
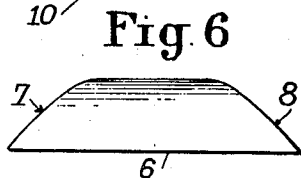
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2,240,308

ORTHOPEDIC BELT FOR THE TREATMENT OF GASTRIC PTOSIS

Filed Jan. 13, 1938

2 Sheets-Sheet 1



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ORTHOPEDIC BELT FOR THE TREATMENT OF GASTRIC PTOSIS

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2 Sheets-Sheet 2

Fig. 9

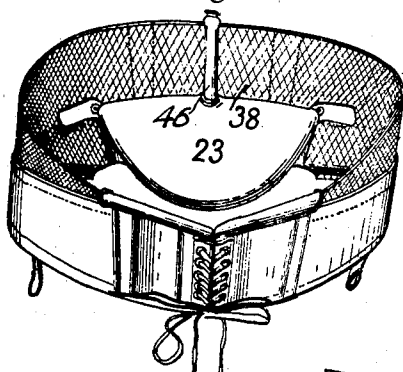


Fig. 10

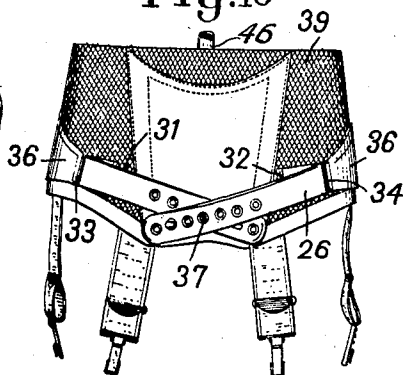


Fig. 11

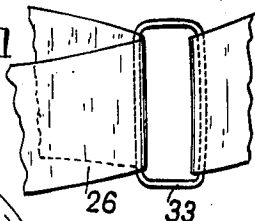


Fig. 12

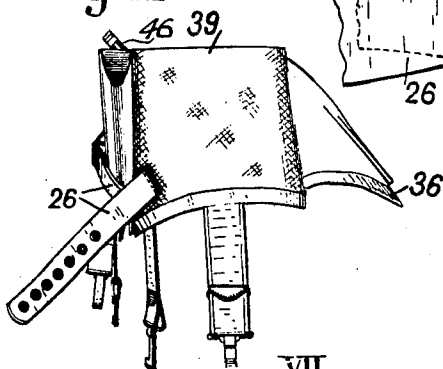


Fig. 13

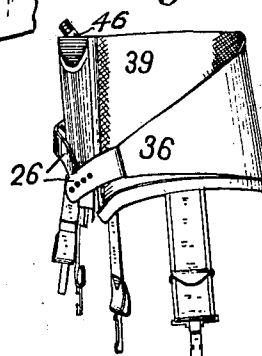


Fig. 14

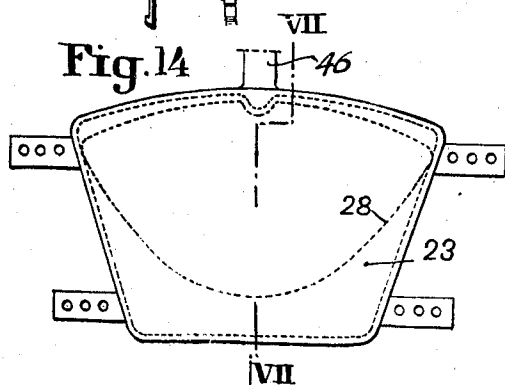


Fig. 15

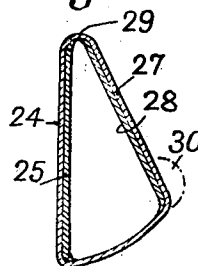


Fig. 16

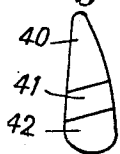


Fig. 17

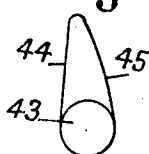
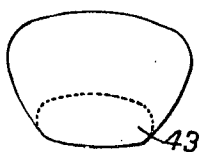


Fig. 18



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UNITED STATES PATENT OFFICE

2,240,308

ORTHOPEDIC BELT FOR THE TREATMENT
OF GASTRIC PTOSSES

Roger Hervé Mahé, Le Havre, France

Application January 13, 1938, Serial No. 184,744
In France April 23, 1937

4 Claims. (Cl. 128—96)

This invention relates to an orthopedic belt for the treatment of gastric ptoses. The main object is to provide such a belt in which local pressure can be exerted on the body as desired.

It has been already proposed, in order to maintain or to restore approximately to a normal or less painful position a stomach which has dropped owing to a gastric ptose, to use belts adapted for supporting the internal organs, but certain devices of this kind offer the disadvantage that they exert only a lateral pressure or a horizontal pressure on the stomach, so that the said devices, while seeming first to bring some relief to the patient, are likely to exert a prejudicial action because of the compression resulting on the stomach.

The belt according to the invention, which does away with such inconveniences, comprises in combination with an elastic or semi-elastic or conveniently conformable sheath forming a support, a reducing device such as a pneumatic pad or the like of suitable form, preferably of a prismatic form, provided with a strap or belly-band the pressure of which is controllable and which directly exerts a pressure on the said pad while resting against the sheath and thus exerting on the organ or organs to be restored to the normal position an oblique pressure with an upwardly directed component which can have every possible desired value, while the belly is practically free from every horizontal compression which would be likely to cause a condition of uneasiness.

In the appended drawings which show by way of example of an embodiment of the invention forms of execution of a belt for the treatment of the gastric ptose:

Figure 1 is a perspective view of the whole of a first form of execution of the belt according to the invention.

Figure 2 is a side elevational view, the tightening band being loosened.

Figure 3 is a front view of the belt.

Figure 4 is an inner view of the belt, showing more particularly the pad and its assembly.

Figure 5 is a view of the pad alone on an enlarged scale.

Figure 6 is a plan view of the pad of Figure 5.

Figure 7 is a side view of Figure 5.

Figure 8 is a modification of the side view of Figure 7.

Figures 9 and 10 are, respectively, a general back view and a general front view of another form of execution of the belt.

Figure 11 is a detail view showing a strap securing buckle.

Figures 12 and 13 are side views of the belt of Figures 9 and 10 in the open and closed positions, respectively.

Figures 14 and 15 are, respectively, an elevational view and a sectional view of the pad through the line VII—VII of Figure 14.

Figures 16, 17 and 18 are diagrammatical views of modifications of the pad.

Referring first to Figures 1 to 8 inclusive, the belt comprises a sheath 1 preferably of an elastic fabric, provided, on the one hand, with a lacing 2 and, on the other hand, with a tightening device formed of straps or the like, a portion of which only is shown in Figure 1 and designated by 3.

The said sheath, which is thus elastic on the whole or only in a portion of its length, may comprise strengthening devices such as busks or the like so as to fit as closely as possible onto the body of the patient in order to form a resting surface which is resisting while being yieldable, for the organs for the purpose of effecting treatment of the ptose.

The sheath 1 carries, in its front part and on its inner surface, a pad 4 which is preferably simply supported on the inner surface of the sheath 1, by hooking or securing lugs 5 in any desired number, the pad having the form of an irregular prism more completely shown in Figures 5 to 7 and having a plane bottom 6 preferably of polygonal form to which the sloping lateral surfaces 7, 8 are connected. The irregular prism which forms the pad has at its end an active or supporting face 9 to which a lower face 10 is connected, the slope of which is preferably steeper, as shown in the side views of Figures 7 and 8, and forming a kind of wedge.

The pad, which receives from the sheath a simple suspension support insuring its maintenance in the desired position is pushed to an active position by a strap 11 which passes between its back face and the inner face of the sheath 1. As shown more particularly in Figures 2 and 3, this strap passes through openings 12 in the sheath 1 and is provided, at its free lateral ends, with securing buckles 13 into which lugs 14 (see Figures 1 to 3) engage which are provided at the end of a flexible but non-extensible band of fabric 15 secured to the back part 16 of the sheath 1. The said parts are secured, for instance, by means of seams such as 17 made on the upper and lower edges of the band 15 while leaving to the sheath 1 its whole elasticity along the larger part of its length.

The front part 18 of the sheath or the part of

the sheath which carries the pad 4 is preferably made of a non-extensible fabric with the exception of its upper and lower portions 19, 20 which are preferably made of elastic fabric, the front part 18 being able to receive a suitable half-stiffness through the application of reinforcing leather bands or of suitable busks.

Owing to the described arrangement, the pad which is generally designated by 4, will constantly be maintained in the position which is most favorable for the treatment which it is desired to effect, its sloping active face 9, which engages the abdomen under the stomach like a wedge tending to cause an efficient raising movement for this organ without exerting any excessive pressure onto the same, while the said pad, terminating abruptly in its lower part at the steeper sloping face 10, can avoid any direct engagement with the body, thus diminishing the uneasiness of the patient.

The pressure of the pad is obtained by means of the strap 11 the lateral ends of which, projecting from the sheath 1 through the openings 12 (see Figure 2), are connected to the lugs 14 of the tightening band 15 through the securing buckles 13 through which it is possible, at every moment, to adjust the pressure exerted onto the pad and, consequently, the action of this pad on the internal organs to be treated.

Owing to this arrangement, it is thus possible practically to avoid having a strong pressure exerted on the abdomen by the sheath 1 which otherwise forms a firm and sure support for adjusting the position of the pad and for controlling the action of the latter.

The pad proper will be made preferably of rubber and may receive an inflation connection similar to 35 in Figs. 4, 5, 7, 8 and 46 in Figs. 9, 10 and 12 to 14. However, in order to insure its wedge action by facilitating its penetration into the abdomen of the patient, it will be possible to provide its top with a rigid armature 21 of Celluloid, metal, leather or like suitable substance, in order to prevent any deformation of the said pad in its top portion.

This armature will be applied preferably only under the top of the wedge formed of the pad in order to avoid a direct engagement of the metal with the body of the patient. It would be also possible, in order to avoid any change in the position, or any tilting movement of the pad, to insert the latter with its bottom into a rigid or elastic armature, preferably of metal, forming the resting surface for the strap 11, the said insertion taking place to a suitable extent and more particularly on the face 9 of the pad and possibly also on the faces 7, 8 and 10 in an amount which varies according to each particular case.

In order to avoid the disadvantage of giving to the top of this pad a hardness which would be likely to hurt the patient, it is also possible to arrange, in the interior of the pad, an armature of suitable form, made of metal or any other desired substance, or it is also possible, as shown in Figures 7 and 8, to give different thicknesses to the rubber pocket which forms the pad, the greater thickness being given about the top 22 of the said pad, in order to obtain at this point a great firmness of the said pad but without hurting the patient.

It would be possible also to obtain the desired elasticity of the pad by providing the latter with one or more springs of metal strip or the like permitting of insuring the elastic action of the

pad with a projection in its top in order to reduce the ptose by exerting an elastic raising action on the stomach.

Referring now to Figures 9 to 15, the pad 23 comprises in its back wall 24 an armature plate 25 of suitable rigidity arranged on the inner face of the wall 24 and thus permitting this wall of receiving the action of the pressure strap 26 without any deformation (see Figure 10).

The front wall 27 adapted for engaging the belly of the patient also possesses an armature 28 of suitable rigidity having, for instance, the form shown in dotted lines in Figure 14, the unit formed of both armatures 25, 28 having somewhat the appearance of a hinge the flexible link 29 of which (see Figure 15) is formed by the wall of the pad itself.

Owing to this arrangement it is possible by varying the pressure of the compressed air inwardly of the pad, to modify the relative angular position of the armatures 25—28 and thus to obtain a more or less accentuated slope of the active front face of the wall 27 of the pad forming per se a nondeformable plane acting on the belly of the patient in order to act upon the ptose.

In order to soften the contact of the pad with the belly of the patient as much as possible, a cushion 30 which may be, for instance, a pneumatic cushion optionally having a special inflation tube 46 will be arranged about the lower edge of the front armature 28. This pneumatic cushion may be replaced also by a padding of felt or other suitable material.

The application of the pad against the belly of the patient is effected by means of a single strap 26 which passes between the back face of the front wall 38 of the belt (see Figure 9) and the pad 23 and through the said front wall at the points 31 and 32 as shown in Figure 10, the said strap 26 then passing through buckles 33, 34 provided at the ends of the flexible but preferably non-elastic lugs 35, 36 in order to be hooked with their eyelets 37 on suitable securing hooks. Thus a kind of tilting movement of the pad is obtained, the latter being applied against the belly of the patient, and the more pronounced the tilting movement becomes, the more the front part of the sheath tends to move outwardly away from the abdomen.

Owing to this arrangement, it is thus possible to graduate and to determine exactly the action which the belt is to exert by obtaining the most favorable slope of the front part 27 for the result which is desired and by adjusting the pressure exerted by the pressure strap 26.

The sheath or belt 1 or 39 will be made preferably of an elastic fabric the elasticity of which is suitably different from that of the strap 11 or 26. The strap 11 or 26 will have preferably an elasticity which is less accentuated than that of the sheath or belt, so as to permit the pad to be maintained in a favorable position regardless of the position of the body of the patient, the pad being preferably secured on the sheath by elastic fastenings such as strips of rubber or elastic fabric.

The return buckles 33 used for securing the fastening of the strap 26 may have any desired form, preferably a trapezoidal form, the said strap 26 optionally taking the form of a band along its whole length.

The pad 23 can be formed of any suitable material and the pneumatic pressure may be replaced, for instance, by the pressure of springs

of suitably balanced or different resiliency and spaced between the plates or armatures 25, 28. It would be also possible, by using the pneumatic pressure, to arrange between the said plates elastic or non-elastic bonds such as rubber or fabric or even leather strips for adjusting the limit spacing between the said plates at their respective securing point.

It would be also possible, as shown in Figure 16, to form the pad of a number of independent chambers such as 40, 41, 42 of suitable form or also to arrange a pneumatic chamber 43, as shown in Figures 17 and 18, between the edges of the walls 44 and 45 of the pad so as to obtain the sloping position which is the most favourable for the active portion of the pad.

Instead of compressed air the pad could contain a soft body having for instance a melting point near the normal temperature of the human body so as to form a pressure member having a relatively thicker portion of small hardness easily fitting the surfaces which it engages with its portion which rests on the belly of the patient, the fluidity and consequently the deformability of the said substance decreasing towards the wall which rests on the sheath. Obviously, the radiation of heat from the outside of said soft body tends to cool and congeal it to form an outer harder shell.

The said pad could be filled, for instance, with an animal, vegetal or even mineral fat or with a mixture of such fats or any other substances fulfilling the required conditions.

In order to reduce the trouble imposed on the patient by the engagement of the lower edge of the pad, this lower edge could be made flexible, for instance by giving to the armature arranged in the face which engages the belly of the patient a thickness which diminishes towards its lower part, or by forming this plate of a plurality of laminations which give the same the appearance of a multiple leaf spring, thus obtaining a firmness or rigidity which decreases towards the lower edge of the armature plate.

It would be also possible to obtain a suitable flexibility of the lower edge of the plate by serrating this lower edge.

Lastly the armature plate could be replaced by a frame of suitable rigidity on which elastic strings or bonds may be stretched and which increase in size downwardly.

The sheath 1 or 39 can be made of any suitable material, preferably of rubber impregnated fabric, the dimensions of the various parts being, of course, suitably chosen for each particular case.

The invention is adapted for making orthopedic belts of every kind and more particularly those used for the treatment of gastric ptoses.

Manifestly, variations may be resorted to and parts used without others within the scope of the appended claims.

Having now fully disclosed my invention, I claim:

1. In an orthopedic belt for the treatment of gastric ptosis having a conformable enveloping sheath for the body forming a support and means for retaining said sheath in position upon the body, the combination of a reducing device comprising a pad and having the shape of a rigid wedge movably secured to said sheath and capable of assuming variously inclined positions independently of said sheath, including two pivoting plates forming a dihedral angle between them, and resilient means located between said plates serving to determine the amplitude of said angle and the inclination of the wedge formed by the pad.

2. In an orthopedic belt for the treatment of gastric ptosis having a conformable enveloping sheath for the body forming a support and means for retaining said sheath in position upon the body, the combination of a reducing device comprising a pad and having the shape of a rigid wedge movably secured to said sheath so as to be partly independent of said belt, and individual securing means forming a tightening system exerting a direct pressure upon said body independently of the belt and the pressure thereof on the body, said securing means comprising an independent strap forming into two resilient arcs which are fulcrumed at their ends at two fixed portions of the belt, one of said arcs being external to the belt and the other arc being interiorly disposed to the first arc and interiorly disposed of the belt along the major portion of its length while being independent of said belt and in a position directly acting upon the pad.

3. In an orthopedic belt, a pad having the shape of a wedge, two pivoting rigid plates forming a dihedral angle and constituting the faces of said pad, resilient means for regulating the amplitude of said dihedral angle, and means for keeping said pad applied to the stomach of a patient.

4. In an orthopedic belt, a pad having the shape of a wedge, two pivoting rigid plates forming a dihedral angle and constituting the faces of said pad, resilient means for regulating the amplitude of said dihedral angle, two resilient arcuate bands constituting an independent tightening and keeping strap for said pad, said bands being fulcrumed at their ends on two fixed parts of said belt, one of said arcuate bands being located outside of said belt, and the other arcuate band being located inside of said first mentioned arcuate band and inside of the belt along the major portion of its length, said arcuate bands being thus in a position to directly act upon said pad, independently of said belt.

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