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**RIB BELT**

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9 Claims. (Cl. 128-167)

This invention relates to an improvement in rib belts and deals particularly with a belt designed to encircle the body just beneath the arms to hold the ribs in proper relation after one or more ribs have been broken or the rib muscles strained.

The breaking of ribs or, and straining of rib muscles are relatively commonplace accidents. Under usual circumstances the ribs will heal and the muscles will heal properly if they are held in the proper position over a period of time. In the past it has been usual practice for the doctor treating a patient with broken ribs to apply adhesive tape over the rib area to hold the ribs in a set position during the healing operation. This adhesive tape often causes severe skin irritation and in some instances the irritation caused by the tape is more painful to the patient than the broken rib or strained muscle.

A feature of the present invention lies in the provision of a belt which is particularly designed to encircle the chest. Means are provided for tightening this belt so that the ribs will be held in proper position during healing. The belt is mainly constructed of a fabric which will not irritate the skin even though the belt remains in place for a period of several days.

A feature of the present invention resides in the provision of a belt of the type described having a resilient insert therein. This insert normally extends from top to bottom of the belt in substantial alignment therewith or intermediate the ends thereof and in the portion of the belt designed to overlie the back of the patient. This resilient insert is designed to permit the belt to snugly fit about the chest and definitely prevents the bunching or bulging of the belt. When this resilient insert is not present it is virtually impossible to secure the belt in such a manner that it will remain flat against the body while being worn. The normal taper of the body makes it virtually impossible to draw the belt properly about the body even though vertically spaced tightening elements are provided. However, by providing the resilient insert in the belt at the point described the upper portion of the belt may expand more than the lower portion so that the belt will fit properly regardless of the degree of taper of this portion of the body.

A further feature of the present invention resides in the provision of a belt of the type described having a pair of straps secured to the belt on opposite sides of the resilient insert. These belts are supported to cross upon the back of the wearer and to extend over the shoulders, the ends of the belt being secured through the front portion of the belt on opposite sides of the belt tightening. By mounting the supporting straps in this position the straps tend to contract the resilient portion of the belt.

A further feature of the present invention resides in the provision of a series of vertically spaced belt tightening elements which are located in the front of the belt by means of which the belt may be drawn tight about the body. These belt tightening means are located in such a manner that the belt can be easily tightened by the patient.

An added feature of the present invention lies in the provision of a belt designed to encircle the body and which may be provided with a cut away portion in the upper edge thereof to fit beneath the bust portion of a female body. The sides and the rear of the belt are of full height.

These and other objects and novel features will be more clearly and fully set forth in the following specification and claims.

10 In the drawings forming a part of the specification:

Figure 1 is a diagrammatic view of the belt in flat condition.

Figure 2 is a front elevational view of the belt encircling the chest of a male patient.

15 Figure 3 is a rear view of the belt applied to the body.

Figure 4 is a diagrammatic view of the belt as it is constructed to fit the female body.

20 Figure 5 is a front elevational view of the belt applied to a female body, the rear view of the belt being similar to Figure 3.

The belt A illustrated in Figures 1, 2, and 3, of the drawings is particularly designed to encircle the chest of a male. The belt includes two elongated strips 10 and 11, in the same plane of alignment, of suitable webbing or other fabric material. The material forming the portions 10 and 11 of the belt is relatively nonresilient but the material is soft and flexible so as not to irritate the portion of the body over which it extends.

25 A section of elastic or resilient material 12 is interposed substantially in the same plane of alignment between the adjacent ends of the strips 10 and 11 and is secured thereto by binding tapes such as 13 and 14. The elastic section 12 is in that portion of the belt A which is designed to overlie the back of the body.

30 A series of short fabric straps 15 are secured to the belt section 10 at a point spaced from the end 16 thereof. Straps 15 are shown connected to the belt section 10 by rows of stitching 17. The ends of the straps 15 most remote from the end 16 of the belt section 10 are anchored to the belt section by a tape strip 19 which extends transversely of the portion 10 or vertically on the belt A.

35 Each of the straps 17 supports a buckle element 20. These buckle elements may be of any suitable type and are designed to engage a corresponding strap on the other end of the belt and to hold it in adjusted position.

40 A series of straps 21 are secured to the forward or free end portion of belt section 11 at a point in spaced relation to the end 22 of the belt. Rectangular areas of stitching 23 anchor the straps 21 to the belt section 11. The straps 21 extend substantially beyond the end 22 of the belt so as to overlap the other end of the belt in actual operation.

45 By having the straps 15 and 21 anchored to the belt at points spaced from the ends of the belt, it is possible to have the belt entirely encircle the body so that the ends 16 and 22 are in overlapping relation. These belt ends are preferably provided with a binding tape to prevent the tape from fraying and to reinforce the same.

50 A shoulder strap 24 is secured to the belt portion 10 at a point adjacent to the tape strip 13 connecting the section 10 to the resilient center section. The strap 24 is anchored at 25 by stitching, or the like, closely adjacent to the upper edge 26 of the belt. The strap is anchored in such a way as to extend upwardly at an angle to the vertical as illustrated in Figure 1.

55 A second shoulder strap 27 is anchored to the upper edge of the belt section 11 adjoining the tape 14 which connects the section 11 to the elastic center section 12. This strap 27 is anchored at 29 and extends upwardly at an angle to the vertical so as to cross the strap 24,

This particular arrangement of cross straps is of particular advantage in the specific arrangement illustrated as the straps are anchored at opposite sides of the elastic portion 12 and as any stretching of the resilient center portion 12 tends to exert a pull upon the straps 24 and 27.

A short strap 30 is secured in substantially vertical relation upon the belt section 11. The strap 30 is anchored by stitching, or other suitable means, at its lower end 31. A buckle 32, or other suitable belt holding means, is freely supported upon the upper edge of the strap 30 so that this strap may be secured to the shoulder strap 24.

A second strap 33 is supported upon the belt section 10 and is anchored at its lower end as indicated at 34. The strap 33 supports at its upper end a buckle 35 of any suitable type to engage and hold the shoulder strap 27.

In use the belt is worn as illustrated in Figures 2 and 3 of the drawings. The body of the belt is placed to encircle the chest just beneath the arms and the belt is then tightened by engaging the series of straps 21 in the buckles 20 supported by the straps 15. These belts 21 may be drawn up to apply the necessary tension against the body to hold the ribs and rib muscles in their proper place. As the straps 21 are tightened the elastic center portion stretches somewhat to cause the belt to conform with the shape of the body. Under usual circumstances the upper portion of the belt will have to expand more than the lower portion thereof and as a result the belt is of greater circumference at the top than at the bottom after it has been tightened.

The shoulder straps 24 and 27 are next placed over the shoulders and are secured to the cooperable buckles 32 and 35 so as to prevent the belt from moving downwardly. The straps thus prevent the belt from slipping down as the belt would otherwise tend to do when encircling a body which is smaller around the waistline than around the chest.

When the belt is positioned as described the elastic portion 12 will permit the belt to expand and contract to some extent but will resist expansion. Any expansion of the elastic section 12 of the belt exerts a pull upon the shoulder straps 24 and 27 and accordingly holding the belt from sliding downwardly. In practice it has been found that the elastic center section thereby places some slight tension upon the shoulder straps, this tension being insufficient to irritate the skin or to cause discomfort.

In Figures 4 and 5 of the drawings I disclose a modified form of belt B which is designed to fit about the female figure. In general the belt B is similar to the belt A but the forward portion of the belt is cut down somewhat to fit beneath the busts of the female figure.

The belt B includes a belt section 36 and a belt section 37 in the same plane of alignment and which are formed of webbing, belting, or other fabric material, which is soft and flexible but is relatively inelastic. A central connecting portion 39 in alignment with the belt sections 36 and 37 is provided at the center of the belt which is formed of elastic or resilient fabric or other elastic material. The elastic section 39 is connected to the belt section 36 by suitable tapes 40 and is connected to the belt section 37 by similar tapes 41.

The end portions of the belt sections 36 and 37 which are most remote from one another in flat condition of the belt are provided with notches 42 and 43 which cut down the belt to approximately one-half its normal height. The notches 42 and 43 are defined by a substantially S-shaped curve, the center portion of which extends horizontally approximately midway between the upper and lower edges of the belt sections 36 and 37.

A pair of short straps 44 are secured in horizontal parallel relation to the belt section 10 at a point spaced from the end thereof by means of an anchoring tape 45. The belts 44 support buckles 46 which are designed to

engage and hold a cooperable strap at the other end of the belt.

A pair of strips of fabric tape or other suitable material forming belt end 47 are anchored at their one end to the belt section 37 at a point spaced from the forward portion or free end of the belt section 37. These belts 47 are designed for engagement into the buckles 46, at the forward portion or free end of belt section 36, so as to tighten the belt about the chest portion of the body as is best illustrated in Figure 5 of the drawings.

A shoulder strap 49 is anchored to the belt portion 36 near the central elastic section 39 of the belt. The strap 49 is so secured as to extend upwardly diagonally across the center of the back. A similar shoulder strap 50 is anchored at its lower end to the belt section 37 and extends upwardly in a diagonal direction to cross the strap 39. The straps 49 and 50 are designed to extend over the shoulders of the wearer.

As also indicated in Figure 4 of the drawings a pair of short straps 51 and 52 are anchored to the belt sections 37 and 36 respectively near the notches 43 and 42 therein. The strap 51 is designed to engage the end of the shoulder strap 49 and is provided with a buckle 53 at its upper end for this purpose. The strap 52 is provided with a similar buckle 54 to engage the shoulder strap 50 and to hold the belt at a proper elevation.

We have found that the rib belts are extremely affective for their purpose, holding the ribs and rib muscles in proper position so that they can mend. The belt also fits snugly against the body and is held from wrinkling by the elastic insert portion in the back of the belt. The shoulder straps fasten in the manner described and have an unusual effect, the stretching of the elastic portion also tending to tighten these belts and to exert a pull thereupon.

In accordance with the patent statutes I have described the principles of construction and operation of my rib belt and while I have endeavored to set forth the best embodiment thereof I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A completely flexible rib belt for broken ribs and strained muscles designed to encircle the body just beneath the arms in the rib area including in combination a pair of relatively non-resilient sections, a resilient belt section interposed between said relatively non-resilient belt sections and securing the non-resilient sections together in the same plane of alignment, adjustable means at opposite ends of the belt for tightening the belt about the body of the wearer, crossed shoulder strap means connected to said non-resilient belt sections, and buckle means secured to said non-resilient belt sections adjacent the said adjustable means at opposite ends of the belt for adjustably securing the opposite ends of said crossed shoulder strap means and hold the rib belt in the rib area just beneath the arms.

2. A flexible rib belt for broken ribs and strained muscles designed to encircle the body just beneath the arms in the rib area including in combination a pair of relatively non-resilient sections, a resilient belt section interposed between said relatively non-resilient sections and connecting the same in substantially the same plane of alignment, a series of vertically spaced belt tightening means secured to the ends of the relatively non-resilient sections for tightening the belt in body encircling position just beneath the arms in the rib area, and crossed shoulder strap means adjustably attachable to the ends of the relatively non-resilient sections for holding the rib belt in the rib area just beneath the arms.

3. A completely flexible rib belt for broken ribs and strained muscles designed to encircle the body just beneath the arms in the rib area including in combination a pair of relatively non-resilient sections, a resilient belt

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section interposed between said relatively non-resilient sections and connecting the same in substantially the same plane of alignment, adjustable shoulder straps secured to said relatively non-resilient sections closely adjacent said resilient belt section and designed to extend over the shoulders of the wearer, and a series of vertically spaced belt tightening means secured to the ends of the relatively non-resilient sections by means of which the belt may be tightened in body encircling position just beneath the arms in the rib area.

4. A completely flexible rib belt for broken ribs and strained muscles designed to encircle the body just beneath the arms in the rib area including in combination a pair of relatively non-resilient sections, a resilient belt section interposed between said relatively non-resilient sections and connecting the same in substantially the same plane of alignment, a series of vertically spaced belt tightening means secured to the ends of the relatively non-resilient sections by means of which the belt may be tightened in body encircling position just beneath the arms in the rib area, a pair of shoulder straps secured to the relatively non-resilient sections of the belt closely adjacent the resilient section, said straps being secured to extend upwardly in crossed relation from the back portion of the belt, and strap connecting means for securing said straps to the forward portion of the belt adjacent said series of vertically spaced belt tightening means.

5. A completely flexible rib belt for broken ribs and strained muscles designed to encircle the body just beneath the arms in the rib area including in combination a pair of elongated relatively nonresilient sections secured in substantial linear alignment, a relatively resilient section between said relatively nonresilient sections and secured at each end thereto, a series of vertically spaced straps secured to one end of the belt portion thus formed, a series of vertically spaced belt strap securing means secured near the other end of the portion of the belt thus formed, said vertically spaced straps and belt strap securing means being anchored to the forward ends of said relatively nonresilient sections at a point spaced from the extreme forward ends thereof, each end of said belt portions being provided with notches adapted to underlie the busts of a female figure, and shoulder strap means for holding the rib belt in the rib area just beneath the arms without binding a bust area.

6. A completely flexible rib belt for broken ribs and strained muscles designed to encircle the body just beneath the arms in the rib area including in combination a pair of elongated nonresilient belt sections in substantial linear alignment, a relatively resilient section be-

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tween said first named pair of belt sections and securing the same together, a series of vertically spaced straps secured to one of said relatively nonresilient sections at a point spaced from the end thereof and extending beyond the end thereof, a series of vertically spaced strap anchoring means secured to the other of said relatively non-resilient sections near the end thereof, and shoulder straps secured to said nonresilient sections closely adjacent to the connection thereof with the relatively resilient section, and fastening means for adjustably securing said straps to the forward portion of the belt.

7. The construction described in claim 6 and in which the shoulder straps are secured in upwardly inclined relation so that said straps will cross and support said belt sections at points closely adjacent said resilient section at each back end thereof and at points intermediate the edges of the belt sections at the forward ends thereof.

8. The construction described in claim 7 and in which the ends of the relatively nonresilient sections of the belt are notched along their upper edge so that the forward ends of the nonresilient sections are substantially narrower than the remainder of the belt.

9. A flexible rib belt for broken ribs and strained muscles being designed to encircle the body in close tight fitting relationship to the rib area just beneath the arms of a female figure, said belt comprising a pair of belt sections adapted to extend about each rib section of the body, each said belt section having free end sections which are most remote from one another and the center of the flexible rib belt, each end portion having notches which cut down the end portions of the belt to approximately one-half their normal height, strip means secured in parallel relationship at a point spaced from the free end portion of one belt end for fastening the one belt end portion to the other belt end portion, buckle means attached in parallel relationship at a point spaced from the free end portion of the other belt end for engagement with said strip means to secure the belt firmly about a female chest in close tight fitting relationship to the rib area just beneath the arms and the said notches fitting just beneath the busts of the female figure, and adjustable shoulder strap means for holding the rib belt closely beneath the arms without binding the bust area.

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