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PELVIC TRACTION BELT

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Fig. 1.

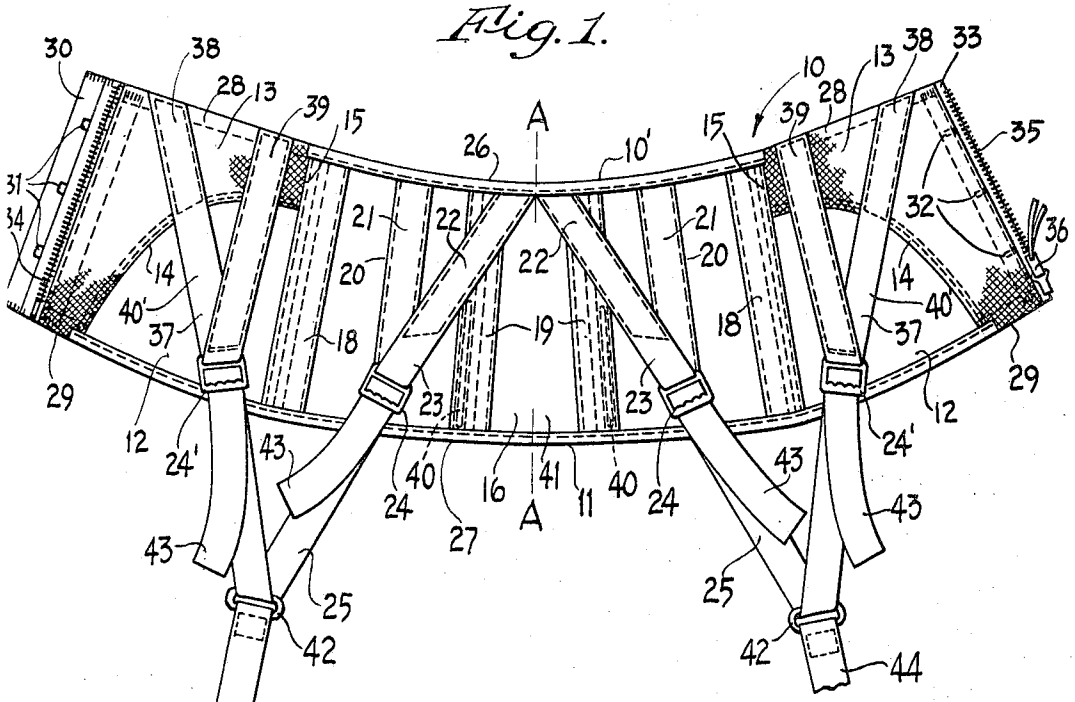
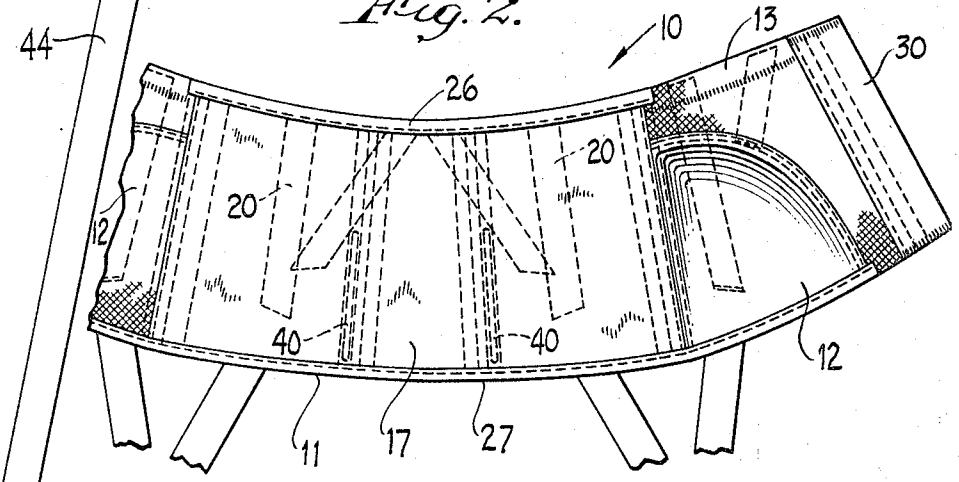


Fig. 2.



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PELVIC TRACTION BELT

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ABSTRACT OF THE DISCLOSURE

A pelvic traction belt consisting of a band of a length to completely encircle the waist of a patient and a width to extend downwardly over the pelvic crests including a central nonstretchable portion, stretchable end portions attached to the opposite ends of the central portion, and cupped segments essentially attached between said central portion and said end portions for effecting complementary mating engagement with the pelvic crests, a pair of spaced stays located centrally of said central portion for bracketing the spine and thus locating the spaced cupped segments over the pelvic crests, strap means for attachment to a traction device, tapes for securing the strap means to the belt, and fixed fastening means mounted on said opposite end portions for securing them to each other in position on the patient, said fastening means being unadjustable so as to cause the belt to always assume a given length except for the expansion permitted by the stretchable end portions.

The present invention relates to an improved pelvic traction belt for use on a patient having a lower back ailment who is to be placed in traction.

In my previous Patent No. 2,638,091 a basic form of pelvis traction belt is disclosed which includes a band which is adapted to be placed around the waist and over the crest of the pelvic bones and hips which is provided with extension straps adapted to be connected to a spreader and weights, so that a patient suffering from injury to the anatomical structures of the lower back and pelvis may be placed in traction, but otherwise will be free to move his limbs and body. The foregoing device included fastening means at the ends of the belt for joining these ends to each other after the belt was placed in position on a patient. However, these fastening means were in the nature of straps by which the patient could adjust the tightness with which the belt was applied. If a patient tightened the belt too much, he would be subjected to discomfort and unfavorable physical changes, such as edema, pressure necrosis, and so forth. If the belt was not tightened to a sufficient degree, it would not perform its intended function. It is with the providing of an improved traction belt which consists an improvement over the above mentioned previous belt that the present invention is concerned.

It is accordingly one object of the present invention to provide an improved pelvic traction belt which is extremely easy to install on a patient and which is automatically applied correctly, thus assuring its efficiency. It is a related object of the present invention to provide an improved pelvic traction belt which does not permit the patient, in applying the belt to his body, to exercise his judgment in violation to the principles of treatment capable of achievement by the belt.

Another object of the present invention is to provide an improved pelvic traction belt which will fit a patient with the required degree of tightness while continuously conforming to changes in his abdominal configurations. A related object is to provide an improved pelvic traction belt which can fit a plurality of different sized patients within a specified size range.

A further object of the present invention is to provide an improved traction belt which tends to insure proper centering of the belt on a patient for properly locating soft pliable cups or hoods over the crest of the pelvic bones to thereby insure optimum results from the traction by pull on the pelvic bones. A related object of the present invention is to provide an improved pelvic traction belt which, when properly located, cannot ride out of proper position on a patient as a result of the shifting of his position. Other objects and attendant advantages of the present invention will readily be perceived hereafter.

The improved pelvic traction belt of the present invention comprises a band adapted to encircle the waist of a patient and extend over his pelvic crests, lower abdomen and hips. Means are provided on first and second end portions of the band for securing them to each other and these means do not permit the effective length of the belt to be adjusted. Therefore, when a physician prescribes a belt of a certain size for a specific patient, this patient will not be able to adjust the belt to either produce attendant discomfort and complications, if it is drawn up too tightly, or render the belt ineffectual, in the event that it is not tightened enough. The belt can have fixed means, such as hooks or a slide fastener, for securing the first and second end portions to each other because it consists of a first length of nonstretchable material which forms a first portion of the band and stretchable material which forms a second portion of the band. The nonstretchable material preferably is the central portion of the band and extends around the lower back and over the hips of a patient. The stretchable material constitutes the first and second end portions of the belt which are fastened to each other and meet over the lower abdomen. The stretchable portions permit a belt of a given size to be used efficiently on patients having different abdominal configurations within a given waist size. In addition, there is sufficient yieldability in the stretchable portions to permit the belt to expand and contract to thereby adjust to the varying contour of a patient's abdomen as it changes within given limits. However, the stretchable material constitutes a sufficiently small portion of the entire length of the band so that the belt remains relatively firm about a patient's hips and lower back, thereby insuring the firmness of fit. The belt includes spaced segments, which are preferably cupped, which overlie the crests of the pelvis to thereby insure good traction to be exerted through the pelvic bones when weights are applied. The cupped segments are of pliable material which provides hood-like areas which conform to the configuration of the brims of the pelvic bones. Preferably, the spaced segments are located at the junctions between the stretchable and nonstretchable portions of the belt. In addition, the belt includes spaced stays which bracket the spine to center the belt about the spine of the patient to thereby insure proper placement of the spaced segments over the crests of the pelvic bones and also prevent the belt from curling up underneath the patient. The stays also provide support to the lower back. The present invention will be more fully understood when the following portions of the specification are read in conjunction with the accompanying drawings wherein:

FIGURE 1 is a plan view of the outside of the belt, when the belt is laid flat on a planar surface and in addition to the belt itself shows the manner in which strips of webbing are attached to the belt which in turn are attached to weights or the like to provide the traction; and

FIGURE 2 is a fragmentary plan view of the inside of the belt primarily showing the manner in which stays are positioned for the purpose of centering the belt when it is in mounted position on a patient.

The improved traction belt **10** consists essentially of band **11** having curved upper and lower edges, and consisting of three portions, namely, a central portion **10'** flanked on its opposite ends by pliable cloth acting as cups or hoods **12** which receive the crest of the hips, and stretchable portions **13** which are attached to cups or segments **12** at seams **14** and are attached to central portion **10'** at seams **15**. In usage the band **11** is placed in encircling engagement about the waist of a patient with central portions **10'** proximate the lower back and cups **12** overlying the crests of his hip bones. Thereafter the ends of the band **11** are fastened to each other on the patient's abdomen in a manner which will become more apparent hereafter.

The central portion **10'** lying between seams **15** consists of a fine grade of cotton cloth, such as canvas, duck or the like **16** on the outside and flannel **17** on the inside (FIG. 2). Strips of nonstretchable fabric tape **18** are located at the ends of cloth **16** and suitable stitching designated by dotted lines (not numbered) attaches canvas **16**, flannel **17** and tapes **18**. Centrally located nonstretchable fabric tapes **19** are secured to canvas **16** and flannel **17** by suitable stitching designated by dotted lines (not numbered). In addition, nonstretchable fabric tapes **20** are provided which have first portions **21** thereof attached to canvas **16** and flannel **17** by stitching designated in dotted lines and second portions **22** thereof attached to canvas **16** in the same manner. Portions **21** and **22** lie at an angle, as shown, to distribute the pull along the length of the belt. The central portions **23** of tapes **20** are not attached to canvas **16** and thus form loops which mount buckles **24** which in turn mount first ends of straps **25** in an adjustable manner so as to permit these ends to be lengthened or shortened to fit any particular patient. The upper and lower edges of the central portion **10'** have tapes **26** and **27** sewn thereto for enclosing the edges of the various tapes **18**, **19** and **20** and the edges of canvas **16** and flannel **17**. Tapes **18** and **19** reinforce central portion **10'** against excessive stretching or yielding in a direction transverse to its length. Tapes **20** also perform this function in addition to acting as anchors for buckles **24**. Tapes **26** and **27** tend to prevent excessive stretching in a lateral direction in addition to covering the loose edges of the other tapes and of the canvas **16** and flannel **17**.

By way of explanation it is to be noted that all the dotted lines associated with tapes **18**, **19**, **20**, **26** and **27**, except as noted hereafter, designate stitching in FIGURE 1 and FIGURE 2. There are no dotted lines in FIGURE 2 which are used in the nature of invisible lines for designating the shape of the tape.

The right end of left cup **12** and the left end of right cup **12** are secured to central portion **10'** by sewing along tapes **18**. Lower tape **27** has portions which extend across the lower edges of cups **12**, as shown in FIGURE 1. Cups **12** have curved edges proximate stitching **14** which secure said cups to elastic portions **13**. In addition, as best shown in FIG. 2, cups or segments **12** are of slightly convex shape for good mating engagement with the crests of the pelvic bones. This configuration is achieved by suitable tailoring. Cups **12** are made of a suitable nonstretchable pliable conforming material which will give good cupping engagement with the crest of the hips. It will be appreciated that segments or cups **12** may be planar.

The stretchable portions **13** are preferably an open weave elastic which is stretchable. It is to be noted that the upper portions **28** are longer than the lower portions **29**. This permits much greater stretching of the portion of the belt which fits around the waist of a patient, to thereby permit ready conforming to this portion of the anatomy of a person on which it is mounted. A tape **30** is stitched to the left edge of left elastic **13** in FIGURE 1 and this tape serves a plurality of functions. Firstly, it prevents elastic **13**, where backed by the tape, from stretching in a top-to-bottom direction while not impairing the stretching of the elastic in a direction transverse thereto, that is, in a direction around the waist of the patient. In addition, it mounts eyes **31** which receive hooks **32** mounted on tape **33** sewn to the right edge of right elastic **13** in FIGURE 1. The hoops **32** are inserted into corresponding eyes **31** during mounting of band **11** on a patient, and thereafter slide fastener halves **34** and **35** which are mounted on tapes **30** and **33**, respectively, are joined by manipulating slide fastener runner **36** to thereby complete the mounting of the belt on a patient.

Nonstretchable fabric tapes or bands **37** are mounted on band **11** in the following manner: Ends **38** thereof are stitched to stretchable portions **13** by stitching which appears in dotted lines and is not numbered. This mode of attachment not only secures the ends of bands **37** to portions **13** but also reinforces the latter against stretching in a direction in which the tapes extend. Ends **39** are also secured to band **11** by stitching (not numbered) which attaches it to portions **13** and portions of cups **12**. This mode of attachment further reinforces the portions **13** against stretching in a direction in which the tapes extend and also reinforces cups **12**. Ends **38** and **39** lie at an angle to each other, as shown in FIG. 1, to distribute the pull along the length of the belt. Central portions **40'** of tapes **37** are not attached to cups **12** but form loops to permit shaping thereof to the contour of the crests of the pelvic bones. This tends to maintain pull on these crests while permitting good conforming action of the cups **12** thereto.

From the foregoing description it can readily be seen that the belt in essence consists of two halves which are mirror images of each other about line A—A, except for the tapes **30** and **33** and the hooks **32** and eyes **31** and except for the fact that the fastening element **36** is mounted on one of the slide fastener halves.

In order to facilitate proper centering of pelvic traction belt **10** on a patient, stays **40** are provided. The stays extend from lower tape **27** to approximately the point of intersection of the lower edges of tape portions **22** and tapes **19**. The stitching on tape portion **22** prevents stays **40** from moving upwardly. Stays **40** are housed within pockets provided by the tapes **19**, that is, by pockets provided by the stitching on opposite sides of stays **40**, this stitching appearing as dotted lines in FIGURES 1 and 2.

In use, the central portion **41** of central portion **10'** is placed in contiguous relationship to the spine of a patient with stays **40** on opposite sides thereof to provide a self-centering action. Stays **40** may be made out of metal, plastic or any other stiff but flexible material. In addition, the stays **40** will prevent the lower edge of the band from riding upwardly and curling underneath the patient.

Each size of the belt has a specific dimension for central portion **10'**, cups **12** and stretchable portions **13**. The size of the belt will be prescribed by a doctor for each particular patient and this size will be based on the circumference around a patient's hips. The stretchable portions **13** will yield to confrom to different abdominal contours of different patients and will also flex and yield as the patient moves to provide a maximum of comfort.

It will readily be appreciated that because of the foregoing construction, firm encircling engagement is provided by traction belt **10** with the patient's hips while permitting a required amount of yielding to insure a patient's comfort and to compensate for differences in abdominal contours of different patients having approximately the same waist size. Because of the fact that hooks **32** and eyes **31** are a fixed distance apart and because of the fact that the parts of slide fastener can only be joined in one position, the patient cannot exercise his own judgment as to the tightness or looseness of the belt and therefore cannot substitute his own judgment in violation of the principles of treatment prescribed by a physician. In other words, the belt can only assume one

size around the back of a patient and over the crests of his hips once it has been installed. It cannot be too tight and it cannot be too loose, provided of course that it has been fitted properly.

While only one row of hooks **32** and one row of eyes **31** have been shown, it will be appreciated that it is within the contemplation of the present invention to utilize a plurality of parallel rows of eyes and slide fasteners, if desired. When an alternate construction of this type is used, the patient would be instructed to insert the hooks into a specified row of eyes. It will readily be appreciated that the patient cannot substitute his judgment for that of the physician in determining the tightness of the belt because the fastening means, namely, the hooks and eyes on opposite ends of the belt, would meet in a predetermined position, depending on which row of eyes is used, and the tightness of the belt could not be adjusted by the patient, as was the case when straps of the type shown in my previous patent were used.

Metal D rings **42** are mounted on tapes **25** for sliding movement, with first ends **43** of tapes **25** being mounted on buckles **24'** which are in turn mounted on tapes **37**, and with second ends **43** of tapes **25** being mounted on buckles **24** which in turn are mounted on tapes **20**. Mounted on loops **42** are fabric straps **44** which extend toward and are received by a spreader bar, such as shown in my previous patent, the spreader bar being in turn attached to weights which are attached to the middle of the spreader bar by a cable which rides over a pulley. It will readily be appreciated that by adjusting the ends **43** of tapes **25**, the length of the central portion of tape **25** can be adjusted to fit different sizes of patients.

It thus can be seen that the improved pelvic traction belt of the previous invention is manifestly capable of achieving the above enumerated objects and while a preferred embodiment has been disclosed, it will be appreciated that it is not limited thereto but may be otherwise embodied within the scope of the following claims:

1. A pelvic traction belt comprising a fabric band having a top edge and a bottom edge and being of a length to completely encircle the waist of a patient and of a width to extend downwardly over his pelvic crests while encircling his waist, first and second end portions on said band, a nonstretchable material forming a first portion of the length of said band, stretchable material means forming a second portion of the length of said band, spaced segments on said band for overlying said pelvic crests and following the contour thereof to provide firm engagement therewith, fastening means mounted on said first and second end portions and adapted to be joined to fasten said first and second end portions to each other, strap means for attachment to traction means, means for securing said strap means to said band to apply traction to the pelvic area, said stretchable material means comprising said first and second end portions of said belt and said nonstretchable material comprising a central portion of said band between said first and second end portions and said spaced segments being located between said nonstretchable material and said stretchable material means at said first and second end positions so that said stretchable material means cause said spaced segments to be drawn against and follow the contour of said pelvic crests, said spaced segments being cupped for complementary mating engagement with the crests of the hips.

2. A pelvic traction belt comprising a fabric band having a top edge and a bottom edge and being of a length to completely encircle the waist of a patient and of a width to extend downwardly over his pelvic crests while encircling his waist, first and second end portions on said band, a nonstretchable material forming a first portion of the length of said band, stretchable material means forming a second portion of the length of said band, spaced segments on said band for overlying said pelvic crests and following the contour thereof to provide firm engagement therewith, fastening means mounted on said first and second end portions and adapted to be joined to fasten said first and second end portions to each other, strap means for attachment to traction means, means for securing said strap means to said band to apply traction to the pelvic area, said stretchable material means comprising said first and second end portions of said belt and said nonstretchable material comprising a central portion of said band between said first and second end portions and said spaced segments being located between said nonstretchable material and said stretchable material means at said first and second end portions so that said stretchable material means cause said spaced segments to be drawn against and follow the contour of said pelvic crests, said central portion including opposite ends each of which includes an upper portion proximate said top edge of said band and a lower portion proximate said bottom edge, said first and second end portions each having a lower part and an upper part with each of said upper parts being attached to an upper portion of said central portion, said spaced segments each having first and second edges with each of said first edges being secured to one of said lower portions of said central portion and each of said second edges being secured to one of said lower parts of said first and second end portions, said upper parts of said first and second end portions being of a longer length than said lower parts lengthwise of said band for good conforming action to the waist of the patient, said segments being of cupped shape for complementary mating engagement with the crests of the hips, said means for securing said strap means to said band comprising a pair of elongated tapes with each tape having a first length proximate said central portion and extending transversely to said band and being stitched proximate to both the upper part of an end portion and also being stitched to the segment adjacent thereto, each tape also including a second length which is stitched to the upper part of an end portion between said first length and said fastening means on the end portion on which said tape is stitched, and each of said elongated tapes including a center portion between said first and second lengths overlying a segment and being unattached to said segment with which it is associated so as to form a loop to permit shaping thereof to the contour of the crests of the pelvic bones so that said tapes may maintain a pull on the crests while permitting good conforming action of the cupped segments thereto.

3. A pelvic traction belt as set forth in claim **2** including spaced stays mounted on said central portion and extending transversely thereto for lying on opposite sides of the spine and immediately adjacent thereto to insure proper positioning of said spaced segments in overlying relationship to the pelvic crests.

4. A pelvic traction belt as set forth in claim **1** wherein said fastening means are non-adjustable so as to cause said band to assume a given length except for the elongation of the stretchable material means.

5. A pelvic traction belt as set forth in claim **3** wherein said fastening means are non-adjustable so as to cause said band to assume a given length except for the elongation of the stretchable material means.

6. A pelvic traction belt comprising a fabric band having a top edge and a bottom edge and being of a length to completely encircle the waist of a patient and of a width to extend downwardly over his pelvic crests while encircling his waist, first and second end portions on said band, a nonstretchable material forming a first portion of the length of said band, stretchable material means forming a second portion of the length of said band, spaced segments on said band for overlying said pelvic crests and following the contour thereof to provide firm engagement therewith, fastening means mounted on said first and second end portions and adapted to be joined to fasten said first and second end portions to each other, strap means for attachment to traction means, means for securing said strap means to said band to apply traction

to the pelvic area, said stretchable material means comprising said first and second end portions of said belt and said nonstretchable material comprising a central portion of said band between said first and second end portions and said spaced segments being located between said nonstretchable material and said stretchable material means at said first and second end portions so that said stretchable material means cause said spaced segments to be drawn against and follow the contour of said pelvic crests, said central portion including opposite ends each of which includes an upper portion proximate said top edge of said band and a lower portion proximate said bottom edge, said first and second end portions each having a lower part and an upper part with each of said upper parts being attached to an upper portion of said central portion, said spaced segments each having first and second edges with each of said first edges being secured to one of said lower portions of said central portion and each of said second edges being secured to one of said lower parts of said first and second end portions, said upper parts of said first and second end portions being of a longer length than said lower parts lengthwise of said band for good conforming action to the waist of the patient, said spaced segments being cupped for complementary mating engagement with the crests of said hips, and spaced stays mounted on said central portion and extending transversely thereto for lying on opposite sides of the spine and immediately adjacent thereto to insure proper positioning of said spaced segments in overlying relationship to the pelvic crests.

7. A pelvic traction belt comprising a fabric band having a top edge and a bottom edge and being of a length to completely encircle the waist of a patient and of a width to extend downwardly over his pelvic crests while encircling his waist, first and second end portions on said band, a nonstretchable material forming a first portion of the length of said band, stretchable material means forming a second portion of the length of said band, spaced segments on said band for overlying said pelvic crests and following the contour thereof to provide firm engagement therewith, fastening means mounted on said first and second end portions and adapted to be joined to fasten said first and second end portions to each other, strap means for attachment to traction means, means for securing said strap means to said band to apply traction to the pelvic area, said stretchable material means comprising said first and second end portions of said belt and said nonstretchable material comprising a central portion of said band between said first and second end portions and said spaced segments being located between said nonstretchable material and said stretchable material means at said first and second end portions so that said stretchable material means cause said spaced segments to be drawn against and follow the contour of said pelvic crests, said central portion including opposite ends each of which includes an upper portion proximate said top edge of said band and a lower portion proximate said bottom edge, said first and second end portions each having a lower part and an upper part with each of said upper parts being attached to an upper portion of said central portion, said spaced segments each having first and second edges with each of said first edges being secured to one of said lower portions of said central portion and each of said second edges being secured to one of said lower parts of said first and second end portions, said upper parts of said first and second end portions being of a longer length than said lower parts lengthwise of said band for good conforming action to the waist of the patient, said spaced segments being cupped for complementary mating engagement with the crests of the hips.

8. A pelvic traction belt as set forth in claim 7 wherein said second edges of said spaced segments are curved and wherein the attachment between said central portion and said end portions and said spaced segments is by stitching.

9. A pelvic traction belt comprising a fabric band having a top edge and a bottom edge and being of a length to completely encircle the waist of a patient and of a width to extend downwardly over his pelvic crests while encircling his waist, first and second end portions on said band, a nonstretchable material forming a first portion of the length of said band, stretchable material means forming a second portion of the length of said band, spaced segments on said band for overlying said pelvic crests and following the contour thereof to provide firm engagement therewith, fastening means mounted on said first and second end portions and adapted to be joined to fasten said first and second end portions to each other, strap means for attachment to traction means, means for securing said strap means to said band to apply traction to the pelvic area, said spaced segments being cupped for complementary mating engagement with the crests of the hips.

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