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[54] **ABDOMINAL MUSCULAR SUPPORTING GIRDLE**
9 Claims, 10 Drawing Figs.

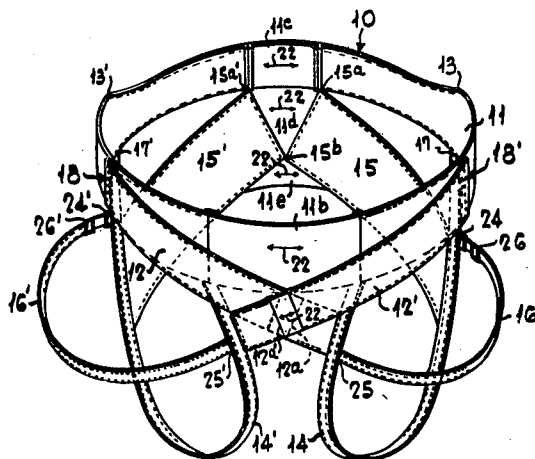
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ABSTRACT: A self-contained girdle for providing substantially parallel support for the external oblique, the internal oblique, and the transversalis muscles of the human body. Specifically, the girdle is characterized by a belt adapted to fit around and upon the wearer's hips, in combination with biased bands which follow the above-named muscles to form a snug cradle which supports the abdomen. The upward pull by the bands upon the abdomen at the fore portion of the belt is counteracted by a sidewise downward pull by other bands upon the gluteus maximus muscles at the aft portion of the belt.



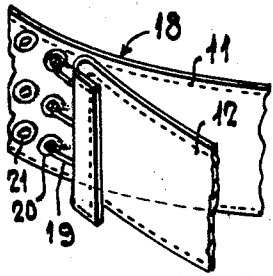


Fig. 2

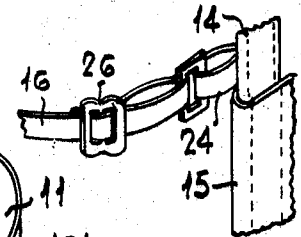


Fig. 3

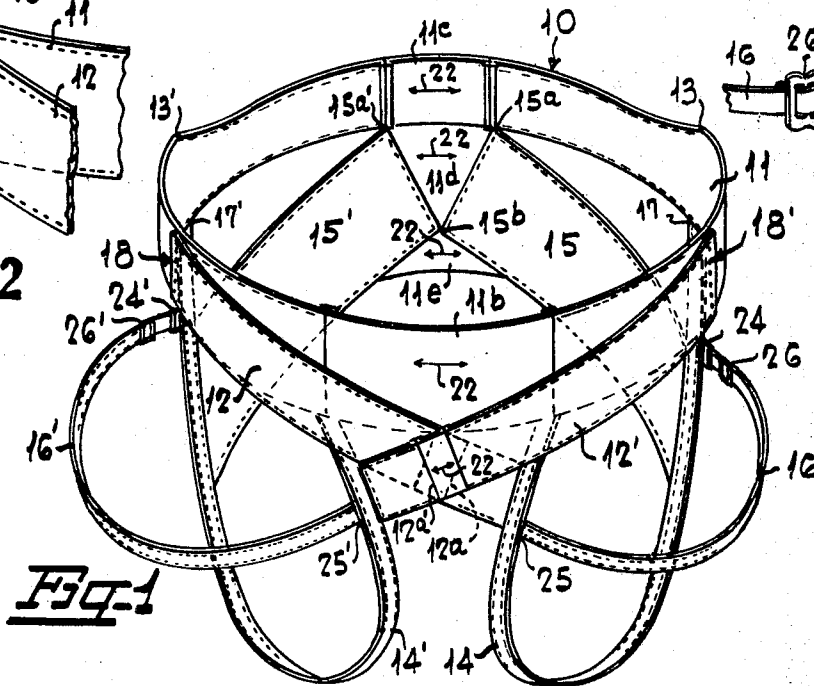


Fig. 1

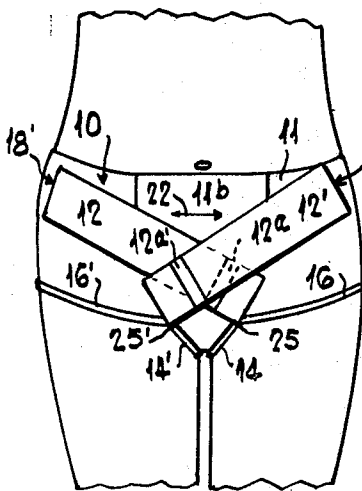


Fig. 5

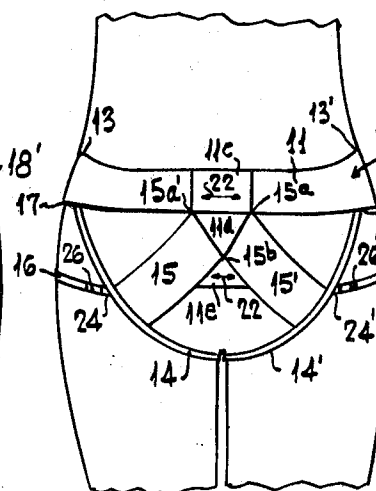


Fig. 6

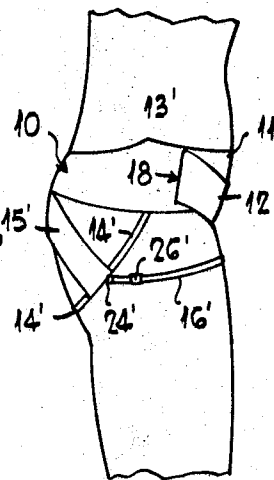


Fig. 7

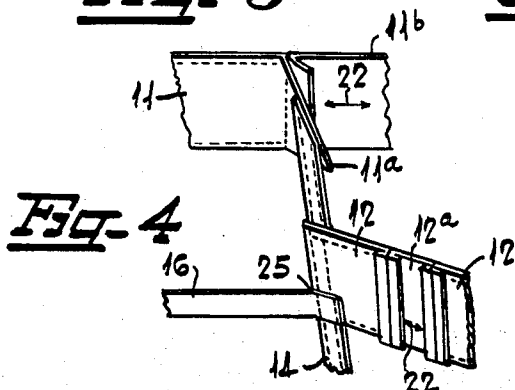
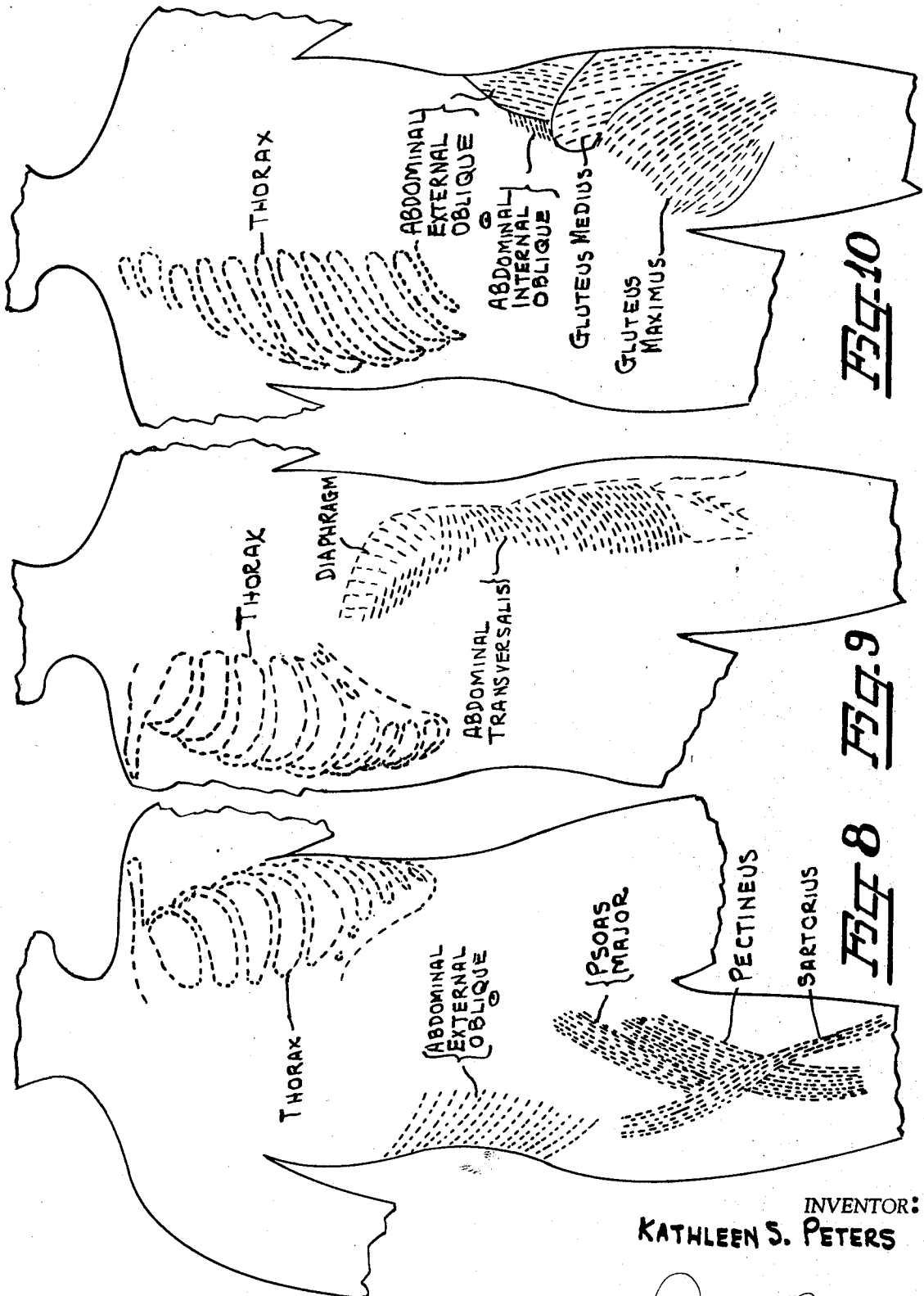


Fig. 4

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ABDOMINAL MUSCULAR SUPPORTING GIRDLE

This invention relates to undergarments and more especially to a girdle which provides substantially parallel support for the muscles of the abdomen and buttocks of the human body.

Many human figures are out of proportion, not because of over-weight as generally supposed, but due to a protruding abdomen which displaces the associated abdominal and buttock muscles. The girdle embodying the present invention restores the displaced muscles to bring about a slimmer flatter abdomen, a correct and comfortable posture, and a more attractive figure.

Conventional girdles are usually constructed primarily to impart a more graceful exterior appearance, but without due regard to the manner in which the body muscles may be constricted. Girdles according to the invention are self-contained and embody the principle of parallel muscular support. The girdle parts are arranged so as not to compress against the natural flow of muscular movement or to bind the extension of the psoas or pectineus muscles which flex and rotate the thigh outwardly. Furthermore, the girdle is especially useful for active men and women, and may be worn as an inconspicuous undergarment with bathing suits, shorts or slacks while the wearer is engaged in activities such as swimming, hiking, gardening and the like. The novel girdle construction alleviates empty feelings such as experienced by women after hysterectomies and child births, and helps to alleviate some of the discomfort during menstrual periods.

It is therefore an object of this invention to provide an abdominal support for the human body which, without pressure on the wearer's abdomen and buttocks, will improve the postural appearance by restoring and maintaining displaced abdominal and buttock muscles to correct positions.

It is another object of this invention to provide a girdle support of the type described which is capable of effecting substantially parallel support for the abdominal and buttock muscles while permitting perfect freedom of body movement and the performance of natural body functions.

It is yet another object of this invention to provide a girdle of the type described and which is self-contained and capable of rendering parallel muscle support independently of other apparel while functioning properly.

Some of the objects of invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which,-

FIGURE 1 is an isometric view of a girdle made according to my invention;

FIGURE 2 is an isometric detail view of a typical adjustable connection between the girdle belt and the abdomen supporting bands or straps;

FIGURE 3 is an isometric view of the adjustment means employed on each of the girdle leg straps;

FIGURE 4 is an isometric view showing a typical connection between the belt and groin loop straps, between the abdomen supporting bands and the loop straps, and between the side leg straps and the loop strap;

FIGURE 5 is a front view of the girdle on the wearer;

FIGURE 6 is a rear view of the girdle on the wearer;

FIGURE 7 is a side view of **FIGURE 6**;

FIGURE 8 is a diagrammatic front view of the human body showing the location of certain external muscles supported by the girdle;

FIGURE 9 is a diagrammatic rear view of **FIGURE 8** showing the location of certain internal body muscles supported by the girdle, and

FIGURE 10 is a view similar to **FIGURE 9** showing the location of other external body muscles supported by the girdle.

Referring more specifically to the drawings, the numeral **10** broadly denotes a girdle comprising: a belt **11** which supports a pair of diagonal abdomen contact bands or straps **12**, **12'**, a pair of groin loop straps **14**, **14'**, a pair of diagonal buttock muscle contact bands or straps **15**, **15'**, and a pair of side leg straps **16**, **16'**.

The girdle construction which cooperates with one side of the wearer's body is opposite-hand to that which cooperates with the other side. Therefore, a set of reference numerals will be employed in connection with the description of one side of the girdle; and like reference numerals with prime notations added will be employed to designate the corresponding opposite-hand girdle parts which function in the same manner as the parts described. Stated differently, the parts **12**, **14**, **15** and **16** associated with one side of the girdle function in an identical manner to the corresponding opposite-hand parts **12'**, **14'**, **15'** and **16'** associated with the other side of the girdle.

Belt **11** is preferably made of relatively inelastic material. Woven fabric having the warp threads thereof arranged to withstand the principal tensile stresses has been found to be an especially suitable material. When worn, the belt **11** is brought around the upper portion of the hips just below the waistline and across the navel in front of the body (**FIGURE 5**). The upper back edge of the belt is notched or cut away between points **13** and **13'** to conform to the natural curvature of the back (**FIGURES 6** and **7**); and, when the belt is brought together in front, it will dip slightly relative to the navel.

To facilitate getting in and out of the girdle, suitable front and back elastic segments **11b** and **11c** respectively are provided in belt **11**, said segments being stretchable in the directions indicated by arrows **22**. Segments **11b** and **11c** do not compress the underlying muscles, but instead, lightly encase the flesh that has been pulled up from the abdomen by the diagonal crossed bands **12**, **12'** as later described.

At the junction of each end of segment **11b** with the adjacent inelastic portion of belt **11** a short extension **11a** is provided, said extensions **11a** having the front ends of groin loop straps **14** and **14'** respectively secured thereto. The straps **14** and **14'** are adapted to pass downwardly from the respective extensions **11a**, then rearwardly along the groins, and then upwardly and laterally outwardly to anchorage points **17** and **17'** on the back portion of belt **11**.

One end of diagonal band **12** is secured to groin strap **14** at a point immediately below extension **11a** (**FIGURE 4**), said band **12** including a short elastic segment **12a** which provides longitudinal elasticity and permits the band to contract with the body muscles when the body is prone thereby affording a smooth fit.

A connection **18** is provided for detachably and adjustably securing the upper end of abdomen supporting band **12** to the right fore portion of belt **11** (as it appears on the wearer in **FIGURES 5** and **7**). Connection **18** consists of a row of hooks **19** on the band and two rows of eyelets **20** and **21** in the belt **11**. By causing the hooks **19** to engage a selected row of eyelets, the tension in band **12** and its associated loop strap **14** may be varied to thereby adjust the lift effect by the band **12** upon the abdomen of the wearer. When only one diagonal band, such as indicated by reference numeral **12**, is secured in position as shown in **FIGURE 5**, parallel reinforcement or support will be supplied to the external oblique, internal oblique, and the transversalis abdominal muscles of the right side of the body (See **FIGURES 8-10**). In most cases, however, the diagonal abdomen supporting band **12** operates in conjunction with an opposite-hand diagonal abdomen supporting band **12'** which crosses band **12** and supports the corresponding muscles on the left side of the body in a similar manner.

The upward pull upon the abdominal muscles by band **12** at connection **18** with the fore portion of belt **11** is equalized by a counteracting downward pull at the aft portion of the belt and in a sidewise direction following the gluteus maximus muscles (**FIGURES 6** and **10**). This downward pull is effected by the band **15** which is connected to band **12** by groin loop strap **14**.

Unless the aft band **15** is employed as illustrated, a continued tension in the front band **12** will, in some instances, cause a strain on the end of the spine with a resulting back pain. The invention, however, contemplates the use of girdle **10** associated with or without band **15** as conditions require. The aft band **15**, when connected as shown, exerts the sidewise downward pull which counteracts the upward pull by

the fore band 12 upon the abdomen and thereby reinforces the gluteus maximus muscles.

One side of triangular elastic piece 11d coincides with and is secured to the bottom edge of elastic segment 11c, the two remaining sides of said piece 11d coinciding with and being secured to the respective proximate upper ends of bands 15 and 15'. At the upper vertices 15a and 15a' of piece 11a, the bands 15 and 15' are respectively connected to belt 11; and at the lower vertex 15b, the bands 15 and 15' are connected to one another. Thus the elastic pieces 11c and 11d, acting together, permit expansion of belt 11 and a concurrent spread between the proximate ends of bands 15, 15' in response to body stresses. The piece 11d does not create a pull against the muscles but conforms more to sitting position of the wearer. A second elastic piece 11e is secured to the adjacent lower edges of bands 15, 15' and serves to cause the bands to conform to the body when in standing position.

Where elastic pieces are employed in the girdle, the required directions of stretch are indicated by arrows 22, the girdle parts not so indicated are preferably made of relatively inelastic material.

Leg strap 16 has its back end connected as at 24 to both the groin loop strap 14 and the buttock band 15. The front end of strap 16 is secured to abdomen band 12 and to the front portion of strap 14 as at 25. A sliding clamp 26 is provided to adjust the length of strap 16.

When the previously described members 12, 14, 15 and 16 are employed in conjunction with opposite-hand members 12', 14', 15' and 16' in the manner shown in FIGURES 1 and 5, parallel support is imparted to the underlying muscles on both sides of the body as previously described. Although concurrent use of both sets of members offer a more balanced muscular support for the body under most conditions, the invention contemplates the use of one or both sets as conditions may require.

As sometimes referred to herein, the endless belt 11 is composed of a fore or abdomen segment extending approximately between connections 18 and 18', an aft or back segment extending approximately between connections 17 and 17', and two oppositely disposed hip segments forming the remaining length of the belt.

The location of certain body muscles reinforced by a girdle according to the invention is shown in FIGURES 8-10 and further demonstrate the purpose and utility of the construction. Each of these muscles function in a well-known manner. Briefly stated, the external oblique abdominal muscles compress the viscera and flex the thorax to aid in expulsive acts. The internal oblique abdominal muscles compress the abdomen, flex the thorax, and aid in expiration. The transversalis abdominal muscles compress the viscera and flex the thorax.

The viscera is any large interior organ in the four great body cavities, particularly the abdomen. The girdle does not inhibit the pectineus muscles, the latter muscles being located in the abdomen and extending downwardly into the legs as a means of rotating the outward thigh. While supporting the psoas major a certain amount, the girdle allows freedom of this muscle to flex and rotate the thigh outwardly, to flex the trunk on the pelvis, and to abduct and flex the lumbar spine.

In the drawings and specification a preferred form of the invention has been disclosed, and although specific terms are employed, these are used in a generic sense and not for purposes of limitation, the scope of invention being defined in the following claims:

I claim:

1. A self-contained girdle for supporting the abdominal muscles of the human body comprising:

a body-encircling belt for fitting around the abdomen and hips of the body, said belt having a front abdomen portion, a back portion opposite said front portion, and a pair of oppositely disposed hip-covering portions, a pair of loop straps each connected at one end to said front abdomen portion, the intermediate portions of said straps adapted to pass underneath the respective body groins, and abdomen supporting straps each having one end thereof connected to the fore portion of one of said loop straps, said abdomen straps extending diagonally upwardly across the front of the belt and secured at the opposite ends to the respective hip-covering portions of the belt.

2. A girdle as defined in Claim 1 and further comprising: means for adjusting the tension in said abdomen supporting strap.

3. A girdle as defined in Claim 1 and further comprising: a pair of buttock muscle straps each connected at one end to said back belt portion and at the other end to the rear portion of one of said loop straps, said muscle straps extending diagonally downwardly in opposite directions from their respective back belt portion connections to thereby cover the gluteus maximus body muscles.

4. A girdle as defined in Claim 3 and further comprising: a pair of transversely disposed side leg straps each connected at one end to one of said fore connections of the loop and abdomen support straps and at its other end to the rear portion of the last-named loop strap, and means for adjusting the length of said leg strap.

5. A girdle as defined in Claim 1 wherein said belt further comprises an elastic section in its fore intermediate portion and a second elastic section in its aft intermediate portion, the remaining portions of said belt being relatively inelastic longitudinally thereof.

6. A self-contained girdle for supporting the abdominal muscles of the human body comprising:

a body-encircling belt for fitting around the abdomen and hips of the body, said belt having a front abdomen portion, a back portion opposite said front portion, and a pair of oppositely disposed hip-covering portions, a pair of loop straps each connected at one end to one of said hip-covering portions and at the other end to said front abdomen portion, the intermediate portions of said straps adapted to pass underneath the respective body groins, and at least one abdomen supporting strap having one end thereof connected to the fore portion of one of said loop straps, said abdomen supporting strap extending diagonally upwardly across the front of the belt and secured at its opposite end to the other of said hip-covering portions of the belt.

7. A girdle as defined in Claim 6 and further comprising: means for adjusting the tension in said abdomen supporting strap.

8. A girdle as defined in Claim 6 and further comprising: a pair of transversely disposed side leg straps each connected at one end to one of said fore connections of the loop and abdomen support straps and at its other end to the rear portion of the last-named loop strap.

9. A girdle as defined in Claim 6 and further comprising: a pair of buttock muscle straps each connected at one end to said back belt portion and at the other end to the rear portion of one of said loop straps, said muscle straps extending diagonally downwardly in opposite directions from their respective back belt portion connections to thereby cover the gluteus maximus body muscles.