ABSTRACT: This invention teaches a simple one piece sanitary napkin support belt formed of elastomeric plastic film and useful for supporting a menstrual napkin in a functional position on a female torso. A single support belt can fit a majority of female torso sized with minimum mechanical adjustments. The belt is sufficiently low cost to be discarded after using for one menstrual period.
ONE PIECE SANITARY BELT

CROSS REFERENCES

This patent application relates to my copending application Ser. No. 720,502 teaching a sanitary belt, and to my copending applications Ser. Nos. 720,500 and 742,922 relating to sanitary napkins. Further, this application relates to my U.S. patent application, filed as of this filing date, for a Two Piece SANITARY BELT.

BACKGROUND OF THE INVENTION

Sanitary belts made of rubberized elastic webbing have been conventionally used for decades, to support menstrual napkins in the functional position on the female torso. The commercial sanitary belts are constructed with separate adjustable fasteners, so the belts are adjustable over a large range of torso sizes.

Before using the present commercial belt, each female must mechanically adjust the belt to her size. The belts are not extremely low in cost; hence, they are customarily bought separately from the napkins and reused by females for a large number of menstrual periods. For this reason, the female customarily keeps the belt in storage at home between menstrual periods, using it during her menstrual period.

Although menstrual napkins are widely sold at many types of retail stores and other outlets for quick demand, the lack of quick access to a sanitary napkin support belt at the required time can be very discomforting to the female. This invention teaches a very inexpensive sanitary belt which can be placed in each commercial retail package of sanitary napkins and sold as a part of the retail package.

SUMMARY OF THE INVENTION

This invention teaches an endless, circular, ribbed waist belt, to which a single napkin support strap is permanently bonded. The support strap is sealed normal to the waist belt, when the waist belt is in the normal functional position on the female torso. Thus, a one piece sanitary napkin support belt is provided.

The thin elastomeric film waist belt is reinforced with ribs disposed normal to the waist belt perimeter. The highly elastic, one piece, sanitary napkin support belt can be formed of a highly plasticized polyvinyl chloride composition. The waist belt can be stretched to fit a wide range of female hip and waist contour sizes, utilizing only one manufactured nominal perimeter.

Included in the objects of this invention are:

First, to provide an inexpensive and compact one piece menstrual napkin support belt having no separate mechanical adjustment or securing components.

Second, to provide a simple one piece menstrual napkin support belt, which will fit a wide range of female torso sizes without separate mechanical linkages or fasteners.

Third, to provide a low cost sanitary belt which can be enclosed in a commercial retail package of menstrual napkins, to be used with the napkins in the package and then discarded.

Fourth, to provide a one-piece, low cost, easily manufactured sanitary napkin support belt made of elastomeric plastic film having a very low modulus of elasticity in tension and a short elongation recovery time.

Other objects and advantages of this invention are taught in the following description and claims.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of the improvement in a menstrual sanitary napkin support belt.

FIG. 2 is an enlarged perspective view of the slit securing means disposed in the waist belt of the sanitary napkin support belt.

FIG. 3 is a plan view of an intermediate film flat component as fabricated, for the manufacture of an endless, circular, ribbed belt, having multiple, circumferential reinforcing rib arc lengths.

FIG. 4 is an elevational perspective view of an endless, circular, ribbed belt component which is an intermediate in the sanitary belt manufacture. It can typically be formed from the flat component of FIG. 3.

FIG. 5 is an elevational view of a female torso illustrating the application of the one piece sanitary napkin support belt of this invention, in functional position, supporting a menstrual napkin taught by the copending U.S. Pat. applications Ser. Nos. 720,500 and 744,922.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1 in detail, the menstrual sanitary napkin support belt 1 is shown in perspective elevational view. A thin film, elastomeric plastic, endless ribbed waist belt 2 is fabricated of a plastic composition having a short stress relaxation time. A long, narrow, thin elastomeric plastic, menstrual sanitary napkin support strap 3 is joined at a first terminus to the waist belt 2, forming the permanent bond means 4. The permanent bond means 43 disposed the support strap 3 normal or perpendicular to the waist belt 2. The free, second terminus 5 of the support strap 3 can be reinforced and rounded to facilitate insertion through the slit securing means 6, which is disposed in the waist belt 2 diametrically opposed to the permanent bond means 4. The slit securing means 6 is disposed in a specific waist belt minor arc reinforcing rib length 7, which is formed as a stiffener for waist belt 2.

All the multiple reinforcing ribs 8 are disposed at spaced intervals on the waist belt 2 perimeter, each providing a stiffening means for the multiple elastomeric thin film waist belt perimeter intervals 9. The ribs 8 stiffen the waist belt 2, preventing the belt width 10 from rolling or wrinkling into a round, tubelike or ropelike elastomeric band, on placing the belt 2 on the female torso.

In general, the greater number of multiple ribs 8 formed in the waist belt 2, the shorter belt perimeter length they are required to be. Thus, for example, 6 ribs of 1-inch belt perimeter length, 12 ribs of ¼-inch perimeter length, and 24 ribs of 1/16-inch perimeter length are typical. The perimeter of the rib length 7, which serves as a specific reinforcing rib, as well as a base component for the slit securing means 6, is typically ¼ inches. The ribs 8 can be spaced at belt intervals as required, to prevent rolling of the belt width 10 on wearing.

FIG. 2 illustrates in greater detail the waist belt minor arc rib length 7 in which the slit securing means 6 is disposed, parallel to the perimeter of belt 2. The slit opening 11 of the slit securing means 6 is connected to and terminated at both ends by the two stress relieving circular openings 12. Both the openings 11 and 12 penetrate through the rib 8. Typically, the opening 11 is one inch length. A conventional narrow oval-shaped slot opening can likewise form the slit securing means 6. The slit securing means 6 can be disposed at an angle other than parallel to the waist belt 2 perimeter, as shown in FIG. 2.

FIG. 3 illustrates one intermediate film flat component 30, useful in fabricating the waist belt 2, or the like. The intermediate film flat component 30 has a width 31 and a continuous length 32. The multiple reinforcement ribs 33, ultimately after fabrication equivalent to ribs 8 or the like, are disposed in parallel array in the flat film component 30. The thin film intervals 34 are spaced to provide thin elastomeric film which can elongate at least 180 percent in the component width 31. The specific rib 35 corresponds in function to the arc rib length 7 of belt 2. The thin film interval 36 corresponds in its width 37 to the width 38 of rib 35.

The width 37 of the thin film interval 36 is overlapped in parallel over the width 38 of rib 35, and sealed, to form the tubular film component 40 of FIG. 4, made from the component 30 of FIG. 3. The tubular film component 40 can also be formed by extruding the elastomeric composition through a die designed to form the multiple ribs 33' separated by the multiple thin film intervals 34', and the rib 35', corresponding to the arc rib length 7 of belt 2. A continuous length 32' of the tubular component 40 can be formed, by extrusion or sealing components together. By successively, repetitively cutting
component 40 at the dotted lines 39, 39', normal to the tubular form continuous length 32', belt components 41 can be formed, which can be simply fabricated into waist belts 2 and the like.

The component 30 can be formed by sealing ribs 33, and the like, to a thin film base, as by dielectric sealing. By this process, a more rigid plasticized polyvinyl chloride, thick film, composition (typically 0.105 - 0.300-inch thick), forming a rib predecessor 33, can be sealed to a highly elastomeric, soft thin film base (typically 0.002 - 0.004-inch thick), forming thin film intervals 34. When the tubular form component 40 is continuously extruded, a more elastomeric, softer, plasticized, polyvinyl chloride composition is necessary for the extruded component 40.

The napkin support strap 3, or the like, is permanently bonded to the waist belt component 41, or the like, by known methods such as thermal or dielectric heating, or by cementing. The slit securing means 6, or the like, is also formed in the waist belt component 41, or the like, by known processes.

The wide range of female body torso size which require a sanitary napkin support belt are typified by the dress size range of misses size 7 regular to women's size 42 regular, as listed by the Department of Commerce Standard in Report C5215-58 on female body measurements. Table I below lists the corresponding bust, waist and hip dimensions, as well as other data, for the standardized dress sizes 7 regular through 42 regular.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>7 regular</th>
<th>20 tall</th>
<th>30 regular</th>
<th>42 regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bust...</td>
<td>2915</td>
<td>40</td>
<td>30...</td>
<td>45</td>
</tr>
<tr>
<td>Waist...</td>
<td>271[5]</td>
<td>315</td>
<td>31...</td>
<td>38(5)</td>
</tr>
<tr>
<td>Hip...</td>
<td>42</td>
<td>44</td>
<td>40...</td>
<td>48</td>
</tr>
<tr>
<td>Crotch length...</td>
<td>25(5)</td>
<td>34</td>
<td>21...</td>
<td>35</td>
</tr>
<tr>
<td>Weight (lbs.)...</td>
<td>62[5]</td>
<td>70</td>
<td>65...</td>
<td>665(5)</td>
</tr>
</tbody>
</table>

It is very desirable for a single size sanitary napkin support belt 1, or the like, of this invention to be able to function properly over a reasonably large range of body sizes. Typically, a single sanitary support belt 1 can function over the range of body sizes corresponding to dress size 7 regular, through size 20 tall, to size 36 regular. A sanitary belt 1 can satisfy the waist belt size requirement with a fabricated waist belt perimeter of 26 inches, which can expand to 40 inches to fit over the torso of a size 20 tall or a size 36 regular dress wearer. A napkin support strap 3, having a length of 38 inches will properly function. Typically, the waist belt 2 can range in width 10 from 1/2 to 1/4 inches.

Referring to FIG. 5, a menstrual sanitary napkin 50, taught in my earlier copending patent applications Ser. Nos. 720,500 and 742,922, is shown secured in a functional frontal position on a female torso 51 by the menstrual support belt 52. The waist belt 53 is shown fitted on the torso 51 in a region between the waist and the hips. The napkin support strap 54 extends, as from the permanent bond means 4 or the like in FIG. 1 (not shown in FIG. 5) to the front of the female torso 51 through the female torso crotch. The strap 54 is threaded through two end slot openings 55 of the menstrual napkin 50. Only the front half of napkin 50 is shown, illustrating one oval end slot opening 45 through which the strap 54 is threaded. The support strap 54 is generally exteriorly adjacent the exterior face of the napkin 50, supporting napkin 50 in close proximity to the anterior surface of the vagina. The strap 54 is passed through the slot securing means 56, pulled into a comfortably tight position, and then wrapped several times around the waist belt 53. Thus, it becomes very difficult to accidentally lose a sanitary napkin while in use.

The menstrual napkins 1 and 52, or the like, have the marked advantage of no mechanical metal or plastic fasteners which must be adjusted to fit the belt to a female torso. These belts are particularly simple and easy to use, easily applied by the majority of women who have little interest in adjusting or using mechanical devices.

On the basis of the placement technique, the waist belt 53, or the like, must be stretched from the manufactured perimeter to larger than a hip or bust perimeter, as the belt is placed in position on the torso between the waist and hips. Then the belt 53 must quickly shrink back to a perimeter which snugly conforms to the chosen perimeter on the torso where the belt 53 is placed.

The specific properties of one suitable polyvinyl chloride composition containing 38 percent ester plasticizer is listed below in Table II.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stiffness (D1048) at 23°C, p.s.</td>
<td>550</td>
</tr>
<tr>
<td>Tensile strength (3980) transverse direction, min. p.s.</td>
<td>1,850</td>
</tr>
<tr>
<td>Ultimate elongation (D866) transverse direction, min. percent</td>
<td>180</td>
</tr>
<tr>
<td>Tensile temperature (D754) 50% extension, min. °F.</td>
<td>82</td>
</tr>
<tr>
<td>Durometer hardness (D668) Shore type A, 18 sec. reading, ave.</td>
<td>61</td>
</tr>
</tbody>
</table>

* The numbers are ASTM test procedures.

The plastic composition having these properties is particularly soft in feel, and elastic enough to form the waist belt and support strap of this invention. From the viewpoint of the users torso comfort it is very important that the above described composition has a short stress relaxation time at body temperature (98.6°F). Thus, the stretched plastic waist belt rapidly assumes a low tensile force after placement on a user's torso. The plastic softness greatly reduces the chafing potential of the napkin support strap in use.

Other waist strap and napkin support strap geometrical variations in dimension can be made without departing from the scope of this invention. Many modifications and variations of my improvements in a one piece sanitary napkin support belt can be made in light of my teachings. It is therefore understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

I claim:
1. A one piece sanitary napkin support belt comprising:
   a. an elastomeric plastic, endless, waist belt whose perimeter is adapted to female torso dimensions, said plastic having a low modulus of elasticity and a short stress elongation recovery time at 90 to 100°F, and said waist belt having a multiplicity of stiffening ribs disposed in said waist belt normal to said belt perimeter, each said rib disposed between a pair of thin film belt perimeter intervals,
   b. a slit securing means disposed in one stiffening rib,
   c. a narrow, long length, thin elastomeric plastic menstrual napkin support strap, having a length adapted to support said napkin in a functional position on a female torso and adapted to provide a first support strap termi which is mechanically securing said support strap in said slit securing means;
   d. a permanent bond means normally securing together a second termi of said support strap and said waist belt at a position directly opposed to said slit securing means.
2. The sanitary napkin support belt or claim 1 in which said belt comprises a plasticized polyvinyl chloride elastomeric composition having:
   a. a tensile strength of substantially 1800 psi,
   b. an ultimate elongation of substantially 180 percent, and
   c. a durometer hardness, Shore-type A, of substantially 65.