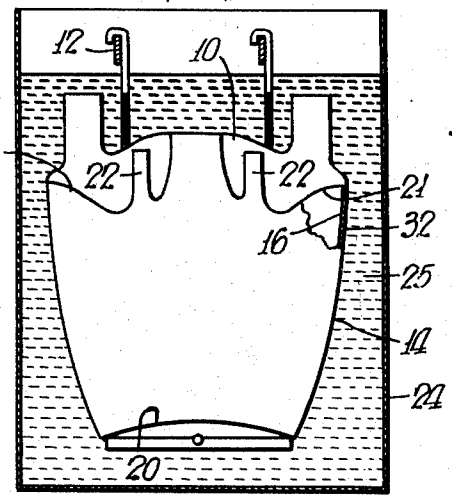
April 28, 1953 H. J. BARTH 2,636,173

LATEX GIRDLE WITH A LINING OF FIBERS

Filed May 12, 1951

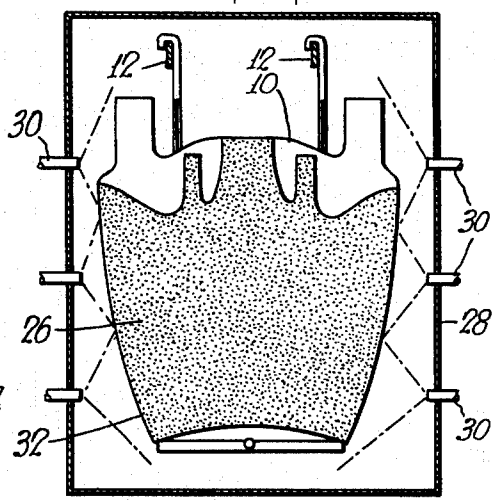
REVERSE FORMING

Fig. 1.



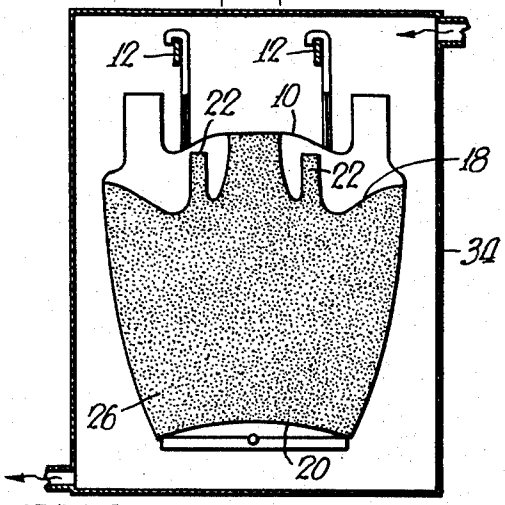
ADDING OUTSIDE LINING

Fig. 2.



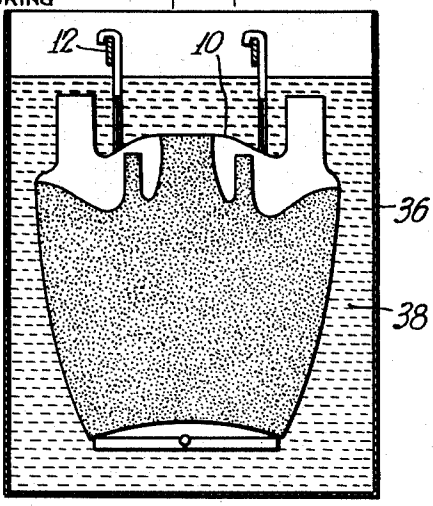
AIR DRYING

Fig. 3.



HOT WATER CURING

Fig. 4.



REVERSE SHAPING

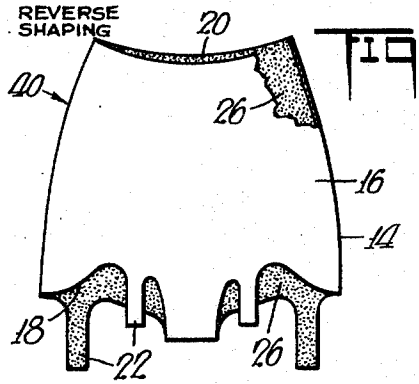


Fig. 5.

Fig. 6.

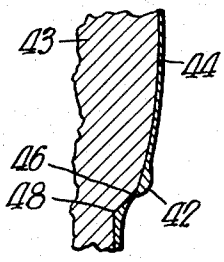
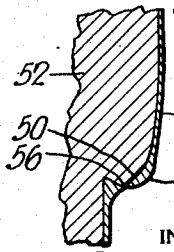


Fig. 7.



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LATEX GIRDLE WITH A LINING OF FIBERS

Harry Jacob Barth, Dover, Del., assignor to International Latex Corporation, a corporation of Delaware

Application May 12, 1951, Serial No. 226,081

2 Claims. (Cl. 2—37)

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My invention relates to girdles made from liquid latex.

Hitherto girdles have been made from liquid latex and many advantages have been obtained therefrom such as great elasticity and universal stretch, reduced thickness, ability to wash and dry more or less instantly, the freedom from staining, and the freedom from surface irregularities which permit closely fitted clothes to be worn without disfigurement. As a result, as of the present writing, girdles made from liquid latex are the most popular of all known types.

Girdles made from liquid latex can be further improved I have determined, if the girdle can be provided with a lining which will enable the latex surface to slide with greater facility over the skin. Such a lining will permit the evaporation of moisture if the body is perspiring, and the lined girdle would therefore be more comfortable to wear than a similar unlined product.

The accomplishment of the foregoing objects are the primary purpose of my invention.

Further objects are the provision of such a lining which will not irritate the skin, which will space the skin from the latex surface throughout the girdle; which will flex with the skin in substantially the same degree as the thin latex surface; which will not separate from the latex when stretched to the ultimate breaking point of the latex and which will not add to any extent, to the cost of the unlined latex girdle.

Prior methods of securing a lining of fibers to latex articles generally are of little value in forming such a lining on a girdle. If an interwoven fabric is to be employed it will be difficult to provide the universal stretch, or the degree of elasticity obtained from a latex formed girdle. The differential stretch between lining and girdle will deprive the latex girdle of some of its present elastic values. If a cement or adhesive is used the differential stretch between a girdle formed from liquid latex and the stretch possible with a cemented lining may cause the layer carrying the adhering fibers to crack and peel and allow particles of the cement to remain on the body when the girdle is removed. In addition when an elastic cement is used as the adhesive, the solvent which is necessarily contained therein may attack the latex girdle and cause it to swell unevenly, and also loosen on the dipping form.

The principal objection to employing adhesive coatings to the surfaces of the formed girdle is the failure of the adhesive to secure the individual fibers properly. In all my experiments with adhesives for cementing the fibers, it has been

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found that in nearly every subsequent use of the gridle, some of the fibers themselves are loosened and remain on the skin when the girdle is removed. I have discovered that this is particularly true of girdles made from liquid latex and subject to extensive stretching over moist skin.

Some prior art methods disclose the principle of applying the fiber particles directly to the dipping form, and adding the latex to the coated form. These methods are impractical particularly if it is desired to preserve the latex supply free of particles so that displaced fiber particles will not appear on the outside of the finished girdle and disfigure it.

Further objects of my invention are to secure a lining of fibers to a girdle made from liquid latex without the use of adhesive coatings; to secure such a lining by a method which does not bring the fibers into contact with the liquid latex supply; which permits all the attached fibers to be thoroughly embedded in the latex body of the girdle itself; which permits a denser coating of fibers to be obtained; and which is simple and less costly to apply than other known methods.

In the manufacture of girdles made from liquid latex with which I am here concerned, the inside of the formed girdle will appear as the outside of the finished girdle, as the finished girdle in my invention will be turned inside out.

This reversal in normal forming procedure requires a careful study of the surface configuration of the dipping form for all surface configurations must be reversed.

Further complications occur in the manufacture of girdles from liquid latex for it will be noted that upper and lower edges are required to be reinforced, a fact which distinguishes girdles from most articles made from liquid latex. Whereas most articles made from liquid latex require a single reinforcing edge which may be provided on the form by gravity, two separate and oppositely positioned reinforcing edges are required in a girdle, and they must be accounted for in any changes hereinvolved. I have found that forming the girdle in an inverted position, as well as an inside-out position will enable me to accomplish the purposes of my invention.

A further object of my invention therefore comprises the manufacture of a girdle made from liquid latex that can be reversably formed, and in an inversed position.

I accomplish these and other objects and obtain

new results as will be apparent from the device described in the following specification, particularly pointed out in the claims, and illustrated in the accompanying drawing, in which—

Fig. 1 illustrates my inverted and reversed girdle form being dipped into a supply of liquid latex to form the girdle shown partly in section;

Fig. 2 illustrates diagrammatically the form and girdle supported in a chamber containing apparatus for blowing the fibers onto the outside surface of the freshly dipped formed girdle;

Fig. 3 is a diagrammatical illustration of the form and girdle in a drying chamber;

Fig. 4 is a similar view but in a hot water curing vessel;

Fig. 5 illustrates the reverse shaping to produce the final girdle, shown partly in section;

Fig. 6 is an enlarged fragmentary sectional elevation view of a form and a latex girdle forming a reinforcing bead; and

Fig. 7 is a similar view of an improvement thereof.

In my process I provide a form **10**, supported on the rails **12** for making a dipped latex girdle **14** in an inverted and inside-out position. Thus the inside surface **16** of the dipped girdle becomes the outside surface of the final article by final reversing.

In the manufacture of a girdle made from liquid latex it will be noted that upper and lower openings defined by edges **18** and **20**, respectively, are required as distinguished from articles provided with a single opening. I am able by my invention to dip my article in an upside-down as well as inside-out position, to produce the special edge reinforcement as will be hereinafter described, which provides maximum protection at the waist opening **20** of the girdle, and which reinforcement may be formed at the bottom edge of the girdle as it is supported in an upside-down position. The depression on the mold **10** in which the girdle is formed is indicated by the numeral **21**.

The girdle straps **22** for supporting the hosiery are formed directly on the form, and the reinforcement provided at opening **18** continues around the perimeter of the straps.

The form is thoroughly cleaned before first using and is then dipped, as illustrated in Fig. 1, into a tank **24** of liquid latex compound **25** consisting of, as an example, 100 parts by weight of rubber as latex containing 2½ parts of zinc oxide, 2 parts of sulfur, 0.5 part of an organic accelerator, such as sodium dibutyl dithiocarbamate, the completed mixture containing 40% water.

For making the comminuted fiber lining **26**, I may employ cotton filaments of extremely short length of from ½ to 1½ millimeters. These cotton filaments are of small diameter and have great surface area as compared with their mass.

While the absorbency factor is not of great importance with viscous materials, such as are commonly employed for adhesives where the adhering surface contact is all that is substantially obtained, I am primarily concerned with embedding the ends of the cotton fibers directly into a liquid latex film containing a large proportion of water. The fibers, if made of cotton, upon contacting the surface of the liquid latex will instantly absorb large quantities of the moisture causing the liquid latex to become viscous at the surface. The subsequently impinging fibers do not penetrate the viscous surface and are less securely embedded. I have found that for thoroughly embedding all the cotton fibers that are possible it is therefore desirable to have a dipped liquid latex film of maximum thickness on the form. Thus more liquid is provided for maintaining the initial surface viscosity. This is an important factor in the use of absorbent fibers on liquid latex surfaces containing large amounts of water.

If as an example I may employ for a girdle, a film of liquid latex having a variable thickness, I prefer to use the maximum thickness practicable knowing that the degree of fiber embedment and density of secured fibers will be in proportion to the increased thickness, within the limits of the absorbency factor of the fibers.

This is in contrast to adhesives and cements where the viscosity of the adhering coating makes penetration of air borne filaments difficult, for then thickness is no factor since only a surface adhesion is obtained regardless of depth.

After the form has been dipped in the liquid latex compound to the desired thickness, the form is quickly moved into a closed chamber **28** where the cotton fiber filaments **26** are blown through spray nozzles **30** at about 30 lbs./sq. in. pressure against the wet surface **32** of the liquid latex covered form, or at a velocity sufficient to cause the particles to become suitably embedded therein, but at insufficient speed to cause any wave motion in the liquid latex surface. When the maximum number of fibers has been embedded into the wet latex, the form containing the dipped and fiber covered girdle is withdrawn, and placed in a drying chamber **34** through which heated air is circulated until the excess moisture has been removed from the latex. Drying at 150° F. for 30 minutes is sufficient.

Thereafter the coated forms are placed in a curing or vulcanizing bath **36** containing preferably water **38** at just below boiling temperature for 30 minutes or until the latex has been satisfactorily cured. The water will simultaneously wash the lined article free of all loose and soluble matter.

Thereafter such procedures as stripping and tumbling are employed, and any steps applied as are known in the art.

The girdle is finally turned inside-out, to the final shape **40**, as shown in Fig. 5, or to the reversed position from that produced on the dipping form as shown in Fig. 1, resulting in a girdle made from liquid latex with a thoroughly secured and dense inner lining of fibers.

In the manufacture of a girdle employing this invention, it should be noted that the beadings and edges employed for reinforcement of the girdle to prevent tearing when applied to the body, will be reversed if provided on the form. Thus the outwardly protruding reinforcing bead **42** of the type shown in Fig. 6 will be reversed in position in my process and will therefore project into the skin, when the article is reversed. The bead **42** of Fig. 6, as an example may be formed during the dipping process by holding the form **43** in the same position after removal from the supply of liquid latex, so that the force of gravity will permit a slight excess of the liquid latex **44** to accumulate at the edge **46** of the form. At this edge the form is set back slightly as at **48**. The surface tension of the accumulated liquid latex will cause the bead **42** to form, reinforcing the edge of the thin latex girdle and thus prevent tearing.

In carrying out my present invention which reverse-shapes the girdle such a bead would be caused to project into the skin. To prevent such

occurrence, I may obliquely cut back as at **50**, the former edge **46**, in the new type form **52** which may be shaped as shown in Fig. 7. The cut-back is for approximately the same distance as the bead formerly protruded, so that the effect is to form the new bead **54** below the cutback **50**. The former edge **46** is now replaced by the edge **56**. This construction will reverse the direction of protrusion in the latex **58**, with respect to the ultimate inner surface, or the outside of the girdle as formed.

The girdle is then reverse-shaped, and the new type reinforcing bead will extend away from the body and will not mark the skin.

An important manufacturing step in dipping simultaneously a plurality of forms is to cause the forms to be as close to each other as possible during dipping. This arrangement benefits production. However, the forms should be separated as far as feasible when the lining of fibers is applied in order to insure that the greatest number of fiber particles are applied, and said fibers applied as nearly normal to the surface of the liquid latex film as conditions permit.

Instead of short cotton fibers, other vegetable or animal fibers may be used. In addition synthetic fibers such as rayon, may be employed advantageously.

I have thus illustrated one method of producing a novel girdle with an inner lining of fibers which provides an air cushion between the latex formed girdle and the skin. On this air cushion the girdle can be easily slipped on and off the body whether the skin is dry or moist. The ease with which the girdle may be applied makes possible a girdle of reduced edge reinforcement and thickness. Some women like a girdle to be extremely tight to control fatty tissue making the movement of a tight girdle over loose flesh a hitherto hazardous task for a thin unlined latex formed girdle especially when applied by a woman having long finger nails. With my invention the difficulties and hazards have been eliminated.

The girdle when worn has unexpected advantages. The movement of the hips on the lining of fibers causes the air cushion to "breathe" and to expel the moisture evaporating from the body and the heat from the skin. A girdle lined with fibers thus becomes cooler to wear in summer, while the impermeable latex makes the girdle warm to the body in the winter.

The ease with which a latex girdle may be washed and dried is maintained as a practical matter. The exposed ends of the fibers having maximum surface exposure for their mass, easily dry out when the girdle lining is exposed by reversal.

The advantages of a girdle made from liquid latex have thus been retained while adding the advantages of an absorbent air cushion. Even the straps or garter sections are provided with a lining of fibers so that an unbroken area of contact of soft fiber with the skin is maintained.

The garter fastening elements, not shown, are added to the straps in a manner known to the art.

By reversing the manufacturing procedure of forming the girdle, I am thus able to form the

girdle with its inside surface on the outside, and secure a lining of fibers directly to and in the body wall by embedding portions of the fiber in the liquid latex surface of the girdle before it is dried on the form.

I have thus eliminated the shortcomings previously believed necessary, such as applying a separate adhesive or cement to the form and securing the fibers to the adhesive before dipping into the liquid latex bath. In my process the liquid latex bath is free of fiber particles which enables me to produce a final outside surface of smooth latex without evidence of the fiber particles. In addition, I eliminate the added step of applying adhesives which involves extra equipment and separate application and drying operations.

Finally by properly preparing the surface of the form, it is possible to produce articles which when turned inside out are completely ready for use and do not require added steps of applying reinforcement edges or layers and which possess the necessary external surface configurations required of the finished article. A considerable saving in manufacturing cost is thus effected.

I have thus described my invention, but I desire it to be understood that it is not confined to the particular forms or uses shown and described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of my invention, and, therefore, I claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, and by means of which, objects of my invention are attained and new results accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to attain these objects and accomplish these results.

I claim:

1. A formed elastic girdle made from liquid latex comprising an endless shaped band of vulcanized deposited latex for encircling the body, forming an upper waist opening and a leg opening, said girdle having on the inner surface thereof a lining of individual short fibers individually movable apart from each other with the band of vulcanized latex when it is stretched the remaining thickness of the deposited latex band being free of the fibers, the outside surface of the girdle having the surface replica of the form, on which it was made.

2. The latex girdle of claim 1, having an outwardly extending reinforcement formed on the outer replica surface and positioned on the upper edge of the band at the waist opening for reinforcing said edge.

HARRY JACOB BARTH.

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