

Jan. 11, 1966

J. J. BYRNE

3,228,401

FOUNDATION GARMENT WITH REINFORCED PANELS

Filed Sept. 10, 1963

2 Sheets-Sheet 1

FIG.1.

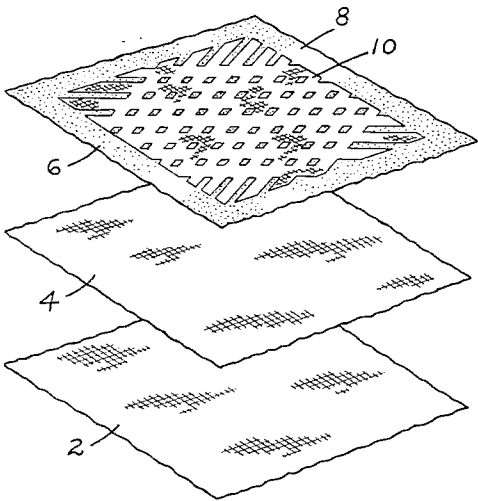


FIG.2.

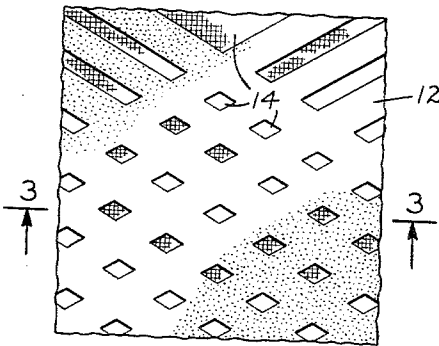


FIG.3.

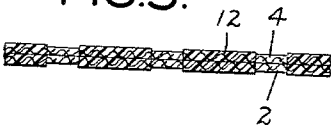
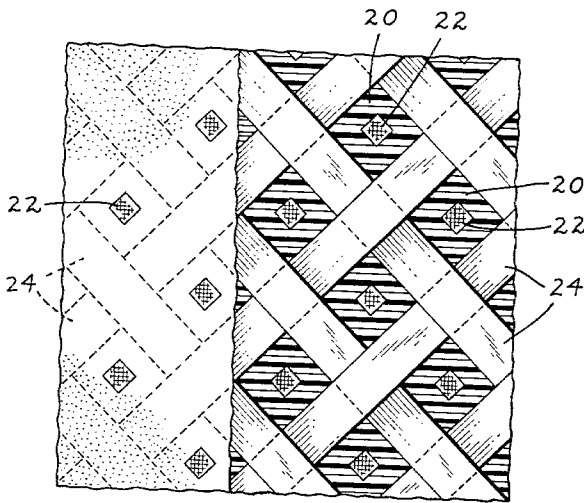


FIG.4.



Jan. 11, 1966

J. J. BYRNE

3,228,401

FOUNDATION GARMENT WITH REINFORCED PANELS

Filed Sept. 10, 1963

2 Sheets-Sheet 2

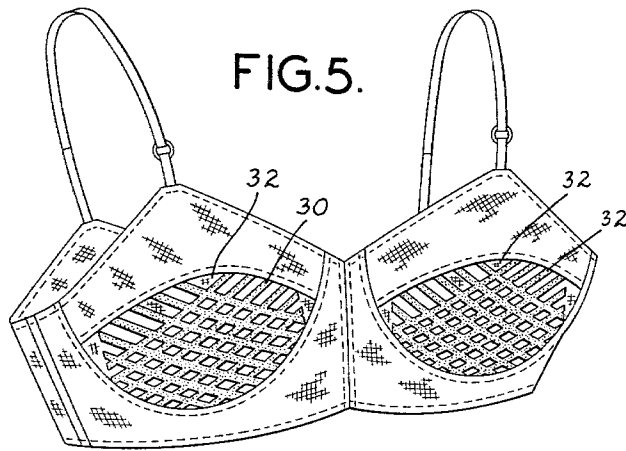
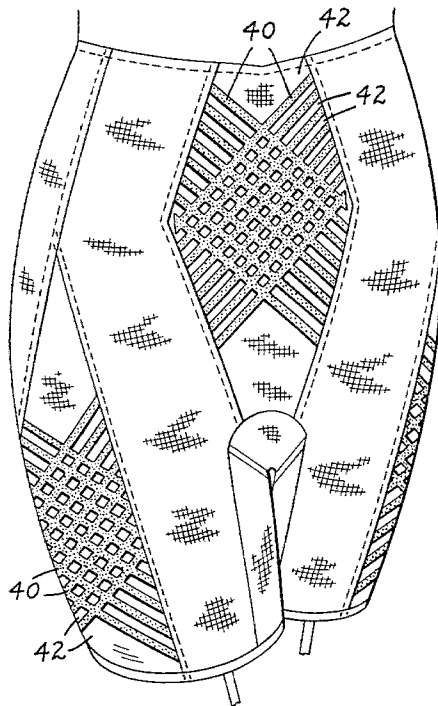


FIG. 6.



1

2

3,228,401

FOUNDATION GARMENT WITH REINFORCED PANELS

James J. Byrne, Easton, Conn., assignor to The Warner Brothers Company, Bridgeport, Conn., a corporation of Connecticut

Filed Sept. 10, 1963, Ser. No. 307,836

5 Claims. (Cl. 128—538)

This invention relates to methods of producing and reinforcing fabrics and, more particularly, to methods of producing and reinforcing fabrics for use in foundation garments, such as corsets, girdles and brassieres.

Many attempts have been made, heretofore, in the manufacture of foundation garments such as corsets, girdles and brassieres to provide a garment which is light in weight, comfortable for the wearer, does not show through outer garments and which, at the same time, provides support and restraint in the desired areas. Such attempts have included metal strips, multi-ply reinforcing panels, stitched ribs and various and sundry other reinforcing media. While these have all met with some degree of success they have increased the weight of the garment, resulted in seams and the like which tend to show through outer garments, reduced the comfort of the wearer or, in some other manner, detracted from the garment.

In many foundation garments it is desirable that the degree of support which the garment provides be varied in the various parts of the garment. For example, in a girdle it is often desirable that the portions covering the stomach, buttocks or hip areas have a greater degree of support than in the intermediate areas. Even within a portion, for example the stomach area, it is often desirable to vary the support within various parts of the area. One means heretofore employed to vary the support has been the use of superimposed panels. Thus, panels of reinforcing materials were superimposed and stitched onto areas to provide desired support. This practice increased the weight and thickness of the garment, resulted in seams that, in many instances, might be uncomfortable to the wearer and which, with sheerer types of outer garments, might appear through the sheer, tightly fitted outer garment. In addition, such reinforcing materials are often tightly woven and prevent the garment from breathing. Where, as is often the case, the tightly woven reinforcing material covered a relatively large area, the lack of breathing adds a further discomfort to the wearer.

It is an object of the present invention to provide an improved method and fabrics for reinforcing foundation garments.

It is a further object to provide such a method and fabric wherein the reinforcement can be provided at the particular point where required without sacrifice to other areas.

A still further object is to provide such a method and fabric which will not require seaming and stitching.

Still a further object is to provide a fabric in which reinforcement can be limited to those particular areas where reinforcement is desired without impairing the over-all breathing of the area.

These and other objects will be more apparent from the following description and attached drawings in which:

FIG. 1 is a perspective view showing the fabrics and the screen employed in the method of one embodiment of the invention, the screen and the fabrics being separated for purposes of illustration;

FIG. 2 is a top plan view illustrating one configuration of reinforcement according to the instant invention;

FIG. 3 is a sectional view through the reinforced fabric taken along line 3—9 of FIG. 2;

FIG. 4 is a top plan view, partly in section, illustrating a second reinforcement configuration according to the instant invention and showing a portion of one of the fabrics removed;

FIG. 5 is a perspective view of a brassiere showing reinforced panels of fabric of the invention; and

FIG. 6 is a perspective view showing a girdle with reinforced panels of the fabric.

In the following description, and for purposes of illustration, the invention is described in configuration with an open mesh, woven fabric. The fabric may be woven with elastic threads, inelastic threads or a combination of elastic and inelastic threads. It should, of course, be realized that the elasticity or stretchability of the fabric will, for a large part, depend upon the elasticity of the thread, the direction in which the threads in the fabric run, the particular fabric weave, and how tight the threads are woven. The instant invention is applicable to any type of woven or knitted fabrics for use in foundation garments where it is desired to selectively reinforce portions of the fabric area.

In the instant invention a plastic reinforcing material is applied, in a pattern, to the area of the fabric to be reinforced. Any plastic material which, with a solvent or heat, forms a flowable paste and which on removal of the solvent or cooling is flexible, dry and non-sticky, can be used for this purpose. Preferably, the plastic material and the solvent, where a solvent is employed, should be selected so as to avoid irritation to the skin of the wearer. The plastic and solvent selected must, of course, be compatible with the fabric.

The plastic material is first formed into a paste and the paste is applied, in a pattern, to the fabric. The fluid, plastic paste, is passed through the fabric between the threads within the pattern area and then dried or set. Thus within the area of the pattern, the fabric threads are imbedded in the plastic. Outside of the pattern area the threads are unaffected, and maintain their original woven or knitted relationship and properties.

The fluidity of the plastic paste can be varied in many known manners, for example by the amount of solvent, with plasticizers, by heat, or other well-known manners. In the practice of the instant invention it is preferred to regulate the fluidity so that the fluid plastic will flow through the material and imbed the threads but, at the same time, will not flow or spread to any substantial degree outside of the intended reinforcement pattern area.

The instant invention may be practiced with a single thickness fabric, multi-thickness fabrics, or may be employed to interconnect and join two or more superimposed fabrics. When used on a multi-thickness fabric or to join two or more fabrics, the fluidity of the plastic must be regulated to attain the desired penetration or flow of the plastic through the fabric plies.

Referring now to FIGS. 1 to 4, the method and reinforced fabric of the invention is shown and will be described in connection with a two-ply fabric. It is to be understood, however, that this is merely for the purpose of illustration. As will be obvious, by omitting one of the fabrics the illustration and description is applicable to a single fabric. Conversely, by adding additional fabrics to the illustration and description is applicable to more than two-ply.

In FIG. 1 there is shown a first fabric 2, a second fabric 4, and a screen 6. Screen 6 is of the type well-known in the reproducing art as a "silk screen" and has a relatively tightly woven and, for present purposes, impervious portion 8 and a relatively open area 10. Open area 10 is in the configuration of the desired reinforcing pattern.

In the practice of the invention, fabric 2 is placed on a relatively smooth, flat, impervious surface and fabric 4

is placed over fabric 2. The two fabrics may be superimposed, one over the other, with their threads aligned or intentionally misaligned depending on the over-all properties desired in the multi-ply fabric. With fabrics 2, 4 superimposed, screen 6 is placed over fabric 4, the under surface of screen 6 being in contact with the top surface of the fabric 4. A fluid plastic paste is then applied to the top of screen 6.

As has been noted above, the fluidity of the plastic paste is regulated so that the paste will flow vertically through open pattern area 10 in screen 6 and through fabrics 4 and 2 but will not spread horizontally in the fabric outside of the pattern area. The paste may be applied in a mass to the screen and spread across open area 10 with a blade or knife or may be applied to and through the screen with a brush or roller. After the paste is applied and has passed through the screen and the fabrics, the screen is removed and the paste is then dried or set. Where a solvent has been employed to make the plastic flowable, the solvent is evaporated.

In the embodiment of FIG. 1, open area or pattern 10 of screen 8 is in the form of intersecting bands or ribbons, the areas between the bands or ribbons being closed. Thus, in the open area of the bands or ribbons the plastic paste passes through the screen and flows vertically through fabrics 4, 2 and, in the closed, impervious portions 8 of the screen, the paste is retained on the screen.

Referring now to FIGS. 2 and 3, a portion of fabric reinforced with plastic applied through the screen of FIG. 1 is shown. In the reinforced product of FIGS. 2 and 3, the plastic forms ribbons or bands 12 of plastic which pass through the fabrics, joining or uniting the fabrics in the area of the bands. Intermediate the ribbons or bands and in the areas designated 14 in FIGS. 2 and 3, fabrics 2, 4 are not joined and maintain their original open woven or knitted pattern. In FIG. 3, the thickness of the reinforcing ribbons or bands 12 of plastic material are somewhat exaggerated for purposes of illustration. The thickness of the ribbons or bands will, to a large extent, depend upon the reinforcing plastic and the amount of plastic employed. In most instances, however, ample reinforcement is attained where the thickness of the ribbon or band is no greater than that of the fabric. In many instances the amount of plastic applied, especially after the plastic is dried and set, is less than the amount required to fill the volume between the threads.

FIG. 4 shows a fabric in which the plastic has been applied in a modified pattern. Like FIGS. 1 to 3, FIG. 4 is made up of two fabrics, superimposed one on the other, through which the plastic paste is first applied and then dried or set. Rather than in strips or ribbons, as in FIGS. 1 to 3, in FIG. 4 the plastic paste is applied in the form of boxes 20, the center of each box 20 being open leaving a square 22 of unreinforced fabric in the center of each box, and intersecting strips of unreinforced fabric between the boxes. The reinforced fabric may be used in this manner, or where additional or stronger reinforcement is required, metal stays of the type commonly employed in corsets may be inserted between the fabrics in the otherwise unreinforced intersecting strips. It is the latter embodiment which is shown in FIG. 4.

In FIG. 4, metal stays 24 are inserted between the fabrics from the edges of the fabrics after the plastic has been applied and dried or set. As shown, the stays are woven, each with the other, as they are passed between the fabrics. Weaving in this manner gives a particular type of reinforcement. Obviously, where desired, the metal stays may be inserted without weaving. Materials other than metal may be employed in the stays.

As is apparent from the foregoing description, within the plastic area the fabric of the instant invention is reinforced while outside the plastic area the fabric retains its original properties. Thus, within the plastic area the plastic restrains and reinforces the fabric. Outside the plastic area the fabric is unreinforced and unrestrained.

By selecting the plastic, the amount of plastic applied, and the pattern, the amount of reinforcement can be varied. If desired, the plastic pattern may be designed for esthetic appeal as well as for reinforcement. Such design may take the appearance of lace, flowers, or any other desired form. In selecting the plastic, the amount to be applied, and the pattern, it is of course important that the fabric, after reinforcement, be sufficiently flexible to avoid discomfort. Plastics which, when cured, are hard, brittle and cannot be flexed should be avoided.

Turning now to FIGS. 5 and 6, the reinforced fabrics of the instant invention are shown as applied to a brassiere and to a girdle. In FIGS. 5 the reinforced fabric is shown in the lower or support panel of a brassiere cup. Here the plastic is applied to the fabric in interesting strips or ribbons 30, leaving the fabric areas 32 intermediate the strips free or open. Thus, the supporting panel of the cup is reinforced in an open network, providing the desired support in the cup yet, at the same time, not substantially increasing the thickness of the panel or weight of the brassiere. The unaltered fabric network, intermediate the plastic strips or ribbons, allows free passage of air.

In FIG. 6 the reinforced fabric is shown applied in the stomach and hip panels of a girdle. These panels may be of a single thickness or a plurality of thicknesses. The plastic reinforcing material may be applied to the panel before the panels are sewed into the garment or after the garment is made. In most instances it is preferred, however, to first form and dry or set the plastic reinforcement in the panel and then sew the panel into the garment as the garment is made. As in FIG. 6, the plastic is shown as applied to the fabric in strips or ribbons 40, leaving fabric areas 42 intermediate the strips free or open.

Both in the brassiere of FIG. 5 and the girdle of FIG. 6, the reinforcing plastic can be applied in any pattern which will provide the desired support. By selecting the pattern and the direction of the reinforcement, reinforced panels may be made which will provide reinforcement in one direction and not in another or the amount of reinforcement in one direction may be selected to be much greater than in another. If desired, and in addition to the single or plurality of fabrics in the reinforcing panel, a panel of unreinforced fabric may be positioned over one or both sides of the reinforced fabric when the panel is sewed into the garment.

While the instant invention has been described in conjunction with reinforcing panels for foundation garments, the invention may also be applied to the edges of such garments to stiffen the edge and prevent rolling or curling. Likewise, the invention may be employed for joining or connecting the overlapping edges of adjoining panels. In the latter application the edges of the adjoining panels are lapped and then imbedded by passing the flowable plastic through the lapped edges and then drying or setting the plastic. For further reinforcement a reinforcing tape may be imbedded in the plastic along with the panel edges.

In the foregoing description the fluid plastic is applied through a silk screen. Other forms of stencils may be employed in a similar manner or the flowable plastic may be applied by printing, with a patterned roller or in any similar manner, permitting selective application and depositing of the plastic paste.

The terms and expressions which have been employed are used as terms of description and not of limitation, and there is no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but it is recognized that various modifications are possible within the scope of the invention claimed.

What is claimed is:

1. A foundation garment having reinforced fabric panels, said panels comprising a plurality of superimposed layers of fabric reinforced and joined in spaced parallel lines with a plastic material imbedded in the fabric layers

5

and extending through said fabric layers at their interfaces and through said fabric layers from one side thereof to the other, said fabrics intermediate said spaced parallel lines forming pockets between said fabrics, and reinforcing stays in said pockets.

2. A foundation garment having reinforced fabric panels, said panels having areas of reinforced and unreinforced fabric, said reinforced areas having imbedded in the fabric in such area a plastic material, said plastic material extending through said fabric from one side of said fabric to the other side of said fabric.

3. A girdle having a panel of reinforced fabric, said fabric having reinforced and unreinforced areas, said reinforced areas having imbedded in the fabric in such area a plastic material, said plastic material extending through said fabric from one side of said fabric to the other side of said fabric.

4. A girdle as recited in claim 3 in which said panel is a plurality of superimposed layers of fabric and said plastic material extends through said layers at their interfaces to join and reinforce said panel.

6

5. A girdle as recited in claim 4 in which said plastic material is imbedded in said fabric layers in spaced parallel lines, said fabrics intermediate said spaced parallel lines forms pockets between said fabric layers and stays are positioned in said pockets.

References Cited by the Examiner

UNITED STATES PATENTS

1,974,209	9/1934	Fowler	156—291
2,209,311	7/1940	Karcher	156—291
2,298,071	10/1942	Smith	139—420
2,393,612	1/1946	Bullinger	128—538 X
2,409,089	10/1946	Whitman	139—420
2,413,970	1/1947	Hawley	161—76
2,686,312	8/1954	Schmidt	128—463
2,774,073	12/1956	Herbener	128—533
2,869,555	1/1959	Hollar	128—533
2,892,459	6/1959	Rosenthal	128—464
2,893,396	7/1959	Thompson	128—464

ADELE M. EAGER, *Primary Examiner.*