

Aug. 26, 1952

C. R. ANDERSON

2,608,078

FOUNDATION GARMENT AND ELEMENT THEREFOR

Filed Jan. 4, 1950

2 SHEETS—SHEET 1

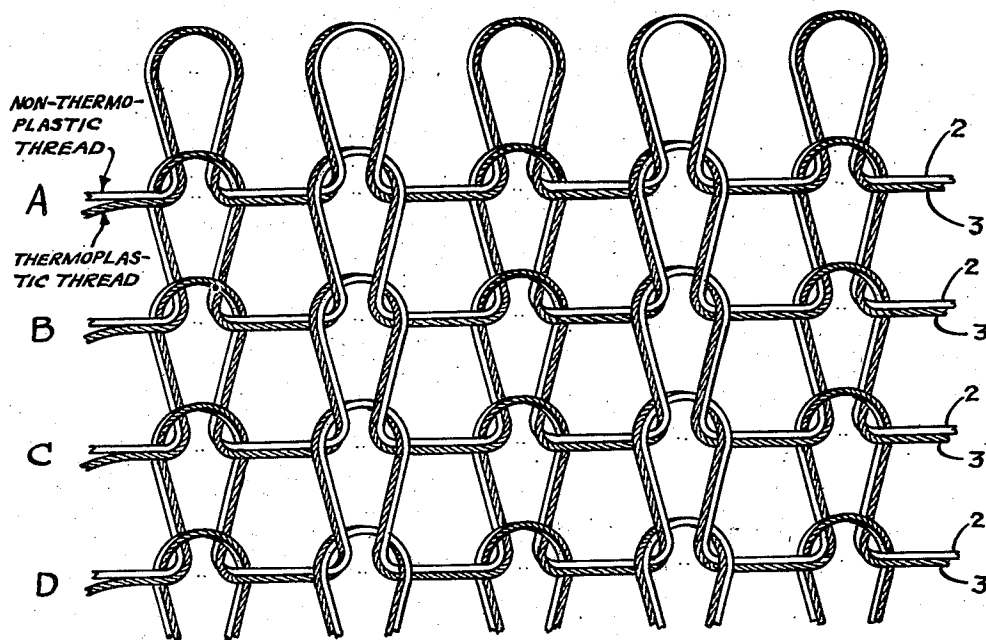


FIG. 1

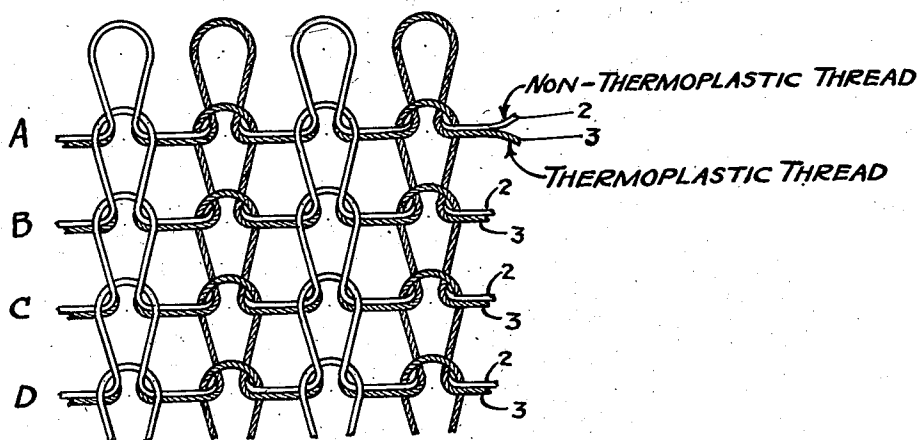


FIG. 2

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2 SHEETS—SHEET 2

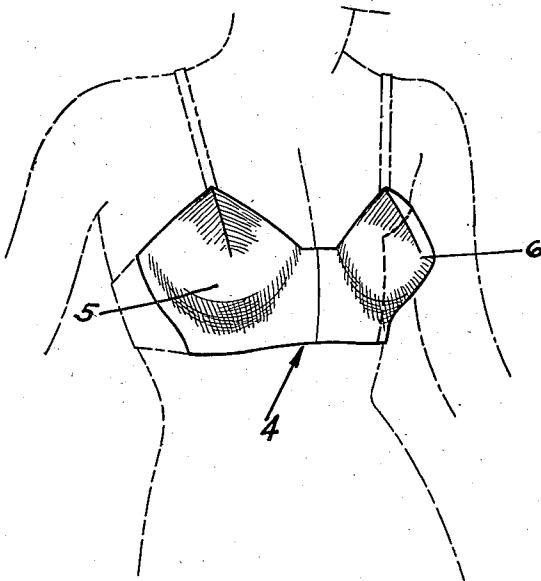


FIG. 3

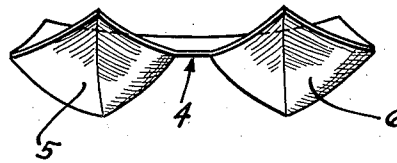


FIG. 4

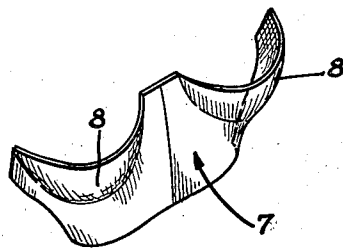


FIG. 5

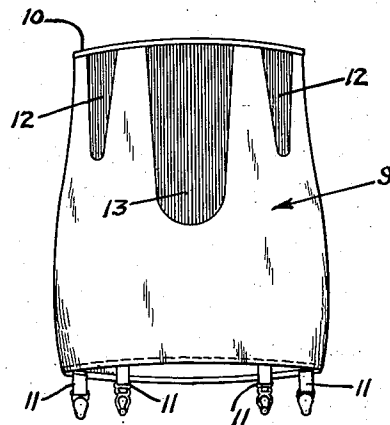


FIG. 6

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2,608,078

FOUNDATION GARMENT AND ELEMENT THEREFOR

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Application January 4, 1950, Serial No. 136,722

2 Claims. (Cl. 66—176)

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This invention relates to new and useful improvements in fabrics, and more particularly to a novel fabric which has the inherent characteristic of being capable of being shaped into various forms by the application of heat thereto.

This application is a continuation-in-part of my copending application Serial No. 714,815, filed December 7, 1946, and now abandoned.

An important object of the present invention is to provide a fabric, preferably of the knitted type, composed of one or more natural or synthetic cellulosic threads such as cotton threads or viscose or acetate rayon threads, and a thermoplastic yarn or thread composed of filaments of a copolymer of vinyl chloride and vinyl acetate, whereby when the fabric is completed, it may be rendered dense and semi-stiff by the application of heat thus providing a fabric which readily lends itself for use in various forms of body supporting garments as, for example, brassières, foundation garments, and the like.

A further object is to provide a fabric composed of a plurality of threads suitably interknitted or interwoven with one another to provide a composite fabric, one of said threads being constructed of a suitable material capable of being activated by the subsequent application of heat to the resultant fabric, whereby the fabric, or portions thereof may be formed into various shapes by simply placing it over a suitable form, or forms, and applying heat and probably pressure to the fabric while supported on the form, and which shape the fabric will retain under all ordinary use after the fabric is permitted to cool.

A further object is to provide a fabric which readily lends itself for use in the construction of body supporting garments such as brassières, foundation garments, and the like, in that the fabric has the inherent characteristic of readily being rendered semi-stiff or rigid, by the simple application of heat thereto, and with the assurance the so-treated fabric will retain its original appearance and will have ample pliability to enable it to adapt itself more or less to the shape or contour of those portions of the body to be supported or constrained thereby, and whereby bust-supporting pockets may be formed in such garments as brassières without gores, and in most cases without seams, thereby making it possible to produce such a garment which will provide the utmost in comfort to the wearer, and will be economical and inexpensive to manufacture.

Another object of this invention is to provide a fabric, preferably a rib knitted fabric, com-

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posed of one or more natural or synthetic cellulosic threads and a thermoplastic yarn or thread composed of filaments of a copolymer of vinyl chloride and vinyl acetate characterized in that the completed fabric or any selected area thereof may be subjected to heat; and, if desired, pressure to soften and shape the vinyl copolymer yarn or thread which latter yarn or thread, because of the unique properties of the vinyl copolymer, will shrink materially thus providing, upon cooling, a compact and dense semi-rigid area capable of supporting a portion of the body of the wearer of the fabric with which it is in contact.

Still another object of this invention is to provide a rib knitted fabric composed of one or more natural or synthetic cellulosic threads and a thermoplastic yarn or thread composed of filaments of a copolymer of vinyl chloride and vinyl acetate wherein the cellulosic threads are plated over the vinyl copolymer yarn or thread so that only cellulosic thread appears on the outer faces of the fabric thus providing a fabric having absorbent surfaces that are comfortable to the wearer of garments formed from the fabric.

A still further object is to provide a fabric which may be readily embodied in the construction of foundation garments to take the place of the usual separable bones or stiffening elements, now commonly embodied in such garments for providing the necessary support and constraining effects upon the body, my novel fabric, before being heat treated, having substantially the same characteristics, as to softness and pliability as the material from which the body of the garment may be made, so that it may be sewed into the garment either in a single or double thickness, as may be required, after which heat and pressure may be applied thereto to render it semi-stiff or rigid so as to provide the necessary supporting effect upon the body.

Other objects of the invention will appear from the following description and the accompanying drawings and will be pointed out in the annexed claims.

In the accompanying drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claims which follow.

Figure 1 is a detail view showing a portion of a knitted fabric, greatly enlarged, to more clearly

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illustrate the interknitting of the threads in the construction of the fabric;

Figure 2 is a similar view on a smaller scale, showing the cellulosic threads plated over the thermoplastic yarn or thread in the operation of knitting the fabric;

Figure 3 is a view showing the fabric embodied in a brassière and the bust-supporting pockets of the garment being formed therein;

Figure 4 is a top view of the bust-supporting portion of a brassière, showing the bust-supporting pockets formed in the fabric;

Figure 5 is a perspective view of the front portion of a brassière in which the bust-supporting portions are of slightly different shape;

Figure 6 is a view showing the invention embodied in a foundation garment.

The novel fabric herein disclosed is best illustrated in Figures 1 and 2, wherein it is shown greatly enlarged in order to more clearly illustrate the simple construction thereof. In the present disclosure, the fabric is shown comprising two threads, 2 and 3, which may be simultaneously knitted into each course A, B, C and D of the fabric, in a manner well known in the art, to provide a knitted fabric.

The important feature of the present invention resides in interknitting a thermoplastic yarn or thread composed of a synthetic resinous material capable of shrinking materially upon the application of heat thereto with natural or synthetic cellulosic threads. In Figures 1 and 2, the cellulosic thread, which may be cotton or viscose or acetate rayon or any other suitable synthetic cellulose derivative, is designated by the numeral 2, and the heat-shrinkable thermoplastic yarn or thread is designated by the numeral 3. The thermoplastic synthetic resinous yarn or thread is composed of filaments of a copolymer of vinyl chloride and vinyl acetate which is sold under the trade name "Vinyon." The yarns or threads of this vinyl resin copolymer possess the property of shrinking materially upon the application of heat thereto which property provides one of the outstanding advantages of this invention. Other thermoplastic resinous yarns or threads are capable of shrinking upon the application of heat as, for example, nylon but none of the other available thermoplastic resinous threads will shrink upon heating to a degree sufficient to produce the results obtained with the vinyl copolymer threads. The cellulosic thread 2 and the vinyl copolymer thread 3 may be interknitted into the fabric simultaneously by methods which are well known.

In Figures 1 and 2 the vinyl copolymer thread is shown knitted into all of the wales in each course, but it is to be understood that this thread may be occasionally floated or otherwise knitted into the fabric in a manner to produce various ornamental effects. It is preferred, however, to plate the cellulosic thread over the vinyl copolymer thread to produce a fabric wherein only cellulosic threads appear on the outer faces of the fabric. A fabric is thus provided which has absorbent faces which are more comfortable to the wearer of garments formed from the fabric due to the absorption of body moisture by an absorbent face of the fabric. While this feature has been shown in Figures 1 and 2 in a one and one rib knit fabric, the same advantages may be obtained in two and two rib knit fabrics, three and three rib knit fabrics and other common forms of rib knit fabrics.

The interknitting of the thermoplastic thread into the fabric does not complicate the knitting

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operation, as the thermoplastic vinyl copolymer thread may be knitted into the fabric simultaneously with the cotton or viscose or acetate rayon threads 2, with conventional equipment and without complications.

The important feature of the present invention, as hereinbefore stated, resides in the combination with the usual cellulosic threads of a knitted fabric, of a thermoplastic vinyl copolymer thread which may be activated by the subsequent application of heat to the completed fabric, whereby the resultant fabric provides an ideal one for use in the construction of brassières, foundation garments, and the like, as shown in Figures 3 to 6, inclusive, although it is to be understood the fabric may also find use in the construction of other articles, when applicable.

Because of the introduction of the thermoplastic vinyl copolymer thread in the fabric, the fabric may be placed over a suitable form and when heated to a certain temperature, it will soften, shrink and readily adapt itself to the contour of the form and will retain such shape, when cooled.

The fabrics of this invention are activated by subjecting them to a temperature of about 240° F. The vinyl copolymer yarn or thread which has been introduced into the fabric as described softens and shrinks when heated to this temperature. The soft yarn or thread may be shaped in any desired manner on a form. The cellulosic threads of the fabric control the degree of shrinkage of the vinyl copolymer thread and produce substantially uniform shrinkage throughout the area subjected to heat. The shrinkage of the vinyl copolymer thread, however, tends to bring the cellulosic threads together thus compacting and densifying the heated area. When the heated area is permitted to cool the shape imparted thereto is retained and this area has been rendered dense, compact and semi-rigid. When heated to a temperature of about 240° F. and allowed to cool the vinyl copolymer threads become set so that normal washing and pressing of a garment formed of the fabric will not alter the desired shape and properties of the heat treated areas. The dense, compact, semi-rigid areas are pliable but possess the rigidity necessary to support portions of the body of the wearer of a garment formed from the fabric. Greatly added strength and increased ability to support portions of the body are accomplished by the shrinking effect above described.

In Figures 3 and 4 there is shown the bust-supporting portion of a brassière, generally designated by the numeral 4, having bust-receiving cups or pockets 5 and 6 formed therein by simply placing the fabric over suitable forms and applying sufficient heat (240° F.) thereto to cause the vinyl copolymer threads of the fabric to soften and shrink, whereupon the fabric will retain its shape upon cooling, and such shape will be permanent unless the fabric is again subjected to a temperature sufficiently high to cause the vinyl copolymer threads to soften.

The copolymer of vinyl chloride and vinyl acetate from which the thread 3 is made requires a relatively higher temperature to soften it than the usual temperature of laundry water. The preformed portions of garments formed from the fabrics of this invention will, therefore, retain their shape even though frequently passed through conventional laundering processes.

In Figure 5 the invention is shown embodied in a brassière 7 of slightly different form, it being

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understood that the entire body of the brassière, as shown in Figure 5, may be made from the same fabric in which portions only have been heat-treated and preformed to provide partial bust-supporting cups or pockets, as indicated at 8.

In Figure 6, there is shown a foundation garment 9 of conventional construction comprising a waist line 10 and having the usual garter straps 11 secured to the lower edge thereof, as is well known.

The entire body of the garment shown in Figure 6, may, if desired, be constructed from a single tubular blank of fabric in which a vinyl copolymer thread has been interknitted in conjunction with the cellulosic threads constituting the fabric of the garment, as hereindisclosed.

In a foundation garment, it is common to stiffen certain portions of the garment to provide the desired support for the wearer's body. Heretofore, this has usually been accomplished by embodying in the garment stiffening bones or elements, which require the construction of suitable pockets for their reception.

By utilizing the novel fabric herein disclosed, any desired portion or area of the body of the garment may be quickly stiffened or made semi-rigid to provide the necessary supporting effect, by simply applying heat to the particular areas to be rendered relatively stiffer than other portions of the body of the garment. This may be readily accomplished at low cost by utilization of the present invention and a permanent construction obtained, since the characteristic of the vinyl copolymer used in the thread 3 is such that it cannot become reactivated when the garments are subsequently laundered. Any portion or portions of the wall of the body of the garment may be heat-treated to provide the desired results, as will readily be understood by reference to Figure 5. If the single thickness of the fabric of the garment does not provide adequate stiffness, when heat-treated to stiffen it, the particular portions of the garment to be stiffened may readily be rendered more so by simply adding another ply or thickness of the same material to the particular portions to be stiffened, before heat is applied to such areas.

In the garment shown in Figure 6, the shaded portions 12 and 13 represent portions of the fabric which have been heat-treated to render such portions or areas of the garment body relatively stiffer than the remaining portions thereof, thereby to provide the desired body supporting effect for such areas.

By knitting a vinyl copolymer thread into the fabric, as herein disclosed, the inherent characteristic of the fabric will be the same as any knitted fabric, until portions thereof are sub-

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jected to a temperature which is sufficiently high to cause the thermoplastic threads to become reactivated.

It will be apparent to those skilled in the art that I have accomplished at least the principal objects of my invention, and it will also be apparent to those skilled in the art that the embodiments herein described may be variously changed and modified without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiments are illustrative only, and that my invention is not limited thereto.

I claim:

1. A foundation garment having rigid areas adapted to provide support for portions of the body of the wearer of said garment, said rigid areas consisting of a rib knitted fabric, each stitch of said rib knitted fabric comprising a cellulosic thread and a thread consisting of an elastic copolymer of vinyl chloride and vinyl acetate, said copolymer being characterized by the property of shrinking upon the application of heat, said cellulosic thread being plated over said vinyl copolymer thread to provide a rib knitted fabric wherein only cellulosic thread appears on the inner and outer faces of said fabric, said vinyl copolymer thread being heat shrunk to render said fabric dense and rigid.

2. A shaped reinforcing element for a foundation garment said element consisting of a rib knitted fabric, each stitch of said rib knitted fabric comprising a cellulosic thread and a thread consisting of an elastic copolymer of vinyl chloride and vinyl acetate, said copolymer being characterized by the property of shrinking upon the application of heat, said cellulosic thread being plated over said vinyl copolymer thread to provide a rib knitted fabric wherein only cellulosic thread appears on the inner and outer faces of said fabric, said vinyl copolymer thread being heat shrunk to render said fabric dense and rigid.

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