United States Patent Office 3,089,806 Patented May 14, 1963

3,089,806

GARMENT COMPONENT AND METHOD OF MAKING SAME

Louis R. Mizell, Washington, D.C., assignor, by mesne assignments, to The Williamson-Dickie Manufacturing Company, Fort Worth, Tex.

No Drawing. Filed May 13, 1959, Ser. No. 812,806
1 Claim. (Cl. 156—264)

This invention relates to garments having greater resistance to abrasive wear and to a method of making such garments.

The useful life of many garments is dependent upon the resistivity to abrasion of the fibrous textile materials in exposed areas such as the knee and elbow regions of the garments. In some instances, efforts have been made to buttress these areas of garments by adding knee or elbow patches designed to increase the thickness of the garment in that area which is subjected to the greatest abrasive wear. These patches, when applied to the outside of the garment, detract from its appearance. When applied to the inside of the garment, the material of the garment usually shows abnormal wear in the area surrounding the edges of the patch. Where the patches have been secured by an adhesive to the material of the garment, the patches tend to loosen during laundering operations.

Efforts to increase the wearing characteristics of the fabric itself, as by impregnating with longer wearing materials or coating with plastics, have not been particularly successful. If the entire garment is so treated, it has a resultant stiffness which is undesirable and the treatment is expensive. If only the localized areas subjected to greatest wear are treated, difficulties have been encountered in obtaining a coating or treatment having a uniform effect. Frequently efforts to spread a coating in the area of maximum wear have left edges similar to those of the textile patches so the untreated material adjacent the coating is worn at an abnormal rate.

A major object of this invention is to prolong the life of garments made of fibrous textile material without substantially increasing the cost of production of such garments and in a manner which may be incorporated in present production methods.

Another object of the invention is to provide a component for a garment having only that area subjected to the greatest abrasive wear reinforced to prolong the life of that area without adversely affecting contiguous areas of the component.

Still a further object of the invention is to provide a method of making garments having a greater resistance to wear in those areas normally subject to abrasion without disrupting or unnecessarily changing present production methods and techniques.

In the attainment of these objects an important feature of the invention resides in the arrangement of a piece of fibrous textile material having peripheral dimensions and shape for fabrication into a garment with a layer of plastic material of uniform thickness embedded in the interstices of the yarns on one side of the piece in the area of the garment subjected to the greatest wear. Preferably this plastic layer is in the form of a thermoplastic film adhered to one surface of the textile fabric by the application of heat and pressure. The film is cut to peripheral dimensions in shapes smaller than the textile pieces and arranged to cover only that region subjected to excessive abrasive wear.

In its complete method, the invention contemplates the production of pieces of fibrous textile material having peripheral dimensions and shape for fabrication and assembly into a completed garment with a smaller piece of thin plastic film of a shape and dimension corresponding

to the area of the garment subjected to the greatest abrasive wear overlying one of the textile pieces in that area and adhered thereto by the application of heat and pressure. This heat and pressure is preferably sufficient to cause the film to flow into the interstices between the fibers of the fabric until the film separates at such interstices to partially surround the individual yarns of the fibrous fabric and form openings providing air and water permeability to the film and fabric.

This invention has been found particularly useful in denim pants, known as jeans or dungarees, and the method of making such pants. In the manufacture of pants embodying the invention, a standard fibrous textile fabric for the manufacture of dungarees, such as ten ounce denim fabric, is cut into pieces having shapes and dimensions conforming to the component parts of the pants. On the filling or inner side of the front panel of the pant legs a piece of plastic film, preferably of a thermoplastic material such as those known as polyethylene, Nylon Type-6 (manufactured by Ludlow Papers, Inc., Needham Heights, Massachusetts) or polypropylene film (manufactured by Ludlow Papers, Inc., Needham Massachusetts) of a uniform thickness of approximately 2 mils and a size of approximately 6" x 6" is positioned to overlie that area of the pant leg which is subjected to the greatest abrasive wear at the knee.

Heat and pressure are then applied to the film and the fibrous plastic material sufficient to soften the film and cause it to flow into the interstices of the fibrous fabric and thereby partially surround each of the fibrous yarns and fibers. In the case of polypropylene film, the fabric and film were placed between platens heated to temperatures of 345° F., to 370° F., at pressures from 14 lbs. p.s.i. to 145 lbs. p.s.i. for a period of between 3 and 10 seconds. If only that plate of the press opposite the film were heated, the temperature was raised to 390° F., and the period of time required was 10 seconds. In the case of Nylon Type-6 film it was found that the best results were obtained at a temperature of about 440° F., at 100 lbs. p.s.i. with a five second period. Addition of a plasticizer to the film permits the use of lower temperatures and pressures to cause the film to flow into the interstices of the fabric.

Extensive tests have been run on the polypropylene film and the Nylon Type-6 film. In both instances, the resistance to abrasion both before and after laundering greatly exceeded untreated denim by as much as 250% and exceeded the fabric knee patch by 25% to 50%.

The durability of plastic film patches applied as above has been demonstrated through repeated launderings and extensive wear tests. The air and water permeability of the film and fabric permits complete laundering and removes any accumulation of grit which might increase the effect of abrasive wear at the knee area.

In those instances where increased tear strength as well as increased abrasive resistance is desired, the plastic film may be reinforced with a lightweight fabric, preferably of coarse weave and cut on the bias. For example, a piece of coarsely woven material cut to approximately the same peripheral dimensions as the plastic film, is located between the film and the fabric of the garment, or may overlie the film while heat and pressure is applied. In this way the plastic film flows and becomes embedded in the interstices of both the fabric of the garment and the coarsely woven material. Resultant increase in abrasive wear corresponds to that previously described in connection with the application of the plastic film. In addition, the tear strength of the fabric is greatly increased.

After application of the plastic film, it was expected that difficulty would be experienced in ironing the area

to which the film was applied as an iron will tend to stick to a plastic film at normal temperatures for ironing cotton, i.e., 350° F., to 500° F. However, the fabric with a plastic film embedded in a selected area may be ironed at these temperatures without having the plastic stick to the iron.

The foregoing description is considered to be exemplary rather than limiting, and the scope of my invention is to be determined by the following claim.

What I claim is:

A method of making a garment comprising, cutting pieces of fabric of about 10 ounce weight to peripheral dimensions and shapes for fabrication into a garment, overlaying said pieces in areas of potential wear with a film of thermoplastic material having a thickness of approximately 2 mils, and simultaneously applying heat from about 345° F. to 440° F. and pressure from about 14 p.s.i. to 145 p.s.i. for periods of about 3–10 seconds to cause the film to flow around the fibers of the fabric in said area on one side only and separate at the interstices between the fibers to render said area permeable to air and water and prevent mechanical separation of the thermoplastic material from the fabric.

References Cited in the file of this patent

UNITED STATES PATENTS

2,096,750	Lawrence	Oct. 26, 1937
2,101,607	Block	Dec. 7, 1937
2,524,842	Slaman et al.	Oct. 10, 1950
2,633,618	Moe	Apr. 7, 1953