

Aug. 10, 1971

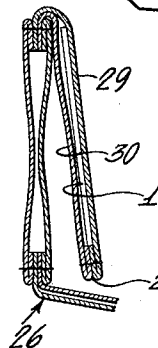
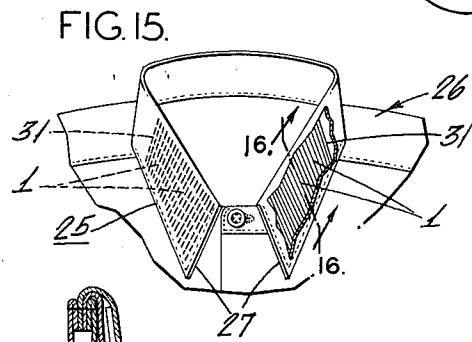
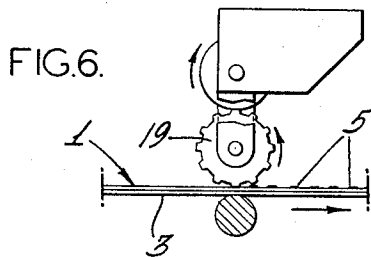
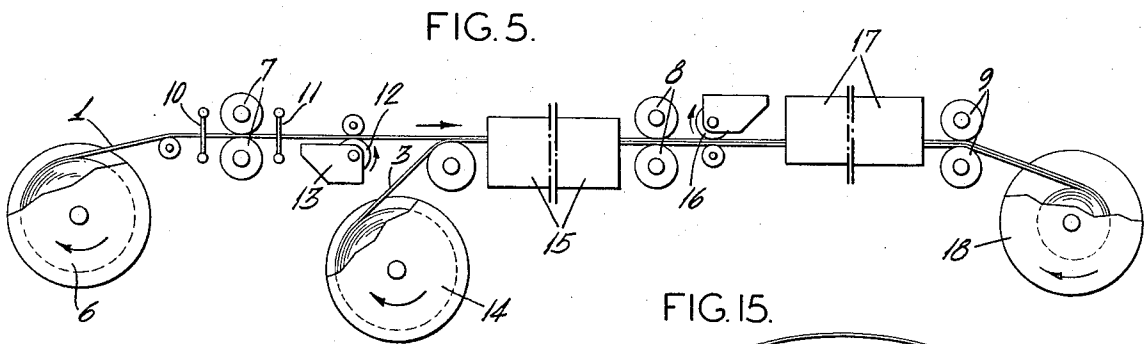
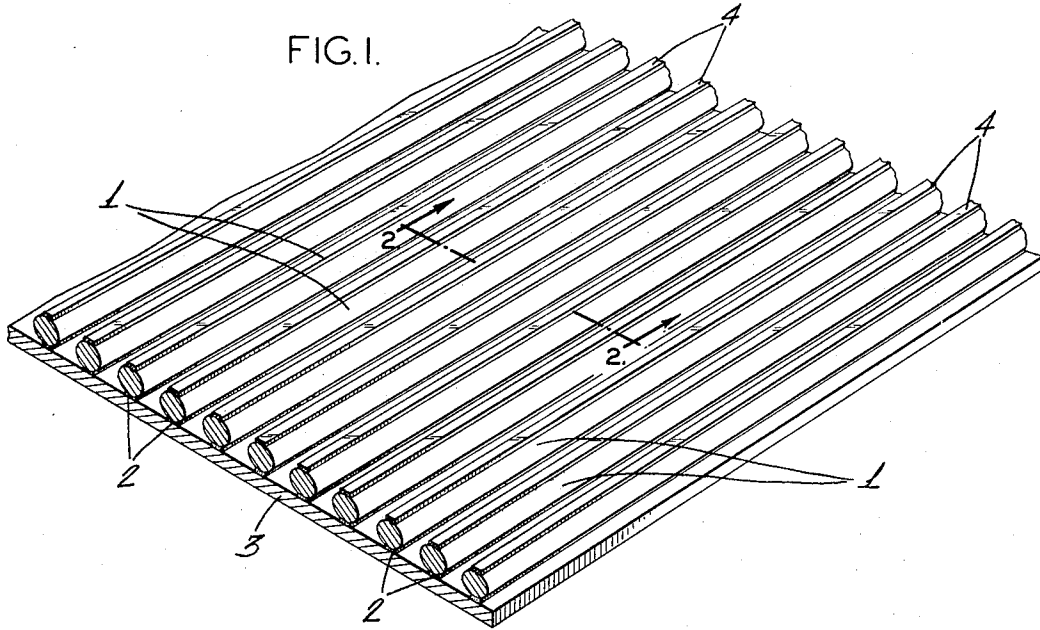
P. C. FEFFER ET AL

3,598,689

GARMENT INTERLINING

Filed Dec. 16, 1968

3 Sheets-Sheet 1



INVENTORS:
PHILIP C. FEFFER
WILLIAM G. WOLFGANG
BY *Howson & Howson*
ATTYS.

Aug. 10, 1971

P. C. FEFFER ET AL

3,598,689

GARMENT INTERLINING

Filed Dec. 16, 1968

3 Sheets-Sheet 2

FIG. 7.

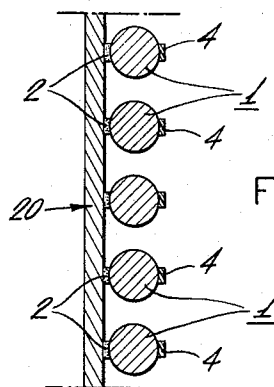
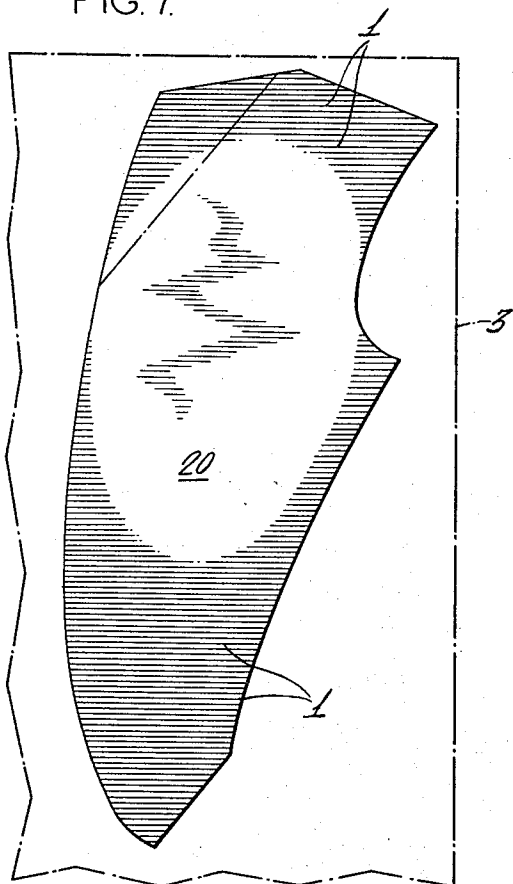


FIG. 2.

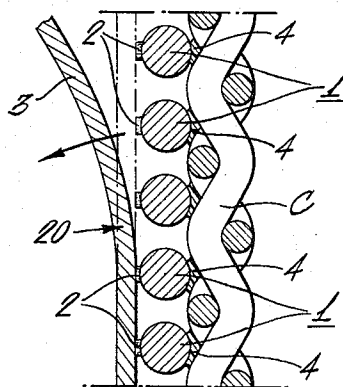


FIG. 9.

FIG. 12.

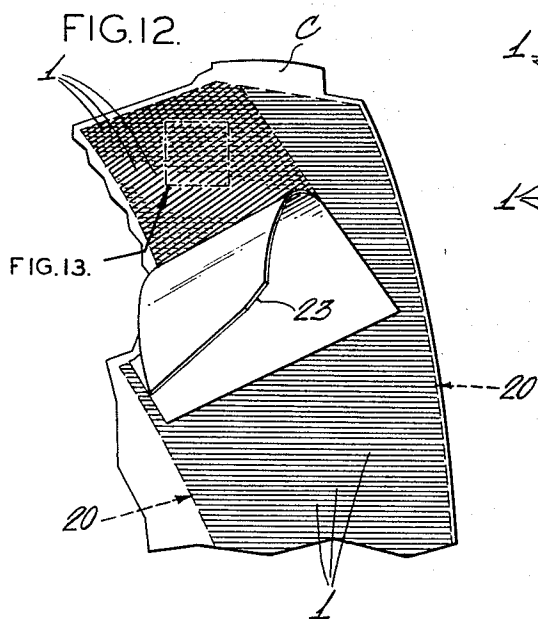


FIG. 13.

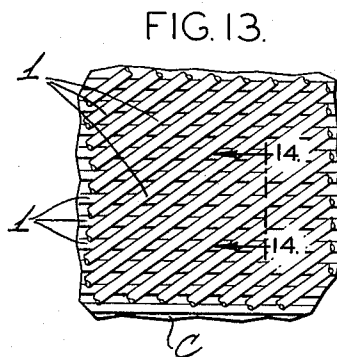
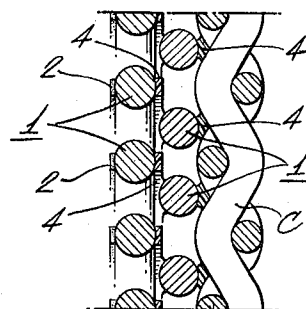


FIG. 13.

FIG. 14.



INVENTORS:
PHILIP C. FEFFER
WILLIAM G. WOLFGANG

Howson & Howson
ATTYS.

Aug. 10, 1971

P. C. FEFFER ET AL

3,598,689

GARMENT INTERLINING

Filed Dec. 16, 1968

3 Sheets-Sheet 3

FIG. 8.

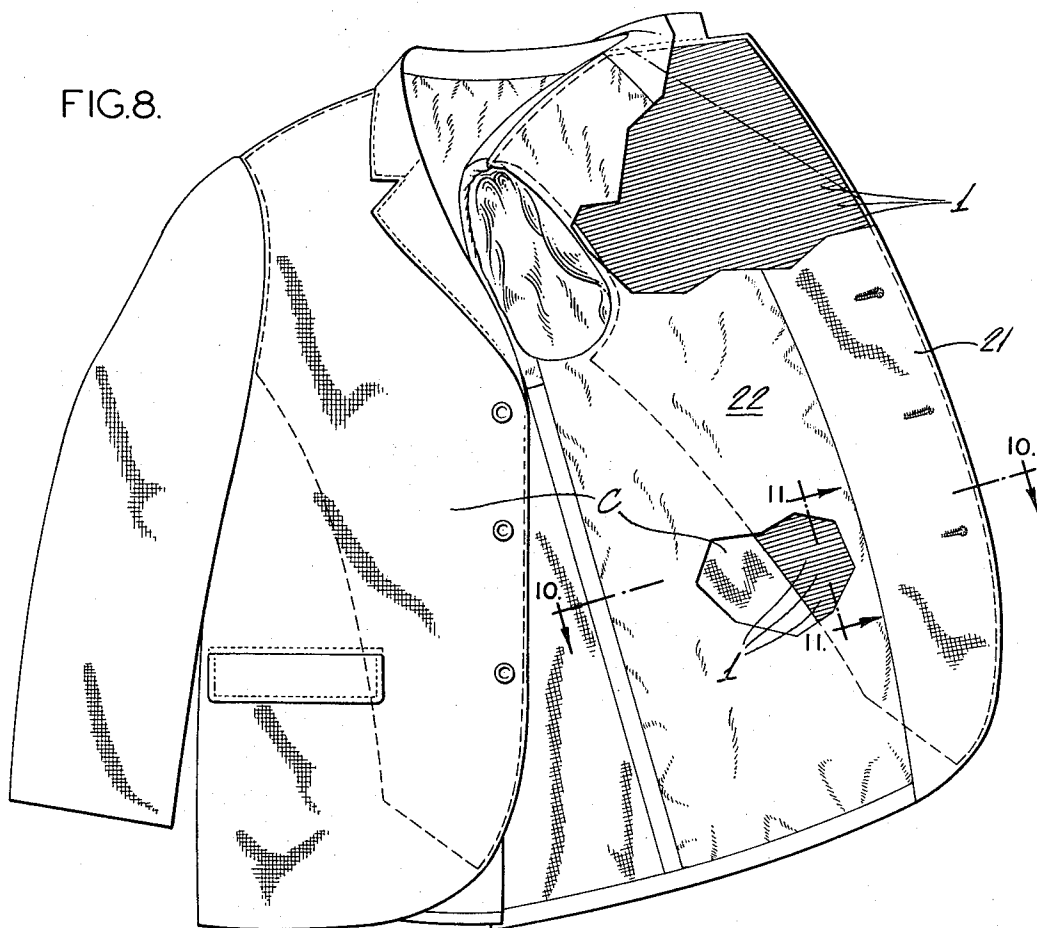


FIG. 10.

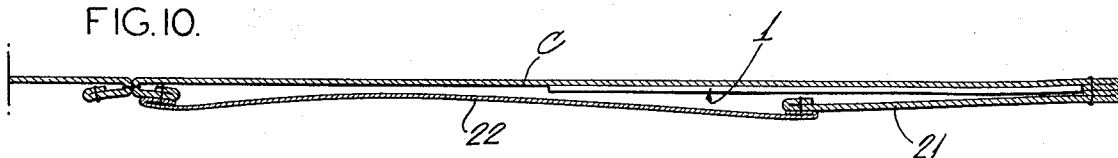


FIG. II.

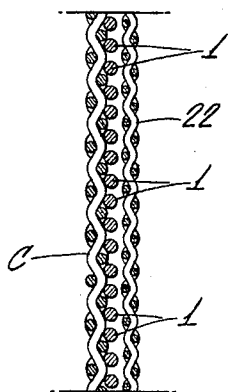


FIG. 3.

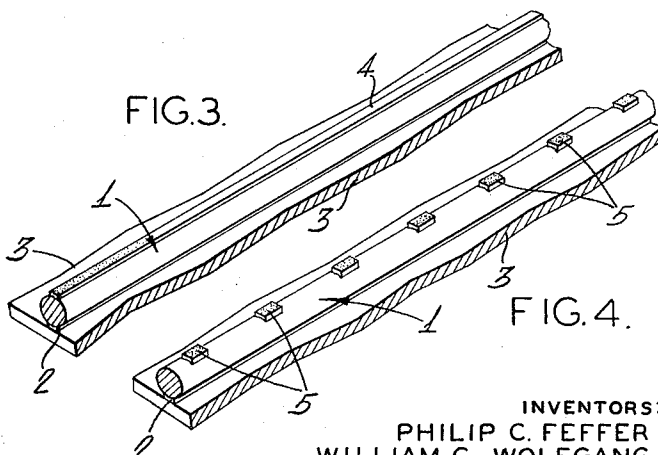


FIG. 4.

INVENTORS:
PHILIP C. FEFFER
WILLIAM G. WOLFGANG

BY
Howdson & Howdson
ATTYS.

1

2

3,598,689

GARMENT INTERLINING

Philip C. Feffer, Philadelphia, Pa., and William G. Wolfgang, Cherry Hill, N.J., assignors to Philadelphia College of Textiles and Science, Philadelphia, Pa.

Filed Dec. 16, 1968, Ser. No. 784,058

Int. Cl. A41d 27/06; B32b 3/16

U.S. Cl. 161—143

4 Claims

ABSTRACT OF THE DISCLOSURE

Interlining material for garments comprising a plurality of yarns adhesively secured in closely spaced parallel relation to a peelable backing sheet. An adhesive is also provided on the outer surface of the yarns opposite the backing sheet for permanently bonding the interlining yarns to a surface of the cloth of a garment or other article of the cloth of a garment or other article, the backing sheet being peeled from the yarns after yarns have been bonded in place in a garment. A method for making the interlining material and a garment construction embodying the interlining material are also disclosed.

This invention relates to new and useful improvements in interlining materials adapted to be bonded by heat-sealing to a surface of the cloth or fabric of a garment. More particularly, the invention relates to novel interlining material for use in wearing apparel such as coats, jackets and like garments, shirt and other collars as well as for stabilizing fabrics such as knit goods which normally are highly unstable.

For example, in the manufacture or tailoring of coats, jackets and like garments it is the growing practice to provide in the front shoulder and front body covering portions of the garment an interlining which is heat-sealed to the inner surface of the outer cloth or fabric of the garment and disposed between the latter and the conventional facing and lining of the garment for the purpose of imparting to the front portions of the garment the desired stiffness and resilience commonly referred to in the trade as "hand." In the clothing industry such interlinings are referred to as fused or fusable interlinings.

In the case of such garments it is desirable that the stiffness and resilience provided by the interlining material be manifested principally in the lateral or horizontal direction of the front portions of the garment circumferentially of the wearer and be substantially minimal in the direction vertically of the garment and the person wearing it. The reason for this is that the less stiffness and resilience in the vertical direction of the garment the better the garment will drape and conform to the vertical body contours of the wearer.

However, prior to the present invention it has been the general practice in the industry to utilize as fused or fusable interlining materials woven fabrics composed of relatively stiff resilient fibres such as hair, wool, cotton and the like as well as selected synthetic filaments. Woven fabrics have both warp and weft and consequently a fusable interlining made of such materials when incorporated in a garment such as a coat or jacket provides stiffness and resilience to the garment not only in the lateral or horizontal direction as described but also in the vertical direction which is not desirable as aforesaid. Attempts to eliminate this objection and disadvantage have included proposals to use fusable non-woven fabrics and similar substitutes as the interlining material, but none of these have proved satisfactory because they usually provide stiffness and resilience or "hand" to the garment in the vertical direction as in the horizontal direction.

Bearing the foregoing in mind, the present invention provides a novel fusable interlining material having the characteristic stiffness and resilience in one direction only of the interlining material so that it can be incorporated in the front portions of a garment, such as coat or jacket, to give the desired degree of stiffness and resilience to garment portions only in a predetermined or selected direction without providing undesirable stiffness, and resilience in other directions of the garment portions.

The invention also provides a novel fusable interlining material which can be prefabricated, cut into the desired pattern or shape and then heat-sealed into a garment to provide the desired "hand" of stiffness and resilience to the garment in the selected direction.

These and other features and objectives of the invention are hereinafter more fully set forth and described with reference to the accompanying drawings, in which:

FIG. 1 is a fragmentary perspective view showing a section of interlining material made according to the present invention;

FIG. 2 is an enlarged fragmentary sectional view taken on line 2—2, FIG. 1;

FIG. 3 is an enlarged fragmentary perspective view better illustrating certain details;

FIG. 4 is a view similar to FIG. 3 showing a modified arrangement of the thermoplastic adhesive applied to a yarn of the interlining material;

FIG. 5 is a diagrammatic side elevational view of one form of apparatus for producing the interlining material of the present invention;

FIG. 6 is a fragmentary side elevational view showing a modification of the means for applying thermoplastic adhesive to the yarns of the interlining material;

FIG. 7 is a fragmentary plan view showing a portion of a sheet of interlining material made according to the present invention having the pattern for the interlining of a coat or jacket front portion thereon preparatory to cutting the interlining pieces from the sheet;

FIG. 8 is a perspective view of a coat or jacket incorporating interlining material made according to the present invention, certain portions of the lining and facing of the jacket being cut away to illustrate the construction and arrangement of the interlining therein;

FIG. 9 is an enlarged fragmentary sectional view showing the interlining material secured to the inner surface of the outer cloth of a coat or jacket and the backing sheet being peeled or stripped from the yarns of the interlining;

FIG. 10 is an enlarged fragmentary sectional view on line 10—10, FIG. 8;

FIG. 11 is an enlarged fragmentary section view on line 11—11, FIG. 8;

FIG. 12 is a fragmentary plan view of a coat or jacket front portion showing a modified arrangement of the interlining therein;

FIG. 13 is an enlarged fragmentary plan view of the portion of FIG. 12 bounded by the broken line square in FIG. 12;

FIG. 14 is an enlarged fragmentary sectional view taken on line 14—14, FIG. 13;

FIG. 15 is a fragmentary perspective view of a shirt having an attached collar incorporating an interlining of the present invention; and

FIG. 16 is an enlarged sectional view taken on the line 16—16, FIG. 15.

Referring now to the drawings, and particularly to FIGS. 1 and 2 thereof, fusable interlining material made according to the present invention comprises a plurality of ends of yarn 1 arranged in closely spaced parallel relation and independently secured by means of a suitable adhesive 2 to a backing sheet 3 in a manner so that

3

the sheet 3 may be later peeled or stripped from the yarns 1 as hereinafter described.

The spacing of the yarns 1, their denier, construction, and material or composition may vary widely according to the stiffness and resilience or "hand" effect desired to be provided in a garment according to the type and weight of the particular garment. Thus the yarns 1 may be monofilament, spun or plied yarns and may be composed of synthetic, natural or metallic materials, glass fibres, or suitable blends of such materials selected to provide the desired stiffness and resilience for the particular application and use. As a typical illustration, the yarns of an interlining material to provide the desired degree of stiffness and resilience, or "hand," to the front portions of men's winter weight suit coats or sport jackets, may consist of 5 mil 66 nylon monofilament yarns secured to the backing sheet 3 in spaced parallel relation, the spacing between the yarns being about $\frac{1}{32}$ of an inch.

The backing sheet 3 is preferably flexible and has sufficient strength or resistance to tearing to retain the yarns 1 in the selected spaced parallel relation during fabrication of the interlining as well as during subsequent handling including cutting the desired interlining pattern and incorporating it into a garment. Similarly, the adhesive 2 employed to secure the yarns 1 to the backing sheet 3 must have sufficient strength to adhere to the yarn 1 to the sheet 3 and preserve the spaced parallel relationship of the yarns relative to each other and said backing sheet during the handling, cutting and tailoring operations previously mentioned. In addition, the combination of the adhesive 2 and the backing sheet 3 must permit the backing sheet 3 to be readily peeled or stripped from the yarns 1 after the interlining has been cut to the desired pattern and secured or anchored in place as hereinafter described, the adhesive 2 must be non-tacky after the backing sheet 3 has been stripped so that residual adhesive on the yarns 1 will not adhere or tend to stick to the adjacent cloth or fabric of the garment or to other portions of the lining. The adhesive should also be of a composition that will not stain or mark the garment fabrics. An example of a suitable thermo-setting adhesive which provides the foregoing requirements and gives satisfactory results is a urea formaldehyde adhesive manufactured by Rohm & Haas Company, Philadelphia, Pa. and available on the market under the trade name or designation Rhonite R-1. Also, other adhesive such as certain waxes and pressure-sensitive adhesives having the foregoing properties may be used.

A feature of the present invention is to the provision of an interlining which may be adhesively secured permanently in place in the garment or other article. To this end, each of the yarns 1 secured to the backing sheet 3 is provided lengthwise along its outer surface diametrically opposite the backing sheet 3, with a continuous stripe or strip 4 of a suitable adhesive as shown in FIGS. 1 and 3 capable of permanently bonding each of the yarns 1 of the interlining to the cloth or fabric of the garment upon application of the required heat and pressure. By utilizing a stripe or strip 4 of the adhesive, each of the yarns 1 of the interlining will be bonded continuously throughout its length to the cloth of the garment or other article and this construction is preferred in most garments. On the other hand, in some applications it may be preferred to secure each of the interlining yarns 1 to the cloth only at predetermined intervals along the length of the yarns 1, in which event the adhesive may be applied to the yarns at predetermined spaced intervals, or spotted, along the length of each yarn, for example, as shown at 5 in FIG. 4 of the drawings.

The adhesive employed must be capable of permanently bonding the yarns 1 to the cloth of the garment or other article and maintain them in the spaced parallel relationship and directional orientation in which initially incorporated into the garment or article, throughout the wear life of the garment and the customary periodic

4

laundering or cleaning and pressing thereof. An example of a thermoplastic adhesive which meets these requirements and gives satisfactory results is a polyester sold by Chicopee Mills, Inc., New York, N.Y. under the trade name or designation Thermogrip 5030. Other thermoplastic materials such as polyethylene, polypropylene and polyamid, both in solid and liquid form, may be used.

The interlining may be manufactured, for example, as diagrammatically illustrated in FIG. 5 of the drawings wherein the desired number of yarns 1 is drawn through a warp beam arrangement comprising a supply roll 6 of the yarns 1, pairs of draw rolls 7, 8 and 9, respectively, and reeds 10 and 11. The reeds 10 and 11 function to establish and maintain the preselected spaced parallel relationship of the yarns 1 desired in the finished interlining material, and the pairs of draw rolls operate to draw the yarns 1 from the supply roll 6 at the desired speed and under a draw tension which, in cooperation with the reeds 10 and 11, maintains the desired spacing and parallel relationship of the yarns during manufacture of the interlining material at least until the yarns 1 are secured to the backing sheet 3.

After the yarns 1 from the supply roll 6 have been drawn through the reed 10, draw rolls 7 and reed 11, the said yarns pass over an adhesive applicator roll 12 which applies to the undersurface of each of the yarns 1 a continuous stripe or strip 2 of a selected adhesive in the reservoir 13. After application of the adhesive, the adhesive coated surfaces of the yarns 1 are engaged by the backing sheet 3 which is drawn from a supply roll 14 thereof at the same speed of travel as the yarns 1. During travel of the yarns 1 over the applicator roll 12 and onto the backing sheet 3, the said yarns are maintained in the desired spaced parallel relationship by the reeds 10 and 11 and the draw-tension on the yarns provided by the successive pairs of draw rolls 7, 8 and 9. The combined backing sheet 3 and yarns 1 thereon then passes through a suitable dryer 15 which is maintained at the temperature required to set and dry the adhesive applied to the yarns by the roll 12 and thereby adhesively secure the yarns 1 in the desired spaced parallel relationship to the backing sheet 3. In lieu of applying the adhesive to the yarns 1 by the roll 12, the adhesive may be applied to the surface of the sheet 3 just prior to inter-engagement of said sheet and the yarns 1.

From the dryer 15 the combined backing sheet 3 and yarns 1 adhesively secured thereon passes between a second set of draw rolls 8 and then beneath an applicator roll 16 which applies a continuous stripe or strip 4 of the selected adhesive to the upwardly facing surface of each of the spaced parallel yarns 1 opposite the backing sheet 3. The backing sheet 3 and yarns 1 with the adhesive 4 thereon then passes through a second dryer 17 which is maintained at a temperature to dry and render non-tacky the adhesive applied to the surfaces of the yarns 1 by the applicator roll 16. From the dryer 17 the interlining material comprising the backing sheet 3 and yarns 1 passes between a pair of draw rolls 9 and thence to a wind-up roll 18 on which the interlining material is wound preparatory to shipment of the roll of interlining material to a clothing factory or other customer to be used as desired or required in the manufacture of garments.

In lieu of the applicator roll 16 which applies a continuous stripe or strip 4 of adhesive to the yarns 1 as shown in FIG. 3 of the drawings, an applicator roll 19 having the surface configuration shown in FIG. 6 may be employed to apply or spot the adhesive at spaced intervals along the surface of the yarns 1 as previously described and shown in FIG. 4.

By way of illustration, to use the interlining material of the present invention, a predetermined length and width thereof may be laid flat upon a cutting table or other surface with the backing sheet 3 facing upwardly. The pattern of the interlining piece 20 to be cut from the material may then be placed or marked upon the surface

5

of the backing sheet 3, care being taken to place or mark the pattern on the backing sheet 3 in the proper relationship to insure that the yarns 1 extend or are oriented in the direction desired when the interlining piece is cut according to said pattern. For example, in the case of an interlining pieces 20 for the lefthand front portion of a man's suit coat or sports jacket, the pattern is placed or marked on the backing sheet 3 so that the yarns 1 of the interlining piece cut from the material will be disposed generally horizontally or crosswise of the interlining as shown in FIG. 7 of the drawings.

After the interlining piece 20 is cut according to the desired pattern from the interlining material, the piece is placed in the desired location and relationship upon the inner surface, for example, of the outer cloth or fabric of the left front portion of the garment as indicated by solid and broken lines in FIG. 8 of the drawings. This may be accomplished by placing the sections of the outer fabric or cloth of the garment, cut to the desired pattern, upon a suitable table or other flat surface with the inner surface of the outer cloth section facing upwardly. The interlining piece 20 which has been cut to the desired pattern as aforesaid is placed in position upon the section of outer cloth of the garment with the backing sheet 3 facing upwardly and the strips 4 of the adhesive on the yarns 1 in contact with the inner surface of the cloth of the garment. The interlining section is then permanently bonded to the inner surface of the front portion of the outer cloth of the garment by means of the strips 4 of adhesive on the yarns 1 of the interlining by the application of sufficient heat and pressure to activate and set the adhesive. Similar steps and procedures may be employed in preparing the piece of interlining for the right hand front portion of the garment and securing it to the cloth of the garment.

After the interlining piece 20 has been permanently secured to the inner surface of the front portion outer cloth of the garment as described, the backing sheet 3 is peeled or stripped from the yarns 1, for example as shown in FIG. 9, leaving each of the yarns 1 of the interlining piece 20 permanently bonded independently to the inner surface of the outer cloth of the garment front portion. The conventional facing 21 and lining 22 of the garment may be tailored into the garment in the usual manner, as shown for example in FIGS. 8 and 10, and the garment completed.

In a garment having an interlining 20 made and assembled in the front sections thereof as described, it will be observed by reference to FIGS. 8 and 10 of the drawings that the closely spaced parallel yarns 1 constituting the interlining not only are secured independently to the inner surface of the outer cloth of the garment, but also extend in a direction generally horizontally or laterally of the garment and the body of the person wearing it. Thus, the "hand" provided to the garment by the interlining yarns 1 is unidirectional and provides the desired stiffness and resilience to the garment only in the horizontal or lateral direction and not in the direction vertically of the garment and the wearer. Also, as shown in FIGS. 10 and 11 of the drawings, the facing 21 and lining 22 of the garment are not attached or connected to the interlining yarns 1 so that relative freedom of movement is provided between the facing and lining with respect to the interlining yarns 1.

In some garments, including coats and jackets, it may be desirable in certain instances to supplement or augment the "hand" provided by the main interlining piece 20 as previously described, and to provide, for example, in the front shoulder area of the garment an additional interlining piece 23 as shown in FIG. 12 of the drawings, disposed in overlying relation to the main interlining piece 20 with the spaced parallel yarns 1 of said additional interlining piece 23 extending at an angle to the underlying yarns 1 of the main interlining piece 20 as illustrated.

This additional interlining piece 23 is of the same

6

construction as the main interlining piece 20 and comprises closely spaced parallel yarns 1 adhesively secured in the manner described to a backing sheet 3 and provided with a coating of adhesive on the outer surface of each of the yarns 1 diametrically opposite the backing sheet 3 for heat-sealing the interlining in a garment. The additional interlining piece 23 may be secured to the underlying main interlining piece 20 by heat-sealing the yarns of the former to the underlying yarns of the latter, as shown in FIG. 14, after which the backing sheet 3 of the interlining material may be peeled or stripped from the yarns of the interlining piece 23 as illustrated in FIG. 12.

Another use of the present invention as the interlining for the attached collar 25 of a man's shirt 26 is shown in FIGS. 15 and 16 of the drawings. The interlining material is cut to a pattern so that the parallel yarns 1 thereof are disposed generally parallel to the forward or front edge seams 27 of the collar and extend from the bottom edge seam 28 substantially to the top of the collar as illustrated. The yarns 1 of the interlining material preferably are bonded by heat sealing to the inner surface of the outer collar fabric 29, but it will be apparent that the yarns 1 could be bonded to the collar lining fabric 30 if desired. Of course, after the yarns 1 are bonded to the collar fabric the backing sheet 3 is peeled or stripped from the yarns as previously described. Also, in a shirt collar 25 it is not necessary that the interlining extend circumferentially throughout the entire collar and in many instances the interlining material need only extend circumferentially inward from the front edge seams 27 of the collar to a point adjacent the side of the wearer's neck, for example as indicated at 31.

As previously stated the interlining of the present invention may be used effectively to stabilize knitted fabrics. One objectionable characteristic of knitted fabrics is the tendency of the fabric stitches to become distorted by stretching or elongation and accompanying widthwise narrowing of the fabric, and this tendency can be eliminated and the knitted fabric substantially stabilized by bonding to the inner surface thereof the yarns 1 of the present interlining material and then stripping or peeling off the backing sheet 3. This can be accomplished following knitting of the goods in the piece or in the finished garments or other articles made therefrom.

While certain embodiments of the present invention have been illustrated and described herein it is not intended to limit the invention to such disclosures, and it is contemplated that changes and modifications may be made in and to the invention within the scope of the following claims.

We claim:

1. Garment interlining comprising a backing of flexible sheet material, a plurality of yarns extending continuously in spaced parallel straight-line relation over one entire surface of the backing sheet, first adhesive means releasably securing said backing sheet to each of said spaced parallel yarns, and second adhesive means on the outer surface of each yarn at the opposite side thereof from the backing sheet for permanently bonding the yarns independently to an adjacent surface of a garment in said closely spaced parallel relation, the first adhesive means normally maintaining the yarns in said spaced parallel relation on said sheet until said yarns are permanently bonded to a surface of the garment by said second adhesive means, the backing sheet being peelable from the yarns and residual first adhesive on said yarns after the backing sheet is peeled therefrom being non-tacky.

2. Garment interlining as claimed in claim 1 wherein the first adhesive means securing the yarns to the backing sheet is a thermo-setting adhesive.

3. Garment interlining as claimed in claim 1 wherein the adhesive on the yarns for bonding the latter to an adjacent surface is a thermoplastic adhesive.

4. Garment interlining as claimed in claim 1 wherein the yarns are monofilament yarns.

References Cited

UNITED STATES PATENTS

1,323,606	12/1919	Midgley	156—436X
2,561,781	7/1951	Bruce	161—406UN
2,780,572	2/1957	Carlson	161—141X

3,077,947	2/1963	Peebles et al.	161—143X
3,083,131	3/1963	Wentz	156—174

WILLIAM A. POWELL, Primary Examiner

2—272; 156—178, 249, 291, 302, 436; 161—146, 148, 167, 406