This invention relates to the construction of garments employing stays, particularly shirt collars and more particularly to stays for employment in such garments and which are normally subjected to laundering operations.

This application is a division of my application Serial No. 167,332, filed June 10, 1950, now Patent No. 2,701,880, granted February 15, 1955, for Collar and Like Stayed Construction.

Known to me is the employment of stays made from spring metal and thermoplastic material, such as cellulose nitrate, cellulose acetate, which are formed into sheets, and affixed into a pocket formed in a collar, to leave the major portion of the collar or garment soft and comfortable, while distending predetermined portions of the garment, such as the points, in a neat manner, free from wrinkles and creases. Stays made of the above thermoplastic materials, if left in the garment while subjected to laundering operations, are calculated to resist the laundering operations but do not resist temperatures employed in ironing apparel, but become tacky and tend to cement the layers of fabric to each other. Likewise, the stay either breaks, creases or tears the garment, if left in position during laundering, to mar the goods.

Repeated laundering of garments, with the usual practice of removing the stay, is accomplished by an accumulation of starch in the pocket for the stay, to make replacement of the original stay in the intended position within the garment difficult.

The use of the foregoing materials, which may be characterized as whalebone substitutes, has resulted in the development of garments to receive the same which make provision for removal of the stay before laundering, at the risk of tearing or maring the garment if not so removed. Attempts to simulate, in a degree, the effect of starch in ironing garments by fusion processes are known to me, but these, as in the case of fusible stays, such as cellulose acetate, bind the plies of fabric together during ironing, eventually to weaken the fabric.

I have discovered that mere durability during laundering of materials employed as stays, such as for example as metal strips, nitrocellulose foils or sheets, cellulose acetate foils or sheets, which has been the objective heretofore in the selection of materials for stays is a property to be avoided. I have discovered that by the employment of a stay having a temporary condition of limpness during laundering and the property of absorbing water or the like laundering fluids to become reduced to a limp condition, coupled with a property for restoration of stiffness or horniness under drying temperatures, will permit of a collar construction which when dry, after ironing, has all the desirable attributes of a stayed garment, without sacrificing any element of appearance, if initially constructed as part of the garment or retained herein, designedly or accidentally.

Specifically, my invention is predicated upon the discovery of a material which, when formed into sheets by moulding or extrusion in predetermined thickness, has the desired hornary character of snap stiffness, to act as a stay but, because it absorbs water and other aqueous materials used in laundering or cleaning garments, has been considered objectionable for use wherever indiscriminate ironing temperatures are to be employed.

Specifically, I have discovered that the employment as a stay of a normal water repellant, hornary sheeted material which has relatively high water absorption characteristics, to become relatively limp, permits an unrestrained laundering operation and the subsequent ironing operations to be performed on the garment with the stay retained therein, without sacrificing the desired properties of horniness or stiffness of the stay when the material combines the hereinafter described characteristics.

Still more particularly, it is an object of my invention to provide a garment and stay which may hold the stay against displacement from the desired place once it is combined with the garment, and which is characterized by (1) a hornary quality for stiffening predetermined portions of the garment, and when laundered, absorbing sufficient water and/or laundering fluids to become relatively limp, not to interfere with the laundering operations; (2) which does not become tacky at temperatures below scorching of the fabric, to permit repeated laundering operations without uniting or integrating the plies to each other and diffusing the stay material into the fabric, tending to tear the plies; (3) which responds to heat for ironing below scorching temperatures of the fabric, to restore the original hornary staying property; (4) providing a material of low thickness with relation to the fabric it underlies, to provide the requisite staying property without marring the surface of the overlying layer by displaying ridges when ironed with the stay in position.

Still more particularly it is an object of my invention to provide a garment construction employing stays which will permit employment of stays during manufacture without uneconomical departure from commercial methods for making these garments, while embodying features permitting laundering of the garments with the stays embodied therein.

Still more particularly it is an object of my invention to provide a stay for reinforcing articles of apparel which will have all the advantages of removability from a garment and which will not adversely affect the garment left in it while subjected to normal laundering and ironing operations.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, I make reference to the accompanying drawing forming a part hereof, in which—

FIGURE 1 is a fragmentary plan view of a collar illustrating my invention;

FIGURE 2 is a plan view of the stay embodied in the garment in accordance with FIGURE 1;

FIGURE 3 is a magnified section taken on the line 3—3 of FIGURE 1;

FIGURE 4 is a fragmentary plan view of a collar in accordance with another embodiment of my invention;

FIGURE 5 is a plan view of a stay to be embodied therein;

FIGURE 6 is a section taken on the line 6—6 of FIGURE 4;

FIGURE 7 is a plan view of a fragment of a collar in accordance with another embodiment of my invention;

FIGURE 8 is a stay to be embodied therein;

FIGURE 9 is a magnified section taken on the line 9—9 of FIGURE 7;

FIGURE 10 is a fragmentary plan view of a still further embodiment of my invention;

FIGURE 11 is a section taken on the line 11—11 of FIGURE 10;

FIGURE 12 is a fragmentary plan view of a collar embodying another embodiment of my invention;

FIGURE 13 is a magnified section taken on the line 13—13 of FIGURE 12;
FIGURE 14 is a perspective view of the plies combined with the stay before turning. FIGURE 15 is a fragmentary perspective view of a collar and stay showing the plies and stay of another embodiment of my invention; FIGURE 16 is a plan view of the stay to be embodied in the assembly shown in FIGURE 15; FIGURE 17 is a fragmentary perspective view of a collar showing the plies and stay of still another embodiment; FIGURE 18 is a plan view of the stay to be embodied in the assembly shown in FIGURE 17.

My invention, in summary, resides in the provision of a stay which has the requisite horny characteristic of resilient snap stiffness, i.e., stiffness to distort the garment and give it a neat appearance; absorbs water and becomes limp to permit laundering operations to be carried out without tearing the fabric with which it is combined; may be permanently retained in the garment and resists ironing temperatures tending to laminate or unify the plies with which it is combined; does not weaken when ironed yet responds to restoration to the initially stiff condition; has requisite staying properties or stiffness without being of such bulk as to form ridges when ironed in the garment; the provision of a garment, such as a collar, which may be incorporated in it as part of the collar producing operations, to provide the desired staying effect, permitting laundering by becoming limp without tearing the collar, and may undergo repeated laundering operations without weakening the collar structure or stay.

More specifically, my invention resides in embodying a nylon or rayon stay, removable or permanently, in a collar, at predetermined portions to be stayed, and to undergo laundering operations without harmful effects by reason of the absorption of water, to render the stays soft or resiliently limp when wet, and reverting to its original form or horny, stiffened condition when dry, and during normal or displaced in the garment exhibiting no adhesive tendencies. By way of further defining the terms "soft or resiliently limp" as used herein, it is contemplated to embrace the condition that under aqueous laundering operations of a shirt having a nylon collar stay in accordance with the teachings of the present invention, the stay is deformable and yields with the shirt fabric so as not to pierce the fabric.

In the drawing there is illustrated a fragment of a neckband 10 of a shirt, to which is sewn a collar 11 comprising the facing ply 12, the back ply 13, the liner 14, which ply is sewn together by the peripheral rows of stitches 15 for the three plies and with the row of stitches 16 uniting the back ply and lining, to form the stay pocket 17, and then turned to the obverse side and united by the row of border stitches 18, leaving an open entrance end 19 and an abutment wall 20 adjacent the collar point 21. The mouth 19 may be finished by a seam to lie adjacent the fold line of the collar band, in which event a stay may be inserted in the pocket 17 provided at each corner after the collar and shirt to which it is applied is completed. The mouth 19 may be closed by the row of stitches 22 for attaching the collar to the band, in which event the stay may be incorporated before the collar making operations are completed and then the collar operations of attaching the collar to the neckband may be accomplished.

Where the stay is inserted after the collar is completed, I may employ a form of stay pocket 12c, as in FIGURE 14, or the stays may be incorporated in the laundering operations, notwithstanding the slit 19 not being closed by stitching. In this form of construction I provide a water repellant, horny stay 23, deformable by water, of the material hereinafter to be described, having an angular forward edge 24 contiguous to and 20 of the stay pocket 17 previously described. The edges 25 and 26 are formed with barbs 27, whose points are directed away from the edge 24. These barbs, serrations or saw teeth are spaced apart with some relation to the spacing between the rows of stitches 16 and 18 and the penetrating point of these stitches through the plies forming the pocket 17, so that the pocket is distended and the slits 27 enter the plies between the stitches, and engage the same to prevent accidental displacement, and urge the edge 24 into engagement with the bottom wall 20. Where the stay 23 is made with the engaging edges as described, standard collar construction practices may be followed as with those permitting removable stays. However, laundering will not displace the stay from position, and upon being subjected to the pressing or ironing operations, the relatively limp stay, even though creased in laundering, may be restored to horny stiffness. This present operation may be carried out without leaving unslit ridges when a thickness of stay is employed as hereinafter described. Ironing temperatures up to those which will scorch cotton or wool may be employed, without rendering the stay tacky, to disperse it in the superficies of the fabric and laminate the plies, where made of the materials hereinafter described.

In FIGURES 4, 5 and 6 I have shown another embodiment of my invention in which the stay 29a has an end edge 29e, with the side edges 29d and 26a left smooth as in the use of commonly employed stays which are to be removed. The end edge 29e of the stay 29a of the collar 11c is formed with a pocket 17e between the back layer 13e and the liner layer 14a. A slotted portion 19a, spaced from the stitch line 22a, permits insertion of the stay therethrough. The slots 19a being spaced from the stitch line and the end 24b of the stay being extended to the fold line of the collar, accidental displacement with is avoided in normal use. The utility of this form of construction will be described in connection with the embodiments hereinafter referred to.

In FIGURES 7, 8 and 9 a still further embodiment of my invention is illustrated wherein the collar 11b is formed with pocket 17b, as in FIGURE 14, as hereinbefore described. In this form of construction, a stay 23b is provided having the side edges thereof smooth as in the embodiment illustrated in FIGURE 5. The end 24c is formed with a slot 24d, providing bifurcations or fingers 24e. In the embodiment illustrated in FIGURE 7, the collar may be provided with a stay pocket 17b normally employed for removable stays illustrated in FIGURES 1 and 4. The rear ply 13b is formed with a layer terminating into an edge 19b, forming an entrance to the pocket to receive the stay 23b. The plies comprising the collar back ply 14b and lining ply 14d are connected to the collar, with tacking stitches 28, 29 and 30, to provide loops 31 which may be engaged by the fingers 24e, previously described, spanning the through stitch 29, to prevent displacement of the stay when it has been pushed into the pocket, passed the entrance 19b so that the edge 24f abuts the pocket adjacent the bottom wall 20. Displacement of the stay is thereby prevented.

In the embodiment illustrated in FIGURE 10, I show a collar 11c whose back ply 13c and lining ply 14c are joined to the face ply 12c in the normal way in making collars, before attachment to the band, where three plies of fabric are employed. At this stage, a stay strip 23c is inserted and the stay is tacked in corner engaging position by the rows of stitches 32, after applying the plies with the usual peripheral stitch 33. The composite then permits turning of the collar to position the face ply to lie to one side, with the collar 11c and the row of stitches 34 is applied. The stay strip 23c is thereby incorporated into the garment during the manufacturing process.

The width of the stay strip in this embodiment may be extended to permit the staying action with a relatively thin ply and herein described so that instead of relying upon the distending force of a narrow strip of stiffener material a more extensive width may be employed of a lesser gauge.
In the embodiment illustrated in FIGURES 12 to 14, there is illustrated a collar 11d whereby the strip of stay material 23a is united to the collar during the same stitching operation employed for uniting the plies to each other. As shown in FIGURE 14, the collar plies are arranged to position the liner ply 35 to one side of the facing material 36, with the rear face ply 37 overlying the facing ply 35. When these plies are co-terminal, the row of stitches 38 is passed through the three plies and the overlying stay strip 23d, to unite the plies and stay at the same operation. Thereupon, in turning the collar a relationship of the parts is secured as shown in FIGURE 13, with the seam forming the edge of the collar.

With wool shirtings of heavy bodied shirting fabric, a row of border stitches 39 may be passed through the plies 36, 35, 37 and the stay 23d. The row of border stitches 39 may, however, be omitted as the peripheral edge 23e of the stay which is closely adjacent to the row of stitches 38 will hold the collar stretched by the stay 23d.

In the embodiment illustrated in FIGURES 15 and 16, there is shown a collar 11e wherein the strip of stay material 23b is united to the collar before attachment of the collar to the collar band or shirt. As shown in FIGURE 15, the collar plies are arranged to position the liner ply 35a to one side of the facing material 36a, with the rear face ply 37a overlying the liner ply after turning in the normal way. The rear face ply 37a adjacent the edge 40 is spaced from the fold line 41 at an angle to provide a spaced edge 42 running diagonally from the liner ply 35a. Rows of stitches 43–44 define a pocket having a mouth portion 44. Through this mouth there is extended the stay 23f whose angularly pointed edge 45 conforms congruently to the collar point 46. Its rear edge 47 is extended to become exposed adjacent the edge 42. A perforation 48 is arranged to receive a tacking stitch 49 passing through the ply 35a. This tacking stitch may be applied after the collar is turned and before the edge 41 is affixed to the shirt or to the collar band, if such is employed. Thereafter, the edge 41 is affixed to the shirt or collar band by the usual procedure.

The tacking stitch as described permanently retains the stay 23f in the collar for laundering operations, as previously described in connection with the prior embodiments.

Should the user find it undesirable to employ a stay in the shirt that he purchases, he may sever the tacking stitch 49 to permit removal or sever the stay by a scissors cut 49e shown by the dotted line. The severance of the tacking stitch or by a snip likewise permits a selection of use of the collar with or without a stay.

In the embodiment illustrated in FIGURES 17 and 18, a similar arrangement is shown with regard to the collar structure as shown in FIGURE 15. In this embodiment, however, the stay 23g is formed adjacent its rearmost end 47e with a tongue 48e having a lobe 50, laterally directed in the path of the reentrance slot 51, to form a displaced mouth 52. The position of the tongue 48a with regard to the edge 43 is calculated to be such that it is retained within the pocket defined by the rows of stitches 43–43. A tacking stitch 49f is applied to pass through the plies 35a and 37a after the collar is turned and the stay 23g is slid into position. The loop thus formed through the layers acts as an anchor for the engagement of the tongue 48a, holding the stay against accidental displacement once the stay has been in the collar, and may be used in permanent form when the collar undergoes the laundering operations, including washing and ironing, as previously described. However, the open mouth 42 of the slot permits the removal of the stay by backing the lobe 50 into the pocket, to disengage the tongue from the tacking stitch 49f.

By the constructions described, I have provided a combination collar and stay in which the stay is permanently incorporated in the collar, temporarily incorporated there-
herein contemplated is intended to include nylon in solid sheet form, and will be so referred to in the claim to distinguish from the woven, filamentary fabric which may be made from related compounds of nylon. By “solid” as used herein, it is intended to cover the hereindescribed cast or extruded sheeted material, as contrasted with the woven arrangement of monofilaments or yarns of such nylon.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

A shirt collar made of a plurality of fabric plies, stitches through at least a pair of said plies joining the plies to each other, a stay through which a row of such stitches is directed to form a permanent assembly, said stay consisting of a sheet of a thickness of from .010 to .025", having the stiffness characteristics of temporary limpness during laundering, and restorable to its original dry stiffness, and non-tacky delaminating properties after ironing, of the order of those of nylon FM10001.

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