COLLAR AND LIKE STAYED CONSTRUCTION

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

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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.

Known to me is the employment of stays made from spring metal and thermoplastic material, such as cellulose nitrate, 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 portion 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, they either break, crease or tear the garment, if left in position during laundering, to mar the goods.

Repetitive laundering of garments, with the usual practice of removing the stay, is accompanied 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 marring 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 produce acetate, bind the plies of fabric together during ironing, eventually to weaken the fabric. I have discovered that other durability during laundering can be achieved by employing as stays, such 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 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 horny 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 repellent, horny sheeted material which has relatively high water absorption character, distortedly 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 hereinbelow 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 horny quality for stiffening predetermined portions of thegarment, and when laundered at temperatures sufficient water and/or laundering fluids to become relatively limp, not to interfere with the laundering operations; (2) which does not become sticky 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 horny stay property; (4) providing a material of low thickness with relation to the fabric it underlies, to provide the requisite stay 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 the garments, and 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 sectional view along the line 2--2 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 sectional view of 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 sectional view along 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 sectional view of 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 sectional view along the line 13--13 of Figure 12;

Figure 14 is a perspective view of the stays 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 and stay 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 distend the garment and give it a neat appearance; absorbs water and becomes
l imp 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 resist lin-

2,701,880 3 limp to permit laundering operations to be carried out without tearing the fabric with which it is combined; does not weaken when ironed yet responds to restoration to the initially stiff condition; has room for movement provided thereby for the removal of such bulk as to form ridges when ironed in the garment; the provision of a garment, such as a collar, which has a stay incorporated in it for the purpose of allowing laun-

20 25 ding operations, to provide the desired staying effect, per-
mitting laundering by becoming limp without tearing the collar, and may undergo repeated laundering opera-

25 tions without weakening the collar itself or the garment as a whole.

More specifically, my invention resides in embodying a nylon stay, removably or permanently, in a collar as pre-

30 determined portions to be stayed, and to undergo laun-

dering operations without harmful effects by reason of the absorption of water, to render the stays soft or re-

siliently limp when wet, and reverting to its original form or being stiftened upon drying, without the permanance of a limp condition when dry, and during nor-

35 mal ironing of the garment exhibiting no adhesive ten-
cencies. By way of further defining the terms 'soft or resiliant limply' as used herein, it is contemplated to em-

brace the condition that under aqueous laundering operations of a shirt having a nylon collar stay in accord-

40 ance with the teachings of the present invention, the stay is deformed, and yields with the shirt fabric so as not to 

45 present the fabric.

In the drawing there is illustrated a fragment of a neckband 10 of a shirt, to which is sewn a collar 11 com-

46 prising a back ply 12, the bearing edge of which composite is sewn together by the peripheral row of

50 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. The stay 23 is then turned to the obverse side and united with the row of border stitches 18, leaving an open entrance 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, or the mouth 19 of a stay may be inserted in the pocket 17 provided at each corner after the collar and shirt to which it is applied is com-

55 pleted, or 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 stays or strips 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 which is not removed or

60 displaced by the laundering operations, namely, the slit 19 not being closed by stitching. In this form of construc-

65 tion 1 provide a water repellent, horny stay 33, to be seamed in by water, of the material hereinafter to be de-

70 scribed, having an engaging forward edge 24 for form-

75 ing to the end 20 of the stay pocket 17 previously described. The edges 25 and 26 are formed with bars 27, and are commonly employed stay from the edge 24. These bars, 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 thorough the plies forming the pocket 17, so that the pocket is distended and the darts 27 enter the plies between the stitches, and engage the same to prevent accidental displacement, and urge the edge 24 into engage-

80 ment 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

85 will not dislodge the stay from position, and upon being subjected to the pressing or ironing operations, the rela-

tively limp stay, even though creased in laundering, may be reformed without dislocation. Removable stays may be carried out without leaving marring ridges where a thickness of stay is employed as hereinafter described.

90 Heating temperatures up to those which will scorch cotton or wool will not damage or discolor the stays, but may be tacky, to disperse it in the supercices of the fabric and laminate the plies, where made of the materials herein-

95 fore described.

In Figures 4, 5 and 6 I have shown another embodiment of my invention in which the stay 23a has an edge 24a, with the side edges 25a and 26a left smooth as in the preferred form, and used to support stays which are to be removed from garments. The garment in the form of a collar 11a is formed with a pocket 17a between the back layer 15a and the liner layer 14a. A slotted portion 19a, spaced from the outer face of the collar, permits insertion of the stay therethrough. The slot 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 is avoided in the present operation and the stiffness without the dis-

100 location described in connection with the embodiments hereinafter referred to.

In Figure 7 a still further embodiment of my invention is illustrated wherein the collar 11b is formed with a stay pocket 17b, as in the first embodiment de-

scribed by me. In this form of construction, a stay 23b is provided having a weakening of the collar by the front edge 46. Its rear edge 47 is extended to become exposed adjacent the edge 46 of the stay therethrough. The stay 23b is spaced from the stitch line 24d, providing bifurcations or fingers 4a. In the embodiment illustrated in Figure 7, the col-

120 lar may be provided with a stay pocket 17b normally employed for removable stays illustrated in Figures 4 and 5. The rear ply 15b is formed with a layer termi-

nating into an edge 19b, forming an entrance to the 

125 pocket to receive the stay 23b. The plies comprising the back ply and lining ply 14b are supplied before turn-

ing the collar, with tacking stitches 28, 29 and 30, to provide loops 31 which may be engaged by the fingers 4a, previously described, spanning the through stitch 29, to prevent displacement of the stay when it has been pushed into the pocket, past the entrance 19b so that the edge 24a enters the pocket wall 20. Displacement of the stay is thereby prevented.

In the embodiment illustrated in Figure 10, I show a collar back 11c whose back ply 13c and lining ply 14c are joined to the face ply 12c in the manner described for the back and collars, before attachment to the band, where three plies of fabric are employed. At this stage, a stay strip 23c is inserted into the stay pocket in accordance with 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, in which event each of the border stitches 34c is applied. The stay strip 23c is then incor-

150 porated into the garment during the manufacturing process by means of stitching.

The width of the stay strip in this embodiment may be extended to permit the staying action with a relatively thinner form of stay material as herein employed so that in place 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 provided whereby the strip of stay material 23d is united to the collar during the stitching operation employed for uniting the plies to each other. As shown in Figure 14, the collar plies are arranged with a facing ply 36a on the front face of the material 36, with the rear face ply 37a overlying the facing ply 36. The edges of these plies are co-terminous, the row of stitches 38 is passed through the three plies and the overlapping 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 shirts of heavy bodied shirt 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 Figure 16 and 17, there is shown a collar 11e wherein the strip of stay material 23f is united to the collar before attachment of the collar to the band or shirt. As shown in Figure 15, the collar plies are arranged to have a liner ply 35a to one side of the facing material 36a, with the rear face ply 37a overlying the liner ply after turn-

190 ing in the present operation. The engaging edge 46 of the stay 23f is spaced from the fold line 41 at an angle to provide a spaced edge 42 running diagonally over the liner ply 35a. Rows of stitches 43-48 define a pocket having a mouth portion 49, and it is extended the stay 23f whose angularly pointed edge 45 forms congruently to the collar point 46. Its rear edge 47 is extended to become exposed adjacent the edge 48. A perforation 45 is arranged to receive a tack-
ing 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 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 and sever the stay by a scissor cut 49a shown by the dotted line. The severance of the tacking stitch or by a slit likewise permits a selection of use of the collar band 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 23f is formed adjacent its rearmost end 47c with a tongue 48a having a loke 50, laterally directed in the path of the reentrant slot 51, to form a displaced mouth 52. The position of the tongue 48a is calculated to be such that it is retained within the pocket defined by the rows of stitches 43—44. A tacking stitch 49b is applied to pass through the plies 35b—37a after the collar is turned and as shown in the view 23b. The loop thus formed through the layers acts as an anchor for the engagement of the tongue 48a, holding the stay against accidental removal. Once the stay has been incorporated 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 of the removal of the stay by backing the loke 50 into the pocket, to disengage the tongue from the tacking stitch 49b.

All the constructions described, I have provided a combination collar and stay in which the stay is permanently incorporated in the collar, temporarily incorporated in or permanently incorporated therein, as the ease of the wearer may dictate. However, in each instance the stay may be retained in the collar assembly to undergo the laundering operations, including ironing, to restore the assembly to its original condition, with the benefits heretofore emphasized.

It will be observed that by the various constructions described, normal collar making procedure may be followed to provide a stay which may be removably included in the assembly as illustrated in Figures 1 to 9, 17, and 18, or permanently included, as illustrated in Figures 9 to 12, as part of the shirt making procedure, adding little or no additional cost to the usual fabricating process and in no way interfering with such prior routine procedural practices in making collars with removable stays.

The material which 1 employ is nylon, extruded or cast to a thickness ranging from .010 to .015 inch, for combination with a shirring material of the class such as percale, broadcloth, cotton, wool, flannel, in accordance with the thickness of such shirring, having a melting point of approximately 507° F., a tensile strength of 10,530 pounds at 77° F., a modulus of elasticity of about 325,000 pounds per square inch, and a stiffness of about 290,000 pounds per square inch, and a water absorption factor of 1.5%, said stay being characterized by its washability in a shirting material and being deformable and yielding with the shirt fabric so as not to pierce the fabric during aqueous laundering operations, and being restorable upon ironing of the fabric up to the charring point of the fabric to restore the stay substantially to its original form, without adhesive lamina-

The incident pressure will restore the strip from the wet condition or with absorbed water to cause a degree of limpness, the herringbone springiness and snap, without tuck or penetration of the fabric with which the stay is combined.

Any creases which may have been formed in the stay by reason of the laundering process are removed by the hot ironing operation which is applied to the fabric, likewise to remove the creases from the stay as well as to re-establish the herring bone springiness of the original, dry stay.

In general, the thickness of the nylon is chosen with regard to the fabric with which the stay is combined. Thus, a thickness of .010 to .015 inch has been employed with broadcloth or percale shirting material in that under temperatures normally employed for ironing such shirtings, there will not result any discernable goring or chafe caused by the edge of the stay, whereas with thicker shirtings, such as wool or flannels, a thicker stay may be employed, without evidencing ridges in ironing the composite.

The term "nylon" as employed herein is the generic term for any long-chain synthetic polymeric amide which has recurring amide groups as an integral part of the main polymer chain, and which is capable of being formed into a filament in which the structural elements are oriented in the direction of the axis, the basic constituent of which is made under United States Patents No. 2,071,250 issued February 16, 1937 and Carothers No. 2,130,523, issued September 30, 1938.

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

1. A collar stay of sheeted nylon of a thickness ranging from .010 to .025 inch, for combination with a shirring material of the class such as percale, broadcloth, cotton, wool, flannel, in accordance with the thickness of such shirring, having a melting point of approximately 507° F., a tensile strength of 10,530 pounds at 77° F., a modulus of elasticity of about 325,000 pounds per square inch, and a stiffness of about 290,000 pounds per square inch, and a water absorption factor of 1.5%, said stay being characterized by its washability in a shirting material and being deformable and yielding with the shirt fabric so as not to pierce the fabric during aqueous laundering operations, and being restorable upon ironing of the fabric with which it is combined as a stay substantially to its original form, without adhesive lamina-

2. A collar stay of sheeted nylon of a thickness of .015 inch for shirting material comprising percale or broadcloth, characterized by a melting point of approximately 507° F.; a tensile strength of 10,530 pounds at 77° F.; a modulus of elasticity of about 325,000 pounds per square inch, and a stiffness of about 290,000 pounds per square inch, and a water absorption factor of 1.5%, said stay being characterized by its washability in a shirting material and being deformable and yielding with the shirt fabric so as not to pierce the fabric during aqueous laundering operations, and being restorable upon ironing of the fabric up to the charring point of the fabric to restore the stay substantially to its original form, without adhesive lamina-

3. A shirt collar stay of sheeted nylon of a thickness capable of being pierced in the collar sewing operations, such as upon aqueous laundering in combination with the fabric and ironing of the same, evidences no superficial bulk on the face of the collar, said stay imparting to the collar a herringbone springiness and snap, ability to withstand laundering, said stay being characterized by a melting point of from 455 F. to 507 F.; a flexural strength at 77° F. of from 8,000 to 13,000 pounds per square inch, a stiffness of from 1,600 to 2,200 pounds per square inch, a water absorption factor not in excess of 2.3% and a minimum of .44% said stay being characterized by its washability in a shirting material and being deformable and yielding with the shirt fabric so as not to pierce the fabric during aqueous laundering operations, and being restorable upon ironing of the fabric up to the charring point of the fabric to restore the stay substantially to its original form, without adhesive lamina-

4. An article of apparel including a stay comprising a collar or the like made from a plurality of percale or broadcloth, said stay being characterized by its washability in a shirting material and being deformable and yielding with the shirt fabric so as not to pierce the fabric during aqueous laundering operations, and being restorable upon ironing of the fabric up to the charring point of the fabric to restore the stay substantially to its original form, without adhesive lamina-

stitched together at spaced points to define a stay pouch,
an edge of said stay having engaging means, said stay being a sheeted strip in accordance with claim 1.

5. An article of apparel including a stay, comprising a collar or the like made from a plurality of fabric layers, stitched together at spaced points to define a stay pouch, an edge of said stay having engaging means, said stay being a sheeted strip in accordance with claim 2.

6. An article of apparel including a stay, comprising a collar or the like made from a plurality of fabric layers, stitched together at spaced points to define a stay pouch, an edge of said stay having engaging means, said stay being a sheeted strip in accordance with claim 3.