J. B. BOLTON.

COLLAR.

APPLICATION FILED FEB. 26, 1914. RENEWED OCT. 29, 1919.

1,383,693. Patented July 5, 1921.

3 SHEETS—SHEET 1.

Fig. 1

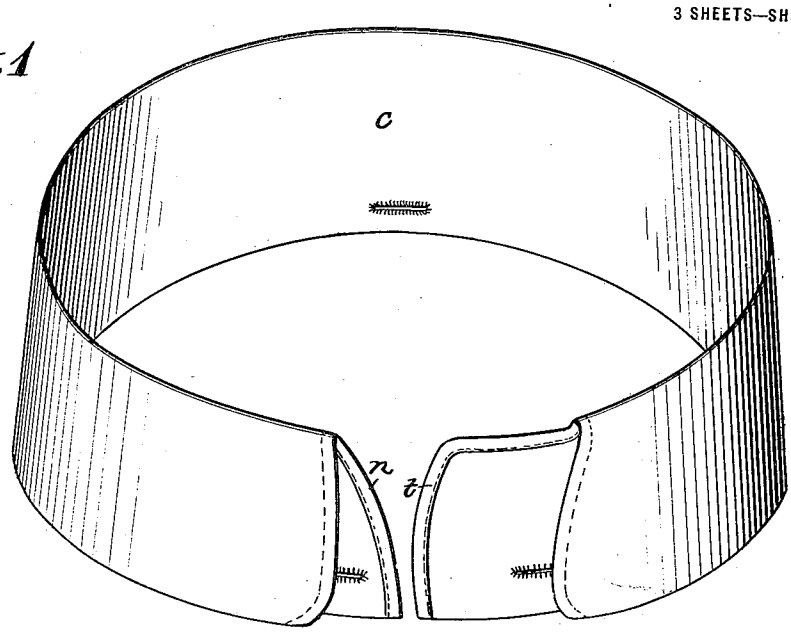


Fig. 2.

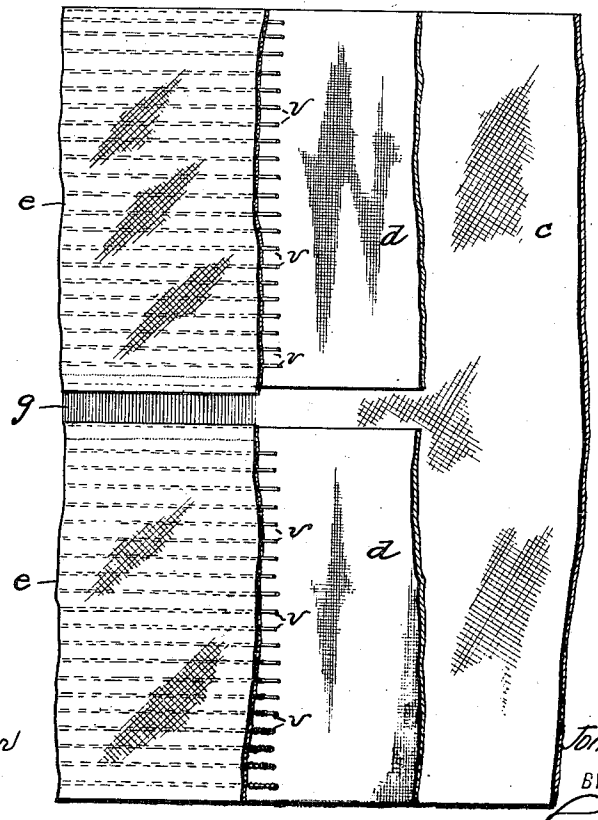
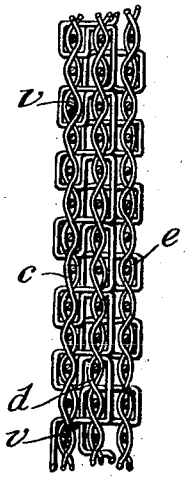


Fig. 11.



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3 SHEETS—SHEET 2.

Fig. 4,

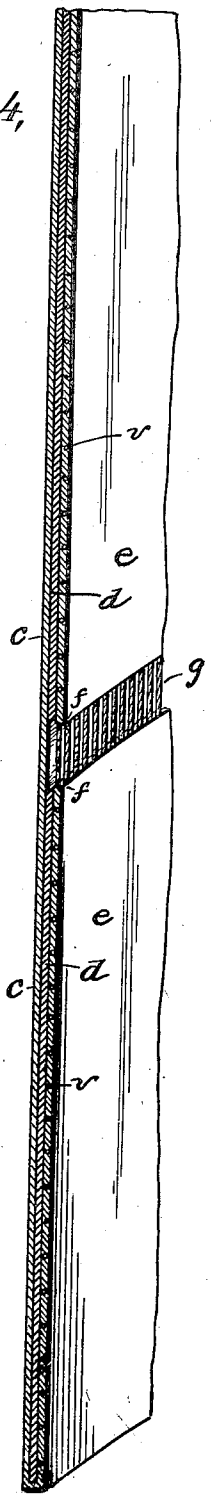


Fig. 5,

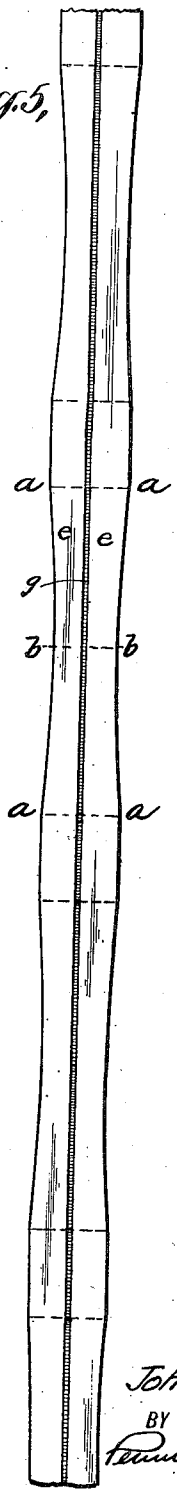


Fig. 6,

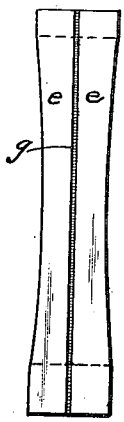
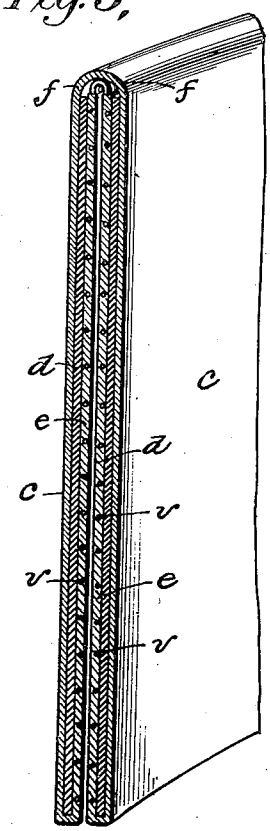


Fig. 3,



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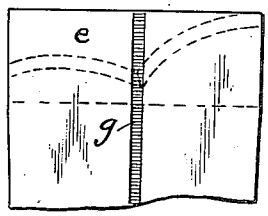
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3 SHEETS—SHEET 3.

Fig. 7,



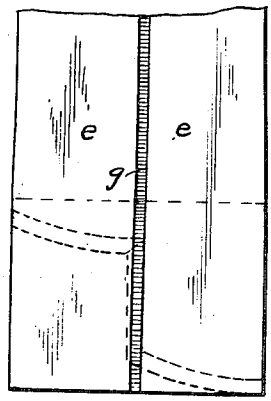
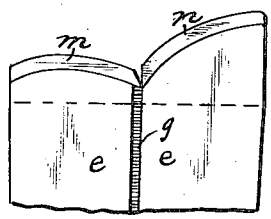


Fig. 8,



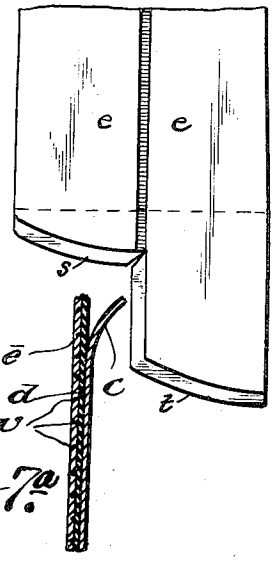
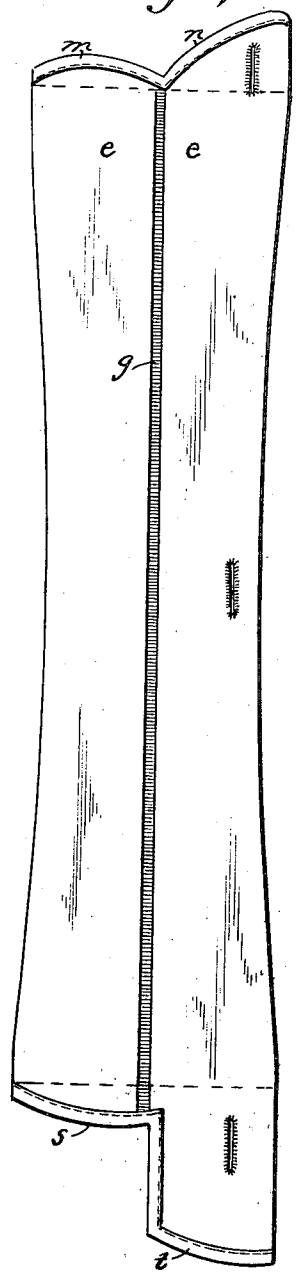


Fig. 7a.

Fig. 9,



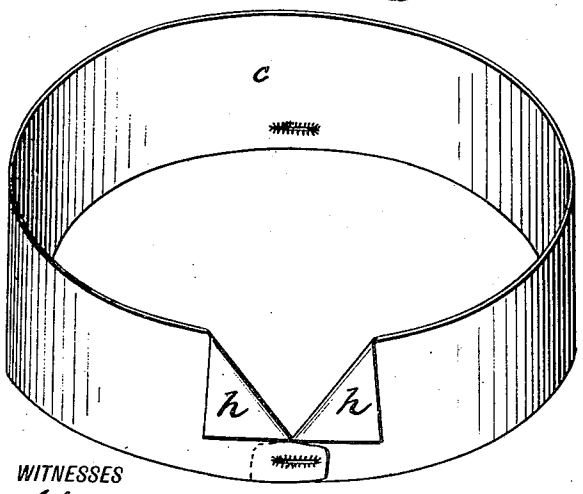


Fig. 10.

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COLLAR.

1,383,693. Specification of Letters Patent. Patented July 5, 1921.

Application filed February 26, 1914, Serial No. 821,350. Renewed October 29, 1919. Serial No. 334,375.

To all whom it may concern:

Be it known that I, JOHN B. BOLTON, a citizen of the United States, residing at Methuen, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Collars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in collars.

The invention provides a collar of multiple-ply interwoven fabric which is sufficiently stiff to maintain its shape without the employment of starch, and is nevertheless sufficiently pliable to assume the necessary curvature to fit the neck of the wearer without undue rigidity. Accordingly the collar may be washed and, if desired, ironed, without the supplemental use of starch, which, therefore, becomes unnecessary in the laundry operation. So, also, the invention assures for the collar what may be called a "soft roll," in the sense of providing, along the line of bend, in collars of the turnover type, a flexible section of increased flexibility in the multiple-ply interwoven collar fabric, preferably of less thickness or stiffness than the main body portion of the collar so that the collar is provided with a portion of increased flexibility at the fold edge thereof between the neck band and turn down portions of the collar. This feature of the invention permits the collar to be readily folded along the line of bend without putting undue strain upon the fabric and gives a relatively soft surface of contact between the upper edge of the collar represented by such bent portion and the neck of the wearer. Furthermore, the mode of manufacture of the fabric from which the collar is made permits the end flaps, tips and like projections to be protected by the reverse folding of one of the constituent layers of the fabric, so as to leave no rough, unfinished, or stitched edges along the margin line of such tips or projections.

In the accompanying drawings.—

Figure 1 represents, in perspective, a turn-down collar embodying the improvements;

Fig. 2 represents a fragmentary plan view, on a larger scale, of the multiple-ply interwoven fabric from which the collar is made, and shows the several layers thereof;

Fig. 3 represents, on a still larger scale, partly in cross-section and partly in perspective, a portion of the folded fabric;

Fig. 4 represents, partly in cross-section and partly in perspective, a portion of the fabric before folding;

Fig. 5 represents a plan view of a strip of fabric, woven in collar lengths;

Fig. 6 represents a single collar length or blank cut from said strip;

Figs. 7, 8 and 9, represent various steps in the production of the collar from the blank of Fig. 6;

Fig. 7ª is a fragmentary longitudinal section of the blank shown in Fig. 7, showing the non-interwoven tab ends of the outer fabric layer.

Fig. 10 represents, in perspective, a stand-up collar with turn-down tips or wings, appropriate to the uses of the invention.

Fig. 11 is an enlarged sectional detail showing one form of interweaving of the multiply fabric.

Similar letters of reference indicate similar parts throughout the several views.

In the practice of the invention, I prefer to weave the fabric from which the collar is made, in a series of lengths or blanks forming a continuous strip, as indicated in Fig. 5. To this end, a loom is selected which will narrow the individual blanks from their ends toward their centers, that is to say, from a point indicated by the line *a*, *a*, of Fig. 5, to a point indicated by the line *b*, *b*, thereof, this conformation being appropriate to the prevailing style of turn-over collars. It will be understood, however, that, in this respect a wide variation is permissible, according to the choice of the operator.

The loom selected is preferably of the kind that permits the simultaneous weaving of three layers of cotton fabric *c*, *d*, *e*, these layers forming substantially a single entity by reason of the interweaving, at intervals, of threads from adjacent layers into each other, as illustrated, for example, in Fig. 11. Particularly, however, as indicated in the several figures of the drawings, the longitudinal threads and also the cross threads

of the intermediate layer are interrupted along the longitudinal median line, corresponding to the proposed fold or turn-over edge, *i. e.*, between the points indicated by the letters *f*, *f*, of Figs. 3 and 4, in order to furnish, in the multiple-ply interwoven fabric, a section of increased flexibility, and thus give to the collar a fold edge of increased flexibility as compared with the fabric of the neck band and folding portions of the collar. The cross-threads *g* of the innermost layer *e*, are, however, preferably continued across this longitudinal gap of the intermediate layer.

The several layers are woven from spun thread, as, for instance, from cotton thread of any suitable kind and quality appropriate to collar manufacture; but one of the layers (preferably the innermost layer *e*) is provided with reinforcing threads, of such a character that they will take on and maintain a more or less permanent set, qualified by such degree of pliability as will decrease their rigidity within the confines of comfort to the wearer. For instance, assuming the number of longitudinal cotton threads on each side of the median line to be say 500, it will be appropriate to intersperse therewith, say, 20 longitudinal threads *v* of soft copper wire upon which has been spun a coating of cotton fiber, as indicated in Fig. 2. The soft copper wire threads with their coating of spun cotton are of small gage, not exceeding, usually, more than once or twice the gage of the ordinary cotton thread, and they are wholly invisible as a distinguishing element of the fabric in the completed article, by reason of their relatively small size and their cotton coating. The function of these soft copper wires is to permit the fabric to receive the curvature of the ordinary turn-down collar of Fig. 1, or the stand-up collar of Fig. 10, or their equivalents, and to insure the permanence of that curvature, by reason of the tendency of the wires to remain set after they have been bent or curved. This same pliability of the soft copper wires and their tendency to remain set in the position into which they are curved or bent allows the turn-over wings or tips *h* of the upright collar of Fig. 10, to be bent over as indicated and to remain in the bent-over condition. In order that these tips or wings *h* shall be thus susceptible of bending, without breaking the copper wires, the copper should be of a high degree of purity and should be annealed to withstand the relatively sharp flexure required. The small gage of the copper wire, while quite sufficient to impart the necessary set required for the suitable curvature of the collar, nevertheless permits the collar to yield to the movement of the neck of the wearer more readily than is the case with the customary heavily starched collar in ordinary use, and, accordingly, the collar may be worn with a correspondingly increased degree of comfort.

As hereinbefore indicated, the main intent and purpose of the invention is to dispense with the customary employment of starch in collars generally. In the present instance, this is accomplished, while preserving the general appearance of the collar, in the sense of giving it the general aspect of a stiff collar in contradistinction to a collar of the soft or "negligée" type, and, at the same time, to give to the wearer very much of the comfort of the soft collar and lack of absolute rigidity of the starched collar. Moreover, the avoidance of the use of starch results not only in a saving, *per se*, of the starch itself and the cost of ironing the starched fabrics, but also lessens the wear and tear upon the fabric incident to the ironing operation and to the more or less destructive influence of the starch upon the fabric under the conditions prevailing in the modern laundry.

This saving in the wear and tear upon the collar is particularly emphasized, in the present instance, because of the circumstance that the omission of the longitudinal threads along the median line of the collar, to give the fold edge of increased flexibility diminishes the thickness of the combined fabric along the line of fold, so that, in passing through the mangle, the greater thickness of the fabric opposite the sides of the median line protects the fold from immediate contact with the rollers of the mangle and consequently diminishes frictional wear along the fold. So also, the maintenance of the "soft roll" along the fold, incident to the omission of these longitudinal threads insures against the sharp bend of the ordinary starched collar along the corresponding edge, and likewise adds to the life of the fabric thereat, while the cross-threads *g* of the reinforce give the necessary backing appropriate to practical use. It will, of course, be understood that I do not limit myself to the use of soft copper wire as the reinforcing element of the composite fabric making up the collar, but contemplate the employment of such equivalents therefor, whether metallic or non-metallic, as have the capacity to receive and maintain a curvature imparted to them and yet to yield within the requirements of the comfort of the wearer while the collar is in use. In weaving the fabric into the strip form shown in Fig. 5, it is preferred not to interweave the outer layer *e* with the other layers at the button-hole tabs of the blank, but to leave such tab portions of the outer layer separately foldable, as indicated in Fig. 7ª. The blank may then be cut as indicated in dotted lines in Fig. 7

and full lines in Fig. 8, and the edge portions of the tips *m*, *n*. *s*, *t*, of the layer *c* may then be folded reversely, and sewed as indicated in Fig. 1 and Fig. 9, so as to protect the corresponding raw edges of the button-hole tabs of the collar from exposure. The projecting portion of the layer *c*, when thus cut to shape, reversely folded and stitched, forms of itself, a binding for the said edges, which circumstance enhances the attractive appearance of the collar.

In so far as I am aware, it is broadly new, in the manufacture of collars, to provide the fabric, whether single or composite, from which the collar is made, with reinforcing threads of a material that will take on and maintain a curvilinear set of the character incident to the employment of the soft copper wires hereinbefore described, so that the collar will have an upright appearance corresponding generally to that of a starched collar. It will be understood, therefore, that I intend the broad claims which conclude the present specification to have a correspondingly generic interpretation. So also, in so far as the location of the reinforcing layer of the composite fabric is concerned, I do not limit it to the innermost layer, although, in the particular construction shown, I prefer that location.

It will be further understood that while I prefer to use the soft copper wires *v* as reinforcing threads, they may, in some instances, be omitted, provided always that the collar as a whole will possess sufficient rigidity to maintain a practically curvilinear set, without the addition of starch which is the main purpose and intent of the invention. For most purposes, also, the main body portion of the several layers of the composite fabric will consist of cotton thread, as is usual in the manufacture of the ordinary grade of collars, but linen, ramie, or other threads familiar to the art may be employed in weaving the fabric, in whole or in partial substitution for the threads of cotton.

Having thus described my invention, what I claim is:—

1. A shirt collar, made up of fabric having a reinforce interwoven therein and inherently capable in an unstarched condition of receiving and maintaining a curvilinear set.

2. A shirt collar, made up of fabric having a reinforce of longitudinal threads of pliable material interwoven in the fabric and inherently capable in an unstarched condition of receiving and maintaining a curvilinear set.

3. A shirt collar, made up of fabric having a reinforce of longitudinal threads of pliable material interwoven in the fabric and capable of receiving and maintaining a curvilinear set, said threads comprising soft metal wire.

4. A shirt collar, made up of fabric having a reinforce of longitudinal threads of pliable material interwoven in the fabric and capable of receiving and maintaining a curvilinear set, said threads comprising soft metal wire having a coating of spun fiber.

5. A folding shirt collar, made up of multiple-ply interwoven fabric comprising an outer layer of woven fabric, an intermediate layer of woven fabric whose longitudinal threads are omitted along a median line corresponding to the folded edge of the collar, and a third layer whose longitudinal threads are similarly omitted.

6. A shirt collar, made up of an outer layer of woven fabric, an intermediate layer of woven fabric whose longitudinal threads are omitted along a median line corresponding to the folded edge of the collar, and a third layer whose longitudinal threads are similarly omitted, but whose cross threads are continued across the said median line.

7. A shirt collar, made up of a composite multiple-ply interwoven fabric, comprising an outer layer, an intermediate layer whose longitudinal cross threads are omitted along a longitudinal median line corresponding to the folded edge of the collar, and a third layer constituting a reinforce and provided with interwoven threads of a material adapted to take on and maintain a curvilinear set.

8. A shirt collar, made up of a composite fabric, comprising an outer layer, an intermediate layer whose longitudinal cross threads are omitted along a longitudinal median line corresponding to the folded edge of the collar, and a third layer constituting a reinforce and provided with interwoven threads of a material adapted to take on and maintain a curvilinear set, said reinforcing layer having its longitudinal threads omitted along said median line, but having its cross threads continued transversely of said line.

9. A shirt collar, made up of a composite fabric, comprising an outer layer, an intermediate and a reinforcing layer, said layers being interwoven, said composite layer, when folded into collar form, being inherently adapted in an unstarched condition to take on a curvilinear set.

10. A folding shirt collar, made up of a composite multiple-ply interwoven fabric forming the neck band and folding portions of the collar, said neck band and folding portions of the collar being joined by a portion of the fabric of greater flexibility than the other portions to provide a fold portion of increased flexibility.

11. A folding collar made up of an inner

neck band and an outer turn-down band, said bands being woven in one piece of multiple-ply interwoven fabric and connected along their upper edges by an intermediate weakened edge-fold portion.

12. A folding collar, made up of an inner neck band, an outer turn-down band of multiply interwoven fabric and an edge-fold portion connecting the bands along their upper edges and constituting a weakened part of the multiply interwoven fabric.

In testimony whereof I affix my signature, in presence of two witnesses.

JOHN BLAKESLY BOLTON.

Witnesses:
HERBERT C. TOWLE,
WALTER BATES FARR.