

June 29, 1943.

T. L. SHEPHERD ET AL

2,322,889

COLLAR FABRIC

Filed April 8, 1940

2 Sheets-Sheet 1

Fig. 1.

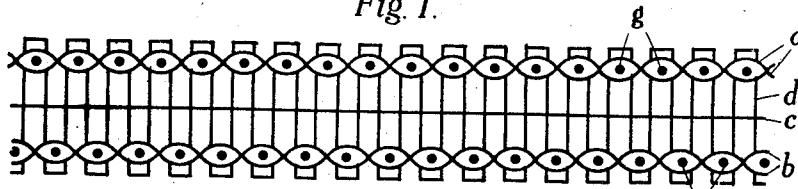


Fig. 2.

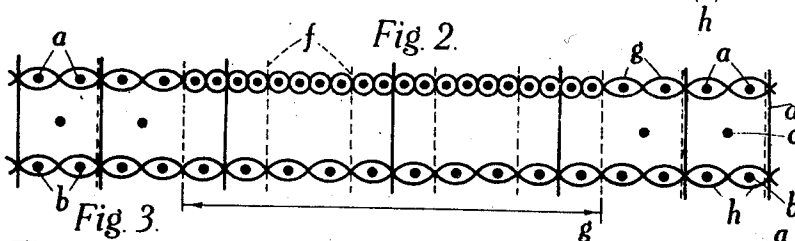


Fig. 3.

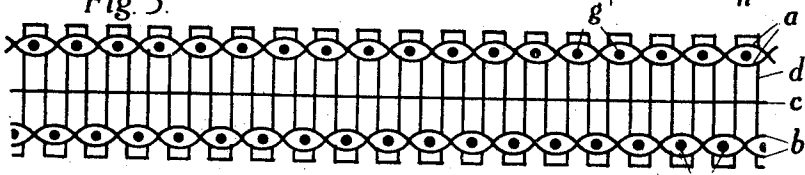


Fig. 4.

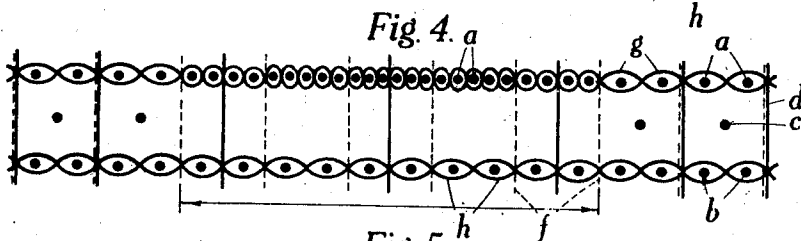
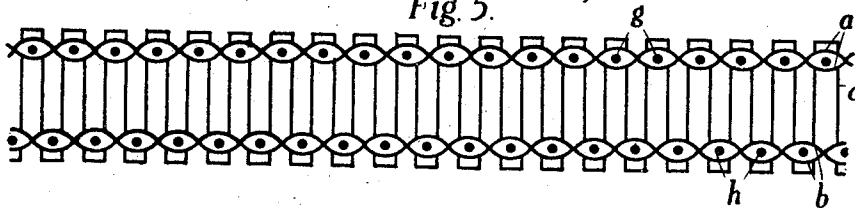


Fig. 5.



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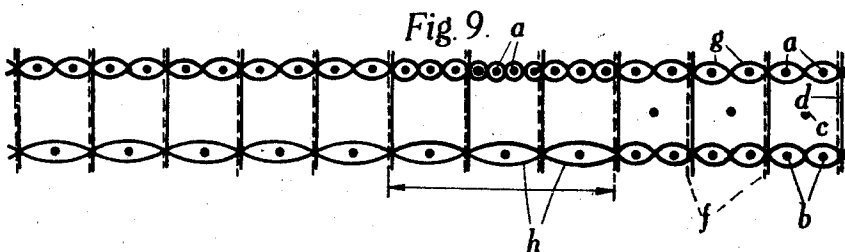
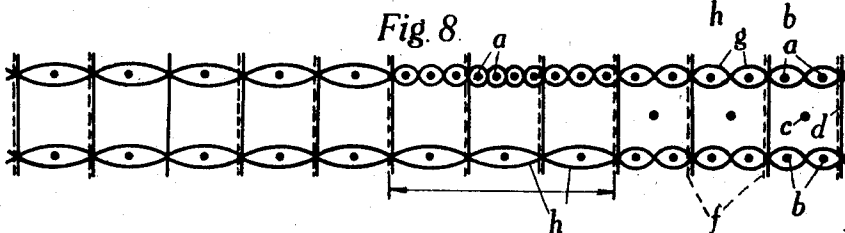
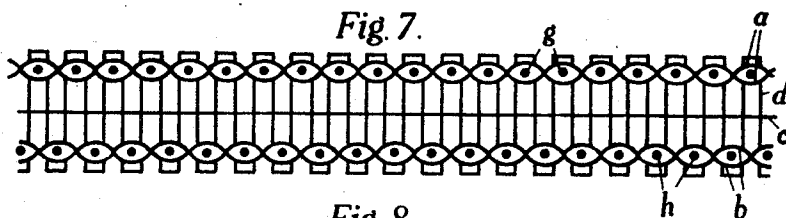
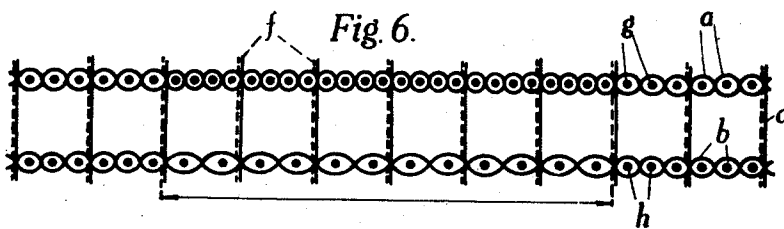
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COLLAR FABRIC

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2 Sheets-Sheet 2



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2,322,889

COLLAR FABRIC

Thomas Lewis Shepherd and William Richardson,
London, EnglandApplication April 8, 1940, Serial No. 328,461
In Great Britain February 3, 1939

2 Claims. (Cl. 139—385.5)

This invention relates to a fabric or cloth for use in the manufacture of collars and cuffs.

It is known that one-piece collars may be made from woven multi-warp curvilinear cloth containing a weakened fold line, which is formed in the cloth by the omission of certain of the warp threads. Also, as described in the specification of prior British Patents Nos. 491,492, 515,191 and 519,077, such cloth can be covered with a facing cloth on one or both sides as desired, e. g. to match with the shirting material.

In contradistinction to the foregoing we have now found that a fold line for such curvilinear collar cloths may be formed by using a differential reinforcement of the warp threads in the zone or part representing the fold line. By differential reinforcement we mean the reinforcement, for example by the addition of extra warp threads, of the plies of the cloth at the fold line so that the cloth folds easily by maintaining a differentiation in the number of threads in the top and bottom plies. This differentiation is maintained despite the reinforcement by the addition of warp threads.

It is to be understood that, in the claim language, the term "warp thread reinforcement of the fold zone" refers to the use of warp threads in the fold zone which are either thicker, of greater mass, more numerous and/or possessed of greater physical strength than the warp threads used in the rest of the cloth, although usually it will be found most convenient to increase the number and the strength of the threads in conjunction. In this way therefore such cloths will be made with a reinforced as opposed to a weakened fold line.

In carrying the invention into effect we provide for example a greater number of warp threads per dent in the face of the cloth at the fold line, leaving the threads in the back ply unchanged. By this means we prepare a cloth which folds readily in one direction and has at the same time a strengthened fold line so as to promote good wearing properties. Such a cloth can be used for the manufacture of one-piece collars in any known way. The cloth may also be used for covered collars according to our aforementioned prior specifications. It will be understood that the cloth according to this invention may be made on any suitable type of loom.

In the accompanying drawings showing diagrammatic cross-sectional views of fabrics constructed according to the invention,

Figures 1, 3, 5 and 7 represent sections across

the weft threads and Figures 2, 4, 6, 8 and 9 represent sections across the warp threads.

As an example of a suitable fold line according to the invention, the area constituting the fold line consists of a width of five dents having double the number of threads per dent (e. g. four) in the face or upper warp at the fold line and the same number (e. g. two) in the back or lower warp at the fold line as elsewhere, and the filler warp is omitted over the area of the fold line.

This example is illustrated in Figures 1 and 2 of the accompanying drawings which represent a section of the multi-ply cloth made in accordance with the invention taken on a line parallel with and across the warp threads respectively.

In these figures *a* and *b* represent the upper and lower warp threads respectively while *c* represents the filler threads. *g* and *h* represent the upper and lower weft threads respectively.

d represents the binder warp threads and the dotted lines *f* represent the dents.

The fold area of the cloth extends between the arrows shown in Figure 2 and as will be seen from this figure constitutes a width of five dents. The normal cloth seen on either side of the fold area has five threads per dent, namely two warp threads *a* in the upper ply and two warp threads *b* in the lower ply, and also one filler thread *c* between the plies.

The fold area between the arrows while having the same number of warp threads *b* per dent, namely two for the lower ply, has double that number of warp threads *a* in the upper ply. The filler threads *c* are omitted over the fold area.

As a further example according to the invention, a fold line of five dents is formed by varying the number of face warps in each dent. Thus for the centre dent, six threads are used in the face and two in the back. In the dent on each side of the centre, the warps may be five in the face and two in the back. In the dent next to these on each side, the warps may be four to two, and in all the dents the filler warps are omitted.

This example is illustrated in Figures 3 and 4 which represent a section of the multi-ply cloth made in accordance with the invention taken on a line parallel with and across the warp threads respectively.

In these Figures, *a* and *b* represent the upper and lower warp threads respectively, *c* the filler warps, *d* the binder warps and *g* and *h* the upper and lower weft threads respectively.

As will be seen from Figure 4 the fold line

area extends between the arrows shown and constitutes a width of five dents. On each side of the fold area the fabric has five threads per dent, i. e. two warp threads *a* and two warp threads *b* respectively, and a filler thread *c* per dent.

At the fold area the warp threads *b* remain at two per dent for the lower ply but they vary in the upper ply as shown. For the centre dent of the upper ply there are six warp threads *a* per dent and for the dent on each side of the centre dent there are five warp threads *a*. On the next dent to those on each side of the centre dent there are four warp threads *a*. It will also be noted that the filler threads *c* are omitted over the fold area.

As a further means of manufacturing a reinforced fold line we may employ warp threads in the fold line which are physically stronger per unit of cross section than the warp threads used in the rest of the cloth.

Variants of the methods of utilising cloths having reinforced fold lines as described include the following features. To further increase the ease of folding and ironing we may include a thread or threads of different colour to the remainder and in the back warp only, such thread or threads being situated in the centre of the said specially woven fold line in order to indicate its exact position. We have also found that in the weaving of curvilinear collar cloths a neater and less coarse appearance may be obtained by omitting the filler warp throughout and replacing same by additional threads in the back and/or face warps, this naturally resulting in a closer weave and one more approximating to normal facing fabrics such as poplins. With this type of cloth there is also less danger of the backing or interlining showing through when the collars are fused with the aid of a thermoplastic adhesive, for example as described in the specification of our prior British Patent No. 481,015.

This modification is illustrated in Figures 5 and 6 which represent sections of the multi-ply fabric taken on a line parallel with and across the warp threads respectively.

In these figures, *a* and *b* represent the upper and lower warp threads respectively, *g* and *h* the upper and lower weft threads respectively, and *d* the binder threads. Filler threads have been entirely omitted. The fold area extends between the arrows shown in Figure 6 over six dents, the dents being represented by the dotted lines *f*, and a warp thread *b* has been omitted from each dent in the lower ply and has been added to the upper ply so that the same number of threads per dent remains throughout.

Again, if the neck band of the collar is desired to be thinner or softer than the collar top, the number of back and/or face threads can be reduced and/or the filler threads omitted altogether over this area; a similar effect can be ob-

tained by using lighter counts of cotton over the same area. The reverse is equally applicable should the effect be desired for the collar top instead of the band.

Figures 7 and 8 illustrate this modification in which Figure 7 represents a section of the multi-ply fabric taken on a line parallel with the warp threads while Figure 8 represents a section taken across the warp threads. In these figures *a* and *b* represent the upper and lower warp threads respectively, *c* the filler warp threads, and *d* the binder warp threads.

As will be seen from Figure 8 at the three dent fold area between the arrows the filler warp threads have been omitted but extra warp threads have been added to the upper ply, as in Figures 5 and 6. In the weakened neck band portion shown in Figure 8 to the left of the fold line area the filler threads *c* have been omitted and the upper warp and lower warp threads *a* and *b* have been reduced.

The collar top portion of the fabric shown at the right of the fold line area has filler warp threads *c* and an equal number of upper and lower warp threads *a* and *b* respectively.

If desired the upper ply of the neck band portion of the fabric may contain the same number of warp threads as the collar top portion.

This is shown in Figure 9 from which it will be seen that the upper ply at the left of the figure contains two warp threads per dent, that is the same number as the upper ply of the collar top portion shown at the right of the figure.

As in Figure 8 there is only one warp thread per dent in the lower ply and the filler threads are omitted from the fold portion and from the neck band portion of the fabric.

We claim:

1. A woven multi-ply collar fabric comprising warp threads, weft threads and binder warp threads principally, the fabric being woven with a longitudinally extending fold zone including warp thread reinforcement which increases per unit of width from the respective outer margins of the fold zone to a maximum per unit of width at a location intermediate said margins and designated a fold line, the number of warp threads in that area of the fabric exclusive of the fold zone being substantially uniform.

2. A woven multi-ply collar fabric comprising warp threads, weft threads and binder warp threads principally, the fabric being woven with a longitudinally extending fold zone including warp threads in one ply which increase in number per unit of width from the respective outer margins of the fold zone to a maximum number per unit of width at a location intermediate said margins and designated a fold line, the number of warp threads elsewhere in the fabric being substantially uniform.

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