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RAVEL-PROOF SEAM AND METHOD OF MAKING THE SAME

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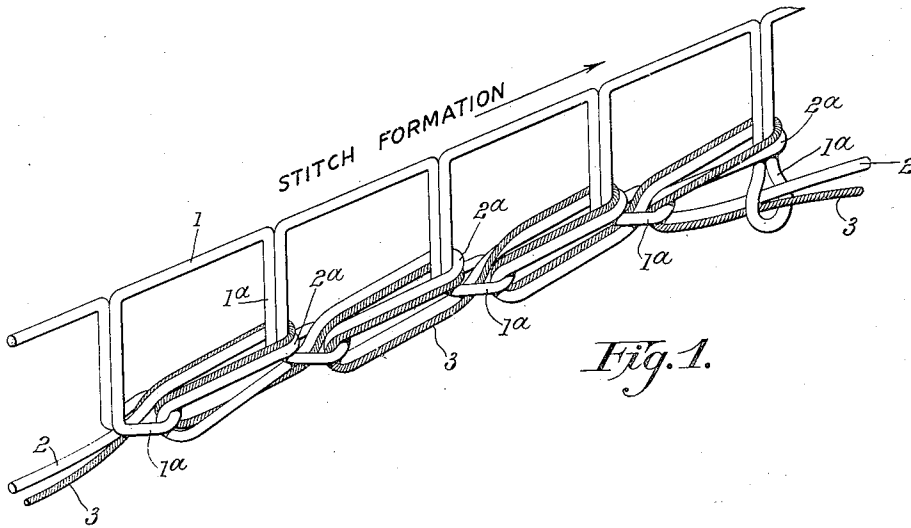


Fig. 1.

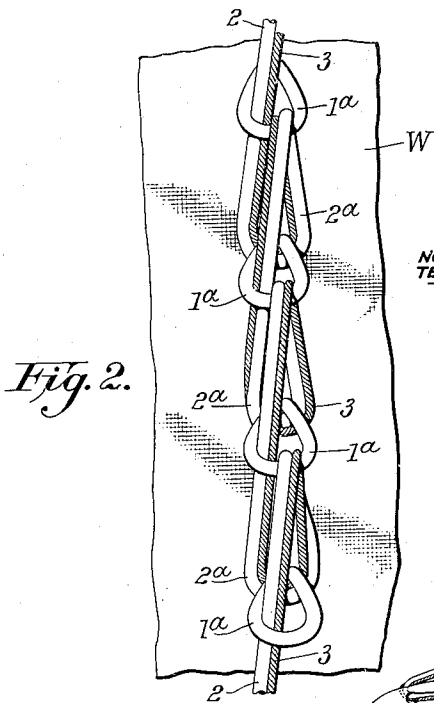


Fig. 2.

NORMAL
TENSION
 t'

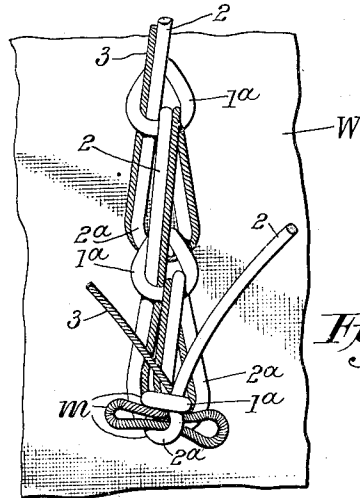


Fig. 3.

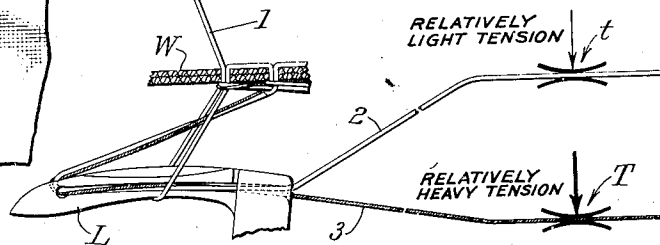


Fig. 4.

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RAVELPROOF SEAM AND METHOD OF
MAKING THE SAME

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13 Claims. (Cl. 112-262)

1.

This invention relates to a ravel-proof seam and a method of making the same.

In certain articles of wearing apparel, such, for example, as overalls, dungarees and similar articles of work clothing, which are given hard usage and subjected to the action of briars and the like, it is not uncommon for the threads of the sewed seams to be worn through or broken. These seams are usually of the chain-stitch variety, and when a thread is ruptured the seam will readily ravel.

This invention has as an object to provide a sewed seam which, when one or more threads thereof are broken, will be locked against raveling.

Another object of the invention is to provide an improved method of making a ravel-proof sewed seam.

These objects have been attained by making a conventional sewed seam of a needle thread and a primary loop thread and simultaneously therewith incorporating in the seam an additional or auxiliary thread and so tensioning the auxiliary thread that it will produce sufficient friction on the loops of the other thread, or threads, to bind the loops together and prevent the threads from raveling, should one or more of the threads be broken.

Preferably, but not necessarily, the auxiliary locking thread is relatively elastic (as compared with the other threads which are relatively inelastic) and is placed in the seam under a tension sufficient to cause the auxiliary thread to contract, if broken, but not sufficient to cause puckering or shirring of the workpiece.

The terms "elastic thread" and "inelastic thread" are used in this specification in a relative sense, the former being intended to indicate a thread adapted to be stretched substantially as, for example, a nylon or a rubber thread, whereas the term "inelastic thread" is intended to mean a conventional thread of cotton or the like.

Drawings depicting my improved seam and illustrating a method of making it form a part of this disclosure and in such drawings:

Fig. 1 is a perspective view of a chain-stitch seam embodying my invention, with the seam made "in the air" or apart from a workpiece.

Fig. 2 is an under side view of a portion of a workpiece and my improved ravel-proof seam therein, the threads of the seam being shown substantially in the positions which they occupy in an unbroken seam.

Fig. 3 is a view similar to Fig. 2, but illustrat-

2.

ing the snarling action of the threads which takes place automatically when the threads of the seam are broken.

Fig. 4 is a diagrammatic view of certain stitch-forming instrumentalities which may be used to make my improved seam and also illustrating diagrammatically the application of unequal tensions to the two loop threads.

Referring more specifically to the drawings, the improved seam is shown as comprising an upper or needle thread 1 which is passed through the work W at spaced intervals and formed into loop 1^a at the under side of the work. Passing through and surrounding the loops 1^a are loops 2^a of a main interlocking or loop thread 2.

As shown in Fig. 4, the threads 1 and 2 are carried, respectively, by a needle N and a looper L. These threads are relatively inelastic and are concatenated in the manner of a conventional two-thread chain-stitch seam. In their travel from their respective sources of supply to the needle N and the looper L, respectively, the threads 1 and 2 pass through suitable tensioning devices represented diagrammatically in Fig. 4, as *t'* and *t*, respectively.

Cooperating with the threads 1 and 2, and concatenated with the former, is a third or auxiliary locking thread 3 which also is carried by the looper L and which traverses the same course as the thread 2 throughout the seam length. The thread 3 is preferably made of nylon, rubber or other material which is more elastic than the material (e. g. cotton) of which the threads 1 and 2 are made. In its travel to the looper L, the thread 3 also passes through tensioning means shown diagrammatically in Fig. 4 and designated generally as T. This tensioning means applies to the thread 3 a somewhat greater tension than the tension which is applied to the thread 2 so that the thread 3, as incorporated in the seam, exerts a binding action on the threads 1 and 2. When the thread 3 is made of relatively elastic material, this additional tension causes the thread to be incorporated in the seam in a stretched condition. The tendency of the thread 3 to contract, however, is not sufficiently great to cause puckering of the work, especially when sewing through relatively heavy material such as is used for making overalls and other work clothes. While the thread 3 follows the same general course as the thread 2 throughout the seam, nevertheless, due to twist and unequal tension in the threads, the loops of the thread 3 frequently cross over the loops of the thread 2 as will be seen from an inspection of Fig. 1. This

3

causes a binding of the threads and helps to prevent raveling of the seam when the threads are broken, as hereinafter will be described.

The locking thread 3 is preferably materially smaller in cross-sectional area than the looper thread 2. This prevents the seam from being unduly bulky at the under side of the work and yet does not interfere with its function of locking the threads together.

Inasmuch as the tensioned elastic thread 3 frictionally engages both the needle thread 1 and the looper thread 2, if either or both of those threads should be broken the gripping action of the auxiliary thread 3 will cause the threads 1 and 2 to be bound together frictionally and thus prevent raveling of the seam.

Should the elastic thread 3 be broken, either alone or with the threads 1 and/or 2, contraction of the thread 3 will cause it to snap back and shift the threads comprising the last several stitches of the seam into a malformation, as illustrated at *m* in Fig. 3, thereby snarling or tangling the threads, which additionally prevents the seam from being ravelled.

In making this improved ravel-proof seam the needle and looper are threaded with the threads 1 and 2, respectively, as is customary in two-thread chain-stitch sewing machines, the threads passing through suitable tensioning means. In addition, the auxiliary thread 3 is passed through a heavier tension than is the looper thread 2, and also is threaded through the looper, which may have a somewhat enlarged thread groove and thread eyes to accommodate the two threads. The machine is then operated in the manner common to two-thread chain-stitch sewing machines and produces the above described ravel-proof seam.

It is recognized that it is not broadly new to sew a seam with a single needle thread and two similar looper threads but, insofar as I am aware, no one heretofore has sewed such a seam in which (a) both looper threads are carried by the same looper and follow the same course throughout the seam length and have materially different cross-sectional areas; (b) in which one of the looper threads is under greater tension than the other thereby causing the greater tensioned thread to produce a binding effect on the other threads of the seam; or (c) in which that one of the looper threads which is subjected to the greater tension also has greater elasticity than the other and tends to contract and snarl the other threads when the elastic thread is broken.

Having thus set forth the nature of the invention, what I claim herein is:

1. A ravel-proof seam comprising an upper thread formed with a plurality of loops projecting through a workpiece at spaced intervals, a lower thread concatenated with the loops of said upper thread at the under side of the workpiece, and a locking thread concatenated with the loops of said upper thread coincident with said lower thread and tensioned to exert a binding action on the other threads.

2. A ravel-proof seam comprising a first thread located at one side of a workpiece and having loops projecting therethrough at spaced intervals, a second thread at the opposite side of the workpiece and having loops concatenated with the loops of said first thread, and a third thread at said opposite side of the workpiece and concatenated with the loops of said first thread similarly to and coincident with said second thread, said third thread being more heavily

4

tensioned than said second thread and exerting a binding action on the loops of the other threads.

3. A ravel-proof seam comprising a needle thread extending along one face of a workpiece and having a plurality of loops projecting there-through at spaced intervals, an inelastic looper thread extending along the opposite face of the workpiece and concatenated with the loops of said needle thread, and an elastic looper thread traversing the same course as said inelastic thread and concatenated with the loops of said needle thread, said elastic thread normally being tensioned and stretched in said seam and adapted to contract and snarl the other threads when the elastic thread is broken, thereby to prevent raveling of the seam.

4. A ravel-proof seam comprising an upper thread formed with a plurality of loops projecting through a workpiece at spaced intervals, a lower thread concatenated with the loops of said upper thread at the under side of the workpiece in a manner common to two-thread chain-stitch seams, and a seam-locking thread concatenated with the loops of said upper thread coincident with said lower thread and tensioned to exert a binding action on the other threads, said seam-locking thread being materially smaller in cross-section than said lower thread and being twisted thereabout throughout the seam length.

5. A ravel-proof seam comprising a needle thread extending along one face of a workpiece and having a plurality of loops projecting there-through at spaced intervals, an inelastic looper thread extending along the opposite face of the workpiece and concatenated with the loops of said needle thread, and an elastic locking thread traversing the same course as said looper thread and concatenated with the loops of said needle thread, said elastic locking thread being materially smaller in cross-section than said looper thread and being embodied in said seam in a stretched condition.

6. A ravel-proof seam comprising a first thread disposed on one face of a workpiece having loops projecting through said workpiece at spaced intervals, a second thread at the opposite side of the workpiece and having loops concatenated with the loops of said first thread, and a third thread at said opposite side of the workpiece and concatenated with the loops of said first thread, one of said three threads being relatively elastic and normally being tensioned and stretched in said seam and adapted to contract and snarl the other threads when one of said threads is broken.

7. A ravel-proof seam formed in a workpiece and comprising, a first thread formed at intervals into work-penetrating loops, and unequally tensioned second and third threads concatenated with and anchoring the loops of said first thread in the work.

8. A ravel-proof seam formed in a workpiece and comprising, a first thread formed at intervals into work-penetrating loops, and unequally tensioned second and third threads of different elasticity concatenated with and anchoring the loops of said first thread in the work.

9. The method of making a ravel-proof seam which comprises successively projecting loops of a thread through a workpiece, concatenating with said loops other loops formed in main and auxiliary interlocking threads having substantially the same course of travel throughout the seam, and applying to said auxiliary thread a tension sufficiently great to cause the loops of said auxil-

5

iary thread to bind together the loops of the other threads to prevent ravelling of the seam upon breakage of any one of said threads.

10. The method of making a ravel-proof seam which comprises successively projecting loops of a needle thread through a workpiece at spaced intervals, concatenating with said loops other loops formed in main and auxiliary looper threads, and subjecting said looper threads to unequal tensions whereby the loops of the greater tensioned looper thread exert a gripping action on the needle thread and the other looper thread.

11. The method of making a ravel-proof seam which comprises successively projecting loops of a needle thread through a workpiece at spaced intervals, concatenating with said loops other loops formed in main and auxiliary looper threads, said auxiliary looper thread being relatively elastic, and applying a tension to said auxiliary looper thread to cause it to be embodied in the seam in a stretched condition.

12. The method of making a ravel-proof seam which comprises extending a relatively inelastic

6

thread along the upper face of a workpiece, projecting loops of said thread through a workpiece at spaced intervals, concatenating with said loops at the under side of the workpiece a retaining thread and a locking thread, said retaining and locking threads following substantially the same course throughout the seam but crossing each other at various places along the seam, and applying to said locking thread sufficient tension to cause it to bind the loops of the retaining thread against ravelling.

13. The method of making a ravel-proof seam which comprises successively projecting loops of a needle thread through a workpiece at spaced intervals, concatenating with said loops other loops formed in main and auxiliary looper threads, one of said threads being relatively elastic, and applying a tension to said relatively elastic thread to cause it to be embodied in the seam in a stretched condition.

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No references cited.