May 9, 1961 J. H. ROGERS 2,983,027

SEAMED WOVEN FABRIC STRUCTURE

Filed March 14, 1958

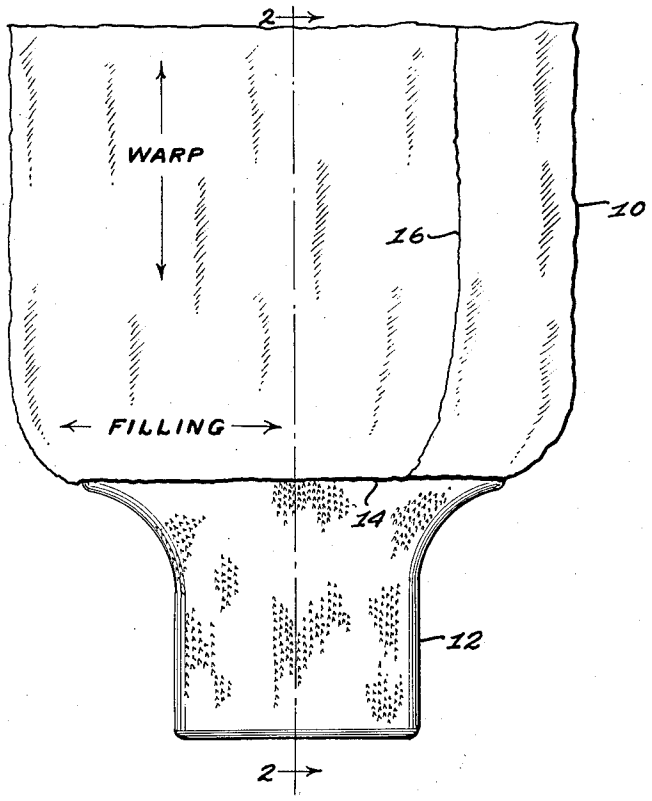


Fig. 1

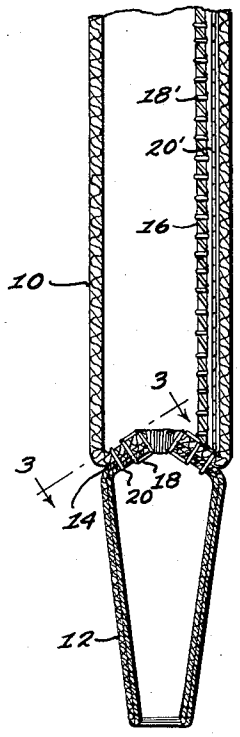


Fig. 2

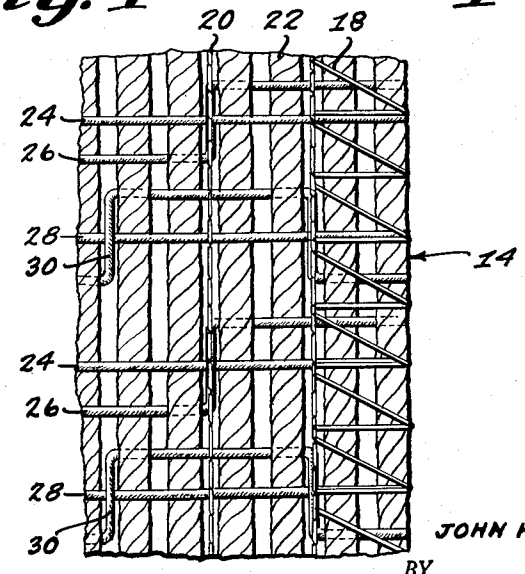


Fig. 3

INVENTOR.
JOHN HOWARD ROGERS
BY
Parrott & Richards
ATTORNEYS

United States Patent Office 2,983,027
Patented May 9, 1961

2,983,027

SEAMED WOVEN FABRIC STRUCTURE

John Howard Rogers, Black Mountain, N.C., assignor to Beacon Manufacturing Company, a corporation of Delaware

Filed Mar. 14, 1958, Ser. No. 721,389

7 Claims. (Cl. 28—78)

This invention relates generally to garments formed of napped fabrics, such as snow suits, children's sleeping wear, and other infants' garments and the like, and more particularly to the use of an improved form of napped woven fabric that may be seamed effectively in forming such garments and to the unique form of seam structure that results from the use of this fabric.

The use of woven fabrics in garment manufacture requires special attention to the finishing or seaming of cut edge portions that run parallel to the filling of the fabric, because of a characteristic tendency of the fabric filling to ravel or be pulled loose easily at such cut edge portion. In napped woven fabrics, which are normally rather heavy fabrics and are usually formed of a relatively coarse soft twisted filling woven with a relatively fine hard twisted warp, the raveling or fraying tendency is especially pronounced and has heretofore made it extremely difficult to form satisfactorily secure seams fillingwise of such fabrics.

This difficulty has in fact been so troublesome that knit fabrics have largely replaced woven fabrics in the manufacture of napped fabric garments, such as are mentioned above, because a knit fabric has an interlocking loop structure that may be securely seamed with ease; and this replacement has taken place despite the fact that knit fabrics cannot be napped with the same effectiveness or fullness as woven fabrics and have the further substantial disadvantage in garment manufacture of lacking the squareness of woven fabrics and therefore being much more difficult to handle.

According to the present invention, the foregoing difficulty with woven fabrics in garment manufacture is eliminated entirely by employing a woven fabric in which the warp is woven with the filling in a regular leno pattern and serves to form uniquely strong and secure seam structures fillingwise of the fabric by interaction with the seaming stitch chain or chains to lock the filling in place adjacent a seamed edge. The weave construction details for a woven fabric of the type employed according to the present invention are disclosed at length and claimed in copending application Serial No. 733,615, filed May 7, 1958, while the form of seam structure that results according to the present invention is described in further detail below in connection with the accompanying drawings, in which:

Fig. 1 is a fragmentary elevation of the cuff end portion of a garment sleeve such as may be formed from a woven fabric with the cuff seamed securely thereon in accordance with the present invention;

Fig. 2 is a sectional detail taken substantially at the line 2—2 in Fig. 1; and

Fig. 3 is an enlarged and exaggerated fragmentary plan detail of the cuff seam structure as seen at the face or side thereof indicated by the line 3—3 in Fig. 2.

Referring now in detail to the drawings, Fig. 1 illustrates the general form of a representative garment sleeve portion having a sleeve body 10 formed of a napped

woven fabric material with a knit fabric cuff 12 seamed on the sleeve body 10 at 14.

The sleeve body 10 is fashioned in the usual manner at a further seam 16 running lengthwise thereof, and as the pattern blank for the sleeve body 10 is conventionally cut from the woven fabric of which it is formed so that the fabric warp is arranged longitudinally and the filling transversely thereof, in accordance with the labeled indication in Fig. 1, the seam 16 can be formed securely as a matter of course because it runs across the filling and acts to bind it readily in this relation. At the cuff attaching seam 14, however, the fabric filling of the sleeve body 10 extends lengthwise at the seamed edge thereof and cannot normally be held securely enough to form a seam of satisfactory strength thereat because of the raveling tendency of the filling which makes it subject to pulling loose (i.e., pulling out of the warp) adjacent the seam under the ordinary strains that are to be expected during use of the garment in which the sleeve is incorporated. It should also be noted that the cuff attaching seam 14 is only representative in this respect, the same difficulty being normally encountered whenever the napped woven fabric body material must be seamed fillingwise or in the general direction of the filling, as at the shoulder seam (not shown) for the sleeve body 10, or at a sleeping garment foot portion seam, or at collar or waist or ankle attachments, and so on.

The common form of seam employed in garment manufacture in instances such as are represented in the drawings at 14 and 16 is an inturned seam at which edge portions of the fabric elements to be seamed are turned inwardly and secured in face to face relation by one or more seaming stitch chains such as are indicated in Figs. 2 and 3 at 18 and 20 for the seam 14, and at 18′ and 20′ for the seam 16. The seaming stitch chain 18 (or 18′) arranged closest to the cut edges of the fabric elements being joined is usually of the overcast type so as to serve also for finishing these cut edges. In a considerable number of instances an overcast seaming stitch chain 18 (or 18′) of this sort is used alone, although a second, inwardly spaced, plain seaming stitch, such as 20 (or 20′) is frequently added to provide a more substantial seam structure. An overcast seam stitch chain, such as 18 (or 18′), is commonly proportioned so that it is overcast about at least two filling picks adjacent the seamed edge (or edges) of the woven fabric (or fabrics) being joined, and when a second plain seaming stitch chain is added, such as 20 (or 20′), it is usually spaced inwardly about two filling picks in relation to the outer stitch chain (see Fig. 3).

The characteristic form of woven fabric that is employed according to the present invention for obviating the above noted difficulty with fillingwise seaming is illustrated in exaggerated form in Fig. 3, in which a relatively coarse soft twisted filling is indicated at 22 interwoven with pairs of relatively fine hard twisted warp ends 24, 26 and 28, 30 that are arranged in a regular leno pattern; all of the warp ends being maintained at one face of the fabric (the inner face) except where one end 26 or 30 of each pair is alternately changed to the other face of the fabric for two successive filling picks 22 and crossed over its paired warp end between these picks to form a staggered pattern of leno crossings in the fabric, as disclosed in further detail in the previously noted copending application Serial No. 733,615. The copending application also describes other arrangements of the same characteristic form of woven fabric that might be employed equally well according to the present invention, the particular arrangement indicated in Fig. 3 being especially suited for single face napping to excep-

tional advantage, and a single face nap being used to a large extent in garments of the type involved here.

Fig. 3 also illustrates the interaction of the lenoed warp pairs **24**, **26** and **28**, **30** with the seaming stitch chains **18** and **20** by which the filling **22** is locked in place at the seam structure according to the present invention, this interaction resulting from the effect of the seaming stitch chains as they run across the lenoed warp in fixing the leno crossings thereof with respect to the filling, while the lenoed warp in turn has the effect of engaging or interlocking with the seaming stitch chains so that they cannot shift or slide lengthwise of the warp. This latter effect is of particular significance in relation to the fine hard twisted warp that is commonly used in napped woven fabrics and with respect to which the seaming stitch chains cannot normally obtain a hold at a fillingwise seam, but which are disposed for effective interlocking with the seaming stitch chains when lenoed according to the present invention.

The present invention has been described in detail above for purposes of illustration only and is not intended to be limited by this description or otherwise except as defined in the appended claims.

I claim:

1. A fabric structure incorporating a seam joining elements of said structure and at which at least one of said elements is a woven fabric having a relatively coarse soft twisted filling arranged lengthwise of said seam, said woven fabric element being further characterized by a relatively fine hard twisted warp tightly woven in a regular leno pattern with said filling, said seam engaging said lenoed warp and being held thereby against shifting lengthwise of the warp.

2. A seam structure comprising a seaming stitch chain joining fabric elements at adjacent edge portions thereof, at least one of said elements being a woven fabric in which the filling is relatively coarse, soft twisted and extends generally lengthwise of the seamed edge thereof and in which the warp is relatively fine, hard twisted and is tightly woven with said filling in a regular leno pattern, said seaming stitch chains extending across the lenoed warp and fixing the leno crossings of said warp with respect to the filling to lock the filling and the seam against lengthwise shifting with respect to the warp.

3. A seam structure comprising at least one seaming stitch chain joining two fabric elements at adjacent inturned edge portions thereof, at least one of said elements being a woven fabric in which the filling extends lengthwise of the seamed edge thereof and in which the warp is woven with said filling in a regular leno pattern, said seaming stitch chain interlocking with said lenoed warp to prevent the seaming stitch chains from shifting lengthwise of the warp and fixing the leno crossings with respect to the filling, thereby forming a secure seam structure.

4. A seam structure as defined in claim 3 and further characterized in that said seaming stitch chain is overcast about at least two filling picks adjacent the seamed edge of said woven fabric element.

5. A seam structure as defined in claim 4 and further characterized in that an additional parallel seaming stitch chain is spaced inwardly of said overcast seaming stitch chain.

6. A seam structure as defined in claim 3 and further characterized in that said woven fabric element is tightly woven and comprises a relatively coarse soft twisted filling and a relatively fine hard twisted warp.

7. A seam structure as defined in claim 3 and further characterized in that the other of said elements comprises a knit fabric.

References Cited in the file of this patent

UNITED STATES PATENTS

1,030,813	Holmes	June 25, 1912
1,978,917	Story et al.	Oct. 30, 1934
2,023,316	Ebert	Dec. 3, 1935
2,124,721	Wagner	July 26, 1938
2,450,631	Buchler	Oct. 5, 1948
2,670,471	Kaufman	Mar. 2, 1954
2,772,699	Scruggs	Dec. 4, 1956