

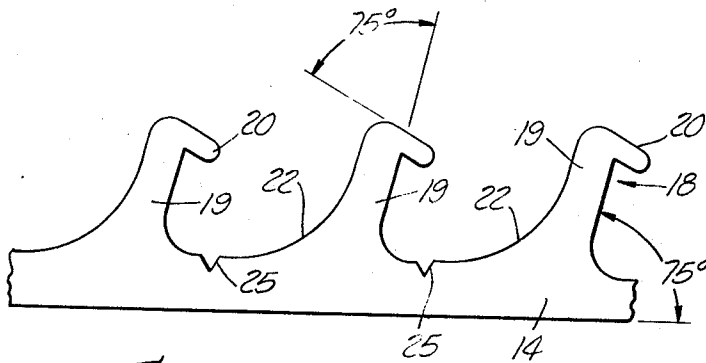
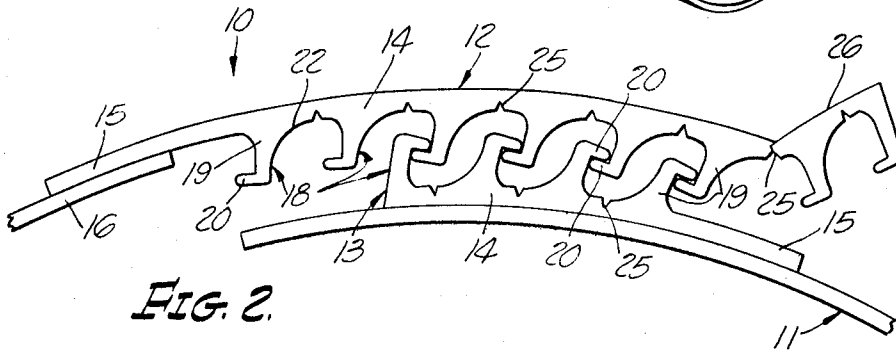
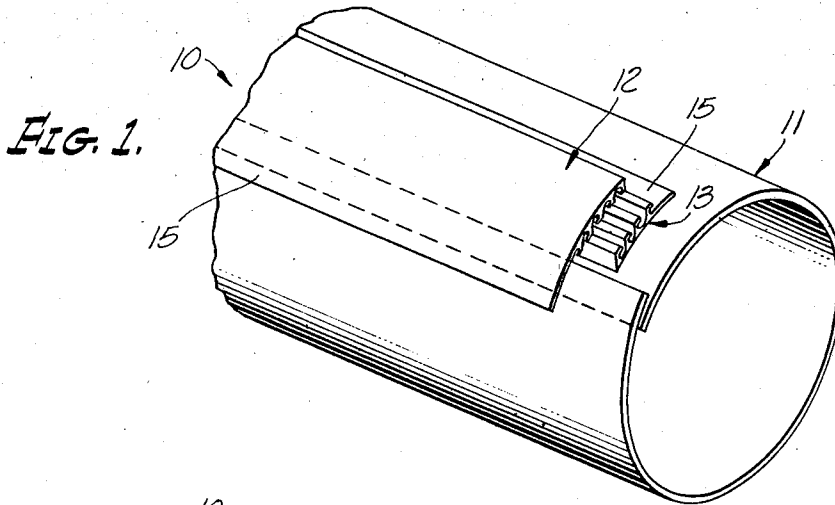
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F. D. EICHBERG

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VARIABLE WIDTH SEAM OF INTERLOCKING COMPONENTS

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FRANK D. EICHBERG
INVENTOR

BY 
ATTORNEYS

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3,495,306

VARIABLE WIDTH SEAM OF INTERLOCKING COMPONENTS

Frank D. Eichberg, Scottsdale, Ariz., assignor to Walter A. Plummer, Sherman Oaks, Calif.

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9 Claims

ABSTRACT OF THE DISCLOSURE

An adjustable variable-width separable seam comprising a pair of extruded flexible tapes having a multiplicity of similarly-shaped hooked ribs extending therealong in closely spaced parallel array. These tapes interlock with one another in any of various overlapped positions when overlapped selectively in different degrees and then pressed into mating relationship. The tapes have many different applications wherein it is advantageous to compensate for tolerance or manufacturing variations, and the like. Weakness grooves formed at intervals facilitate removal of excess widths of the tape whenever this is expedient.

This invention relates to a separable interlocking seam so constructed and arranged that the principal components can be assembled selectively in different overlapped positions. The two principal components comprise a pair of flexible tapes formed from elastomeric material each provided with a series of parallel hook-shaped ribs projecting from one surface and disposed and shaped as to be pressed into interlocking engagement in any of a wide number of overlapped positions. The junction of the ribs with the main body of the tapes is thickened and shaped to facilitate guiding the hooked edges of the ribs into mating relationship. The two tapes are identical in configuration and are secured to the parts to be joined together with their ribs inclined in opposite directions so as to interlock when the ribs of one tape are pressed between the ribs of the other tape.

Many proposals have been made heretofore for separable seam constructions utilizing a pair of tapes formed along their free edges with interengagable and interlocking elements. However, these are subject to various shortcomings and disadvantages sought to be obviated by the present invention. For example, prior constructions are difficult to assemble and disassemble and require special tools or slider mechanisms movable lengthwise of the tapes and effective to shift the interlocking elements into and out of engagement with one another. Another serious disadvantage is that prior tapes include no provision for selective assembly in different positions to compensate for tolerance variations or looseness between the parts being secured together.

By the present invention, these and other disadvantages of prior design are overcome. The new seam comprises a pair of flexible tapes each provided with a series of parallel hooked ribs capable of interlocking with one another when interested and any selected number of which ribs are mateable as necessary to hold the parts being secured together in a desired degree of tautness. The new seam is particularly desirable for use where the seam is normally loaded lightly transversely of its length, this loading being utilized to hold the hooked ribs interlocked with one another.

Accordingly, it is a primary object of the present in-

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vention to provide a unique separable seam adapted to be assembled selectively in different positions of overlap.

Another object of the invention is to provide a separable seam featuring a pair of flexible tapes of similar configuration and each having a plurality of tongues and grooves mateable automatically as their respective tongues are pressed into the grooves of the other tapes and adapted to be held releasably mated by load forces acting transversely of the mated tapes.

Another object of the invention is the provision of a separable seam assembly comprising a pair of flexible tapes each having a wide flat main body provided with a series of parallel hooked ribs projecting from one surface thereof at an angle and capable of being interlocked with one another selectively in a wide range of widths depending upon the number of pairs of ribs assembled in mating relationship.

These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawing to which they relate.

Referring now to the drawing in which a preferred embodiment of the invention is illustrated.

FIGURE 1 is a fragmentary perspective view showing one preferred embodiment of the seam forming tapes in closed position and employed to hold a tubular jacket closed;

FIGURE 2 is an end view on an enlarged scale through the mated tapes; and

FIGURE 3 is a fragmentary view on an enlarged scale of a portion of a single tape.

Referring to the drawing there is shown a preferred embodiment of the invention seam forming tapes designated generally 10 and shown in FIGURE 1 to hold the overlapped edges of a split tubular jacket 11 closed. While not so shown in FIGURE 1, it is pointed out that one of the many typical uses of jacket 11 is to hold resilient heat insulating components in place about conduits and the like.

The details of the seam forming tapes are best shown in FIGURES 2 and 3 wherein tapes 12, 13 are shown interlocked and fully assembled. The two tapes may vary substantially in width or be of identical widths, but otherwise each is of the same configuration and design. Normally the tapes are of identical width and size and are conveniently formed by extrusion from suitable elastomeric material as, for example, polyethylene, polyvinylchloride and any of numerous other thermoplastic materials having related properties. Each tape includes a relatively thin flexible main body 14 provided along one edge with a mounting web 15 here shown as bonded, heat-fused or otherwise secured to one lateral edge 16 of a split jacket 11 which is tubular. Integral with and projecting upwardly from one surface of main body 14 are a series of parallel hooked ribs 18. Each rib includes a relatively long leg 19 and a relatively short leg 20. As is best shown in FIGURE 3 the longer leg 19 of each rib is inclined at an obtuse angle of about 75 degrees to main body 14. It will be understood that this angle is not critical but is representative of an angle found to provide highly satisfactory locking action. Likewise the shorter legs or hooks 20 of each L-shaped rib are inclined downwardly and inwardly toward the base of the next adjacent rib 19, a suitable angle being 75 degrees. Hooks 20 are coextensive in length with the longer legs and the length of the tape proper. It will also be observed that the longer legs 19 are considerably thicker adjacent their lower inner ends which flare and merge with the

main body over a relatively wide area. Desirably the surface 22 of the longer leg remote from the leg 20 is curved in a manner serving to guide the hook of the rib on a mating tape into locking position. The distance between ribs 19, 19 is a matter of designer's choice, the distance shown in FIGURE 3 being somewhat greater than that which would be used in certain applications of a seam embodying the principles of the invention. The minimum separation between ribs is that required for the hooked ends to bypass one another during engagement and disengagement.

Another feature of the invention is the provision of weakening grooves 25 extending lengthwise of the main body intermediate adjacent ones of ribs 19. As herein shown, these grooves are of V configuration with the apex located intermediate the opposite surfaces of the main body. This facilitates severance of a selected width of the tape from the remainder by grasping one end of the free edge of the tape and pulling it toward the other end as the first end of the main body of the tape is held firmly.

Thus it is convenient to make the tapes in relatively wide widths and to remove a portion of the free edge of the outer one of the tapes if it is found upon preparing to assemble them that an excess width of tape will be present when the tapes are properly assembled and tensioned in the operating environment. For example, in FIGURE 2 outer tape 12 is shown fully assembled to the mating tape 13 and as having the two ribs at its right hand free edge without mating ribs on inner tape 13. In this event it is a simple matter to eliminate the excess portion 26 of tape 12 by bending it sharply outwardly placing the apex of weakness groove 25 under severe strain and permitting the excess portion to be severed by progressively shearing portion 26 from the remainder of the tape lengthwise of the weakness groove 25 lying between the second and third ribs from the right hand edge of tape 12.

The mode of use of the invention tapes will be quite apparent from the foregoing description. The respective mounting webs 15 of tapes 12 and 13 having been suitably secured to the opposite lateral edges of a jacket or of any other pair of articles to be separably joined, the user simply presses the edge provided with tape 13 against the underlying object being enclosed while grasping the free edge of tape 12 and pulling its ribs into overlapping relation with the underlying ribs of tape 13. The hooked ribs of the two tapes are pressed into interesting relationship as care is exercised to hold the ribs parallel to one another. As pressure is applied, the facing inclined surfaces along the exterior or shorter legs 20 cooperate in camming the ribs past one another. Continued application of pressure crosswise of the overlapped tapes shifts the hooked ribs into mating relationship, full interlocked engagement occurring as tension is released from the free edge of outer tape 12. Relaxation of this tension, which is enhanced if the jacket body 11 is made of resilient material, acts to maintain the engaged pairs of hooks 20 resiliently and firmly engaged.

Disassembly of the tape is accomplished equally expeditiously by grabbing the free edge of other tape 12 and pulling it crosswise of underlying tape 13 to increase the tension on jacket 11 and to disengage hooks 20 as the outer tape is pulled outwardly and upwardly.

While the particular variable width seam of interlocking components herein shown and disclosed in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiment of the invention.

I claim

1. A variable width seam of interlocking components comprising a pair of continuous seam forming tapes adapted to be interlocked selectively in different overlapped widths, said tapes being formed of extruded

elastomeric material, each tape including a wide main body and a multiplicity of parallel ribs integral with and projecting from one surface of said main body and spaced apart by spaces, said ribs being generally L-shaped in cross-section with the longer leg of each rib lying at an obtuse angle to the plane of the tape and the shorter leg being at the outer free edge of the longer leg and having its inwardly facing surface lying generally at right angles to the longer leg and cooperating therewith to form a retainer hook interlockable with the complementally disposed shorter leg on the free edge of the mating rib on the other of said pair of tapes, the entrance to each of said spaces being greater than the overall length of said shorter leg such that one interlocked pair of ribs is spaced from adjacent ones of the ribs to facilitate engagement and disengagement thereof, and a variable number not less than a plurality of pairs of said L-shaped ribs being selectively mateable to form a high strength seam depending upon the width of the overlapped portions of said tapes, the additional number of pairs of said ribs being interlocked together.

2. A pair of seam forming tapes as defined in claim 1 characterized in that the exterior surfaces of the base portions of adjacent ones of said L-shaped ribs converge toward one another and serve to guide the shorter legs of the two tapes into interlocking engagement as the overlapped portions of the two tapes are assembled into mating relationship and loading is applied to the seam transversely thereof.

3. A pair of seam forming tapes as defined in claim 1 characterized in that said tapes are formed with weakness grooves between adjacent ones of said ribs to facilitate severing a selected portion of the free edge of the tape from the remainder of the tape when not needed.

4. A pair of seam forming tapes as defined in claim 1 characterized in that said longer legs increase in thickness adjacent the junction thereof with the main body of the tape.

5. A pair of seam forming tapes as defined in claim 1 characterized in that adjacent ones of said ribs are interconnected by arcuate shaped portions of the intervening main body portions of said tapes whereby the inner ends of the longer legs are substantially thicker and stiffer than the relatively thin and flexible outer ends of said longer legs.

6. A pair of seam forming tapes as defined in claim 1 characterized in that the interior junction areas of said longer and shorter legs comprise inverted V-shaped recesses adapted to seat the inner free edges of the shorter legs of the other of said tapes.

7. A pair of seam forming tapes as defined in claim 1 characterized in that the outer surface of the longer legs of said L-shaped ribs curves inwardly beneath the shorter leg of the adjacent rib and serves to shift said tapes laterally crosswise of one another to facilitate interlocking engagement of their mated pairs of shorter legs as the mated seams are placed under load crosswise of the closed seam.

8. A readily opened and closed adjustable width seam comprising a pair of continuous seam-forming tapes of flexible material adapted to be assembled selectively in at least three or more different degrees of overlap thereby to accommodate a larger or a smaller girth, said pair of tapes being of generally complementary design in cross-section and each having a multiplicity of parallel grooves formed by L-shaped ribs having hooks along their respective free outer edges, the entrance to each of said grooves being greater than the overall transverse width of said hook, said L-shaped ribs permitting interlocking engagement and disengagement substantially without interference with one another and by shifting said seam-forming tapes laterally crosswise of one another in a direction to disengage pairs of L-shaped ribs, the concealed inner surfaces of said hooks being inclined inwardly toward the base of the adjacent rib and effective

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when mated with a hook of the other of said pair of tapes to hold said hooks firmly engaged when tensile loading is applied transversely of the mated pair of tapes, said tapes having means for securing the same along the edges of material desired to be held separably joined together by interlocked pairs of said ribs after being brought into overlapped interlocking position, and said tapes being selectively mateable in any of at least three or more different degrees of overlap transversely of one another with more than a single pair of hooked ribs interlocked.

9. An adjustable-width seam as defined in claim 8 characterized in that the two outwardly facing surfaces of said L-shaped hooked ribs are inclined in opposite directions diverging toward the base portions of adjacent ones of said ribs and are effective to cam said ribs into mating position as pressure is applied from the exterior surfaces of the overlapped portions thereof.

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