

United States Patent

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[54] SELF-LOCKING SEPARABLE SEAM ASSEMBLY

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[58] Field of Search.....24/201 C, 201 HH; 174/DIG. 11; 138/128, 118

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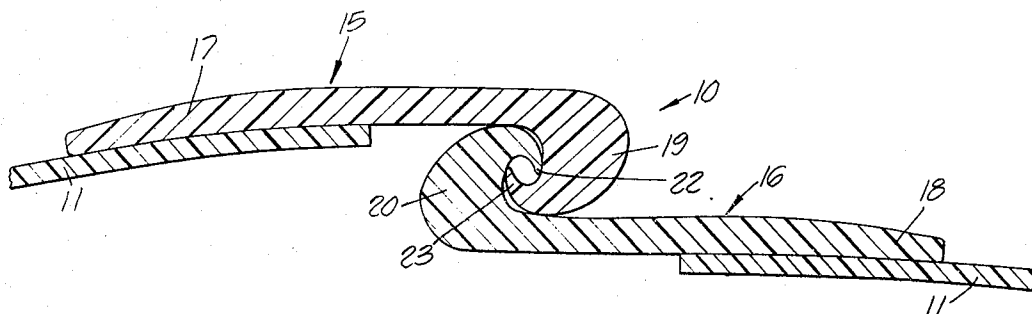
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[57] ABSTRACT

A self-locking separable seam assembly comprising a pair of strips of identical J-shape in cross section extruded from semirigid thermoplastic material featuring a thick semirigid return bend portion bordered by a relatively thin low-height lip positioned to interfere with the corresponding lip of the other strip as the strips are pulled crosswise of one another into interlocking engagement. The seam separates as the two strips are forced past one another in a direction opposite to the assembly operation.

6 Claims, 4 Drawing Figures



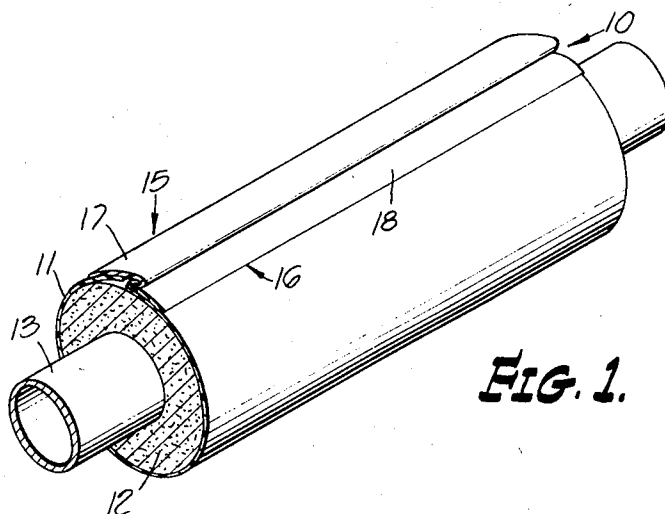


FIG. 1.

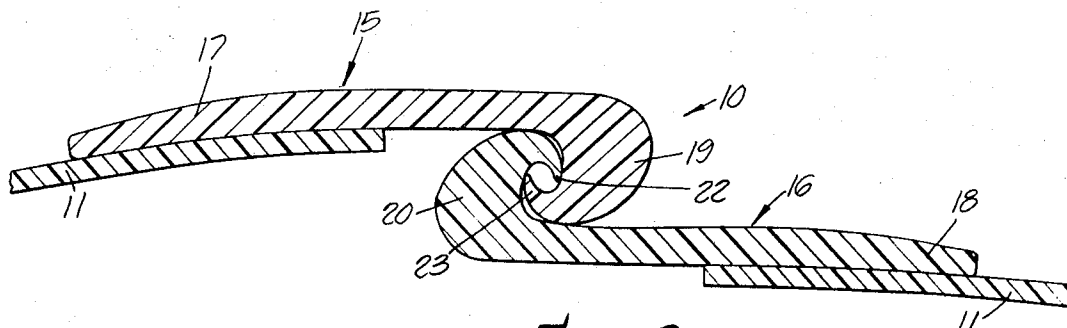


FIG. 2.

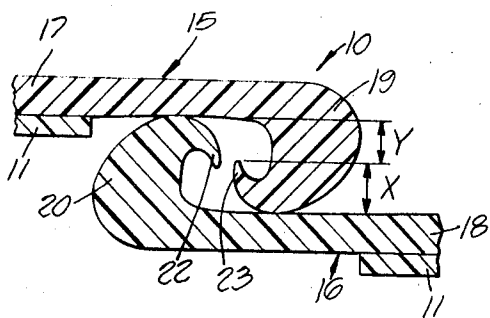


FIG. 3.

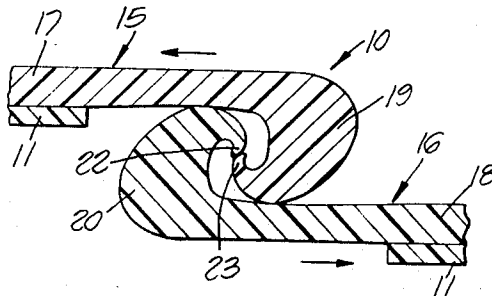


FIG. 4.

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SELF-LOCKING SEPARABLE SEAM ASSEMBLY

This invention relates to separable seam assemblies and more particularly to a self-locking seam formed from semirigid thermoplastic material.

A wide variety of separable seam assemblies have been proposed heretofore so contoured that portions thereof are interengageable to provide a separable seam unit. Many of these require a slider device or other tool movable lengthwise of the seam and effective to engage or disengage the seam progressively from end to end. Others are designed to interlock the seam parts as pressure is applied by the fingers or other means lengthwise of the overlapped parts.

In contrast with the operating principles and characteristics of these prior art seam assemblies, the present invention provides a pair of specially shaped extruded plastic seam components of identical cross-sectional shape designed to interlock automatically as their oppositely facing overlapped hooked edges are moved bodily crosswise of one another into assembled position. The seam operates without need for sliders or closure tools of any kind, it merely being necessary to move the overlapped edges toward or away from one another with sufficient force to flex their interfering lips of their oppositely facing hooked edges.

The trough-shaped lateral edges of the strips are relatively thick and stiff as compared to the thin and more flexible intumed lips forming the outer sidewall of the trough. The invention seam assembly is particularly suitable for use under static conditions wherein the parts being held assembled can be reasonably accurately tailored for a snug fit about the parts being enclosed. In this type of application, the enclosing jacket is readily installed and locked closed simply by overlapping the seam parts and then pulling the parts of the seam laterally in opposite directions by the slight amount required to cam the flexible lips past one another. Separation of the seam is effected by reversing this assembly operation.

Accordingly, it is a primary object of the present invention to provide an improved separable seam assembly which is self-locking in its assembled position.

Another object of the invention is the provision of a self-locking separable seam assembly which snaps closed and open without need for tools, slider devices or the like.

Another object of the invention is the provision of a separable seam assembly formed from a pair of identical extruded plastic strips of J-shape in cross section wherein the trough portion is relatively stiff and equipped with an intumed lip contoured to flex sufficiently to snap past one another during assembly and disassembly.

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:

FIG. 1 is a perspective view of a preferred embodiment of the invention seam assembly applied to a jacket employed to hold insulating material assembled about a conduit;

FIG. 2 is a fragmentary cross-sectional view on an enlarged scale of the seam assembly in closed position;

FIG. 3 is a fragmentary view on an enlarged scale taken through the seam components poised for movement into closed position; and

FIG. 4 is a view similar to FIG. 3 but showing the seam components in the process of being cammed into interlocking assembled position.

Referring initially and more particularly to FIG. 1, there is shown a typical embodiment of the invention separable seam, designated generally 10, bonded to a plastic jacket 11 and tailored to hold a layer of heat-insulating material 12 assembled about a conduit 13. It is well known that both hot and cold pipes have need for heat insulation and suitable appearance jacket means for holding this insulation detachably assembled about the pipes. Such insulation material has considerable resiliency and this property is utilized advantageously to compensate for dimensional variations in the

several components as well as to apply desirable tension forces crosswise of jacket seam 10.

Referring now to FIGS. 2, 3 and 4, it is pointed out that seam 10 comprises a pair of identical extruded tapes 15, 16 of J-shape in cross section. The stem portions of the tapes provide mounting web 17, 18 which can be secured to the appearance jacket 11 in any suitable manner, as by bonding, heat fusing, or the like between their overlapped contacting surfaces. The trough-shaped portions 19, 20 of tapes 15, 16 are relatively thick and stiff, the thermoplastic composition from which the tapes are formed having a durometer of 98 plus or minus 5 on the scale with the result that the trough-shaped portions are relatively stiff and inflexible.

The free edge or outer sidewall of each of the trough shaped portion comprises an intumed tapered hook or lip 22, 23. If a plane is passed through the tip edge of the lip and another in contact with the remote outer edge of the trough portion with each lying parallel to the adjacent inner surface of the mounting web, then it will be understood that the distance X is somewhat greater than the distance Y. In consequence it will be readily apparent that the two lips interfere with one another during the assembly and disassembly operation. This fact is made somewhat clearer by a comparison of FIGS. 3 and 4 and noting that lips 22 and 23 flex and cam past one another as the tapes are moved coplanarly of one another in opposite directions. The continued movement causes the lips to bypass one another as the same parts snap into closed position. The lips are deflected in the opposite direction as the two seam parts are moved in the opposite directions to separate them during the disassembly operation. Owing to the relatively far greater amount of material and the thickness of the trough bottoms, the latter do not flex during assembly and disassembly and this strength is utilized to preclude expansion and opening of the seam under extreme loading conditions and very substantially greater than those attainable with prior separable seam assemblies.

The mode of using the described separable seam assembly will be readily apparent from the foregoing description of the structure. The assembly is initiated by overlapping the two tapes 15, 16 to the position shown in FIG. 3 and holding them in this overlapped position as the trough-shaped portion of the outermost one of the tapes is placed in contact with the underlying surface of the lower tape. The slight tensioning applied to the two tapes while performing this assembly operation is then released and the released stresses acting in the jacket and in the underlying material serve to pull the tapes toward and into locking engagement in the manner described. The tapes may be separated simply by pressing the tapes bodily toward one another in a coplanar direction causing the interfering lips 22, 23 to snap past each other.

While the particular self-locking separable seam assembly 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 embodiments of the invention, and that no limitations are intended to the details of construction or design herein shown other than as defined in the appended claims.

I claim:

1. A self-locking separable seam assembly comprising a pair of elongated thermoplastic strips of the same J-shape in cross section, the relatively wide thin stem portion of said J-shaped strip providing a mounting web, the return bend portion of said J-shaped strips being substantially thicker and stiffer than said mounting web and relatively highly resistant to flexure and including a thin low-height lip projecting inwardly toward said mounting web at an obtuse angle thereto with the inner rim edge thereof lying generally midway between the inner surface of said mounting web and a plane in contact with the exterior surface of said return bend portion and parallel to said mounting web, and said strips being engageable by inverting the free edges of their J-shaped portions to lie in contact with the mounting web of the other and then moving the J-

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shaped portions toward one another in a direction generally coplanar to their respective mounting webs until the inner edges of said inwardly projecting lips are cammed apart and into interlocking engagement one behind the other.

2. A self-locking seam assembly as defined in claim 1 characterized in that the inner edge of said lip is slightly closer to the adjacent surface of the associated mounting web than to the plane in contact with the exterior surface of said return bend portion, and the free inner edges of said lips being engageable to cam the lips past one another as said strips are being interlocked one with the other.

3. A self-locking seam assembly as defined in claim 1 characterized in that said strips are molded from thermoplastic having a durometer in the range of about 98 plus or minus 5 on the A scale.

4. A self-locking seam assembly as defined in claim 3 characterized in that the interior bottom surface of said J-shaped return bend portion is slightly concave and effective to cam the mounting webs of the interlocked strips toward one another as load forces are applied to said mounting webs in a direction tending to move said webs away from one another in the plane thereof.

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5. A self-locking separable seam assembly comprising a pair of elongated thermoplastic tapes of the same J-shape in cross section including a wide stem portion providing a mounting web for securing said tapes to sheet material and a trough-shaped portion along one lateral edge thereof, said trough-shaped portions being relatively thick, stiff and highly resistant to opening when the closed seam is stressed in tension transversely thereof, and the free edge of said trough-shaped portion extending inwardly across the inlet into said trough and being sufficiently flexible to be cammed past the similar lip of the other tape when the inverted trough-shaped portions of said pair of tapes are overlapped and moved laterally of one another until the two trough-shaped portions interlock with their lips fully nested in the trough of the other tape.

6. A separable seam assembly as defined in claim 5 characterized in that the free edge of said trough-shaped portion is generally V-shape in cross section, and the tip thereof being spaced closer to the inner surface of said wide stem portion than to a plane parallel to said stem portion and in contact with the exterior surface of said trough portion.

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