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 [21] Appl. No. **880,058**
 [22] Filed **Nov. 26, 1969**
 [45] Patented **June 1, 1971**

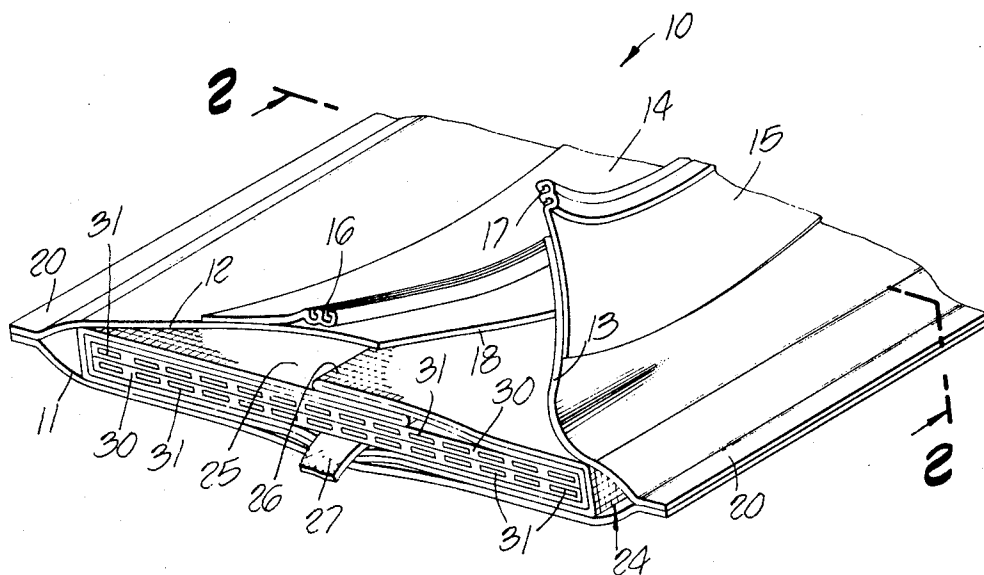
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 UNITED STATES PATENTS
 3,180,923 4/1965 Gow et al. 174/72
 3,254,678 6/1966 Plummer 174/68x
 3,467,761 9/1969 Plummer 174/36

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[54] **SHIELDED JACKET ASSEMBLY FOR FLAT CABLES**
 12 Claims, 2 Drawing Figs.

[52] U.S. Cl. 174/36,
 174/68, 174/102, 174/107, 174/117
 [51] Int. Cl. H01b 11/06
 [50] Field of Search 174/ZT, 36,
 35, 68c, 72, 117, 102

ABSTRACT: A normally fully flattened tubular jacket assembly of flexible nonconductive material having a reclosable interlocking seam and enclosing a longitudinally split inner tubular layer of flexible conductive electric shielding material adapted to embrace a flat cable of conductors. The shielding tube is permanently attached to the interior side of the non-conductive material and to a grounding conductor.



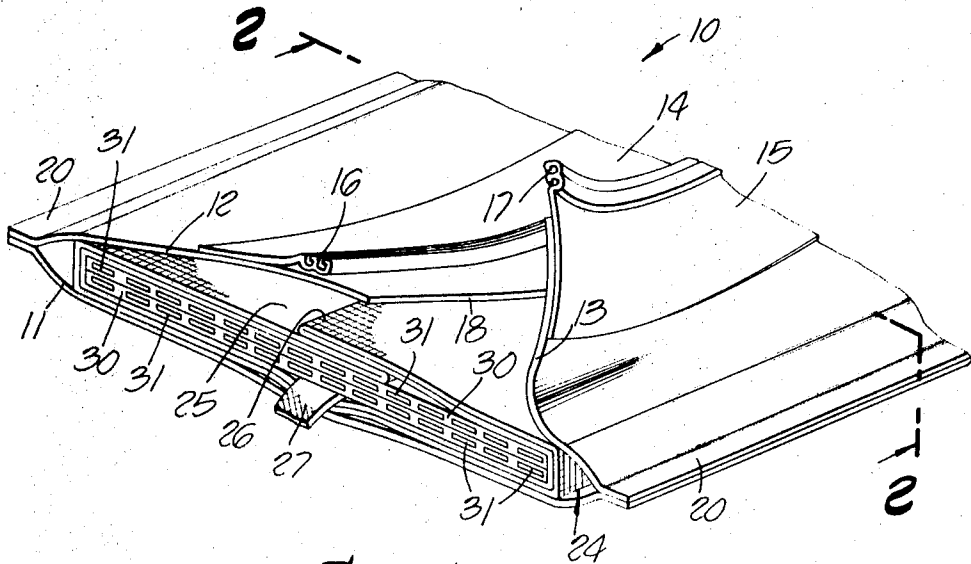


FIG. 1.

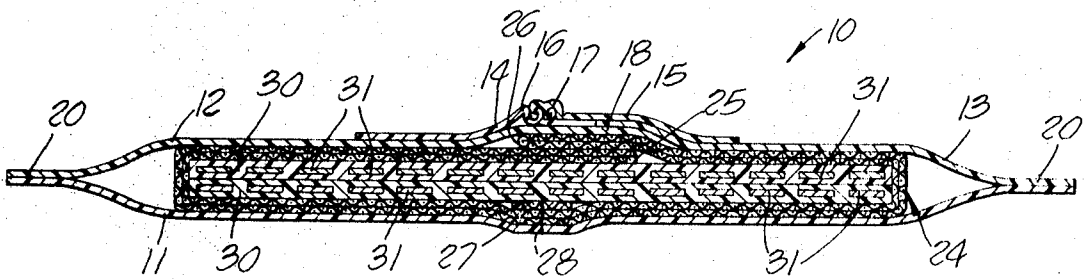


FIG. 2.

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SHIELDED JACKET ASSEMBLY FOR FLAT CABLES

This invention relates to shielding jackets for conductors and more particularly to a flat shielded jacket assembly formed of supple, flexible material equipped with a closure seam and the opposite sides of which are normally fully flattened against one another.

There have been proposed heretofore electrically shielded jacket assemblies for enclosing cabling and adapted to be opened whenever the need arises to permit servicing of the cabling. Typical of these prior proposals is the construction shown in U.S. Pat. No. 2,960,561 granted to W. A. Plummer, Nov. 15, 1960. A related construction employing knit wire mesh as the shielding material is disclosed in the copending application of Walter A. Plummer, Ser. No. now U.S. Pat. No. 3,467,761, filed Sept. 23, 1968, entitled Electrically Shielded Heat-Reactive Jacket for Conductors. However, both of these prior jacket constructions and others heretofore proposed are ill suited for use with flat cables typical of which are various flat ribbonlike cables currently in widespread use. Such flat cables include a multiplicity of insulated conductors held assembled in side-by-side relation and projecting a minimum distance from a flat supporting surface. Such cables can be bent sharply to conform with either inside or outside corners without risk of injury to the conductors.

Such cable assemblies frequently have need for protection against flux fields but shielding jacket assemblies heretofore provided for circular cables are quite inefficient, ineffective and unsightly when an attempt is made to use them to enclose flat cabling. This is due in major part to the fact that prior jacket assemblies naturally tend to assume their normal circular configuration when closed and have no tendency to lie flat against the opposite faces of a flat cable. It naturally follows that the overlapped edges of the shielding spread apart and shift out of good conducting relation and fail to provide a continuous shielding enclosure for flat cabling.

It is therefore a primary object of the present invention to provide a simple, inexpensive, shielded jacket assembly specially constructed for use to enclose ribbon and the like flat cabling. The main body of the assembly includes opposed walls lying flush against one another as manufactured and one of which is provided with a reclosable interlocking separable seam providing access to the jacket. The electrical shielding layer preferably comprises a thin flexible strip of conductive material secured to the interior surface of the jacket main body and having a width substantially greater than the girth of the flat cable to be shielded in order that the opposite lateral edges of the shielding can be overlapped against one another as the jacket is closed. To facilitate and enhance the ability of the main body sidewalls to lie against one another, their opposite lateral edges are bonded together along a narrow strip lying in a common plane. When the seam is open the flaps to either side thereof may be folded away from one another for convenience in inserting and servicing one or more flat cables. When the seam is closed, it is effective to hold the main body flaps pressed against the overlapped edges of the shielding layer and to hold both faces of the jacket and the shielding flush against the flat faces of the cable.

Accordingly, it is a primary object of the present invention to provide an improved shielded jacket assembly specially designed for use with flat cables of conductors.

Another object of the invention is the provision of a shielded jacket assembly having a flat tubular main body formed from two principal layers of flexible nonconductive material fused together coplanarly along their opposite lateral edges and enclosing a split tubular layer of shielding material having a width greater than the girth of the flat cabling to be enclosed thereby.

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 short length of a preferred embodiment of the invention jacket assembly showing a pair of flat cables enclosed therewithin and the seam in the process of being closed; and

FIG. 2 is a cross-sectional view on an enlarged scale taken along line 2-2 on FIG. 1.

Referring to the drawing, there is shown a unitary shielded jacket assembly designated generally 10, having an outer main body formed of any suitable flexible impervious nonconductive material, such as polyethylene, polyvinyl chloride, etc. As herein shown by way of example, the main body includes a relatively wide strip 11 and two narrower strips 12, 13 superimposed upon strip 11. Prior to the assembly of these three strips, the adjacent edges of strips 12 and 13 are assembled to seam forming tapes 14, 15. As herein shown, tapes 14 and 15 are extruded from suitable thermoplastic material and include interlocking tongue and groove portions 16 and 17 of any suitable interlocking design cooperating when pressed together in interlocking relationship to form a re-openable virtually fluidtight seam. Desirably, one of the tapes, as 14, is heat fused or otherwise bonded to strip 12 along an area spaced inwardly from the right-hand edge thereof to provide a guard flat 18. This guard flap underlies or bridges the seam proper when the latter is closed and serves to safeguard against the shielding material interfering with mating of the tongues and grooves of the seam.

The assembly of strips 12 and 13 to wider body strip 11 is preferably carried out while seam parts 16, 17 are mated. These two main body units of the jacket assembly are then superimposed in direct registry with one another whereupon their opposite lateral edges are bonded or heat fused together in coplanar relationship as is indicated at 20, 20. Assembly by heat fusion is particularly expedient when using plastic material. The resultant assembly lies perfectly flat intermediate the coplanar flat seams 20, 20. As will be recognized flaps 12, 13 can be readily folded outwardly but when released immediately resume their normal position flush against the relatively wide main body strip 11.

Suitably attached to the interior of the jacket main body is a wide strip of flexible conductive electrical shielding material 24. As herein shown, the shielding layer comprises a strip of flattened tubular knit mesh material of a well-known commercially available construction, a typical embodiment of which is disclosed in the above-identified copending application. The wire mesh comprises fine resilient wire having very small voids between the adjacent strands and is found highly effective as a barrier against the passage of electrical flux fields, particularly when employed in more than one layer.

The width of shielding layer 24 is substantially greater than the girth of the flat cable to be shielded in order that its opposite lateral edges 25, 26 will overlap each other in a substantial degree in the assembled condition of the jacket. The area of attachment of this layer to the jacket body is a matter of designers' choice, excellent results having been achieved when the shielding jacket is assembled to the main body along a narrow strip underlying seam 16, 17. As herein shown the shielding jacket is secured in place along with a length of flexible braided conductor 27 by means of stitching 28 passing through the conductors, the shielding strip and main body layer 11. The slightly greater thickness thereby provided beneath the overlapped edge 25, 26 of the shielding and the superimposed guard flat layer 18 aids in a substantial degree in applying compressive pressure against the parts and supplements the memory characteristic of the jacket body in tending to return to its normal flattened condition. If desired, braid 27 may be positioned between shielding 24 and strip 11.

Shown assembled within the invention shielded jacket are a pair of a typical ribbon cables 30, 30. Each of these cables includes a plurality of flat conductors 31 embedded in a flat strip of insulation material. This is but one of many types of flat or ribbon type cables now in general use and for which the present shielded jacket assembly is particularly suitable. It will be understood that one or more such ribbon cables are in-

serted into the open jacket while the seam flaps are spread apart and while the opposite lateral edges of the shielded jacket 24 are likewise in open position. Once the flat cables are centered within the open shield, the shield flaps are pulled snugly about the cables and pressed against one another in overlapping relation. Thereafter, body flaps 12,13 are folded against the shield and pressure is applied to seam parts 16,17 to interengage them.

From the foregoing detailed description of the construction and mode of use, it will be readily apparent that the completed assembly is unusually flat and compact and that the closed seam 16,17 is highly effective in holding the overlapped edges 25,26 of the shielding strip 24 pressed against one another and in good conducting relation from end to end of the jacket.

While the particular shielded jacket assembly for flat cables 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.

I claim:

1. An article of manufacture comprising a flat tubular shielded jacket assembly for enclosing a flat cable of conductors comprising, a flattened tubular main body of supple thin sheet plastic material having each flattened opposite edge thereof secured together along a narrow flat band, one sidewall of said flattened main body having reclosable seam forming means secured to and extending lengthwise thereof and providing ready access to its interior when disengaged, a thin flexible strip of conductive electrical shielding material secured to the interior of said main body having a width in excess of the girth of a flat cable of conductors to be enclosed thereby, and the opposite lateral edge portions of said shielding being folded toward one another inwardly of the flattened opposite edges of the main body of said jacket and having the free edges of said conductive strip in overlapping contacting relation thereby to provide a split flattened tubular enclosure of electrical shielding adapted to receive and fully embrace a flat cable of conductors.

2. An article of manufacture as defined in claim 1 characterized in that the opposite lateral edges of said main body are held together in flattened coplanar relation by having the juxtaposed interior surfaces thereof bonded together.

3. An article of manufacture as defined in claim 1 characterized in that the opposite lateral edges of said main body are heat fused together in coplanar relation.

4. An article of manufacture as defined in claim 1 characterized in that said strip of conductive electrical shielding material comprises multiple layers of fine mesh wire netting and a flexible fine wire cable secured to said wire netting and extending lengthwise of said main body.

5. An article of manufacture as defined in claim 1 characterized in that the main body of said jacket assembly and said seam forming reclosable means are formed of flexible thin-walled plastic heat fused together.

6. An article of manufacture as defined in claim 1 charac-

terized in that said conductive electrical shielding layer is attached to said main body along a narrow strip area extending lengthwise of said main body between the opposite lateral edges thereof with the opposite lateral edges of said conductive material free of said main body and accessible for folding about a flat cable of conductors.

7. An article of manufacture comprising a unitary flattened tubular jacket formed of supple thin sheet plastic, the opposite sides of said flattened jacket normally lying parallel to and substantially against one another when not assembled about flat cable, one of said flat sides having reclosable seam forming means secured to and extending lengthwise thereof and providing ready access to the interior of said jacket when open, a thin flexible strip of conductive electrical shielding material secured to the interior of said jacket from end to end thereof and having a width in excess of the girth of a flat cable of conductors to be enclosed thereby, the opposite lateral edges of said strip of shielding being foldable into overlapping contacting relation to one another about the opposite edges of a flat cable to fully embrace said cable, and said seam forming means being closable to hold the edges of said electrical shielding overlapped and pressed together.

8. An article of manufacture as defined in claim 7 characterized in that said electrical shielding strip is secured to one interior side of said jacket along a narrow strip located between the opposite lateral edges of said shielding strip, and a thin flexible braided conductor in electrical contact with said shielding strip secured thereto and to said jacket from end to end thereof.

9. An article of manufacture comprising a flat tubular jacket assembly, comprising upper and lower elongated strips of flexible nonconductive material lying generally flat and parallel to one another in superimposed relation with their juxtaposed lateral edges bonded together, a plurality of pairs of insulated conductors extending lengthwise of and in side-by-side relation between the opposite lateral edges of said upper and lower strips of nonconductive material, conductive shielding enclosed by said nonconductive strips and embracing said pairs of conductors for shielding the same against the passage of electrical flux fields, said conductive shielding means secured to said nonconductive material and extending from end to end of said nonconductive strips.

10. An article of manufacture as defined in claim 9 characterized in the provision of means including nonconductive dielectric material secured about and between said conductors and effective to hold the same assembled in flat ribbonlike array in a plane between and parallel to said upper and lower strips of nonconductive material.

11. An article of manufacture as defined in claim 9 characterized in that the lateral edges of said nonconductive strips are bonded together by heat fusion.

12. An article of manufacture as defined in claim 10 characterized in that one of said nonconductive strips is equipped with nonconductive reclosable seam means providing access to said pairs of conductors.