United States Patent [19]

Baker, Sr.

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[54] **DRAPERY TAPE**

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[73] Assignee: **Baker Drapery Corporation**, Peoria, Ill.

[22] Filed: **Nov. 18, 1971**

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[52] **U.S. Cl.** **160/330**, 160/348

[51] **Int. Cl.** **A47h 1/00**, A47h 13/14

[58] **Field of Search** ..... 160/330, 348, 344, 345, 160/346, 347; 16/87–87.8; 139/387 A; 161/38, 39, 40

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Assistant Examiner—Philip C. Kannan
Attorney, Agent, or Firm—Hofgren, Wegner, Allen, Stellman & McCord

[57] **ABSTRACT**

A tape for suspending a drapery panel from a carrier having a longitudinal dovetail groove. The tape comprises a woven ribbon to which plastic mounting elements or sliders are bonded by a zone of fused plastic which extends only partially through the ribbon. A woven layer of the ribbon underlies the zone of fused plastic providing a flexible connection between the mounting element and the ribbon enhancing the strength of the bond.

The ribbon has a center portion to which the mounting elements are secured and lateral flanges which are thinner than the center portion and which are stitched to the drapery panel. The ribbon has a high degree of flexibility at right angles to its surface to permit the drapery to follow convolutions of the carrier, yet resists deformation in the plane of the ribbon so that the drapery does not sag. The plastic mounting elements are rectangular and cannot turn or twist in the carrier groove.

14 Claims, 17 Drawing Figures

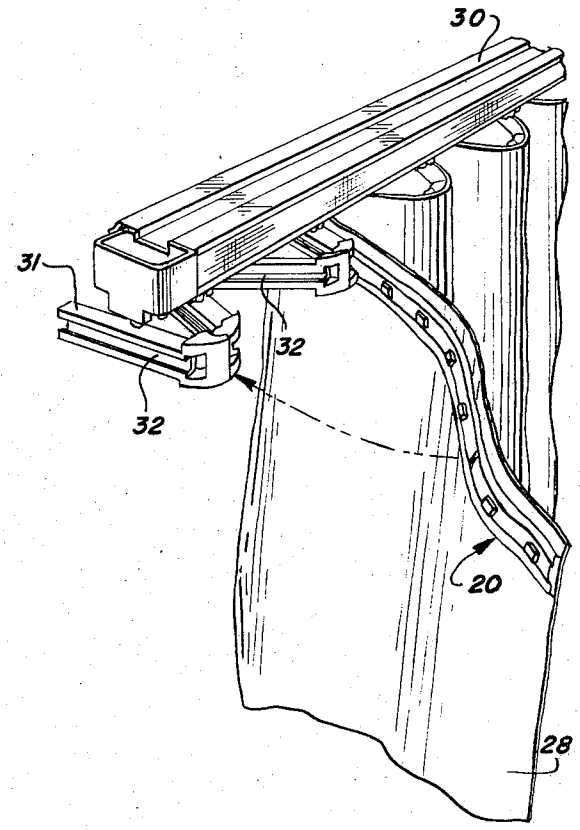
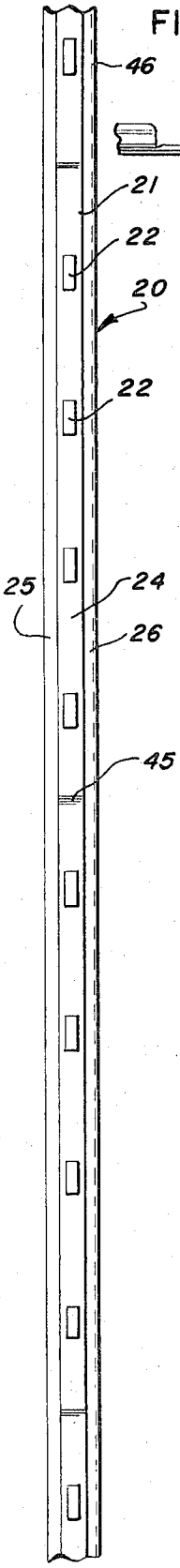


FIG. 1



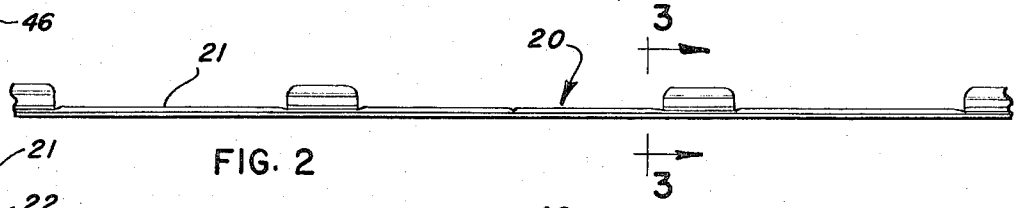
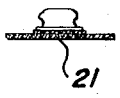


FIG. 2

FIG. 3



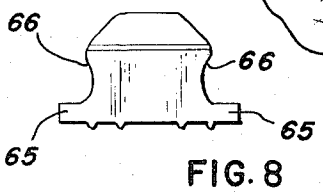
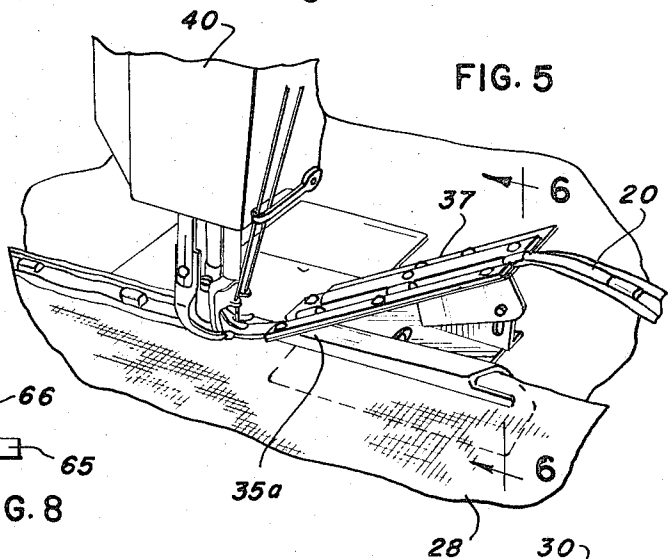


FIG. 8

FIG. 5



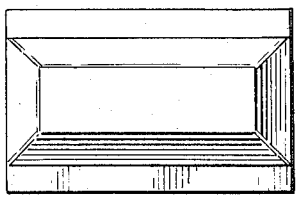


FIG. 9

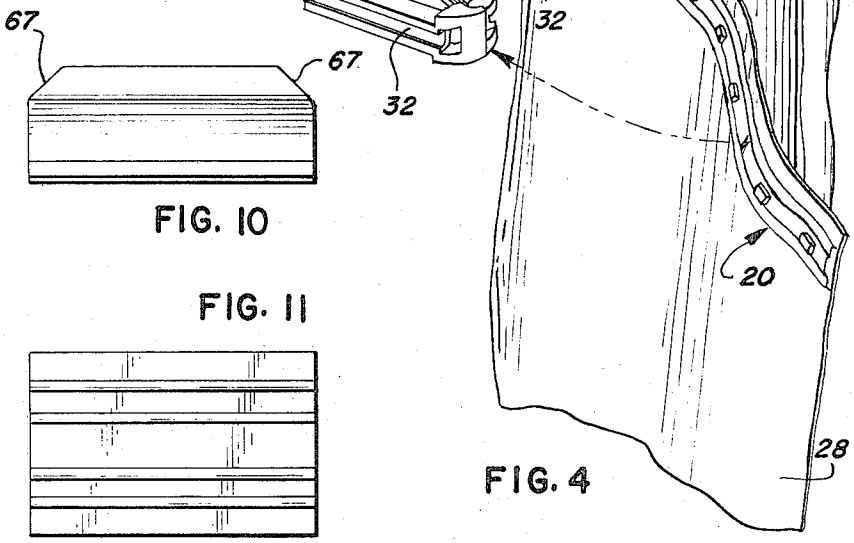


FIG. 10

FIG. 11

FIG. 4

FIG. 12

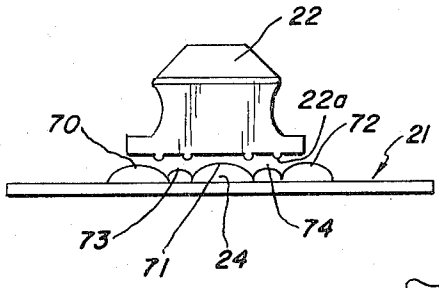
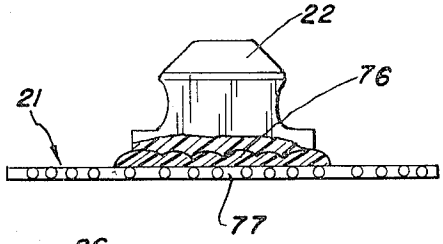


FIG. 13



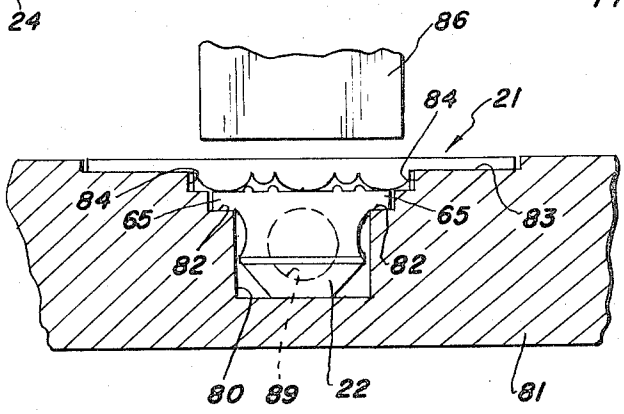


FIG. 14

FIG. 7A

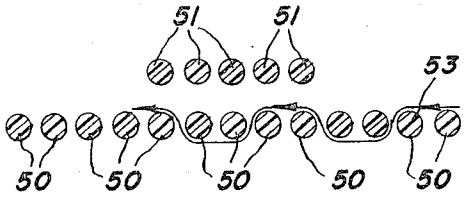


FIG. 7B

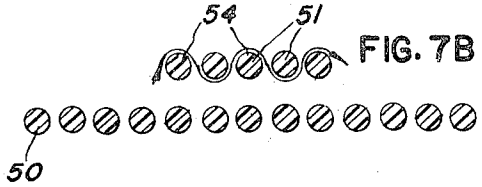


FIG. 7C

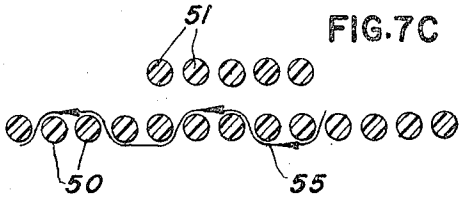


FIG. 7D

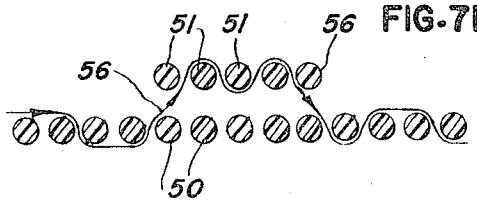
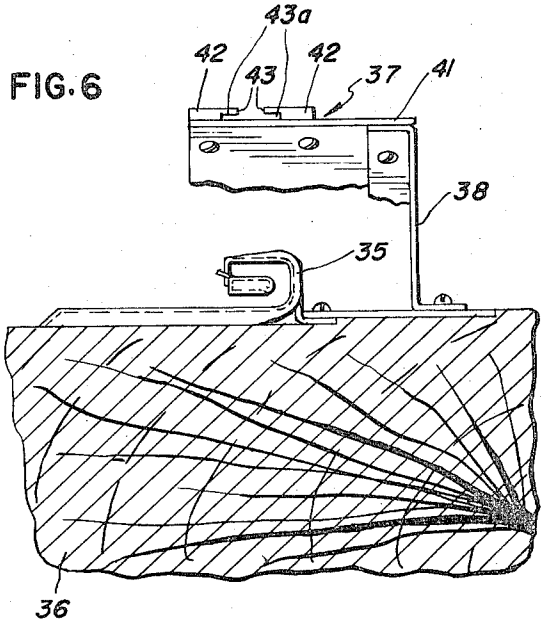


FIG. 6



DRAPERY TAPE

SPECIFICATION

This invention relates to a tape which is stitched to the upper edge of a drapery panel and has spaced mounting elements or sliders thereon which are used to connect the drapery with a carrier.

In my U.S. Pat. No. 3,296,651 I show a drapery carrier or support which has a series of hinged plates suspended from a track. The plates have longitudinal grooves to which the drapery panel is mounted by snap fasteners. The snap fasteners are individually secured to a fabric strip which is sewn to the drapery. The present invention is concerned with an improved drapery tape and fastener or mounting element and is illustrated herein as used with the drapery support of my application Ser. No. 152,879 filed June 14, 1971, which is an improvement of that shown in that patent.

A principal feature of the invention is that the mounting elements or sliders are attached to a woven ribbon by a zone of fused plastic which extends only partially through the ribbon providing a flexible connection between the mounting element and the ribbon. Contributing to the limitation of the depth of the fused plastic zone are two major factors. First, the center portion of the ribbon to which the sliders are bonded has two woven layers. The fused zone extends through only one, leaving the other. Second, the sliders are preferably bonded to the ribbon by the application of induced energy, as by a sonic welder. Both the sliders and the ribbon have physical characteristics which localize the induced heating so that the bond is created in the desired zone.

Another feature of the invention is that the ribbon resists deformation in the plane of its surface yet is quite flexible in the plane at right angles thereto. This provides support to the drapery, reducing any tendency to sag, while permitting the drapery to follow the convolutions of the support. The sliders have a rectangular configuration and are received in a longitudinal slot in the support, preventing twisting of the tape, further reducing any tendency of the drapery material to sag.

A further feature is that the ribbon to which the sliders are bonded has a dual thickness center portion with thin flanges. The flanges may easily be stitched to the drapery panel and the shoulder between the center portion and flanges provides a guide in the handling and sewing of the tape.

Yet another feature is that the sliders are irregularly spaced on the ribbon in a repeating pattern and that indicia on the ribbon identify groups of sliders. Additional indicia distinguish between the upper and lower edges of the ribbon.

Further features and advantages of the invention will readily be apparent from the following specification and from the drawings, in which:

FIG. 1 is a reduced face view of a strip of drapery tape embodying the invention;

FIG. 2 is a side elevation thereof;

FIG. 3 is a section taken generally along the line 3—3 of FIG. 2;

FIG. 4 is a perspective illustrating the attachment of a drapery panel to a support;

FIG. 5 is a perspective drawing illustrating an apparatus for aligning the ribbon with the hem of a drapery panel and for stitching it therewith;

FIG. 6 is a section taken along line 6—6 of FIG. 5;

FIGS. 7A-7D are a series of diagrams taken at right angles to the warp threads of the ribbon, illustrating successive paths of the shuttle in weaving the ribbon,

FIG. 8 is an enlarged end view of a slider;

FIG. 9 is a plan view thereof;

FIG. 10 is a side view thereof;

FIG. 11 is a bottom view thereof;

FIG. 12 is an exploded view illustrating the relation of the ribbon and slider prior to bonding;

FIG. 13 is a view similar to FIG. 12, with a portion in section, illustrating the fused bond between the slider and the ribbon; and

FIG. 14 is a diagrammatic illustration of an apparatus for inducing energy in the ribbon and slider to form the bond between them.

The invention is illustrated and is particularly designed for mounting a fabric drapery panel to hinged supporting plates forming a linkage with a longitudinal slot, slidably carried from a track. Its use is not so limited, however, but may find application in other situations where a flexible panel is mounted on an elongated support. The tape and support permit the panel to be mounted by merely snapping mounting elements into a groove on the support. The panel may be removed by sliding the mounting elements from the groove or by snapping them out.

Tape **20**, FIGS. **1**, **2** and **3**, comprises an elongated ribbon **21** having a plurality of mounting elements or sliders **22** secured thereto at spaced points along its length. The ribbon **21** preferably has a center portion **24** with two lateral flanges **25** and **26**. The bottom surface of the ribbon is flat while the center portion **24** has a greater thickness than the flanges **25**, **26**. The tape is secured to the upper edge of a drapery panel **28**, as by stitching through the flanges **25**, **26**. The section of drapery track **30**, FIG. **4**, based on the track illustrated in my application Ser. No. 152,879, carries a series of hinged plates **31** each having a longitudinal groove **32** of dovetail cross-section therein. Sliders **22** are received in groove **32**, mounting the drapery panel from the hinged plates **31**.

The two thickness ribbon configuration has several advantages. Most important, the thickness of the center portion enables a bonded attachment of the mounting elements without destroying the ribbon integrity as will be discussed in some detail below.

The dual thickness of the ribbon contributes to the desirable physical characteristics of the ribbon. It is necessary that the ribbon have a high degree of flexibility in a plane at right angles to the plane of the tape in order that the tape and the drapery to which it is sewn will fllow the convolutions of the support elements **31** and fit smoothly thereon. If the entire width of the ribbon were the thickness of the center portion, it would be too stiff. The thin flanges also facilitate stitching the tape to the drapery. The thickened center portion **24** contributes to a resistance to deformation of the tape in the plane of its lateral surface. This reduces any tendency of the drapery panel to sag between adjacent mounting elements **22**. This latter effect is enhanced by the rectangular configuration of the mounting elements which are prevented from twisting or turning in the groove **32** of the hinged plates.

The edge surfaces of the raised center portion also serve as a guide in handling the ribbon during manufacture of the tape and attachment to the drapery panel

28. In this connection, FIGS. 5 and 6 illustrate a combination hemmer and tape guide. Hemmer 35 is mounted on a work table 36. Tape guide 37 is carried by a bracket 38 above hemmer 35 and extends downwardly at an angle toward the exit end 35*a* of the hemmer. The edge of the drapery material 28 is folded over as the material advances through the hemmer, forming a hem of the desired configuration and width. Mounting tape 20 is directed through guide 37 into position on the hem. The hem is sewn and the drapery and tape are stitched together by sewing machine 40. Preferably a double needle machine is used to stitch both flanges 25 and 26 of the tape to the drapery in one operation.

Tape guide 37 includes a base member 41 on which are secured a pair of spaced plates 42 with their facing edges 43 undercut to define channels 43*a*. The flanges 25, 26 of the tape 20 are received in the undercut channels 43*a* while the raised center portion 24 passes between guide edges 43. Mounting elements 22 extend upwardly between the guide plates. A snug fit between the edge surfaces of the raised center portion 24 and opposed guide edges 43 accurately positions the tape on the drapery hem.

Mounting elements 22 are preferably secured to tape 21 in groups of four with equal spacing between the sliders in each group. Adjacent groups are spaced apart a greater distance. The four equally spaced mounting members 22 are received in slots 32 of adjacent supporting plates 31 forming an interior V angle. Two mounting members are received in the slot of each plate. A greater extent of material is required around the outside of a hinge than at the inside. This additional material is provided by the greater spacing between adjacent groups of mounting elements.

In order to facilitate correct attachment of the drapery panel 28 to the supports 31, the spaces between adjacent groups of four mounting elements 22 are marked with an indicia 45, which may be a deformed spot on the surface of the ribbon, a colored mark or the like. An indicia 45 is located at each outside hinge as indicated in FIG. 4. Some drapery installations require unequal numbers of mounting elements 22 at either end. With double draw draperies the ends of the left and right panels are reversed. In manufacturing the drapery panels, it is necessary that the tape be properly oriented. To distinguish between flanges 25 and 26 so that the tape may be oriented correctly with respect to the drapery panel, one of the flanges is identified by an indicia 46, as a colored marking at intervals therealong.

Ribbon 21 is preferably a woven fabric. The mounting elements or sliders 22 are preferably molded of a thermoplastic material and are bonded to the ribbon by a zone of fused plastic in which some of the fabric threads are embedded. The extra thickness of the center portion 24 of the ribbon to which the mounting elements are secured insures that a layer of fabric underlies the fused bond between the mounting element and the ribbon. This provides a strong connection between the mounting element and ribbon which will not split and separate even under the strain imposed by heavy drapes or the load imposed when the drapery is forcibly removed from the support.

A weave for the ribbon is illustrated diagrammatically in FIG. 7. In describing this figure, detailed weaving information will be given for a specific ribbon pattern which has been found to be satisfactory. Others will be apparent to those skilled in the weaving art.

Mounting elements 22 are preferably of a thermoplastic material as nylon, and the ribbon 21 is woven of threads which are compatible with nylon. In the preferred form of the invention the ribbon is entirely of nylon. A portion of the warp threads may, however, be of other materials as cotton or, if additional longitudinal strength is desired, a fine wire.

The ribbon has sets of warp threads on two levels. The lower level forms the flanges 25 and 26 and underlies the raised center portion 24. The base or ground has 127 warp threads of 210 denier. The raised center portion has 28 warp threads of 840 denier. There are four binder threads of 210 denier which together with the weft threads interlock the two levels of the center portion. The weft thread is a two-ply 840 denier nylon. The ribbon has a width of three-fourths of an inch and the raised center portion has a width of seven-sixteenths of an inch. The weft thread is woven with 48 picks per inch.

The flanges 25 and 26 are a 2 × 2 twill weave. The center section is a double weave with a double shuttle traverse. This is illustrated diagrammatically in FIG. 7.

Only a portion of the actual number of warp threads used are shown in FIG. 7, to avoid complication of the drawing. Warp threads 50 form the ground while warp threads 51 form the upper level. The binder threads are not shown. The four successive movements of the shuttle (not shown) are illustrated in FIGS. 7A through 7D with arrowheads indicating the direction of the shuttle.

The first movement of the shuttle, line 53, FIG. 7A, is from right to left through alternate pairs of warp threads 50 forming the right flange and center portion of the lower level or ground of the ribbon. The second pass of the shuttle, line 54, FIG. 7B, is from left to right through alternate warp threads 51 of the upper level of the center portion. The third pass of the shuttle is illustrated at 55, FIG. 7C, from right to left through alternate pairs of the warp threads 50 of the lower center section and the left flange. The fourth pass of the shuttle, line 56, FIG. 7D, is from left to right through alternate pairs of the warp threads 50 of the left flange, through the warp threads 51 of the upper level of the center portion and through the warp threads 50 of the right flange. The four steps are then repeated.

The edge indicia 46 may be provided by utilizing a warp thread of a distinctive color.

The configuration of the mounting element or slider 22 is shown in detail in FIGS. 8–11. The slider is generally rectangular and has an outwardly extending flange 65 along the lower edges. The longitudinal sides 66 are rounded providing surfaces which complement the interior surfaces of the dovetail slot 32 into which the slider is snapped. The ends of the upper surface are beveled at 67 to eliminate sharp edges which might injure the hands of the people working with the tape and so that the mounting element will slide in slot 32 without binding.

As illustrated in FIG. 12, the upper surface of the raised center portion 24 of ribbon 21 has a longitudinally ribbed contour with three major ribs 70, 71 and 72 separated by two minor ribs 73 and 74. The ribbed configuration is achieved by grouping the 840 denier warp threads in the three major ribs 70, 71 and 72 and the 210 denier binder threads in the minor ribs 73 and 74, and by applying alternate end tension to the warp threads in the center section.

Mounting element 22 is positioned on the center portion 24 of ribbon 21 as illustrated in FIG. 12 and bonded to the ribbon as shown in FIG. 13. In a preferred form of the invention, both the ribbon 21 and the mounting elements 22 are of nylon. The upper surface of the center portion 24 of the ribbon and the under surface of the base of the mounting element 22 are held together and heat is induced in the adjacent surfaces softening the material of both the mounting element and the ribbon which then fuses together and, upon cooling, hardens to bond the mounting element to the ribbon. It is important that the fused zone 76, FIG. 13, extend only partially through the ribbon, leaving an underlying layer 77 of woven fabric binding fused zone 76 to the rest of the ribbon. If the fused zone extends too far, the integrity of the weave is lost. The fused plastic will crack and mounting element 22 break off under load.

FIG. 14 illustrates diagrammatically an apparatus for bonding the mounting elements 22 to the ribbon 21. The mounting element 22 is inverted and received in a cavity 80 in supporting member 81, preferably of metal. Flanges 65 rest on shoulders 82 and the top of the mounting element is preferably spaced from the bottom of cavity 80. Ribbon 21 is received in a shallow recess 83 and is positioned laterally by the engagement of the edge surfaces of the center portion 24 with lateral surfaces 84 of recess 83.

Sonic excitation induces energy in the form of heat in the plastic of the ribbon and the mounting element, softening the plastic whereupon it flows together and fuses upon cooling. The sonic energy is imparted by a tuned vibrating head 86 shown here spaced from the surface of ribbon 21, but movable into contact to perform the bonding operation. The sonic energy source is not a part of this invention and is not illustrated.

The physical characteristics of ribbon 21 and mounting element 22 concentrate the induced energy in the adjacent surfaces where the fused bond is to be formed. This contributes to the limiting of the zone of fused material and maintains the integrity of the woven ribbon underlying the mounting element. The upper part of the raised center portion 24 of the ribbon is more dense than the underlying portion of the ribbon, by virtue of the weave illustrated in FIG. 7. This serves to concentrate the energy induced in the ribbon adjacent the mounting element surface. The upper layer of the warp threads and the dual filler weave develop more heat and soften sooner than the open weave of the underlying portion of the ribbon. The mounting element 22 is provided with energy directing ribs 22*a* on its under surface which aid concentrating energy in and softening the under surface to fuse with the ribbon.

Concentration of energy in mounting element 22 may also be enhanced by providing a hole 89 extending longitudinally through the mounting element. This reduction in the mass of the plastic body forces the sonic energy to heat the plastic which remains. This construction has the added advantage of reducing the amount of plastic which is required.

I claim:

1. A tape to be secured to a flexible panel for mounting the panel on an elongated support, comprising:
an elongated woven ribbon;
a plurality of mounting elements of plastic material spaced along the length of said ribbon for connection with said support; and
a zone of fused plastic integrally bonding each of said mounting elements to the ribbon, each of said zones extending only partially through the thickness of the ribbon, there being a layer of woven fabric underlying each zone of fused plastic.

2. The tape of claim 1 in which said woven ribbon includes at least some threads of plastic material fused with said mounting elements.

3. The tape of claim 1 in which said woven ribbon has a portion of the warp threads of a non-plastic material.

4. The tape of claim 1 in which said ribbon has a center portion and two lateral flanges, said mounting elements being bonded to said center portion, said flanges being stitched to said panel.

5. The tape of claim 4 in which said flanges are thinner than said center portion.

6. The tape of claim 2 in which the weave of said ribbon is more dense at the level of the zone of fused plastic than in the underlying fabric layer.

7. The tape of claim 6 in which said mounting elements are bonded to the ribbon by induction of energy in the adjacent surfaces of each mounting element and the ribbon.

8. The tape of claim 7 in which said ribbon has a plurality of longitudinally extending ribs on the surface to which said mounting elements are bonded, the mounting elements having a plurality of complementary ribs mating with the ribs of the ribbon.

9. The tape of claim 2 in which said mounting elements have energy directing surfaces, the mounting elements being bonded to the ribbon by the induction of energy in the adjacent surfaces of the mounting elements and the ribbon, the energy directors concentrating the induced energy in such surfaces.

10. The tape of claim 9 in which said mounting elements have a plurality of energy directing ribs on the surface thereof which faces the ribbon.

11. The tape of claim 9 in which said mounting elements have a hole extending longitudinally therethrough, concentrating the induced energy in the surface adjacent the ribbon.

12. Means for securing a flexible panel to an elongated support made up of a series of elongated plates hinged together in end-to-end relation, each plate having a longitudinally extending groove therein, comprising:
an elongated ribbon secured to said flexible panel;
a plurality of longitudinally spaced mounting elements on said ribbon slidably received in and mating with the grooves in said plates, each of said mounting elements having a rectangular configuration with the longer dimension thereof extending longitudinally of the ribbon and groove, said slidable mounting elements being irregularly spaced in groups along the length of the ribbon to conform with the grooves of the hinged plates; and
indicia on said ribbon correlated with each of the repeating groups of the mounting elements and with the hinge between adjacent supporting plates.

13. The securing means of claim 12 including indicia to distinguish between the upper and lower edges of the ribbon.

14. The securing means of claim 13 in which said ribbon is woven and the edge distinguishing indicia is a warp thread of distinctive color.

* * * * *