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RECTANGULAR CONDUCTOR HARNESS MEANS AND ATTACHMENTS

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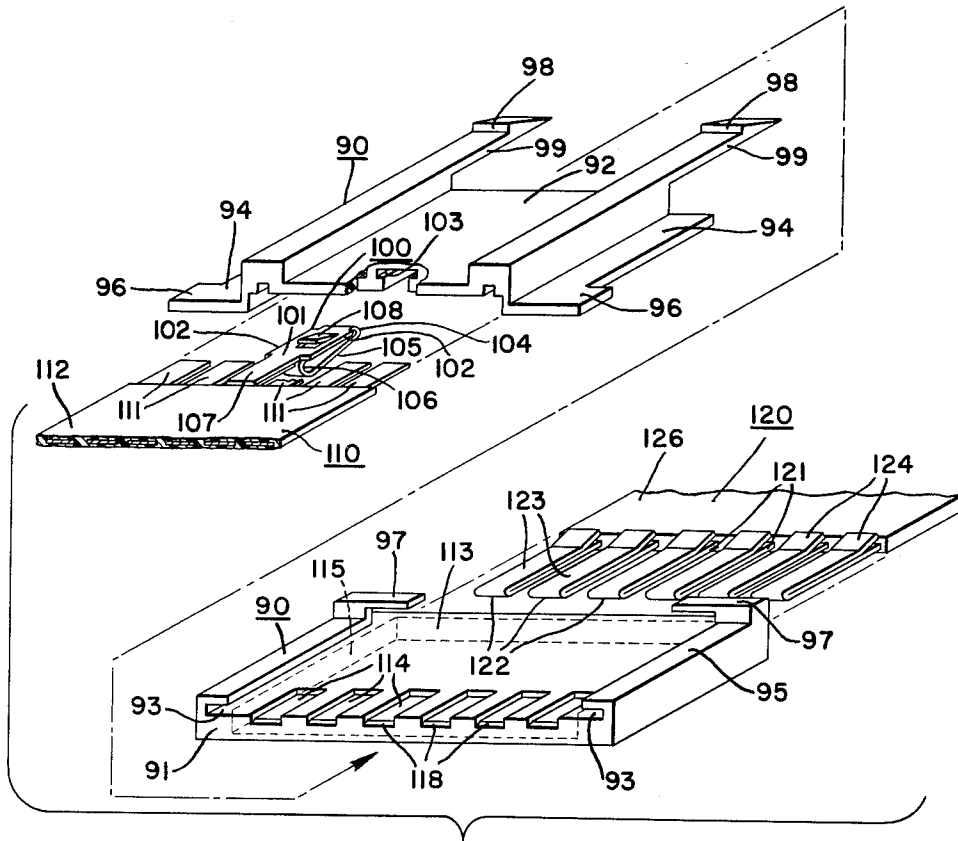


Fig. 1

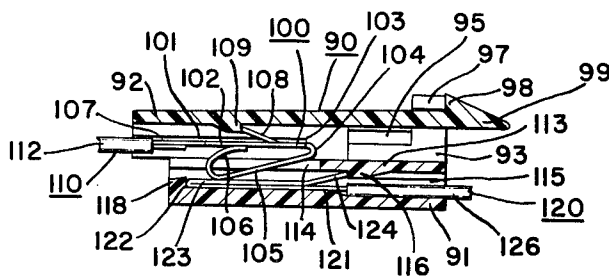


Fig. 2

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RECTANGULAR CONDUCTOR HARNESS MEANS AND ATTACHMENTS

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2 Claims. (Cl. 339-91)

This invention relates to wiring and electrical connections and, more particularly, to a rectangular conductor harness means and attachments for vehicle use.

An object of this invention is to provide a new and improved approach to automotive wiring to save space and reduce number and thickness of attachments and components including switches and terminal means for use therewith representing a transition from rounded conductors in vehicle wiring harness means to flattened generally rectangular-shaped conductors more efficient to use.

Another object of this invention is to provide rectangular-shaped conductors in parallel though separably insulated association as a unitary solid flat configuration with predetermined surfacing exposable by stripping as well as window-like cutouts to gain proper electrical connection thereto directly free of any intermediate terminal means in predetermined locations of the insulated flat conductors which can also have single terminal contact anchoring holes, dimples as well as tang-like pierced deformations integral therewith adjacent to ends thereof.

Another object of this invention is to provide electrical energization by means including in part a flat conductor itself and in part a single terminal means adapted to fit in mating engagement directly therewith in sandwiched relation thereto and optionally having a wafer-like polarizing layer of insulation between predetermined flat conductors for terminal means engagement.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein preferred embodiments of the present invention are clearly shown.

In the drawings.

FIGURE 1 is an exploded perspective view of rectangular conductor harness means and attachments in accordance with the present invention.

FIGURE 2 is a cross-sectional view of harness means and attachments of FIGURE 1 in assembled relation.

Motor vehicle manufacturers have produced bodies equipped with wiring means utilizing rounded conductors which can be grouped as a harness provided with a tape-like covering and the like. Such rounded conductors as grouped into a harness can effect transfer of electric power to various electrical devices and switching means to which the wiring harness and conductor means can be routed generally in concealed positions between inner and outer panels of doors as well as between supports such as door-jamb and vehicle upholstery and metal body panels including fenders and the like. There is a continuing trend in body construction in modification of vehicle bodies to increase strength thereof while reducing thickness or spacing between components. Future vehicles will also be provided with thinner door means that provide less space between inner and outer panels thus requiring new types of switch means and accessory devices due to limited space from a point of view of thickness between such mounting panels. In some instances a transition will be made by provision of both rounded as well as flattened insulated conductors and wiring means between which electrical interconnection must be established so that flattened conductor means or substantially rectangular-

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shaped insulated wiring harness means can be used where space accommodations are narrower and cannot permit placement and fitting of round conductors in grouped relation as tape-covered harness means previously used.

In addition to use of a single type of terminal means in an insulating housing to establish interconnection between rounded and flattened conductors, there are instances in the wiring system of a motor vehicle wherein a pair of flattened wiring harness means must be interconnected. FIGURE 1 illustrates components for such interconnection of a pair of flattened wiring harness means and FIGURE 2 provides a cross sectional elevational view of these components in assembled relationship. There is shown in FIGURES 1 and 2 an insulating body or housing generally indicated by numeral 90 and including a first or lower portion 91 as well as a second or upper portion 92 each of insulating material moldable to have predetermined recesses, grooves as well as interlocking fastening means therewith. For interlock purposes the first portion 91 includes a pair of grooves or undercuts 93 into which flanges 94 of the second portion 92 can fit into a location adjacent to rail portions 95. The second portion 92 also has a pair of laterally outwardly extending projections 96 integral with the flanges 94 and adapted to abut as a limit stop against one end of the first body portion 91 to limit inserting sliding movement of the second portion 92 relative to the first portion 91. The first portion further includes a pair of upwardly located and inwardly extending tabs or extensions 97 which are engageable with abutments 98 near ends of a pair of resilient arms 99 having tapered upper surfaces between the ends and abutments 98 thereof. The first and second portions 91-92 of the insulating housing means 90 are adapted to interlock with each other as illustrated in FIGURE 2 and a single type of terminal means generally indicated by numeral 100 is adapted to fit in space provided in between the first and second body portions 91-92. The terminal means 100 includes a longitudinally extending body portion 101 having a pair of laterally outwardly extending flanges 102 on opposite sides thereof that are adapted to fit in a pair of undercut grooves or recesses 103 in the second portion 92 of the insulating housing 90 such that the laterally extending flanges 102 abut against an end of the pair of grooves as indicated in FIGURE 2. The single terminal means 100 is outlined in FIGURE 1 also and further includes a curved end 104 which interconnects the elongated floor or body portion 102 of the terminal means with a substantially J-shaped resilient contact arm or tongue portion 105 with each other such that a loop-like or curved back end 106 of the arm or tongue portion abuts against an underside of the elongated body portion 101 in a location substantially in between the laterally extending flanges 102. Remote from this loop-like end 106 there is a straight conductor engaging end 107 and substantially therebetween the terminal means 100 is provided with a locking tang or projection 108 struck from the elongated body portion 101 and having a free end adapted to engage and abut against a downwardly extending transverse shoulder 109 integral with the second portion 92 of the insulating housing 90. This shoulder 109 as engaged by the tang 108 can be seen in the view of FIGURE 2.

Each of a plurality of such single type of terminal means 100 can be attached to be carried by a flattened wiring harness means generally indicated by numeral 110 and including a plurality of flattened though substantially parallel conductors 111 each exposed adjacent to severed ends thereof and having the straight ends 107 of each terminal means 100 joined thereto such as by an ultrasonic weld of the terminal tab end to the flat cable conductor. The conductors 111 are provided with an extruded protective covering of insulating material 112

and each of the ends of the conductors 111 can project at least partially into the pair of opposite grooves 103 or space therebetween such that individual terminal means 100 as well as individual ends of flattened conductors 111 are maintained in predetermined spaced and parallel position adjacent to each other to assure against short circuit across the conductor ends as well as across adjacent terminal means 100. Length of the second portion 92 of the insulating housing 90 can exceed that of the first portion 91 such that in a location remote from the abutment arms 98-99 integral with the second body portion there is an overhang as a shield for the ultrasonically welded terminal tab ends 107 to ends of the conductors 111. This shielding overhang is apparent in the view of FIGURE 2.

The first body portion 91 includes a partition 113 provided with a plurality of slots 114 extending from only one end thereof and adapted to permit each of the resilient arms or tongue portions 105 and loop-like ends 106 integral therewith to be positioned in a location indicated in FIGURE 2 such that the arm portion 105 and end 106 thereof can project from the space defined by limits of the second body portion 92 into space defined by the first body portion 91. The first body portion 91 includes a substantially rectangular space 115 with which the slots 114 communicate and access to the rectangular space 115 is provided by a continuous slot-like opening in an end of the first body portion 91 remote from the location of the slots 114. The first body portion 91 includes a transverse, downwardly-extending shoulder 116 integral with the partition 113 in a location intermediate inner ends of the slots 114 and the open end of the rectangular space 115. The body portion 91 also includes upwardly extending end abutment means 118 having a slightly tapered upper surface and located adjacent to ends of the slots 114.

A second ribbon-like or flattened wiring harness means generally indicated by numeral 120 is adapted to fit in the rectangular space 115 as indicated in FIGURE 2 such that exposed flattened conductors 121 thereof each have an end 122 that abuts against the upwardly projecting abutment means 118 of the first body portion 91 as well as a folded back portion 123 that terminates in an upwardly bent tab-like end 124 engageable against the transverse shoulder 116 so as to hold the second flattened wiring harness means 120 in place in the first body portion 91. The flattened wiring harness means 120 can include an insulating covering 126 similar to that of the first flattened wiring harness means 110. It is noted that the insulation coverings 112 and 126 for these first and second flattened wiring harness means 110 and 120, respectively, can be made of a thermoplastic insulating material so as to permit parallel joining of flattened or rolled conductors in accordance with a disclosure of S.N. 141,519, Scofield et al., filed September 28, 1961, concerning a Process and System of Manufacture. Thus, the flattened conductors are separately insulated though the insulating cover becomes a substantially flat unitary mass heat sealed together along adjacent edges of the individual insulation of the flattened conductors. It is to be noted that the insulating coverings such as 112 and 126 can be removed from opposite sides of the flattened conductors as illustrated in the embodiment of FIGURES 1 and 2 or the insulation can be removed from only one side as shown in FIGURE 1 of copending applications S.N. 315,081, Baer et al., filed October 9, 1963, and/or S.N. 439,847, Baer et al., filed March 15, 1965, for example. These copending applications based upon the present disclosure as originally filed show other features related to the present subject.

It is to be noted that differing cross sectional sizes of conductors flattened and insulated in accordance with the present invention can be provided for the purpose of carrying various electrical current loads. It is possible also to provide insulation of differing colors around individual though parallel flat strip-like conductors adapted

to be joined to each other and adapted to be interconnected with various electrical devices and switching means in proper relationship with each other.

While the embodiments of the present invention herein disclosed constitute preferred forms, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. For use in combination with flattened wiring harness means, an insulating housing means to hold a single-type terminal means therein, comprising, a pair of substantially flat body portions each having integral interlock projections therewith to maintain assembly therebetween to provide at least one rectangular-shaped access slot for space therein, a partition integral laterally on one body portion and slotted longitudinally inwardly from an edge thereof for accommodation of a contact end of the single type of terminal means projecting from inside one body portion to inside the other whereby a flat conductor of rectangular-shaped harness means fitted through said rectangular-shaped access slot is directly engageable by said projecting contact end of said single type of terminal means.

2. Connector means for a conductor harness means to fit in narrow passages of a motor vehicle body and having a plurality of flattened rectangular-shaped conductors substantially coplanar and parallel with each other joined together by a thin covering of insulating material surrounding each of the flattened conductors longitudinally thereof as well as edge to edge therebetween, comprising, a housing means having a predetermined passage therein for conductor and terminal accessibility as well as having transverse abutment means integrally therewith, said passage on one end of said housing means having termination into at least one rectangular opening into which said conductor harness means per se fits substantially, complementary directly to said housing means, predetermined terminal means having location at least adjacent to the opening of said housing means and having a substantially bow-shaped contact as well as at least one free-ended tang, and contact surfacing of said flattened rectangular-shaped harness means conductors per se laterally exposed at least on only one side thereof which is engaged by said predetermined terminal means bow-shaped contact directly, said housing means including complementary body portions of which one of said body portions has a pair of opposite laterally outwardly extending flanges and a pair of longitudinally extending resilient arms having tapered upper surfacing between ends and abutments thereof, said other body portion having a pair of opposite undercuts complementary to said flanges in a longitudinal slide fit, said lateral body portion in a location adjacent to ending of said undercuts having a pair of opposite laterally inward tabs engaged by said abutments of said resilient arms complementary thereto though displaceable for separation of said body portions from each other, one of said body portions having a partition including a plurality of window-forming slots which provide passage communicating space collectively to said rectangular opening into which said flattened rectangular-shaped harness means is inserted to a position having said contact surfacing thereof in alignment substantially longitudinally adjacent to said window-forming slots through which each said bow-shaped contact projects directly into electrical engagement with said contact surfacing of said flattened rectangular-shaped harness means, said window-forming slots and rectangular opening remaining in assembled relation to said flattened rectangular-shaped harness means.

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