

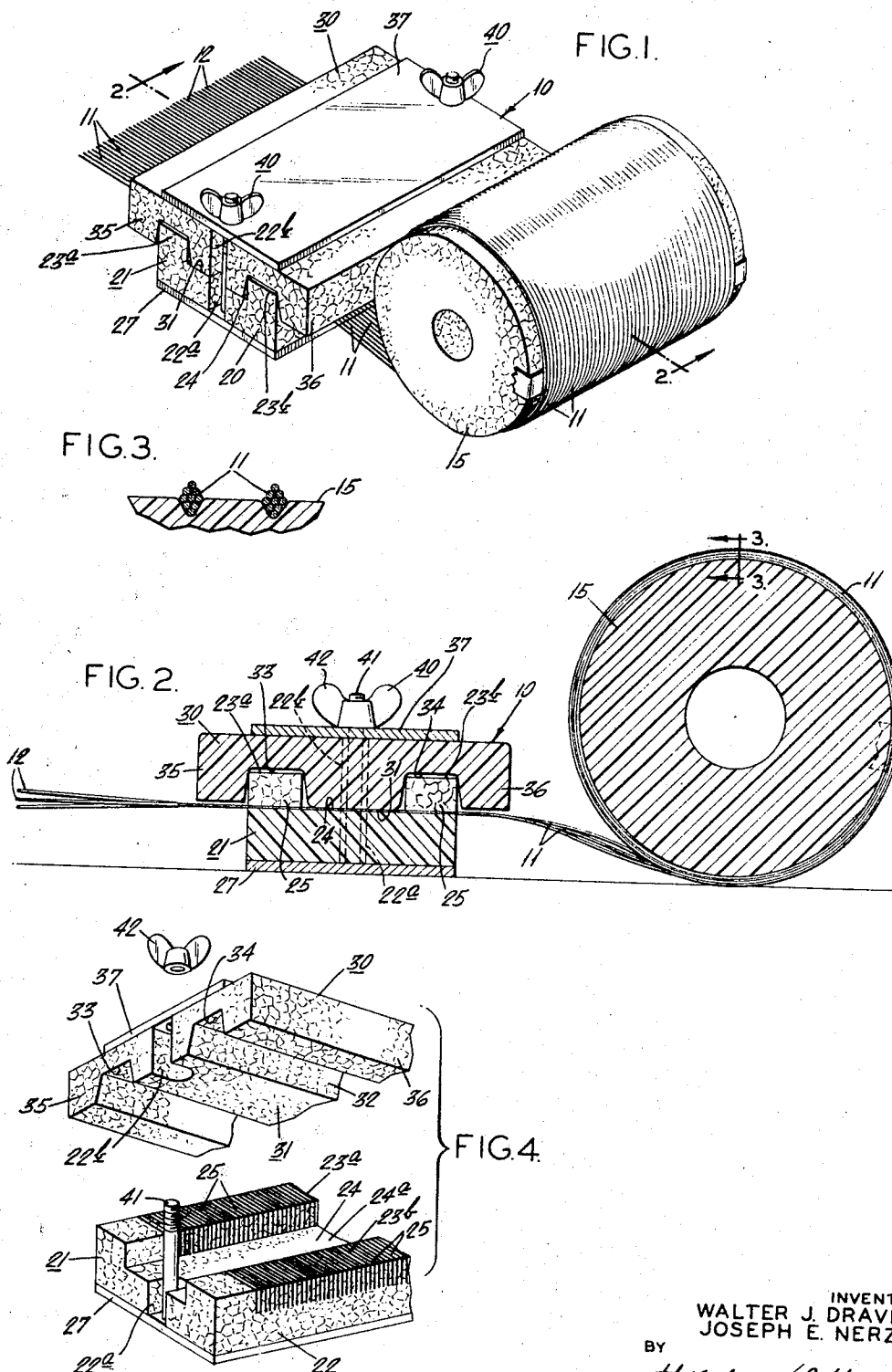
June 17, 1969

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MULTI-FEED WIRE PACKAGE

3,450,359

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Sheet 1 of 2



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Sheet 2 of 2

FIG. 5.

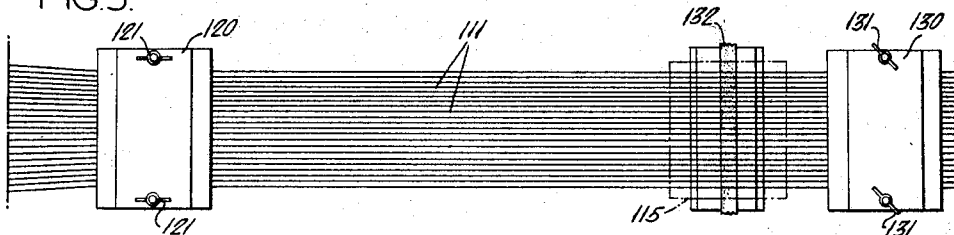


FIG. 6.

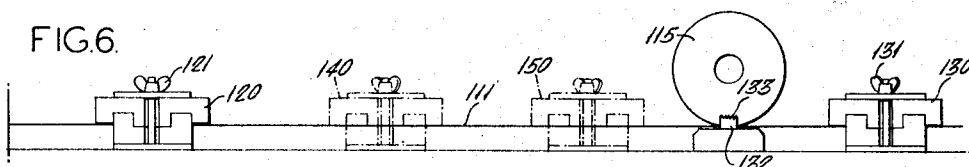


FIG. 7.

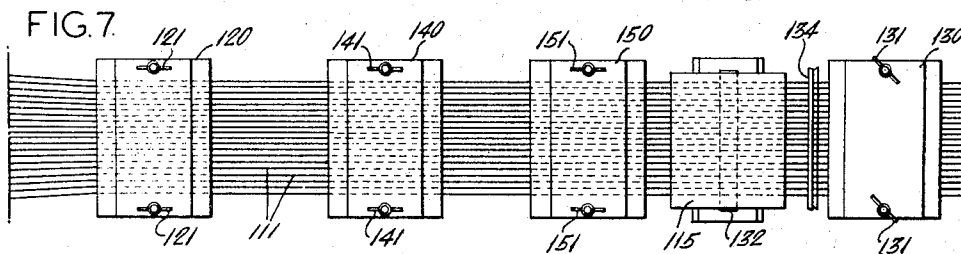


FIG. 8.

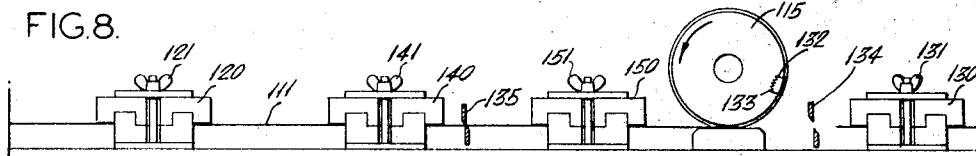


FIG. 9.

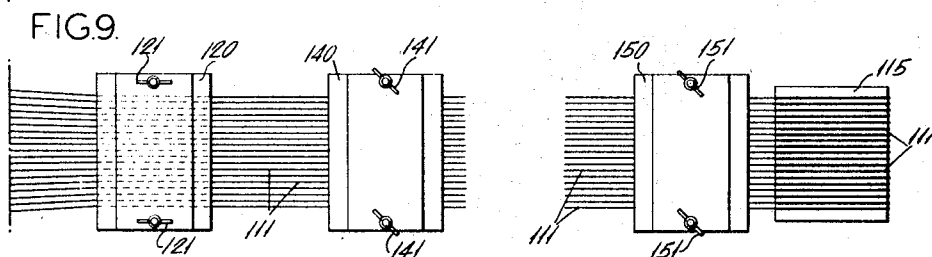
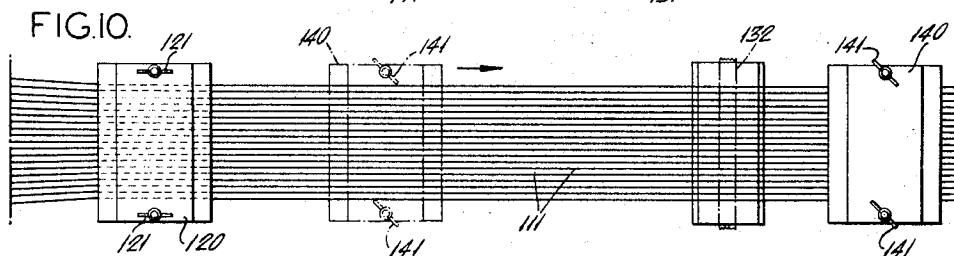


FIG. 10.



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MULTI-FEED WIRE PACKAGE

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U.S. Cl. 242—54

14 Claims

ABSTRACT OF THE DISCLOSURE

A package for storing for use in a preset spacing, separate lengths of small diameter wires which are to be used, for example, in threading or wiring a magnetic core memory plane. The package includes a spool adapted to have wrapped thereon a plurality of separate wires axially spaced along the periphery of the spool. To retain the wires and the correct spacing thereof one from the other, a wire mounting block is provided, the block including, a planar base portion having a pair of laterally spaced, axially extending upstanding rail means, and means defining a plurality of laterally extending, axially spaced slots in each of the rail means, the slots in the one rail being aligned with the slots in the opposite rail and adapted to receive the extended ends of the wire wrapped on the spool, therein. Also included is a cover which overlies the upstanding rail means to substantially enclose the upper surface of the means defining a slot and including means on the cover for engagement with the wires to press the same against the block intermediate the upstanding rail means to prevent inadvertent displacement of the wires from the block.

Summary of the invention

The present invention relates to a multi-feed wire package, and more specifically to a multi-feed wire package in which a plurality of separate wires is maintained in a preset and predetermined relation, one wire with respect to the other.

In magnetic core memory type computers, a magnetic core located with respect to other magnetic cores in a preset and predetermined position is used to store data or information, the data being alpha or numeric or combinations of each. Each magnetic core is a tiny ring of ferromagnetic material having a diameter of approximately .020 inch. Each core is pressed from a mixture of ferric oxide powder and other materials and then baked in an oven. Cores of this type, besides being extremely small, have the advantage of being able to achieve a state of total magnetism within a very short period of time, i.e. a few microseconds or less. In addition, the cores, unless deliberately altered, retain their induced magnetism indefinitely making it an ideal means for storing data.

The cores are arranged in a flat plane in aligned rows, each core being set at a position of approximately 45° with respect to the intersection of the axis of the rows. The cores, in order to attain the desired storage data therein, and data output from the plane, are provided with wires which pass through each core in a row. At right angles to the first group of wires, a second wire is passed so that each ring contains an intersection of two wires. Thus by sending half of the amount of current necessary to magnetize a core through each wire, only the core circumscribing the intersection of the wires is magnetized. In this manner, numerous cores can be strung on the screen or grid of wires and magnetized without affecting any other core. Additional wires are used and threaded through the cores for selecting (sense wire) information from the plane and for resetting (inhibit wire) cores to their original state so that the memory is not altered.

2

Because of the small diameter of the cores, very fine wires are used in making up the memory plane. In addition, prior to a few years ago each of the memory planes was hand wired and with planes containing rows of 128 cores per row in a square, the price of a wired memory plane was extremely high. Ultimately a wiring jig was developed in which the wires are exactly positioned so that they enter the memory cores at a precise and defined lateral separation corresponding to the separation between rows of the cores. In this manner the time for wiring one such memory plane is reduced drastically. However, a problem has developed wherein the jig must be hand wired from a plurality of spools having separate wires wrapped thereon. To setup the jig for one such wiring operation, i.e. to run wires through a plurality of rows at the same time, requires 5 to 10 minutes, depending on the number of cores and thus the number of wires which must be run.

In view of the above it is a principal object of the present invention to provide a wire package which permits the storage of a plurality of wires spaced one from the other in an exact position to enable simultaneous placement of the wires in a wiring jig and the like apparatus.

Another object of the present invention is to provide a novel multi-feed wire package which is inexpensive to manufacture and which may be reused.

Still another object of the present invention is to provide a multi-feed wire package which is simple to load for shipment.

An additional object of the present invention is to provide a multi-feed wire package composed of a material which preserves the insulation on the wires.

Other objects and a fuller understanding of the invention may be had by referring to the following specification and claims taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of the package of the present invention illustrating a novel package containing a plurality of separate wires laterally spaced one from the other;

FIG. 2 is a sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view taken along line 3—3 of FIG. 2;

FIG. 4 is an exploded perspective view of a portion of the package illustrated in FIGS. 1 and 2; and

FIGS. 5-10 illustrate the steps of loading the wire package of the present invention with separate wire strands.

Referring now to the drawings, and especially FIG. 1 thereof, a multi-feed wire package 10 containing a plurality of small diameter wires 11 is shown therein.

In accordance with the invention, in order to permit accurate placement and dispensing of the separate wires 11 in an exact and predetermined preset relation to one another, wire storage means, in the present instance a spool 15, contains a plurality of the wires 11 wrapped thereon, which wires are axially spaced from one another, the extended ends 12 of the wires passing through a wire mounting block 20 which maintains the wire ends 12 extending from the spool, in the predetermined preset relation. To this end, the spool 15 has an easily deformable surface, in the present instance being composed preferably of an easily deformable substance such as Styrofoam so that upon wrapping individual strands of wire 11 around the periphery thereof, the strands will tend to deform the periphery such as shown in FIG. 3, and form their own groove. The method of wrapping the wires around the spool 15 in order to separate the wires a preset distance along the axis of the spool will be explained in more detail hereinafter. The extended ends 12 of the wires 11, as set forth above, pass through and are held

in position by the wire mounting block 20 which is adapted for parallel alignment with the axis of the spool. As shown, the wire mounting block includes wire receiving means 21 which serves to maintain the alignment of the wires at a preset distance apart, and cover means 30 which serves to prevent both accidental disengagement of the wire ends 12 from the wire receiving means 21, and to provide a firm engagement of the wire ends 12 extending from the spool 15, when desired.

To this end the wire receiving means 21 includes a substantially planar base portion 22 having a pair of laterally spaced upstanding wall or rail means 23, designated 23a and 23b respectively and defining a groove or depression 24 therebetween. As best shown in FIG. 4, each of the rails 23 includes means defining a plurality of laterally extending, axially spaced slots 25, the slots in the rail 23a being laterally aligned with the slots in the rail 23b. As shown, the slots extend down to the upper surface of the depression 24, and in practice they should have a width, in the direction parallel with the longitudinal axis thereof, a few thousandths larger than the diameter of the wire to be placed therein. For ease in manufacture as well as for economic reasons, the wire receiving means may be composed of an easily deformable material such as Styrofoam, although any material which will not abrad or remove the coated insulation on the wire therefrom as it passes therethrough is acceptable. It has been found that Styrofoam is an excellent material for use as the wire receiving means as it does not tend to remove any of the insulation from the wires.

In order to add stability to the wire receiving means 21, while at the same time stabilizing and strengthening the wire mounting block, a stiffener plate 27 is attached to the lower portion of the base 22, in the present instance the stiffener comprising an aluminum plate.

As heretofore set forth, in order to prevent inadvertent dislodgement of the wire ends 12 from the slots 25, and in order to provide means for fixedly positioning and engaging the wires when desired, cover means 30 including wire engagement means 31 are provided for coaction with the wire receiving means 21. To this end, the engagement means includes at least one axially extending, depending, wire engaging portion 32 which cooperates with the depression or recess 24 and is capable of firm engagement of the wire ends 12 intermediate the portion 32 and the planar surface 24a of the recess 24. As best shown in FIGS. 2 and 4, the cover means 30 also includes rail cover portions 33 and 34, in the present instance recesses, adapted to overlie the upper surface of the rails 23a and 23b to enclose at least the upper surface of the slots 25. To ease any stresses in the wire at the portion of the terminal ends 12 thereof, at the wire mounting block 20, the cover means 30 also includes a pair of depending, axially extending legs 35 and 36 at the lateral extremities of the cover. As best shown in FIG. 2, the legs embrace the lateral extremities or exterior vertical surface associated with the means defining the slots 25 and in this manner afford protection for the slots, while depending a sufficient distance to overlie the wire ends 12 without kinking the same at the point of entry of the wire into the slots of the rail 23b or at the point of egress of the wires from the rail 23a.

In a like manner to the wire receiving means 21, it is preferable that at least the wire engaging portion 31 of the cover be composed of an easily deformable material which will not abrad or tend to remove the insulation from the exterior of the wires when it engages the same. For ease of manufacture, it has been found economic to use a material such as Styrofoam for the entire cover means 30, the Styrofoam having sufficient friction to permit a tight gripping of the wires 12, when desired, while insuring the preservation or retention of the insulation on the surface of the wires.

Similar to the wire receiving means 21, in order to stabilize and strengthen the cover means, a stiffener, in

the present instance an aluminum plate 37 is attached to the upper surface of the cover means 30.

In order to permit easy passage of the wire 11 through the wire mounting block 20 when desired, in order to permit retention of the wires when desired, clamping means 40 are provided to provide pressure between the cover means 30 and the wire receiving means 21 as desired. To this end, the clamping means may comprise auxiliary C-type clamps or clamps of any form desired. However, a simple clamp is shown in FIGS. 1, 2 and 4 and comprises upstanding recesses 22a and 22b which are vertically aligned and located at opposite ends of the wire mounting block 20 to provide a passageway for bolts 41 which pass through the recesses at the opposite ends of the block and through the stiffener plate 37. Utilizing wing nuts 42 on the terminal ends of the bolts 41 provides sufficient control over the clamping pressure to permit wire to pass through the mounting block or to be held therein.

As shown in FIG. 4, the slots 25, if the wire package is to be used for wires to be placed in jigs for wiring memory planes, should be of uniform spacing, anywhere from 20 to 30 thousandths or more of an inch apart. Of course there are numerous methods of forming the slots 25, but one of the easier methods is to form a continuous loop or coil of Nichrome wire, the coils of which are pre-set to the correct lateral spacing in the axial direction of the block, and while pressing a portion of the coil onto the wire receiving means, a current is passed through the Nichrome wire causing a melting of the Styrofoam. Another method, utilizing the same principle is to provide a wire grid of the proper lateral spacing relative to the longitudinal axis of the block, pressing the wire onto the rails 23 and then passing a current through the wire allowing the Styrofoam to melt until the desired depth of slot is achieved. Either of these methods produces the desired configuration in a very short time.

The manner in which the spool 15 and wire mounting block 20 is loaded with a plurality of wires 11 is illustrated in FIGS. 5-10. To this end, a plurality of spools carrying the desired wire size are positioned on a shaft (not shown), and the wire ends are fed into a wire mounting block 120 corresponding to the wire mounting block 20 heretofore described. Of course the initial passing of the wires into the slots is accomplished by hand. A second wire mounting block 130 is positioned to hold the terminal ends of the wire 111 and is spaced from the first form mounting block 120 along the axis of the wires 111. The wire mounting blocks 120 and 130 are then tightly clamped as by their clamping means 121 and 131, identical to the clamping means 40 heretofore described.

A piece of tape 132 is then positioned transversely of the wires 111, underlying the same and in contact therewith while being spaced from but adjacent to the second wire mounting block 130. Thereafter two additional wire mounting blocks 140 and 150 are positioned intermediate the tape 132 and the first wire mounting block 120, and a spool 115, similar to the spool 15 heretofore described, is carefully positioned so that its axis is substantially parallel to the tape 132, overlying the same and in contact along its periphery with the portion of the wires 111 in contact with the tape. The tape is secured as at 133 to the spool 115 and the wires 111 are cut intermediate the spool and the second wire mounting block 130 by shears or the like 134. The clamping means 141, 151 associated with the third and fourth wire mounting blocks 140 and 150 respectively is loosened as well as the clamping means 121 associated with the first wire mounting blocks 120, 140, and 150 are then held in position by any convenient means such as a jig or fixture and a suitable length of wire is wound upon the spool 115 by rotation thereof and pulling of the wire 111 through the three wire mounting blocks 120, 140, and 150. (See FIG. 8.)

Upon a suitable length of wire being wrapped upon the spool 115, the wire 111 is once again severed as by the shears 135 positioned intermediate the third and fourth wire mounting blocks 140 and 150. Thereafter the clamping means 151 associated with the wire mounting block 150 is tightened and the package is boxed for shipment. The setup for the next package is fairly simple and may be easily observed in FIGS. 9 and 10. All that is necessary is to tighten the clamping means 141 associated with the wire mounting block 140 and move this block and the wire 111 clamped therein to the right as shown in FIG. 10 drawing a suitable amount of wire through the wire mounting block 120. The operation may then be repeated for making a new wire package.

It should be recognized that in certain instances the wire mounting block 20 may be used as a jig for wiring memory planes and may be used with various preset and predetermined slot arrangements to provide a setup for wiring, for example, spaced contact points along slide-in modules or printed circuit boards and the like.

Thus the wire package of the present invention while being specifically designed to meet the requirements of the computer industry, i.e. for use in providing even and exact spaced wires for memory plane wiring jigs, is versatile and may be utilized in conjunction with other apparatus.

What is claimed is:

1. A multi-feed wire package comprising in combination: wire storage means adapted to receive a plurality of separate wires; a wire mounting block adapted for alignment transverse to the ends of wires extending from the wire storage means, said wire mounting block having wire receiving means therein including means defining a plurality of laterally extending, axially spaced slots for receiving wires from said wire storage means; cover means overlying said wire receiving means, superposed the upper surface of said means defining said slots; at least one of said wire receiving means and said cover means having wire engagement means for cooperative engagement with said other means and with said wires when said wires are positioned in said receiving means.

2. A multi-feed wire package in accordance with claim 1 wherein said wire storage means comprises a spool for receiving separate wire strands about the periphery thereof; at least the surface of said spool which receives wires being composed of an easily deformable substance.

3. A multi-feed wire package in accordance with claim 1 wherein said wire receiving means includes a substantially planar base portion having at least one upstanding rail means, said slots extending through said rail means.

4. A multi-feed wire package in accordance with claim 1 wherein said wire receiving means includes a substantially planar base portion having a pair of laterally spaced, upstanding rail means defining an axially extending depression therebetween, each of said rail means having said axially spaced slots therein, the slots of one rail means being laterally aligned with the slots of the other rail means.

5. A multi-feed wire package in accordance with claim 4 wherein said wire engagement means depends from said cover means, said engagement means including at least one axially extending, depending, wire engaging portion adapted for cooperation with said depression, and having a height sufficient for firm engagement with the upper surface of said depression intermediate said rails.

6. A multi-feed wire package in accordance with claim

5 wherein said cover means includes rail cover portions positioned on opposite sides of said wire engaging portion and substantially coextensive therewith.

7. A multi-feed wire package in accordance with claim 6 including a pair of depending, axially extending legs positioned outboard of said rail cover portions so as to cooperate with said rails and to overlie the lateral extremities thereof.

8. A multi-feed wire package in accordance with claim 1 wherein at least the surfaces of said wire mounting block which come into contact with said wires are composed of an easily deformable, non-abrasive material.

9. A mounting block adapted for the receipt and alignment in a predetermined, preset position, of a plurality of wires; said mounting block comprising wire receiving means having at least one laterally extending surface and including at least a first upstanding rail means having a plurality of laterally extending axially spaced slots therein for receiving wires in a predetermined, preset position; cover means overlying at least said upstanding rail means, said cover means including a depending wire engagement means for cooperative engagement with said laterally extending surface of said wire receiving means when wire is in said slots to press said wire onto said surface to prevent, as desired, inadvertent movement of said wires through said slots.

10. A mounting block in accordance with claim 9 including a second upstanding rail means laterally spaced from said first upstanding rail means and defining therewith an axially extending depression therebetween, said second rail means having axially spaced, wire receiving slots therein, the slots of one rail means being laterally aligned with the slots of the other rail means.

11. A mounting block in accordance with claim 10 wherein said wire engagement means depends from said cover means, said engagement means including at least one axially extending, depending, wire engaging portion adapted for cooperation with said depression, and having a height sufficient for firm engagement with the upper surface of said depression intermediate said rail means.

12. A mounting block in accordance with claim 11 wherein said cover means includes rail cover portions positioned on opposite sides of said wire engaging portion and substantially coextensive therewith.

13. A mounting block in accordance with claim 12 including a pair of depending, axially extending legs positioned outboard of said rail cover portions so as to cooperate with said rail means and to overlie the lateral extremities thereof.

14. A mounting block in accordance with claim 9 wherein at least the surfaces of said wire mounting block which come into contact with said wires are composed of an easily deformable, non-abrasive material.

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U.S. Cl. X.R.

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