

Oct. 10, 1967

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3,346,020

WIRE HARNESS DEVICE

Filed June 2, 1965

2 Sheets-Sheet 1

FIG. 1

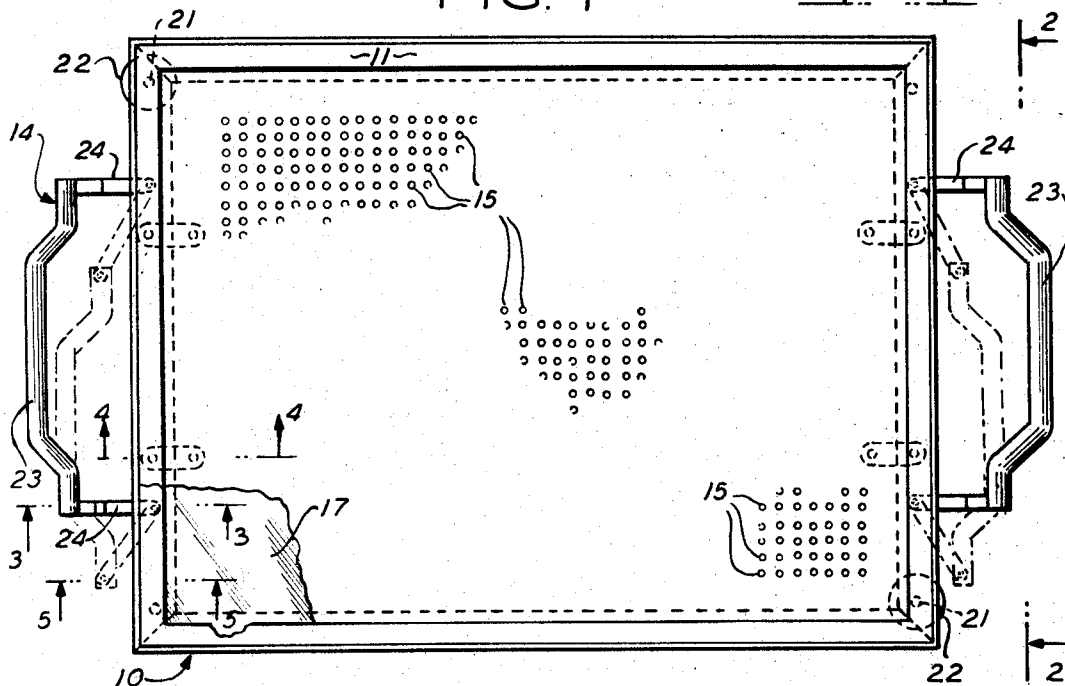


FIG. 2

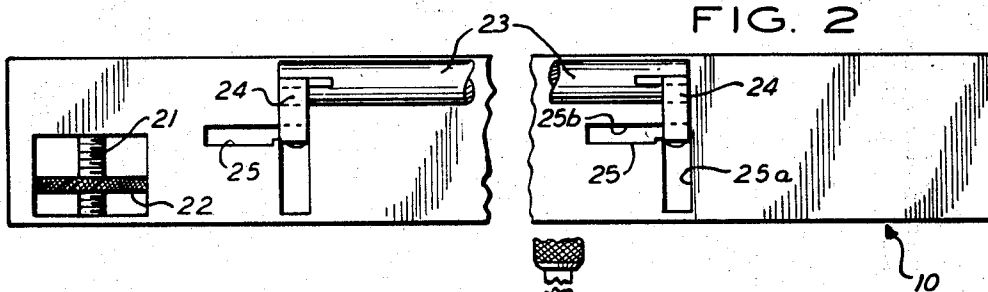


FIG. 3

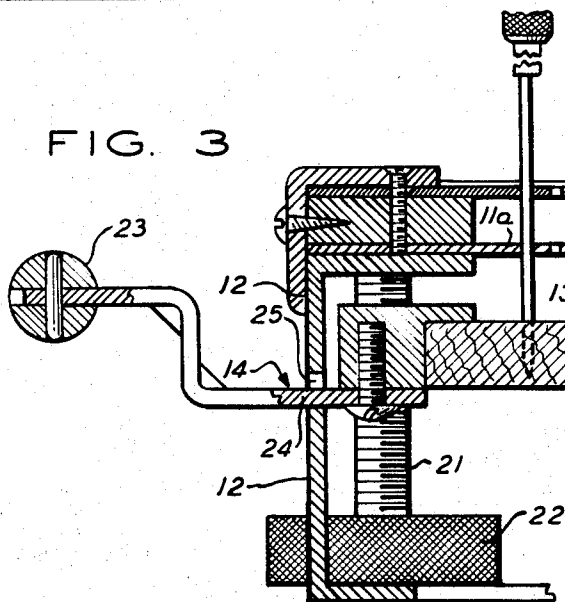
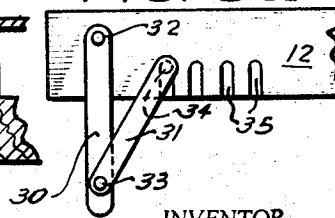


FIG. 3a



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2 Sheets-Sheet 2

FIG. 4

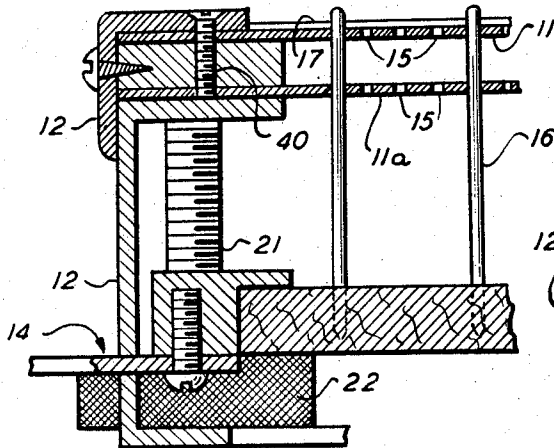


FIG. 5

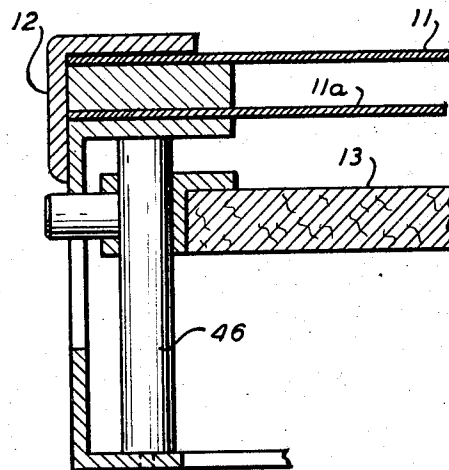


FIG. 6

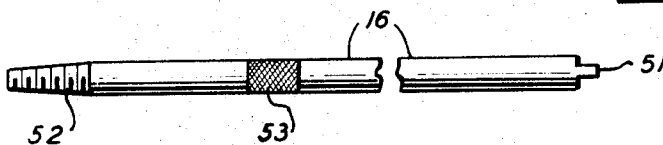


FIG. 7

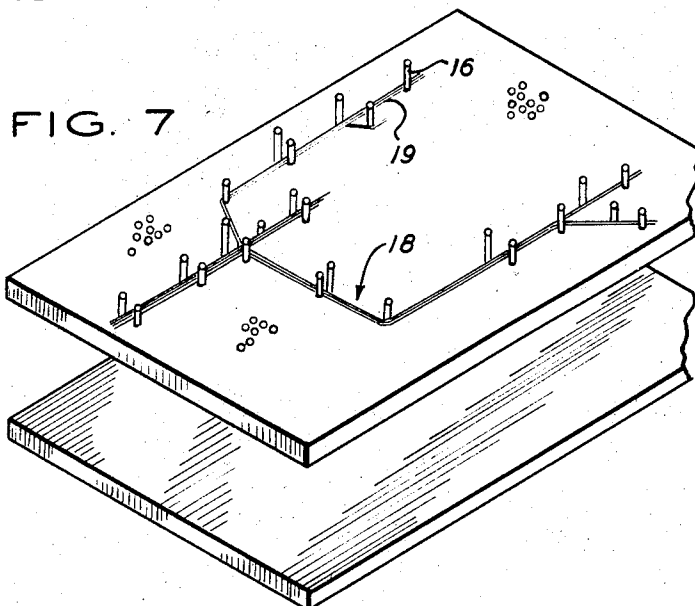
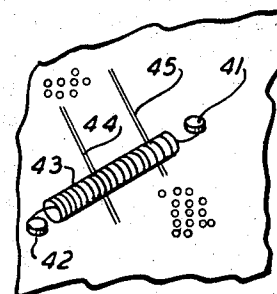


FIG. 8



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1

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WIRE HARNESS DEVICE

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16 Claims. (Cl. 140-92.1)

ABSTRACT OF THE DISCLOSURE

A wire harness device comprises a casing with a face plate perforated throughout its area through selected perforations of which pins may be slidably inserted, these pins being embedded in a second plate parallel to the first plate. The second plate is movable at will to any desired spacing with reference to the first plate. A harness out of wires may be formed on the first plate, the protruding pins forming a guide for the wires. The second plate and pins carried thereby may be lowered to facilitate tying together of the wires forming the harness and removal of the harness. If desired a tiltable foot arrangement may be provided at one end of the casing to enable tilt of the casing.

The invention may be used for forming harnesses of tape forming bundles of wires to the final harness outline desired and holding them in the so defined wire harness outline without hindrance to the application of securing and tying devices thereto.

The invention may be used for forming harness of an infinite variety, to be defined in each case by selective positioning of pins in said device. A further feature of the invention is the provision of novel means for moving said pins from an initial position of projection substantially above the wire harness, for positioning the wires to outline desired, to a second position, in which the pins are substantially retracted, to facilitate application of tying devices to the wires, securing them together as a harness of the desired final outline.

The device of this invention enables the user to immediately fabricate any particular outline of harness desired; a template or guide sheet may be applied to the top of the device, having marked thereon the positions in which pins are to be placed. The pins, thus precisely located, may be inserted through a first board of the device and the wire bundle inserted between the pins for accurate fabrication of the harness desired, in a simple and highly accurate fashion.

The drawings, illustrating procedures and devices useful in carrying out the invention, and the description below, are exemplary only of the invention, which shall be deemed to cover all other devices and procedures coming within the scope and purview of the appended claims.

In the drawings, wherein similar reference characters indicate like parts:

FIG. 1 is a top plan view of a harness device embodying the invention,

FIG. 2 is a partly broken, side elevational view thereof, taken at line 2-2 of FIG. 1,

FIG. 3 is an enlarged vertical sectional view, taken at line 3-3 of FIG. 1,

FIG. 3a is a fragmentary end elevational view, taken at line 3a-3a of FIG. 1,

FIG. 4 is an enlarged vertical sectional view, taken at line 4-4 of FIG. 1,

2

FIG. 5 is an enlarged vertical sectional view, taken at line 5-5 of FIG. 1,

FIG. 6 is an enlarged, side elevational view of a pin 16 which may be used in the device of the invention,

FIG. 7 is a schematic perspective view of first and second boards in the device of the invention, and

FIG. 8 is a fragmentary plan view of the first board.

As shown in the drawings, the device 10 of this invention (FIG. 1) comprises a board 11 which (FIG. 3) is secured to the casing 12 and a second board 13 movably arranged relative to the first board by suitable means, exemplified at 14 in FIG. 3, in an arrangement such that the first and second boards may be selectively moved to a spaced apart (FIG. 4) position from one of close spacing (FIG. 3) and back again as desired, in use. The first board 11 is provided with a plurality of apertures 15 (FIG. 1) therethrough so that pins 16 may be positioned through the first board 11 and into the second board 13 (FIG. 3) with said pins projecting substantially above the first board.

In practice, in use of the device, a sheet 17 (FIGS. 1 and 4) which may have marked thereon the outline of the harness desired and pin locations (or said outline may be provided by stencils) is positioned atop the first board as by masking tape or other suitable securing means, to define the harness outline 18 (FIG. 7). The first board 11 may be a single board 11 or, with an intermediate board 11a, secured to the casing 12, in parallel spaced relation (FIG. 4) to define spaced boards 11, 11a, having a plurality of apertures 15 therein (FIGS. 1 and 3). Boards 11, 11a may be made of perforated metal, plywood or other suitable material, and the second board, 13, of wood or any other suitable material and thickness so that pins 16 (which may if desired be nonmetallic nails) may be readily passed through the boards 11, 11a and into the second board 13, and will be maintained therein until removed by the user.

The pins 16 may be passed through boards 11, 11a and into board 13 with use of a tool, if desired; a driving tool 50 (FIG. 3) may be used; the pin 16 may be firmly grasped as by providing the pin 16 with registration means 51 at the end (FIG. 6) to be received in the tool. The other end 52 of the pin is preferably tapered (and threaded if desired) to facilitate entry into the second board 13. The tool 50 may be hand or power operated and the pins may be removed by turning the tool in the direction opposite that for inserting the pins. The pins may have serrated reference portions 53.

As shown in FIG. 4, by use of a registration stud 40 passing through the apertures 15 of boards 11 and 11a and into the casing 12, the apertures of said boards may be accurately aligned.

After positioning pins 16 through the boards 11, 11a and into board 13 in the initial position of the parts as in FIG. 3, with the pins extending substantially beyond the board 11 to define the harness board outline desired, the user then positions the bundle of wires 19 (FIG. 7) between the pins 16. Screws 41, 42 may be used to hold accessories to the device; for example, to hold termination springs 43 (FIG. 8) for termination of the wires 44, 45 of cable 18 at the ends or other desired points.

Means may be provided in the device to control movement of the second board 13 away from the board 11, such as one or more posts 21 (FIGS. 3 and 1) non-rotatably secured to the casing, with which internally threaded plates, thumb nuts or supports 22 may be engaged to provide a means for rapid adjustment of the

position of the second board relative to the first or for limiting movement of the means 14 for the same purpose.

The means 14 (FIGS. 1 and 3) may comprise one or more bars 23 connected by links 24 to the second board the links being movable in slots 25 in the casing 12, whereby the second board may be rapidly elevated through the vertical portions 25a (FIG. 2) of the slots and then moved to the horizontal portions 25b thereof for locking the second board in spaced relation to the first. On moving the links 24 out of the horizontal slots 25b and into the vertical slots 25a the board 13 (and pins 16 carried thereby) is moved to a position determined by the location of the supports 22 on posts 21 (FIG. 4). Alignment posts 46 may be provided to be slidably engaged by the second board 13 in the corners of the device not provided with post or posts 21.

The operating procedure for the device of this invention is as follows:

The harness layout sheet 17 is secured to the top surface of harness board 11, fastened with masking tape, etc. The handles 23 should be in the up (FIG. 3) position, with the handle bracket beyond (FIG. 2) the locking tooth 47. Pins 16 are pushed through the drawing sheet 17 and through boards 11, 11a, so that the pins contact the board 13. The pins are driven into the board 13 with a tool 50 so that the top of knurl marking 53 is flush with the drawing sheet 17. Termination devices 43, FIG. 8, etc. may be secured to board 11 as by self-tapping screws 41, 42. Adjusting knobs 22 are set to desired position. The harness 18 is fabricated by routing the wires between the pins 16 and securing them to a terminating device 43. Initial wires may be routed with the pins 16 at the lowest pre-set height (FIG. 4) as the wires approach pin height, the handles 23 are raised to locked position, the pins are then in their uppermost (FIG. 3) position; routing of the wires is continued. Upon completion of routing, the second board 13 is moved away from the first board 11 by suitable means, so that the pins will project for a lesser extent above the first board or will not appreciably extend thereabove. Insertion of tying straps or devices around the bundle of wires 19 to hold them in their final harness outline is facilitated. The tying devices may be thus secured at desired locations. To lower the board 13, the handles 23 are moved to cause the links 24 to ride over locking teeth 47, the handle is moved to register the links 24 of the handles in the vertical slots 25a (FIG. 2) and downward pressure applied until the board 13 comes in contact with adjusting knobs 22 (FIG. 4).

Assembly of the harness 18 may be achieved with the pins in their upper (FIG. 3) position. Upon completion of stringing or running the wires, the harness 18 is now ready to be tied. The lower board 13 is dropped to a position (FIG. 4) where the pins 16 are at a height equal to or slightly below the diameter of the harness 18. There are now no obstructions to interfere with the installation of straps or the bundling devices around the harness 18. The completed harness 18 may be removed and the device reused for forming another wire harness in accordance with the outline applied to the first board 11 as on the sheet 17.

The device 10 may be in the form of a generally flat casing to be positioned on any suitable table or other supporting surface and may have means for angularly tilting the same, such as legs 30 (FIG. 3a) pivotally connected as at 32 to the casing 12 with suitable link means 31 connected thereto as at 33 with a pin 34 at the free end of link 31 to be received in any of several slots 35 in the casing. The position of the leg 30 may thus be adjusted to tilt the casing to the degree desired. In the vertical position of leg 30 in (FIG. 3a) the casing is at its maximum tilted position; as the pin 34 is moved to slots 35 progressively further away from the pivot point 32 of the leg to the casing, lesser tilting is achieved. By with-

drawing the pin from the slots completely no tilting is achieved.

The adjusting knob 22 is set, prior to the routing of the harness wires, to provide the proper pin height desired for the particular job at hand when the inner board 13 is lowered; that setting need be made only once for forming a particular wire harness.

While the foregoing disclosure of exemplary embodiments is made in accordance with the patent statutes, it is to be understood that the invention is not limited thereto or thereby, the inventive scope being defined in the appended claims.

I claim:

1. A wire harness device, comprising a first board perforated substantially throughout its area, a second board spaced from the first board, a plurality of pins, less in number than said perforations, positioned through selected perforations in the first board and detachably engaged with the second board to define the outline of a harness to be formed with a plurality of wires intermediate the pins and repositionable to define the outlines of another harness.

2. In a wire harness device as set forth in claim 1, means for movement of one of the boards relative to the other, so that said boards may be moved apart to partly withdraw the pins through the first board.

3. In a wire harness device as set forth in claim 1, said device having a frame, said first board being fixed to said frame and defining the upper surface of the device and means in said device for effecting relative movement of one board relative to the other.

4. In a wire harness device as set forth in claim 2, said means for relative movement engaging said second board, to dispose the same in predetermined spaced relation to the first.

5. In a wire harness device as set forth in claim 2, means movably mounted in said device toward and from said second board engaging and supporting the second board in a predetermined lower position of the board.

6. In a wire harness device as set forth in claim 2, a harness outlining sheet positioned on the first board marking the positions for insertion of the pins in said device, to define the harness outline desired.

7. In a wire harness device as set forth in claim 1, means for variably spacing one end of said device from a supporting surface.

8. In a wire harness device as set forth in claim 1, means secured to the first board for holding ends of said wires.

9. In a wire harness device as set forth in claim 8, said means having a plurality of adjacent convolutions for receiving and so holding the wire ends.

10. In a wire harness device, a casing, an upper plate fixed to the casing and perforated with evenly spaced apertures, throughout substantially its entire area, a lower plate, a handle attached to said lower plate to raise and lower the same, means on the casing cooperable with the handle to maintain the handle and lower plate in a raised position, a post in the casing, a knob movable to a fixed adjusted position on the post and in a position to support the lower plate when in its down position and pins passing slidably through selected apertures in the upper plate and detachably engaged with the lower plate to enable wires to be woven about said pins in accordance with a predetermined pattern and upon lowering of the lower plate to facilitate tying together the wires to form a harness.

11. In a wire harness device as set forth in claim 10 in which the handle comprises a bar with a pair of links on each end of the bar, the links being connected between the handle and the lower plate, the casing having an inverted L-shaped slot through which the links move.

12. In a wire harness device as set forth in claim 10 in which the inverted L-shaped slot is further provided with a projection to act as a lock against swinging movement of the links.

5

13. In a wire harness device as set forth in claim 10 in which the post is threaded and the knob is threadedly engaged with the threads on the post.

14. In a wire harness device as set forth in claim 10, a third plate fixed in the casing between the upper and lower plates and spaced from the first plate and having perforations registering with the perforations in the first plate. 5

15. In a wire harness device as set forth in claim 10, each of said pins being formed at its upper end with a configuration to be easily engaged by a pin rotating and driving tool, the lower end of the pin being threadedly engaged with the lower plate. 10

16. In a wire harness device as set forth in claim 15, each of said pins being further provided with markings 15

6

thereon to enable the depth of insertion of the pins through the upper plate to be determined.

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