Aug. 4, 1959 E. E. OTT 2,898,242

METHOD AND FIXTURE FOR IDENTIFYING CONDUCTORS

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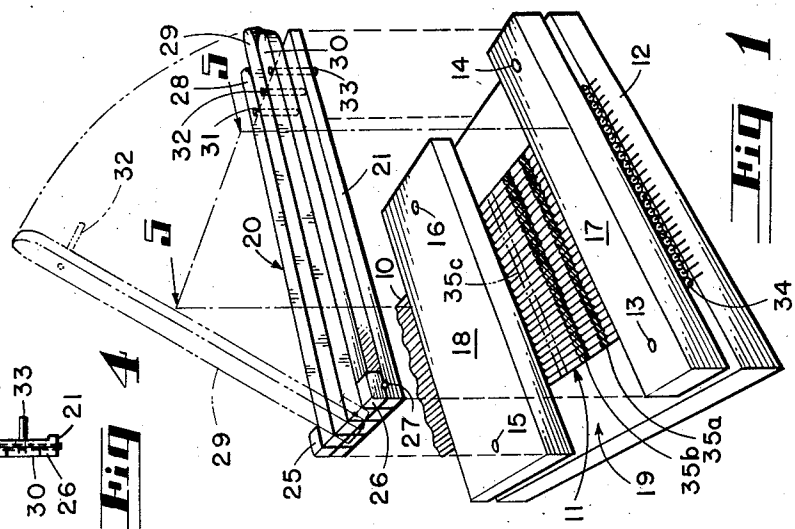


Fig. 1

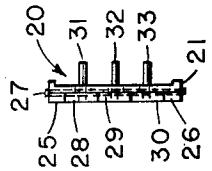


Fig. 4

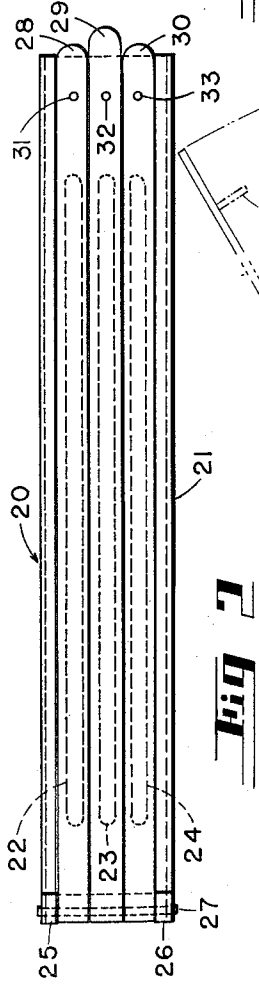


Fig. 2

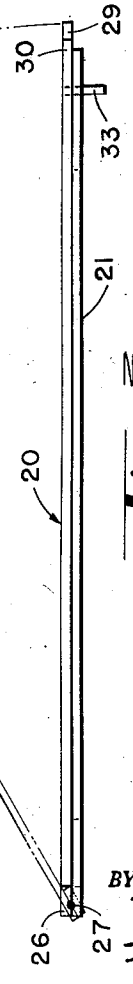


Fig. 3

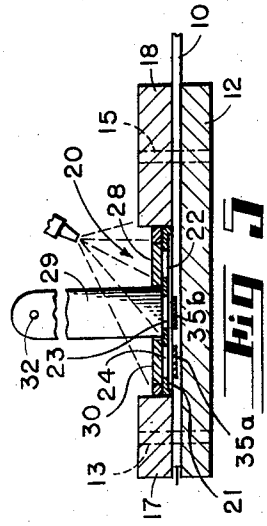


Fig. 5

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METHOD AND FIXTURE FOR IDENTIFYING CONDUCTORS

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3 Claims. (Cl. 117—212)

The present invention relates to industrial processing, and specifically to a novel apparatus and method for identifying wires.

A summary consideration of the prior art is persuasive that there has been a persistent need for an improved fixture and process or method for identifying wires, a method and apparatus in consonance with modern mass production requirements. One widely used prior art method involves placement on the wire of a collar with integral tabs bearing identifying indicia. This method of identification is characterized by the following disadvantages and limitations:

(1) The necessity to remove the markers when the wires have been identified and placed;

(2) The undesirable adhesive residue remaining on the surface of the wire after removal of the markers;

(3) The tendency of such markers to become separated from the wires during sorting or installing operations;

(4) The cost of the markers;

(5) The storage and sorting of the markers.

Another prior art method is to print identifying letters and numbers on the several wires. In practice the following disadvantages of this method have become apparent:

(1) Substantial capital cost of apparatus;

(2) The necessity to read the identifying indicia in the direction of the axis of the wire;

(3) The confinement of presently available commercial equipment to utility in marking only short lengths of wires;

(4) The necessity to use different sizes of type for various wire gauges;

(5) Time-consuming margin-setting operations.

The primary object of this invention is to provide improved method and apparatus for wire identification, characterized at once by speed, flexibility, low cost, simplicity, reliability, and freedom from the disadvantages and limitations of prior art practices and apparatus.

The accomplishment of the principal object of the invention involves the concept of utilizing for wire identification the universal color coding established by the Radio, Electronic, and Television Manufacturers Association, and the following typical color coding is exploited in the present invention, although it will be understood that any system of color coding may be used:

Number:	Color
1	Brown.
2	Red.
3	Orange.

4	Yellow.
5	Green.
6	Blue.
7	Violet.
8	Gray.
9	Gold.
0	Black.

The colors, as applied to the wire in accordance with the invention, are read from the outer end of the wire inwardly. One color stripe is required for identifying wires numbered 0 to 9, two color stripes for wires numbered 10 to 99, and three color stripes for wires numbered from 100 to 999.

The exploitation of this concept in accordance with the method and apparatus of the invention has demonstrated cost savings of 700% in practical commercial operation in a large industrial plant.

In accordance with the invention there is provided a novel method of color coding wire which comprises the steps of arranging a plurality of wires in side-by-side or juxtaposed position in a single layer, securely positioning and aligning said wires, superimposing on said layer of wires a single template having normally closed slots extending transverse to the wires, opening a selected one of those slots, and spraying the coloring material on the wire areas defined by the opened slot.

The invention provides a novel fixture for positioning wires, defining areas to be spray-coated, and masking otherwise exposed areas on the wires. A representative and preferred embodiment of such fixture, found to be successful in practice, comprises a base plate for supporting and aligning a single-layer plurality of juxtaposed insulated wires, a pair of spaced holding-down plates positioned transversely of the wire at opposite margins of the base plate, said wires being disposed between said holding-down plates and said base plate, together with means for locating said holding-down plates to provide a space therebetween. The inventive combination further provides means for selectively defining areas of the wire to be sprayed, while protecting otherwise exposed areas. This novel means comprises a template adapted to be positioned in the space between the holding-down plates and formed with a plurality of parallel slots extending transversely across the wires. Each of the slots is proportioned to define the deposit of spray coating on the wire areas immediately beneath it. This selective defining means also includes masking means comprising slot covers hinged to the template. Each of those covers is swingable to one position in which its associated slot is open and to another position in which such slot is closed.

For a better understanding of the invention, together with other and further objects, advantages, and capabilities thereof, reference is made to the following description of the accompanying drawings, in which:

Fig. 1 is a rear perspective view of a preferred form of fixture in accordance with the invention, the combined template and masking device being shown, for purposes of exposition, in a position vertically displaced from that in which it is placed during the spraying operation;

Fig. 2 is a top plan view of the combined template and masking device provided in accordance with the invention and included in the entire apparatus of Fig. 1;

Fig. 3 is a rear elevational view of the Fig. 2 device;

Fig. 4 is a left-hand elevational view (i.e., left with respect to the operator) of the Fig. 2 device; and

Fig. 5 is an elevational sectional view taken along the plane 5—5 of Fig. 1, looking in the direction of the arrows, and showing the relative positions of the parts during normal operation when the combined template and masking device is in place and one of the slot covers is in open position to define the wire area to be sprayed.

A typical insulated wire to which the color coding is applied is designated by the reference numeral **10**. The reference numeral **11** collectively designates a single-layer plurality of such wires, laid side by side on a rectangular base plate **12**. The single layer **11** here shown comprises 25 wires, but it will be understood that the invention is not limited to this number, and 50 or more have been simultaneously color-coded in the practice of the invention. The base plate includes at its rear (and away from the operator) a pair of vertically upstanding locating pins **13** and **14**, and at its front (and near the operator) a similar pair of locating pins or posts **15** and **16**. Superimposed on the layer of wires **11** is a rectangular holding-down plate **17** which is provided with apertures slidably engaging the pins **13** and **14**, whereby plate **17** is positioned above the rear margin of the base plate. Similarily superimposed on layer **11** at the front margin of the base plate is a rectangular holding-down plate **18**, which is also provided with positioning apertures complementary to the locating pins **15** and **16**. Thus, plates **17** and **18** maintain the layer of wires **11** together and in alignment, and between the plates **17** and **18** is formed a space or channel **19** in which there is placed the combined template and masking device **20**.

The combined template and masking device **20** comprises a generally rectangular template member **21** formed with a plurality of longitudinally extending slots **22**, **23**, and **24**, extending in a direction transverse to the wires, and with spaced pin-receiving extensions **25** and **26**, between which there is secured a hinge pin **27**. Hinged on pin **27** are slot covers **28**, **29**, and **30**, each of which is associated with one of the slots **22**, **23**, and **24**, respectively. Extending downwardly from the slot covers and projecting through registering apertures in the plate **21** are positioning pins **31**, **32**, and **33**. When the combined template and masking device **20** is in place, these positioning pins abut against the side of base plate **12** to maintain such device in position. Further, template **21** snugly fits into the space **19** between plates **17** and **18**.

In color coding wire in accordance with the process of the present invention, the following sequence of steps has been found to be satisfactory:

(1) First the several parts **12**, **17**, **18**, and **20** of the fixture are disassembled;

(2) A plurality of insulated wires to be marked is put into position on the base plate **12** so that one end of each wire is in line with the rear edge of the base plate as shown at **34** (Fig. 1);

(3) The holding-down plate **18** is placed on its guide pins, and the wires positioned so that they lie in a layer;

(4) The space plate **17** is put into position on its guide pins;

(5) With the use of a suitable spray gun, the wires in the channel **19** between the plates **17** and **18** are sprayed with white paint;

(6) The spray shield or masking device **20** is placed in space **19** with all slot covers closed;

(7) Slot cover **30** is opened, and the wire areas which slot **24** defines are sprayed with the first identifying color;

(8) Slot cover **30** is closed and slot cover **29** is opened, and a spray gun is used to spray the wires as defined by slot **23** as shown in Fig. 5;

(9) Slot cover **29** is closed and slot cover **28** is opened, and a spray gun is used to spray the desired coding on the wire areas defined by slot **22**;

(10) Slot cover **28** is closed, the spray shield or masking device **20** removed, and holding-down plates **17** and **18** taken off from their locating guide pins.

In Fig. 1 there is shown a typical spray-coated area **35***b* which results from the operation shown in Fig. 5, wherein slot cover **29** is raised. It will be understood that the spray-coated area **35***a* in Fig. 1 was similarly produced when slot cover **30** was opened. Likewise, area **35***c* will be sprayed when slot cover **28** is opened.

In the case where it is desired to apply the same color to more than one area, the slot covers masking such areas are opened simultaneously, so that the spraying of two or three areas with the same color is accomplished in a single operation.

In the spraying operation, colored ink of the spray type is preferred. Suitable insulating materials for the wire are as follows:

(*a*) Vinyl
(*b*) Polyamide
(*c*) Polytetrafluoroethylene
(*d*) Rubber or latex
(*e*) Braided shielding (metal)

It will be seen from the foregoing that the invention provides a method of color-coding wire which comprises the steps of arranging a plurality of wires side by side in a single layer **11**, securely positioning and aligning said wires with the plates **12**, **17**, and **18**, superimposing on said layer **11** of wire a single template **21** having normally closed slots **22**, **23**, and **24** extending transverse to the wires, opening a selected one (for example, **23**) of said slots, and spraying coloring material (Fig. 5) on the wire area (for example, **35***b*) defined by the open slot.

While there has been shown and described what is at present believed to be the preferred embodiment of the invention, it will be understood by those skilled in the art that various modifications and changes and substitutions of equivalents may be made without departing from the scope of the invention as defined by the appended claims. For example, the combined template and masking device may optionally be placed in a transposed position in the space **19**, with the hinged end (**25**, **26**, **27**) to the operator's left.

I claim:

1. A fixture for positioning wires, for defining areas to be spray-coated, and for masking otherwise exposed areas on the wires, said fixture comprising a base plate for supporting and aligning a single-layer plurality of juxtaposed insulated wires, a pair of spaced holding-down plates positioned transversely of said wires at opposite margins of said base plate, said wires being disposed between said holding-down plates and said base plate, means for locating said holding-down plates to provide a space therebetween, and means for selectively defining areas of the wires to be spray-coated while masking otherwise exposed areas, comprising: a template adapted to be positioned in the space between the holding-down plates and formed with a plurality of parallel slots extending transversely across said wires, each of said slots being proportioned to define an area to be spray-coated on the wires immediately beneath it, and masking means comprising slot covers hinged to said template, each of said covers being swingable to one position in which its associated template slot is open, and to another position in which said slot is closed.

2. The method of color-coding which comprises the steps of arranging a plurality of wires side by side in a single layer, securely positioning and aligning said wires, superimposing on said layer of wires a single template having normally closed slots extending transverse to the wires successively opening selected ones of said slots, and successively spraying coloring material on the wire areas defined by each opened slot.

3. A device for defining areas to be spray-coated on a plurality of juxtaposed wires and masking otherwise exposed areas on the wires, comprising a template formed with a plurality of parallel slots extending transversely across said wires, each of said slots being proportioned to define the area to be spray-coated on the wire areas

immediately beneath it, and masking means comprising slot covers hinged to said template, each of said covers being swingable to one position in which its associated template slot is open, and to another position in which said slot is closed.

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