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METHOD FOR WINDING WIRE COILS

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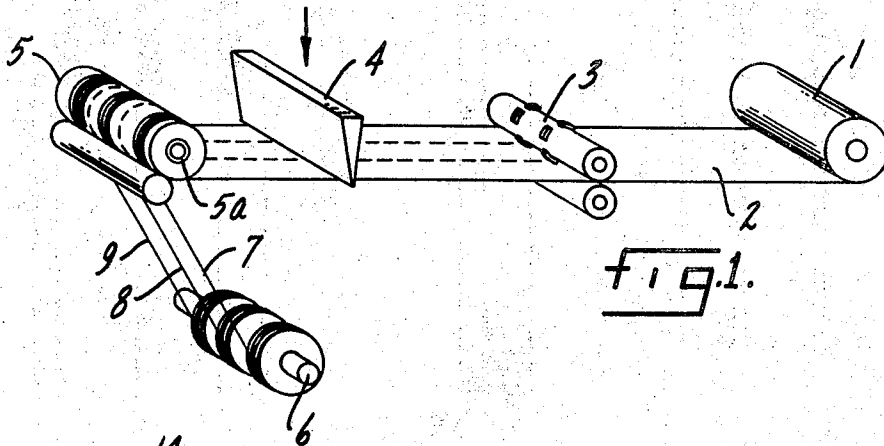
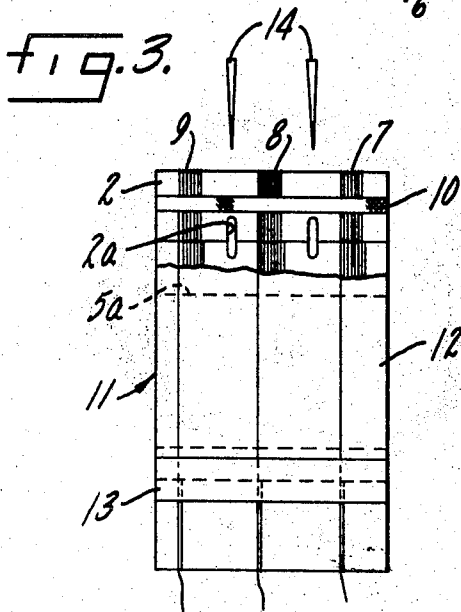
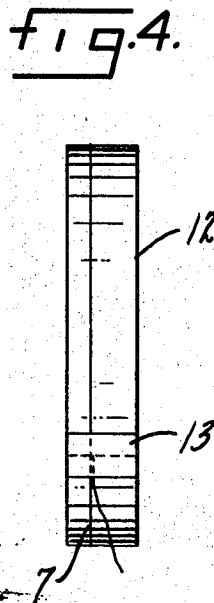
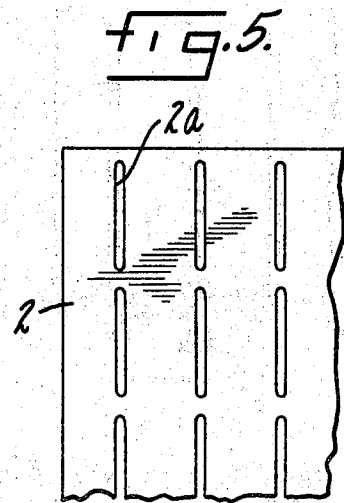
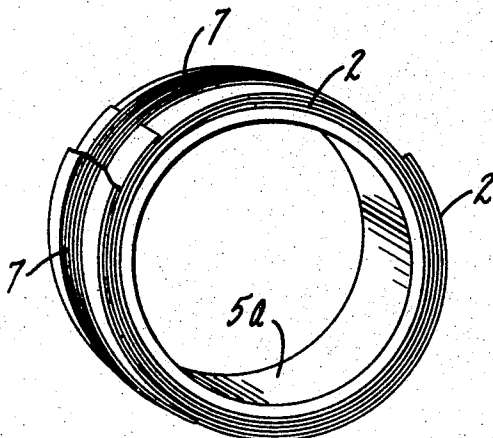
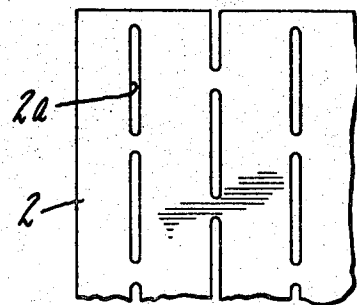


Fig. 2.

Fig. 6.

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METHOD FOR WINDING WIRE COILS

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1 Claim

ABSTRACT OF THE DISCLOSURE

A means and method of forming a wire coil by interwinding a wide roll of paper and a plurality of spaced wire strands, the paper having openings pre-positioned between the wire strands for subsequent separation of individual coils.

SUMMARY OF THE INVENTION

A means and method wherein a roll of paper is cut to form predetermined spaced, longitudinally aligned rows of openings. A plurality of individual wire strands each wound in alternating layers with the paper and on the spaces between the openings, the resulting cylinder having spaced wire coils thereon being cut in substantial alignment with the openings to form individual separate coil elements.

This invention relates to wire coils and the like and has for one of its purposes provision of a means and method facilitating the formation of individual wire coils.

Another purpose is to provide a means and method of forming wire coils having greater identity in size and shape.

Another purpose is to provide a means and method of forming wire coils effective to avoid bending and distortion of cutting elements.

Another purpose is to provide a means and method of forming wire coils more safely and more rapidly and with reduced requirement for trained personnel.

Another purpose is to provide a means and method of forming wire coils which shall avoid excess heat in the formation thereof. The wire coils resulting from the practice of the invention may be employed in a variety of instruments. An example thereof is the wire coil known as a paper-section, wire-wound coil and employed as a component in a sweep transformer or flyback structure of television sets wherein accuracy of winding and dimensions as well as purity and economical construction are important criteria. Accordingly, it is another purpose of the invention to provide a means and method of forming such coils in maximum correspondence with said criteria.

Other purposes will appear from time to time during the course of the specification and claim.

The invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

FIG. 1 is a diagrammatic perspective illustrating a step in the method of the invention;

FIG. 2 is a detail perspective with parts broken away;

FIG. 3 is a view illustrating another step in the method of the invention;

FIG. 4 is a view illustrating the resulting product;

FIG. 5 is a detail view; and

FIG. 6 is a detail view showing a variant form of FIG. 5.

Like parts are indicated by like numerals throughout the specification and drawings.

Referring now to the drawings, numeral 1 generally designates a supply of non-conductive or insulating material in the form of a roll of paper 2, such as kraft paper and the like. The paper 2 is drawn from the roll 1 and adjacent suitable mechanism, such as the dies indicated

at 3 for example, to form in the paper 2 a plurality of spaced openings such as those indicated at 2a in FIG. 5. A laterally disposed cutter or slicer is indicated at 4. Individual sheets cut from the paper strip 2, after it has moved through the perforating station 3 and cutting station 4, are wrapped about a core 5a on an arbor 5.

Indicated at 6 is a support for a plurality of rolls of wire strands, the strands being indicated, for example, by the numerals 7, 8, 9. While three such rolls and strands of wire are shown it will be understood that any number may be employed. In practice, for example it has been found convenient to employ as many as fourteen such rolls and strands equally spaced across a distance of about 9 inches.

A first length of the paper 2 is cut off by the knife 4 and turned about the core 5a which is then rotated to wind the strands 7, 8, 9, for example, on said paper length between each set of adjacent, parallel, longitudinally extending rows of aligned openings therein. A predetermined number of windings on the strands 7, 8, 9 are applied to the first length of paper 2 on the core 5a in side-by-side relationship as illustrated in FIG. 3. It will be observed that said windings, while covering a substantial portion of the space between adjacent rows of openings 2a, are nonetheless spaced somewhat therefrom. Thereafter, the paper 2 is advanced while a second length thereof is separated by the knife 4 and wound about the core 5a on top of the existing windings or layer of strands 7, 8, 9. Each of the strands remains unbroken, however, and is then wound upon said second length of the paper 2 in the manner described in relation to said first length. The described process is continued until a relatively solid cylinder of predetermined diameter is created on the core 5a and which consists of tightly rolled, alternating layers of paper and fine wire windings. A strip of adhesive tape 10 is then placed longitudinally over the exposed end edge of the last length of paper in the cylinder. The resulting cylinder indicated by the numeral 11 in FIG. 3 may then have a protective wrapper 12 applied thereto and a second tape 13 applied to close wrapper 12. The excess end portions of strands 7, 8, 9 projecting from the wrapper 12 are broken and wound thereabout and secured as indicated.

As shown in FIG. 3, the cylinder 11 is then presented to a suitable cutting mechanism which may consist of a plurality of cutter members 14 spaced in predetermined relationship for alignment with each lateral row of perforations or slot openings 2a. While a plurality of cutter members 14 is shown, it will be understood that a single such cutter may be employed and the cylinder 11 may be intermittently shifted in relation to such cutter for application of such single cutter to each row of perforations 2a. In either event, a cutter 14 will pass through the cylinder 11 in alignment with the perforations 2a rapidly and without generation of heat, burning of paper or deflection of the cutter 14. The resultant individual coils, as shown in FIG. 4, will be substantially perfect cylinders having opposite end faces substantially perpendicular to the circumferential walls thereof.

Whereas there has been shown and described an operative form of the invention, it should be understood that this showing and description are to be taken in an illustrative or diagrammatic sense only. There are many modifications in and to the invention which will be apparent to those skilled in the art and which will fall within the scope and spirit of the invention. For example, while the perforating station 3 is shown in FIG. 1 as adjacent to the cutter 4 and arbor 5, it will be readily understood that the paper 2 could be perforated at a remote point and rewound on a suitable roll 1 for later delivery to the cutter 4 without departing from the nature and scope

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of the invention. Similarly, the perforations 2a could take a variety of planar configurations. As shown herein, the perforations 2a take the preferred form of elongated slots having rounded ends. It will be understood that various forms of opening may be employed, that the opposed ends of adjacent slots may lie in parallel angles, etc., without departing from the nature and scope of the invention. The slots may be arranged in lateral alignment as shown in FIG. 5 or in alternately offset lateral relationship as shown in FIG. 6, it being understood that the open area of the perforations is maintained at the maximum permissible, the longitudinal paper areas between the rows being fully sufficient to insure ability to draw the paper from roll 1 and onto core 5a.

I claim:

1. The method of rapidly forming a plurality of paper and wire coils formed of alternating layers of paper and wire without burning of the paper and misdirection of a cutting means, which consists of the steps of supplying a sheet of paper, forming in said sheet a plurality of longitudinally aligned, longitudinally spaced, elongated slots in laterally spaced, parallel rows throughout the extension of said sheet, thereafter separating individual lengths from said sheet and winding said lengths on a core, simultaneously winding a plurality of lengths of wire strands on and between layers of said sheet lengths and between

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each adjacent pair of said rows in parallel, with and out of contact with said adjacent rows to form a tightly wound cylinder of wire and paper and thereafter cutting laterally entirely through said cylinder in alignment with each of said rows and out of contact with said wire strands, whereby the paper only is rapidly, smoothly cut to form from said cylinder a plurality of substantially identical, parallel-sided, disc-like coils of wire and paper.

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