

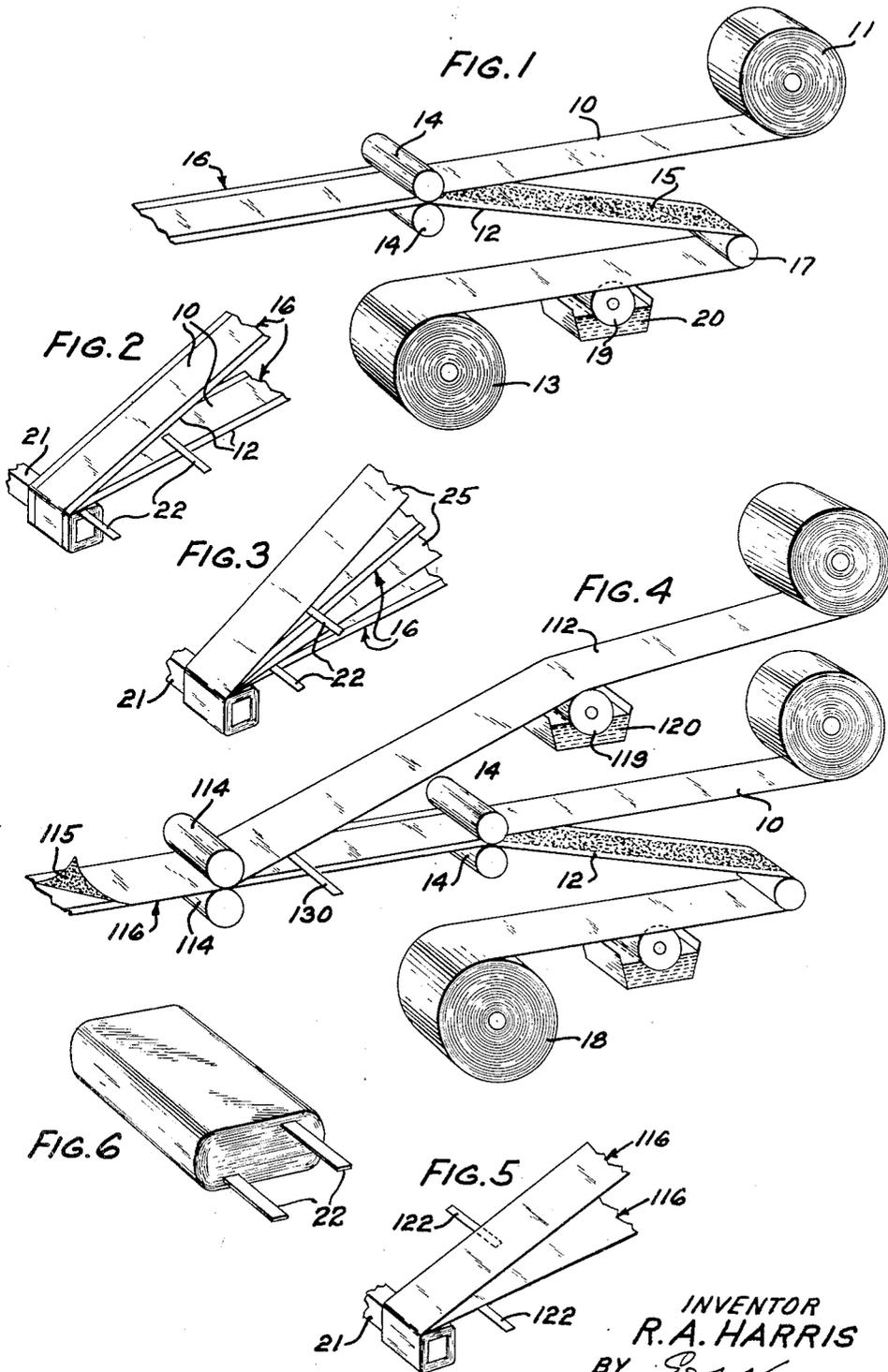
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METHOD OF MANUFACTURING CONDENSERS

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METHOD OF MANUFACTURING CONDENSERS

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1 Claim. (Cl. 29—25.42)

1

This invention relates to a method of manufacturing condensers and more particularly to a method of making paper and foil wound condensers.

In a common method of winding paper and foil condensers in which the foil is very thin, and where the strips of paper and strips of foil are individually guided onto an arbor and wound thereon, it frequently happens that one or both of the strips of foil become wrinkled and cause a spongy or thick condenser or that one or both of the strips of foil break or tear and cause a substantial amount of waste and loss of time.

It is an object of the present invention to provide an improved and efficient method of winding condensers.

A particular feature of this invention is to reinforce the strip of foil by adhering it to one or two strips of the dielectric prior to the condenser winding operation and thereby permit the foil to be wound at a greater speed, with a substantial reduction in the breakage and wastage thereof, and resulting in a more uniform product.

In one embodiment of the invention, the strip of foil is pressed into adhering relation with the strip of paper dielectric, coated on one side with an adhesive, and two of such paper backed foil strips are fed into a winding machine with two paper strips for covering the foil strips and wound into a condenser, during the winding of which terminal leads are inserted between the strips of foil and their cover strips.

In another embodiment, a strip of paper dielectric is adhered to one side of a strip of metal foil with adhesive and, at intervals, terminal leads are placed upon the second side of the foil strip and another strip of paper dielectric is adhered to the second side of the foil strip and two of such paper-enclosed foil strips, with their associated terminal leads, are wound on a rotatable mandrel to make a condenser.

The invention will be more fully understood from the following description when considered with the accompanying drawings diagrammatically illustrating several embodiments thereof, in which:

Fig. 1 is a fragmentary diagrammatic view in perspective illustrating the method of adhering a strip of foil to a strip of paper dielectric;

Fig. 2 is a fragmentary diagrammatic view in perspective illustrating a method of winding a pair of reinforced foil strips shown in Fig. 1 into condensers;

Fig. 3 is a view similar to Fig. 2 showing a pair of reinforced foil strips and a pair of strips of paper dielectric being wound into a condenser;

Fig. 4 is a diagrammatic fragmentary view in perspective illustrating the method of adhering

2

strips of paper dielectric to opposite sides of a strip of foil;

Fig. 5 is a view similar to Fig. 2 illustrating the method of winding a pair of paper-enclosed foil strips into a condenser; and

Fig. 6 is a perspective view of a condenser.

In practicing one method of the invention as illustrated in Figs. 1 and 2, a strip of foil 10 from a supply roll 11 and a strip of paper dielectric 12 from a supply roll 13 are guided in aligned and converging relation to a pair of feed rolls 14, which advance the strips and press them into intimate contact with each other. The inner side of one of the strips, preferably that of the paper strip 12, has applied thereto a coating 15 of adhesive and the strips, as they pass through the feed rollers 14, are caused to adhere to each other and form a combined unitary reinforced foil strip 16. The strip of paper 12 may be as wide as the foil strip 11, but preferably is wider, to provide free marginal portions, as illustrated in Fig. 1, and the coating 15 of adhesive may extend across the full width of the paper 12, but preferably is of a width equal to that of the foil strip. The composite condenser strip 16 thus formed may be wound into rolls, later to be used in the manufacture of condensers, or it may be fed directly, together with another strip 16, into a winding machine and wound into condensers. The paper strip 12, as shown in Fig. 1, has the coating 15 of adhesive applied centrally thereto by an applicator roller 19 of the desired width immersed in a supply of adhesive 20 and the coated strip passes around an idler roll 17 to present the adhesive surface toward the foil strip 10.

The adhesive may be of any suitable kind, such as natural and synthetic resin adhesives. The adhesive, in addition to adhering the foil to the paper strip, may have desirable electrical characteristics to improve the dielectric properties of the paper strip 12 and increase its breakdown strength. As illustrated in Fig. 2, two sets of combined foil and paper strips 16 may be fed into a condenser winding machine and wound on a mandrel 21 thereof with the strips 16 in superposed relation and with the foil 10 interposed between paper dielectric strips 12 of the superposed strips 16. The winding of the condenser may be interrupted at suitable intervals to insert a pair of terminal members or leads 22—22 in contact, respectively, with the individual strips of foil 10. On completion of the winding of the condenser, the combined foil and paper strips 16 are severed from the supply and the condenser is shaped to its desired form and enclosed in a suitable wrapping. If desired, the combined foil and paper strips 16 may be sup-

3

plied with cover strips 25 of paper dielectric of substantially the same width as the paper strips 12, as illustrated in Fig. 3, and two sets of combined strips 16 and cover strips 25 may be fed into the winding machine and wound on the arbor thereof to make a condenser. Terminal leads 22 may be inserted in engagement with the foil strips 10 at suitable positions in the condenser during the winding thereof.

In another embodiment of the invention, the foil strip 10 is adhered to one side of the paper strip 12, as previously described, and a second paper strip 112, having a coating of adhesive 115 applied thereto, is adhered to the other side of the foil strip 10, as shown in Fig. 4. The adhesive 115 is applied to the underneath side of the paper strip 112 by an applicator roller 119 rotatable in a supply of adhesive 120 and the strip 112 is pressed into tight engagement with the foil strip 10 and the paper strip 12 as the strips pass through a pair of feed and compression rolls 114. Preferably, the paper strip 112 is substantially the same width as the strip 12 and, when pressed into tight engagement with the foil strip 10 and the paper strip 12, forms a composite strip 116, in which the foil strip 10 is completely enclosed and reinforced by the paper backing strips 12 and 112. Since it is not possible to apply terminal leads to the composite strip 116 while the strips are being wound into a condenser, the terminal leads 22 are applied to the foil strip 10 at regular intervals at a position in advance of the compressing rolls 114 and the paper strip 112 covers a portion of the terminals and secures them in place in the composite condenser strip. The terminal leads 22 are thus formed as an integral part of the composite condenser strip 116. In making a condenser with the composite strips 116, two of the strips are guided to the winding

4

machine in superposed relation and wound on the arbor until the proper size of condenser has been attained, at which time the strips 116 may be severed from the supply and the condenser removed from the mandrel and shaped to the desired form and enclosed in a suitable enclosure. A condenser may be wound with the terminals 22 of the strips 116 extending from the same end thereof or, if desired, one of the strips 116 may be reversed with respect to the other to position the terminals 22 associated therewith on the opposite end of the finished condenser from the terminals 22 of the other strip 116.

What is claimed is:

- 15 A method of making condensers which comprises applying adhesive to one side of a strip of dielectric, pressing a strip of metal foil onto the strip of dielectric and the adhesive thereon to adhere one side of said strip of foil to said strip of dielectric to form a composite strip wherein the other side of said foil is uncoated, winding a pair of said composite strips into a condenser, and inserting terminal members in contact with the uncoated side of said strips of foil during the winding of said condenser.

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