Sept. 13, 1932. C. C. RITTER 1,877,254

SHEET MATERIAL

Filed Sept. 12, 1930

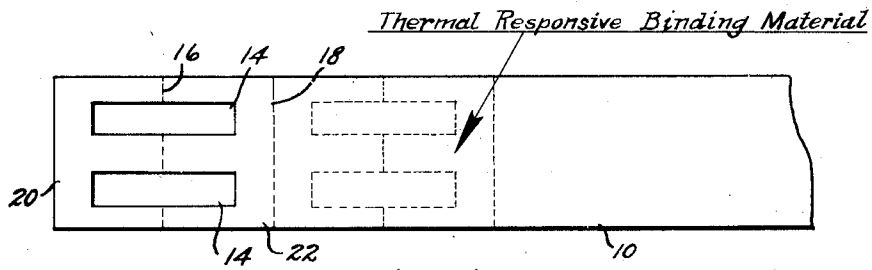

Fig. 1

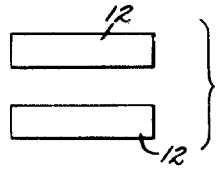

Fig. 2

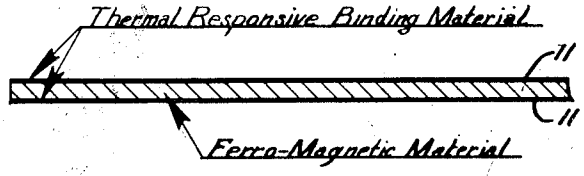

Fig. 3

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Patented Sept. 13, 1932 1,877,254

UNITED STATES PATENT OFFICE

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SHEET MATERIAL

Application filed September 12, 1930. Serial No. 481,479.

This invention relates to the manufacture of transformers and in more particular to the method of manufacturing laminations and the assembly of the laminations.

The conventional method of maunfacturing transformers or other apparatus made from laminations includes substantially the following steps in the following order: forming the laminations from a strip of sheet metal, coating the laminations thus formed by a suitable varnish or other binding material, stacking the laminations before the varnish sets or hardens, then in some cases the laminations are clamped together so as to aid the binding material in holding the laminations in a unit thereby preventing hum. This process, as can be seen, involves a step of coating each individual lamination with a suitable binding material.

An object of the present invention is to eliminate the step of coating each individual piece of the laminations. This is accomplished by coating the sheet metal by a thermal-responsive binding material prior to the forming of the individual laminations from the sheet. The laminations thus formed from a sheet metal previously treated with the thermal-responsive binding material are stacked which is easily accomplished for the reason that the laminations do not adhere to each other as they would if a sticky binding material were used as in the old method. After stacking the lamination, this assembly is heated so as to soften the thermal-responsive binding material thereby causing the adjacent laminations to be bound together as the assembly cools and the thermal-responsive binding material sets.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of one form of the present invention is clearly shown.

In the drawing:

Fig. 1 discloses a strip of sheet material coated by a thermal-responsive binding material.

Fig. 2 discloses a pair of I-shaped laminations.

Fig. 3 discloses a sectional view of the sheet material drawn to an enlarged scale.

In the drawing the reference character 10 indicates a suitable sheet of ferro-magnetic material that has a coating 11 of thermal-responsive binding material. From this sheet 10 having the coating 11, the I-shaped laminations 12 may be sheared or severed leaving the apertures 14 as disclosed in Fig. 1. After I-shaped laminations are severed from the sheet material the sheet may be severed along the dotted line 16 and 18 thereby forming E-shaped laminations 20 and 22 as is well known to those skilled in the art.

The E- and I-shaped laminations are then stacked so as to form a transformer core as is well known to those skilled in the art. The coating 11 is preferably made or applied to the strip of sheet metal by rollers, by spraying, or by dipping. It has been found desirable to apply this coating to the sheet iron as the last step in the forming process at the steel mills.

For transformers such as audio frequency transformers for use on radio receivers provided with a core made of laminations, varnish or material of wax or gum origin or the like may be used as a coating providing the material adheres to the sheet metal and solidifies quickly after being applied to the sheet metal so as to facilitate the ease of handling and shipping. Another essential characteristic of this material is that upon being heated to a suitable temperature such as 250° F. the material then becomes viscous or soft and upon cooling hardens and cements adjacent laminations together. It has been found that this coating gives very satisfactory results if it is from .0005 to .001 inch thick.

Thermal-responsive binding material as used in the claims designates a material suitable as a coating for sheet metal that is to be severed into pieces and assembled as laminations, said binding material having the characteristics that upon heating to a sufficiently high temperature, it becomes plastic, soft or viscous and at ordinary temperatures at which the electrical device is to be used is firm, adheres to and binds adjacent laminations together.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. The method of making laminations, comprising the steps of coating the sheet material with a thermal-responsive binding material and severing the laminations from the coated sheet material.

2. A method of making transformer laminations including the step of coating the sheet metal with a thermal-responsive binding material, drying the binding material and severing the laminations from the coated sheet metal.

3. A method of making a transformer including the steps of forming laminations from sheet metal having a coat of thermal-responsive binding material, assembling the laminations and treating the assembled laminations so as to cause the binding material to bind adjacent laminations together so as to prevent chattering.

4. A method of making a transformer including the steps of forming the laminations from a sheet of metal coated with a thermal-responsive binding material, assembling the laminations, heating the laminations to a temperature sufficient to cause the binding material to become plastic thereby causing the adjacent lamination to be bound together upon cooling.

5. A method of making a transformer including the steps of forming the laminations from a sheet of metal coated with a binding material, assembling the laminations, softening the binding material after assembling and treating the softened binding material so as to cause it to bind the adjacent laminations into a unit whereby chattering noises are reduced.

In testimony whereof I hereto affix my signature.

CARL C. RITTER.