Feb. 25, 1930. F. R. MARCEL 1,748,389

MICA SHEET

Filed Aug. 8, 1927

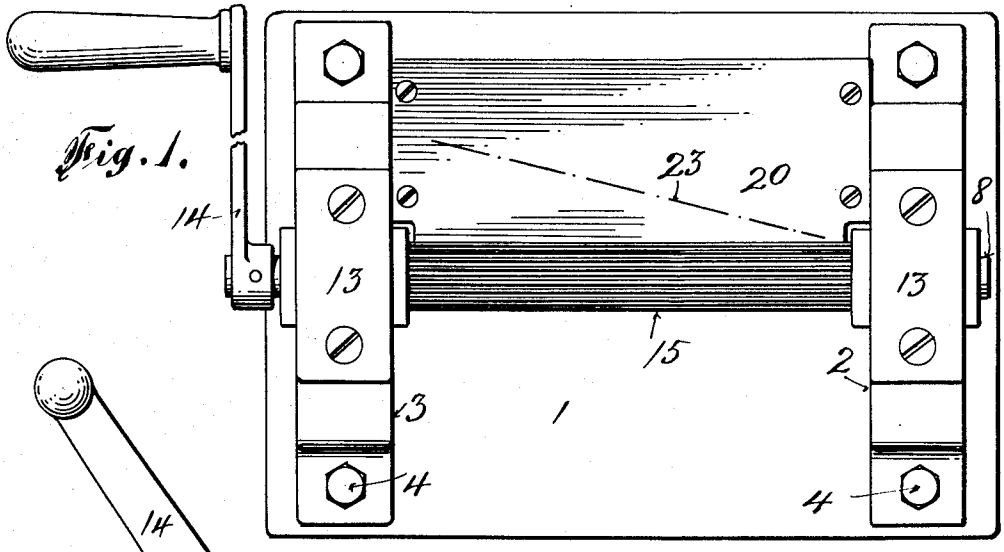


Fig. 1.

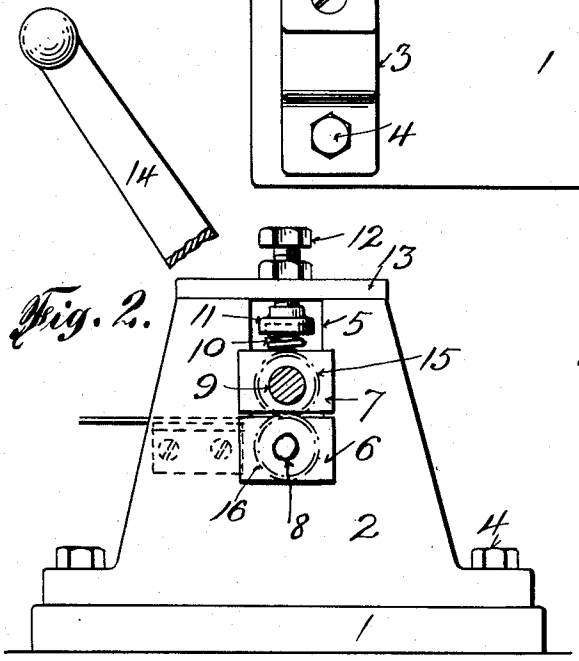


Fig. 2.

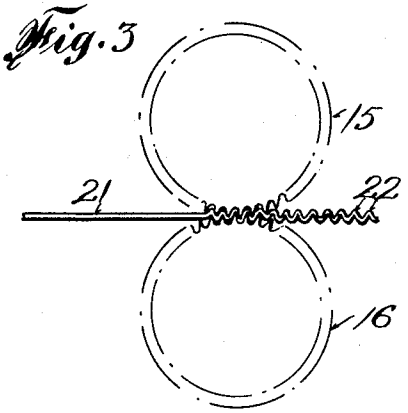


Fig. 3

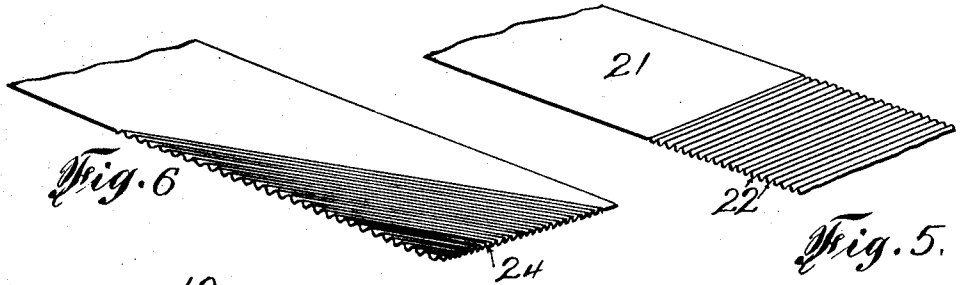


Fig. 6

Fig. 5.

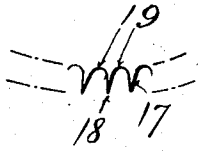


Fig. 4.

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UNITED STATES PATENT OFFICE

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MICA SHEET

Application filed August 8, 1927. Serial No. 211,407.

In employing mica for insulating purposes, as well as in many other uses, it is necessary to bend the sheets or pieces of mica in order to enclose coils of resistance wire and for various other reasons. In many instances in the electrical art it is necessary to shape sheets of mica to suit various requirements, but due to the natural stiffness of this material and its brittleness, it is difficult and tedious to shape it, especially to roll it into small tubes. Furthermore, when rolled into tubes and various other shapes it is necessary to hold or retain the mica in position until it is confined either by an outer shell or cement or other enclosing means, and this makes handling of the mica slow and expensive. The object of my invention is to provide a method of rendering the sheets of mica more pliable or bendable and the product treated by this method. I have found that sheets of mica may be rendered pliable or easily bendable by passing the sheets between rollers having teeth intermeshing with each other whereby corrugated parallel lines are formed across the mica. The corrugations may be formed crosswise or lengthwise of the sheets, according to the manner in which they are to be used or shaped, or strips or sheets may be corrugated diagonally in order to roll the strips or sheets into helical shape. This latter is especially useful where strips of mica are to be wound spirally around a long, thin heating unit and in similar uses. The method consists, broadly, in treating the mica to form corrugations which permanently render the sheets more pliable and the product consists of sheets or strips of mica which have been corrugated in accordance with this method.

In the drawing forming part of this application,

Figure 1 is a plan view of a simple device or machine for treating mica in accordance with my method,

Figure 2 is an end view thereof,

Figure 3 is a diagrammatic view showing the action of the rollers on the mica,

Figure 4 is an enlarged detail of a portion of the teeth of one of the rollers,

Figure 5 is a perspective view of a sheet of mica having the corrugations formed crosswise of the sheet, and

Figure 6 is a strip of mica having the corrugations arranged diagonally or obliquely of the length of the strip.

I will first describe the simple machine or apparatus which may be employed in corrugating the mica. In the drawing I have shown such a machine adapted for hand operation although it will be understood that it may be arranged to be operated by means of a motor. The machine shown consists of a bed 1 preferably of metal, on which are bolted the upright standards 2, 3 in spaced, parallel relation at opposite ends of the bed, preferably by means of the bolts 4 which pass through apertures in the standard and in the base. These standards are provided with vertical slots 5 which serve as guides for the bearing blocks 6, 7 in which the ends of parallel shafts 8, 9 are journaled. The bearing members are adapted to slide vertically and to be guided by the side edges of the slot 5 in the standards, the lower boxes resting bearing blocks 6, 7 in which the ends of paring blocks 6, 7 are duplicated at opposite sides of the machine and the upper bearing block 7 at each side of the machine is pressed downwardly with resistible pressure by means of a coiled spring 10 resting on the top of the bearing member and pressed downwardly by the spring cap 11 which is adjusted in position by means of the bolt 12 passing through the top member or cap 13 extending across the open upper end of the slot 5. The shafts 8, 9, as stated above, are arranged parallel to each other and one of them projects beyond one of the standards where it has attached to it a hand crank 14 by means of which the shafts may be revolved.

The members which act upon the mica comprises rollers which may be integral with or attached to the shafts 8, 9. For this purpose I have shown the two rollers 15, 16 arranged parallel to each other and each of these has teeth 17 extending longitudinally or parallel to the axis of each roller; and the teeth of one roller engage between or mesh with the teeth of the opposed roller, similar to the teeth of meshing gears. These

teeth are preferably made sharp or very narrow on their top edges 18 in order to form a definite and sharp bend in the mica where it passes over one of these edges, whereas the bottoms of the teeth, as shown at 19 are preferably rounded. I have shown a shelf or platform 20 on which the mica sheets may be placed in position to be fed between the rollers; and the top surface of this shelf will therefore be substantially in horizontal line with the bight of the two rollers.

In carrying out the invention with a piece of mica of rectangular shape, such as is shown at 21 in figure 5, the sheet is placed on the platform 20 with its leading edge parallel with the bight of the rollers, and the sheet is then moved horizontally toward the rollers until the front edge is taken between them. The rollers are revolved by turning the hand crank 14 and when the forward edge of the sheet of mica has been engaged by the rollers it will be propelled by them in the manner illustrated in Figure 3; and as the mica passes between the rollers the meshing teeth form corrugations in it which corrugations are parallel to each other, and in the instance cited these corrugations will extend crosswise of the sheet 21. The rollers will be revolved until the whole sheet has been passed between them and discharged at the opposite side of the rollers, at which time the whole sheet of mica will have been provided with the corrugations 22.

If it is desired to have the corrugations extend diagonally of the sheet or strip of mica, the strip is placed upon the platform 20 with its longest side registering with or gauged along the dotted line 23 which may be a gauge line cut in the surface of the platform. As the strip is then advanced toward the rollers one corner of it will be first engaged by the rollers and as the rollers are operated the strip of mica will pass diagonally between them and the corrugations 24 will be formed diagonally of the strip, as shown in figure 6. It will be understood that in both Figures 5 and 6 the sheet is illustrated in its partially completed condition as in actual practice the corrugations will be continued throughout the entire surface of the sheet or strip. In like manner circular washers and various other forms of mica pieces may be fed through the rollers to receive corrugations similar to the plain sheets shown herein and I will refer to the articles as blanks intending thereby to cover all forms of mica which may be treated in accordance with this process.

When the mica has been treated to produce the corrugations as above described there will be a slight cracking of the mica along the tops of the corrugations in many instances but this will not materially affect the insulating properties of the mica and on the other hand these will eliminate accidental splits or breaks of a more injurious character which often occur when mica which has not been treated by this method is bent into various shapes.

The teeth 17 operate more effectively on the mica when the tops 18 are narrow or sharp than if they are blunt or dull.

I believe that I am the first to conceive and to prove the fact that mica can be corrugated and thus rendered permanently more pliable than in its original state and this without destroying the utility as an insulating material.

Having described my invention, what I claim is:

1. As a new article of manufacture a blank of mica rendered pliable by having corrugations formed therein.

2. As a new article of manufacture, a blank of mica rendered pliable by having closely arranged, parallel corrugations formed therein.

3. As a new article of manufacture, a blank of mica rendered pliable by having closely arranged, fine corrugations formed therein.

Signed at the city, county, and State of New York, the 29th day of July, 1927.

FRANÇOIS R. MARCEL.