M. MEIROWSKY.

MANUFACTURE OF INSULATING TUBES.

APPLICATION FILED MAY 4, 1906.

966,460.

Patented Aug. 9, 1910.

2 SHEETS—SHEET 1.

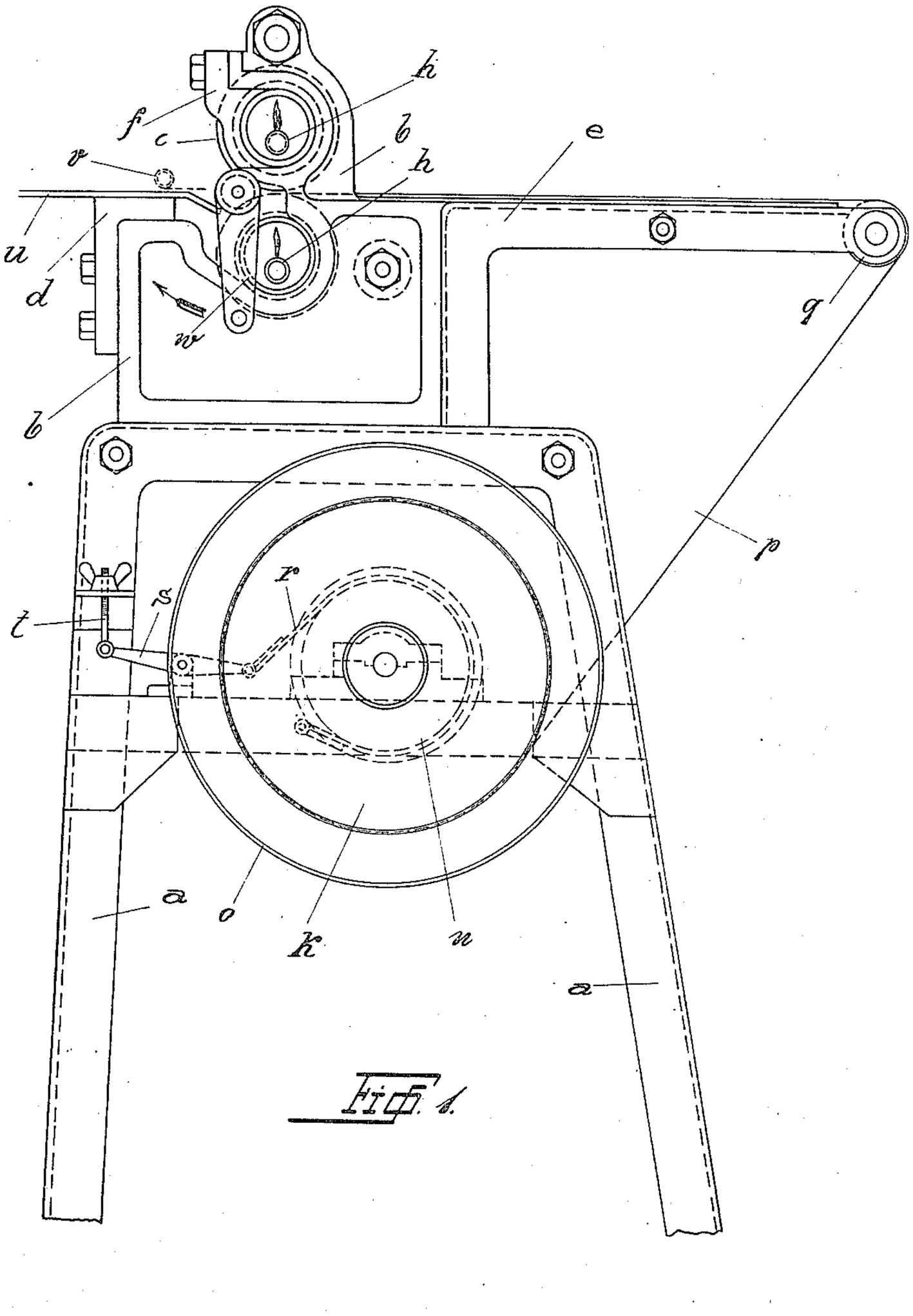

Fig. 1.

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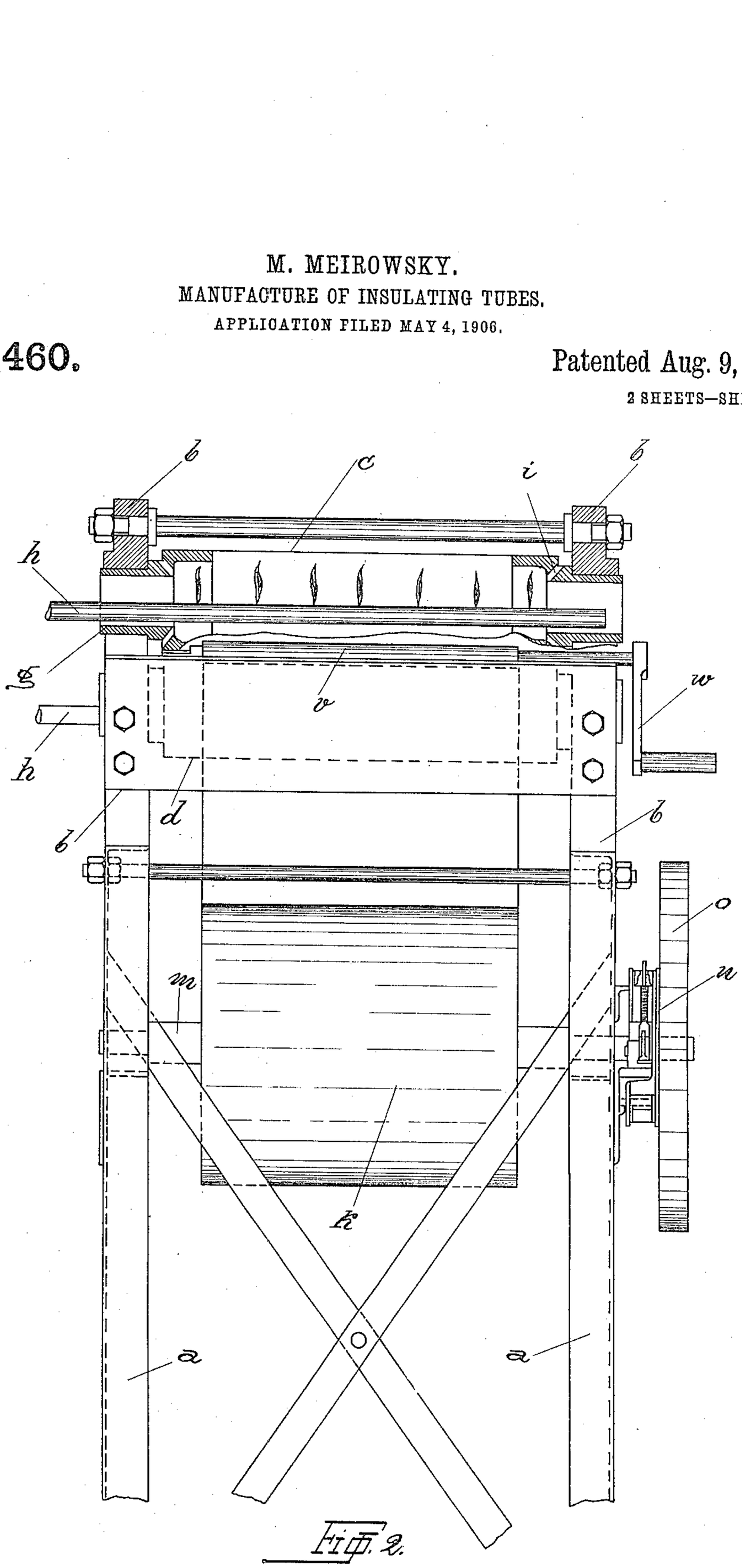

Fig. 2.

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UNITED STATES PATENT OFFICE.

MAX MEIROWSKY, OF COLOGNE-EHRENFELD, GERMANY.

MANUFACTURE OF INSULATING-TUBES.

966,460. Specification of Letters Patent. Patented Aug. 9, 1910.

Application filed May 4, 1906. Serial No. 315,258.

To all whom it may concern:

Be it known I, MAX MEIROWSKY, manufacturer, a citizen of the German Empire, and resident of 31–33 Philipp street, Cologne-Ehrenfeld, Germany, have invented certain new and useful Improvements in Manufacture of Insulating-Tubes, of which the following is a specification.

In manufacturing insulating tubes by means of a winding core, the latter is usually placed upon a fixed foundation with angular grooves, in order to heat the foundation and to dry the agglutinant with which the material to be worked is covered before it is wound upon the core-bar. As a rule the core-bar is pressed by means of a roller against the heated foundation, in order to maintain, on the one side, the pressure required for effecting a close union of the different materials, and, on the other, to increase, as far as possible, the heating effect of the foundation. The pressing together of the material by means of the roller has, however, several drawbacks, as, for instance, if the material is not perfectly smooth, or the pressure is not evenly distributed, the material is squeezed and damaged during the winding, whereby air-interspaces are formed in these places, which cause a displacement of the current and the creeping of sparks. Moreover, in consequence of the increasing thickness of the material of the core-bar with a fixed foundation and roller, the pressure becomes uneven and requires to be constantly regulated.

The object of the present invention is to remove the drawbacks of these apparatuses.

The essential feature of the same consists therein that the fibrous material, hereinafter briefly called the fibrine, used together with the insulating material, is highly stretched on being put upon the core-bar, so that the fibrine forms during the winding-process the outer core-die, and the materials are wound upon the core-bar perfectly uniformly and tightly, while a fixed foundation and a roller are dispensed with.

In order to effect a perfect drying of the agglutinant during the winding-on of the layers of material, the fibrine, before it is wound upon the core-bar, is caused to pass through between two hot rotating rollers, against the peripheries of which the highly stretched fibrine uniformly presses the freely and independently moving core-bar. In this way the materials are, under pressure, heated from the outside in two different places, and the heating-rollers are forced to follow the rotary movement in the same direction, so that fixed foundations and their drawbacks are done away with.

In order to assist the heating-action of the core-bar, if the same is of a great diameter, a heating-support may be provided which resiliently presses against the material, and the inside of the core-bar itself may be heated.

The stretching of the fibrine on being wound upon the core-bar is preferably effected by a brake acting on the fibrine-roller, which allows of regulating the tension.

The accompanying drawing shows a sample form of construction of the device.

Figure 1 is a side-view, Fig. 2 partly a front-view, partly a longitudinal section.

Similar letters refer to similar parts throughout the several views.

By a stand formed by a strutted frame *a* are carried the two supports *b*, in which the rollers *c* are journaled. The supports *b* are united on one side by an angle-iron *d*, while on the other side they touch against the table *e*, which is likewise carried by the frame *a*, and can be heated.

In order to allow of taking the rollers *c* easily out of their bearings *b* for the purpose of exchanging them, the lower roller is inserted loosely, while the upper roller is held in position by the journal-covers *f*, which can be taken off. The journal-pins *g* of the rollers *c* are hollow, so that the gas-pipes *h* can pass through them to the interior of the rollers for the purpose of heating them. The diameter of the bore in the journal-pins *g* is sufficiently large that air can enter into the rollers. For the same purpose there are also provided air-holes *i* on the circumference of the hollow pins *g*.

In the frame *a* there is journaled, under the heating-rollers, the roller *k* carrying the fibrine, whose axle *m* carries on one side a brake-disk *n* and a hand-wheel *o*. The brake-band *r*, placed around the disk *n*, can be tensioned or relaxed through a double lever *s* with the aid of the adjusting-screw *t*, in order to regulate the tension of the fibrine. The fibrine wound off from the roller *k* is conducted over the heatable table *e* by means of a roller *q*, and introduced between the two heating-rollers *c*. Before passing through the heating-rollers it is covered with an agglutinant and eventually with the necessary

insulating material. At the side opposite the one where it enters is provided a table-plate *u* resting on the angle *d* and the edge of which facing the heating-rollers slants toward the bottom. The freely and independently moving core-bar *v* carries on one of its ends a cranked handle *w*, and when not in use it is preferably in the position indicated by a dotted line in Fig. 1.

The mode of manufacturing insulating-tubes is as follows: By turning the hand-wheel *o* so much fibrine is wound off that it can be drawn through between the two rollers and placed once around the core-bar *v*, which is in the position indicated by a dotted line, in order that the fibrine, during the further turning of the core-bar, will be tightly drawn around the same. Thereupon the core-bar *v*, is, by a rapid retrograde turning of the hand-wheel *o*, brought into the position shown in Fig. 1 in full lines, in which the layers of fibrine wound around it are firmly pressed against the rollers *c* so that the fibrine is well heated from the start. If now the core-bar *v* is turned by means of the crank *w* in the direction of the arrow, as shown in Fig. 1, under a corresponding tension of the brake-band *r*, the highly stretched fibrine is uniformly wound upon the core-bar, and eventually together with an insulating-material, till the desired thickness of the tube is attained, while the two rollers *c* turn in the same direction as the core-bar.

The pressure required for uniting the layers of material wound upon the core-bar is therefore exclusively produced by the tension of the fibrine itself, so that the same, on being wound upon the core-bar, forms the outer core-die. At the same time the fibrine, by the strong pressure of its layers against the rollers *c*, is so much heated from the outside that all moisture is driven out of the agglutinant, the dissolvent of which can already evaporate on the heatable table *e*. The rotating heating-rollers make it impossible for the fibrine to get damaged, and they effect moreover an intense heating of the same from the outside during its being united with the other material, when it is heated by the lower roller *c* as well as after the winding-on immediately before receiving a new layer of stuff, when it is heated by the upper roller *c*. This is of great importance, as the upper roller drives out any moisture which may have entered into the first layer after its being wound upon the core-bar, and makes the pores of the fibrine free and able to receive the insulating agglutinant, and in this way considerably increases the electrical and mechanical resistance of the insulating-tube. In consequence of the fact that each single paper-winding tightly presses down the previous one, there is effected such a close union that air interspaces are avoided, and the tubes themselves become as hard as metal, which cannot be attained with devices working with core-dies.

As the core-bar in the device shown in Figs. 1 and 2 is pressed into the groove between the two heating rollers, it can neither spring nor bend, in spite of the great tension of the fibrine.

As shown in the above description and the accompanying drawing, the heating-rollers *b* with the core-bar *v*, as well as the fibrine-roller *k* with the brake-device *n*, *r*, *s*, and the hand-wheel *o*, are so arranged in the frame *a* that a workman can actuate all the parts from one and the same place.

What I claim as my invention and desire to secure by United States Letters Patent is—

An apparatus for manufacturing insulating tubes from fibrous material comprising a rotary web support for the fibrous material, a rotary core-bar adapted to receive the material from said support, a pair of heating rolls between which the material passes prior to reaching the core-bar, a regulatable braking device acting on said support to tension the material upon the rotation of said core-bar; and a support on which the core-bar is movably mounted relatively to the heating rolls to be forced against the surfaces of the heating rolls by the tensioned material.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MAX MEIROWSKY.

Witnesses:

BESSIE F. DUNLAP,

LOUIS VANDORN.