

E. D. C. BAYNE & L. A. SUBERS.

PROCESS OF COATING THREAD.

APPLICATION FILED JAN. 21, 1907. RENEWED DEC. 22, 1908.

929,651.

Patented Aug. 3, 1909.

Fig. 1

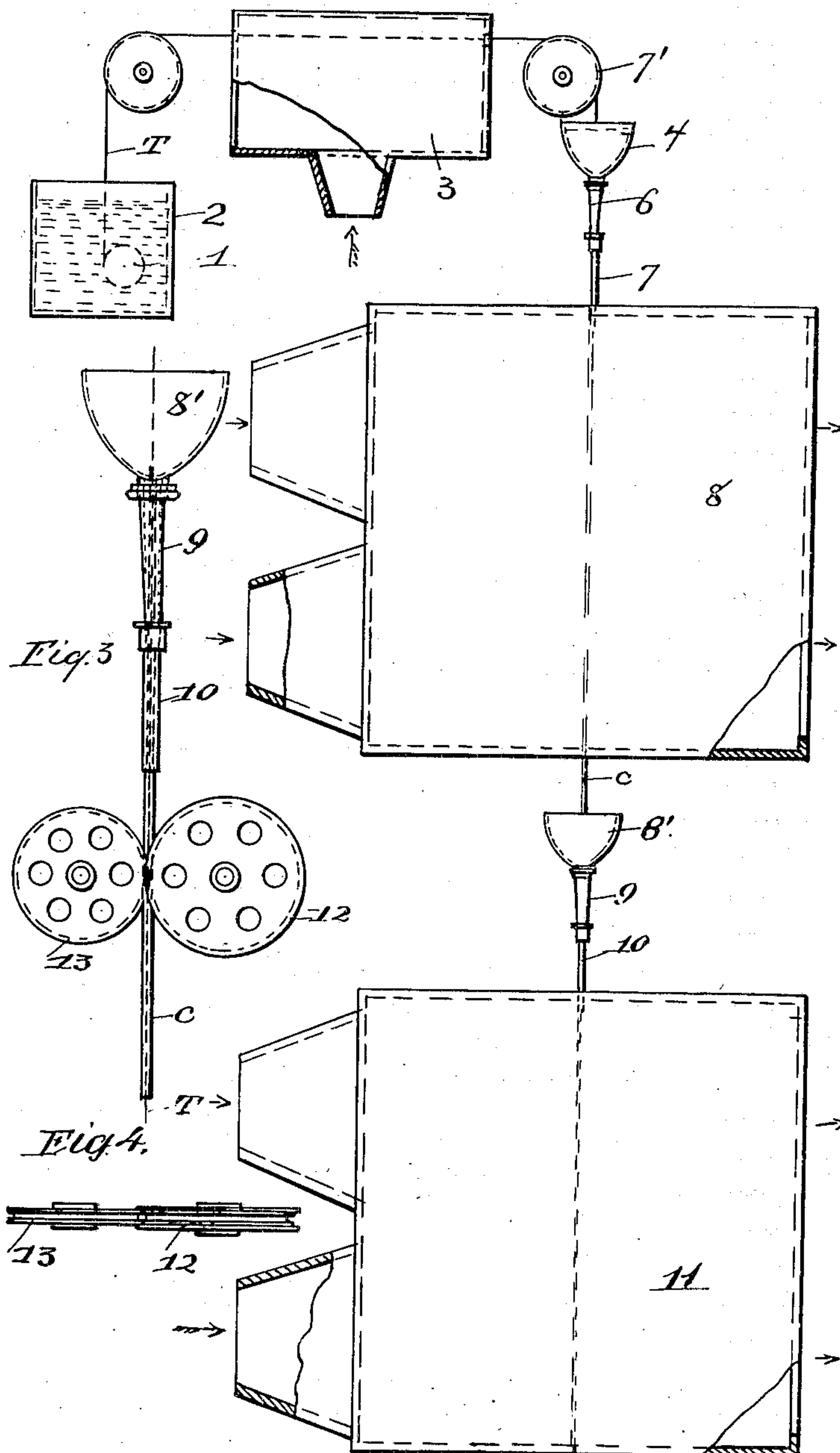


Fig. 2

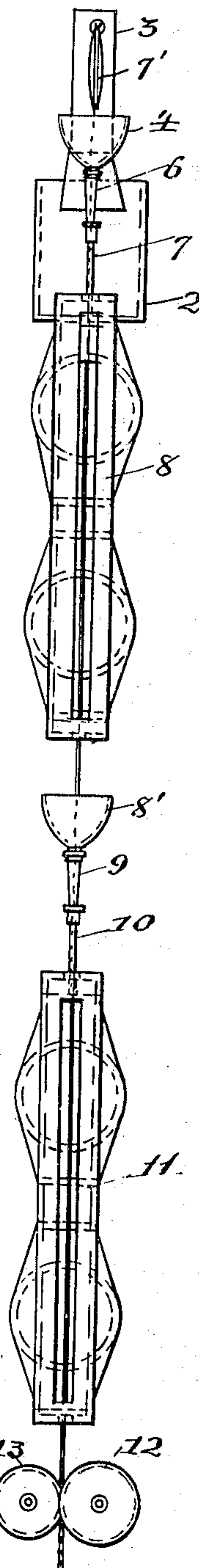


Fig. 3

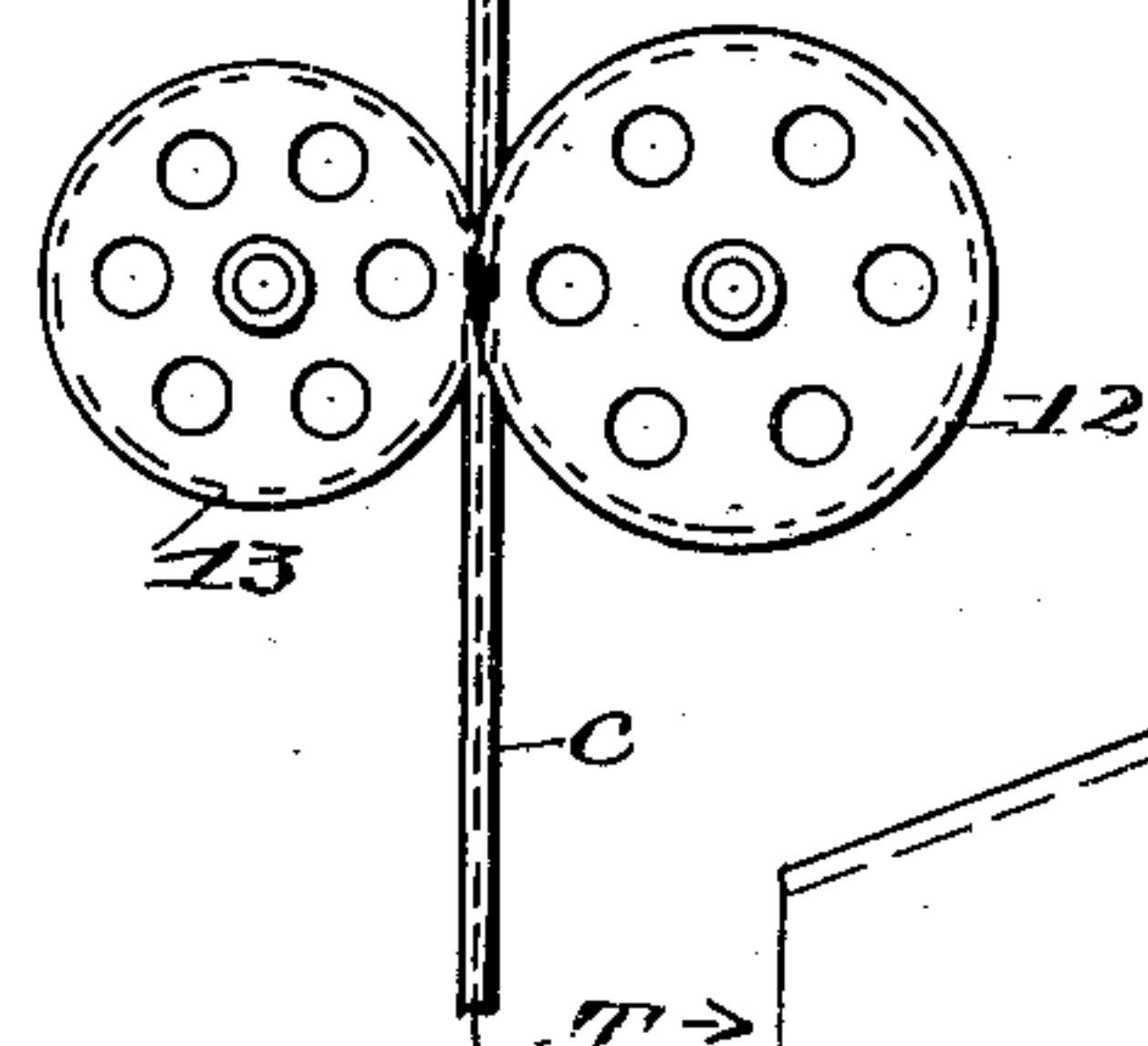
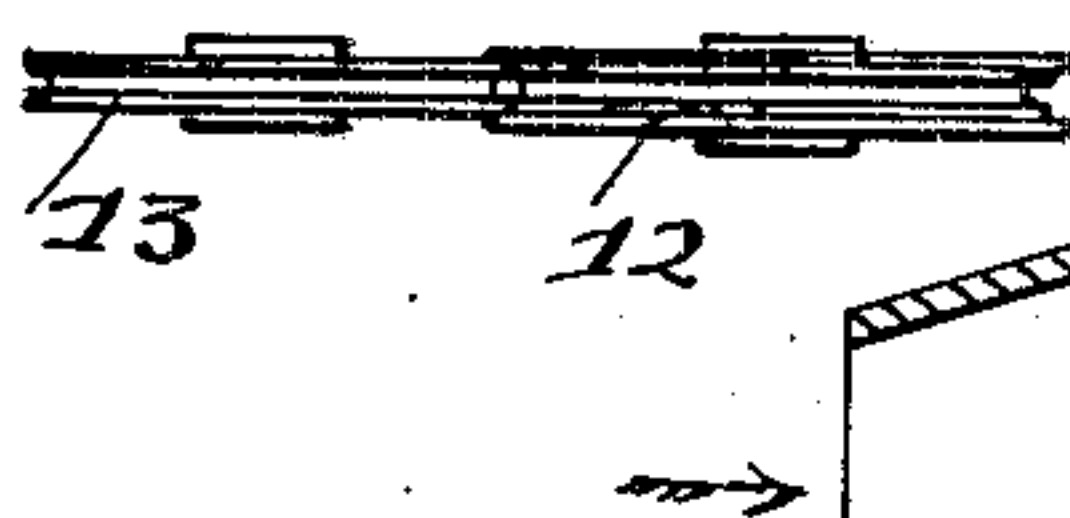


Fig. 4



Witnesses
A. C. Osborn.
J. B. Sawyer

Inventors
Eugene D. C. Bayne
and Lawrence A. Subers
By Wm. H. Monroe
Attorney

UNITED STATES PATENT OFFICE.

EUGENE D. C. BAYNE AND LAWRENCE A. SUBERS, OF CLEVELAND, OHIO.

PROCESS OF COATING THREAD.

No. 929,651.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Original application filed November 19, 1906, Serial No. 344,094. Divided and this application filed January 21, 1907, Serial No. 353,351. Renewed December 22, 1908. Serial No. 468,859.

To all whom it may concern:

Be it known that we, EUGENE D. C. BAYNE and LAWRENCE A. SUBERS, citizens of the United States, and residents of Cleveland, county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Processes of Coating Thread, of which we hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of the invention are to provide a new and complete method of coating linen or other plastic and other fiber thread with rubber or tenacious material having a sticky surface which can be vulcanized afterward and from which fabric can be constructed simply by pressing the surfaces of the insulating threads together into intimate contact whereby when the completed fabric is vulcanized the structure becomes substantially an integral one.

The art or method has reference first to a degreasing process to render the fibers clean so that the insulating or coating material compound will adhere thereto, second to the particular treatment of the thread to open up the fibers so as to be receptive of the coating material which is applied in a semi-fluid or viscous condition so that it will be readily absorbed among the fibers by capillary attraction.

The next feature of the process consists in drawing the thread through a series of baths of the coating material and in applying a gradually increasing thickness of the material upon the thread after it has absorbed as much thereof as possible among its fibers, by means of successive coating of the material, and also thoroughly drying each coating before the next is applied. The final process consists in compacting and shaping the completed coating to a perfectly smooth and cylindrical form ready for immediate application to the fabric in which the thread is to be employed.

We illustrate the process by means of the appliances shown in the accompanying drawings, in which—

Figure 1 is a side elevation showing a tank containing cleansing medium in which the thread is immersed, a hood through which the thread passes and is immersed in a hot air blast which serves to loosen and separate the fibers, and evaporate all residue of the

cleansing media. In this figure are also shown coating baths and devices for applying the coating material to the thread and for drying and shaping the same; Fig. 2 is an end view of the same; Fig. 3 is a detail view of one of the baths and coating tubes and forming rollers and Fig. 4 is a plan view of the forming rollers.

We carry out this process by first introducing the thread T wound upon a spool 1, into a suitable degreasing bath of naphtha or other volatile grease dissolving medium, as shown at 2 where it is thoroughly cleansed of all impurities, thence the thread passes through a hood 3 through which a blast of hot compressed air passes which has the effect of heating and evaporating the naphtha or other degreasing medium and thereby swelling the component fibers and thereby separating them, so that the coating fluid will permeate the body of the thread. The thread is then passed through the primary bath 4 of semi-viscid material, which is taken up by capillary attraction into the opened body of the thread and thus a foundation for the exterior insulation C is obtained to which it will cling and form a unitary mass therewith. This is of great importance since ordinarily a coating of rubber or similar insulating material will not enter the substance of a linen or other hard twisted thread but will merely remain upon the surface from which it can be removed by stripping, but when made unitary with the mass within the body of the thread it cannot be separated but becomes a part thereof.

The coating process is performed by means of the graduated tube 6 followed by the cylindrical tube 7, slightly larger in diameter than the thread, by means of which a thin coating of the material is applied. The tube 6 is vertically placed, and the thread is maintained in the exact center thereof by gravity as it hangs from the guiding roller 7', so that an equally distributed coating is applied thereon. The next step in the process is to thoroughly dry this coating and for this purpose it passes through the hood 8 through which a forced natural air blast passes, thus fixing the first coating. Another coating is applied upon the first insulation by means of a similar bath 8' and graduated and straight tubes 9 and 10, the tube 10 being of slightly larger diameter than the tube 6. A forced natural air blast through the hood 11

follows until the last coating is entirely dry, and the coated thread is completed and the plastic coating compressed into a perfect cylindrical form by means of grooved rollers 12 and 13 the edges of which interlock to form a perfect die.

The thread and its successive coatings remain in the vertical position until the coating is dry, and hence the thread remains centrally located therein which would not be the case if the thread lay horizontally, since the plastic material would sag upon the thread from its own weight.

The method or process just described results in a perfectly smooth coating of rubber or other vulcanizable material upon a thread, located in the exact center thereof. The surface is also adhesive and in condition for applying in the manner specified in our application, Ser. No. 344,094, for an automatic tire winding machine.

The process is continued until a sufficient thickness of coating is obtained to provide the degree of flexibility required in the fabric of which the coated threads are component parts. The coating thus deposited upon the thread is thick enough to completely "insulate" in the sense of "isolate" them from other threads or substances. That is, each thread is altogether out of contact with others, but flexibly connected therewith in every fabric manufactured therefrom.

This application is a division of our application Ser. No. 344,094, filed Nov. 19 1906, for tire winding machine.

Having described the invention what we claim as new and desire to secure by Letters Patent is:

1. The herein described method of treating and coating a thread with a plastic and vulcanizable material having a sticky surface, consisting of first cleaning it in a volatile degreasing medium from grease and impurities, separating the component fibers to make it receptive of the coating material, filling the opened fibers with the coating compound and distributing over the exterior surface of the thread an evenly disposed coating thereof, drying the coating in a vertical position, applying a fresh coating thereto, and drying the same in a vertical position until the coatings are of the desired thickness and finally compressing and forming the applied coatings into a perfect cylindrical form between polished surfaces, substantially as described.

2. The method of forming a coated thread permeated with the coating compound consisting of opening the fibers composing the thread by heat and the evaporation of a volatile medium therein, filling the interstices between the fibers with the coating compound, giving a succession of thin coatings evenly distributed to the thread thus permeated with the coating compound, in a vertical position, and submitting each coating in turn to a forced natural air blast to dry the same, and finally shaping the same to a perfect cylindrical form.

In testimony whereof we hereunto set our hands this 19th day of January, 1907, at Cleveland, Ohio.

EUGENE D. C. BAYNE.
LAWRENCE A. SUBERS.

Witnesses:

A. T. OSBORN,
Z. R. SAWYER.