J. A. HEANY.

ELECTRIC INSULATION.

APPLICATION FILED AUG. 16, 1915. RENEWED NOV. 9, 1916.

**1,211,443.** Patented Jan. 9, 1917.

Fig. 1.

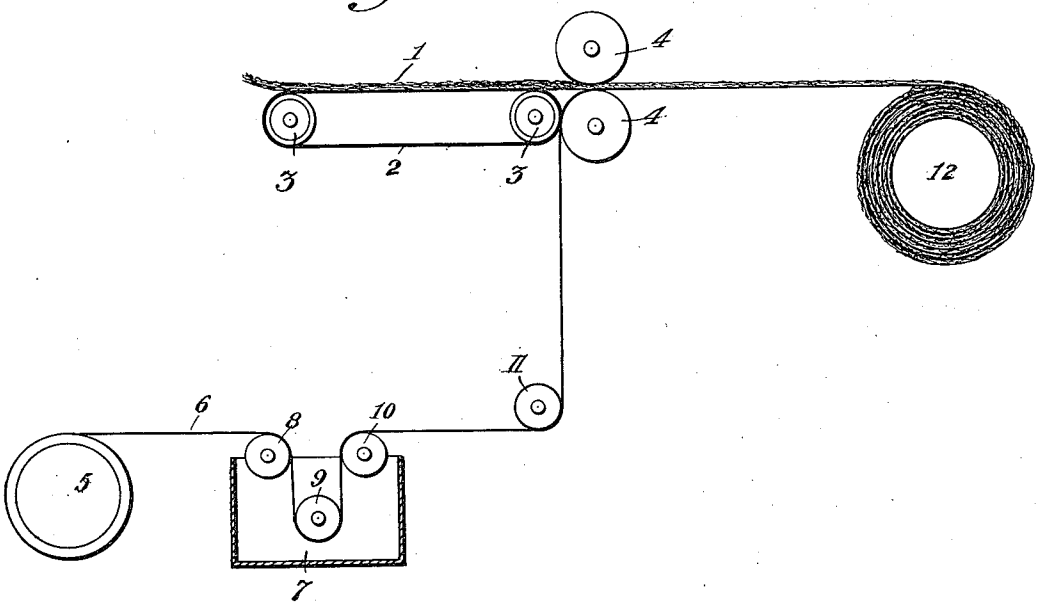



Fig. 2.

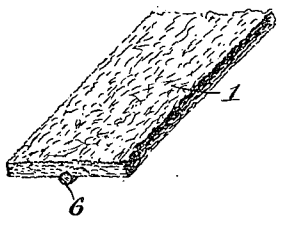
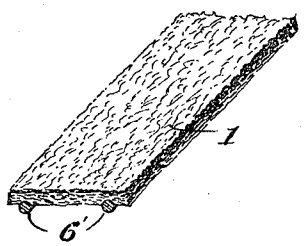



Fig. 3.




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# UNITED STATES PATENT OFFICE.

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## ELECTRIC INSULATION.

1,211,443. Specification of Letters Patent. Patented Jan. 9, 1917.

Application filed August 16, 1915, Serial No. 45,667. Renewed November 9, 1916. Serial No. 130,472.

*To all whom it may concern:*

Be it known that I, JOHN ALLEN HEANY, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Electric Insulation; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to a new and useful insulating medium comprising a roving, sliver, or tape-line body of fibers having secured to one face thereof a supporting or reinforcing thread or filament, which latter serves to impart to the sliver or flattened body of fibers sufficient strength to render the composite insulating medium self-sustaining and capable of being applied to the surface of electric conductors to produce a substantially uniform, homogeneous sheath of insulation of high resistance factor, and which may also be rendered fluid-proof.

The invention is particularly well adapted to the employment of short fibers of asbestos or the like, assembled in the form of a sliver or roving. As is well known, slivers, cords and similar bodies formed of asbestos fibers are extremely fragile, and are so easily disrupted that it is a practical impossibility to employ the same as insulating media for electric conductors, without associating with the fibrous bodies certain reinforcing means. While it has been suggested heretofore to use a flattened tape of asbestos, to be wound upon a conductor to form an insulating covering therefor, for reasons before given, such tape has proven wholly ineffective. To remedy this inherent defect, in my co-pending applications, Serial Nos. 863,123 and 863,124, filed September 23, 1914, I have disclosed insulating media involving fibrous bodies of asbestos or the like, having a foundation cord or filament embedded in and surrounded by the fibers. While these prior forms of insulating media have proven thoroughly effective and have fully realized the advantages ascribed to them, in actual practice, yet, nevertheless, it has been found desirable to provide a somewhat simpler and cheaper insulating medium, possessing the same excellent qualities as the media disclosed in the applications aforesaid and this demand for an equally good insulating medium which could be produced by simpler methods and at less expense, has resulted in the present invention, in which one or more reinforcing threads, cords, or filaments are attached, by means of an adhesive or otherwise, to one side or face of a sliver, roving or tape-like body of fibers, such as would be produced and delivered by the ordinary carding machine.

In the accompanying drawings, Figure 1 is a diagrammatic view of mechanism for producing the new form of insulating medium. Fig. 2 is a perspective view of a short section of insulation. Fig. 3 is a modification showing multiple reinforcing threads applied to the tape-like sliver.

Referring to Fig. 1 of the drawings, the numeral 1 indicates a sliver or roving of fibers, preferably short-fibered asbestos, as delivered by an ordinary carding machine, on a delivery belt or apron 2, which runs on suitable guide rollers 3. As is well known, these slivers or rovings are usually taken off the carding machine by the doffer rolls in the form of continuous ribbon or tape-like bodies, which in the case of most animal and vegetable fibers, are sufficiently interlocked to constitute a self-sustaining body having considerable tensile strength. In the case of asbestos fibers, however, the well known lubricating character of the fibers precludes any effective locking together of the fibers so that the resultant sliver is extremely fragile and tenuous and ruptures under very slight tensile strains. In fact, slivers or rovings of asbestos even when of considerable thickness must be handled with exceeding care to prevent rupture.

In order to support the sliver of asbestos fibers delivered from the carding machine, it is proposed to secure to one face of the sliver, a thread or threads which in themselves have sufficient tensile strength to resist rupture in the ordinary operations attendant upon the application of the fibrous slivers to covering electric conductors and the like. In order to apply the reinforcing thread or filament 6 to one longitudinal face of the sliver, the said thread or filament is taken from a spool or cop 5, passed through a tank 7 containing a suitable adhesive, being guided in its passage through the tank over rollers 8, 9 and 10 and thence under the guide roller 11, whence it passes together

with the sliver through condensing or flattening rollers 4, 4, which flattens or condenses the sliver and forces the reinforcing thread or filament 6 firmly into engagement with the under face of the sliver. From the condensing rolls 4, 4, the composite reinforcing sliver is wound upon a suitable spool or reel 12, from which it may be taken and wound directly upon the conductor to be covered.

If it is found desirable, after leaving the rolls 4, 4 and before being taken up on the spools 12, the reinforced tape-like sliver may be passed through a bath of waterproofing or other impregnating medium, as will be understood.

When the insulating medium has been completed, it is in the form of a tape or ribbon-like body of matted fibers having a reinforcing thread or threads 6 or 6′ permanently secured to one face thereof, as illustrated in Figs. 2 and 3. To apply the insulating medium to its intended use, it is preferably wound about the electric conductor with the face to which the thread is attached adjacent to the conductor, and when the latter has been covered to the desired extent with the tape-like medium, the sheath thus formed may be worked down to a smooth, homogeneous, uniform envelop for the conductor, and if desired, given any additional treatment which may be found necessary.

What I claim is:—

1. An insulating medium for electric conductors comprising a sliver or roving of fibers and a reinforcing thread or filament cemented to one face thereof.

2. An insulating medium for electric conductors comprising a flattened tape-like sliver of fibers and a reinforcing thread or filament cemented to one face thereof.

3. An insulating medium for electric conductors comprising a flattened tape-like sliver of asbestos fibers and a reinforcing thread or filament cemented to one face thereof.

4. An insulating medium for electric conductors comprising a flattened tape-like sliver of asbestos fibers and multiple reinforcing threads or filaments cemented to one face thereof.

In testimony whereof I affix my signature.

JOHN ALLEN HEANY.