June 23, 1936. S. J. ROSCH 2,045,103

INSULATED CONDUCTOR

Filed May 26, 1934

Fig. 1.

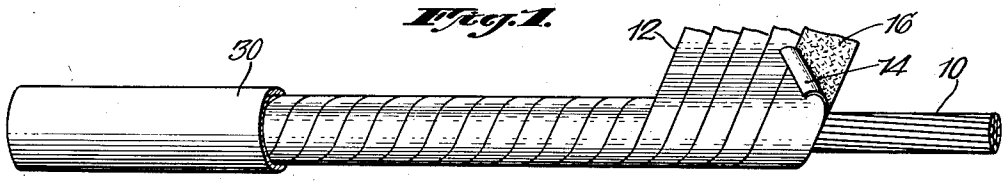


Fig. 2.

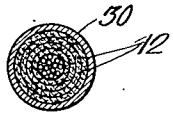


Fig. 3.

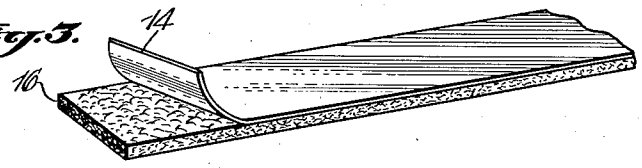


Fig. 5.

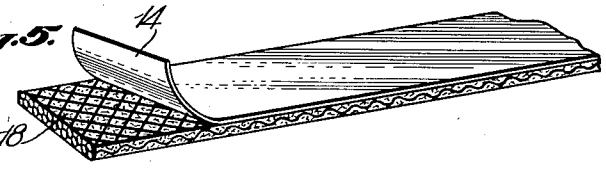


Fig. 4.

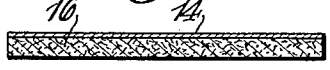


Fig. 6.

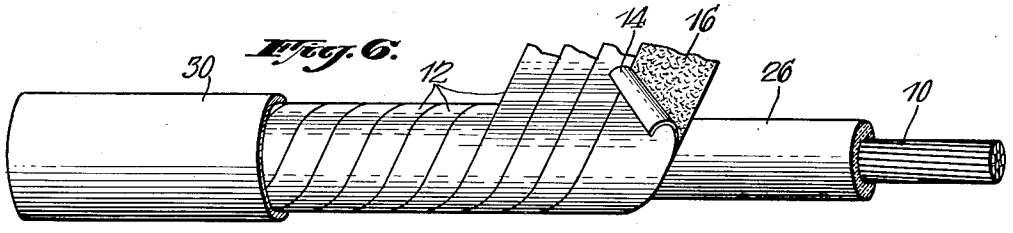


Fig. 7.

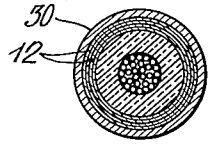


Fig. 8.

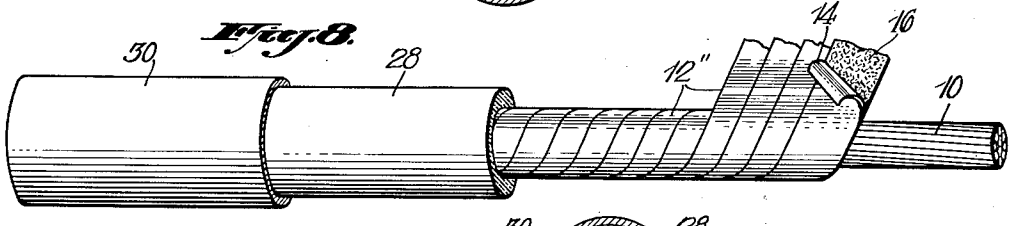


Fig. 9.

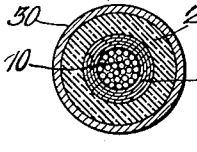
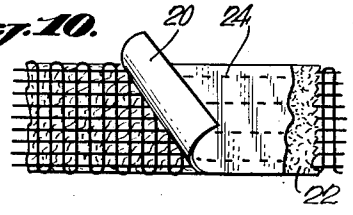


Fig. 10.



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BY

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2,045,103

UNITED STATES PATENT OFFICE

2,045,103

INSULATED CONDUCTOR

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Application May 26, 1934, Serial No. 727,642

5 Claims. (Cl. 173—264)

This invention relates to electric conductors and more particularly to a conductor having insulation in the form of asbestos carried by a relatively tough backing strip or tape.

The use of asbestos is not broadly new. But, so far as I am aware it has not been possible heretofore to apply asbestos in the form of thin-tape-like wrappings because it has very little tensile strength and is, therefore, incapable of withstanding the tension which is necessarily imposed when wrapping it about a conductor.

A feature of my invention relates to an improved insulating tape adapted to be wrapped about a conductor or over other insulation carried by the conductor, this tape being formed of a relatively tough backing strip faced with asbestos fibres. The backing strip can be of cellulose composition such as Cellophane. Or, it may be of a tough paper such as glassine or the like.

In some cases, the asbestos will be calendered and adhesively united with the tough backing strip. It is also contemplated to provide a strip of coarsely interwoven strands having asbestos fibres interspersed throughout the net-like structure, this interspersed body of asbestos being secured to a tough backing strip or tape of Cellophane, paper, or in some cases to a strip or tape of cambric or other textile material.

Various embodiments of the invention are illustrated in the accompanying drawing, in which—Fig. 1 is a side elevation of a conductor having insulation incorporated therein embodying the invention; Fig. 2 is a cross section of the conductor of Fig. 1; Fig. 3 is a perspective view of a length of insulating tape embodying the invention, one end thereof being peeled away from another portion; Fig. 4 is an enlarged cross section of the tape shown in Fig. 3; Fig. 5 is is a view similar to Fig. 3 showing a modification wherein the asbestos fibre is interspersed through a coarsely woven textile fabric; Fig. 6 is a modification of the improved tape applied over a body of insulation; Fig. 7 is a cross section of Fig. 6; Fig. 8 is a modification illustrating the improved tape applied directly to the conductor and having insulation enveloping the tape; Fig. 9 is a cross section of Fig. 8; Fig. 10 is a detail view illustrating a modification, wherein a body of asbestos fibre is interposed between the backing strip and a textile net-like strip, the three being held together by one or more lines of stitching.

In Fig. 1, 10 represents a suitable conductor which may be regarded as either a solid member or a multiple strand member. This is wrapped with a plurality of layers of tapes 12. Each tape includes a relatively tough backing strip 14 of Cellophane, glassine, paper, cambric, or the like to which is secured a relatively flat layer of asbestos fibres such as indicated at 16. Fig. 3 illustrates a short length of the improved tape before incorporation in the cable insulation, the backing strip being peeled free from the asbestos fibres by way of illustration.

In the modification illustrated in Fig. 5, the backing strip 14 may be regarded as substantially the same as that above described. The asbestos facing in this form, however, constitutes a fibrous body interspersed through the coarsely woven net-like textile fabric 18. This lattice-like textile body serves as a base or reinforcement and the fibres may be matted therein by calendering and the thus reinforced body of asbestos adhesively secured to the backing strip 14 of Cellophane or the like. In some cases, the adhesive union between the asbestos body and the tough backing strip may be secured by feeding a tissue-like strip of gutta-percha between the backing strip and the asbestos body and then subjecting the laminated body to heat and pressure. The gutta percha being a thermoplastic adhesive material will then unite the parts.

Instead of adhesively uniting the asbestos to the backing strip, I may provide a laminated strip, such for example as shown in Fig. 10, in which 20 represents a relatively tough backing strip of Cellophane, paper, cloth or the like. Underneath this, there is a body of asbestos fibre indicated at 22 and under the fibre there is a coarsely woven strip of textile material such as cotton netting and the three component parts thus associated are secured by one or more lines of stitching, as indicated at 24.

The various types of backed asbestos tape described can be incorporated in conductor or cable insulation in various manners other than that indicated in Fig. 1. For example, as shown in Fig. 6, the conductor 10 is enclosed in a body of conventional insulation such as rubber, or one more layer of paper, indicated generally at 26, and over this there will be a plurality of layers of my improved asbestos insulation backed with a tough supporting member. In the modification of Fig. 8, the wrappings 12'' of asbestos strip are applied directly over the conductor 10 and are in turn enveloped in a body of insulation indicated at 28, which may be regarded as a body of rubber, layers of paper, cambric or other conventional types of insulation known to those skilled in the art. In each case, the conductor will preferably have an outer protective jacket

or cover, indicated at 30. This may be in the form of a metallic sheath or may consist merely of a woven jacket of interconnected strands of cotton and twisted paper. Or, other conventional braids and the like may be used.

The reinforced asbestos tape herein disclosed may be impregnated with various types of insulating compounds or waxes prior to the application on the conductor. Or such insulating compounds may be applied in between the layers of asbestos tape during the taping operation. Asbestos itself possesses only a moderate dielectric value. But, when backed by a sheet of cellulose or the like, it is endowed with a materially greater dielectric value.

In the event that during operation of the conductor any surface arcing should occur as a result of a short circuit or due to a defect in the insulating structure, even though the cellulose or other reinforcing backing incorporated may be partly or wholly consumed for an appreciable distance it will be appreciated that the asbestos insulation being non-inflammable will remain and serve as a heat resisting and electrical spacing medium between the conductor and any other conducting substance within the insulation body which might have a tendency to arc over if the insulation were destroyed.

While I have described quite specifically certain embodiments of the invention herein illustrated it is not to be construed that I am limited thereto since various modifications and substitutions of equivalents may be made by those skilled in the art without departure from the invention as defined in the appended claims.

What I claim is:—

1. An electric conductor having an envelope of insulation including a wrapping of tape and a body of asbestos interspersed throughout a textile network secured to said tape.

2. An electric conductor having an envelope of insulation including a wrapping of a composite tape comprising a tough backing strip, a net-like fabric facing and an intermediate filling of loosely matted fibres.

3. An electric conductor having an envelope of insulation including a wrapping of a composite tape comprising a tough backing strip, a net-like fabric facing and an intermediate filling of loosely matted fibres, said backing strip and said facing being joined by stitching passing through said filling.

4. A composite insulating tape comprising a layer of asbestos interposed between a tough backing strip and a woven textile fabric stitched to the backing strip.

5. An insulating tape comprising a relatively tough backing strip having secured thereto a relatively coarse textile netting with asbestos fibres interspersed throughout the meshes thereof.

SAMUEL J. ROSCH.