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C. H. GRAY & T. SLOPER.

CORD FOR THE MANUFACTURE OF RUBBER FABRIC.

APPLICATION FILED OCT. 5, 1903.

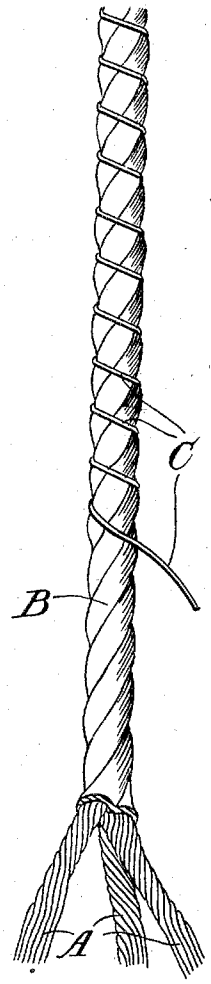


Fig. 1.

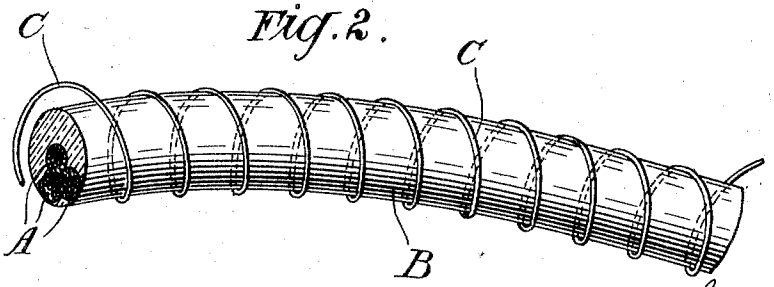


Fig. 2.

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UNITED STATES PATENT OFFICE.

CHRISTIAN HAMILTON GRAY, OF SILVERTOWN, AND THOMAS SLOPER, OF DEVIZES, ENGLAND; SAID SLOPER ASSIGNOR TO SAID GRAY.

CORD FOR THE MANUFACTURE OF RUBBER FABRIC.

SPECIFICATION forming part of Letters Patent No. 783,574, dated February 28, 1905.

Application filed October 5, 1903. Serial No. 175,883.

To all whom it may concern:

Be it known that we, CHRISTIAN HAMILTON GRAY, residing at Silvertown, county of Essex, and THOMAS SLOPER, residing at Devizes, county of Wilts, England, subjects of the King of England, have invented certain new and useful Improvements in Cords for the Manufacture of Rubber Fabric, of which the following is a specification.

This invention is for a new article of manufacture relating to threads or cords coated or permeated with rubber to be finally incorporated in a rubber fabric. Hitherto threads or cords of this description have been made in various ways, and it has been found in using them after they have been treated with rubber that the adhesive nature of the rubber until in a thoroughly dry condition rendered it difficult to manipulate the cords. To get over this and also to obtain other advantages, we proceed as follows: We take the cord treated with rubber, whether made up of a single core or of many threads of fibers twisted or laid together, already coated with rubber, and wind upon it a thread of any suitable material—say, for example, common cotton—which has not been treated with rubber, or if it has been so treated has been provided only with a very thin layer or has been dried or treated in such a manner that it is not in such a sticky condition as the cord treated with rubber which is to be dealt with. This cotton or other thread, which we will call, for the sake of distinguishing it from the main thread or cord, the "binding-thread," is of much smaller diameter than the cord upon which it is to be wound. It, however, prevents the latter from adhering to itself or to other sticky surfaces in such a manner that, as would otherwise be the case, when again separated it would tear the rubber from one of the parts.

In the accompanying drawings, Figure 1 is a perspective view of a cord provided with a binding-thread according to this invention, and Fig. 2 is a similar view showing a modified form of the same.

Like letters indicate like parts throughout the drawings.

The cord A shown in the drawings is made of several strands twisted together, each strand composed of a number of hemp or other suitable fibers, as clearly shown, the whole impregnated and covered with unvulcanized rubber, (indicated at B.) After twisting the cord and impregnating it with rubber by any convenient means an open winding of thread C is applied—that is to say, the coils of the thread are so wound upon the cord that they do not touch each other, but leave portions of the cord exposed between them. This binding-thread is preferably wound upon the cord in an opposite direction to the twist of the latter, as clearly shown. We prefer to apply the binding-thread while the cords are under the tension of twisting, as by this means a stronger and smaller cord is obtained and the air more completely expelled, which is important in view of vulcanization, and in some cases the binding-thread provides a means by which air occluded in a fabric is able during vulcanization to escape.

In addition to the binding-thread C, protecting the cord B while the rubber has not thoroughly dried, as described above, the binding-thread has the additional advantage that when the cord is embedded in the rubber substance of some article or fabric it increases the strength of it, since the covering rubber of the cord which adheres to the rest of the rubber is then less liable to be torn from its cord and the fabric spoiled.

Although we show only one thread wrapped round the cord treated with rubber, it will be obvious that two or more may be employed.

In the case of pneumatic tires or fabrics or other articles where great strain is placed upon the cords and the rubber surrounding them, so that the rubber is liable to be stripped from the cords and the tire more or less spoiled, we find it useful to utilize the binding-threads C for the purpose of actually securing the rubber, of which, for example, the tread portion of the tire is made to the cords themselves. This may be done by coating the core-cord thickly with rubber—if necessary, thicker upon one part than the other, as shown in Fig. 2—and lashing that rubber to the cord by means of the binding-thread C passed

round both the thickened covering of the rubber and the contained cord. This extra thickness of rubber would unite solidly in the vulcanizing process with the core or body of the article, the binding-threads thus holding all the parts together. The cords thus treated may be laid side by side in any desired order and in any convenient number of layers, the thickly-coated sides being toward the exterior of the tire-cover and the whole further covered with rubber, canvas, or the like, according to requirements.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, a cord treated with rubber and having an exterior winding of thread of smaller diameter than the core-cord, each coil of the thread being separated from the adjacent coils, substantially as and for the purpose described.

2. As a new article of manufacture, the herein-described cord consisting of a plurality of cords treated with rubber and embedded in rubber each of said cords having an exterior winding of thread of smaller diameter than the core-cord, each coil of thread being separated from adjacent coils of the same thread, substantially as set forth.

3. As a new article of manufacture, a cord consisting of a core treated with unvulcanized rubber, and an exterior winding of thread of smaller diameter than the core, each coil of said thread being separated from adjacent coils, substantially as and for the purpose set forth.

4. As a new article of manufacture, a cord consisting of a plurality of strands twisted together and embedded in rubber, and an exterior winding of thread of smaller diameter than the core, each coil of the thread being separated from its adjacent coils, substantially as and for the purpose set forth.

5. As a new article of manufacture, a cord consisting of a plurality of strands twisted together and embedded in rubber, and an exterior winding of thread, of smaller diameter than the core of the cord, placed in position while the cord is under tension of twisting, each coil of said thread being separated from adjacent coils, substantially as and for the purpose set forth.

6. As a new article of manufacture, a cord consisting of a core embedded in rubber which is thicker on one side of the core than on the other, and an exterior winding of binding-thread, of smaller diameter than the core, each coil of said binding-thread being separated from adjacent coils, substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHRISTIAN HAMILTON GRAY.
THOMAS SLOPER.

Witnesses to the signature of Christian Hamilton Gray:

T. L. OSMAN,
W. J. NORWOOD.

Witnesses to the signature of Thomas Sloper:

WILLIAM H. BALLANTYNE,
A. M. HAYWARD.