

H. Z. COBB.
BRAIDED FABRIC FOR HOSE.
APPLICATION FILED SEPT. 30, 1912.

1,104,777.

Patented July 28, 1914.

Fig. 1.

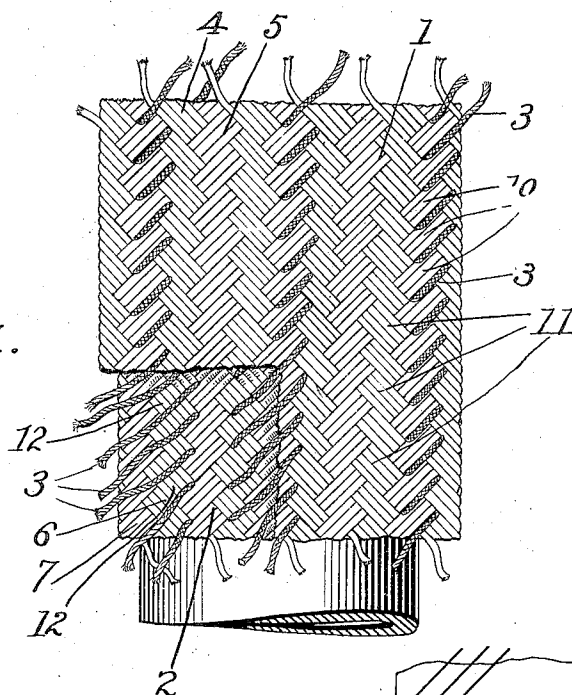


Fig. 2.

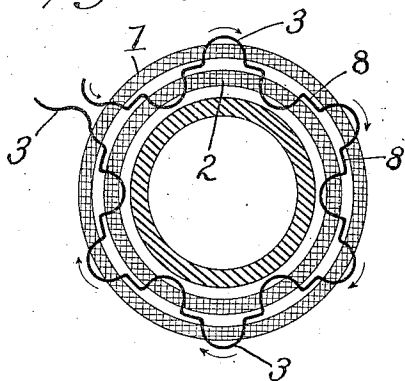
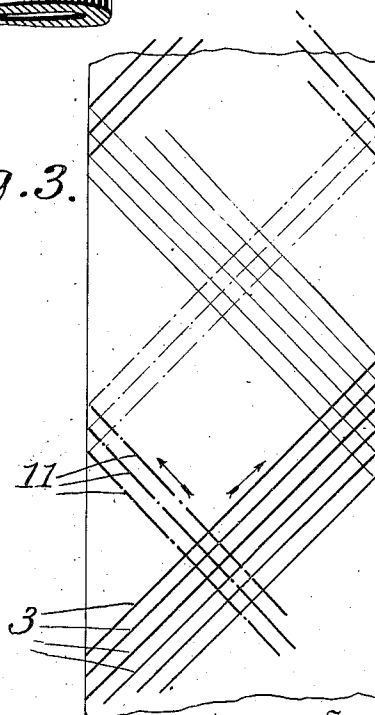


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY Z. COBB, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO REVERE RUBBER COMPANY, A CORPORATION OF RHODE ISLAND.

BRAIDED FABRIC FOR HOSE.

1,104,777.

Specification of Letters Patent.

Patented July 28, 1914.

Application filed September 30, 1912. Serial No. 723,038.

To all whom it may concern:

Be it known that I, HENRY Z. COBB, a citizen of the United States, residing at Winchester, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Braided Fabrics for Hose, of which the following is a full, clear, and exact disclosure.

My invention relates to that class of fabrics that are formed by being braided on a machine known as a braiding machine, in which the bobbins are caused to travel in circular paths and pass sinuously in and out between each other so as to braid the strands or yarn carried by the bobbins, in the form of a cylindrical tube having one or more plies or layers.

The object of my invention is to produce a fabric, cylindrical in form and one that may be utilized particularly in the manufacture of hose, although the same may be used in connection with other articles requiring a braided covering. This tubular or cylindrical fabric may be impregnated or combined with rubber compounds and similar substances or rendered more durable by vulcanization or analogous processes.

The present invention does not relate to the combining of rubber or other similar substances with this fabric disclosed, since such compounds may be applied to the fabric in any preferred or well-known way. This invention however, relates to a tubular braided fabric comprising two distinct layers or plies which are united or locked together by a series of strands which interlace with the strands of the two distinct layers. The two layers of the braided fabric and the interlocking strands are formed simultaneously upon the braiding machine, the bobbins of the interlocking strands being caused to intercept the paths of the bobbins which carry the strands to form the inner and outer layers, at requisite points, as the forming of the inner and outer layers or plies progresses.

A special object of this invention is to produce such a relative arrangement of the strands of the two layers and of the interlocking strands as shall balance the tendency of the fabric, or hose to twist when a preponderance of strands are woven therein in one direction. This result is accomplished as will hereafter more particularly be

pointed out and claimed in the accompanying claims.

For a detailed description of one form of my invention reference may be had to the following specification and to the accompanying drawing forming a part thereof, in which:

Figure 1 is a side view of a portion of a cylindrical tube such as hose, showing the inner and outer layers of the braided fabric cut away and indicating the position of the interlocking strands and the relative arrangement of the strands of the two layers. Fig 2 is a diagrammatic view showing a cross-section of the tubular layers and indicating the course of the strands uniting the same; and Fig. 3 is a diagrammatic view indicating a longitudinal portion of a braided fabric and the course that the uniting strands take in a longitudinal direction.

Referring to the drawing, the numeral 1 indicates the outer layer or ply of the braided fabric and the numeral 2 indicates the inner layer.

The numeral 3 indicates the strands which unite the two layers. It will be seen that both the inner and outer layers consist of two sets of strands indicated by 4 and 5 in the outer layer and by 6 and 7 in the inner layer. The respective sets are interlaced with each other and pass helically about the article in opposite directions. In this form of my invention, the interlocking or uniting strands 3 follow the same direction as the strands 5 and 7 of the outer and inner plies of the fabric, there being one interlocking strand to each set of parallel strands going in one direction in each ply. As will be seen in Fig. 2, the interlocking strand 3 passes through the outer ply 1 and then through the inner ply 2, the length of the strand between the two plies being approximately the length of the strands of the outer and inner layers that lie between the cross strands in each layer, as indicated at 8 in Fig. 2. This construction therefore results in two similarly braided plies or layers with a series of uniting strands running helically about the article in one direction. This arrangement allows a certain amount of movement between the outer and inner layers if they are not otherwise united or vulcanized. However, the movement depends upon the length of the interlocking strands between

the point where they emerge from one layer and pass into the other layer.

Referring to Fig. 1, it will be noted that the additional interlocking strand 3 when taken with the three parallel strands 10 of the outer and inner layers, makes four strands or picks, forming the strands of the outer and inner layers passing in one direction. In other words, in the tubular fabric illustrated there are 24 additional strands added to form the interlocking part of the fabric. Since these are under a certain tension and pass helically about the article, there would be a certain tendency to twist the fabric owing to the unbalanced tension caused by a greater number of strands passing in one direction than in the other. The object of this part of my invention is to counterbalance this tendency to twist the fabric, by adding to the outer and inner layers additional strands which produce a tension opposite to that produced by the interlocking strands. In Fig. 1 it will be seen that every other set of strands, indicated by the numeral 11, passing helically about the article in the direction opposite to that of the interlocking strands, consists of four strands instead of three, in the outer layer. The inner layer is similarly arranged in that the sets of strands indicated by 12 also are provided with the said compensating strand. Now, since there are 24 sets of strands in each layer, providing one additional compensating strand for each alternate set of strands in both the inner and outer layers will amount to 24 additional strands being added to compensate for the 24 interlocking strands. In other words, 12 compensating strands are added to the outer layer and 12 compensating strands are added to the inner layer, which makes 24 compensating strands to counterbalance the 24 interlocking strands.

In the manufacture of this tubular fabric, it will be seen that, in accordance with the above description, there would be 48 bobbins on the machine for forming the outer layer and 48 bobbins for forming the inner layer, with 24 bobbins for introducing the inter-

locking strands; while at the same time 12 of the bobbins forming the outer layer and 50 passing in one direction have four strands instead of three, and twelve of the bobbins of the inner layer passing in the same direction also have four strands instead of three. This construction results in the formation 55 of a two ply hose in which the tension strains are completely counterbalanced and the tendency of the fabric to twist is entirely obviated.

Having thus described this form of my invention, what I claim and desire to protect by Letters Patent, is:

1. The improved braided fabric comprising distinct parallel braided tubular webs, one of which has extra strands extending in one direction and a series of interlocking strands which unite said parallel webs and which pass alternately through said webs in a direction transverse to said extra strands.

2. The improved fabric which comprises two distinct parallel braided tubular webs, each of which has extra strands extending in one direction and a series of interlocking strands which unite the said parallel webs and pass through each of the said webs in a parallel direction, and transversely with respect to the corresponding extra strands of the respective webs.

3. The improved braided fabric comprising two distinct parallel braided tubular webs, each of which has extra strands extending in one direction only, and a series of interlocking strands which unite said parallel webs and which pass through each of said webs in one direction only, transversely with respect to the direction of the interlocking strands of the respective webs, the sum of the extra strands of each web being equal to the number of interlocking strands.

Signed this 19th day of Sept., 1912.

HENRY Z. COBB.

Witnesses:

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