

W. T. COLE.
HOSE FABRIC.
APPLICATION FILED AUG. 21, 1913.

1,139,467.

Patented May 11, 1915.

Fig. 1

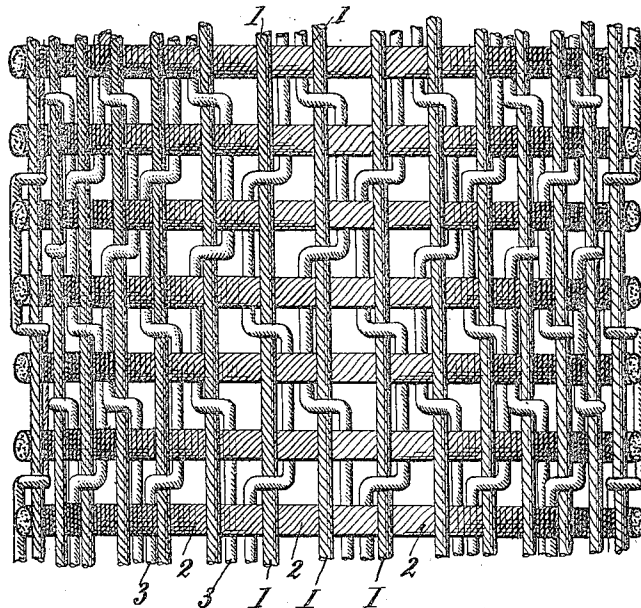


Fig. 4

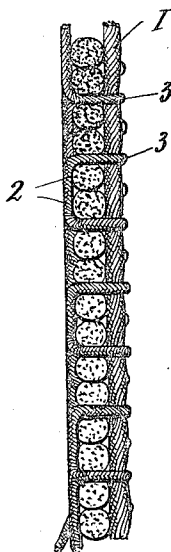


Fig. 2

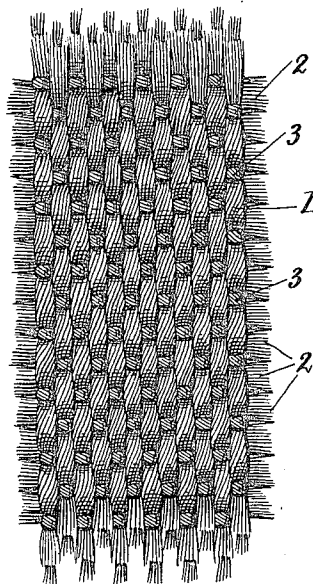
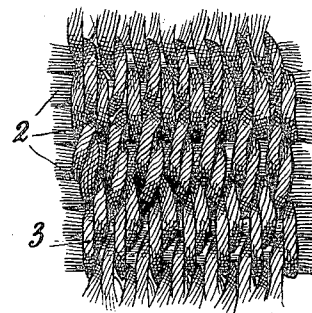
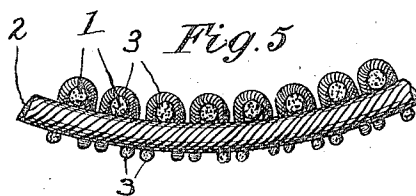


Fig. 3



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UNITED STATES PATENT OFFICE.

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HOSE FABRIC.

1,139,467.

Specification of Letters Patent.

Patented May 11, 1915.

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To all whom it may concern:

Be it known that I, WILLIAM T. COLE, a citizen of the United States, residing at Newtown, county of Fairfield, State of Connecticut, have invented certain new and useful Improvements in Hose Fabrics, of which the following is a full, clear, and exact disclosure.

This invention relates to a new and improved fabric, particularly one adapted for use as a fabric for woven fire hose made on a circular loom as distinguished from braided hose made on a braiding machine having only continuously moving intermeshing shuttles.

The object of my invention is to produce a fabric which has a minimum of longitudinal stretch when under tension, either caused by internal pressure or other forces, and also one which shall have a minimum tendency to twist when used as a hose carrying heavy pressure of water or other liquid.

The fabric of my invention is particularly adapted to cotton fire hose which is usually lined on the inner surface with a layer or coating of rubber or rubber composition.

Other advantages and objects of my invention will be apparent hereafter.

For a detailed description of one embodiment 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 diagrammatic interior view of a section of a tubular fabric cut on a longitudinal plane illustrating the arrangement of the yarn as it would be arranged in a hose, the strands of the yarn however, being separated to show the relative arrangement more fully; Fig. 2 is a view of a piece of the completed fabric as it appears on the inner side of the hose; Fig. 3 is a view of a portion of the outer surface of the fabric of the hose; Fig. 4 is a longitudinal sectional view of the fabric as shown in Fig. 2; Fig. 5 is a transverse sectional view of the fabric as shown in Fig. 3.

It will be appreciated that woven fabric for hose, as it has been made for many years, has consisted of longitudinal warp threads and transverse weft threads, usually termed the "filler". In the fire hose heretofore used more commonly, the warp threads passed alternately over and under

the filler threads, adjacent warp threads passing over and under different but consecutive filler strands. Owing to the fact that the warp threads in such hose take a waving or sinuous course in and out between the strands of the filler, the elongation or stretching under tension produced by internal pressure occurs to an undesirable extent. Furthermore, the elongation and greater tension on the yarn of the warp strands or threads produce a force opposite to that of the twist of the yarn and that causes the hose to twist as well as to elongate under pressure. As distinguished from this construction, my invention comprises main warp strands and filler strands which are substantially straight or smooth instead of being bent in and out between the corresponding transverse strands. In accordance with this I provide main warp threads or strands 1 which extend longitudinally of the hose or fabric, and transverse filler strands 2 which extend around the tubular fabric helically relative to the length of the hose. These two sets of strands are bound or tied together by means of a third set of strands or threads 3 which are in the nature of warp threads, but whose principal function is that of tying the aforesaid main warp threads and filler together.

As will be fully appreciated from an examination of Fig. 1, the binder threads or yarn pass between two adjacent strands of the filler and over the warp threads 1, then between the same two strands of the filler, then beneath the next two strands of the filler, and then again over the warp in the opposite direction. Or, supposing the fabric be viewed from the outside, as shown in Fig. 3, the binder passes between two of the filler strands, over the next adjacent filler strands, then down between the next pair of filler strands, underneath the warp strands, again up between the same warp strands, over the next two adjacent filler strands and then down between the succeeding pair of filler strands. In other words, between each single loop over a warp thread the binder passes on the opposite side of two of the filler strands. It will also be seen from an examination of Fig. 1 that adjacent binder threads alternate with each other as regards the pair of filler strands between which they pass. This gives the smooth surface on the inside of the hose, as indicated in Fig. 2.

It must be appreciated that in order to produce the effect shown in Figs. 2 and 3, the tension of the warp and filler threads is made considerably greater than has heretofore been practicable, the binder threads being of less tension so as to bind without distorting the other threads or strands. The arrangement also allows the successive strands of the filler and warp to be very tightly forced together, and this is also facilitated by making the binder threads smaller than the warp threads. Of course, the filler strands may be made of any desirable size to give the requisite strength for any particular internal pressure.

By reference to Fig. 2 it will be seen that on the interior of the hose an unusually smooth water-way is provided owing to the "basket weave" arrangement of the threads. It will be appreciated that there is a binder thread for each warp thread and that there are two shuttles carrying the respective filler strands. However, the loom for weaving this fabric is the subject of another application.

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

1. A tubular fabric comprising substantially straight longitudinal warp strands, filler or weft strands wound helically about said warp strands exteriorly thereof, and secondary warp or binder strands looped over the first named warp and filler strands alternately, said strands being closely pressed together to form a closed mesh.
2. A tubular fabric comprising tightly woven strands, forming a closed mesh, said strands consisting of substantially straight warp strands, substantially smooth transverse filler or weft strands and secondary warp strands binding the first named warp and filler strands together, and looping successively over a warp strand and two filler strands.
3. A tubular fabric comprising tightly woven strands forming a closed mesh, said strands consisting of substantially straight inner warp strands, substantially helical transverse outer filler or weft strands, and secondary warp strands binding the first named warp and filler strands together, and

looping successively over a warp strand and two filler strands.

4. A tubular fabric, comprising tightly woven strands forming a closed mesh, said strands consisting of substantially straight warp strands, substantially helical transverse filler or weft strands, and secondary warp strands binding the first named warp and filler strands together, and looping successively over a warp strand and two filler strands, the loops of adjacent binder strands passing between alternate filler strands.

5. A tubular fabric comprising tightly woven strands forming a closed mesh, said strands consisting of substantially straight inner warp strands, substantially helical transverse outer filler strands, and secondary warp strands binding the first named warp and filler strands together, and looping successively over the warp strands and the filler strands, the loops of adjacent binder strands passing between alternate filler strands.

6. A tubular fabric comprising tightly woven strands forming a closed mesh, said strands consisting of substantially straight warp strands, substantially helical transverse filler or weft strands, and secondary warp strands binding the first named warp and filler strands together, said warp and filler strands being under comparatively heavy tension and said binder strands being under less tension so that they loop over said warp and filler strands without substantially distorting the same.

7. A tubular fabric comprising substantially straight longitudinal warp strands, filler or weft strands wound helically about said warp strands exteriorly thereof, and secondary warp or binder strands looped over one of the first named warp strands and then over two of said filler strands alternately, adjacent binder strands being looped over their corresponding warp strands between alternate filler strands, said strands being closely pressed together to form a closed mesh.

Signed this 18th day of August, 1913.

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Witnesses:

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