

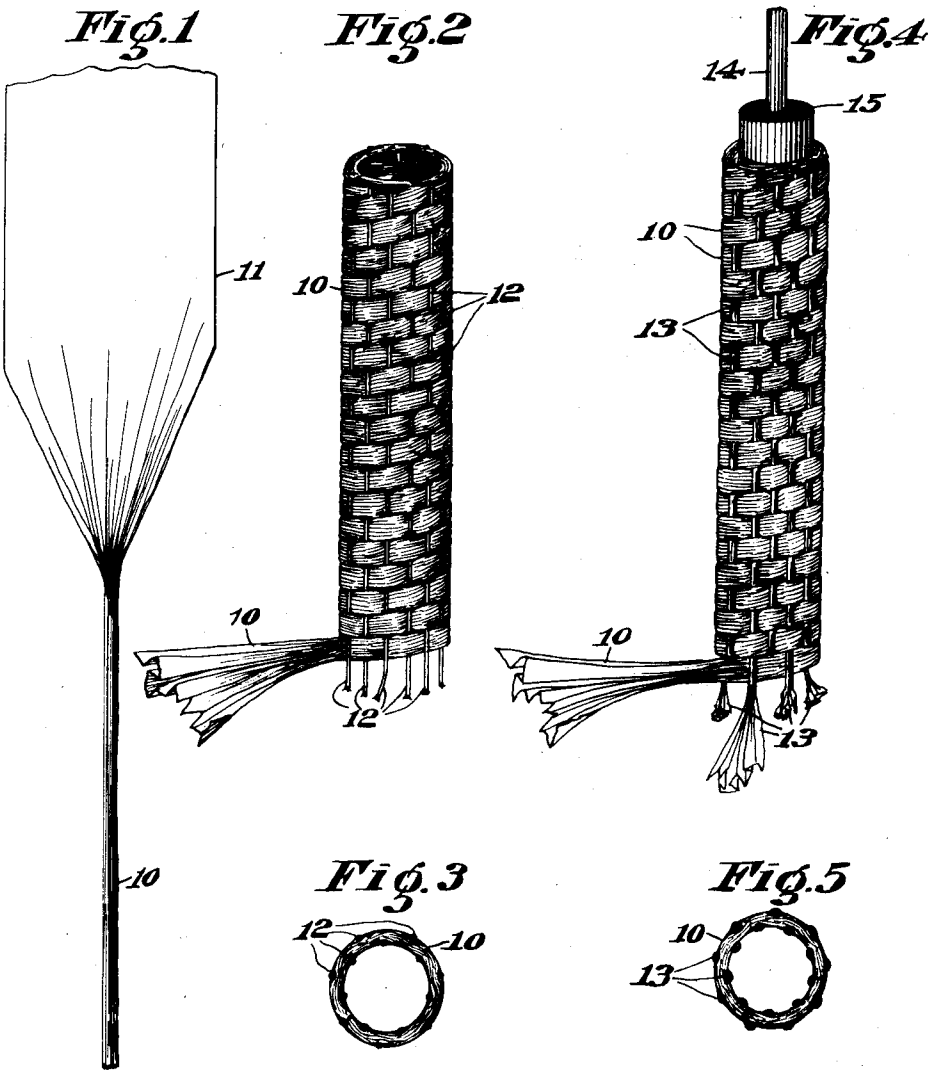
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WOVEN TUBULAR FABRIC

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WOVEN TUBULAR FABRIC

Application filed November 16, 1928. Serial No. 319,884.

This invention relates to woven tubular fabrics having either one or both sets of the interwoven strands formed of soft crumpled strips of paper.

Woven tubular fabrics are extensively employed as protecting jackets for electric conductors and for other purposes, and the walls of such tubes are usually made relatively thick to afford the desired mechanical and electrical protection.

A large amount of material is therefore employed in the construction of these tubes, and the present invention relates to improved constructions whereby woven tubes that are capable of affording a high degree of mechanical and electrical protection can be produced at an extremely low cost.

This is accomplished in accordance with the present invention by constructing either the warp or weft threads of the woven fabric, or if desired both the warp and weft threads of soft, untwisted, readily compressible strands of crumpled paper. Such strands, due to their soft, readily compressible properties will yield under the pressure of the strands interlocked therewith and allow the interlocking strands to sink into the surface of the soft paper strands to thereby improve the locking or binding engagement between the warp and weft threads. The paper strands will also spread laterally under pressure to improve the covering effect of the woven fabric. This tendency of the crumpled paper strands to spread laterally under pressure serves to close the interstices between the adjacent strands and helps to form a substantially impervious covering.

The various features of the present invention will be best understood from the following description when read in connection with the accompanying drawings, wherein:—

Fig. 1 is a side elevation of a flat strip of paper the lower portion of which is crumpled to form a rounded strand;

Fig. 2 is a perspective view of a woven tube constructed in accordance with the present invention, the weft thread being formed of the crumpled paper of Fig. 1;

Fig. 3 is a sectional view of the tube of Fig. 2;

Fig. 4 is a perspective view of a modified construction in which both the warp and weft strands of the tube are formed of crumpled paper; and

Fig. 5 is a sectional view of the tube of Fig. 4.

The untwisted crumpled paper strands employed in carrying out the present invention are easily produced by passing a flat ribbon or narrow sheet of paper 11 through a crumpling die such as shown in my copending application, Serial No. 319,884 filed Nov. 16, 1928, since matured into Patent No. 1,760,768, dated May 27, 1930.

In carrying out the present invention the woven tubular fabric may be constructed in part or entirely of paper, and in the construction shown in Fig. 2 the tubular fabric is formed of a relatively large weft strand of crumpled paper similar to the strands 10 of Fig. 1 which is interwoven with smaller warp strands 12 of cotton or the like. The warp strands 12 are shown as disposed in spaced relation to each other, and the tendency of the soft paper strand 10 to spread laterally under pressure is relied upon to close the cracks or apertures between the adjacent coils of the strand 10. As a result of this arrangement only a relatively few warp threads are required in addition to the weft thread to form a tightly closed fabric possessing good covering properties.

It is not necessary, however, in all embodiments of the invention that the paper threads be secured in contacting relation with each other for if desired an open weave may be employed, in which case the lateral spreading effect of the paper strand will help to increase the covering properties of the fabric and will increase the smoothness of the outer and inner faces of the fabric.

In the modified construction shown in Fig. 4 both the weft and warp strands are formed of crumpled paper to produce an all-paper fabric, and while the weft strands 10 of crumpled paper are shown larger than the warp strands 13 of crumpled paper, the size of these strands may obviously be varied as desired. It will also be apparent that various forms of weaves may be employed in

constructing the tubular fabric of the present invention. The advantages of the present invention, however, are more particularly observable when the type of weave employed is such that the paper strands are free to spread laterally to increase the covering effect of the crumpled paper.

The tubular fabric of the present invention is well adapted for use as a protecting covering for electric conductors and for various other purposes, and is shown in Fig. 4 as forming a protecting jacket for an electric conductor 14 which is surrounded by the insulating material 15.

Woven tubular fabric constructed of crumpled paper in accordance with the present invention is inexpensive to manufacture, affords excellent protecting properties, and as a result of the laterally spreading tendency of the paper may be readily woven to form a tight practically impervious fabric.

What is claimed is:—

1. A conduit of woven tubular fabric comprising warp strands having weft strands interwoven therewith and formed of substantially untwisted strips of paper that are crumpled into thick strands that are sufficiently soft and compressible to spread laterally in the fabric to a pronounced degree between and partly around the binding warp strands to close the interstices in the woven fabric.

2. A conduit of woven tubular fabric comprising interwoven warp and weft strands and having one set of the interwoven strands formed of substantially untwisted strips of paper that are crumpled into strands that are sufficiently soft and compressible to spread laterally in the fabric under pressure and to cause these strands to spread to a pronounced degree, between, and partly around the other set of strands to close the interstices in the woven fabric.

3. A conduit of woven tubular fabric comprising interwoven warp and weft strands and having one set of the interwoven strands formed of substantially untwisted strips of paper that are crumpled into relatively large strands that are sufficiently soft and compressible to spread laterally in the fabric to a pronounced degree to increase the covering effect of the fabric and to spread between the binding strands sufficiently to close the interstices in the woven fabric.

In testimony whereof, I have signed my name to this specification.

DANIEL H. MURPHY.