Jan. 26, 1926.

1,570,886

W. H. FULTON ET AL

FLEXIBLE TUBE

Filed Sept. 5, 1919

Fig. 1.

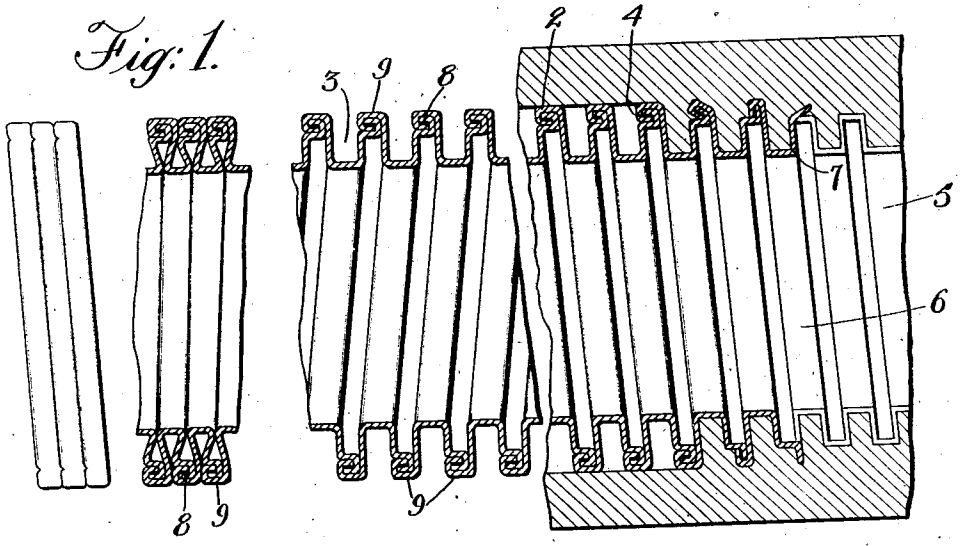
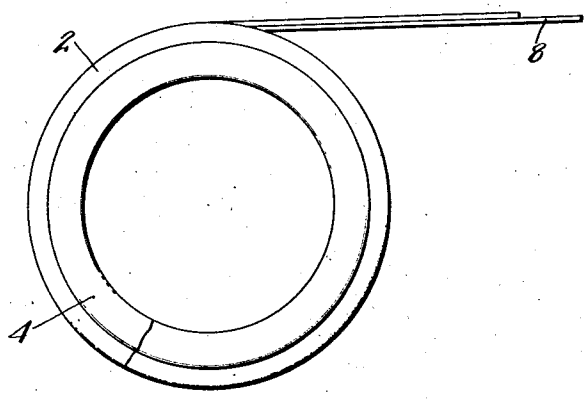


Fig. 2.



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By their Attorney
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Patented Jan. 26, 1926. 1,570,886

UNITED STATES PATENT OFFICE.

WILLIAM H. FULTON, OF IRVINGTON, AND HERMAN SHELLMER, OF NEWARK, NEW JERSEY, ASSIGNORS, BY MESNE ASSIGNMENTS, TO TITEFLEX METAL HOSE CO., A CORPORATION OF NEW JERSEY.

FLEXIBLE TUBE.

Application filed September 5, 1919. Serial No. 321,747.

To all whom it may concern:

Be it known that we, WILLIAM H. FULTON, a citizen of the United States of America, residing at Irvington, county of Essex, and State of New Jersey, and HERMAN SHELLMER, a subject of the King of England, residing at Newark, county of Essex, and State of New Jersey, have invented new and useful Improvements in Flexible Tubes, of which the following is a specification.

This invention relates to tube formed from a strip which is helically coiled and the edges of adjacent convolutions interfolded, and wherein flexibility is provided by means of corrugations.

Such a tube is shown in the Patent No. 1,198,392, Louis H. Brinkman, patented September 12th, 1916. In the tube therein shown the interfolded parts of the joint do not comprise any packing. It is advantageous however, under some conditions and for some uses, to place a packing between radially displaced parts of the interfolded joint or seam, while the longitudinally displaced parts are positively held against relative movement longitudinally of the tube.

It is therefore the main object of the invention to provide a tube of the character indicated having a packing between radially displaced parts of the seam but having longitudinally displaced parts positively held against relative movement longitudinally of the tube.

Other and ancillary objects of the invention will appear hereinafter.

In the accompanying drawings which illustrate the invention,

Fig. 1 is a view, partly in section and partly in side elevation showing a tube embodying the invention and a portion of a machine by which it may be formed; and

Fig. 2 is a section on the line 2—2 of Fig. 1 indicating the manner in which the packing string or strip and the metal strip from which the tube is formed, are fed into the forming die.

Referring to the drawings, the tube may be formed from a strip by precisely the same method and apparatus as shown and described in the Patent No. 1,198,392 above referred to, (except that some of the clearances may require to be increased to accommodate the packing) a strip or cord of packing material such as asbestos or other suitable substance being fed into the joint at an appropriate stage in the manufacture. As the metal strip, of which the tube is formed, is fed into the forming die 1, it is of a cross section including the curled over portion 2, the central longitudinal groove 3 and the right hand portion 4 (Fig. 1). As the strip progresses around the mandrel 5 having the screw thread 6, the portion 4 will, after one revolution, be bent into the right angled section as shown at 7. A portion of this right angled section is embraced by the curled-over edge 2 of the succeeding convolution which is being fed into the die and as this curled-over portion is fed in, there is fed in with it a cord or strip 8 of suitable packing material such as a cord of asbestos. This strip will enter in between the radial portion of the right angled section as shown at 7 and the left hand side of the curled-over portion as shown. As the mandrel revolves and draws the strip into the forming die, the packing strip, being gripped between the portions of the metal strip as described, will be drawn in with it so that there will be a continuous packing of the joint as it is made. From the point where the packing string enters the forming die as described, the engaging portions of adjacent convolutions of the metal strip will be carried forward, as the mandrel revolves, through the various bending channels of the die, until as the tube leaves the die it will have a joint as shown in cross section at 9. It will be observed that the packing is between portions of the interfolded joint which are displaced radially of the tube while the interfolded parts, forming the joints between the convolutions, positively engage with each other so that they are held against relative movement longitudinally of the tube. It will be seen that the extreme edge of each convolution extends to and abuts against the bottom of the fold of the adjacent convolution, there being no clearance so that the interfolded parts are positively held against movement with relation to each other longitudinally of the tube.

The tube as delivered by the die may be compressed longitudinally so that the sides of the walls of the central longitudinal groove in the strip will be reflexed, a section of the tube so operated upon being shown at

10. The exterior of the tube will then be as shown at 11.

The details of the machine and of the formation of the tube need not be gone into further here as they are described in great detail in the patent above referred to. Enough has been disclosed herein to enable those skilled in the art to suitably incorporate the packing in the tube.

While the invention has been illustrated in what is considered its best application, it may have other embodiments without departing from its spirit and is not, therefore, limited to the structure shown in the drawings.

What we claim is:

1. A flexible tube comprising a helical strip having edges of adjacent convolutions interfolded, said strip having a longitudinal fold or groove, and the parts interfolded together having positive engagement with each other holding them permanently from relative movement longitudinally of the tube and a packing interposed between portions of said interfolded parts which portions are displaced from each other radially of the tube.

2. A flexible tube comprising a helical strip having edges of adjacent convolutions interfolded, said strip being bent transversely to provide flexibility and the parts interfolded together having positive engagement with each other holding them permanently from relative movement longitudinally of the tube, and a packing inserted between portions of said interfolded parts which portions are displaced from each other radially of the tube.

3. A flexible tube comprising a helical strip having edges of adjacent convolutions interfolded, said strip having a longitudinal fold or groove and the parts interfolded together having the extremity of the edge of one convolution extending to the bottom of the fold in the other convolution, there being no clearance between the said extremity and the bottom of the fold against which it abuts, forming a positive engagement holding the interfolded parts permanently against relative movement of the parts longitudinally of the tube, and a packing interposed between radially displaced portions of the interfolded parts.

In testimony whereof we have signed this specification the 29th day of August, 1919, and the 2nd day of September, 1919, respectively.

WILLIAM H. FULTON.
HERMAN SHELLMER.