May 28, 1929. W. K. MEDERNACH 1,715,072

INSULATING TAPE

Filed Dec. 2, 1927

Fig. 4.

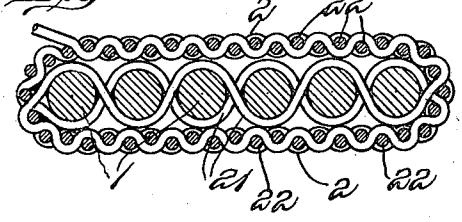


Fig. 2.

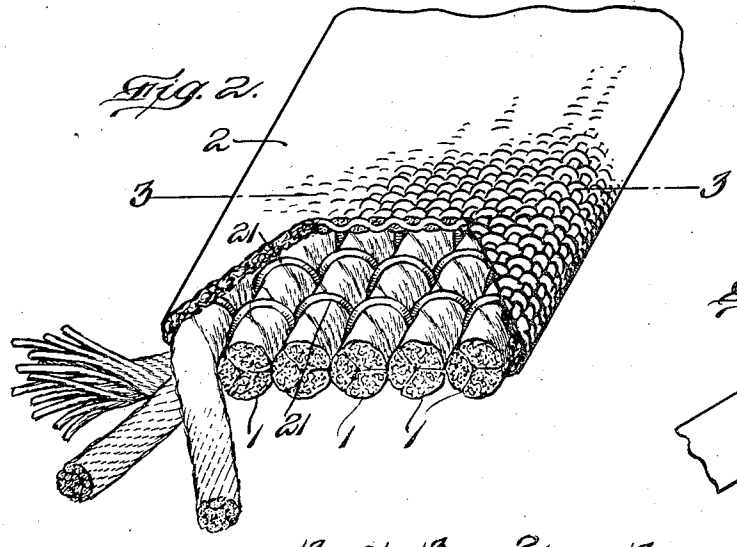
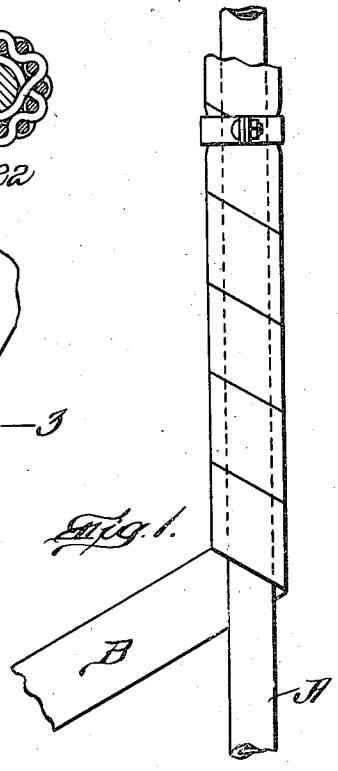


Fig. 1.



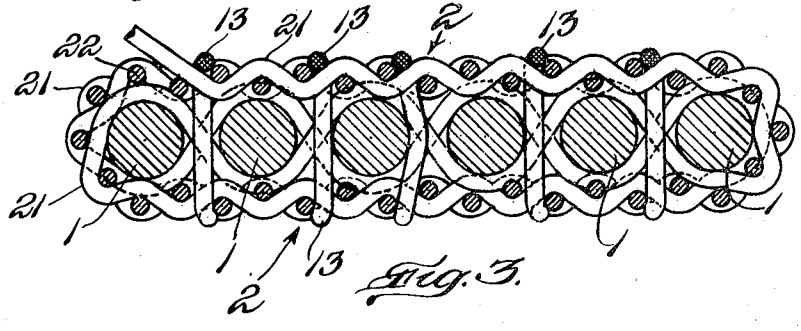


Fig. 3.

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UNITED STATES PATENT OFFICE.

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INSULATING TAPE.

Application filed December 2, 1927. Serial No. 237,354.

The invention has relation to strips or tapes of the class employed for heat insulating purposes by being wrapped spirally about a pipe, for example a steam pipe, to form a covering therefor to prevent the loss of heat. One known type of such insulating strips or tapes is in the form of a tubular covering or sheath of asbestos fabric enclosing a body or filling of asbestos in the form of rovings.

The invention is more particularly an improvement in insulating strips or tapes of the type just mentioned. The proper shape, &c., of such a strip or tape is that of a flat fairly thick band, two or three inches wide, and the strip or tape should be pliable to permit it to be laid in a close spiral about the pipe to which it is applied, as well as soft and conformable to enable it to be shaped and fitted smoothly to the exterior of the pipe with the successive turns of the spiral in snug contact with one another.

The general object of the invention is to produce a strip or tape answering the requirements just noted, and which while possessing the desired thickness, softness, pliability, and conformability, shall retain its flat shape, without liability to lateral displacement of the contained body or filling of heat insulating material. A special object in this connection is to produce an insulating strip or tape which will not, in being handled, become compressed laterally into a more or less cylindrical or rope-like form requiring to be worked back into shape suitable for being wrapped spirally around a pipe or the like.

Illustrative embodiments of the various features which are comprised in the invention is shown in the drawings, in which latter,—

Fig. 1 is a view showing the application of an insulating strip or tape to a pipe.

Fig. 2 is a perspective view of a portion of an insulatitng tape containing the said features.

Fig. 3 is a view in cross-section on line 3, 3, of Fig. 2.

Fig. 4 is a cross-sectional view showing a modification.

In Fig. 1, the pipe to which the insulating covering is applied is marked A, and B is a heat insulating tape which is represented as wound spirally about the said pipe.

Described in general terms, the insulating tape shown in the drawings comprises a fairly thick body or filling composed of a series of large, loose, soft rovings 1, 1, &c., extending lengthwise of the tape and disposed side by side and in close contact with one another; protecting and confining layers 2, 2, of fabric disposed above and below the said series and composed of yarns or threads of asbestos; and yarns or threads (referred to again later herein) intervening between the said rovings so as to confine the respective rovings from lateral displacement and from overriding one another.

The layers 2, 2, by which the rovings 1, 1, &c., constituting the core or filling are protected and confined consist of coarse-textured loosely woven fabric produced by the interlacing of yarns or threads of asbestos; in this instance through the interweaving of weft-threads 21, 21, with warp-threads 22, 22. Other known methods of fabric-construction may be adopted in practice, if preferred. The said layers are united or joined with each other at the margins of the strip, in this instance concurrently with the production of the fabric, forming thereby a tubular fabric sheath enclosing the rovings. The tubular sheath form of covering is preferred, though sometimes the layers may remain not joined at the said margins.

The yarn or threads by which the respective rovings are confined from lateral displacement and from overriding one another comprise, in Fig. 3, certain of the weft-threads, and binder-warps—so-called binders—13, 13. The weft-threads which serve to confine the rovings from lateral displacement extend transversely of the series of rovings, from one margin of the strip or tape to the other, and are interwoven with the rovings. Each of such weft-threads alternately overlies and underlies successive rovings, and in passing from the top of one to the bottom of the next passes between the two. When one weft-thread passes over a given roving, the next succeeding weft-thread passes under such roving, as appears in Fig. 2. The weft-threads which are thus utilized are spaced somewhat widely apart, as shown in Fig. 2, so as to leave the body or filling yielding and pliable to facilitate the application of the strip or tape to a pipe. Such weft-threads are interwoven also with the warp-threads in the construction of the layers 2, 2, of fabric, as indicated in Figs. 3 and 4. The binder-warps (binders) 13, 13, extend

lengthwise of the strip or tape. They are engaged alternately in the top layer of fabric and in the bottom layer, so that they connect and bind together the two layers. They extend between adjacent rovings, in passing from one layer to the other. In addition to their function of holding the rovings from lateral displacement, they keep the layers of fabric from spreading apart. Thereby they operate to maintain the flat shape of the strip or tape.

In some cases I may omit the binder-warps or binders, as in Fig. 4, and depend upon the weft-threads alone to confine the rovings from displacement relative to layers 2, 2; in other cases, I may omit the weft-threads which are thus utilized in Fig. 3 and depend upon the binder-warps alone to confine the rovings from displacement relative to said layers.

In the absence of confining threads, the strip or tape in being handled would be liable to lose its flat shape and become crushed together laterally into more or less rounded or cylindrical form, with lateral displacement of the rovings and overriding of one thereof upon another, causing thereby more or less inconvenience in applying the strip or tape properly to a pipe or the like. This drawback and resulting inconvenience are obviated by my invention, while at the same time my strip or tape has a loose yielding consistency and pliability such that the rovings are left free enough from each other and from the sheath to permit a certain amount of relative movement of the respective rovings and the sheath lengthwise sufficient to allow the respective rovings and sheath to accommodate themselves to the spiral disposition of the strip or tape in being wrapped about a pipe, and to any differences of tension at the two margins of the strip or tape.

What I claim as my invention is,—

1. An insulating tape adapted to be wrapped spirally about a pipe or the like, composed of a series of longitudinally extending large, loose, soft rovings of heat insulating material disposed side by side and in close contact with one another, protecting and confining layers of coarse-textured loosely woven fabric above and below the said series composed of yarns or threads of asbestos, and yarns or threads intervening between the rovings so as to confine the respective rovings from lateral displacement and from overriding one another, the said tape having consistency and pliability permitting slight longitudinal shift of the rovings relative to one another.

2. An insulating tape adapted to be wrapped spirally about a pipe or the like, composed of a series of large, loose, soft longitudinally extending rovings disposed side by side and in close contact with one another, protecting and confining layers of fabric above and below the said series composed of yarns or threads of asbestos, and yarns or threads extending transversely of the series, interwoven with and intervening between the rovings, whereby the respective rovings are restrained from lateral displacement relative to one another and thereby from overriding one another.

3. An insulating tape adapted to be wrapped spirally about a pipe or the like, composed of a series of large, loose, soft longitudinally extending rovings disposed side by side and in close contact with one another, protecting and confining layers of fabric above and below the said series composed of yarns or threads of asbestos, and yarns or threads extending transversely of the series and interwoven with the rovings and with the said layer of fabric.

4. An insulating tape adapted to be wrapped spirally about a pipe or the like, composed of a series of large, loose, soft rovings disposed side by side and in close contact with one another, protecting and confining layers of fabric above and below the said series composed of yarns or threads of asbestos, and means for confining the respective rovings from lateral displacement and from overriding one another, comprising yarns or threads extending transversely of the said series and interwoven with the rovings and also binders extending lengthwise and binding the said layers together between the respective rovings.

5. An insulating tape adapted to be wrapped spirally about a pipe or the like, composed of a series of large, loose, soft rovings of asbestos disposed side by side and in close contact with one another, a sheath composed of asbestos yarns or threads interlaced in the form of a tubular fabric enclosing the said rovings, with yarns or threads intervening between the rovings so as to confine the respective rovings from lateral displacement and from overriding one another.

6. An insulating tape adapted to be wrapped spirally about a pipe or the like, composed of a series of large, loose, soft rovings of asbestos disposed side by side and in close contact with one another, a sheath composed of asbestos yarns or threads interlaced in the form of a tubular fabric enclosing the said rovings, with yarns or threads engaging with the sheath at its lateral margins and between such margins engaged with said rovings so as to confine the respective rovings from lateral displacement and from overriding one another within the said sheath.

7. An insulating tape adapted to be wrapped spirally about a pipe or the like, composed of a series of large, loose, soft rovings of asbestos disposed side by side

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and in close contact with one another, a sheath composed of asbestos yarns or threads interlaced in the form of a tubular fabric enclosing the said rovings and means for holding the tape in flat shape and confining the respective rovings from lateral displacement and from overriding one another, comprising binders passing between the respective rovings and binding the top and bottom faces of the sheath to each other.

8. An insulating tape adapted to be wrapped spirally about a pipe or the like, composed of a series of large, loose, soft rovings of asbestos disposed side by side and in close contact with one another, a sheath composed of asbestos yarns or threads interlaced in the form of a tubular fabric enclosing the said rovings, and means for confining the respective rovings from lateral displacement and from overriding one another, comprising transversely extending yarns or threads engaging with the sheath at its lateral margins and interwoven with the said rovings intermediate such margins, and binders passings between the respective rovings and binding the top and bottom faces of the sheath to each other.

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