Oct. 5, 1937. S. HUGHES 2,094,919

HEAT INSULATING TAPE

Filed June 18, 1934

Fig. 1.

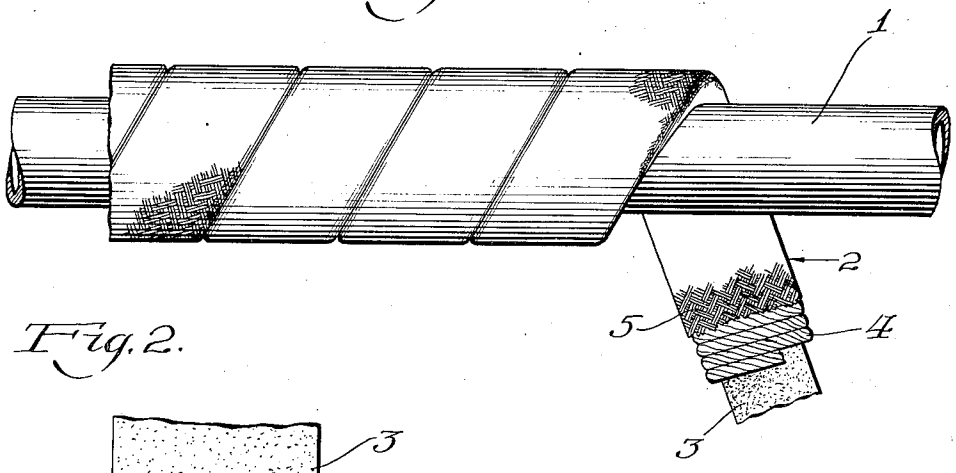


Fig. 2.

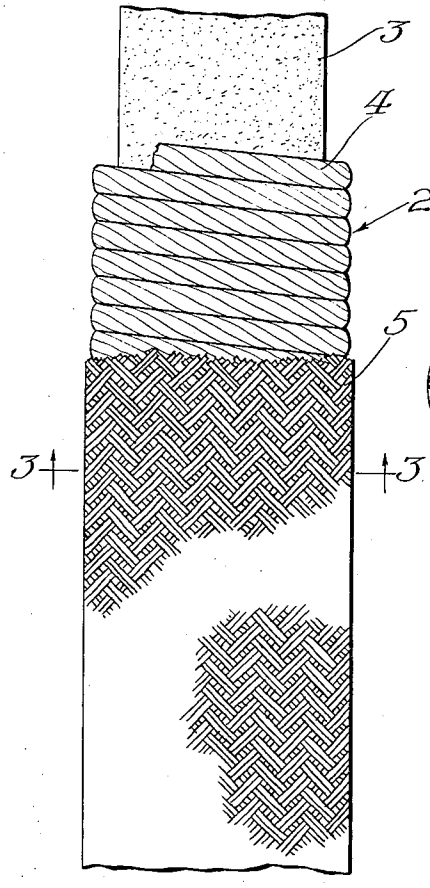
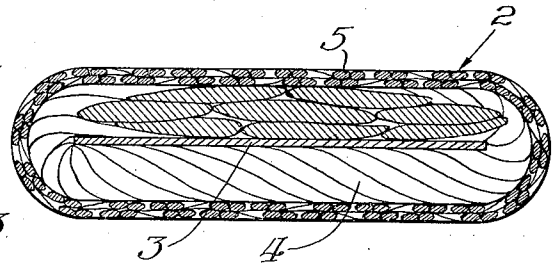


Fig. 3.



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HEAT INSULATING TAPE

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10 Claims. (Cl. 154—44)

This invention relates to improvements in thermal insulation and refers specifically to a heat insulating tape or wrapping for pipes, conduits and containers which carry fluids under relatively high temperatures, the tape being characterized in that it will not buckle when wrapped around pipes or conduits of even relatively small diameters; the constituent elements of the tape will not chafe or be placed under undue stress when wrapped; and that the confining sheath or envelope of the tape is continuous and seamless.

Heat insulating wrapping or tape has heretofore been used for wrapping pipes or conduits which carry fluids at relatively high temperatures. Such tapes usually comprise a core or body of heat insulating material covered by woven asbestos cloth, the cloth being folded longitudinally about the body material and the edges joined by stitching or adhesive. However, in view of the fact that cloth of this type is more or less inflexible, a stress is set up at the longitudinal seam of the covering when the tape is wrapped about a pipe or conduit, which stress is intensified with pipes of relatively small diameters. Moreover, there is a tendency for the tape to buckle due to the inability of the covering to conform to the curvature of the pipe. This results in a clumsy appearing wrapping and also renders it most difficult to properly wrap the pipe and eliminate leakage spaces between adjacent coils of the tape upon the pipe.

Also, there is a tendency for the tape to distort across its width upon the side in contact with the pipe, causing folds or buckles in and upon the tape. Such buckling prevents full and complete contact between the tape and the pipe and provides pockets leading to joints of the tape through which heat will escape when the edges of adjacent coils are not in close contact. In addition, the ridges formed by said buckling present high points of contact with the pipe which will tend to abrade due to the vibration of pipes not in rigid stationary position.

As a feature of my invention I confine a body portion of insulation within a jacket or envelope, braided or woven of asbestos yarn. The braided jacket is not only without seams but possesses sufficient flexibility to permit the tape to conform with the curvature of the pipe without buckling.

As a further feature of my invention the body portion or filler of the tape comprises a relatively flat, thin, flexible sheet of asbestos paper, around which soft asbestos wicking or roving is wound in helical fashion, the roving completely covering the asbestos sheet. This construction is such, that, when the wrapping is wound in spiral or helical fashion around a pipe, the clay between adjoining layers or coils of the roving permits the tape to adjust itself upon the pipe without buckling. This feature permits the wrapping to be wound around pipes of extremely small diameters.

Another feature of my invention resides in the provision of a core for the tape or wrapping which comprises a relatively elongated, thin, flat, flexible sheet of asbestos paper, which, due to its shape causes the tape or wrapping as a whole to conform therewith, that is, remain relatively flat, and, due to its composition, asbestos, serves as an additional barrier to the conduction of heat.

Other objects and advantages of my invention will be apparent from the accompanying drawing and following detail description.

In the drawing, Fig. 1 is a side elevational view of a section of pipe covered by my insulating tape or wrapping.

Fig. 2 is a fragmentary side elevational view of the insulating tape, parts being broken away to illustrate the component parts thereof.

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2.

Referring in detail to the drawing, 1 indicates a pipe or conduit which may be adapted to carry fluids at relatively elevated temperatures. It is to be understood, of course, that although the tape or wrapping comprising my invention is particularly adaptable for pipes or conduits, the same may be utilized for containers, vats or the like in which fluids under relatively high temperatures are maintained. The reference numeral 2 indicates the tape or wrapping comprising my invention. Tape 2 may comprise a relatively elongated, thin, flat, flexible core of asbestos paper indicated at 3. Relatively soft asbestos roving, rope or wicking 4 may be wound or wrapped in helical fashion around core 3, the adjacent coils 4 being disposed in contiguous relationship. The wrapping operation, when performed, is so carried out that the core 3 is maintained in its original shape. In other words, the core 3 wrapped with the roving 4 is maintained in tape-like form.

A sheath or envelope 5 of seamless construction may be either braided or woven around the roving-covered core and forms a relatively flexible covering for the structure comprising the core and roving. The sheath or covering 5 may be braided or woven of asbestos yarn or other heat resistant material.

It is to be understood, of course, that although my invention is shown and described as comprising an asbestos core, a body of asbestos roving and a covering comprising woven or braided asbestos yarn, other insulating materials may be used providing that they possess similar characteristics to asbestos with respect to flexibility and heat resistance. However, if the tape 2 is utilized to insulate pipes, conduits, or containers which may carry relatively cold fluids, such as, refrigerator pipes, the material comprising the

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tape need only possess characteristics of heat insulation and flexibility.

In utilizing my invention tape 2 may be wound or wrapped in helical fashion around pipe 1, the longitudinal edges of adjacent coils of the helix so formed being contiguous, so as to provide a complete insulating covering for the pipe. By the provision of the paper core 3 the tape may be conveniently wrapped in helical manner around the pipe without said tape losing its shape or becoming distorted which would result in imperfect joints between adjacent coils of the helical winding. Moreover, by the provision of the core 3 the tape 2 may be conveniently handled and shipped.

By the provision of the helically wrapped roving 4, tape 2 may be wound or wrapped around a pipe or conduit of relatively small diameter, the play between adjacent coils of the helix formed by the roving preventing buckling of the tape even when said tape is wrapped around pipes of diameters as small as ¼ inch.

The seamless sheath 5 is so woven or braided as to have characteristics of flexibility which permit a limited amount of play of the adjacent coils of the roving when said tape is wound around relatively small pipes and conduits. In view of the fact that the sheath 5 is constructed without seams, no parts thereof are unduly exposed to chafing.

The tape 2 may be economically manufactured in view of the fact that the roving 4 can be wound around core 3 by machine. In tapes of this character heretofore produced with longitudinal strands of roving, a number of manual operations are necessary which increases cost.

As a feature of the present invention the process of manufacturing the tape may be continuous. The paper core may take the form of a continuous strip unwound from a roll, being fed to that portion of the machine which wraps the roving in spiral fashion around the core. The tension of the machine is adjustable to insure a tight winding around the core as well as close joints between adjacent coils of the round roving. The roving-covered core may be continuously fed to that portion of the machine which braids or weaves the seamless sheath around the roving-covered core. The tension of the weaving or braiding means is adjustable to insure close contact between the sheath and the roving-covered core while at the same time permitting sufficient play therebetween to adapt the tape to pipes of different diameters.

It is to be understood, of course, that although the drawing illustrates a winding composed of a number of strands, such winding may consist of a single strand, or several superimposed strands, depending upon the thickness desired in the final product. If desired, a single layer of roving may be provided by winding one or more strands of roving 4 upon core 3 in the form of, for instance, double or triple helices.

As an important commercial feature of my invention, the tape 2 may be manufactured and marketed in one width which may be utilized upon a wide range of sizes of pipes or conduits. This results from the fact that the tape embodying the concept of my invention is so constructed that the filler or body of the tape, namely the roving 4, may be readily flexed without causing the tape as a whole to buckle when small diameter pipes are wrapped. Tapes utilized for analogous purposes are manufactured and marketed in varying widths depending upon the diameters of the pipes or conduits to be wrapped. Obviously, this results in an economic loss which is obviated by my invention.

I claim as my invention:

1. An insulating tape adapted to be wrapped in helical fashion around a pipe, conduit or container, comprising an elongated core of relatively flat asbestos paper, asbestos roving helically wrapped around said core, and a fibrous sheath covering said core and roving.

2. An insulating tape adapted to be wrapped in helical fashion around a pipe, conduit or container, comprising an elongated core of relatively flat asbestos paper, asbestos roving helically wrapped around said core, and a seamless fibrous sheath covering said core and roving.

3. An insulating tape adapted to be wrapped in helical fashion around a pipe, conduit or container, comprising an elongated core of relatively flat asbestos paper, asbestos roving helically wrapped around said core, the adjacent coils of roving comprising the helix being in contiguous relationship with each other, and a fibrous sheath covering said core and roving.

4. An insulating tape adapted to be wrapped in helical fashion around a pipe, conduit or container, comprising an elongated core of relatively flat asbestos paper, asbestos roving helically wrapped around said core, and a braided fibrous sheath covering said core and roving.

5. An insulating tape adapted to be wrapped in helical fashion around a pipe, conduit or container, comprising an elongated core of relatively flat asbestos paper, asbestos roving helically wrapped around said core, and a braided sheath of asbestos yarn covering said core and roving.

6. An insulating tape adapted to be wrapped about a pipe, conduit or container, comprising an elongated core of relatively thin, flat insulating material, an insulated roving material wrapped about said core, and a flexible sheath covering about said core and roving.

7. A flexible insulating tape adapted to be wrapped about a pipe, conduit or container, comprising an elongated core of relatively thin, flat insulating material, and asbestos roving wrapped about said insulated core, and a seamless fibrous sheath enclosing said core and roving.

8. A flexible insulating tape adapted to be spirally wrapped about a pipe, conduit or container, comprising a core of flat asbestos paper, asbestos roving wrapped about said paper core in the form of a plurality of contiguous helices, and a seamless, fibrous sheath enclosing said paper core and roving.

9. A flexible thermo insulating tape adapted to be wrapped about a pipe, conduit or container, comprising an elongated core or flat thin material that is relatively flexible in longitudinal direction, an insulated roving material wrapped about said core, and a sheath of flexible asbestos material enclosing said core and roving.

10. A flexible thermo insulating tape adapted to be wrapped about a pipe, conduit or container, comprising an elongated core of flat thin material that is relatively flexible in longitudinal direction, an insulated roving of asbestos material completely surrounding said core, and a sheath of flexible fibrous material enveloping said core and said roving.

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