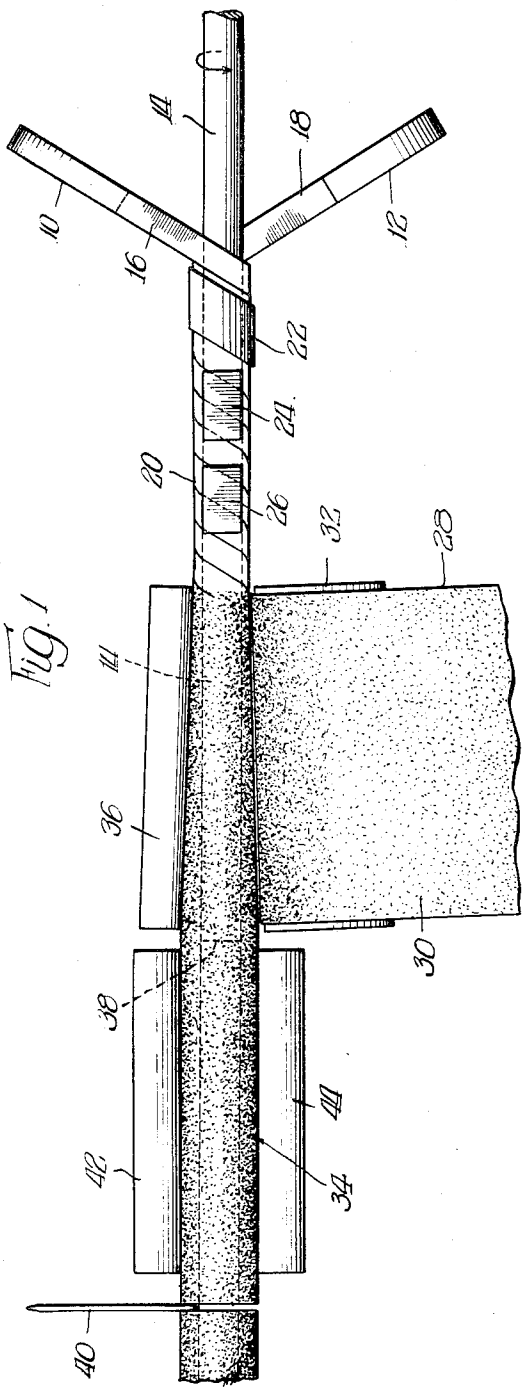
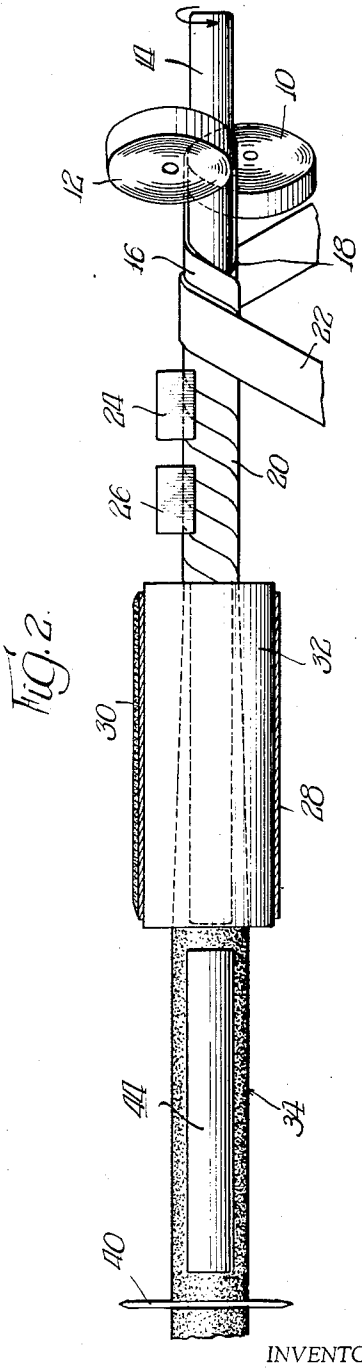
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CONTINUOUS METHOD OF MANUFACTURING ASBESTOS-CEMENT PIPE

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CONTINUOUS METHOD OF MANUFACTURING ASBESTOS-CEMENT PIPE

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4 Claims. (Cl. 154—2)

The invention relates to the art of making tubing and has more particular reference to a method of producing lined asbestos-cement pipe in a continuous manner.

The major difficulties in the production of pipe of the character referred to has been the lack of a commercial method for making the same continuously and the fact that the lining or interior coating would split and become detached from the pipe. The present invention has successfully overcome the above difficulties by providing a continuous process for producing cement-asbestos pipe by using a pre-formed liner that has been treated to securely bond with the cement and which will resist corrosion and attack by certain types of fluids.

A primary object of the invention, therefore, is to provide a tubular liner for cement-asbestos pipe and the like which will form a coated interior with the pipe and which will have a secure bond therewith to prevent separation of the liner even under the most severe conditions.

Another object is to provide a method for forming the tubular liner continuously and for treating the same during the formation thereof so that when the cement-asbestos material is applied the most satisfactory conditions are present for a permanent and secure bond.

A more specific object of the invention resides in the formation of a tubular member from resin or asphalt impregnated felt, asbestos paper or other suitable material to provide a foundation tube for the cement-asbestos material, and in the steps of heating the same and then adding thereto an asphaltic emulsion immediately in advance of applying the cement-asbestos exterior.

Another object is to provide a cement-asbestos mixture that has been treated with an asphaltic emulsion so as to bond with the foundation tube.

With these and other objects in view the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawing and claims appended hereto.

In the drawing which illustrates one embodiment of the invention, and wherein like reference characters are used to designate like parts—

Figure 1 is a plan view showing in diagrammatic form a machine for producing lined cement-asbestos pipe according to the invention; and

Figure 2 is a side elevational view also in diagrammatic form of the structure of Figure 1.

In the illustrated embodiment, structure is shown for fabricating in a continuous manner a tubular foundation for the cement-asbestos pipe and which, in accordance with the invention, is formed from felt, asbestos paper or other suitable material that has first been impregnated with asphaltic or resinous material. The felt or paper is supplied by the rolls 10 and 12 in strip form of the required width, and which has been either saturated or coated with an asphaltic material or with a resin including the natural resins such as rosin, shellac or the copals and also the synthetic resins such as Bakelite. The material in strip form is unwound from the rolls 10 and 12 simultaneously and wound in spiral overlapping formation on a revolving mandrel 14. The mandrel 14 is rotated but the same is not moved in an axial direction. Instead the tubular foundation 20 formed from the felt or paper strips 16 and 18, respectively, is rotated and moved in an axial direction by the band 22, the movement taking place on the mandrel and being facilitated by rotation of the mandrel.

As shown in Figure 2, the numeral 24 represents a station having suitable equipment for applying heat to the spirally wound foundation material on the mandrel 14. By heating the exterior the overlapping strips 16 and 18 of felt or paper having an asphaltic or resinous material therein are caused to bond as the material is softened and rendered adhesive by the heat. This application of heat, however, does not impair the movement of the foundation tube on the mandrel.

The next station indicated by numeral 26, Figure 2, contains suitable equipment for applying an asphaltic emulsion to the exterior of the foundation tube. In accordance with the method of the invention I desire to use at station 26 an asphaltic emulsion to which has been added from five to thirteen per cent asbestos fiber and from ten to thirty per cent Portland cement. The proportions given are preferred but, of course, the ingredients of the emulsion may be varied beyond said limits.

The next step in the production of the pipe of the invention is to apply to the exterior the wet cement-asbestos pulp from the endless band 28. The pump may be described as a partially dehydrated sheet of cement and asbestos in proper proportions and properly mixed. The web or sheet 30 of the same on the endless band 28 is applied to the foundation tube as the band passes around the large roller 32. It will be understood that the web 30 of cement-asbestos material is relatively thin and a large number of turns of the tube is required to build up the required thickness for the pipe 34. This can be controlled

by the axial movement of the foundation tube 20 by the band 22. The said band is disposed at an angle to the tube and sufficient friction is produced to impart movement to the tube in an axial direction and at the desired rate. As the cement-asbestos material is applied in a continuous manner to the foundation tube the same is rolled and worked by the roller 36 located in opposed relation to the large roller 32.

The mandrel ends at 38 since it has been found that from this point on the tube is strong enough to support itself. The treatment given to the strips comprising the foundation member will make possible a secure and permanent bond as regards the cement-asbestos material. If desired the heat at station 24 may be eliminated and a fluid coating of asphalt or resin applied to the overlapping strips. Also the cement-asbestos mixture on the band 28 may be treated during mixing thereof to further insure a good bond. This treatment preferably consists of adding to the cement-asbestos slurry a slow breaking asphalt emulsion in amounts ranging from three to ten per cent of the slurry.

At 40 a revolving knife is disclosed for cutting the pipe into the lengths desired. The knife is mounted on a moving carriage, not shown, whereby the cutting of the pipe is effected simultaneously with the manufacture of the same. Before cutting additional work is done on the formed pipe by the rollers 42 and 44 which are suitably journalled for rotation and positioned on the respective sides of the pipe. The rollers may be rotated by a source of power such as an electric motor or they may be merely journalled and allowed to rotate by the rotary movement of the pipe itself. It is preferred that the rollers 42 and 44 and also roller 36 have an auxiliary source of power for rotating them independently of the pipe, since then a speed can be secured to aid in the axial movement of the pipe and a better working of the cement-asbestos exterior is also obtained.

The method above described is for producing lined cement-asbestos pipe characterized by a secure and permanent bond between the foundation tube and the cement-asbestos exterior. When unlined pipe is desired, the procedure is the same except that the heat or fluid application at 24 is omitted and also the emulsion at 26 is omitted. Likewise it is not necessary to make any addition of an asphalt emulsion to the cement-asbestos slurry. Upon aging pipe wherein the asphaltic emulsions are omitted it will be found that the foundation tube will soon crack away from the pipe and the same can then be withdrawn, leaving a smooth and homogeneous interior.

The specific apparatus for journalling the rollers 36, 42 and 44 has not been disclosed since this structure does not form any part of the invention. The novelty of the present invention is primarily in the method of forming a foundation tube from treated strips and which are additionally treated so as to insure a secure and perfect bond with the asbestos-cement slurry. The method in its more specific aspects contemplates treatment of the slurry also with an asphaltic or resinous emulsion to form a mixture which will adhere to the foundation tube and which will not crack or separate therefrom during use of the pipe.

What is claimed is:

1. The method of making lined cement-asbestos pipe, which consists in forming a foundation tube from strips of asphalt impregnated flexible material, treating the said foundation tube by applying thereto an asphaltic emulsion containing asbestos fiber and cement, and finally applying to the treated foundation tube a plurality of thicknesses of cement-asbestos pulp, said pulp being applied in sheet form.

2. The method of making lined cement-asbestos pipe, which consists in forming a foundation tube from strips of asphalt impregnated flexible material, heating the formed foundation tube, treating the said foundation tube by applying thereto an asphaltic emulsion containing asbestos fiber and cement, and finally applying to the treated foundation tube a plurality of thicknesses of cement-asbestos pulp, said pulp being applied in the form of a sheet for each said thickness.

3. The method of making lined cement-asbestos pipe, which consists in forming a foundation tube from asphalt impregnated strips of flexible material, treating the said foundation tube by applying thereto an asphaltic emulsion containing asbestos fiber and cement, and finally applying to the treated foundation tube a plurality of thicknesses of cement-asbestos pulp, said pulp containing an asphaltic emulsion to facilitate the adhesion of the pulp to the foundation tube, and said pulp being applied in sheet form.

4. The method of making lined cement-asbestos pipe, which consists in forming a foundation tube from strips of flexible material impregnated with a substance capable of bonding the strips of flexible material, treating the formed foundation tube by applying thereto an asphaltic emulsion containing asbestos fiber in proportions ranging from five per cent to thirteen per cent and containing cement in the proportions ranging from ten per cent to thirty per cent, and applying to the treated foundation tube a plurality of thicknesses of cement-asbestos pulp, said pulp containing an asphaltic emulsion including as an ingredient a slow-breaking asphalt to facilitate the adhesion of the pulp to the foundation tube, and said pulp being applied in the form of a sheet for each said thickness.

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