

May 16, 1933.

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1,909,704

METHOD FOR THE MANUFACTURE OF RIB PIPING

Filed Nov. 24, 1930

Fig. 1.

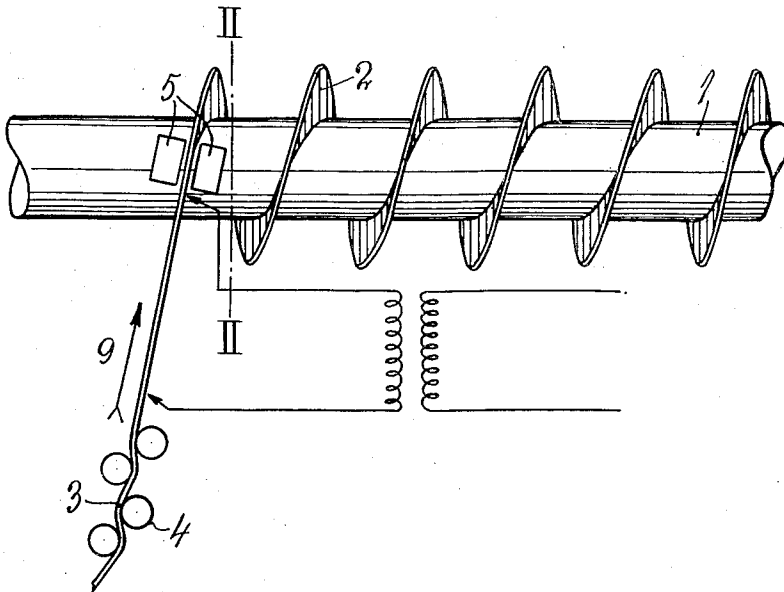
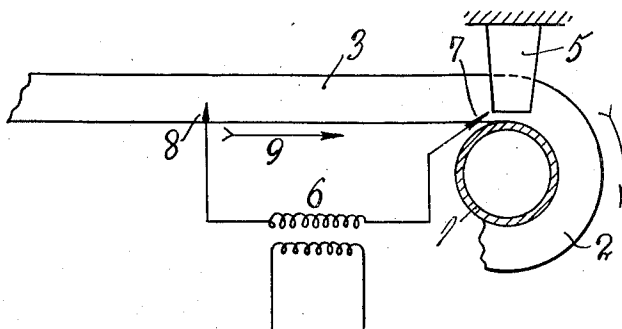


Fig. 2.



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METHOD FOR THE MANUFACTURE OF RIB-PIPING

Application filed November 24, 1930, Serial No. 497,768, and in Norway November 25, 1929.

My invention relates to ribbed tubing of the type consisting of a steam or gas pipe or tube with ribs extending in substantially radial direction and consisting of a continuous ribbon of sheet material wrapped around the tube in the form of a spiral. The tube may be provided with one or more spiral ribs arranged as a single or multiple threaded screw. Previously ribbed tubing has been made in two different ways, either by cold wrapping or by hot wrapping of the rib forming band. Cold wrapping can easily be used where the radius of bending, i. e., the diameter of the piping is large, compared with the width of the band, i. e., the height of the rib. The allowable maximum height of the ribs will thus also in this case to a great extent depend upon the properties of the rib material. In order to increase the height of the ribs the base of the ribs has been made wider, for example, by providing the ribbon with corrugations on the edge which contacts with the pipe, or by folding or bending over the edge of the bend, or finally by providing outbent teeth on the rib.

As will be understood from the above, cold coiling has the disadvantage of limiting the height of the rib in relation to the diameter of the piping.

If this disadvantage to some extent is limited by corrugations, the disadvantage is introduced that only material of relatively little thickness can be used. The mechanical durability of the rib thus becomes short, as the ribs are very poorly adapted to be used where they are subjected to the danger of rust development. A common disadvantage in all rib piping, where the ribs have been wrapped on cold, is that the contact pressure between the pipe and the rib is very low, which of course again reduces the conductivity.

By wrapping the band on hot the above-mentioned disadvantages are eliminated, the material in the ribs becoming ductile to such an extent that the necessary stretching of the outer edge and upsetting of the inner edge of the band will take place when the rib material is wrapped around the pipe.

The method previously used when coiling of the band on hot, has been to heat the same by means of a gas flame previous to its coiling on to the pipe.

One object of the present invention is a method according to which the rib material is electrically heated immediately before it is coiled on to the pipe.

According to the invention a number of obvious advantages are obtained, as for instance that the temperature of the rib material easily can be varied as desired and that the heating of the rib material can take place all the way up to that point where it is brought in contact with the pipe. By a suitable arrangement of the feeding contacts it is even possible to continue the heating of the rib material to such a degree at the point where it is brought in contact with the pipe that it will be welded to the pipe.

Other objects and novel features of the invention will appear from the following description describing the method according to the invention with reference to the appended drawing showing the making of single-threaded rib piping as an example only.

In the drawing:

Fig. 1 is a view showing the manufacture of a ribbed tube, and

Fig. 2 is a section at the line II—II of Fig. 1.

In the drawing 1 denotes the tube and 2 the coiled rib. During the wrapping the rib material 3 is fed on edge and through stretching means 4 on to the surface of the tube from a suitable supply reel. At the pipe proper guiding means 5 may be arranged serving to keep the rib material in a vertical position in relation to the pipe and also aiding in the stretching of the outer edge of the material. By means of contacts 7 and 8 and suitable leads electric current from an electric source 6 is fed to the rib material. The contacts 7 and 8 may be of any suitable construction, as for instance roller contacts or sliding contacts. The contact 8 may be arranged in contact with the rib material 3, and the contact 7—if it is found desirable may be arranged within

the pipe or on the outside of the same or at some other suitable point. The pipe is continuously rotated and the material 3 moves in the direction indicated by the arrow 9 in Fig. 2. The temperature which the rib material will obtain will depend on the electric power supplied from the source 6, the distance between the contacts 7 and 8 and the rate of coiling, which latter is determined by the speed of rotation of the pipe. Where the contact 7 is in contact with the strip 3, the heat is conducted to the point of contact through the strip and where the contact 7 bears upon the pipe, the heat is conducted through the pipe itself.

The temperature at the place of coiling may thus be varied as desired by varying one or more of these factors mentioned. Further it is possible by suitable arrangement of the contact 7 to obtain more or less concentration of flow of current at the contact point between the rib and the tube, thus making a variation of the temperature in the lower edge of the band in relation to the outer edge possible.

If multiple-threaded ribbed tubing is made, i. e., a tube where simultaneously two or more bands suitably spaced adjacent to each other are wrapped onto the tube, it is according to the invention possible to use single or multiple-phase current corresponding with the number of threads, each of the bands then preferably being connected respectively to one each of the poles of the source of polyphase current. The use of one pole in contact with the pipe may then be omitted.

By suitably choosing the above-mentioned heat-controlling factors it is possible to deform the band in transverse section during the wrapping operation, by stretching the outer edge and upsetting the inner edge in such a way that the contacting surface between the band and the tubing will be substantially larger than that of the outer edge of the rib; thereby primarily providing for increased heat conductivity between the tube and the rib, and secondarily strengthening the mechanical stiffness of the finished rib.

I have not shown or described specific apparatus for carrying out the invention, these being for any technical trained man very simple to construct on the basis of the showing in the description and claims.

I claim:

1. In the production of ribbed piping by winding a ribbon helically upon a pipe, the process which comprises electrically heating that part of the ribbon immediately adjacent the pipe while it is being wound upon the same, and maintaining said ribbon under sufficient tension to decrease the thickness of that portion of the ribbon remote from the pipe.

2. In the production of rib-piping having

a helically wound rib formed from ribbon originally of substantially uniform thickness, the process of heating by electrical current the part of the ribbon which is to form the rib immediately adjacent the pipe while it is being wound around the same, and maintaining said ribbon under sufficient tension to increase the thickness of that part of the ribbon adjacent the pipe and to decrease the thickness of that portion of the ribbon remote from the pipe.

3. In the production of ribbed piping by winding a ribbon helically upon a pipe, the method of electrically heating that part of the ribbon immediately adjacent the pipe while it is being wound upon the same, which comprises conducting the heating current to the edge of the ribbon adjacent to the pipe, thereby to cause a higher degree of heating along the inner edge of the ribbon and a decreasing temperature towards the outer edge of the ribbon.

4. In the production of rib-piping having a helically wound rib, the process of heating by electrical current the part of the ribbon which is to form the rib immediately adjacent the pipe while it is being wound around the same, said electrical current being conducted to the ribbon near the edge adjacent to the pipe to cause a higher degree of heating near this edge and a decreasing temperature towards the other edge, to thereby effect an upsetting of the ribbon increasing in thickness towards the edge in contact with the pipe through the bending operation.

In testimony whereof I have signed my name unto this specification.

LEIF MORSETH.