

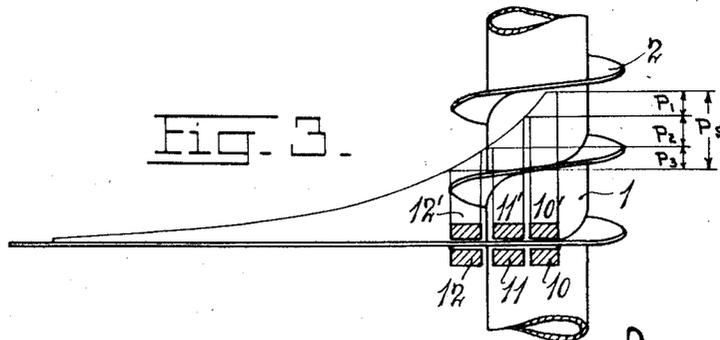
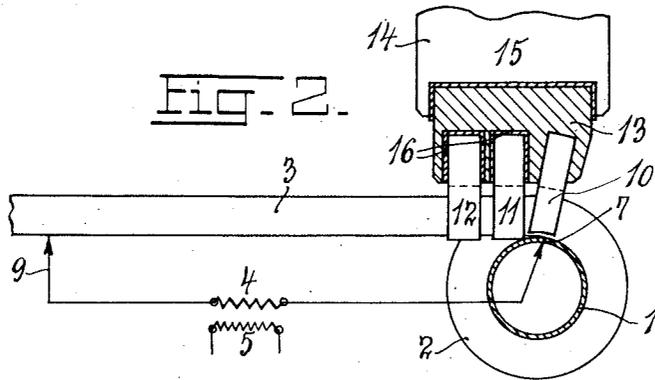
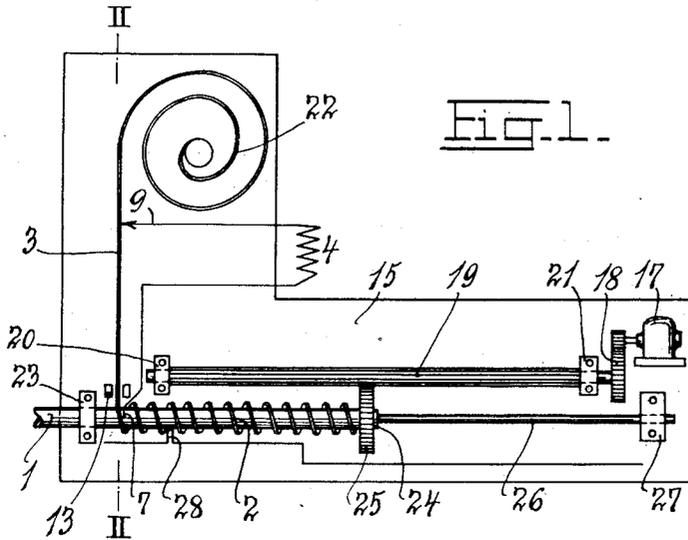
Feb. 8, 1938.

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2,107,831

MACHINE FOR THE MANUFACTURE OF RIBBED PIPING

Filed Sept. 15, 1936



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UNITED STATES PATENT OFFICE

2,107,831

MACHINE FOR THE MANUFACTURE OF RIBBED PIPING

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Application September 15, 1936, Serial No. 100,949
In Switzerland September 17, 1935

4 Claims. (Cl. 219—3)

The present invention relates to a machine for the manufacture of ribbed piping as for instance described in U. S. Patent No. 1,909,704.

One object of my invention is to provide new and novel means, by means of which the guiding of the ribbon to the pipe under the manufacture of the ribbed piping will take place in a proper way. A further object of my invention is to construct an arrangement of said guiding means in such a way that the potential fall in the electric current which is used for the purpose of heating the ribbon at a time and before it is wound on to the pipe, shall be as small as possible, due to the by-pass of the current through the said guiding means.

For this purpose, my invention consists in a machine for the manufacture of ribbed piping and comprising a frame, means for feeding a pipe rotating about its axis in the axial direction on the said frame and means for feeding a metal ribbon to be wound on to the pipe substantially normal to its axis and electrical means for feeding an electric current through the said ribbon from a point substantially adjacent to the point of contact between the ribbon and the pipe to a point on the ribbon remote from the pipe, guiding means adjacent to the said pipe on both sides of the said ribbon adapted to maintain the said ribbon in proper angular relation to the said pipe, said guiding means comprising a plurality of pairs of guiding blocks, mounted on said frame and electrically insulated from each other.

In order that my invention may be readily understood, I shall now describe the same with reference to the drawing which diagrammatically illustrates a preferred embodiment of the same.

In the drawing,

Fig. 1 is a diagrammatical drawing, showing the complete machine for the production of ribbed piping according to my invention.

Fig. 2 illustrates a detail of the machine to a much larger scale and taken as a cross section on the line II—II of Fig. 1, and

Fig. 3 illustrates also to a much larger scale parts of the machine and the method of manufacture of the ribbed piping according to my invention.

In the drawing, Fig. 1, 15 denotes the frame of the machine, on which is mounted a driving motor 17, for instance of the conventional electric type, which by gears 18 rotates a gear 19 which extends from one end to the other of the frame, and which is journalled in bearings 20 and 21 at each end of the frame. The pipe 1, to be provided with a helically wound metal ribbon 2

which is supplied from a supply coil of ribbon 22, is journalled in a bearing 23 and may in the free end 24 be held by some holding means, comprising a gear 25 and a shaft 26, journalled in a bearing 27 at the opposite end of the frame 15. An electrical source of current 4 supplies electricity to the point 7, preferably where the ribbon 3 first contacts with the pipe 1, and by means of another contact 9 the current is taken out from the ribbon 3 at some distance from this contact point 7. By passing a sufficient amount of current through the ribbon 3, this will be heated in such a way that it may easily be helically wound around the pipe 1, when this is rotated by means of the gear 19 and the gear 25. A notch or other means 28 may be arranged to engage with the thread between two windings of the said ribbon 2 and will tend to move the pipe 1 in the direction to the right on the drawing, when the same is rotated, whereby the ribbon 3 will be wound on to the pipe in a helix, as will be understood by anybody skilled in the art.

Close to the point where the ribbon 3 contacts with the pipe 1, means 13 are provided for guiding the ribbon just before it is bent around the pipe. For the further understanding of the details of this invention, there will now be referred to Figs. 2 and 3.

As above mentioned, Fig. 2 illustrates diagrammatically one part of the machine as above described, looking on it in the direction of the pipe to be manufactured. In this figure, 1 as before denotes the pipe on which the ribbon 2 is to be formed in a helix. Electric current is from the secondary coil 4 on the transformer, the primary coil 5 of which is fed from some line of electric power, conducted to the point 7 preferably on the inside of the pipe 1 and is taken out from the ribbon 3 by means of an electrode 9 at a suitable distance from the point 7. Due to the passage of this current, the ribbon is heated, and the heat will of course be highest at the point where the band is wound around the pipe, due to the fact that this part of the band has been under the influence of the electric current during the longest period of time. At this point where the band is wound around the pipe, rather large stresses will appear. These stresses will tend to bend the band over to the side in such a way that it will not have the desired angle with reference to the pipe.

According to the invention a number of guiding blocks 10, 11, 12 and 10', 11', 12' are arranged at this place, which blocks may be held in a frame 13, which although preferably insu-

lated from the frame of the machine 15, is rigidly mounted on the same.

The guide blocks are of electrically conductive material and, if no means were provided to prevent the current from passing from the point 7 through the guiding block 10 and the block 13 and further through the guiding block 12 to the ribbon 3, this passage would constitute a rather low resistance shunt over the first part of the ribbon 3, which is to be heated by the passage of the electric current and consequently the action of the current on this part of the ribbon would be greatly reduced. In order to prevent this, insulating material 16 is therefore according to the invention introduced between the guiding blocks 11 and 12 and the holding frame 13. Such insulating material may of course also be arranged between the guiding block 10 and the said frame 13; but this is not really necessary for the object to be fulfilled. By this arrangement one prevents the great drop of voltage which otherwise would be present, as will be understood from the following explanation:

Assume that instead of using a plurality of guiding blocks 10, 11, 12, one uses only one pair of guiding blocks, the total width of the same corresponding to the sum of widths of the three guiding blocks 10, 11, 12, then the drop of potential over this pair of guiding blocks would correspond to the potential drop p_3 , Fig. 3, and the resistance in the guiding block would equal the ohmic resistance of the said guiding block plus the surface resistance between the guiding block and the ribbon. By the division of the guiding blocks into a plurality of pairs of guiding blocks as illustrated in the drawing, the drop of potential over the first pair 10, 10' would equal p_1 , that over the next pair p_2 , and that over the last pair p_3 , and by proper dimensioning of the blocks, the resistance in the current path through one pair of guiding blocks which is parallel to the current path through the band adjacent to the block, would be large, compared with the resistance in the ribbon, due to the fact that the resistance in the first mentioned by-path to a substantial degree corresponds to the surface resistance between the band and the guiding block. Therefore, that part of the current which under the conditions according to the invention is not utilized for the heating of the band, will be substantially smaller than that part of the current which would have passed through, if one pair of guiding blocks only had been used, assuming that the said blocks would have had the same total width as the sum of the pairs of guiding blocks used according to this invention.

It is, of course, understood that the details of the foregoing description with reference to the drawing only must be regarded as examples, and that a number of guiding blocks to be used must be chosen under the actual conditions to be met.

I claim:—

1. In a machine for the manufacture of ribbed piping and comprising a frame, means for feeding a pipe rotating about its axis in the axial direction

and for feeding a metal ribbon, to be wound on to the pipe, to said pipe substantially normal to its axis, and electrical means for feeding an electric current through said ribbon from a point substantially adjacent to the point of contact between the ribbon and the pipe to a point on the ribbon remote from the pipe, guiding means adjacent to the said pipe on both sides of the current-carrying section of said ribbon to maintain the said ribbon in proper angular relation to the said pipe, said guiding means comprising a plurality of pairs of guiding blocks of electrically conductive material mounted on the frame and electrically insulated from each other.

2. In a machine for the manufacture of ribbed piping and comprising a frame, means for feeding a pipe rotating about its axis in the axial direction and for feeding a metal ribbon, to be wound on to the pipe, to said pipe substantially normal to its axis, and electrical means for feeding an electric current through said ribbon from a point substantially adjacent to the point of contact between the ribbon and the pipe to a point on the ribbon remote from the pipe, guiding means adjacent to the said pipe on both sides of the current-carrying section of said ribbon to maintain the said ribbon in proper angular relation to the said pipe; said guiding means comprising a frame, a number of guiding blocks of electrically conductive material mounted in said frame, and electrical insulation between the said blocks.

3. In a machine for the manufacture of ribbed piping and comprising a frame, means for feeding a pipe rotating about its axis in the axial direction and for feeding a metal ribbon, to be wound on to the pipe, to said pipe substantially normal to its axis, and electrical means for feeding an electric current through said ribbon from a point substantially adjacent to the point of contact between the ribbon and the pipe to a point on the ribbon remote from the pipe, guiding means adjacent to the said pipe on both sides of the current-carrying section of said ribbon to maintain the said ribbon in proper angular relation to the said pipe; said means comprising a guide supporting frame, guiding blocks of electrically conductive material in the said guide supporting frame and electrical insulation between the said frame and the said frame of the machine.

4. Apparatus for the production of ribbed piping and of the type in which a ribbon is helically coiled upon a pipe and electrically heated to facilitate the winding of the ribbon upon the pipe, said apparatus including guide means adjacent said pipe for constraining said ribbon to a path of travel substantially normal to the axis of said pipe, and means for passing current through the ribbon from its region of contact with the pipe to a point remote therefrom, characterized by the fact that said guide means comprises a plurality of pairs of electrically conductive guide members, and means electrically insulating said guide members from each other.

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