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METHOD AND DEVICE FOR MAKING RIBBED TUBES WITH SMOOTH RIBS

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Fig. 1

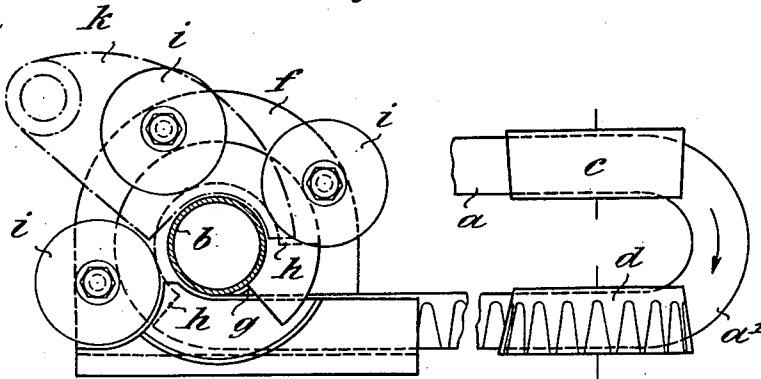


Fig. 3

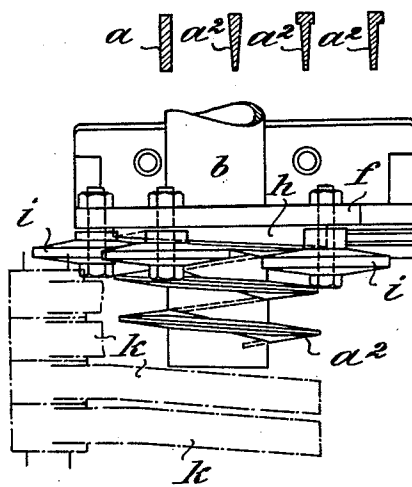
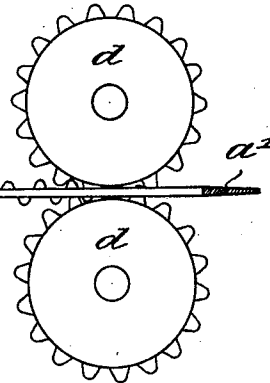


Fig. 2



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METHOD AND DEVICE FOR MAKING RIBBED TUBES WITH SMOOTH RIBS

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Methods and devices for making tubes with ribs or fins are already known in which a metal strip is wound, in the hot state, on edge and helically on the tube, the strip being
5 crimped or corrugated on the side adjacent to the tube. The radiating seams which the ribs thus acquire, form a dust and dirt trap and render the ribbed tubes unsuitable for many purposes. The object of this invention
10 is to make it possible to wind the helical rib smooth, that is to say, without seams round the tube and the aim of the invention is accordingly a process and device for producing ribbed tubes with smooth ribs.

15 The invention consists in first rolling the heated metal strip, which is to form the helical rib, to give it a tapering cross-section and a curvature corresponding to that of the tube to which it is ultimately to be applied, then
20 crimping its thinner tapering part so that it may be fed in a straight line to the tube and, simultaneously with the smoothening out of the crimped part winding it helically onto the smooth seamless tube.

25 The apparatus for carrying out this process comprises two smooth conical rolls for the purpose of tapering the cross-section of the strip towards the outer edge, two conical toothed rolls meshing with each other for
30 crimping the tapered portion of the strip, and a tool for winding the strip on the tube, consisting of a guide for the tube, and the strip and means for stretching or pressing smooth the previously crimped portion of the
35 strip.

The drawing illustrates by way of example one form of the apparatus according to the invention.

40 Figure 1 is a front view of the apparatus with a strip passing through.

Figure 2 is a plan of the same, and

Figure 3 shows cross-sections of the metal strip before and after its winding.

45 The metal strip a , which is helically wound upon the tube on edge, is first conveyed in the usual way through a furnace for the purpose of heating it up to red heat. Then it is brought between two conical rolls c in order to produce the gradual tapering of its cross-
50 section towards its outer edge and to curve

the metal strip as at a' by stretching it on one side to correspond with the curvature of the tube b to which it is to be ultimately applied.

The strip then passes, in the course of the process, through a pair of conical crimping
55 rolls d meshing with each other, which crimp the tapered portion of the metal strip, in order to permit of its conveyance to the tube b , or to the tool used to wind the strip. After the front end has been attached to the circum-
60 ference of the tube on edge, in the usual manner, that is to say, after it has been welded, the metal strip, owing to the winding motion of the tube b , which is slowly rotated by means of a suitable device and is displaced at
65 the same time in an axial direction, is helically wound on the same, when the crimped part of the metal strip is again stretched. For this purpose, a tool is used which consists, as usual, of a vertical flange f which is pro-
70 vided with a central circular opening g through which the strip is passed and upon which an arcuate wedge-like pressing surface h surrounding the opening g , is provided, and against which the metal strip a' ,
75 with its previously crimped portion, is firmly pressed by rollers or discs i , so that the crimping entirely disappears and a smooth seamless helical rib a^2 is produced. The cross-
80 section of the metal strip a can be altered by an appropriate form of the pair of rolls, in such manner that the helical rib a^2 which is tapered outwardly has on its inner edge, adjacent to the tube, a projecting rib on one or
85 both sides as shown in Figure 3. Owing to the fact that the helical rib wound round the tube contracts when it cools down, it tightens round the circumference of the tube, so that it remains immovable, when cold. In order
90 to prevent a displacement of the ribs from their parallel position, hinged guiding cheeks k are provided which lie between the first winding of the helical rib a^2 , so that any change in the position and distance, during
95 the cooling, is prevented.

The means for rotating the tube b and for advancing it axially is not illustrated, as such is entirely conventional and usual in machines of this type.

I claim:

1. A process for making ribbed tubes consisting in first rolling a heated metal strip to give it a tapered cross-section and a curvature corresponding to that of the tube to which it is ultimately to be applied, then
5 crimping its thinner tapering part and feeding it in a straight line to the tube and, simultaneously with the smoothening out of the crimped part winding it helically onto the
10 tube substantially as hereinbefore set forth.

2. Apparatus for making ribbed tubes of the type wherein the tube to which the ribs are to be secured is rotated and moved axially, comprising a pair of conical rolls for rolling
15 a heated metal strip into a tapered cross-section, a pair of crimping rolls for crimping the tapered portion of said strip, a guide for guiding said crimped strip to the tube and means for flattening the crimped portion of
20 the strip while it is being wound on the tube.

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

HEINRICH DORNDORF.

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