Sept. 6, 1932. E. Z. TAYLOR 1,876,094

MANUFACTURE OF TUBES OF PAPER OR LIKE MATERIAL

Original Filed March 27, 1929

FIG. 1.

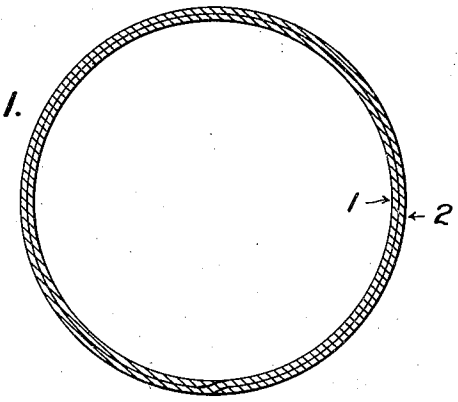


FIG. 2.

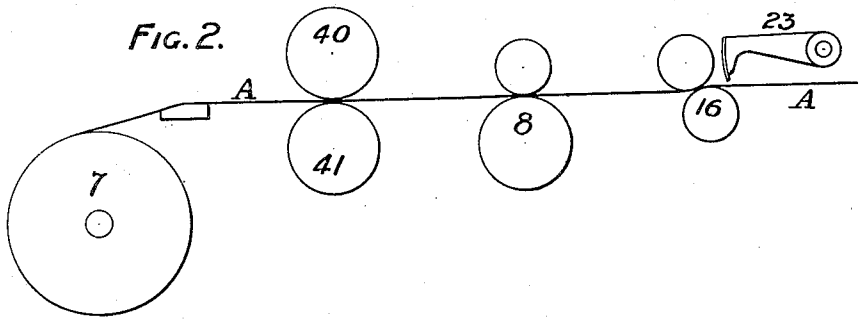


FIG. 3.

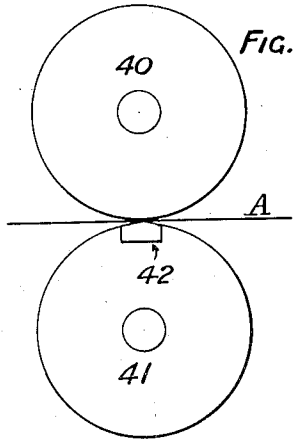


FIG. 5.

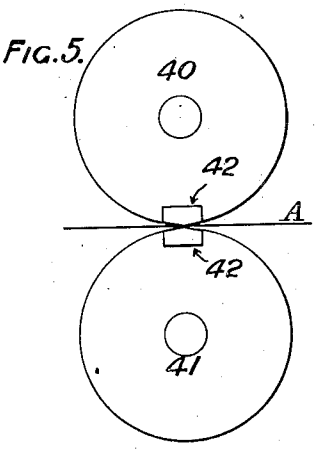


FIG. 4.

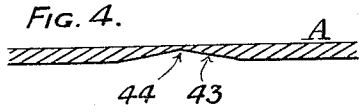
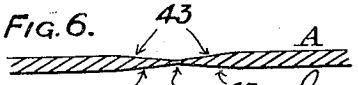


FIG. 6.



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UNITED STATES PATENT OFFICE

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MANUFACTURE OF TUBES OF PAPER OR LIKE MATERIAL

Application filed March 27, 1929, Serial No. 350,395. Renewed July 15, 1932.

In the specification of an application for patent Serial No. 350,396, filed March 27, 1929, in the name of Cyrus Taylor, an invention is described relating to the manufacture of convolutely wound tubes of paper or like material, such invention enabling the manufacture to be carried on practically continuously, that is to say without interruption during the feed of the material from a reel. The object of the present invention is to enable an improved result to be obtained, particularly in connection with the method and means described in the said application of Cyrus Taylor although as will be seen the present improvements may be applied in other cases.

In the accompanying drawing:—Fig. 1 is a horizontal section of a tube formed in accordance with the present invention. Fig. 2 is a diagrammatic view of part of the machine showing the application of the present invention. Fig. 3 is an enlarged view of the mechanism for effecting the particular object sought to be attained, and Fig. 4 a still further enlarged section showing the effect obtained thereby on the material employed. Fig. 5 shows a modification of the arrangement shown in Fig. 3, and Fig. 6 the effect produced on the material by the modified arrangement shown in Fig. 5.

Referring to Fig. 1 of the drawing it will be seen that the walls of the tube are there shown as consisting of two convolutions 1, 2, of the paper or other similar material. The object of the present invention is to avoid the unevenness in the surfaces of the finished article which would arise through the natural thickness of the paper, this object being attained by applying considerable crushing pressure to the ends of the blanks in such a manner that the material thereof is tapered off to comparative thinness, without being actually severed thereby. As above stated the present improvement has been particularly designed for use in connection with the method of and mechanism for the manufacture of paper tubes described in the specification of the application of Cyrus Taylor hereinbefore referred to, and Fig. 2 of the accompanying drawing illustrates that part of the machine described therein to which the parts for effecting the object now sought to be attained are added. Such additional parts consist of a pair of rollers 40, 41, disposed at a suitable point between the reel 7 from which the web of paper or other material is unwound and the pasting roller 8 by which the necessary adhesive is applied thereto.

The rollers 40, 41, are rigidly mounted in respect to each other, and are driven in such relation with the other parts of the machine as to make a complete revolution as the proper length for the desired blank passes. Such rollers do not act to pull or feed the paper forward, but, as shown in Fig. 3, one of them (41) is provided with a hard steel insert or projecting part 42 which, as the paper web A passes the centre line between the rollers 40, 41, indents the material with such pressure that it assumes the section shown (greatly enlarged) in Fig. 4, the sloping surfaces 43 tapering down to the point 44 without actually severing the material. A modification of this arrangement is shown in Fig. 5, where both rollers 40, 41, are provided with steel inserts or projecting parts 42, the effect of which will be that the web of material will be impressed to the formation shown in section (also greatly enlarged) in Fig. 6, that is the inclined surfaces 43 are formed on both sides of the material so that the latter is tapered down from both sides to the thinnest point 44.

As described in the said Cyrus Taylor's application means are provided for breaking or severing the web into suitable lengths after the pasting operation and during the winding of the material on one of a series of mandrels 16, such breaking or severing mechanism consisting of an arm 23 which is operated at a suitable time. In applying this arrangement in connection with the improvement sought to be covered in the present application the breaker arm 23 is caused to operate at such a time that its operating end will come in contact with the web of material A at its thinnest point, that is to say at the point 44 produced by the action of the steel inserts carried by one or both of the rollers 40, 41. The crushing operation to which the web has been subjected will facili-

tate the breaking of it at the desired point. It will of course be understood that the crushing operation must not be such as to actually break the material, as this would interfere with the subsequent operation of the machine, but only sufficient to obtain the desired effect of a blank with tapered ends, enough material being left at the thinnest point to give the web sufficient strength to be carried along into the machine.

The subsequent operations on the severed blank do not form part of the present invention, but may be similar to those described in the application of Cyrus Taylor hereinbefore referred to. In Fig. 1 of the drawing a rolled-up blank which has been treated as above described is shown, and the improved result attained by the present invention will be apparent, there being a practically smooth surface on both the inner and outer sides of the article, instead of the ledges which would otherwise be presented by the natural edges of the material. It will be readily understood that the tubes may consist of more than two convolutions of the material, and also that they may be of square, hexagonal or other form instead of circular as shown.

What I claim and desire to secure by Letters Patent is:—

1. In a tube-making machine, a pair of rollers between which material for making a tube is passed, one of such rollers being provided with a projecting part co-acting with the surface of the other roller to taper off the material by crushing the same.

2. In a tube-making machine, a pair of rollers between which material for making a tube is passed, both of such rollers being provided with projecting parts which operate together to crush the material and thus taper off the ends of the blanks to be formed.

In witness whereof I have signed this specification.

ELMER ZEBLEY TAYLOR.