May 1, 1923. 1,453,846

R. LA CROIX

TUBE MAKING MACHINE

Filed Feb. 17, 1921

Fig. 2.

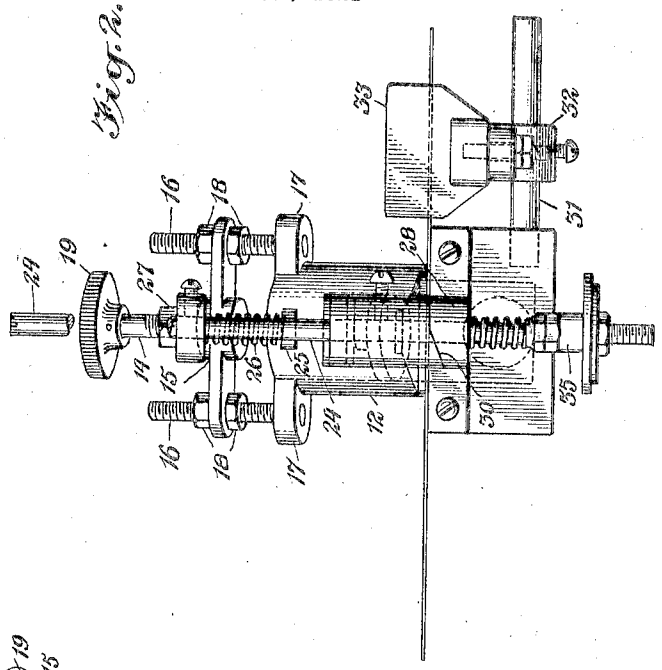


Fig. 3.

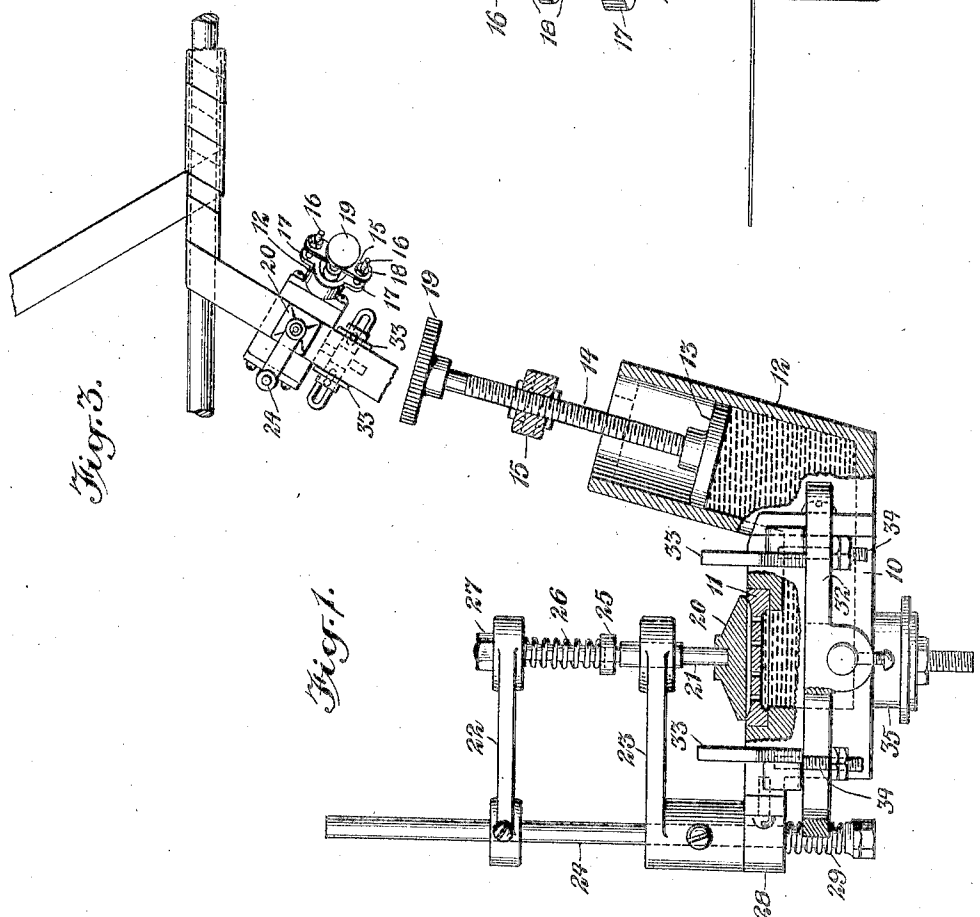


Fig. 1.

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UNITED STATES PATENT OFFICE.

ROMEO LA CROIX, OF HOLYOKE, MASSACHUSETTS, ASSIGNOR TO SAMUEL M. LANGSTON COMPANY, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TUBE-MAKING MACHINE.

Application filed February 17, 1921. Serial No. 445,597.

To all whom it may concern:

Be it known that I, ROMEO LA CROIX, a citizen of the United States, and resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Tube-Making Machines, of which the following is a specification.

In the manufacture of paper or fibre tubes, it is common practice to wind one or more strips of paper or other material helically and on a mandrel. The tube, as fast as formed, by the gluing or pasting together of the wound strip or strips, is moved longitudinally of the mandrel and off one free end thereof, so that the tube may be continuously manufactured and cut into sections of the desired length as delivered. A machine of this general character is shown in the Langston Patent 981,774.

The strip surface which forms the inner surface of the finished tube frictionally engages with the mandrel during the longitudinal movement of the completed tube, and this friction, when high, materially limits the speed of manufacture and prevents smoothness and uniformity of operation.

The main objects of my invention are to reduce this friction, gain greater smoothness of operation and permit greater speed by the provision of simple inexpensive and efficient means for lubricating the frictionally engaging surfaces. This is accomplished by delivering a lubricant to that surface of the strip which is to form the inner surface of the tube, and which slides along the mandrel from the point where the strip first comes in contact with the mandrel to the free end of the latter. In its preferred form my improved device is designed as an attachment which may be readily applied to a machine already built or in use, and which may be readily adjusted to different widths and angles of delivery of the strip. The device also serves as a guide for the paper strip, and may be employed in place of the ordinary paper guide. The device serves as a tension for the strip, and is so constructed that the strip may be brought into proper relationship to the lubricator and the desired tension applied very easily in threading up the machine.

In the accompanying drawings I have illustrated one form which my invention may assume.

Figure 1 is a side elevation looking in a direction at right angles to the path of the strip.

Figure 2 is an elevation at right angles thereto, portions of the device being broken away, and

Figure 3 shows a portion of a tube making machine with my improved device attached thereto.

In the device illustrated there is provided a lubricant chamber 10 having a top wall or cover plate 11, over which the paper strip may pass, said plate being reticulated or otherwise formed to permit the comparatively slow delivery of lubricant from the chamber through the plate into engagement with the strip passing over the plate. I do not wish to be limited to any particular kind of lubricant, although I much prefer to use one which is normally in a semi-solid state and which will be picked up to a comparatively slight extent by the strip. I have found from experience that mutton tallow is a very suitable material for this purpose.

At one side of the chamber 10 there is provided a main reservoir 12, in which the lubricant may be placed, said reservoir having means for putting the lubricant under pressure and insuring the delivering thereof through the reticulated plate 11 to the strip. For this purpose I have illustrated the reservoir 12 as being cylindrical in form and provided with a plunger member 13 connected to a threaded stem 14. The stem has threaded engagement with a yoke 15 mounted on a pair of threaded supporting rods 16 carried by lugs 17 on the wall of the reservoir. The yoke is held at each end between pairs of nuts 18 so that the position of the yoke may be varied. The plunger stem 14 is provided with a head or other member 19 to facilitate the rotation of the stem and the forcing of the plunger downwardly to put the lubricant under pressure and deliver it through the reticulated plate 11. Preferably the surface of this plate is slightly dished or concave to facilitate a better distribution of the lubricant on the surface of the strip.

In order to yieldingly hold the strip in engagement with the lubricant delivering

device, I provide a pressure plate 20 carried by a stem 21 extending substantially at right angles to the plane of the plates 11 and 20, and between which the strip of paper passes. The stem 21 is mounted in a pair of arms 22—23 secured to a supporting rod 24. Between the two arms the stem 21 has a collar 25 serving as a stop or seat for one end of a coil spring 26, the other end of which engages with the under side of the arm 22 so that the spring normally tends to press the plate 20 downwardly toward the plate 11. To limit this movement of the plate 20 the stem 21 preferably has a nut 27 on its upper end, engaging with the upper side of the arm 22.

To facilitate threading up of the machine the arms 22—23 and the parts carried thereby, including the pressure plate 20, are mounted to swing about the axis of the rod 24 as a center. The two arms are preferably rigidly secured to the rod at the desired distance apart by means of suitable set screws and the rod itself is mounted for rotation in a bracket 28 mounted on one side of the lubricant chamber 10. The hub of the arm 23 rests directly on this bracket and the coil spring 29 on the lower end of the rod 24 normally tends to pull the rod 24 and the parts carried thereby downwardly to the limiting position established by the engagement of the hub of the arm 23 with the bracket 28. In order to lift the pressure plate 20 away from the distributing plate 11, the engaging surfaces of the bracket 28 and the hub are inclined or formed as cam surface 30, as illustrated particularly in Figure 2. Thus, as the rod 24 is rotated to swing the pressure blade 20 away from the lubricant distributing plate, the rod 24 is moved endwise and upwardly and the pressure plate 20 is therefore lifted away from the plate 11 as well as moved laterally in respect thereto.

To insure the proper positioning of the strip in respect to the distributing plate and at the same time to properly guide the strip to the mandrel, the device is provided with adjustable means for engaging with the side edges of the strip. This means is shown as including a rod 31 projecting from the side of the chamber 10 in the general direction of the path of the strip and adjustably mounted on this rod is a transverse bar 32 rigidly held in any suitable manner, as for instance, by means of a set-screw. Two guide plates 33 are supported on this bar 32 and are adjustable along the length of the latter. Preferably the bar 32 is slotted at each end and each guide plate 33 has a depending threaded stud 34 projecting through the corresponding slot and provided with lock nuts or other securing means. The two guide plates may be adjusted independently of each other, and they may be turned about their threaded studs as centers to accommodate the device to different angles of delivering, as well as widths of strip.

The device is mounted on the tube making machine in such a position that the paper strip will pass between the guide plates 33 and between the opposed plates 11 and 20, just before reaching the mandrel. Any suitable means may be provided for rigidly securing the device. The underside of the chamber 10 has an elongated lug 35 formed integral therewith and presenting a threaded stud bolt which may enter a slot or aperture in the machine and receive a securing nut. Various other means might be provided for positioning and securing the attachment, and depending in part on the construction of the machine in connection with which the attachment is to be used.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A tube making machine including a mandrel on which a strip of paper is wound helically to form the tube, and in respect to which the completed tube slides lengthwise as formed, a reservoir for lubricant and means for forcing lubricant out of said reservoir and delivering the same into the path of movement of the surface of the strip going to make up the inner surface of the tube.

2. A tube making machine having in combination with the mandrel on which the strip of paper is wound helically to form the tube and in respect to which the completed tube slides lengthwise as formed, a reticulated lubricant distributing plate over which the strip passes.

3. A tube making machine having in combination with the mandrel on which the strip of paper is wound helically to form the tube and in respect to which the completed tube slides lengthwise as formed, a stationary support adapted for the passage of lubricant therethrough and means for guiding the strip of paper across said support.

4. A tube making machine having in combination with the mandrel on which the strip of paper is wound helically to form the tube and in respect to which the completed tube slides lengthwise as formed, a pair of members resiliently pressed into engagement with opposite surfaces of the strip and means for delivering the lubricant through one of said members.

5. An attachment for tube making machines including a lubricant delivering device, and a spring pressed plate for engaging with one surface of the strip and for yieldingly holding the opposite surface against said device.

6. An attachment for tube making machines including a pair of members yield-

ingly pressed together for engagement with opposite surfaces of the strip used to form the tube, means for delivering a lubricant through one of said members and means engaging with opposite edges of said strip for guiding the strip in respect to said members.

7. An attachment for tube making machines including a chamber having a reticulated top plate, a bracket supported by said chamber and a pressure plate carried by said bracket and yieldingly pressed toward said chamber to hold the strip going to make up said tube in engagement with the surface of said chamber.

8. An attachment for tube making machines including a chamber having a reticulated delivery plate, a bracket carried by said chamber, a pressure plate carried by said bracket and yieldingly pressed toward said delivery plate, and means for guiding a strip of paper between said plates.

9. An attachment for tube making machines including a chamber having a reticulated top plate, a bracket carried by said chamber, a pressure plate carried by said bracket and yieldingly pressed toward said top plate, means for guiding a strip of paper between said plates, said bracket being rotatable to move said pressure plate laterally away from said chamber.

10. An attachment for tube making machines including a lubricant chamber having a top wall constituting a lubricant distributing means, a rod supported by said chamber, a pair of arms carried by said rod, a pressure plate having a stem guided by said arms and resiliently pressed toward said top wall, said rod being rotatable to move said pressure plate away from said top wall.

11. An attachment for tube making machines including a lubricant chamber having a top wall constituting a lubricant distributing means, a rod supported by said chamber, a pair of arms carried by said rod, a pressure plate having a stem guided by said arms and resiliently pressed toward said top wall, said rod being rotatable to move said pressure plate away from said top wall, and simultaneously lift it out of engagement with said top wall.

12. A device of the class described, including a chamber having a reticulated top wall, a pressure plate opposed thereto and adapted to yieldingly hold a strip of material in engagement with said plate, means for moving said pressure plate laterally and simultaneously away from said reticulated plate, and means for guiding the strip of material between said plates.

13. An attachment for tube making machines of the type in which a strip of paper is wound helically on a mandrel to form the tube and the tube feeds endwise on the mandrel, said attachment, including a lubricant distributor and a pair of guides supported thereby and at one side thereof for engaging with opposite edges of the strip receiving the lubricant.

14. An attachment for tube making machines of the type in which a strip of paper is wound helically on a mandrel to form the tube and the tube feeds endwise on the mandrel, said attachment, including a lubricant distributor and a pair of guides supported thereby and at one side thereof for engaging with opposite edges of the strip receiving the lubricant, said guides being adjustable toward and from each other.

15. An attachment for tube making machines of the type in which a strip of paper is wound helically on a mandrel to form the tube and the tube feeds endwise on the mandrel, said attachment, including a lubricant distributor and a pair of guides supported thereby and at one side thereof for engaging with opposite edges of the strip receiving the lubricant, said guides being adjustable toward and from said distributor.

16. A device of the class described, including a lubricant chamber having a top wall adapted to support a strip to be lubricated, and serving as a lubricant distributor, a reservoir connected with said chamber and having a plunger member for putting the lubricant under pressure and yielding means for holding a strip to be lubricated in engagement with said top wall.

17. An attachment for tube making machines of the type in which a strip of paper is wound helically on a mandrel to form the tube and the tube feeds endwise on the mandrel, said attachment including a bracket member, a pair of guides carried thereby and adjustable in respect to each other for directing the strip of paper to the mandrel, and means also carried by said bracket for delivering lubricant to the surface of the strip going to make up the inner surface of the tube.

Signed at Holyoke, in the county of Hampden and State of Mass., this 19th day of January, A. D. 1921.

ROMEO LA CROIX.