M. S. LOWER.

TUBING MACHINE.

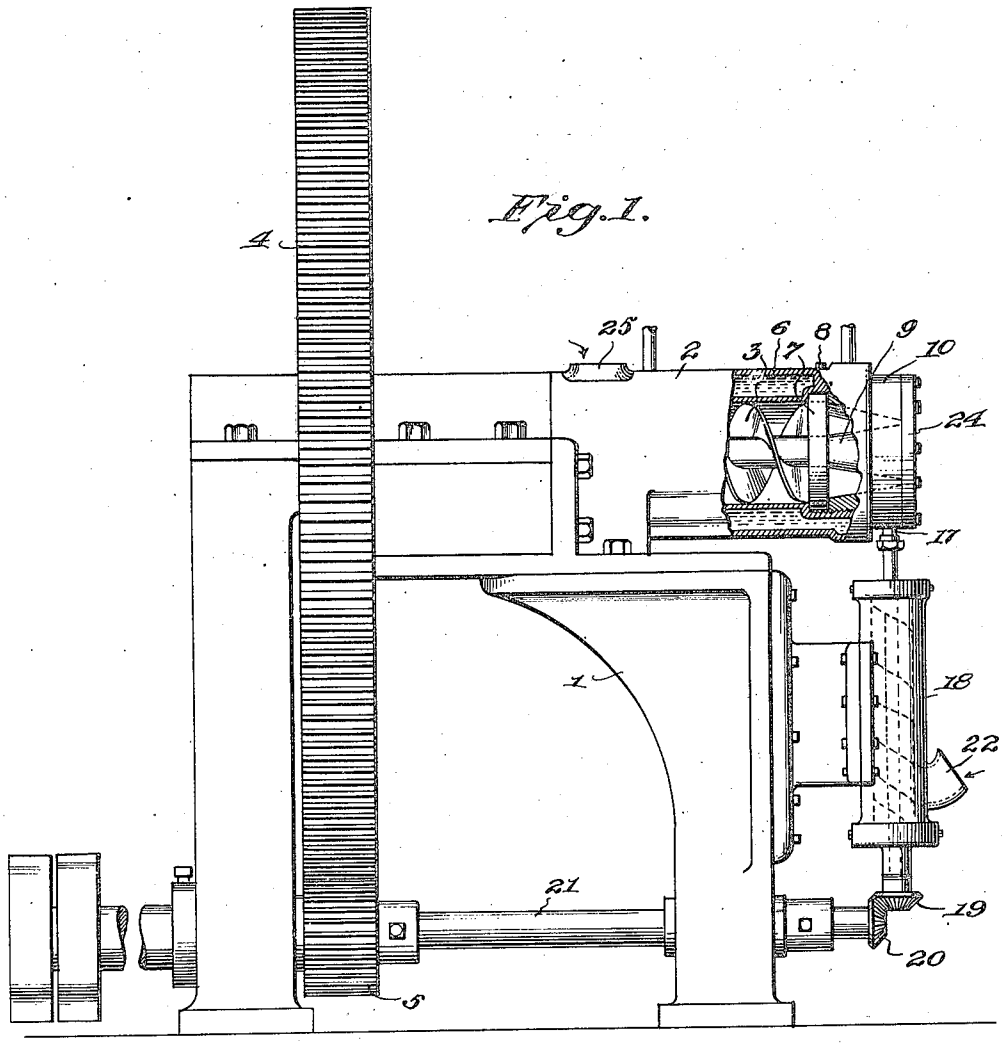
APPLICATION FILED NOV. 3, 1921.

1,428,381.

Patented Sept. 5, 1922.

3 SHEETS—SHEET 1.

Fig. 1.



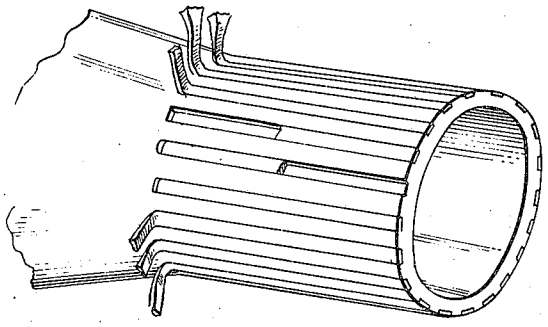


Fig. 2.

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3 SHEETS—SHEET 2.

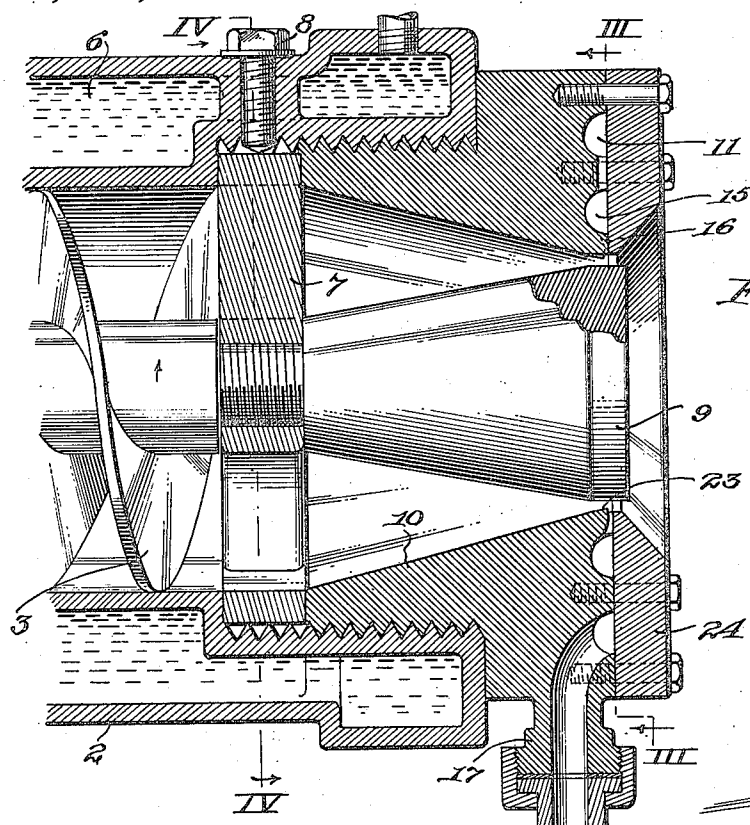


Fig. 2.

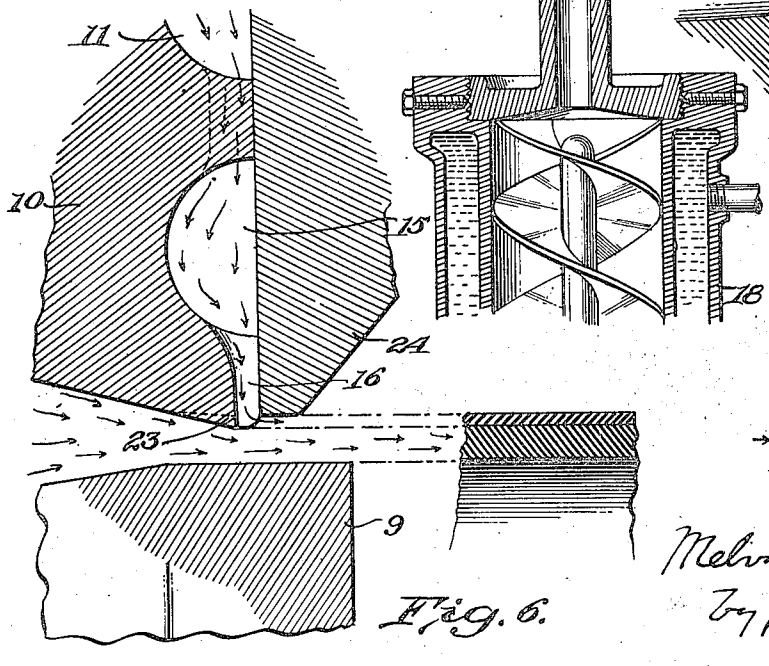


Fig. 6.

Fig. 7.

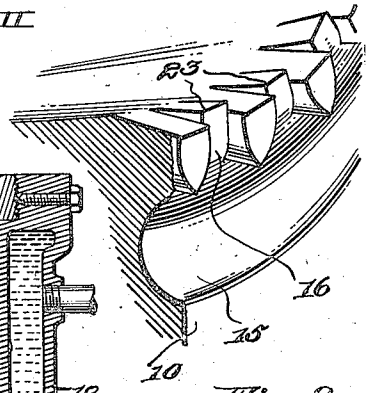
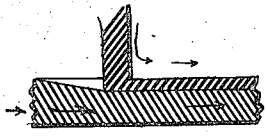


Fig. 8.



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3 SHEETS—SHEET 3.

Fig. 3.

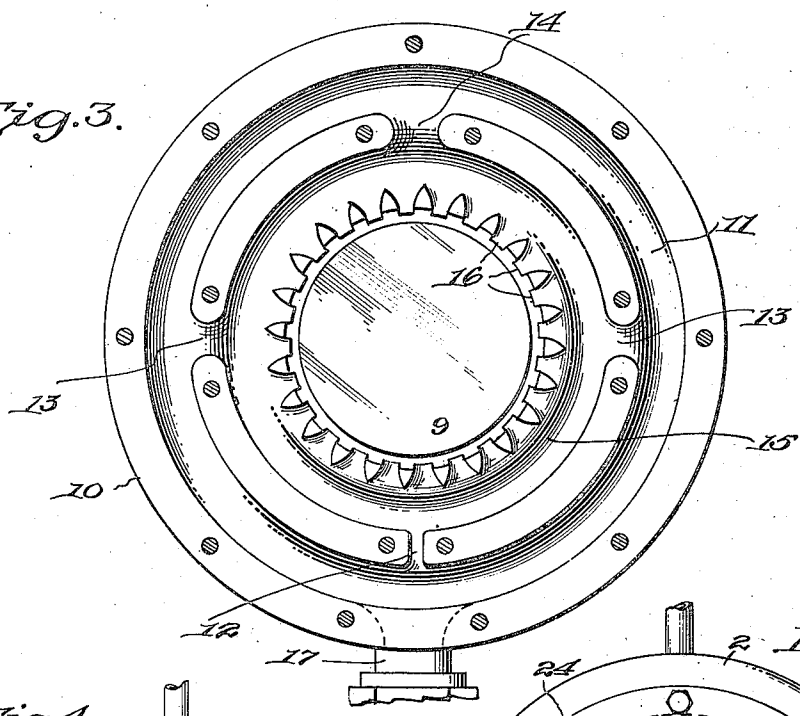


Fig. 4.

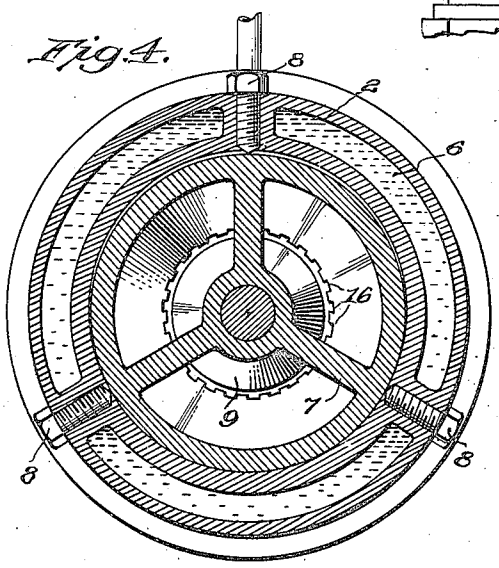
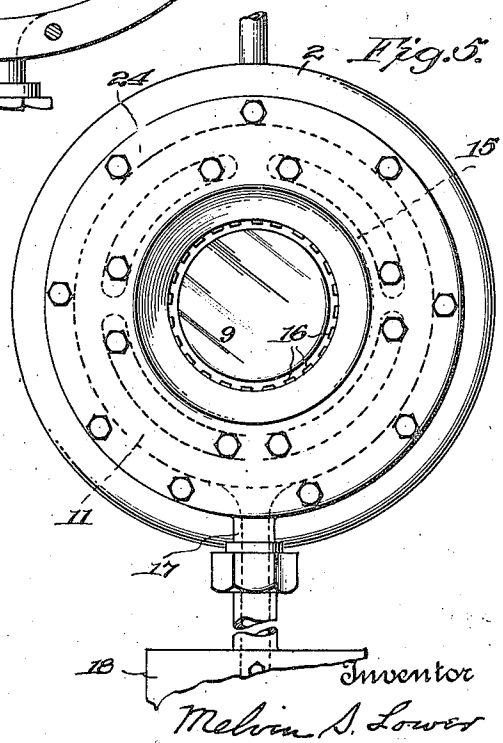


Fig. 5.



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Patented Sept. 5, 1922. 1,428,381

UNITED STATES PATENT OFFICE.

MELVIN S. LOWER, OF ASHLAND, OHIO, ASSIGNOR TO THE FAULTLESS RUBBER COMPANY, OF ASHLAND, OHIO, A CORPORATION OF OHIO.

TUBING MACHINE.

Application filed November 3, 1921. Serial No. 512,697.

To all whom it may concern:

Be it known that I, MELVIN S. LOWER, a citizen of the United States, residing at Ashland, county of Ashland, State of Ohio, have invented certain new and useful Improvements in Tubing Machines, of which the following is a specification.

My invention relates to mechanism for forming tubing of plastic material, such as rubber and the like, and has for its object to provide a machine wherein the tubing when expressed therefrom will embody in its outer surface a plurality of stripes of rubber of a color contrasting with that of the body of the material, but incorporated permanently in said body.

This object I accomplish in the manner and by the means hereinafter described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a side elevation of the mechanism embodying my improved construction, parts of the same being shown broken away and in dotted outline.

Figure 2 is an enlarged detail vertical sectional view of the discharge head of a tubing machine and its attached parts, showing my improved construction.

Figure 3 is a vertical sectional view, taken on the line III—III of Figure 2.

Figure 4 is a vertical sectional view, taken on the line IV—IV of Figure 2.

Figure 5 is a front elevation of the main tubing machine, the auxiliary expressing machine being shown attached thereto and partly broken away.

Figure 6 is an enlarged detail vertical sectional view of the discharge from the main tubing machine, showing the material in the act of being expressed therefrom.

Figure 7 is an enlarged detail perspective view of a portion of the discharge head of the main tubing machine.

Figure 8 is a detail sectional view, illustrating the manner in which the stripes are applied to the body of the material being expressed from the main tubing machine.

Figure 9 is a detail perspective view of the material as it is formed and expressed from the mechanism.

Similar numerals of reference denote corresponding parts in the several views.

In the said drawings, the reference numeral 1 denotes a supporting frame, upon which is mounted horizontally a tubing machine 2 of conventional construction, the same embodying a feed screw 3, driven by a gear wheel 4 in mesh with a smaller gear wheel 5 at the bottom of the machine, which is power-driven in any conventional manner, as shown. The tubing machine 2 is water or steam jacketed at 6 in the usual manner, and near its discharge end is disposed the usual spider 7 fixed in position by the set screws 8 and supporting the front end of the screw 3 as well as the rear end of the usual internal die 9. In all of these respects the mechanism does not differ from tubing machines now in general use, and no further detailed description thereof is deemed necessary.

Mounted in screw-threaded engagement with the interior of the front end of the tubing machine 2 is a head 10, which is on its front face provided with an outer annular groove 11, the same communicating through a series of ports 12, 13 and 14 with an inner annular groove 15, said groove 15 being provided in its inner edge with a plurality of ports 16 discharging annularly in the path of the material as it passes the outer end of the die 9 of the main tubing machine 2, as best seen in Figures 2 and 6. Fixed to a nipple 17 formed on the underside of the head 10 is a smaller machine 18, the same being vertically disposed, and similar in construction to that of the tubing machine 2 except that the die 9 of the latter is omitted, so that the material is expressed therefrom in a smaller but solid stream into the annular groove 11 of the head 10. This supplemental expressing machine is driven by gearing 19, 20, from a shaft 21 forming an extension of the drive shaft which operates the main tubing machine 2, as seen in Figure 1, the material for said machine 18 being fed into the opening 22, in a manner readily understood. In order better to perform the desired operation of the machine, the head 10 at points immediately to the rear of the discharge ports 16 is formed with lips 23, which will serve to form scores in the material being expressed from the main tubing machine, into which the material being expressed through the ports 16 will be received, in order better to incorporate the two mate-

rials in their further passage through the machine. Bolted to the outer face of the head 10 is a circular plate 24 centrally apertured, the same serving to close the grooves 11 and 15, and acting also to shape the exterior of the tube of material being expressed from the tubing machine 2 past the internal die 9, in a manner readily understood.

In operation, when power is applied to the main shaft of the machine, both machines 2 and 18 will be operated, and with material fed into the tubing machine 2 through the usual feed opening 25 therein, the same will be expressed gradually past the die 9 and plate 24 in the form of a tube. If material is fed into the machine 18 at the same time, it will first be forced into the exterior groove 11, and from thence through the passages 12, 13 and 14 into the interior groove 15, from which it will pass through the plurality of ports 16 to meet the flow of material coming from the main tubing machine 2, in a manner readily understood, and will be applied thereto in stripes conforming to the number of ports 16, the ensuing movement of the combined materials being past the outer plate 24, which will incorporate the two and cause the same to present a homogeneous appearance as it emerges from the machine. It will be understood that in applying these stripes, the material fed into the machine 18 will be of a color contrasting with that of the material fed into the main tubing machine 2.

It will be observed, by reference to Figure 3, that the opening 12 from the outer groove 11 to the inner groove 15 is smaller than the openings 13, and the latter in turn are smaller than the opening 14 opposite the opening 12, the object of which is to provide for an equal distribution of material annularly from the outer groove 11 to the inner groove 15, it being obvious that there would be a tendency for the bulk of material to be forced directly through the opening 12, which is in line with the ingress opening, if the same were not made comparatively small.

While I prefer to form the lips 23 upon the head 10 at the discharge ports 16, I wish it to be understood that said construction is not essential to the practical operation of the machine, as it has been found in practice that the stripes will be applied thereto effectually, even if these lips be omitted. By employing said lips, however, and by varying their thickness or amount of projection, the thickness of the stripes applied better may be regulated. While I have shown in Figures 6 and 8, the stripes applied to the material comparatively thick as compared with the body of the material, it will be understood that in practice the stripes are to be extremely thin, not exceeding $\frac{1}{16}$ to $\frac{1}{32}$ of an inch in thickness, though the exterior appearance of the tube when finished will be such that the stripes of contrasting material will seem to be of even thickness.

It usually is the practice in operating tubing machines of this character to position on the front of the discharge head a knife blade, which automatically severs the tube as it emerges from the machine, so that it can be laid out in a flat sheet, and it will be understood that I contemplate the use of such a device, if desired.

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

1. A mechanism for forming striped plastic tubing, comprising a main tubing machine embodying a discharge head, a separate expressing machine fixed to said head and discharging into an annular chamber in said head, and a plurality of ports leading from said chamber and discharging annularly into the discharge orifice of said main tubing machine, whereby material fed by said separate expressing machine will be deposited in stripes upon the material as it is being formed and expressed from said main tubing machine.

2. A mechanism for forming striped plastic tubing, comprising a main tubing machine, a discharge head thereon having outer and inner annular grooves in its outer face connected by ports, said inner groove communicating with a series of ports in the inner edge of said head, a separate expressing machine fixed to said head and discharging into said outer annular groove, and a plate covering said grooves and ports and centrally apertured to permit the passage therethrough of the tube being expressed, the wall of said aperture serving to incorporate the material discharged in stripes from said inner groove in the head with the tube being expressed.

3. A mechanism for forming striped plastic tubing, comprising a main tubing machine, a discharge head therein having outer and inner annular chambers connected by ports, said inner chamber communicating with a series of ports in the inner wall of said head, and a separate expressing machine fixed to said head and discharging into said outer annular chamber, the material from said separate expressing machine being discharged in stripes and being incorporated with the tube being expressed.

4. A mechanism for forming striped plastic tubing, comprising a main tubing machine, a discharge head thereon having outer and inner annular chambers connected by ports, said inner chamber communicating with a series of ports in the inner wall of said head, projecting lips formed on the inner face of said head immediately to the rear of each of said discharge ports, and a separate expressing machine fixed to said

head and discharging into said outer annular chamber, the material from said separate expressing machine being discharged in stripes and being incorporated with the tube being expressed.

5. A machine for forming striped plastic tubing, comprising a main tubing machine, a discharge head thereon having outer and inner annular chambers, said inner chamber communicating with a series of ports in the inner wall of said head, and a separate expressing machine fixed to said head and discharging into said outer annular chamber, said head being provided with a plurality of ports connecting said outer and inner annular chambers, said ports varying in size in accordance with their distance from the inlet from the separate expressing machine, the smallest port being nearest the said inlet.

In testimony whereof, I hereunto affix my signature.

MELVIN S. LOWER.