No. 870,199. PATENTED NOV. 5, 1907.

B. W. SCOTT.

FEEDING AND TENSION MECHANISM.

APPLICATION FILED DEC. 3, 1906.

2 SHEETS—SHEET 1.

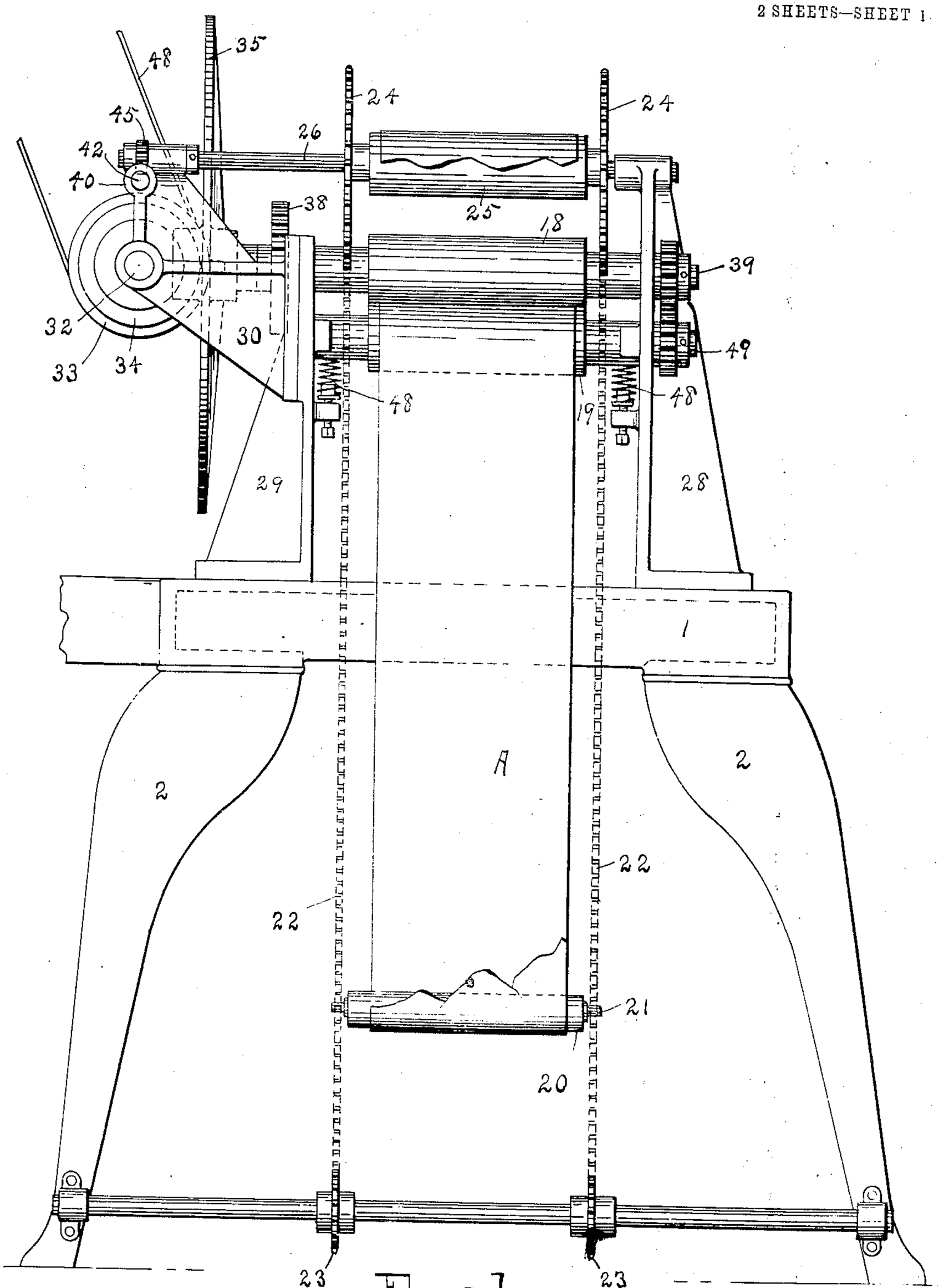

Fig. 1.

Witnesses:
O. B. Baenziger.
Elizabeth M. Brown.

Inventor
By his Attorney
B. W. Scott
Edward N. Pagelsen.

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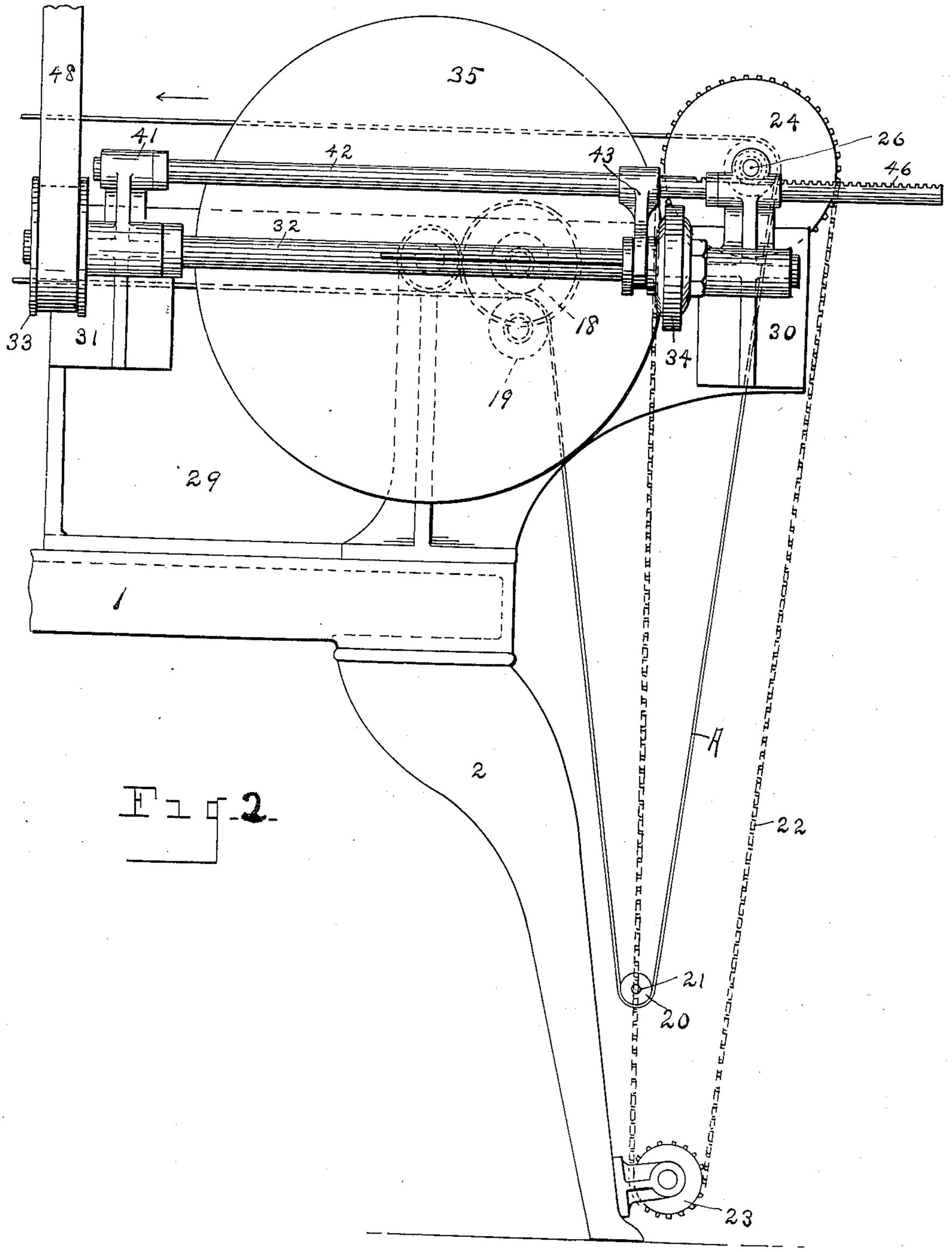

Fig. 2.

Witnesses:
O. B. Baenziger.
Elizabeth M. Brown.

Inventor
By his Attorney
B. W. Scott.
Edward N. Pagelsen

UNITED STATES PATENT OFFICE.

BURTON W. SCOTT, OF DETROIT, MICHIGAN, ASSIGNOR TO KEMIWELD CAN COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

FEEDING AND TENSION MECHANISM.

No. 870,199. Specification of Letters Patent. Patented Nov. 5, 1907.

Application filed December 3, 1906. Serial No. 346,006.

To all whom it may concern:

Be it known that I, BURTON W. SCOTT, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Feeding and Tension Mechanism for Tube-Machines, of which the following is a specification.

My invention relates to machines for forming tubes by convolutely winding bands or strips of paper or other fibrous material coated with cement upon a mandrel, and the object of my improvements is:—to provide means for unwinding the band of tube material from the roll and drawing it through the coating mechanism at such a speed as to supply the winding mechanism as the material is required, and to stop this supply when none is required.

My invention consists in a pair of rollers to pull the band of tube material through the coating means, the speed of the rollers being determined by the pull of the winding mechanism on the band.

It consists further of novel storing means for the excess of tube material which will accumulate between the periods of demand of the winding mechanism.

My invention is embodied in the construction illustrated in the accompanying drawings, in which

Figure 1 is a rear view of my improved device. Fig. 2 is a side view of the same.

Similar reference characters refer to like parts throughout the several views.

The tube machine in connection with which my improved feeding and tension mechanism is to be used is one in which the tube (if of paper) is formed through the machine taking the following steps of operation. 1st. The end of the glue covered paper is fed forward to a hollow mandrel. 2nd. An air pump acting through a longitudinal row of holes in the hollow mandrel causes the paper to be held firmly against the mandrel, and the mandrel revolves to wind up the tube. 3rd. The mandrel stops and the band is cut off by the shears. 4th. The mandrel again revolves and the free end of the paper is pressed against the remainder of the tube to insure its uniting with the same. 5th. The mandrel stops and the completed tube is pushed off. During four of these five steps, there is no demand for the paper, while during the second step the demand is relatively great. If the tube material is wound off a large roll, it is often impossible to start this roll suddenly by tension on the band, and after it has started, its inertia will keep it moving and unwinding.

My improved device is adapted to store the paper unwound because of the inertia of the roll, and by its ability to supply this stored quantity at the time of demand, obviates the necessity of greatly changing the speed of the roll and of the band as it passes through the coating mechanism.

The frame of the machine is composed of bed 1 and the legs 2, the bed being of any desired height and preferably level. To the top are secured any desirable means to support the roll from which the band A is to be wound, and any desired coating mechanism.

The tension and feeding mechanism. The band A passes from the rear roll 12, between the feed rollers 18 and 19, down and around the roll 20 which is mounted on the shaft 21. This shaft is carried by the two chains 22 which pass around the chain wheels 23 and 24. The paper passes from the roller 20 to the roller 25, loosely mounted on the shaft 26 and thence forward over the supporting platform or board 27 to the tube forming mechanism.

In this machine, the paper passes to the tube forming mechanism intermittently, and as the roll 5 of paper is often of great weight and inertia, it is necessary that a constant tension be applied to the strip of paper at the roll 15. It is also very desirable that the paper move through the glue applying mechanism at a constant rate. To insure these results, the following described mechanism is employed.

Projecting from the bed 1, are two frames 28 and 29 and from the frame 29 the brackets 30 and 31 project. In these brackets is mounted a shaft 32 on one end of which is a pulley 33. On this shaft is slidably mounted a friction wheel 34 which is adapted to engage a friction disk 35 secured to the shaft 36. This shaft is mounted in the frames 28 and 29 and carries a gear 37 which meshes with another gear 38, on the shaft 39. Auxiliary brackets 40 and 41 project upwards from the brackets 30 and 31 and in them is mounted a slidable rod 42 which carries a fork 43. The chain wheels 24 are secured to the shaft 26 which has a small gear 45 mounted on its outer end, which gear meshes with the rack 46 on the rod 42. The upper and lower rollers 18 and 19 are geared together at the end opposite the gear 38. The bearings of the shaft 49 of the lower roller 19 are movable vertically in the frames 29 and 30 and are supported by the adjustable springs 48, which construction admits of any desirable pressure between the rollers.

The operation of this mechanism is as follows. The weight of the roll 20 normally keeps it at the position shown in Fig. 2. The position of the friction wheel 34 will be controlled by the position of the roller 20. If too great a demand of the tube material occurs than can be supplied by the rollers 18 and 19, at their speed at that time, the roller 20 will be raised, which movement will move the chains 22, and with them, the chain wheels 23 and 24. The revolution of the chain wheels 24 to the right, Fig. 2, will push the rod 42 to the left

and with the rod the friction wheel 34 will be moved toward the center of the disk 35. The belt 48 on the pulley 33 has a constant speed given it by a counter shaft and therefore the friction wheel 34 has a constant speed. The speed of the friction disk 35 will therefore increase or decrease according as the wheel 34 moves toward and from the center of this disk. As before stated, the feed rollers 18 and 19 are driven by this friction disk 35, and their speed will therefore be increased by the rising of the roller 20 and be decreased by its falling. Any sudden increase in demand for tube material will be met by the roller 20 rising under the pull on the band A, which in turn will cause the feed rollers 18 and 19 to supply the extra demand. When the demand for material ceases entirely, the roller 20 will, of course, reach its lower position, at which the friction wheel 34 will be entirely out of contact with the disk 35, as shown in Fig. 2. This particular part of the mechanism prevents the gummed face of the band A from reaching the floor because the feed rollers 18 and 19 will stop before such time and with them the movement of the band A.

Having now explained my improvements, what I claim as my invention and desire to secure by Letters Patent is,—

1. In a tube machine, the combination of feed rolls for the tube material, gears to connect the same, a friction disk to drive said rolls, a constantly driven friction wheel to contact with the face of said disk and actuate the same at variable speed, a chain gear mechanism to position the friction wheel, and a roller carried by the chain gear mechanism, the position of said roller being determined by the tension of the tube material.

2. In a tube machine, the combination of a bed, a pair of feed rolls, means to control the pressure between the same, friction gears for driving the rolls at variable speed, a toothed gear to control the relative positions of the gears, chain wheels connected to said toothed gear, chains engaging said wheels, a shaft and roller carried by said chains, and a second roller over which the material passes, the band of tube material passing between the feed rolls, down and up around the roller mounted on the chains, and over the second roller, the height of the first roller being determined by the tension on the band, and the speed of the feed rolls being determined by the height of the roller.

3. The combination of feed rolls for a band of flexible material, friction gears to drive the same, and a chain gear mechanism to control the relative positions of the friction gears, the chain gear mechanism being positioned according to the tension on the band of material.

In testimony whereof I have signed my name in the presence of two subscribing witnesses.

BURTON W. SCOTT.

Witnesses:
E. N. PAGELSEN,
JARVIS R. HARBECK.