

E. J. KERN.
MACHINE FOR MAKING TUBES.
APPLICATION FILED NOV. 5, 1908.

1,018,114.

Patented Feb. 20, 1912.

2 SHEETS—SHEET 1.

Fig. 1

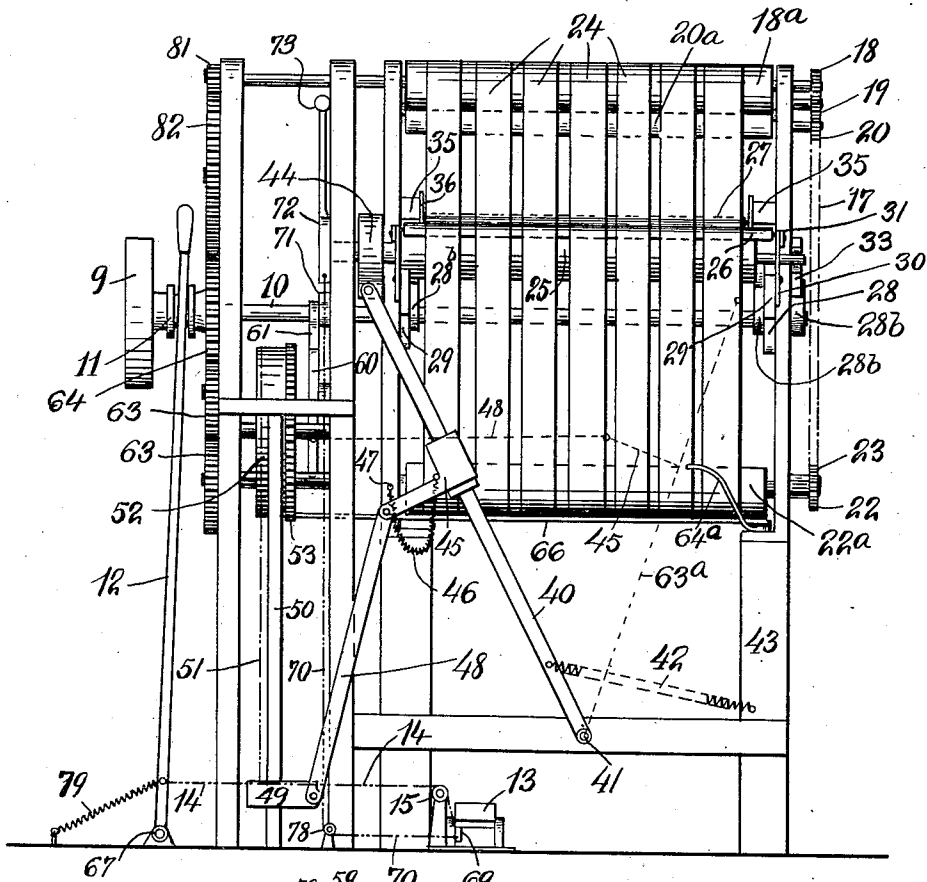
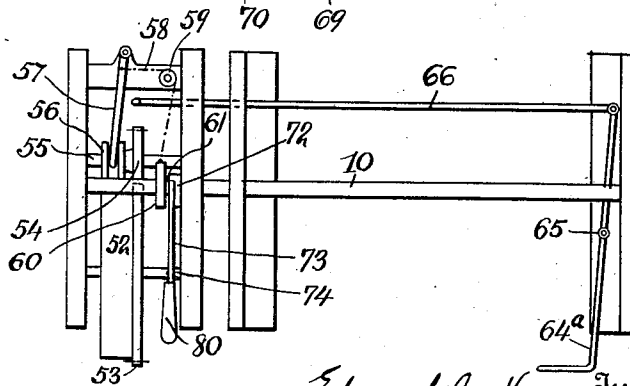


Fig. 2



Witnesses
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By his Attorney
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Fig. 3

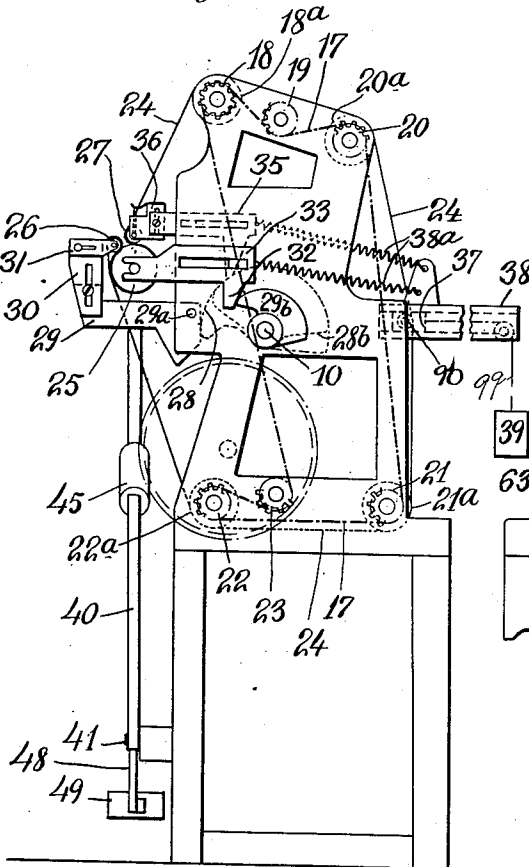


Fig. 4

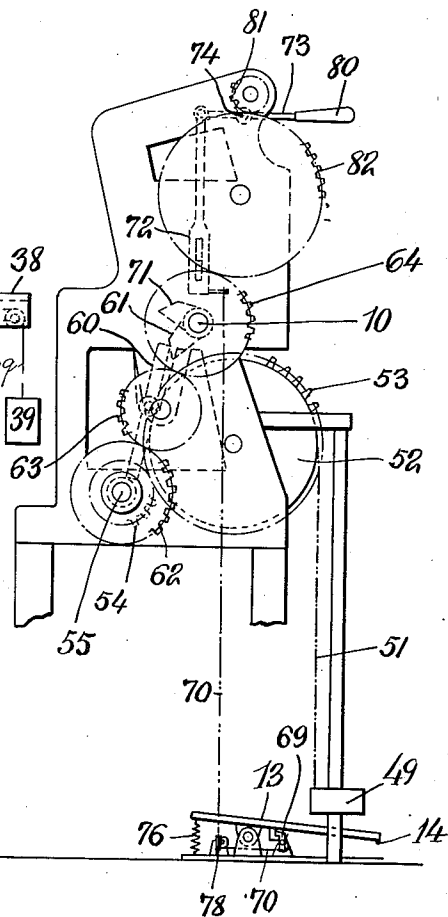
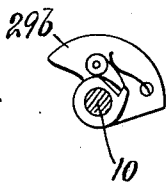


Fig. 5



UNITED STATES PATENT OFFICE.

EDWARD J. KERN, OF BROOKLYN, NEW YORK.

MACHINE FOR MAKING TUBES.

1,018,114.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed November 5, 1908. Serial No. 461,127.

To all whom it may concern:

Be it known that I, EDWARD J. KERN, a citizen of the United States, residing in the borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Machines for Making Tubes, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in tube making machinery and has particular reference to a machine adapted for making paper tubes from sheets of glued paper introduced thereinto.

Referring to the accompanying drawings Figure 1 is a front elevation of a machine illustrating the invention. Fig. 2 is a plan view looking down, with some of the parts removed. Fig. 3 is an end view looking from right to left at Fig. 1. Fig. 4 is a similar view partly broken away looking from left to right at Fig. 1. Fig. 5 is an enlarged view of one of the pawl and ratchet devices used in combination with a cam. Fig. 6 is a diagrammatic view showing the position of the various rollers when in the act of making the tube, and Fig. 7 is another diagrammatic view showing the normal position of said rollers before and after the tube is made.

9 is a suitable driving pulley connected to the main shaft 10 by the clutch 11 which may be operated by the hand bar 12 or which may be operated by placing the foot upon the treadle 13 which is attached to the end of a suitable wire or chain 14 passing over the pulley 15 and also attached to the lever 12 which holds the clutch out of engagement by the spring 79. By this means the power may be thrown on to the main driving shaft 10 by hand or with the foot as shown. This main driving shaft is provided with a gear 64 intercalating with gears 63 and 82, the gear 82 operating the pinion 81 which drives the roller 18^a provided with sprocket 18 over which passes the sprocket chain 17 which then passes beneath the idler roller 19 over the sprocket gear 20 upon the roller 20^a, over the sprocket gear 21 upon the roller 21^a, around the sprocket gear 22 upon the roller 22^a, and

around the sprocket 23 forming a complete circuit and insuring the uniform rotation of said rollers by said sprockets. Endless tapes 24 also pass over the rollers 18^a, 20^a, 90, 21^a, 22^a and the forming roller 25, including in passing around said forming roller the auxiliary forming rollers 26 and 27, the roller 90 being for the purpose of taking up slack as hereinafter set forth.

28 is a cam mounted upon the driving shaft 10 operating the carriage 29 mounted upon the pivot 29^a and upon which carriage is vertically adjustable the standard 30 carrying the horizontally adjustable roller bearing 31. Said driving shaft also carries the cam 29^b adapted to engage the depending projection 32 of the carriage 33 which is thereby reciprocated horizontally upon each revolution of the cam 29^b. 35 is another horizontally reciprocating carriage provided with a depending projection adapted to engage the cam 28^b and provided with the vertically adjustable roller bearing 36. Upon each revolution of the driving shaft 10, the carriage 29, which remains suspended from the bearing 29^a, is thrown upwardly into the position shown in Fig. 3 by the cam 28 and at the same time the cam 28^b throws the carriage 35 leftwardly and the cam 29^b also throws the carriage 33 leftwardly, both said last named carriages being thrown against the action of the springs 38^a, the auxiliary rollers engaging the forming roller 25 which is mounted rigidly on the left looking at Fig. 1, and positioning said auxiliary rollers 26 and 27 in the position shown in Fig. 3 and in the diagram shown in Fig. 6 so that upon inserting the sheet of glued paper between the endless tapes passing between the rollers 25 and 26, said sheet is immediately wound around the forming roller 25 under tension provided by the endless tapes 24, after which the formed tube is ejected as will be hereinafter more particularly set forth. The roller 90 is inside the tapes 24 and is mounted upon the traveler 37 to which is attached the wire 99 and said traveler 37 is adapted to reciprocate horizontally in the frame 38 by virtue of the counter-weight 39 attached to the traveler 99. From this it will be seen that there is always a pull upon

the tapes 24 tending to draw them taut looking at Fig. 3, so that after the cams 28 and 28^b have sufficiently revolved to release their engagements with the depending projections of the carriages 29 and 35, the auxiliary rollers 26 and 27 are moved by the tapes 24. The carriages 33 and 35 thereby recede and the carriage 29 drops downwardly upon its bearing 29^a leaving the position of the rollers as in the diagram shown in Fig. 7, the weight 39 serving to take up the slack in the endless tapes 24 caused by the change in the position of the forming rollers.

40 is a telescopic lever mounted upon the pivot 41 and provided with the spring 42 attached to the frame 43 of the machine. This lever is also provided at the opposite extremity with the sleeve or collar 44 mounted upon the forming roller 25 and adapted to slide freely thereupon when the lever 40 which comprises two telescopic sections is thrown from side to side of the machine.

45 is an arm extending from the lever 40 and provided with the spring 46 anchored to the frame-work of the machine at 47. To this arm 45 is also attached the lever 48 carrying at its lower extremity the weight 49 adapted to ride upon the vertical bar 50. This weight is attached to the end of the wire 51 wound upon the drum 52 provided with the gear 53 intercalating with the pinion 54 loosely mounted upon the shaft 55 which is provided with the fixed clutch member 56 adapted to be thrown into engagement with the pinion 54 by the lever 57 controlled by the wire 58 passing over the pulley 59 and attached to the bar 60 operated by the cam 61 upon the cam shaft 10, so that upon each revolution of the driving shaft 10 the weight 49 is elevated thereby throwing the ejector 44 rightwardly along the forming roller and ejecting the tube formed thereon rightwardly from the machine looking at Fig. 1, the carriage 33 holding the rightward extremity of the forming roller 25 being withdrawn by the spring 38^a as the ejector 44 travels in its direction. As the bar 40 reaches the limit of its stroke as indicated in dotted outline 63^a, it comes in contact with the lever 64^a pivoted at 65 and provided with lever 66 pivoted thereto. As the lever 64^a is struck by the ejector lever 40 it is swung upon the pivot 65 throwing the lever 66 leftwardly looking at Fig. 2 and throwing the clutch member 56 out of engagement with the pinion 54 thereby releasing the weighted member 49 which drops under the influence of gravity and spring 46 returning the ejector 44 to its original position.

The machine is automatically stopped after the formation of each tube by the

clutch 11 which is thrown out of engagement by the lever 12 pivoted at 67 and provided with the wire 14 passing over pulley 15 to the treadle 13 before referred to. This treadle is provided with a little spring catch 69 of usual construction so that as the treadle is thrown down by the foot to start the machine, it locks and after the tube has been formed by the machine the cam 71 upon the driving or cam shaft 10 throws upwardly the lever 72 connected with the wire 70 passing over the little pulley 78 and fastened to the spring catch device 69 throwing the same out of engagement with the treadle and allowing the treadle to return to its original position by virtue of the spring 76, thereby releasing the clutch lever 12 which under influence of the spring 79 returns to its original position releasing the coupling 11. The lever 72 is also pivoted to the lever 73 axially mounted at 74 terminating in the handle 80, so that the machine may be stopped at any time by striking the handle 80 which releases the spring catch 69 the same as if the cam 71 elevated the lever 72 as before described.

For the purpose of reversing the machine the cams may be loosely mounted upon the shaft as shown in Fig. 5 and provided with spring retained pawls so that they will clear the depending projections.

Various modifications may be made without departing from the spirit of the invention.

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

1. In a tube making machine, a driving shaft and transmission means, rolls operated thereby, an endless tape upon said rolls, a roller former having a carriage bearing auxiliary roller formers, means in combination with said roller former and said auxiliary roller formers whereby said carriage bearing and said auxiliary roller formers are moved relatively after each tube is made, and an ejector to discharge the made tube.

2. In a tube making machine, a driving shaft and transmission means, rolls operated thereby, an endless tape upon said rolls, a roller former and auxiliary roller formers, and means in combination with said roller former and said auxiliary roller formers whereby the same are moved relatively after each tube is made, said means comprising carriages in which said auxiliary roller formers are mounted and operating means for raising the carriage of one of said auxiliary roller formers and for advancing the other of said auxiliary roller formers in the direction of said roller former.

3. In a tube making machine, a driving shaft and transmission means, rolls operated

thereby, an endless tape upon said rolls, a roller former and auxiliary roller formers, means in combination with said roller former and said auxiliary roller formers whereby the same are moved relatively after each tube is made, said means comprising carriages in which said auxiliary roller formers are mounted and means for raising one of said carriages and for advancing the other

of said carriages of said auxiliary roller 10 formers.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD J. KERN.

Witnesses:

JOHN T. REILLY,
THOMAS A. HILL.