Jan. 21, 1930. T. L. YOUNG 1,744,292

CONVERTING MACHINE

Filed Dec. 10, 1927 2 Sheets-Sheet 1

Fig. 1

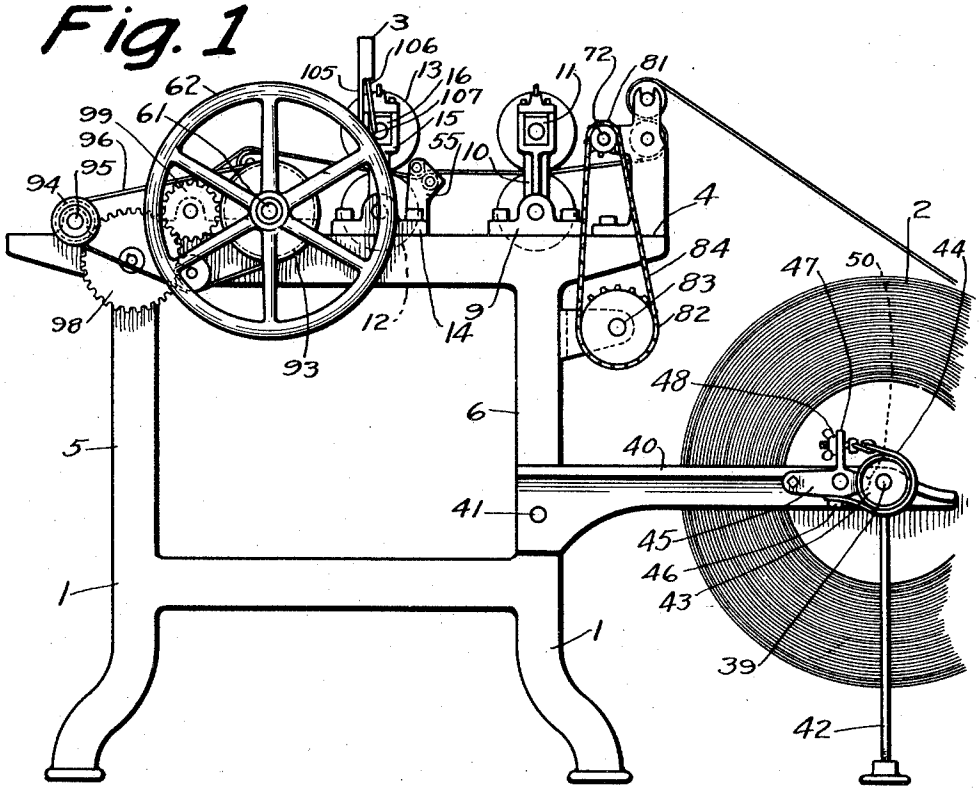
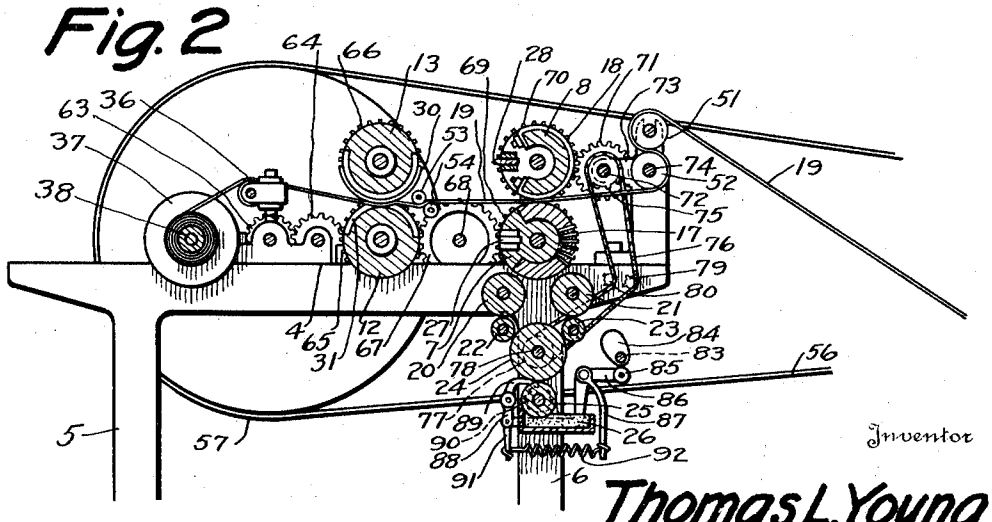


Fig. 2



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Fig. 3

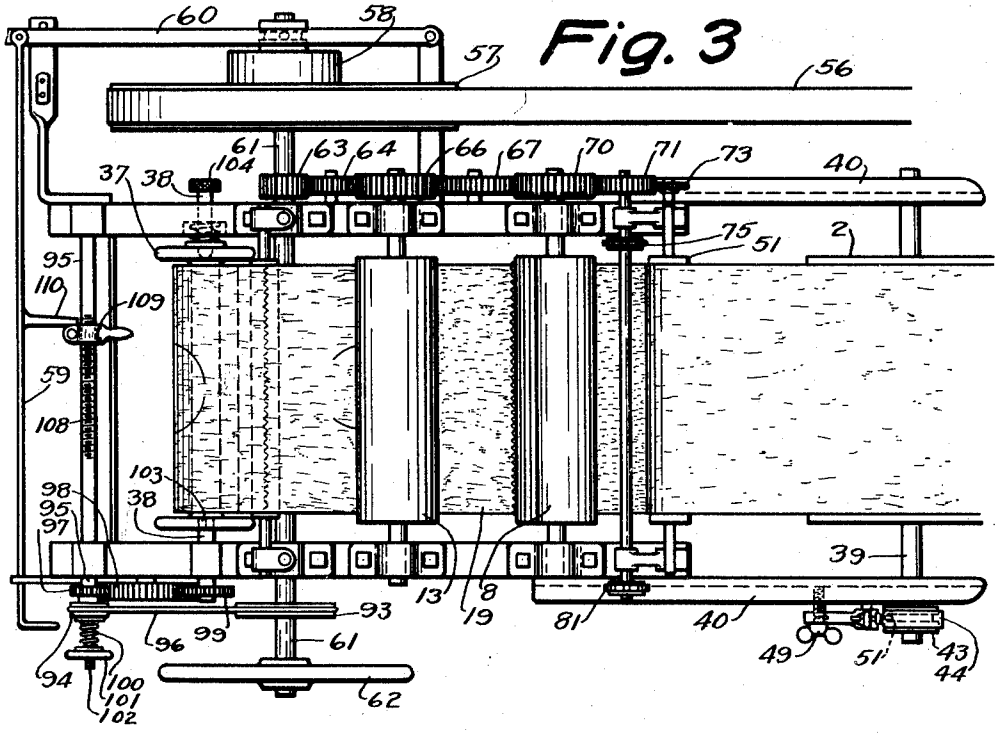


Fig. 4

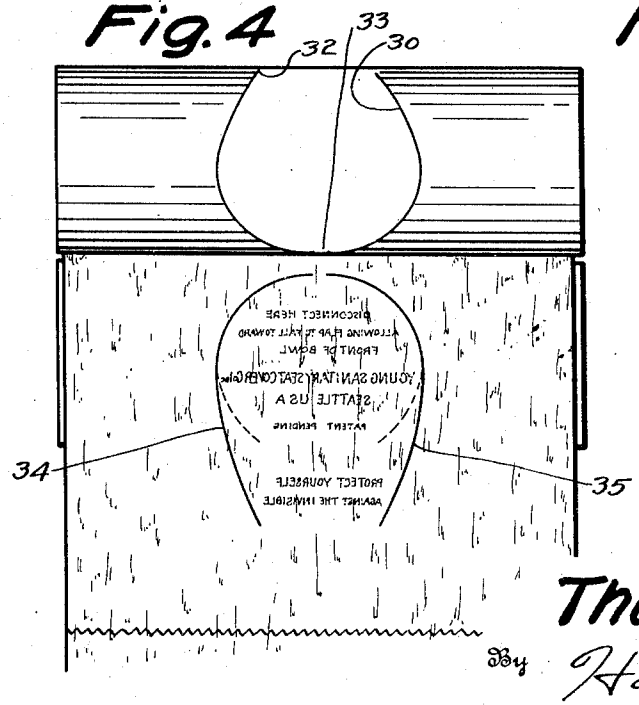


Fig. 5



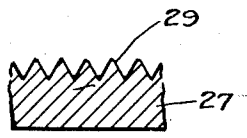


Fig. 6

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UNITED STATES PATENT OFFICE

THOMAS L. YOUNG, OF SEATTLE, WASHINGTON

CONVERTING MACHINE

Application filed December 10, 1927. Serial No. 239,171.

The invention is a machine for printing, perforating and cutting a strip of paper as it is transferred from one roll to another.

The object of the invention is to provide a suitable device for converting a roll of plain paper into small rolls of commode seat covers.

Another object of the invention is to provide a machine embodying the combination of printing, perforating, and partially cutting openings in sheets of paper passing therethrough.

Another object of the invention is to provide a machine for printing and cutting a material that passes from one roll to another in which each roll is provided with means for causing tension in the material.

A further object of the invention is to provide a tabulating device for a machine for converting rolls of paper into commode seat covers which will record the number of covers.

A still further object of the invention is to provide a backing for a perforating knife which is the same shape as the knife so that it will perforate a thin crepe paper with a clean cut.

And a still further object of the invention is to provide a converting machine of the type described which is of a simple and economical construction.

With these ends in view the invention embodies a machine having a stand for holding a roll of paper at one end, means on the stand for frictionally gripping the paper shaft, a frame to which the said stand is attached, two sets of vertically positioned rolls on the said stand, one of the said sets of rolls having means for printing and perforating paper passing therethrough, the other set of rolls having suitable dies for partially cutting openings in the paper, means for inking the said printing device, suitable feed rollers for the said paper, a shaft for a spool upon which the finished product is wound, means for causing tension on the said spool, and suitable driving mechanism for the various devices.

Other features and advantages of the invention will be seen from the following description taken in connection with the drawings, wherein:—

Figure 1 is a side elevation of the machine.

Figure 2 is a longitudinal section showing the rollers and drives.

Figure 3 is a plan view with parts omitted.

Figure 4 is a view showing a sheet of the printed and cut paper as it is passing out of the die rollers.

Figure 5 is a view showing a portion of the perforating knife.

Figure 6 is a view showing a section of the die which forms a backing for the perforating knife.

In the drawings the device is shown as it would be made wherein numeral 1 indicates the main frame, numeral 2 the supply roll of paper, and numeral 3 a tabulating device.

The frame 1 may be made as shown or of any suitable design and of any suitable material. In the design shown it is made with the horizontal upper surface 4 to which the bearings of the main shaft are attached, which is supported on suitable legs 5 and 6.

The printing and perforating rolls which are indicated by the numerals 7 and 8 are mounted in bearings 9 which are provided with uprights 10 in which the upper roll is mounted in blocks 11 so that its position may be adjusted in relation to the lower row. The other set of rollers which form the dies are indicated by the numerals 12 and 13 and are mounted in similar bearings which are indicated by the numerals 14 and provided with uprights 15 in which the upper roller is adjustably mounted in blocks 16. It will be observed that type may be mounted in the roller 7 as indicated by the numeral 17 which will engage a platen as indicated by the numeral 18 in the roller 8 or so that it will print upon the paper which is indicated by the numeral 19 as the paper passes between the type and platen. At the lower side of the roller 7 the type will engage ink rollers 20 and 21 which engage smaller rolls 22 and 23 that engage a larger roller 24 which is inked by an ink roller 25 which dips into an ink pan 26.

The die as shown in Figure 6 and indicated by the numeral 27 is positioned in the side

of the roller 7 as shown in Figure 2 so that the perforating knife as indicated by the numeral 28 and positioned in the roller 8 will extend into it as both pass the center. As the paper passes between the rollers the knife 28 will pass through the paper and make a celan cut with the exception of the corners which as seen in Figure 6 and indicated by the numeral 29 are slightly rounded. With a thin crepe paper of this nature it is absolutely necessary for the edges of the knife to actually engage the backing or die in order to make a clean cut without tearing the paper.

The paper then passes from the rolls 7 and 8 to the rolls 12 and 13 in which the dies 30 and 31 are formed. The male member of the die as indicated by the numeral 30 and shown in Figure 4 is formed with a wide opening as indicated by the numeral 32 at one end and a very small opening as indicated by the numeral 33 at the other end, and the sides of the die are curved as shown to form cuts as shown by the lines 34 and 35 on the piece of paper shown as coming through the dies in Figure 4. The female member of the die as indicated by the numeral 31 is recessed in the roller 12 and the cutting edges are shaped exactly like the edges of the member 30 so that a clean cut will be made on the lines as indicated by the numerals 34 and 35. The devices will be printed on the flap formed between the lines on which the device is cut as shown in Figure 4. From the rollers 12 and 13 the paper will pass over a small roller as indicated by the numeral 36 and from there to a spool 37 upon which the paper is wound and which is mounted on the shaft 38.

The paper is supplied from a large roll 2 which is mounted upon a shaft 39 and supported in arms 40 which are pivotally attached to the legs 6 and the frame 1 by pins 41 and the outer ends of which are supported in adjustable stands 42 so that the outer ends may readily be raised or lowered as desired. The outer end of the shaft 39 is provided with a wheel 43 and a band 44 may be placed around the wheel with one end attached to a member 45 by a bolt 46 and the other adjustably attached to a projection 47 on the member 45 by a thumb screw 48 so that the pressure with which it grips the wheel 43 may readily be adjusted. It will also be observed that the member 45 is positioned from the arm 40 by a thumb screw 49 and the end 50 of the member 45 projects into a slot 51 in the wheel 43 which is shown in dotted lines in Figure 3 so that as the thumb screw 49 is screwed inward or outward it will move the shaft 39 transversally of the said machine so that the supply roller 2 may be positioned relative to the devices on the rolls 7 and 8 and 12 and 13.

From the supply roll 2 the paper passes to a pair of rollers 51 and 52, passing over the roller 51, between the rollers and then under the roller 52 as shown in Figure 2. From the under side of the roller 52 the paper passes between the rollers 7 and 8 and then between the rollers 12 and 13 and then over the roller 36 to the spool 37. A pair of small rollers 53 and 54 may be provided as shown in Figure 2 to feed the paper to the die rollers 12 and 13. These rollers are mounted in stands 55 extending upward from the bearing 14.

The device may be operated by a belt 56 which may be driven from a counter shaft or motor or any other suitable means which will drive a pulley 57 having a clutch 58 at one side which may be operated by a rod 59 through a lever 60 or directly by the lever 60 so that it may be operated from either side of the machine. The pulley 57 is mounted upon a shaft 61 which extends through the frame and the opposite end of which is provided with a hand wheel 62 by which the device may be started or operated if desired. A small gear 63 is mounted on the shaft 61 and it will be observed that this gear meshes with another gear 64 and the gear 64 meshes with a gear 65 on the shaft of the roller 12. The gear 65 also meshes with a gear 66 on the shaft of the roller 13 so that both rollers will operate in unison and the gear 65 also meshes with a gear 67 on a shaft 68, the opposite side of which meshes with a gear 69 on the shaft of the roller 7 to operate the printing roller. The gear 69 meshes with another gear 70 on the shaft of the roller 8 so that this roller will operate in unison with the roller 7 and the gear 70 meshes with a gear 71 on a shaft 72. The gear 71 also meshes with a gear 73 on a shaft 74 which will operate the roller 52. The shaft 72 is also provided with a sprocket 75 over which a chain 76 passes that operates a sprocket 77 on a shaft 78 of the ink roller 24. This chain passes over two idler sprockets 79 and 80. Another sprocket 81 is also mounted on the shaft 72 which drives the sprocket 82 on a shaft 83 through a chain 84 and it will be observed in Figure 2 that the shaft 83 is provided with a cam 84 that engages a roller 85 on a lever 86 which is pivotally mounted on a support 87 and the opposite end of which is attached to a latch 88 having a prong 89 that will engage a ratchet 90 on the shaft of the ink roller 25 so that as the shaft 83 rotates it will operate the latch through the lever 86 and rotate the roller 25 with an intermittent movement. The lower end of the latch 88 is provided with a projection 91 that is resiliently held by a spring 92 which is attached to a projection at the lower end of the support 87. The spring will return the latch to the free position between each rotation of the cam.

The shaft 61 is also provided with a pul-

ley 93 which will drive another pulley 94 on a shaft 95 through a belt 96 and the shaft 95 is provided with a freely mounted gear 97 which will mesh with a gear 98 which also meshes with another gear 99 on the shaft 38 of the spool 37. The gear 97 is resiliently held through the pulley 94 by a spring 100, the tension of which may readily be adjusted by a hand wheel 101 on a screw 102 at the end of the shaft 95. It will be observed that by turning the hand wheel the amount of friction against the gear 97, may be readily adjusted so that the gear may be rotated to rotate the spool with constant pressure on the paper. The shaft 38 is formed of two stub shafts extending into the ends of the spool with the end of one which is indicated by the numeral 103 squared so that it will cause the spool to rotate. Whereas at the opposite end the stub shaft is held by a spring and the outer end is provided with a head 104 so that it may readily be withdrawn to remove and replace the spool.

The tabulating device which is indicated by the numeral 3 is supported on a bar 105 from the stand 15 and provided with a rod 106 which is eccentrically attached to the end of the shaft of the roller 13 as shown at the point 107 so that as the shaft rotates each revolution may be recorded in the device.

It will be observed that the shaft 95 extends across the frame and the inner portion therein is threaded as shown at the point 108 and a split nut 109 is mounted thereon in such a manner that as the shaft makes a predetermined number of revolutions the nut 109 will engage a projection 110 on the bar 59 and move the rod to such a position that the clutch will be free and the machine will stop.

It will be understood that changes may be made in the construction without departing from the spirit of the invention. One of which changes may be in the design or arrangement of the frame as it is understood that any suitable frame may be used. Another may be in the use of other means for feeding the paper, another may be in the use of other means for perforating and cutting the paper, another may be in the use of other means for operating the spool upon which the finished prdouct is wound, and still another may be in the use of other means for automatically stopping the machine. It is also understood that other minor changes may be made in the construction and arrangement without departing from the spirit of the invention.

The construction will be readily understood from the foregoing description. To use the device the machine may be arranged as shown and the paper fed through it as shown in Figure 2. As the machine is started the die and printing and perforating rollers will be operated through the gears and the spool upon which the finished product is wound will also be operated by the belt 96 and through the intermediate gears as shown in Figures 1 and 3, and it will be observed that as the spool 37 is operated, the gear 97 is frictionally held so that the speed of the spool will be automatically regulated to provide a constant tension on the paper. After a pre-determined amount of the finished covers have been wound upon the spool the spool may be removed and the roll of covers removed. It will therefore be observed that this machine will readily convert a large roll of plain paper into a plurality of smaller rolls of commode seat covers which are printed, and have cuts forming flaps therein and are also perforated so that each cover may be torn off.

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

1. In a machine of the class described, a pair of printing rollers, one of the said rollers having type thereon and the other a platen, one of the said rollers also having a perforating knife with the teeth projecting from the surface thereof and the other having a die forming a backing for the said knife with openings, the surface of which corresponds with the edges of the said knife, another pair of rollers one having the male member of a die on the surface thereof and the other having the female member recessed in the surface thereof, said dies being arranged to cut two corresponding curved slits, one end of the said curved slits being spaced apart a considerbale distance and the other ends comparatively close together, means for operating the said rollers, means for feeding a continuous sheet of material through the said rollers, a removable spool upon which the said material will be wound, means for rotating the said spool to automatically provide constant tension on the material and means for automatically stopping the said machine when a pre-determined amount of material has been wound on the said spool.

2. In a converting machine of the class described, a plurality of rollers, means for feeding a sheet of material through the said rollers, means on the said rollers for printing upon the said material, suitable transverse dies for perforating the material in a straight line extending across it suitable longitudinal dies for making two corresponding curved cuts which are comparatively close together in one end and separated at the other in the said material, and a spool upon which the said material may be wound.

3. In a converting machine of the class described, a plurality of rollers, means for feeding a sheet of material through the said rollerse, means on the said rollers for printing upon the said material, suitable transverse dies for perforating the material in a straight

line extending across it suitable longitudinal dies for making two corresponding curved cuts which are comparatively close together in one end and separated at the other in the said material, a spool upon which the said material may be wound, and said spool provided with means for causing a constant tension upon the said material.

4. In a converting machine of the class described, a plurality of rollers, means for feeding a sheet of material through the said rollers, means on the said rollers for printing upon the said material, suitable transverse dies for perforating the material in a straight line extending across it suitable longitudinal dies for making two corresponding curved cuts which are comparatively close together in one end and separated at the other in the said material, a spool upon which the said material may be wound, and means for stopping the said machine when a predetermined amount of the said material has been wound upon the said spool.

5. In a converting machine of the class described, a plurality of rollers, means for feeding a sheet of material through the said rollers, means on the said rollers for printing upon the said material, suitable transverse dies for perforating the material in a straight line extending across it suitable longitudinal dies for making two corresponding curved cuts which are comparatively close together at one end and separated at the other in the said material, a spool upon which the said material may be wound, said spool provided with means for causing a constant tension upon the said material, and means for stopping the said machine when a pre-determined amount of the said material has been wound upon the said spool.

6. In a converting machine, a pair of printing and perforating rollers, a pair of rollers having dies adaptable to cut two curved slits comparatively close at one end and separated at the other, means for feeding a continuous sheet of paper through the said rollers from a supply roll, means for adjustably supporting the said supply roll, means for frictionally holding the said supply roll, means for adjusting the said supply roll laterally, a removable spool upon which the material is wound from the die rollers, means for operating the said spool to provide constant tension on the material being fed thereto, and means for rotating the said rollers to provide continuous operation.

7. In a converting machine, a pair of printing and perforating rollers, a pair of rollers having dies adaptable to cut two curved slits comparatively close at one end and separated at the other, means for feeding a continuous sheet of paper through the said rollers from a supply roll, means for adjustably supporting the said supply roll, means for frictionally holding the said supply roll, means for adjusting the said supply roll laterally, a removable spool upon which the material is wound from the die rollers, means for operating the said spool to provide constant tension on the material being fed thereto, means for rotating the said rollers to provide continuous operation, and means for stopping the said machine when a pre-determined amount of material has been wound upon the said spool.

8. In a converting machine of the class described, a pair of rollers, one of the said rolls having type thereon and the other a platen to co-operate with the said type, the said roll having the type also having a die adaptable to receive a perforating knife and the other roll having a knife adaptable to co-operate with the said die, suitable means for inking type on the said roller adjacent thereto, another pair of rollers having dies thereon adaptable to form two corresponding curved slits with their ends comparatively close together at one side and separated at the other, means for feeding a sheet of material through the said rollers from a supply roll, a spool upon which the said material is wound after passing through the said rolls, suitable means for operating the said rolls, spool and feeding means, and means for holding the said material in tension after it passes through the said machine.

9. In a converting machine of the class described, a pair of rollers, one of the said rollers having type thereon and the other a platen to co-operate with the said type, the said roll having the type also having a die adaptable to receive a perforating knife and the other roll having a knife adaptable to co-operate with the said die, suitable means for inking type on the said roller adjacent thereto, another pair of rollers having dies thereon adaptable to form two corresponding curved slits with their ends comparatively close together at one side and separated at the other, means for feeding a sheet of material through the said rollers from a supply roll, a spool upon which the said material is wound after passing through the said rolls, suitable means for operating the said rolls, spool and feeding means, means for holding the said material in tension after it passes through the said machine, and means for stopping the said machine when a pre-determined amount of the material has passed therethrough.

10. In a device of the class described, means for rotatably mounting a roll of paper, suitable feed rollers for feeding the paper from the roll, a pair of rollers through which the paper is fed, means on the said rollers for perforating the paper, other means on the said rollers for printing the paper, another pair of rollers through which the paper is also fed, means on the said latter rollers for cutting a corresponding pair of curved

lines in the paper, another roller upon which the said paper is rolled, and means for rotating the said roller to provide constant tension upon the paper.

11. In a converting machine of the class described, a plurality of rollers, means for feeding a sheet of material through the said rollers, means on the said rollers for printing upon the said material, and suitable transverse dies for perforating the said material in a straight line extending across it and suitable longitudinal dies for making two corresponding curved cuts which are comparatively close together in one end and separated at the other in the said material.

In testimony whereof he affixes his signature.

THOMAS L. YOUNG.