C. W. JEAN.

COPYING MACHINE.

APPLICATION FILED JUNE 24, 1916.

1,281,780.

Patented Oct. 15, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

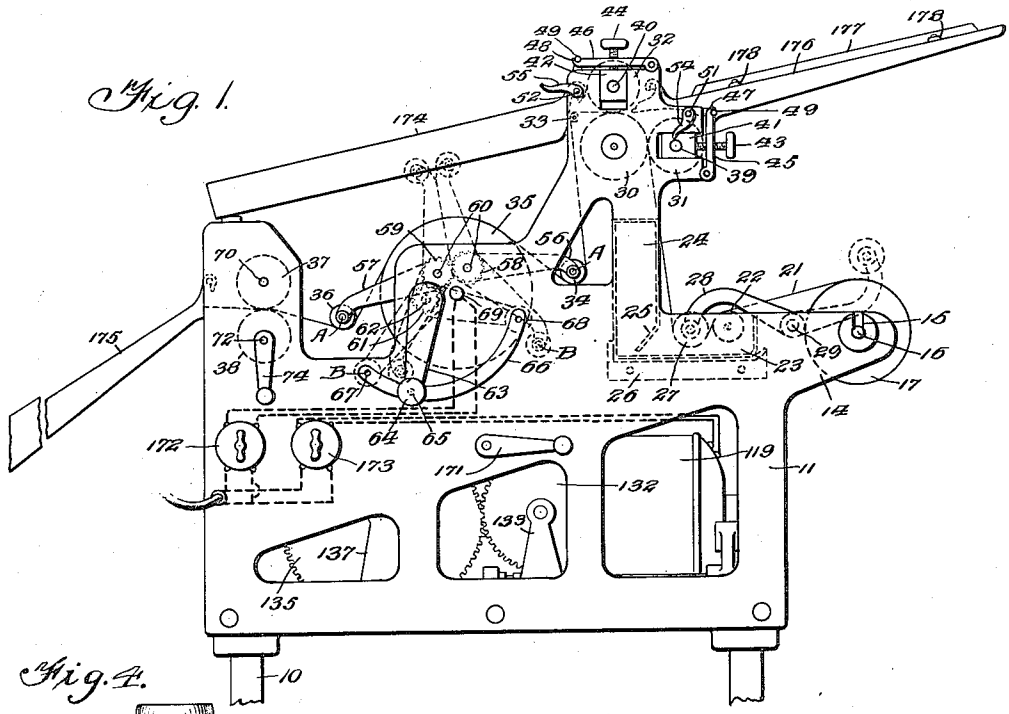


Fig. 4.

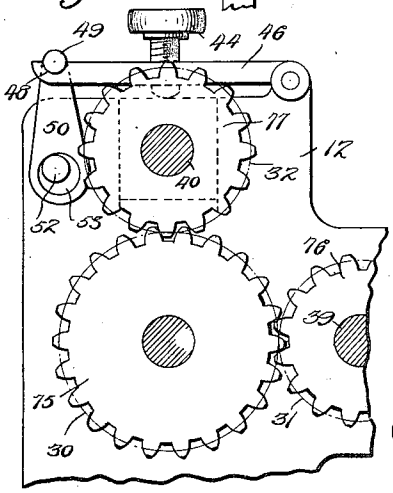


Fig. 6.

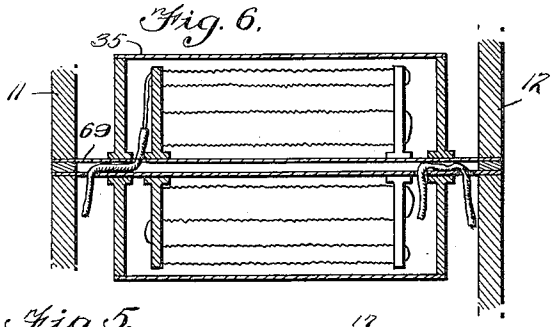
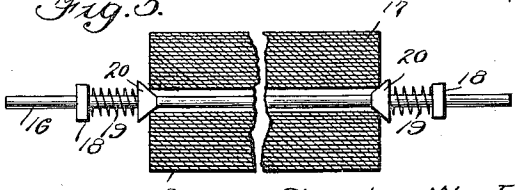


Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 2.

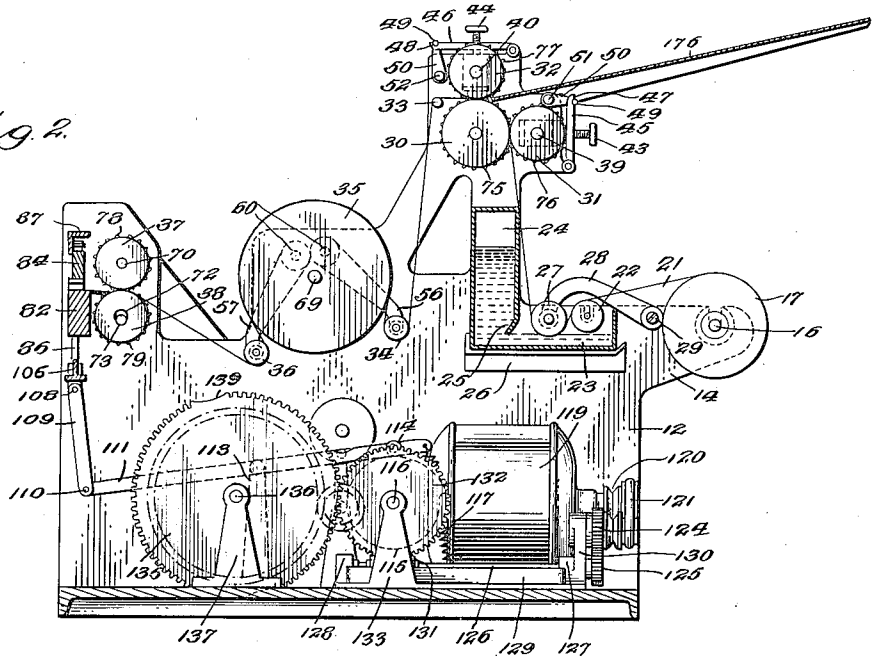
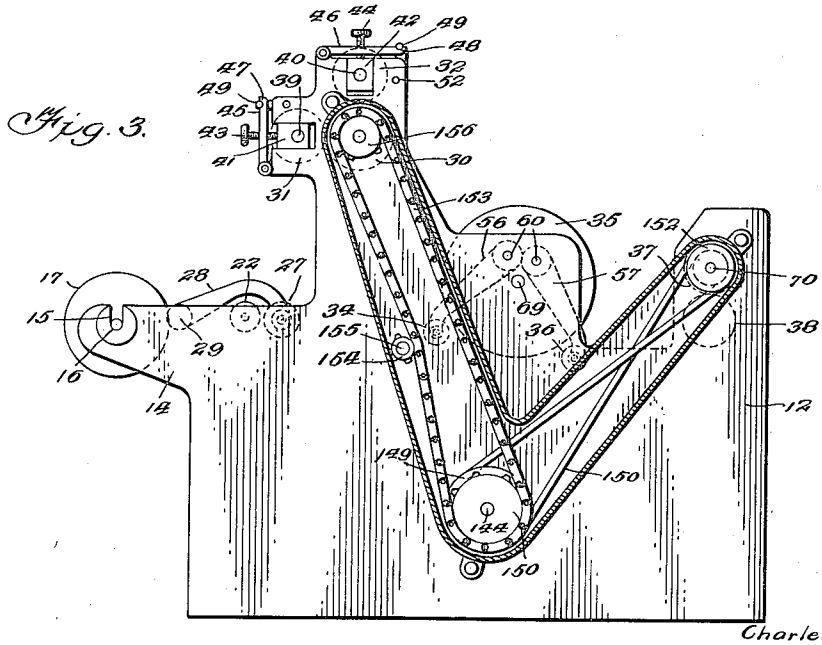


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES W. JEAN, OF NEW YORK, N. Y.

COPYING-MACHINE.

1,281,780. Specification of Letters Patent. Patented Oct. 15, 1918.

Application filed June 24, 1916. Serial No. 105,774.

To all whom it may concern:

Be it known that I, CHARLES W. JEAN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Copying-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to copying machines and more particularly to a power driven machine having controlling means embodied therein, for imparting intermittent movement to certain of the elements thereof.

It has for an object to provide an improved type of copying machine in which a web of paper to receive an impression thereon is fed through the machine intermittently, and said web is moistened to receive the impression, after which it passes about a drying roller and then through a cutting mechanism by which uniform lengths may be cut from said webbing.

A further object of this invention is the provision of means for varying the lengths of intermittent movement of the web through the machine.

A further object of this invention is the provision of improved means for cutting and perforating sections of the webbing after the impression has been made thereon.

A further object is the provision of improved means for adjusting the several rollers relatively to permit quick release of the compression between said rollers with each other.

A further object of this invention is the provision of an improved form of fountain for moistening the webbing before it is fed between the impression rollers.

A further object of this invention is the provision of a pair of rollers adjustably carried by the frame with respect to a heating roller as to cause the moistened web to contact with said heated roller, where it is retained in a stretched condition during the drying process.

Further objects will be apparent from the following specification, appended claims and drawings, in which,

Figure 1 is a side elevation of a machine constructed in accordance with this invention,

Fig. 2 is a vertical sectional view centrally therethrough,

Fig. 3 is a side elevation showing the opposite side shown to that in Fig. 1, and showing the chain housing broken away,

Fig. 4 is a sectional view through a pair of rollers showing the adjustable clamping mechanism,

Fig. 5 is a sectional view through the roll of webbing and its supporting shaft, and

Fig. 6 is a vertical sectional view through the drying roller showing the heating element therein.

In copying machines of this character, where a letter printed with copying ink is passed through a pair of impression rollers together with a moistened web, provision has not been made heretofore to treat said web after having received the impression thereon, so as to discharge the printed copy of the letter from the machine in completed form, so features have been embodied in this machine about to be described, wherein the moistened web, after having received the impression thereon is passed about a heated roller in a stretched state, so that as said webbing is dried, it is maintained in a stretching state to cause it to remain perfectly flat and from the drying roller, it is fed through feeding rollers which maintain the desired tension on said webbing and then this web is passed through a perforator and cutter which is operated in timed relation with respect to the movement of said web as to cause uniform lengths or sheets to be severed from the end of the webbing which when delivered from the machine are ready for filing.

Referring to the drawings in which the several features of this type of machine are clearly shown, 10 indicates a standard or base which supports a frame comprising the side walls 11 and 12 and bottom member 13. The side walls 11 and 12 have rearwardly extending arms 14 which are notched as at 15 to receive a shaft 16 on which a roll of webbing 17 may be placed. The shaft 16 has the adjustable collars 18 thereon, which receive the compression springs 19 and bear against cones 20 to restrict the free rotation of the roll of webbing 17 as the web 21 is drawn therethrough. The web 21 passes over a guide roller 22 carried in bearings in the walls of a well 23, with which the fountain 24 is formed integrally, so that said well and fountain may be removed from

the frame for refilling. The fountain 24 has a depending lip 25 which regulates the amount of water confined in the well 23 and the well and the fountain may be supported by brackets 26 which are secured to the sides 11 and 12. The web then passes partly about a roller 27 which is carried in the arms 28 pivoted as at 29 to the frames 11 and 12, so that this roller may be swung to the position shown in dotted lines in Fig. 1 of the drawings, when the machine is not in use or when the web is being threaded through the machine. The web then passes between the rollers 30 and 31 of which the roller 31 is adjustable relatively to the roller 30 to enable the desired amount of moisture being removed from the webbing 21 and the webbing follows the rollers 30 about a portion of its circumference where the webbing is exposed to the face of a letter to be copied which is fed under the roller 32. After the webbing has received the impression from the letter to be copied by passing between the rollers 30 and 32, it is fed over a guide roller 33 and then downwardly about an adjustable roller 34, where its course is directed about the circumference of the heated drying roller 35 and then about a second adjustable roller 36 to the feeding rollers 37 and 38, from where it passes through a cutting mechanism, where the individual sheets are formed of predetermined lengths.

The rollers 31 and 32 are carried upon the shafts 39 and 40 which are journaled in the movable bearings 41 and 42 respectively, and these bearings receive contact from adjustable screws 43 and 44 which pass through the pivoted supporting members 45 and 46 respectively. The members 45 and 46 have their free ends notched as at 47 and 48, where heads 49 of the locking members 50 engage and these locking members are carried by the shafts 51 and 52 respectively, having support upon the eccentrics 53 formed on said shafts so that when said shafts are partially rotated as by the handles 54 and 55, the locking members 50 cause the members 45 and 46 to vary the compression between the rollers 30, 31 and 32 as the case may be. It is apparent that the desired adjustment is had by the screws 43 and 44 to establish a relatively fixed relation and then the other locking means so provided may be used or released as desired, when altering the former adjustment.

The rollers 34 and 36 are carried by the arms 56 and 57, of which the arms at one end of the roller 35 are provided with the meshing gears 58 and 59 to cause the rollers 34 and 36 to move proportionately. The arms 56 and 57 are pivoted upon studs 60 carried by the ends of the frame 11 and 12 and the gear 59 meshes with a pinion 61 carried by the shaft 62, to which the crank 63 is attached and this crank has a handle 64 formed thereon, as well as a locking pin 65 movably carried therein, so that as said handle is swung to either of its positions about the arc 66, the pin 65 will lock in either of the recesses 67 and 68.

The roller 35 is rotatably carried upon a fixed shaft 69 and this shaft is of tubular formation to admit electric wires passing to the interior of said roller and to an electric heater contained therein, so that said roller may have its circumference heated to the desired temperature for drying the paper as it passes about said roller.

The feeding rollers 37 and 38 are frictionally driven at such speeds as to maintain the desired tension on the web as it passes from the roller 36 and the roller 37 is carried by a shaft 70 which is journaled in the bearings 71 formed in the ends of the frames 11 and 12, while the roller 38 has bearings 71′ formed in the ends thereof, which are carried by a shaft 72 having an eccentric extension 73 therethrough, to pass through the ends 11 and 12 where one of said extensions receives the handle 74. It is apparent that rotation of the shaft 72 causes the rollers 37 and 38 to bind against each other to a more or less degree.

To establish the desired movement of the several rollers with respect to each other, gears are formed on the ends of said rollers which intermesh and said gears are identified as follows: The shaft of the roller 30 supports a gear 75 which meshes with a gear 76 secured to the shaft 39 and a gear 77 secured to the shaft 40 and the rollers 37 and 38 have gears 78 and 79 attached thereto, to establish uniform rotation thereof.

A motor 119 is secured to the bottom member 13 and this motor has a cone pulley 120 on the shaft thereof, about one of the pulleys therein, passes the belt 121 which also passes about one of the pulleys formed in the cone pulley 122 on the stub shaft 123 to drive a spur gear 124 attached to said pulley. The gear 124 drives a corresponding gear 125 on the shaft 126 and this shaft is journaled in bearings 127 and 128 formed in the frame 129. The bearing 127 has a standard 130 rising therefrom to support the stub shaft 123. A worm 131 is secured to the shaft 126 and this worm drives the worm gear 132 which is attached to the shaft 116 journaled in bearings in the standards 133. The shaft 116 supports the intermittent pinion 134 and also the cam 115 above described. The intermittent pinion 134 meshes with a corresponding gear 135 secured to the shaft 136 which is journaled in bearings in the standards 137 and the pinion has the curved portion 138 formed thereon which has a sliding engagement with either of the corresponding portions 139 formed on the gear 135 so that as the

pinion 134 is continuously rotated, the gear 135 has two positions in which its movement is intermittent. The shaft 136 also supports the gears 140 and 141 which mesh with pinions 142 and 143 loosely mounted upon a shaft 144, on which a clutch member 145 is slidably mounted, but has engagement therewith as to cause the clutch member to impart motion to said shaft as the clutch member is thrown into engagement with either of the clutch faces 146 or 147 formed on the hubs of the gears 142 and 143. The shaft 144 is journaled in the bearings in the standards 148 and this shaft supports a pulley 149 and a sprocket wheel 150. The pulley 149 receives a belt 151 which may be crossed and also passes about a pulley 152 secured to the shaft 70 of the roller 37. The sprocket 150 receives a chain 153 which passes over an idler 154 journaled on the stud 155 carried by the side 12 of the frame and said chain passes about a sprocket 156 formed on the shaft of the roller 30.

It is thought that the operation of this copying machine is apparent in view of the foregoing, but the following is a brief description of the operation and use of this type of machine. When it is desired to use the machine, the electric switches 172 and 173 may be thrown as to complete the circuit respectively through the heating element in the drying roller 35 and through the motor 119 at which time the motor is started, the drying roller is heated. The arms 28 which support the roller 27 may be swung to the position shown in dotted lines in Fig. 1 and the handles 64 may be swung to raise the arms 56 and 57 when the web 21 may be threaded between the rolls 30, 31 and 32, over the roller 33 and then pass between the rollers 37 and 38. Then the bail comprising the arms 28 and roller 27 may be swung forwardly as to immerse that portion of the web passing thereunder in the moistening liquid in the well 23 and the screws 43 will then be adjusted to cause the web passing between the rollers 30 and 31 to possess the desired amount of moisture to receive the copy. Then the roller 32 is adjusted to have the desired bearing relation upon the letter to be copied and the web as it passes through the rollers 30 and 32 as by the adjusting screws 44. The letter to be copied is then fed between the rollers 30 and 32 which, as they are rotated, cause the copy to be formed on the web 21 and after passing between these rollers, the letter may be collected in the tray 174, while the web is directed downwardly about the roller 34, which will have been swung to one of the lower positions depending upon the length of the letter to be copied. After passing the roller 34, it partly surrounds the drying roller and then passes about the roller 36 to and between the feeding rollers 37 and 38 and then through the perforating and cutting elements where the severed sheet may be collected in the basket 175. The letter which may be fed into the machine may be fed from the table 176 upon which an adjustable guide 177 may be carried by the extensions 178 to permit the guide 177 being adjustable on said table for reasons which are apparent to users of this type of machine.

As it is commonly desired to copy letters or the like of both letter and legal sizes, provision is made for maintaining a length of webbing between the impression rollers and the feeding rollers which will be multiples of the length of the letter to be copied as for legal size copies, the rollers 34 and 36 are swung to the position indicated at "A" in Fig. 1, when the length of the web is twice that of the legal sheet, but when it is desired to copy a letter of the standard letter size, the arms are swung to the position "B" in Fig. 1, when the length of the tape is then three times that of the standard letter size, so it is seen that the severed sheet will always be of either of the standard lengths, being cut and perforated between the individual copies.

It is apparent that modifications may be made within the scope of the appended claims without departing from the spirit of this invention and no limitation is implied by the limited showing in the drawings which are for illustrative purposes only.

Having thus described this invention, I claim:—

1. In a copying machine, a drying roller adapted to receive a moistened webbing partly thereabout, and binding rollers adjustable about said drying roller to hold said web taut while passing about that portion of the drying roller.

2. In a copying machine of the class described, a plurality of rollers having periods of intermittent movement, a drying roller to receive a moistened webbing from said first mentioned rollers, binding rollers adjustably carried with respect to said drying roller to maintain said web in stretched relation as it passes about said drying roller and gearing having changeable ratios for driving said rollers at different speeds to regulate the length of paper fed between the several rollers during each intermittent movement.

3. In a copying machine of the class described, a frame comprising side plates, a plurality of rollers journaled in said side plates, a drying roller to receive a moistened webbing from said first mentioned rollers, binding rollers adjustably carried by said side plates with respect to said drying roller, said binding rollers being adjustable to several positions to vary the length of webbing between certain of said rollers to

multiples of a given length and said binding rollers holding a web over said drying roller taut.

4. A machine of the class described comprising a frame, a plurality of rollers journaled therein, said rollers being driven in timed relation, a drying roller to receive a web from said rollers, binding rollers adjustably carried by said frame with respect to said drying roller, feeding rollers included among said rollers, means for varying the compression between said feeding rollers, a driving shaft having connection with some of said rollers for a positive drive and said driving shaft having a frictional drive with said feeding rollers to maintain a slight tension on a web passing between certain of said rollers.

5. In a copying machine, a drying roller adapted to receive a moistened webbing partly thereabout, binding rollers spaced from the drying roller, and means to move the binding rollers in a planetary path about the drying roller.

6. In a copying machine, a drying roller adapted to receive a moistened webbing partly thereabout, binding rollers spaced from the drying roller, and arms carrying the binding rollers adapted to move said binding rollers substantially in semi-circles about the drying roller to substantially engage against the periphery of the drying roller when adjacent each other upon one side of such drying roller, and to be spaced a considerable distance from the drying roller when adjacent each other upon the opposite side of the drying roller.

7. In a copying machine, a drying roller adapted to receive a moistened webbing partly thereabout, binding rollers spaced from the drying roller, arms carrying the binding rollers spaced a considerable distance above the drying roller when adjacent each other upon that side of the roller, and to swing in semi-circles to gradually approach the periphery of the drying roller when approaching each other on the opposite of the drying roller.

8. In a copying machine, a drying roller adapted to receive a moistened webbing thereabout, binding rollers spaced from the drying roller, and arms carrying the binding rollers adapted to swing said drying rollers in eccentric arcs, which said arcs are eccentric to the drying roller.

9. In a copying machine, a drying roller adapted to receive a moistened webbing thereabout, binding rollers spaced from the drying roller, and arms adapted to swing the binding rollers about the drying roller upon arcs eccentric to the drying roller.

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

CHARLES W. JEAN.

Witnesses:
GEORGE L. THOM,
HUGO MOCK.