J. O. FROST.

ROTARY TISSUE PAPER PRINTING MACHINE.

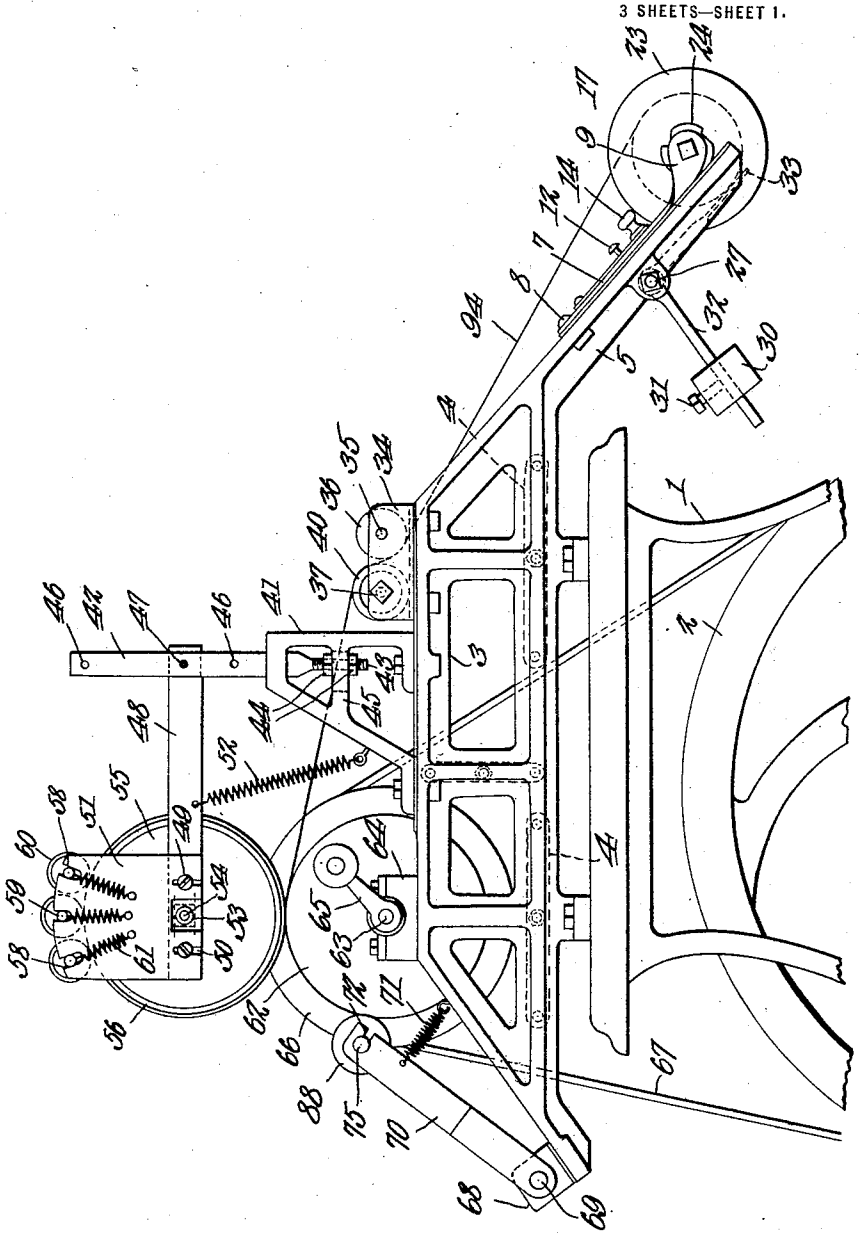
APPLICATION FILED DEC. 20, 1915.

1,185,992.

Patented June 6, 1916.

3 SHEETS—SHEET 1.

Fig. 1.



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Witnesses

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3 SHEETS—SHEET 2.

Fig. 2.

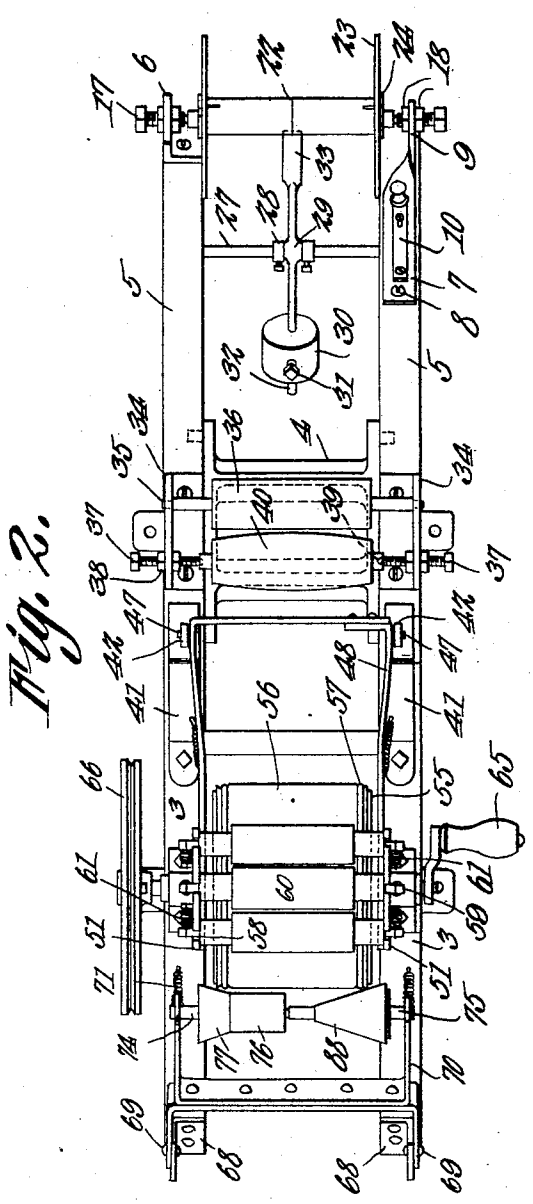


Fig. 3.

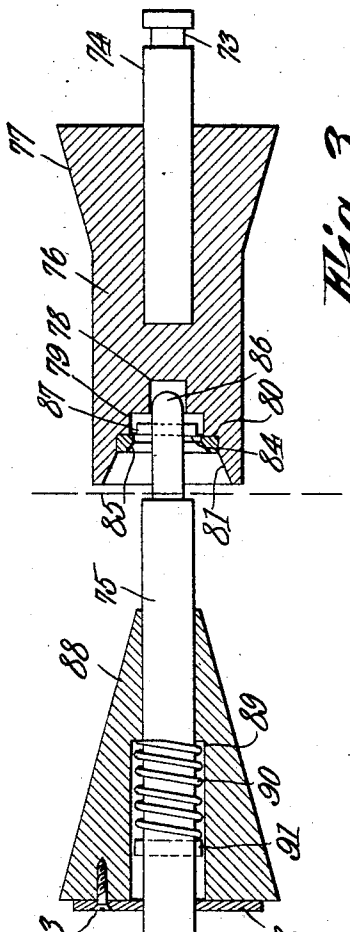
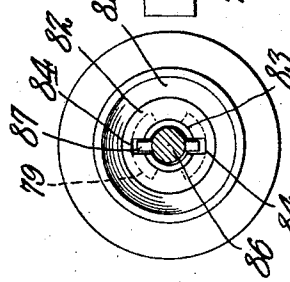


Fig. 4.



Witnesses

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3 SHEETS—SHEET 3.

Fig. 6.

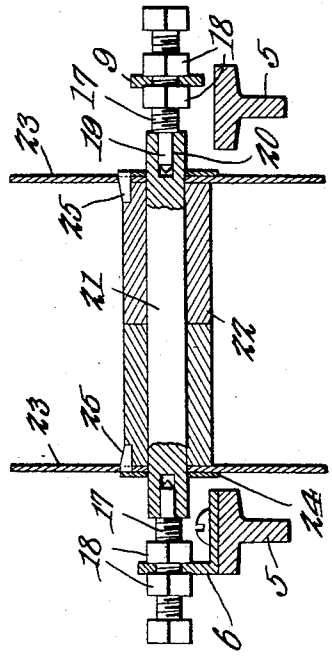


Fig. 8.

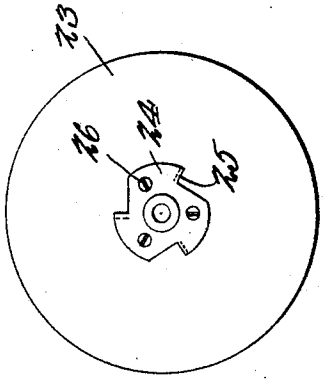


Fig. 7.

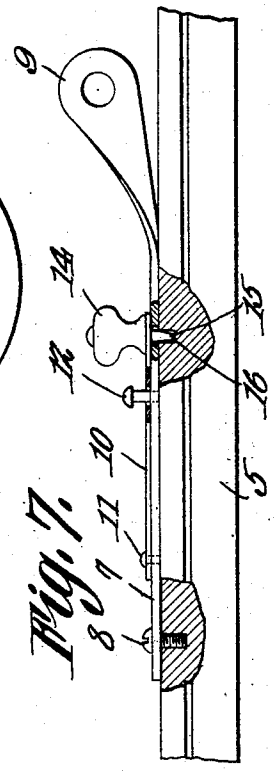
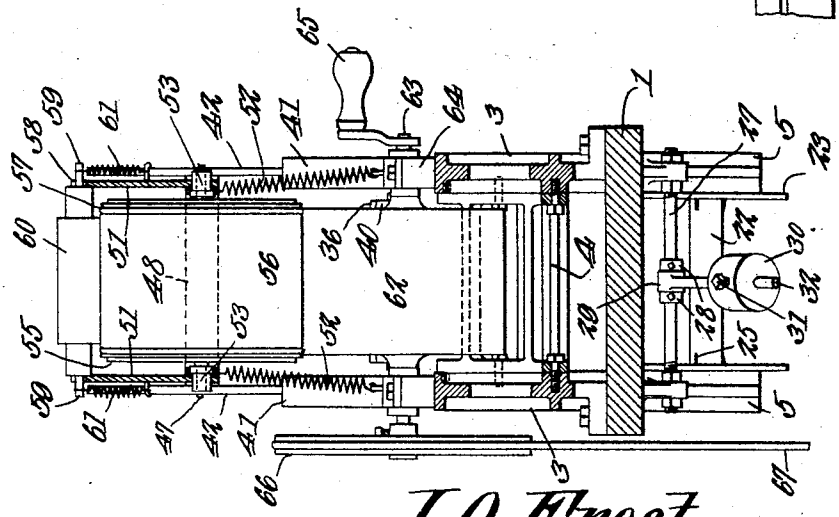


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ROTARY TISSUE-PAPER-PRINTING MACHINE.

1,185,992. Specification of Letters Patent. Patented June 6, 1916.

Application filed December 20, 1915. Serial No. 67,857.

To all whom it may concern:

Be it known that I, JOHN O. FROST, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Rotary Tissue-Paper-Printing Machine, of which the following is a specification.

The device forming the subject matter of this application is adapted to be employed for printing rolls of perforated paper, of the sort commonly employed for wrapping fruit and for other purposes, such paper ordinarily being dispensed in rolls of approximately one thousand sheets each.

The present invention aims to provide a structure of this type which is devoid of complicated gear trains.

Another object of the invention is so to construct and to improve the machine that the tension on the paper may be regulated, to the end that the paper may not be torn asunder as it is advanced through the machine.

Another object of the invention is to improve the delivery mechanism from which the paper starts initially.

Another object of the invention is to improve the printing mechanism and to provide novel means whereby an operative adjustment between the printing mechanism and the platen roller may be brought about.

A further object of the invention is to improve the means whereby the paper, having been printed, is rewound.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the present invention appertains.

With the above and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawing:—Figure 1 shows in side elevation, a printing machine constructed in accordance with the present invention; Fig. 2 is a top plan; Fig. 3 is a longitudinal section of the rewinding mechanism; Fig. 4 is a cross section on the line 4—4 of Fig. 3; Fig. 5 is a vertical transverse section taken through the complete machine; Fig. 6 is a transverse section showing the delivery mechanism; Fig. 7 is a side elevation of one of the movable supports which upholds that portion of the structure depicted in Fig. 6; Fig. 8 is an end elevation of the delivery mechanism shown in Fig. 6.

In carrying out the present invention there is provided a support 1 on which is journaled a drive wheel 2. Upheld by the support 1 and secured thereto are side frames 3 connected by cross braces 4, the forward ends of the side frames terminating in downwardly slanting extensions 5. Mounted on one of the extensions 5 is a fixed support 6. A movable support 7 is pivoted to the other extension 5, as indinated at 8, and embodies an upstanding end 9. A resilient latch 10 is secured as shown at 11 to the movable support 7 and is guided in its vertical movement by a pin 12 carried by the support 7. The latch 10 is provided with a knob 14 embodying a projection 15 adapted to be received in a recess 16 formed in one of the extensions 5, the pin 12 and the recess 16 coacting to prevent the movable support 7 from moving sidewise. Screws 17 are mounted in the supports 6 and 7 and are held in place adjustably by means of nuts 18. At their inner ends, the screws 17 terminate in spindles 19 received in recesses 20 formed in a shaft 21 carrying a two-part core 22 constituting an element of the paper delivery mechanism. Abutting against the ends of the two-part core 22 are end plates 23 held in place by retaining plates 24 from which are struck tongues 25 passing through the end plates 23 and entering the ends of the two-part core 22, the retaining plates 24 preferably being held in place by means of screws 26, passing through the end plates 23 and entering the extremities of the core 22.

Extended between the parts 5 of the side frames 3 is a shaft 27 carrying adjustable set collars 28, between which is fulcrumed on the shaft 27 an angular lever 29 one end 32

of which extends downwardly and is provided with a slidably adjustable weight 30 held in place by a set screw 31. The forward end of the lever 29 is fashioned into a flattened head 33 adapted to coöperate with the roll of paper on the core 22 in a manner which will be set forth hereinafter.

Bearings 34 are secured to the side frames 3 and in the bearings 34 is journaled a shaft 35 carrying a guide roller 36. Screws 37 are adjustable in the bearings 34 and are held in place by means of nuts 38. The ends of the screws 37 coact with the ends of a shaft 39 which is fixed to a guide roller 40 which preferably tapers toward its ends.

Fixed to and rising from the side frames 3 are supplemental frames 41 in which are vertically adjustable, standards 42, the lower ends 43 of which are threaded and are mounted to slide for adjustment in bars 45 constituting parts of the supplemental frames 41. Nuts 44 are threaded onto the ends 43 of the standards 42, so that the standards may be adjusted vertically if desired. The standards 42 are supplied with a plurality of vertically spaced openings 46, adapted to receive pivot elements 47 supporting for vertical swinging movement, a U-shaped arm 48, constrained to swing downwardly by means of retractile springs 52, the upper ends of which are secured to the arm, the lower ends of which are secured to the supplemental frames 41. Mounted in the rear extremities of the arm 48 are clamp screws 49 received for adjustment in slots 50 formed in the lower edges of side plates 51. The rear extremities of the U-shaped arm 48 carry bearings 53 in which is journaled for rotation a shaft 54 carrying a roller 55 which may be circumscribed by a type sheet 56 held in place on the roller 55 by means of screws, or elastic bands 57 received in circumscribing grooves formed in the roller 55 adjacent the ends thereof. In the upper edges of the side plates 51, slots or notches 58 are formed, receiving the ends of shafts 59 carrying inking rollers 60, any desired number of inking rollers being employed, three being shown in the present instance. The lower ends of retractile springs 61 are connected with the side plates 51, the upper ends of the springs being connected with the shafts 59. Disposed below the type roller 55 is a platen roller 62 carried by a shaft 63 journaled for rotation in bearings 64 mounted on the side frames 3. The platen roller 62 may be rotated through the medium of a crank 65 detachably mounted on one end of the shaft 63, or the platen roller may be rotated by means of a pulley 66 operatively connected with the wheel 2 through the medium of a belt 67.

Fixed to and upstanding from the side frames 3 near to the rear ends thereof are ears 68 to which is pivoted as shown at 69, a forwardly extended, inclined frame 70 constrained to swing downwardly by means of retractile springs 71, the lower ends of which are attached to the side frames 3. Adjacent its forward edge and in its lower end, the frame 70 is provided with notches 72, adapted to coact with grooves 73 formed on shafts 74 and 75, near to the ends of the shafts. Secured to the shaft 74 is a core 76, constituting a part of the rewinding mechanism, the core 76 being cone shaped adjacent its outer end as shown at 77. In the core 76 is formed an axial passage 78, communicating with an enlarged recess 79, adjacent which is a shoulder 80, there being a flared mouth at the inner end of the core 76, adjacent the shoulder 80, the flared mouth being designated by the reference character 81. Secured against the shoulder 80 is a retaining plate 82 having a central opening 83, equipped with a laterally extended slot-like extension 84. The retaining plate 82 may be beveled as indicated at 85 adjacent the extensions 84 of the opening 83. The shaft 75 terminates in a reduced tip 86 passing through the opening 83 in the retaining plate 82 and equipped with a cross pin 87, adapted to be introduced behind the retaining plate 82 through the extensions 84 of the opening 83. Mounted on the shaft 75 is a conical core 88 the point of which projects toward the core 76. Within the core 88 is formed a recess 89 in which is located a compression spring 90 surrounding a portion of the shaft 75, one end of the spring 90 abutting against the core 88 at the inner end of the recess 89, and the other end of the spring 90 being engaged with an abutment 91 located within the recess 89 and secured to the shaft 75. The shaft 75 passes through an end plate 92 attached by means of securing elements 93 to the wider end of the cone shaped core 88.

In practical operation, the roll of paper which is to be printed, is mounted on the two part core 22 of the delivery mechanism shown in Fig. 6. By manipulating the screws 17, the pressure on the ends of the shaft 21 may be adjusted, thus permitting the shaft to turn more or less easily. The weight 30 may be adjusted along the arm 32 of the lever 29, so that the weight will have a greater or less moment, the enlarged head 23 of the lever 29 thus being caused to exert an adjustable pressure on the roll of paper which is carried by the delivery core 22. From the delivery core, the paper, indicated by the reference numeral 94, is led beneath the guide roller 36 and over the top of the guide roller 40, it being observed that the drag of the roller 40 may be varied by adjusting longitudinally, the screws 37 whereon the said roller is carried. From the guide rollers 40 and 36, the paper is extended between the platen roller 62 and the

printing roller 55, the paper then being connected to a tubular core (not shown), carried by the parts 76 and 88 of Fig. 3. One end of the core above alluded to is engaged by the part 77 of the member 76 and the other end of the core is engaged by the tapered member 88, the latter being advanced by the spring 90.

In practical operation, the pivoted arm 48 is swung downwardly by the action of the springs 52, the printing roller 55 thus being brought into contact with the platen roller 62 or, more exactly speaking, into contact with the paper 94 which passes between the printing roller and the platen roller. Owing to the action of the springs 71, the frame 70 is swung downwardly, so that the roll of paper which accumulates on the cores 76 and 88 is maintained in contact with the platen roller 62. It will now be obvious that if the platen roller 62 is rotated either through the instrumentality of the crank 65, or the belt 67 and the wheel 2, rotation will be imparted to the roll of paper on the rewinding cores 76 and 88, and rotation will be imparted to the inking rollers 65, the paper being advanced between the guiding rollers 36 and 40, and being drawn from the delivery mechanism represented by the core 22.

The arm 48 may be adjusted vertically by engaging the pivot elements 47 in any of the openings 46 in the standards 42 and the standards 42 may be adjusted vertically by manipulating the nuts 44.

The device herein disclosed is adapted to print each of the sheets of a perforated roll of the sort commonly used for wrapping fruit and for other purposes. Obviously by changing the type sheet 56, every other sheet of paper or sheets more widely spaced, may be printed. Under such circumstances, printing rollers 55 of different diameters are substituted, and the side plates 51 are changed accordingly.

The device forming the subject matter of this application is so constructed that a roll comprising a plurality of perforated sheets may be printed readily without causing the sheets to be severed one from the other during the printing operation. The paper may be passed through the machine under any desired tension and this tension may be so adjusted that there will be no danger of rupturing the roll as it is printed. The machine is devoid of complicated gear trains and like parts adapted to produce friction and to get out of order. The rewinding mechanism shown to best advantage in Fig. 3 of the drawings is so constructed that rolls of different widths may be accommodated.

Having thus described the invention, what is claimed is:—

1. In a device of the class described, a supporting structure; a rotary platen journaled thereon; means for rotating the platen; a printing roller carried by the supporting structure; means for causing the printing roller to coact yieldably with the platen whereby the printing roller will be driven by the platen; rotary means for receiving the material after the same is printed; and yieldable means for causing the rotary means to coact with the platen whereby the rotary means will be driven by the platen.

2. In a device of the class described, a supporting structure; a delivery means located at one end of the supporting structure; a rotary platen journaled on the supporting structure; means for rotating the platen; a printing roller carried by the supporting structure and coacting yieldably with the platen to be driven thereby; guide rollers carried by the supporting structure and located intermediate the platen and the delivery means; and rotary mechanism for receiving the material after the same is printed, the said rotary mechanism coacting yieldably with the platen to be driven thereby.

3. In a device of the class described, a supporting structure ; a rotary platen journaled thereon; a yieldably supported printing roller carried by the supporting structure and coacting with the platen to be driven thereby; a frame mounted to swing on the supporting structure; and rotary receiving means carried by the frame and coacting with the platen to be driven by the platen.

4. In a device of the class described, a supporting structure; a frame mounted to swing on the supporting structure; shafts journaled in the frame detachably; cores carried by the shafts, one shaft being detachably interlocked with one core; spring means for advancing the other core; a rotary platen journaled in the supporting structure; a printing roller carried by the supporting structure and coacting with the platen to be driven thereby; and yieldable means for actuating the frame to cause the material on the cores to act with the platen.

5. In a device of the class described, a supporting structure; a rotary platen journaled thereon; standards carried by the supporting structure; a frame; means for pivotally assembling the frame with the standards, intermediate the ends of the standards for adjustment longitudinally of the standards; a retractile spring forming an operative connection between the supporting structure and the frame; and a printing roller journaled on the frame, the spring constituting a means for depressing the frame, whereby the printing roller will be rotated when the platen is rotated.

6. In a device of the class described, a supporting structure; a platen journaled for rotation thereon; a printing roller carried

by the supporting structure and coacting yieldably with the platen, whereby the roller will be rotated when the platen is rotated; and rotary means for receiving the material after the same is printed, said means coacting yieldably with the platen to be driven thereby.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN O. FROST.

Witnesses:
CLARA STUBENBORDT,
L. J. RITTINGER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."