

916,562.

A. KNOBEL.
PRINTING PRESS.
APPLICATION FILED AUG. 22, 1907.

Patented Mar. 30, 1909.
2 SHEETS—SHEET 1.

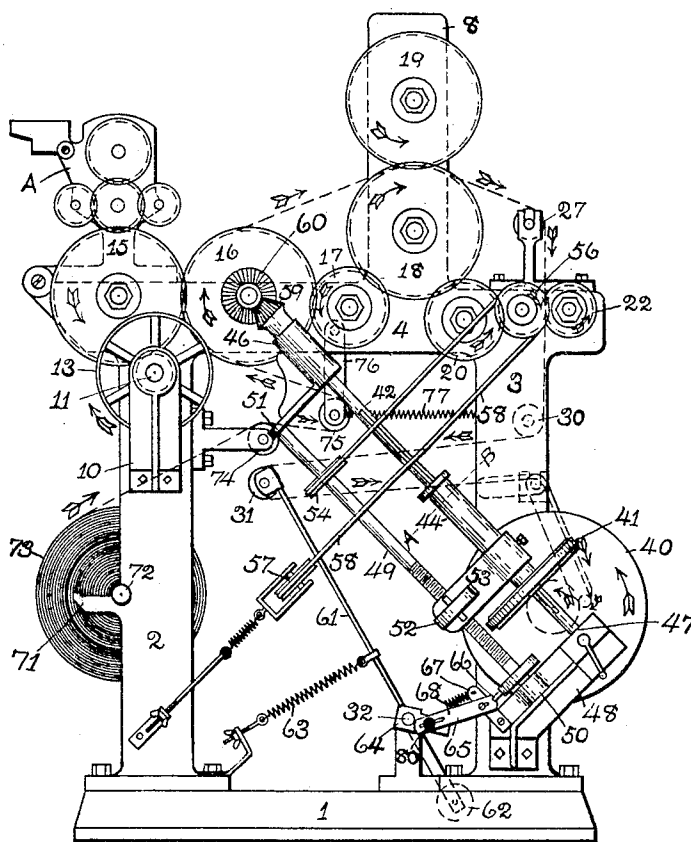


Fig. 1.



Fig. 2.

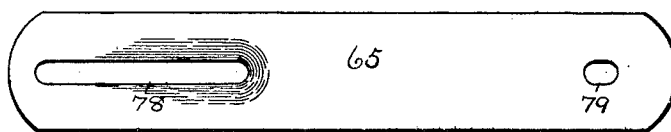


Fig. 3.

WITNESSES:

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2 SHEETS—SHEET 2.

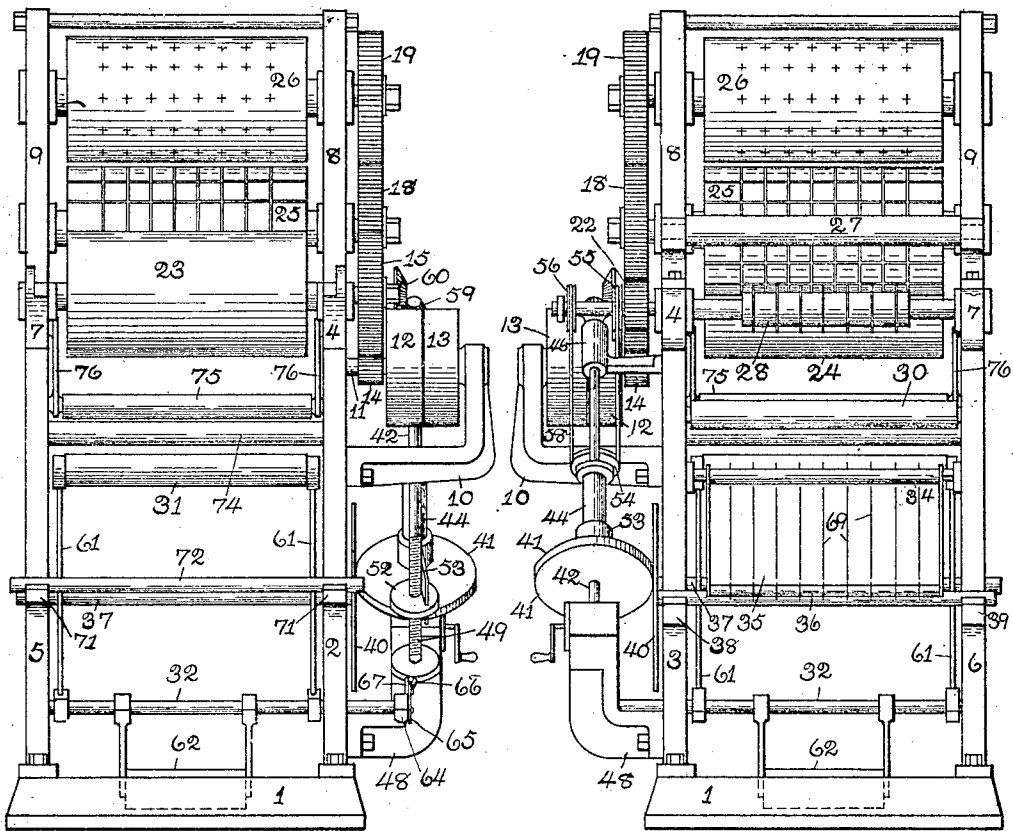


Fig. 4.

Fig. 5.

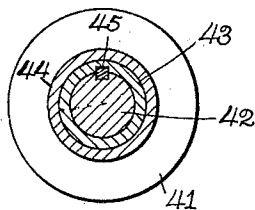


Fig. 6.

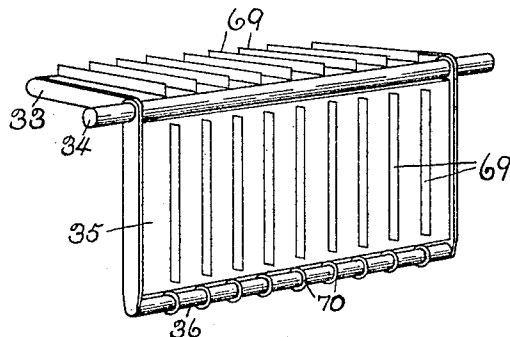


Fig. 7.

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UNITED STATES PATENT OFFICE.

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PRINTING-PRESS.

No. 916,562.

Specification of Letters Patent.

Patented March 30, 1909.

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To all whom it may concern:

Be it known that I, ABRAHAM KNOBEL, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented a new and useful Printing-Press, of which the following is a specification.

This invention relates to rotary printing presses and winding apparatus therefor, for printing and producing tickets, labels, wrappers, and the like, wound in rolls; and the objects of my improvement are, rapid production, automaticity, the production of compactly and uniformly wound rolls, and the saving of labor and time. These objects I attain by means of the mechanism illustrated in the accompanying drawings in which,

Figure 1 is an elevation of the right hand side of a printing press embodying my improvements; Fig. 2, a detail sectional view of the regulating-trigger; Fig. 3, a detail face view of the regulating-trigger; Fig. 4, a rear end elevation of the machine; Fig. 5, a front end elevation; Fig. 6, a detail sectional view of the driving-shaft of the winding apparatus on the line A—B of Fig. 1; and, Fig. 7, a detail perspective view of the apparatus for guiding the separate webs to the winding shaft.

Similar reference characters refer to similar parts throughout the several views of the drawing.

I have illustrated my invention in the drawing as embodied in a rotary printing press, adapted for printing and perforating wrappers for wrapping machines and winding webs of said wrappers into uniformly compact and even rolls. The main body of the machine comprises a base 1, legs 2, 3, 5, and 6, upper connecting-bars 4 and 7 upon which are mounted standards 8 and 9. The legs and standards are kept in parallel alignment by means of cross-bars. The rear end of the frame is surmounted by the usual printing press ink-er A. A bracket 10 is secured to the left hand side of the machine.

A driving-shaft 11 is journaled at its inner end in the upper end of leg 2 and at its outer end in bracket 10. A driving-pulley 12, a loose pulley 13, and a driving-pinion 14 are mounted on shaft 11. Meshing with pinion 14 is a gear 15 mounted on a shaft upon which is also mounted a type-roller 23. A tympan-roller 24 is mounted

adjacent roller 23 and driven by a gear 16 meshing with gear 15. A die-roller 25, formed in this instance with crossed slots in its periphery is mounted on a shaft and driven by a gear, 18, which, in turn, is driven by gear 16, through an intermediate gear 17 which is mounted on a stud secured in part 4 of the frame. A punch-roller 26, corresponding to die-roller 25, is driven by a gear 19 which meshes with gear 18. The punch-roller 26, in this case, is provided with punches in the form of crossed sharp edges which enter the slots formed in roller 25 at their intersections. A paper-guide roller 27 is mounted in front of rollers 25 and 26. A pair of rotary slitters, 28 and 29, is mounted parallel with the rollers mentioned and driven by gears 21 and 22 through an intermediate gear 20 which meshes with gears 21 and 18. A web-guide roller 30 is mounted below slitters 28 and 29.

A swinging slack and tension-roller 31 is mounted on arms 61 pivoted on a shaft 32.

A guide-bar 34 is mounted parallel with roller 30, and to it are attached plates 33 and 35 for guiding the webs. A swinging guide-bar 36 is mounted in the lower edge of plate 35, the plate and the swinging guide-bar being pivoted to bar 34 and adapted to swing vertically. A shaft 37 is mounted in brackets 38 and 39 in such a position that bar 36 may rest against it. Plates 33 and 35 are provided with blades 69, extending at right angles to the plane of the plates and forming channels between them in order to keep the webs suitably separated and guided. For the same purpose bar 36 is provided with separating-blades 70, one in the plane of each of the blades 69.

A shaft 72 is mounted on brackets 71 on the rear end of the machine on legs 2 and 5 of the frame, for mounting a mill roll 73. The paper from mill roll 73 is guided over a roller 74 journaled in stationary brackets, thence over a swinging roller 75, mounted in swinging brackets 76, and drawn forward by springs 77. Thence the paper passes upward between type-roller 23 and tympan-roller 24, where it is printed. It then passes between punch and die-rollers 26 and 25, where it is perforated between the labels printed upon the web. Thence the paper passes over the guide-roller 27, downward between slitters 28 and 29, where it is slit into separate webs. The separate webs now

pass over roller 30, backward over swinging slack and tension-roller 31, forward again through the channels on plate 33, over bar 34, downward through the channels on plate 35, partly around bar 36, being guided between blades 70, and is finally wound upon shaft 37 in the direction indicated by the arrow.

At present I drive shaft 37 through the means of friction gearing, comprising a face friction-disk 40, mounted upon shaft 37, and driven by a corresponding peripheral friction-wheel 41 mounted upon a driving shaft 42. The transmission between wheel 41 and disk 40, however, is positive, slipping not being permitted. The driving shaft 42 is mounted in an upper bearing-bracket 46 and a lower bearing-bracket 48 and is driven by a bevel pinion 59 mounted on its upper end, meshing with a bevel gear 60 which is mounted on the shaft of gear 16 and roller 24. Friction wheel 41 is provided with a sleeve 43 by means of which the disk is slidably mounted on shaft 42. The shaft is splined, and sleeve 43 is provided with a feather 45, adapted to slide in the spline. Over sleeve 43 is mounted a sleeve 44 which is provided with an arm 53. Sleeve 44 forms a bearing in which sleeve 43 rotates and is prevented from sliding off sleeve 43 by wheel 41 at one end and a collar mounted on sleeve 43 at the other end, thus forming means for sliding wheel 41 along shaft 42, in order to engage different parts of disk 40 as required to regulate the speed of shaft 37. A screw 49 is mounted parallel with shaft 42 in bearings in brackets 46 and 48 and provided with a nut 52. A slot, adapted to receive nut 52, is formed in the free end of bracket 53. A pulley 54, for driving screw 49, is mounted thereon. The screw is driven by means of a belt 58 working on a tight pulley 55 and a loose pulley 56, both mounted on the shaft of slit 29. The belt is kept tight by means of an adjustable pulley 57. It will be observed that belt 58 runs in such a direction that it turns the screw to the right, so that nut 52, engaging bracket 53, raises the wheel 41 from the center toward the circumference of disk 40, thus tending to decrease the speed of disk 40. But screw 49 is prevented from operating continuously by a trigger, 65, which is normally held in the path of a stop-pin 66 secured in the screw, and is allowed to rotate only when trigger 65 is withdrawn. When pin 66 is in engagement with trigger 65, belt 58 slips upon pulley 55, but continually tends to rotate the screw. A crank, 64, is mounted upon the outer end of shaft 32, which, in turn, is operatively connected with arms 61 and swinging slack and tension-roller 31. Crank 64 is provided with a crank-pin which works in a slot, 78, in trigger 65. A friction-plate or

washer, 80, is mounted under the head of the crank pin, and adapted to bear against trigger 65. The trigger has a portion of its body along slot 78 reduced, so that friction-plate 80 is not effective at that portion, but the walls of the lower end of the slot are left thick, so that when the friction-plate is brought to that portion it becomes effective. An aperture, 79, very slightly elongated, is provided in the upper end of trigger 65 adapting the trigger to be loosely and slidably mounted at that end upon a bracket 67 by means of a screw or pin. Trigger 65 is thus adapted to be pushed into the path of pin 66 or withdrawn therefrom. A spring, 68, keeps the trigger normally drawn up in the path of pin 66. Roller 31 is counterbalanced by a counterweight, 62, mounted below shaft 32 and is drawn back by a suitable tension-spring 63. In operation, when a series of web-rolls is started on the winding-shaft, wheel 41 is set near the center of disk 40, in order to cause it and its shaft 37 to rotate at sufficient speed to wind up the paper as rapidly as it is delivered when the rolls are first started and consequently of small diameter. It will be understood that, as the rolls increase in diameter, in consequence of the webs being wound thereon, shaft 37 will rotate so rapidly that the webs will be wound faster than they are delivered by the slitters. The slacks therefore, between the slitters, swinging roller 31, and bar 34, will gradually be taken up, and roller 31 will be drawn forward toward bar 34. By this means crank 64 will be operated so that its crank-pin moves downward toward the lower end of slot 78 in trigger 65. When friction plate 80 has reached the thickened part of the walls of slot 78, it pulls the trigger downward out of engagement with pin 66. This allows screw 49 to rotate and elevate nut 52 and with it bracket 53 and wheel 41. Wheel 41 now takes a track on disk 40 of larger diameter, and, consequently, disk 40 rotates more slowly. It will be understood that trigger 65, when withdrawn, allows the screw to rotate as long as the slack in the webs continues to be taken up, or, in other words, until roller 31 is allowed to recede on account of slack in the webs due to shaft 37 rotating too slowly. When roller 31 begins to recede, friction plate 80 and spring 68 operate to return trigger 65 into the path of pin 66. The pin strikes the trigger and the screw ceases to operate. Roller 31 recedes for a short time until the rolls of web have increased to such a size that their peripheral speed is equal to the speed of the webs. The roller rests, however, but for a moment, when it begins to advance again, and screw 49 is allowed to operate as before. Thus, by the oscillation of roller 31 produced by the successive

diminution and increase of slack in the webs, the peripheral speed of the rolls of web is regulated to correspond with the speed of the webs. Heretofore regulation
 5 has been attained by means of continual manual adjustment of friction disks. The friction disks have become heated and worn and have required constant care and attention. The heating of friction apparatus has
 10 heretofore prevented the attainment of great speed and the uncertainty of adjustment has caused loose or excessively tight winding, and thus lack of uniformity or the frequent breaking of the webs. I have
 15 avoided these difficulties by means of my self-regulating apparatus. Heretofore, also, there has been great difficulty experienced in winding a number of slitted webs upon a single shaft. The fibers of the adjacent
 20 webs have interwoven so that it was impossible to separate the rolls, and therefore the expedient of winding alternate webs on separate shafts has been resorted to, thus causing increase of parts and complication
 25 of machinery, which it is desired to avoid. I have overcome this difficulty also and attained the desideratum by means of the plates 33, and 35, the bar 36, the channels formed by the blades 69, and the blades 70.
 30 Bar 36 resting upon the rolls serves to iron down the webs closely as they are wound, and being made of metal, also draws off the static electricity which tends to cause the folds of a web to repel one another and
 35 produce a loosely wound roll. I am thus enabled to run my printing press very rapidly and yet attain uniform and satisfactory results.

40 Having thus described my invention so that any one skilled in the art pertaining thereto may make and use it, I claim—

1. In a web printing press, in combination with rotary means for printing a web, slit-

ters for slitting said web into a number of webs, a guide-roller for guiding said webs, 45 a swinging slack and tension-roller which takes up the slack in said webs and provides tension, a winding-shaft for winding said webs, a face friction disk rigidly mounted on said winding-shaft, a peripheral friction- 50 wheel engaging said face friction disk and operatively connected with said rotary printing means, and means for shifting the position of said peripheral friction wheel diametrically relative to said face friction 55 disk and operatively connected with said swinging slack and tension-roller, so that when said slack and tension-roller is drawn up the speed of said winding-shaft is automatically reduced. 60

2. In a rotary printing press, printing means, slitting means, and web-winding means for winding a number of webs on a single shaft comprising a guide-roller for guiding the webs, a slack and tension-roller 65 for following the slack of said webs and providing the proper tension, troughs for guiding said webs separated from one another, a swinging metal guide-bar adapted to guide and iron down said webs on said 70 winding shaft and provided with separating-blades to keep said webs separate from one another when wound on said winding shaft and render the resulting rolls easily separable, and friction gear on said wind- 75 ing-shaft driven by said printing means and connected with said slack and tension-roller to automatically reduce the speed of said winding shaft when the peripheral speed of the paper rolls becomes greater than that of 80 the paper delivered by said printing means.

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Witnesses:

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