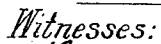


964,130.

2 SHEETS—SHEET 1.



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WEB FEEDING MECHANISM.
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2 SHEETS—SHEET 2.

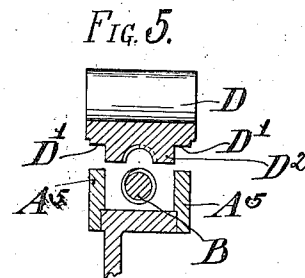
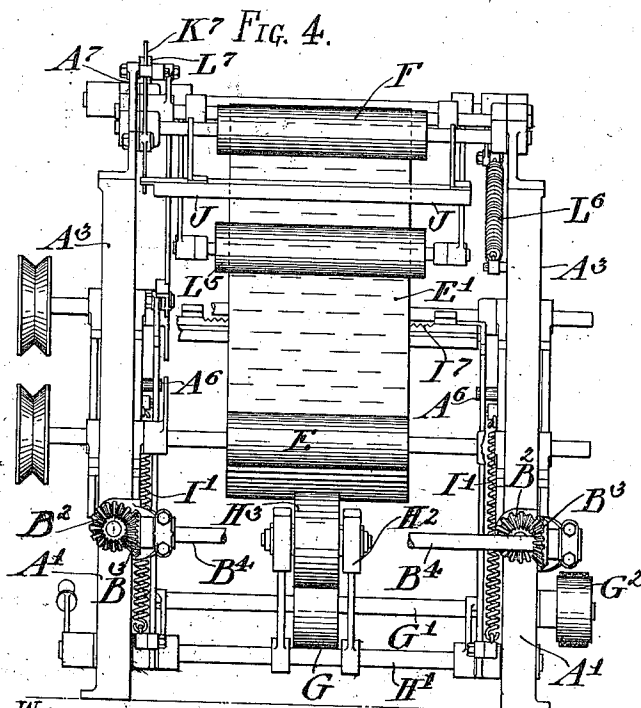
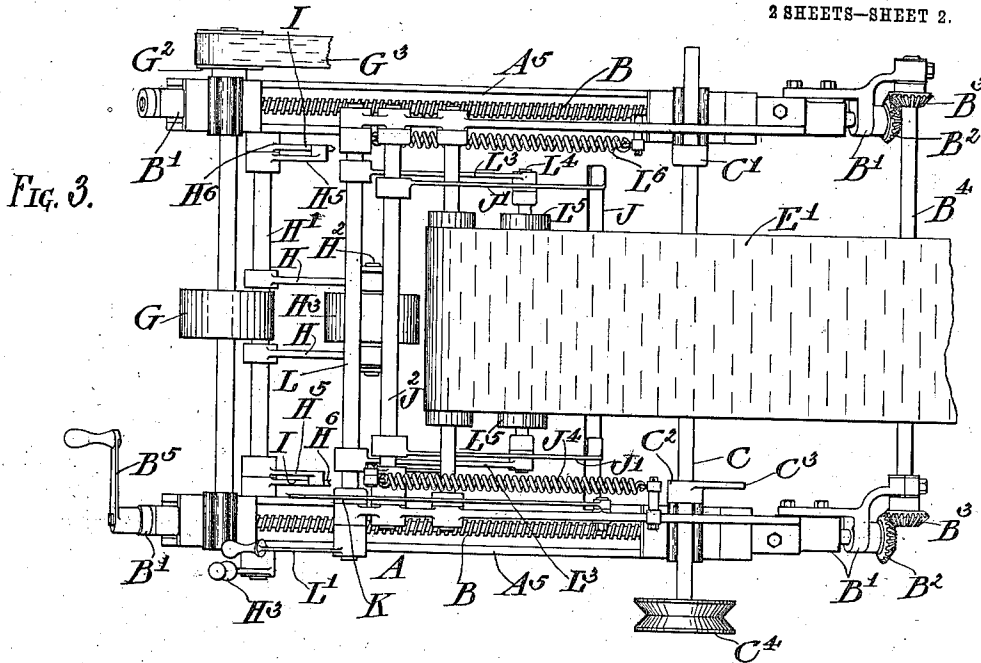
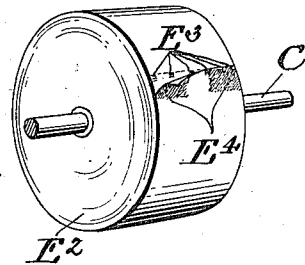


FIG. 6.



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UNITED STATES PATENT OFFICE.

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WEB-FEEDING MECHANISM.

964,130.

Specification of Letters Patent. Patented July 12, 1910.

Application filed June 7, 1907. Serial No. 377,678.

To all whom it may concern:

Be it known that I, CHARLES B. STILWELL, a citizen of the United States of America, residing in Wayne, in the county of Delaware and State of Pennsylvania, have invented a certain new and useful Improvement in Web-Feeding Mechanism, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

In connection with many modern high speed newspaper or other printing presses, paper bag machines and the like, the paper or other material printed, or otherwise worked upon is supplied in the form of a continuous web drawn from a roll.

The object of my invention is to simplify and improve mechanism for so attaching the outer end of a spare roll of material to a web being drawn from a roll of material in use, that the supply from the last mentioned roll may stop as from exhaustion of the roll without interfering with the continuous advancement of the continuous web.

In carrying out my invention, I first attach the flap or outer end of the spare roll to the body of the roll by a bond of paste or the like, strong enough to hold the web in place when the roll is rapidly rotated in the direction in which it tends to unwind. After the end of the roll is thus anchored in place, I set the roll in rotation gradually bringing its peripheral speed up to a parity with the speed at which the web fed from the roll in use travels. I then bring the periphery of the rotating spare roll and the advancing web from the roll in use into contact with sufficient pressure so that a bond will be formed between the end of the spare roll and the advancing web by paste supplied in any suitable manner, the bond formed being of sufficient strength to cause the end of the spare roll to be detached from the body of the roll and fed forward by the web from the roll in use. Usually I attach the two webs before the roll in use is entirely exhausted, and sever the web from the roll in use or "stub" roll just back of the point of attachment to the other roll at or about the time at which the webs of the two rolls are connected together.

By bringing the spare roll up to speed before attaching it to the web of the roll in use, I avoid the shock and disruptive strains which would occur if it were attempted to set the

spare roll in rotation at the proper speed in the instant at which the two webs were connected together. Mechanism for bringing the spare roll up to speed before the webs of the two rolls are connected is not claimed broadly herein, however, as it has been disclosed and broadly claimed in my prior Patent 808,883, granted Jan. 5, 1906.

The present invention is characterized, however, by various novel features of construction and arrangement of the mechanisms for bringing the spare roll up to speed, for making the connection between the webs from the two rolls and for severing the web from the old roll.

The novel method of manipulation disclosed herein forms the subject matter of my other application Serial Number 377,679 filed of even date herewith.

The various features of novelty which characterize the present invention are specifically pointed out in the claims annexed to and forming a part of this specification. For a better understanding of my invention, however, reference may be had to the accompanying drawings and descriptive matter in which I have illustrated and described one form of machine embodying my invention and particularly designed for feeding paper to printing presses, bag machines or the like.

Of the drawings, Figure 1 is a side elevation of the machine in the normal running position with some parts removed. Fig. 2 is a view similar to Fig. 1 but showing the parts in the position occupied at one stage of the operation of putting a spare roll into service. Fig. 3 is a plan view of the machine. Fig. 4 is a rear end elevation with parts broken away. Fig. 5 is a partial section on the line 5-5 of Fig. 1, with the parts separated to better show the construction, and Fig. 6 is a perspective view of a spare or fresh roll of paper prepared for use.

In the drawings, A represents the framework of the machine, comprising legs A¹, side rails A², standards A³ at the rear end of the machine and arms or brackets A⁴ extending from the standards A³. Each side rail has attached to it pieces A⁵ which form a trough-like guideway in which is located a feed screw B. Preferably the guideways are downwardly inclined from the front of the machine, as shown. The feed screws are journaled at their ends in boxes B¹ and carry at their lower ends bevel gears B²

which mesh with bevel gears B³ secured to a cross shaft B⁴. To the upper end of one of the feed screws is connected a crank B⁵ by means of which and the connecting gearing the feed screws may be simultaneously rotated.

Each paper roll is delivered to the machine with a supporting shaft C axially secured in it. The shaft is journaled in half open boxes D having shoulders D¹ resting upon the upper edges of the sides A⁵ of the guideways and are provided each with a portion D² depending between the sides of the guideway and threaded to form a half open nut engaging the corresponding feed screw B. Each shaft C is provided with collars C¹ and C² which engage the inner ends of the corresponding boxes D and prevent axial displacement of the shaft C. One of the collars C² has an extension or arm C³.

In assembling the roll on the shaft, the arm C³ is always turned to point in a definite direction with respect to the outer or flap end of the strip of paper forming the roll for a purpose hereinafter explained. The adjustment may be made by turning the shaft in the desired position relative to the roll before clamping the roll and shaft together or by adjustably securing the collar C² in the desired position on the shaft.

The normal position of the roll in use E from which paper is being fed is that occupied by the full roll in Fig. 1 and the small roll in Fig. 2, the paper web E¹ being drawn from the roll over the idler roll F journaled in the brackets A⁴.

The roll in use may be rotated and the paper web E¹ advanced in any suitable manner as by means of drawing rolls not shown engaging the forward end of the web E¹. To obtain the desired tension, a suitable friction device engages a pulley C⁴ not shown, which may be carried by the outer end of the shaft.

The spare roll E² has its shaft C mounted in boxes D placed at the upper and left hand ends of the guideways as seen in Fig. 2. Preparatory to being put into service, the flap end of the paper on the spare roll E² is lightly secured to the body of the roll as by a paste bond formed by pasting its forward edge to the body of the roll at points E³, see Fig. 6. At this time also the outer surface of the flap end of the roll may be supplied with paste at E⁴ for connecting it to the web drawn from the other roll.

When it is desired to utilize the spare roll E² it is rotated in its boxes D to give it a peripheral speed substantially equal to the advancing speed of the web E¹ drawn from the roll E. The means for gradually bringing the spare roll up to the desired speed includes a friction driving pulley G centrally located below the new roll and car-

ried by a shaft G¹ journaled in the front legs A¹ and driven by a pulley G² and belt G³ with a peripheral speed equal to the feed of the paper web E¹. Arms H secured to a shaft H¹ journaled in the front legs A¹ support at their outer ends movable journal boxes H⁷ for a shaft H² on which is mounted a friction roll H³.

Normally the roll H³ is held by gravity in the position shown in Fig. 1. The operating arm H⁴ connected to the shaft H¹ serves as a means for rotating the shaft H¹ to carry the roll H³ into the position shown in Fig. 2 in which it is driven by the roll G and in turn engages and drives the spare roll of paper with a peripheral velocity equal to the linear velocity of the web E¹ drawn from the roll in use. The shaft H¹ has loosely journaled on it near its ends arms I. The arms I are normally held down in the position shown in Fig. 1 by the weight of the roll H³ and parts connected to it acting through arms H⁵ secured to the shaft H¹ and provided with lugs H⁶ engaging the arms I. When the shaft H¹ is rotated into the position shown in Fig. 2, however, the springs I¹ move the arms I up against stops A⁶ carried by the side frames A². One of the arms I is provided at its free end with a bracket-like extension I² on which is pivoted a trip lever I³ having its end I⁴ toward the roll heavier than the other end I⁵. The overhanging lug I⁶ carried by the lever I³ normally engages the bracket I² as shown in Figs. 1 and 2 to hold the lever I³ in the position relative to the arm I there shown. When the arms I are in the position shown in Fig. 2, the end I⁴ of the trip lever is in position to be engaged and elevated once in each rotation of the spare roll E² by the arm C³.

A striker or cutting off blade J is carried by arms J¹ secured to a shaft J² journaled in the outer ends of the brackets A⁴. The shaft J² also has secured to it an arm J³ to which one end of a tension spring J⁴ is connected. The other end of the tension spring is connected to the corresponding arm A⁷ of the bracket A⁴. The shaft J² also has secured to it an arm J⁵ located in the same plane with the lever I³ and provided with a hook adapted to engage the end I⁵ of the lever I³ when the parts are in the position shown in Fig. 2. The shaft J² and parts connected to it are normally held in the position shown in Fig. 1 by means of a lock lever K provided with a detent K¹ engaging the striking blade J. The forward ends of the brackets A⁴ also have journaled in them a shaft L having secured to it an operating arm L¹, spring engaging arms L² and arms L³ having journaled in their outer ends a shaft L⁴ carrying the idle roll L⁵. Springs L⁶ connected to the brackets A⁴ and arms L² normally hold the shaft and parts

connected to it in the position shown in Fig. 1, but the parts may be moved from this position to that shown in Fig. 2, by manual operation of the lever L¹.

5 In connecting the spare roll to the web E¹ being drawn from the roll in use, the shaft H¹ is first turned to move the parts carried by it into the position shown in Fig. 2, whereby the spare roll is brought up to
10 speed. The handle L¹ is then turned to move the roll L⁵ into the position shown in Fig. 2 and the striker blade is released from the detent K¹ by the operation of the lever K. The last mentioned operations are
15 so timed that the striker is released from the detent K¹ and the roll L⁵ brought into the position shown in Fig. 2 just after the arm C³ has moved out of engagement with the lever end I⁴ and so that the parts are in
20 proper position before the arm C³ again engages the lever end I⁴.

The lock lever K may be released by direct manual actuation or preferably by an arm L⁷ set to engage the lever K and release
25 the striker when the roll L⁵ moves into close proximity to the spare roll. When the lever I⁴ is engaged by the arm C³ after all the parts are brought into the position shown in Fig. 2 the lever I³ is turned to release the
30 arm J⁵ and the springs J⁴ then move the arm J⁵ and striker blade J from the full line position shown in Fig. 2 to the dotted line position. The movement of the striker mechanism is arrested by the engagement of
35 the striker blade or frame with stops I³ carried by the ends of the arms I. The impingement of the striking blade on the tense web of paper E¹ passing from the roll E¹ to the guide roll L⁵ severs the paper. Preferably the arms I carry a serrated blade I⁷
40 cooperating with the blade J.

As the flap end of the paper of the spare roll comes in contact with the paper passing over the roll L⁵, the paste previously
45 smeared over relatively large portions E⁴ of its outer surface causes the flap end to adhere to the advancing web as indicated at E⁵ and be torn loose from its slight anchorage to the body of the roll and to advance with
50 and form a continuation of the web E¹. The arm C³ is so set relative to the flap end of the roll E² that the paper from the roll E is severed at the proper point relative to the joint between the webs of the two rolls.

55 Preferably the idler roll H³ is kept in operative contact with the roll of paper until the wet paste bond between the two webs passes into the draw rolls or the like for advancing the web. After this, the roll H³ is
60 moved back to its normal inoperative position. The old roll is then taken out of the machine, as are the boxes D in which it has been supported and the feed screws are rotated to move the fresh or spare roll, now
65 become the roll in use, from the starting po-

sition shown in Fig. 2 into the working position shown in Fig. 1. It should be explained that in applying the paste to the outer surface of the flap end of the new roll, only portions of the flap end at the sides of
70 the roll E³ are covered with paste.

The rolls of paper employed are usually not uniform in diameter. On this account, the arrangement employed herein for
75 setting the spare rolls in rotation by an idler engaging the peripheries of the spare roll and the belt driven friction driving roll is especially advantageous since the ultimate peripheral speed imparted to the spare roll is exactly equal to that of the driving fric-
80 tion roll, and is independent of the diameter of the spare roll. By making the friction driving roll narrow relatively to the length of the spare roll, the paste portions E⁴ may be made as large as necessary with-
85 out interfering with the driving roll. By manipulation of the feed screws, the position of the spare roll may be readily adjusted so that the roll L⁵ will engage it at the proper stage of its movement about the shaft L so
90 that the lock lever K will be actuated at the proper point.

While the form of my invention disclosed herein is quite satisfactory, it will be understood by those skilled in the art that
95 changes may be made in it without departing from the spirit of my invention.

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

100 1. In a web feeding mechanism, having bearings for a roll in use and for a spare roll, the combination with means for revolving the spare roll with a peripheral speed substantially equal to the traveling speed of
105 the web from the roll in use, means for causing an engagement between the advancing web drawn from the roll in use and the periphery of the spare roll, whereby paste applied to the contacting surfaces causes the
110 webs of the two rolls to adhere.

2. In a web feeding mechanism having bearings for a roll in use and for a spare roll, means for advancing a web drawn from
115 a roll in use, means for rotating the other roll with a peripheral speed substantially equal to the traveling speed of the web advanced, means for deflecting the web drawn from the roll in use against the periphery of said other roll, whereby it may be paste
120 connected to the web of the reserve roll, and means for severing the web from the roll in use back of the point of attachment of the web of the reserve roll.

3. In a web feeding mechanism having
125 means for supporting a roll in use in a normal position, means for supporting a spare roll in a starting position and means for transferring the spare roll from the starting position to said normal position when the
130

roll in use is removed, means for drawing the web from the roll in use through a path normally at one side of the reserve roll, means for rotating the reserve roll and means for deflecting the web drawn from the roll in use into contact with the periphery of the reserve roll, whereby it may be attached to the web of the reserve roll by paste applied to the adjacent surfaces of said webs.

4. In a web feeding mechanism having bearings for a roll in use and for a reserve roll, means for rotating the reserve roll, means for deflecting the web drawn from the roll in use against the periphery of the rotating reserve roll without interfering with the advancement of the web, whereby the advancing web may be attached to the web of the reserve roll by paste and means for severing the web from the roll in use at a predetermined distance back of the joint, said means comprising a striker, means for actuating it in the severing direction, a lock normally holding the striker in an inoperative position, a second lock for holding the striker out of service and means moving with the spare roll for tripping said second lock at a predetermined point in the rotation of the reserve roll.

5. In a paper feeding mechanism having bearings for supporting a roll in use and a reserve roll, in combination with means for rotating the reserve roll and means for attaching the advancing web drawn from the roll in use to the web of the reserve roll, means for severing the web from the roll in use back of the joint between the webs of the two rolls, said severing means comprising a spring actuated severing device, a manually controlled lock for normally holding the device out of service, and a second automatically controlled device for preventing the severing device from severing the paper except when the rotating reserve roll comes into a predetermined position.

6. In a paper feeding mechanism, a pair of parallel inclined guideways and a feed screw parallel to and adjacent each guideway, means for simultaneously rotating the feed screws, and web roll shaft boxes slidably mounted on said guideways and provided with open nut portions engaging said feed screws.

7. In a web feeding mechanism, having bearings for a roll in use, and for a spare roll, mechanism for rotating the spare roll, said mechanism comprising a friction driving roll, means for rotating it with a pe-

ripheral speed equal to the speed of the advancing web drawn from the roll in use, a movable friction idler roll, and means for moving it into and out of the position in which it engages the peripheries of said driving roll and said spare roll, and means for attaching the outer end of the web of the rotating spare roll to the advancing web from the roll in use.

8. In a web feeding mechanism having bearings for a roll in use and for a spare roll, a friction driving roll, means for rotating it with a peripheral speed equal to the advancing speed of the web drawn from the roll in use, a pivoted idler roll normally held out of engagement with the driving roll and the spare roll, means for moving said idler into the position in which it engages the peripheries of the driving roll and the spare roll, whereby the latter is set in rotation with the desired speed, a trip lever brought into operative position during, and by the means for causing, the rotation of the spare roll, an arm carried by the spare roll for tripping said trip lever once during each revolution of the spare roll, means for attaching the outer end of the rotating spare roll to the advancing web from the roll in use, and means for severing the web from the roll in use, said means including a spring actuating striker adapted to engage said trip lever, but released therefrom when said lever is tripped by the spare roll-carried arm.

9. In a web feeding mechanism having bearings for a roll in use and for a reserve roll, means for rotating the reserve roll, means for deflecting the web drawn from the roll in use against the periphery of the rotating reserve roll without interfering with the advancement of the web, whereby the advancing web may be attached to the web of the reserve roll by paste and means for severing the web from the roll in use at a predetermined distance back of the joint, said means comprising a striker, means for actuating it in the severing direction, a lock normally holding the striker in an inoperative position, means actuated by the web deflecting means for releasing said lock, a second lock for holding the striker out of service and means moving with the spare roll for tripping said second lock at a predetermined point in the rotation of the reserve roll.

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