Sept. 6, 1938. A. J. HORTON 2,129,618

WEB SUPPLY MECHANISM FOR PRINTING MACHINES

Filed Oct. 11, 1935 2 Sheets-Sheet 1

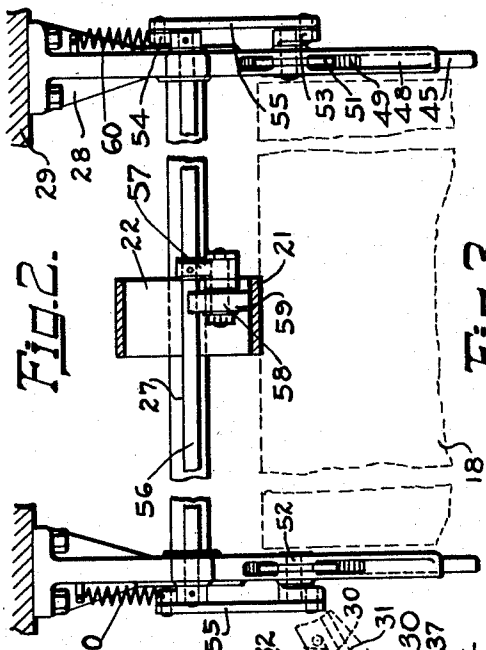


Fig. 2.

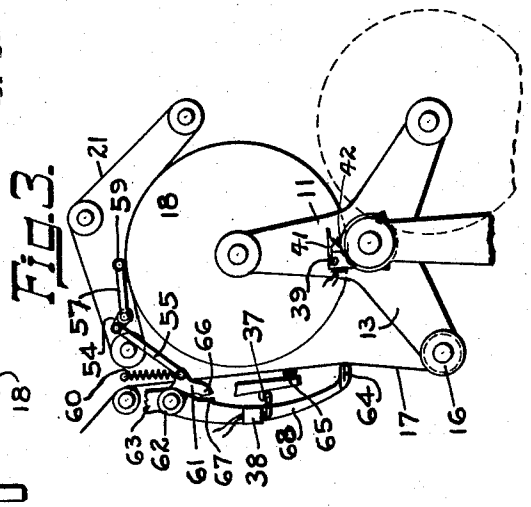


Fig. 3.

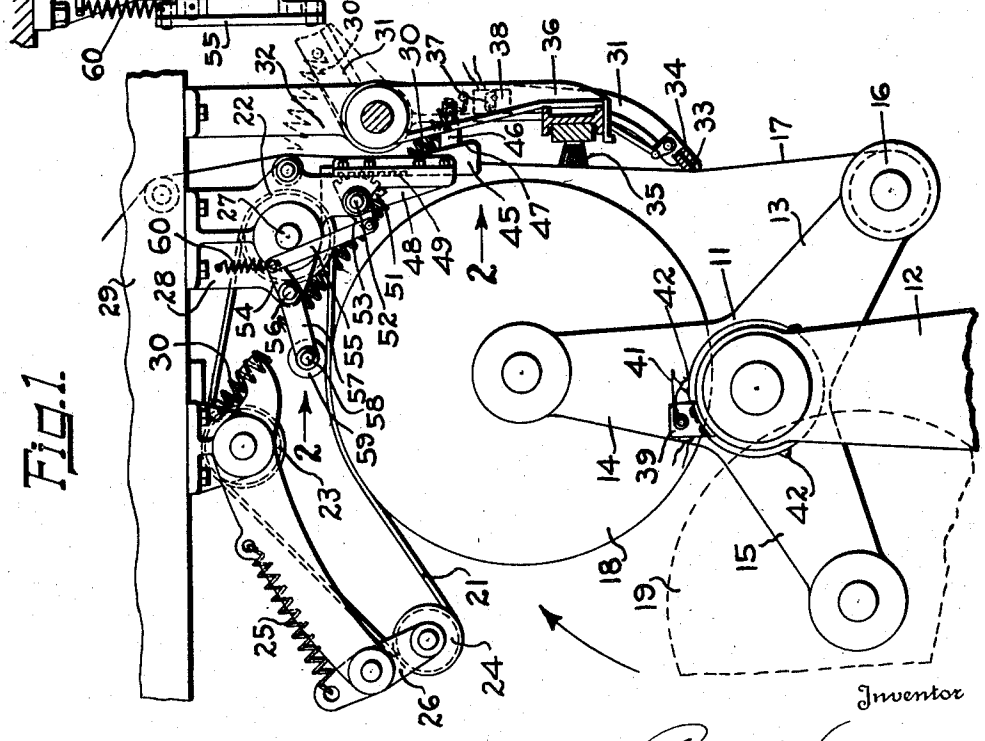


Fig. 1.

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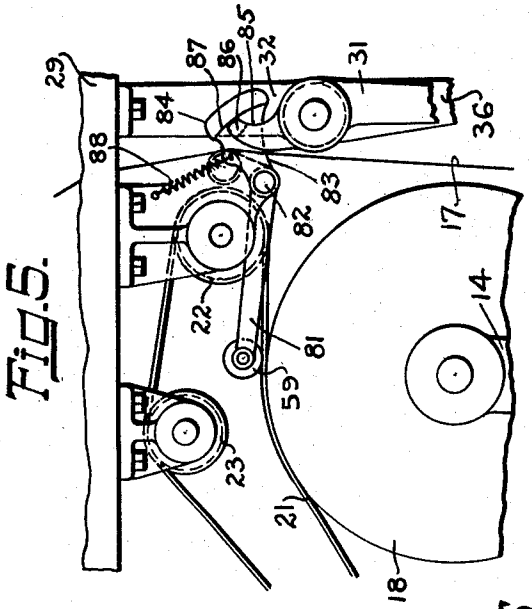


Fig. 5.

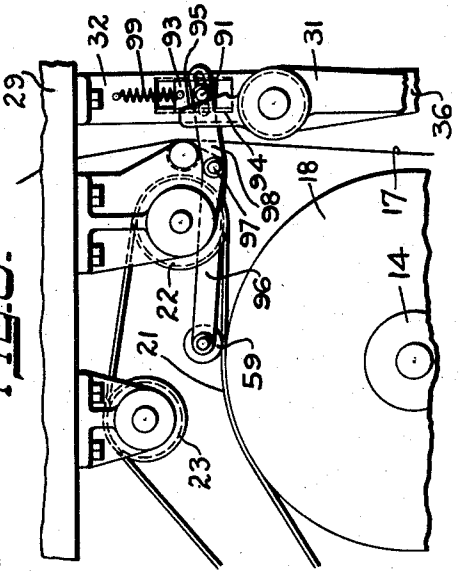


Fig. 6.

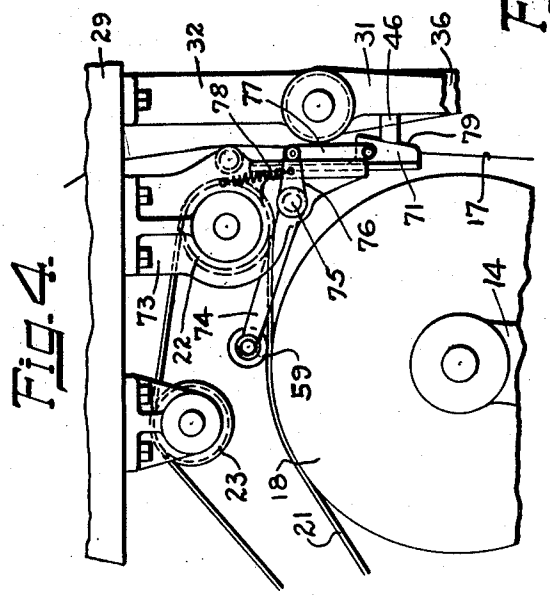


Fig. 4.

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UNITED STATES PATENT OFFICE

2,129,618

WEB SUPPLY MECHANISM FOR PRINTING MACHINES

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Application October 11, 1935, Serial No. 44,485

19 Claims. (Cl. 242—58)

This invention relates to a web supply mechanism for a machine operating upon a web wherein provision is made for changing the web feed from a spent roll to a full roll by joining the web of one to the web of the other without decelerating the machine, and more particularly to a mechanism for accomplishing this that is adapted to guide the web running from the exhausting roll in a desired spaced relation with respect to the surface of the replacement roll, even though there is variation in the diameters of the replacement rolls.

Preferably, the space between the running web and the surface of the web replacement roll should be constant for all diameters of rolls, when the replacement mechanism is in a preparatory position to make the join, in order to provide a constant distance to be traversed by the web deflecting or pasting brush commonly used to deflect the running web toward, and press it against the web of the replacement roll, thus insuring uniform operation in all instances, and that a proper join be made. This invention contemplates the obtainment of this desideratum by providing mechanism whereby the rotation of the roll carrier or reel is positively stopped at a predetermined point in its roll positioning movements, and an initial web deflector and a pasting brush are allowed a variable initial movement toward the replacement roll to compensate for differences in diameters of such rolls.

One object of this invention is to provide automatically operable means to interrupt the roll positioning movement of a roll carrier or reel at a determined point for all diameters of rolls, and to vary the preparatory web joining position of the web deflecting and severing means, whereby the running web and the replacement roll will be spaced apart the desired amount regardless of the diameter of the roll.

Another object is to provide a mechanism operable by the replacement roll, to properly dispose the web replacement mechanism in a preparatory web joining position, and which includes a variably positionable stop, operable to limit the movement of said web deflecting mechanism into pre-joining position.

It is also an object of the invention to provide a running web positioning device for a web supply mechanism, of generally improved construction, whereby the device will be simple, durable and inexpensive in construction, as well as convenient, practical, serviceable and efficient in its use.

With the foregoing 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 various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a fragmentary elevational view of a web supply and joining mechanism, in pre-join position, and showing a web deflector position controlling mechanism, embodying the features of this invention;

Figure 2 is a face elevational view of the mechanism controlling the position of the web joining mechanism, looking in the direction of arrows 2—2 of Figure 1;

Figure 3 is an illustration of a somewhat modified form of the mechanism;

Figure 4 illustrates a modified form of the mechanism somewhat similar to that shown in Figure 1;

Figure 5 illustrates another form of such mechanism; and

Figure 6 illustrates still another form.

The web supply and joining mechanism illustrated in Figures 1 and 2 includes a web roll supporting reel 11 mounted on a suitable shaft journaled in and between suitable supports 12, and has arms 13, 14 and 15 extending radially therefrom, upon which web rolls are rotatably supported in accordance with the present general practice. In this instance the arm 13 supports an expiring web roll 16, the running web 17 of which, is shown directed toward and into a machine adapted to operate upon a web, such as a printing machine (not shown), and the arm 14 supports a replacement roll 18, having a web end with adhesive applied thereon, positioned to have its web joined to the running web 17. It will be understood that, as is usual, the reel 11 is rotated by suitable means, such as an electric motor (not shown), in the direction indicated by the arrow in Figure 1, to position the web rolls into the positions illustrated, the arm 15 being, in this instance, positioned to receive another replacement roll 19 when the same is required.

When the replacement roll 18 is disposed in the position shown, that is, in the web joining position, it is rotated, before the join is made, to bring it up to the speed of the running web, by

suitable means, herein constituted by the driven belt 21, which engages the roll 18 upon an upper portion of the peripheral surface thereof. The belt 21 is guided about pulleys 22, 23, 24 and tensioned by a spring 25 acting upon the belt 21 through a lever 26 and the pulley 24. The pulley 22 is supported upon the shaft 27 journaled in the brackets 28, which are disposed one at either side of the machine, and secured to an adjacent machine frame member 29.

A web severing device is provided, which consists of a pair of swingably mounted arms, one of which is shown at 31, each pivotally mounted on a supporting bracket 32, also secured to the frame portion 29, and may have as herein shown, an automatically operable web severing blade 33, with its holder 34 mounted upon their lower ends. The holder 34 constitutes an initial or first web deflector adapted to be moved with the blade 33 into a web engaging and preparatory web joining position as illustrated, and during such movement to engage the running web 17 to initially deflect and to position it relatively to the replacement roll for the subsequent web joining operation. A spring 30 is provided to maintain the arms 31 both in the position shown and in the inoperative position which is indicated in dotted lines in Figure 1.

A second web deflecting member, herein constituted by a pasting brush 35, is mounted on a pair of arms 36, which are also swingably mounted upon the brackets 32, to be swung toward the replacement roll 18, to join the webs. The arms 36 and the arms 31 are releasably held together by a catch member 37, which is automatically released to permit web joining movement of arm 36 from the preparatory position illustrated, by means of an electrically operated catch release device 38. It will be understood that the arms 31 and 36 are initially moved in unison into the preparatory position illustrated, by manual or other suitable means, after the replacement roll is brought to web splicing position, and that the arm 36, when released by the catch 37, may be further moved manually or by the spring 30, to deflect the web 17 toward and into contact with roll 18 at the moment the adhesive covered end of the web, on this roll, is in position to be joined to the web 17.

Herein the spring 30 is shown connected to the arm 36 and through the catch member 37 acts on the arms 31 as above described.

The rotation of reel 11 relatively to the supports 12 may be accomplished by electrically operated means (not shown), that is stopped by a switch mechanism 39 conveniently mounted upon the support 12, in position to be operated by engagement of a finger 41, with one of the lugs 42, positioned on a collar on the shaft of the reel 11. It will be understood that the rotation of reel 11 is thus stopped to dispose the replacement roll 18, in all instances, at the same position.

In similar mechanisms used heretofore, it has been the practice to provide a fixed stop for the arm 31, to limit its movement toward the replacement roll, and when the replacement rolls have varied in diameter, the variable space between the surface of the same and the running web of an expiring web roll has been compensated for by varying the amount of rotation given to reel 11. According to this invention, the reel 11 is stopped at a predetermined position and always locates the axis of replacement roll 18 in the same position, and a mechanism is provided having a movable stop so arranged that it automatically positions the web deflecting and cutting devices at the proper distance from the axis of the roll 18 and thus controls the space between the surface of this roll and the running web 17, so as to compensate for variation in roll diameters.

One form of mechanism, providing a variable stop for the web deflecting and cutting mechanism, is herein shown in Figures 1 and 2 as including slidable wedge shaped stop members 45, disposed in the path of studs 46, secured to the arms 31 of the web deflecting and severing device. The stop members 45 are slidably supported on extensions 48 of the brackets 28, so as to present beveled surfaces 47 in various positions, to the end of the studs 46, and thus vary the swinging movement of arms 31 toward the replacement roll 18. One surface of each of the stop members 45 is provided with rack teeth 49, which are in mesh with the teeth of a gear segment 51 pivoted to the extension 48, by being secured upon a shaft 52 journaled in said extension. A short lever 53 is secured upon the shaft 52, and is connected to another short lever 54, by a link 55. The lever 54 is secured upon a shaft 56 which extends between and is journaled in brackets 28. An arm 57, secured to the shaft 56, supports a short shaft 58, upon which is rotatably mounted a roller or follower 59, herein shown disposed to engage and ride on the inner surface of the belt 21, opposite its contact with the surface of the roll 18 and, preferably, with its axis approximately in alignment with the axes of the reel 11 and the roll 18 when the latter is in the web joining position. A spring 60 is provided to maintain the follower 59 in engagement with the belt 21. It is obvious that arrangements could be made, to have the follower 59 engage the roll 18 directly upon its surface, instead of the belt 21, if desired, but the arrangement herein shown is most convenient in association with the particular form of web supply mechanism selected for illustrating the application of the same.

The operation of the above described automatically operating stop mechanism results in the positioning of the web deflecting and cutting device, as pointed out above. Difference in diameter of rolls 18 varies the position of the roller 59 and thus rocks the arm 57, and through the shaft 56 rocks the lever 54. Through the link 55, the lever 53, and the shaft 52, the gear segment 51 is caused to rock, and the member 45 is slidably moved to dispose its beveled surface 47 in position to have a point thereon engaged by the stud 46, and thus variably limit the swinging movement permitted the arm 31, and hence position the web deflecting and cutting device in such relation to the roll 18 that the space between the surface of this roll and the running web is always substantially the same.

From the above it will be obvious that should the roll 18 be of smaller diameter than the one illustrated, the member 45 will be lowered thus permitting the arm 31 to swing closer to the axis of the roll 18 and the arm 14, and should the roll 18 be of larger diameter than that shown, the arm will be stopped at a position farther from the axis of the roll 18 and the arm 14, thus providing for a constant and uniform amount of movement of initial web deflector or holder 34 and the brush 35 toward the roll 18 when it is moved preparatory to deflecting the web 17 into contact with the roll. The combination of the gear segment 51 and the rack teeth 49 on mem-

ber 45 provide mechanism for the above purpose whereby pressure applied on the arm 31 will not be transmitted back through the several levers and associated parts, to the roller 59 and hence to the roll 18.

In the form of mechanism shown in Figure 3 the gear segment 51 and the member 45 are omitted and a swingable stop member 61 is provided. The member 61 is pivotally secured at 62, to the bracket 63, upon which the web deflecting and severing device 64 and the pasting brush 65 are pivotally supported. A lug 66 formed on the stop member 61 is moved by the follower 59 through lever 54 and link 55, to a position to be engaged by a lug 67 extending from the arm 68 of the web deflecting and severing device to limit the movement thereof.

Variation in the position of the member 61 varies the movement permitted to arm 68 and is controlled by differences in the diameter of rolls 18. A spring 60 maintains the follower 59 in operative engagement with the belt 21. The reel 11 is stopped in a predetermined position by operation of the rotation controlling switch 39 as in the previously described form shown in Figures 1 and 2, and the web deflecting brush 65 and the arm 68 are likewise joined together by the catch 37, releasable at the proper time to permit deflection of the running web 17 of the expiring web roll 16, by the electrically operable means 38.

In the mechanism shown in Figure 4 the stop member 71 is slidably mounted upon an extension 72 of a belt roll supporting bracket 73. The roller or follower 59, in this instance, slides the member 71 through a lever 74, a shaft 75, a lever 76 and a link 77. A spring 78 maintains the follower 59 in engagement with the belt and through it, with the roll 18. Differences in the diameter of rolls 18 will slide the stop member 71, causing variations in the movements of arm 31, of the web deflecting and severing device, due to the cooperation between the stud 46 and a beveled surface 79 of the member 71.

In the form shown in Figure 5, the follower 59, through a lever 81, and a shaft 82, swings a lever 83 to vary the position of a stop member 84, formed thereon, relatively to an arm 85, extending from the arm 31 of the web deflecting and severing device. The arm 85 has a lug 86, formed upon its end for engagement with a beveled surface 87, of the stop member 84. Swinging movement of the stop member 84 by the follower 59, positions the surface 87 of the member 84, to limit the movement of the web deflecting and severing device toward roll 18. A spring 88 maintains the follower 59 in position to be moved by differences in diameter of rolls 18.

In Figure 6, is illustrated a form of mechanism wherein the stop member is in the form of a stud 91 extending outwardly from a slide 93, which is mounted upon the bracket 32 and is slidable thereon in the path of an extension 94 of the arm 31, of the web deflecting and severing device. A beveled surface 95, formed on the extension 94, cooperates with the stud 91 to limit the movement of the web deflecting and severing device toward roll 18. The stud 91 is moved by the follower 59, through a lever 96, a shaft 97, and a lever 98. A spring 99 maintains the follower 59 in engagement with belt 21, to be moved by differences in the diameter of the rolls 18, to dispose the stud 91 in the proper position.

It will be understood that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiments be considered in all respects as illustrative and not restrictive, reference being had to the claims rather than to the foregoing description to indicate the scope of the invention.

What I claim is:

1. In a web supply mechanism for a machine operating upon a web, a replacement roll movable into web joining position, a member movable to initially deflect a running web toward the positioned replacement roll, and means disposed in the path of said member and having its position controlled by the diameter of the replacement roll to determine the extent of movement of said web deflecting member.

2. In a web supply mechanism for a machine operating upon a web, a rotatable reel for moving a replacement roll into web joining position and, to dispose the replacement roll in a predetermined position, web joining mechanism having an initial web deflecting member adapted to deflect a running web toward the replacement roll, and means to control the web deflecting action of said member and actuated by the replacement roll to insure the required amount of web deflection to position the web a determined distance from said roll.

3. In combination in a web supply mechanism, means to position a replacement roll adjacent a web running from an expiring web roll, means to initially deflect the running web toward the replacement roll, and control means to limit the amount of deflecting movement of said deflecting means to insure substantially the same spacing between the replacement roll and the adjacent running web, when replacement rolls of different diameters are used.

4. In a web supply mechanism, means to position a replacement roll adjacent the running web of an expiring web roll, web deflecting and severing means movable into engagement with the running web, means to rotate the replacement roll, including a driven belt in contact with the surface of the roll, means to vary the web engaging position of said web deflecting and severing means, and means disposed opposite the point of contact of said driven belt with the replacement roll, and in contact with said belt to actuate said position varying means.

5. In a web supply mechanism, rotatably mounted means to position a replacement roll adjacent the running web of an expiring web roll, means to rotatably support a replacement roll on said first means, web deflecting and severing means movable into engagement with the running web, means to vary the web engaging position of said web deflecting and severing means, and means positioned in alignment with the axis of said replacement roll positioning means and said replacement roll supporting means, to actuate said position varying means.

6. In a web supply mechanism, a device for supporting and positioning a replacement roll adjacent the running web of an expiring web roll, a web deflecting and severing device movable into engagement with the running web, and mechanism to vary the web engaging position of said web deflecting and severing device, including means actuated by the replacement roll to operate said position varying mechanism, and means to prevent transmission of a moving impulse applied to said web deflecting and severing

device, through said position varying mechanism to the replacement roll.

7. In combination, means to dispose a replacement roll in position adjacent a running web, a movable member for supporting a device adapted to join a running web to the web of the replacement roll, mechanism including a swingable member, a stop member movable by said swingable member into the path of the movement of said movable supporting member, means operable by variations in the diameter of the replacement roll to move said swingable member, and means on said movable supporting member engageable with said stop member.

8. In a web supply mechanism for a machine operating upon a web, mechanism for disposing a replacement roll in a determined web joining position, web deflecting means mounted for movement toward the replacement roll, and cooperating means including a member movable by the replacement roll and a member movable with said web deflecting means, to variably limit the movement of said web deflecting means toward said replacement roll.

9. In a web supply mechanism, means for supporting a web roll from which a web is running freely to a machine, means for supporting a replacement web roll near the web, a web splicing mechanism movable to guide the web at a desired distance from the replacement roll and closer than it runs freely, and means governed by the radial dimension of the replacement roll to determine the position to which the splicing mechanism is moved.

10. In a web supply mechanism, a rotatable support for a replacement web roll adapted to move the replacement roll toward a web running freely from an expiring web roll, and to locate the axis of the replacement roll at a predetermined position, a web splicing mechanism movable to guide the running web at a desired distance from the replacement roll and closer than it runs freely, and means responsive to the radius of the replacement roll to determine the position to which the web splicing mechanism is moved.

11. In a web supply mechanism, means for supporting a web roll from which a web is running freely to a machine, means for supporting a replacement roll near the web, a web splicing mechanism movable to guide the web at a desired distance from the replacement roll and closer than it runs freely, a pivoted member biased toward the axis of the replacement roll and variably positioned in conformity with the radius of the replacement roll, when said replacement roll is moved into web joining position, and means controlled by the pivoted member to determine the position to which the web splicing mechanism is moved.

12. In a web supply mechanism, a rotatable support for a replacement web roll adapted to move the replacement roll toward a web running freely from an expiring web roll, and to locate the axis of the replacement roll at a predetermined position, a web splicing mechanism movable to guide the running web at a desired distance from the replacement roll and closer than it runs freely, a pivoted member biased toward the axis of the replacement roll and variably positioned in conformity with the radius of the replacement roll when said replacement roll is moved into web joining position, and means controlled by the pivoted member to determine the position to which the web splicing mechanism is moved.

13. In a web supply mechanism, means to dispose a replacement roll with its axis in a determined position, a first movable means to initially deflect a running web to a position adjacent to and spaced from the periphery of the replacement roll, a second movable means to deflect the web into engagement with the roll, said second movable means being connected to said first movable means to be initially moved therewith and being releasable therefrom for further movement, and means to vary the amount of movement of the initial web deflecting means to insure substantially equal spacing between the running web and the peripheries of replacement rolls of different diameters whereby in all instances the amount of movement of said second web deflecting means will be constant.

14. In a web supply mechanism, means to dispose a replacement roll with its axis in a determined position, movable means to deflect a running web to a position adjacent to and spaced from the periphery of the replacement roll, and means actuated by the replacement roll to control the amount of movement of said web deflecting means to insure substantially equal spacing between the running web and the peripheries of replacement rolls of different diameters.

15. In a web supply mechanism, means to support a replacement roll with its axis in a determined position, movable means to deflect a running web toward the periphery of the replacement roll, and means cooperating with the deflecting means and variably positioned automatically in dependence on the diameter of the replacement roll, to determine the amount of deflection of the running web by the deflecting means.

16. In a web supply mechanism, means to support one of a plurality of replacement rolls varying in diameter, with its axis in a determined position, movable means to deflect a running web toward the periphery of the replacement roll, and means positioned in accordance with the diameter of and by the replacement roll, to vary the web deflecting movement of the web deflecting means.

17. In a web supply mechanism, a rotatable support adapted to position a replacement roll adjacent a running web of an expiring web roll, an initial web deflecting member movable into engagement with the running web to deflect the same toward the replacement roll, and a stop positioned to be engaged by said deflecting member when it is moved, to limit the movement thereof, said stop being adjustable in accordance with the diameter of the replacement roll to vary the position of said web with respect to the roll when the web is deflected by the web deflecting member.

18. In a web supply mechanism arranged to feed webs from rolls that may vary substantially in diameter, a reel adapted to support a plurality of web replacement rolls and to dispose the rolls successively in a predetermined position in respect to a running web, a movable part having a web engaging position and adapted to engage the running web and deflect it toward the positioned replacement roll, a stop member positioned to be engaged by said part when it is moved, and mechanism influenced by the diameter of the replacement roll to position the stop member to insure sufficient deflection of the running web by the web engaging portion of said part when it is moved, to space the web a determined amount from the replacement roll.

19. In a web supply mechanism, a reel operable to position a replacement roll in a predetermined position, a first swingable arm having a web engaging member adjacent its free end, a second swingable arm having a web engaging member adjacent its free end, a stop member positioned to be engaged by one of said swingable arms to limit its swinging movement toward the replacement roll on said reel, and a lever arm influenced by the diameter of the replacement roll to position said stop member to engage and stop the swinging movement of the respective arm when the web engaging member on this arm is in a desired spaced relation with respect to the replacement roll, to insure the same amount of further swinging movement of the arm not engaged by said stop toward the replacement roll when replacement rolls of different diameters are mounted on said reel.

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