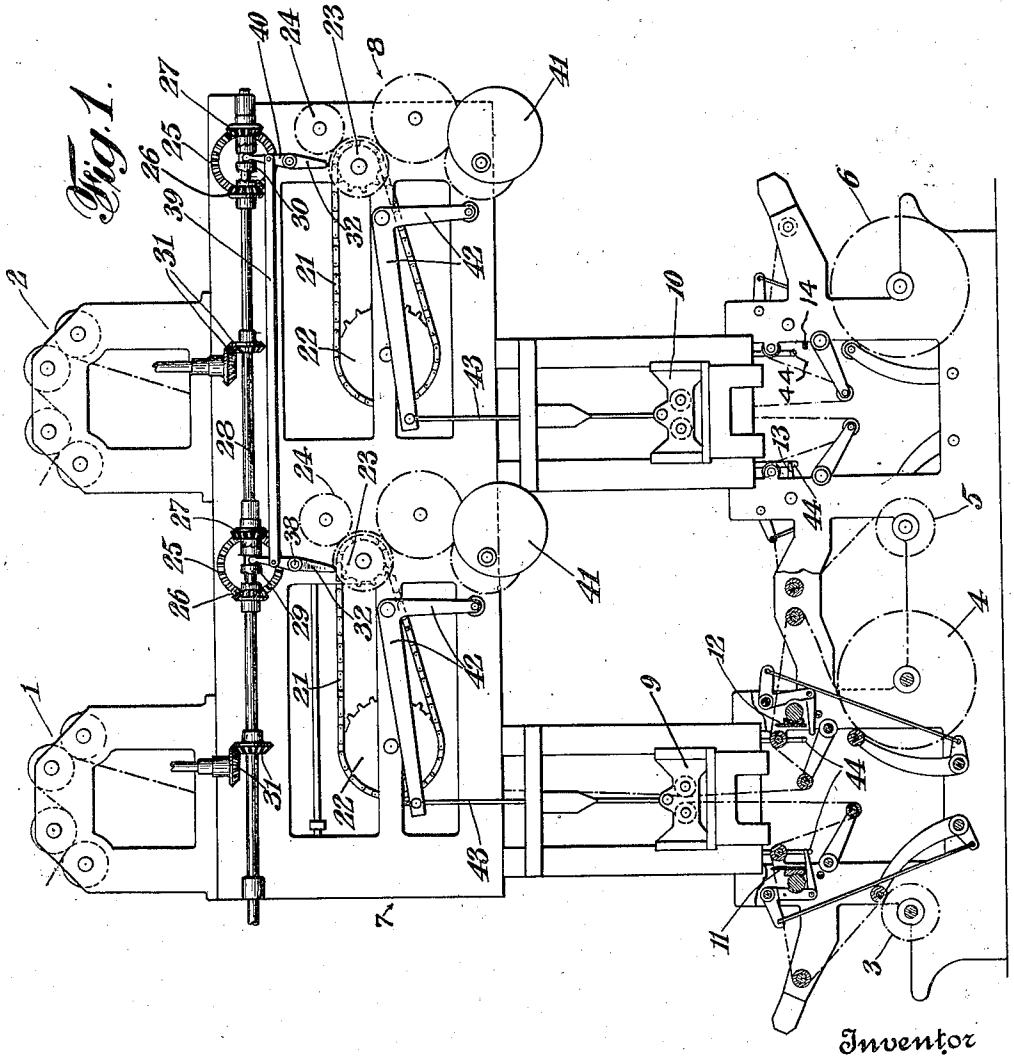
Dec. 6, 1927. 1,651,840

W. C. SCOTT

WEB REPLENISHING MECHANISM

Filed March 6, 1926 5 Sheets-Sheet 1

Fig. 1.



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By his Attorney

Arthur Becker

Dec. 6, 1927. 1,651,840

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WEB REPLENISHING MECHANISM

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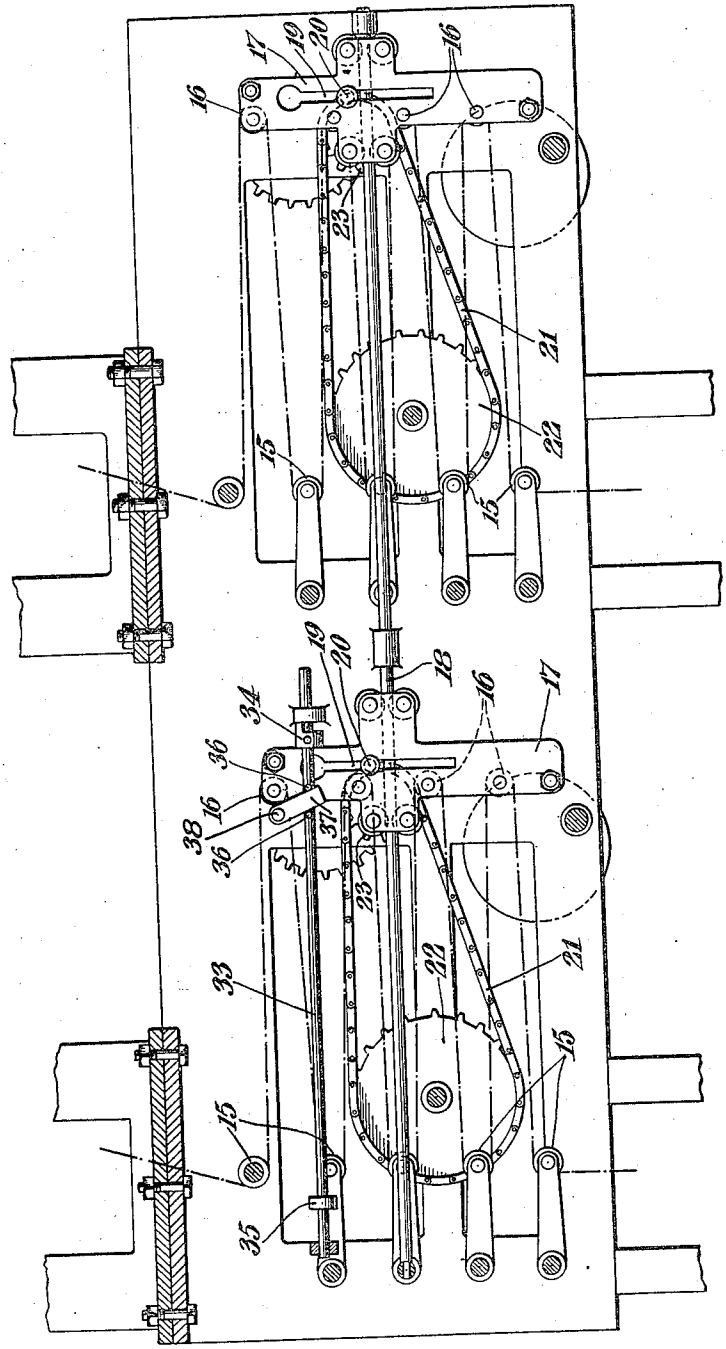


Fig. 2.

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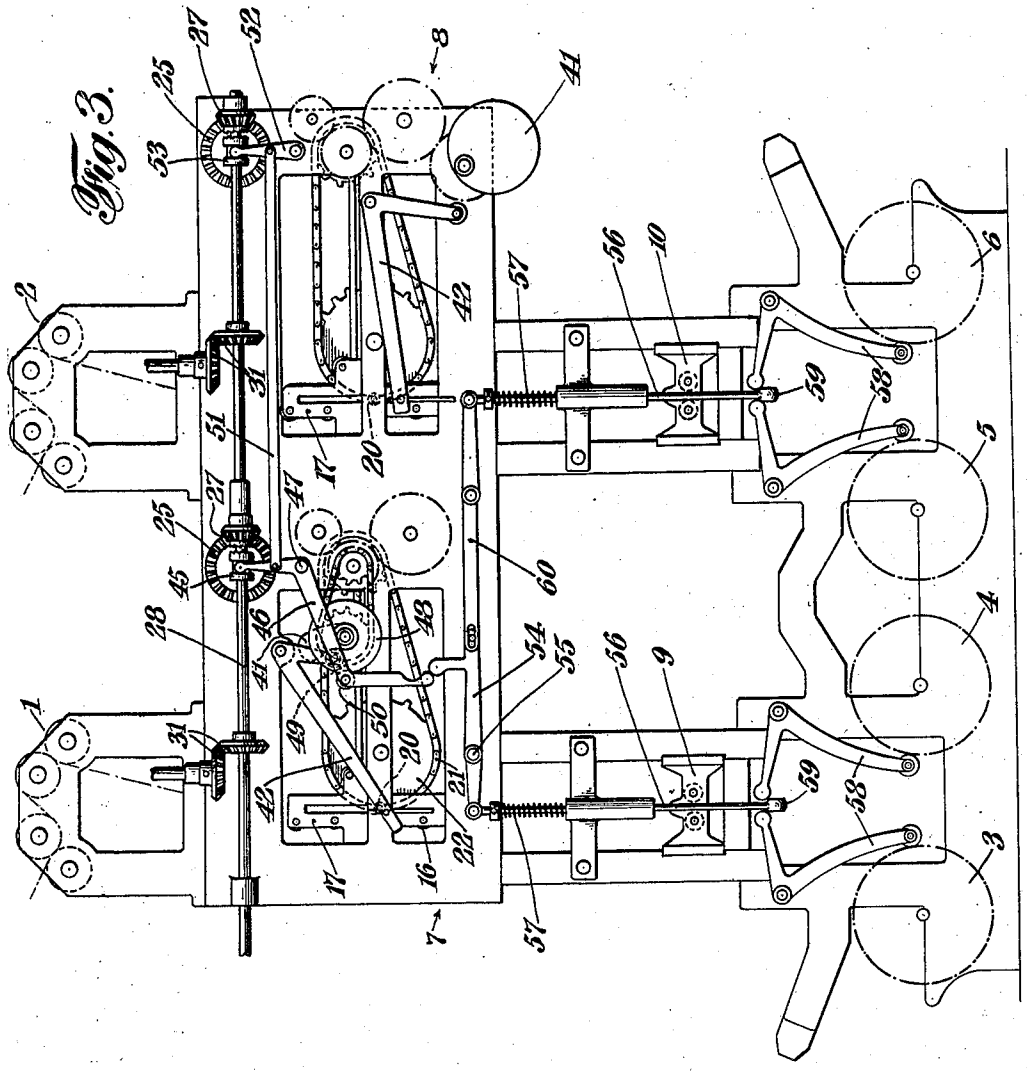
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WEB REPLENISHING MECHANISM

Filed March 6, 1926 5 Sheets-Sheet 3

Fig. 3.



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WEB REPLENISHING MECHANISM

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Fig. 5.

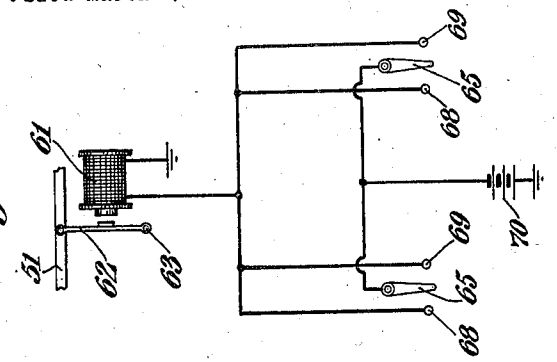
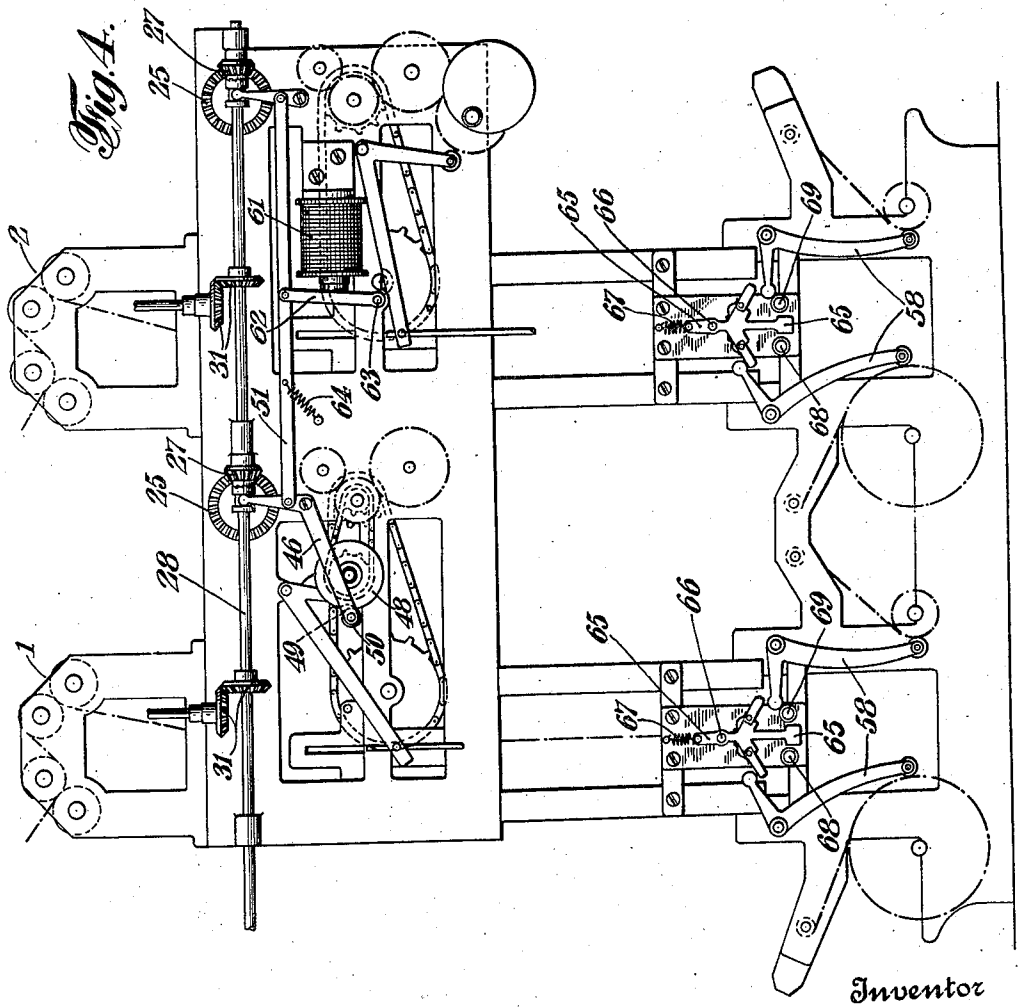


Fig. 4.



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Dec. 6, 1927. 1,651,840

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WEB REPLENISHING MECHANISM

Filed March 6, 1926 5 Sheets-Sheet 5

Fig. 8.

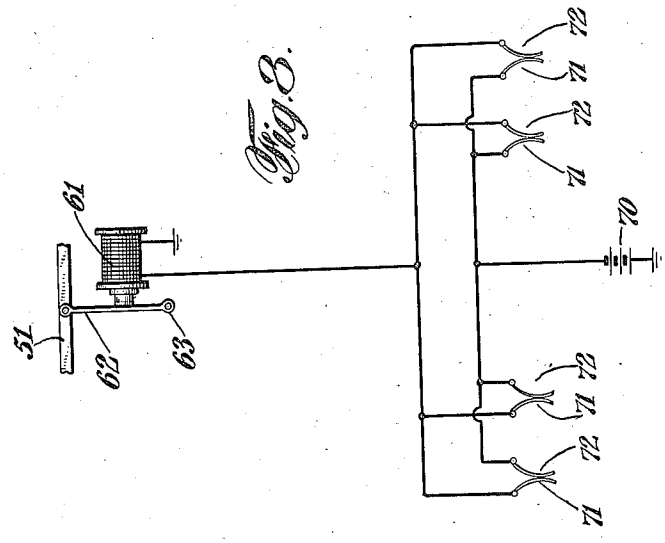


Fig. 6.

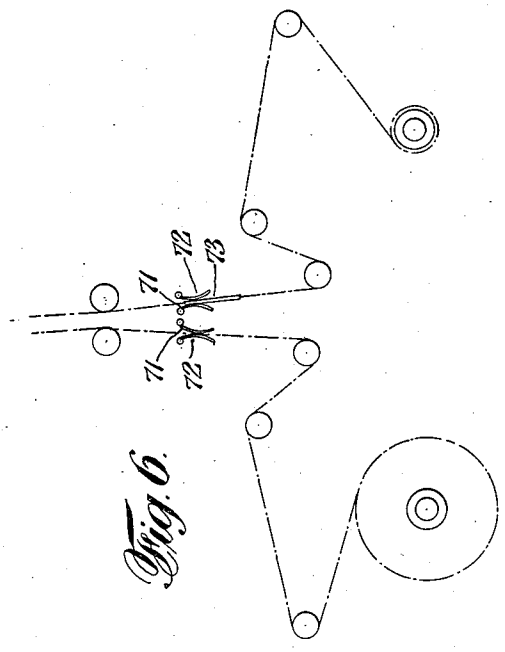
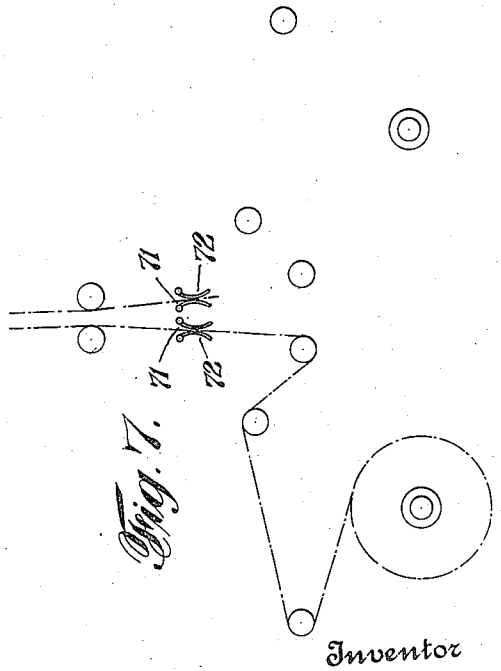


Fig. 7.



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Patented Dec. 6, 1927. 1,651,840

UNITED STATES PATENT OFFICE.

WALTER C. SCOTT, OF PLAINFIELD, NEW JERSEY.

WEB-REPLENISHING MECHANISM.

Application filed March 6, 1926. Serial No. 92,381.

This invention relates generally to web replenishing mechanism and is more particularly an improvement on the web replenishing mechanism described and claimed in applications Ser. No. 44,506, filed July 18, 1925, Ser. No. 51,983, filed August 24, 1925, and Ser. No. 63,817, filed October 21, 1925.

In mechanism of the character indicated, a web-pulling machine, such as a printing machine, receives a continuous supply of web by changing over from one web roll to another without stopping said web-pulling machine, the web change being accomplished by a suitable roll change device preferably while a portion of the employed web is slowed down or stopped by means of a surplus accumulating and dissipating device.

Some web-pulling machines, such as printing machines, are arranged in batteries or in a group of units and each unit or machine has a source of supply of web consisting of a plurality of web rolls brought successively into action. Web rolls vary in the quantity of paper they contain and therefore even were all the units of a group supplied with new web rolls at the same time, the web rolls would become depleted or exhausted at different times and consequently when a battery of machines or a group of units are employed, web changes occur constantly. It will be understood that, even in web-pulling machines that do not have to be stopped to effect the web change, it would be a great convenience to effect the web change simultaneously for all the units and this is entirely practicable because it is the custom to rewind the paper of the depleted stubs and join them into a continuous web which thereafter is used in the web-pulling machine.

The main object and feature of the invention is to create means whereby, when the web of the employed roll of one unit is depleted or nearly so, the roll change device such as a surplus accumulating and dissipating device and associated means, if any, of all the units are rendered active so that the web change for all the units occurs simultaneously.

Another object and feature of the invention is to control one or more surplus accumulating and dissipating devices electrically instead of mechanically, and, preferably, to control them automatically by depletion of an employed web roll.

In the accompanying drawings, the invention is disclosed in several concrete and preferred forms in which

Fig. 1 is a view, partly in elevation and partly in section, of a machine embodying one form of the invention.

Fig. 2 is a vertical longitudinal sectional view through the web surplus accumulating and dissipating devices shown in Fig. 1.

Fig. 3 is a view in elevation similar to Fig. 1, but showing a modified form of the invention.

Fig. 4 is a view in elevation similar to Fig. 1, but showing a modified form of the invention in which electro-magnetic controlling means are employed.

Fig. 5 is a diagrammatic view of a circuit employed in connection with the form of the invention shown in Fig. 4.

Fig. 6 is a diagrammatic view of a modified form of the invention.

Fig. 7 shows still another modification in diagrammatic form.

Fig. 8 is an electrical diagram of the wiring that may be used in connection with the forms of the invention shown in Figs. 6 and 7.

1 and 2 indicate a plurality of web-pulling machines, here disclosed as printing machines. Each web-pulling machine is provided with a set of sources of supply of web material in the form of a plurality of web rolls, here two in number, and indicated at 3, 4, 5 and 6. Intermediate each web-pulling machine and its source of web supply is a roll change mechanism taking here the form of a surplus accumulating and dissipating device generally indicated by 7 and 8. The action of the machine, in general, is that when an employed web roll, as 3, becomes depleted, the surplus accumulating and dissipating device is brought into action, either by hand or automatically, and a portion of the web is slowed down or stopped so that another web from a replenishing roll, as 4, may be attached to the slowed-down or stopped portion of the first web. If desired, a pasting device, as 9 or 10, and web severing means, as 11 and 12 or 13 and 14, may also be employed. The surplus accumulating and dissipating device may take many forms, several of which are disclosed in detail in applications Ser. No. 44,506, filed July 18, 1925, Ser. No. 51,983, filed August

24, 1925 and Ser. No. 63,817, filed Oct. 21, 1925, but in the present instance it is constructed as follows: 15 indicates a series of stationary rolls and 16 a series of movable rolls, the latter series being mounted on reciprocating carriage 17, which latter is slidably mounted on horizontal bars 18 (only one of which is shown). Carriage 17 is provided with a slotted portion 19 with which engages a roll 20 carried by chain 21, which latter passes over sprockets 22 and 23 rotatably mounted in the framework independently of the carriage. The employed web is threaded between rolls 15 and 16 and it will be understood that when sprocket 23 is rotated roll 20, by reason of its engagement with slot 19, will move the carriage. Sprocket 23 is rotated by a train of gears, not shown completely, but indicated by spur gear 24, bevel gear 25 and bevel pinions 26 and 27. Bevel pinions 26 and 27 are loosely mounted on shaft 28 and intermediate the bevel pinions is a clutch member 29 or 30 splined to shaft 28. Shaft 28 is geared to the web pulling machine by means of bevel gears 31, or otherwise. Normally, the accumulating and dissipating device is out of action but when the operator throws clutch 29 into engagement with 27 by means of hand lever 32 of device 7, motion will be imparted to sprocket 23 and carriage 17 will move in one direction thereby creating loops in the web and when clutch 29 is thrown into engagement with 26, sprocket 23 will be turned in the opposite direction and carriage 17 will return, thereby allowing the surplus to become dissipated. This operation may, of course, be carried out wholly by hand, but, in the form disclosed in Figs. 1 and 2, the arrangement is preferably such that once clutch 29 is brought into engagement with 27 the machine will automatically reverse the clutch when the stroke of the carriage in one direction is finished and throw it into engagement with 26, and when the stroke of the carriage in the other direction is finished will automatically disengage 29 and 26 and throw the clutch into neutral position. In the form here shown, the means to effect the automatic reversal are as follows: 33 is a rod, slidably mounted in the framework, carrying two stop collars 34 and 35 and also two pins 36 which latter engage an arm 37 on shaft 38 on which latter clutch lever 32 is mounted. When carriage 17 moves to the right (in Fig. 2) as a result of engagement of clutch 29 with 27, it will eventually encounter collar 34 and will thereby move rod 33 to the right thereby causing pins 36 to shift arm 37 and with it shaft 38 and clutch lever 32. The parts can be so arranged that the amplitude of the movement is such that clutch 29 engages 26 thereby reversing the movement of the carriage. On the return stroke of the carriage it will encounter collar 38 and the clutch lever 32 will be shifted to throw clutch 29 into neutral position. Or, if desired, the amplitude of the movement of the parts can be so arranged that when the carriage encounters collar 34 the clutch will be thrown into neutral position and the operator can then throw the clutch into reverse. This can be accomplished by adjusting collar 34 on rod 33 so that the carriage will encounter it earlier or later in its movement.

Surplus accumulating and dissipating device 8 is constructed exactly like 7, just described, except that it is unnecessary to provide it with rod 33 and its collars, or with arm 37. 39 indicates a connection between clutch lever 32 of device 7 and clutch lever 40 of device 8, whereby it will be seen that the two clutch levers move in unison when either is operated, be it done manually or automatically. As a consequence, web replenishing for both web pulling machines will be accomplished simultaneously.

In addition to the foregoing, a pasting device 9 or 10 may be used and may be operated automatically at the proper time by means of cam or eccentric 41, bell crank 42 and connection 43, cam 41 being driven from the same train of gears 24 as sprocket 23. So, also, severing means 11 and 12 or 13 and 14 may be employed and may be actuated by a member, as 44, mounted on the pasting device, and it will be understood that the severing devices of each set can be made to act in alternation automatically, because at one web change 3 will be the employed roll and on the next web change 4 will be the employed roll. The detailed construction of the surplus accumulating and dissipating device, of the pasting device and of the web severing means is disclosed in application Serial No. 51983 and need not be further elaborated upon here.

In Fig. 3 a modified construction is shown in which carriage 17 is given a complete reciprocation by having pin 20 make a complete circuit from the position shown in said figure and back again without reversing chain 21. In this case clutch 45 is a single clutch and is actuated by a lever 46, pivoted at 47. 48 is a disk making one revolution to each complete reciprocation of the carriage and is provided with a notch 49 in which is engaged a roll 50 on lever 46. It will be understood that when the operator actuates lever 46 to throw in clutch 45 he thereby lifts roll 50 out of engagement with notch 49 and the surplus accumulating and dissipating device is thrown into action. When disk 48 has made a complete revolution notch 49 will come opposite roll 50 and the latter will then drop into the notch, clutch 45 will be withdrawn and the device will stop. Clutch lever 46 is connected by

means of bar 51 with clutch lever 52 of clutch 53 of another surplus accumulating and dissipating device so that both devices act in unison.

Instead of throwing the web change mechanism into action by hand, automatic means, controlled by the depletion of the web roll, may be employed. Referring to Fig. 3, 54 is a lever pivoted at 55 and connected to rod 56 normally pressed upward by spring 57. Normally, spring 57 holds lever 54 in a position where it will not disturb clutch lever 46 but when rod 56 is pulled down against the action of spring 57 the clutch will be thrown in. Adjacent each web roll 3 and 4 is a pivotally supported member 58 which, when the roll is large, remains above projection 59 at the lower end of rod 56; but, when a web roll becomes depleted, member 58 will act against 59 and in passing down past the latter will pull rod 56 down, thereby throwing in the clutch. There is a similar arrangement of parts associated with device 8, except that lever 60 instead of engaging the clutch lever directly is movably related to lever 54 so that, whenever a web roll of either unit is depleted, a web change is automatically effected in both units.

In Figs. 4 and 5 is shown still another modification of the invention. The arrangement here is really the same as that shown in Fig. 3 except that instead of using mechanical means to throw the device into action, an electro-magnetic device is employed. As here shown, a clutch lever or connecting bar 51 is controlled by electro-magnet 61, this being conveniently accomplished by means of an armature 62 pivotally supported at 63 and connected to bar 51. When magnet 61 is energized, armature 62 will be attracted and throw in the clutches, and when the magnet is deenergized spring 64 will, when disc 48 has made a complete revolution and roll 50 drops into notch 49, retract the armature and throw out the clutches. Current may, of course, be supplied to the electro-magnet at will, as by means of a push button, but, preferably, the depletion of an employed roll will automatically close a circuit. As here shown, a circuit closer 65 is pivotally supported at 66 and is normally held in a central position by means of spring 67, but when a roll is depleted a member 58 will move the circuit closer into contact with one or the other of fixed terminals 68 or 69, thereby closing a circuit from battery 70 through the magnet. If a plurality of units is employed the arrangement may be extended to include a number of such units so that the depletion of a web roll in any unit closes a circuit through the magnet and effects a web change in all the units.

In Figs. 6, 7 and 8 are shown modified forms of the invention disclosed in Figs. 4 and 5. Here the web from each roll is threaded between a pair of contacts 71 and 72 of which there may be as many pairs as there are web leads. Normally these contacts are kept separated by the paper. Each roll may then have a metallic insert 73 imbedded in the edge of the paper near the end of the roll. When this insert passes between the contacts the circuit is closed through 61. Or, if desired and as shown in Fig. 7, when the end of the paper passes by the contacts the latter will come together and will close the circuit.

I claim:

1. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, and interconnected actuating means other than the webs, whereby when one device is rendered active the other device is also rendered active.

2. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, and interconnected actuating means, other than the webs, whereby when either device is rendered active the other device is also rendered active.

3. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, and interconnected actuating means, other than the webs and controlled by the depletion of the employed web roll of one set, to render both devices active.

4. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in

synchronism with the web pulling machines, and interconnected actuating means, other than the webs and controlled by the depletion of the employed web roll of either set, to render both devices active.

5. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, web attaching means associated with each device, and interconnected actuating means other than the webs, whereby when one device and web attaching means is rendered active the other device and web attaching means is also rendered active.

6. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, web attaching means associated with each device, and interconnected actuating means other than the webs, whereby when either device and web attaching means is rendered active the other device and web attaching means is also rendered active.

7. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, web attaching means associated with each device, and interconnected actuating means, other than the webs and controlled by the depletion of the employed roll of one set, to render both devices and web attaching means active

8. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, web attaching means associated with each device, and interconnected actuating means, other than the webs and controlled by the depletion of the employed web roll of either set, to render both devices and web attaching means active.

9. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, web attaching and severing means associated with each device, and interconnected actuating means, other than the webs, whereby when one device and web attaching and severing means is rendered active the other device and web attaching and severing means is also rendered active.

10. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, web attaching and severing means associated with each device, and interconnected actuating means, other than the webs, whereby when either device and web attaching and severing means is rendered active the other device and web attaching and severing means is also rendered active.

11. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, web attaching and severing means associated with each device, and interconnected actuating means, other than the webs and controlled by the depletion of the employed roll of one set, to render both devices and web attaching and severing means active.

12. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, web attaching and severing means associated with each

device, and interconnected actuating means, other than the webs and controlled by the depletion of the employed web roll of either set, to render both devices and web attaching and severing means active.

13. Web replenishing mechanism including: a web pulling machine, an employed web roll, a replenishing web roll, a web surplus accumulating and dissipating device for the web of the employed roll, actuating means, other than the web, for said device, and electromagnetic means to control the actuating means.

14. Web replenishing mechanism including: a web pulling machine, an employed web roll, a replenishing web roll, a web surplus accumulating and dissipating device for the web of the employed roll, actuating means, other than the web, for said device, and electromagnetic means to control the actuating means and in turn controlled by the depletion of the employed roll.

15. Web replenishing mechanism including: a web pulling machine, an employed web roll, a replenishing web roll, a web surplus accumulating and dissipating device for the web of the employed roll, web attaching means, actuating means, other than the web, for said device and web attaching means, and electromagnetic means to control the actuating means.

16. Web replenishing mechanism including: a web pulling machine, an employed web roll, a replenishing web roll, a web surplus accumulating and dissipating device for the web of the employed roll, web attaching means, actuating means, other than the web, for said device and web attaching means, and electromagnetic means to control the actuating means and in turn controlled by the depletion of the employed roll.

17. Web replenishing mechanism including: a web pulling machine, an employed web roll, a replenishing web roll, a web surplus accumulating and dissipating device for the web of the employed roll, web attaching and severing means, actuating means, other than the web, for said device and web attaching and severing means, and electromagnetic means to control the actuating means.

18. Web replenishing mechanism including: a web pulling machine, an employed web roll, a replenishing web roll, a web surplus accumulating and dissipating device for the web of the employed roll, web attaching and severing means, actuating means, other than the web, for said device and web attaching and severing means, and electromagnetic means to control the actuating means and in turn controlled by the depletion of the employed roll.

19. Web replenishing mechanism including: a web pulling machine, two web rolls, a web surplus accumulating and dissipating device, actuating means, other than the web, for said device, and electromagnetic means to control the actuating means and controlled by the depletion of either roll.

20. Web replenishing mechanism including: a web pulling machine, two web rolls, a web surplus accumulating and dissipating device, actuating means, other than the web, for said device, electromagnetic means to control the actuating means, and a circuit through said electromagnetic means to be closed by the depletion of either roll.

21. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, interconnected actuating means, other than the webs, whereby when one device is rendered active the other device is also rendered active, and electromagnetic means to control the actuating means and in turn controlled by depletion of the employed web roll of either set.

22. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, interconnected actuating means whereby when either device is rendered active the other device is also rendered active, and electro-magnetic means to control the actuating means and in turn controlled by depletion of the employed web roll of either set.

23. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, interconnected actuating means, controlled by the depletion of the employed web roll of one set, to render both devices active, and electromagnetic means to control the actuating means and in turn controlled by depletion of the employed web roll of either set.

24. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the

other web pulling machine and each set having an employed web roll and a replenishing web roll, two web surplus accumulating and dissipating devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, interconnected actuating means, controlled by the depletion of the employed roll of either set, to render both devices active, and electromagnetic means to control the actuating means and in turn controlled by depletion of the employed web roll of either set.

25. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web roll change devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, and interconnected actuating means, other than the webs, whereby when one device is rendered active the other device is also rendered active.

26. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web roll change devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, and interconnected actuating means, other than the webs, whereby when either device is rendered active the other device is also rendered active.

27. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web roll change devices, normally inactive and which when actuated are driven in synchronism with the web pulling machines, and interconnected actuating means, other than the webs and controlled by the depletion of the employed web roll of one set, to render both devices active.

28. Web replenishing mechanism including: two associated web pulling machines, two sets of sources of supply of web material one set for one and the other set for the other web pulling machine and each set having an employed web roll and a replenishing web roll, two web roll change devices normally inactive and which when actuated are driven in synchronism with the web pulling machines, and interconnected actuating means, other than the webs and controlled by the depletion of the employed web roll of either set, to render both devices active.

Signed at Plainfield, in the county of Union and State of New Jersey, this 1st day of March 1926.

WALTER C. SCOTT.