May 23, 1950 F. E. DUNTON 2,508,566

WEB ROLL BACKSTAND

Filed June 10, 1946 7 Sheets-Sheet 1

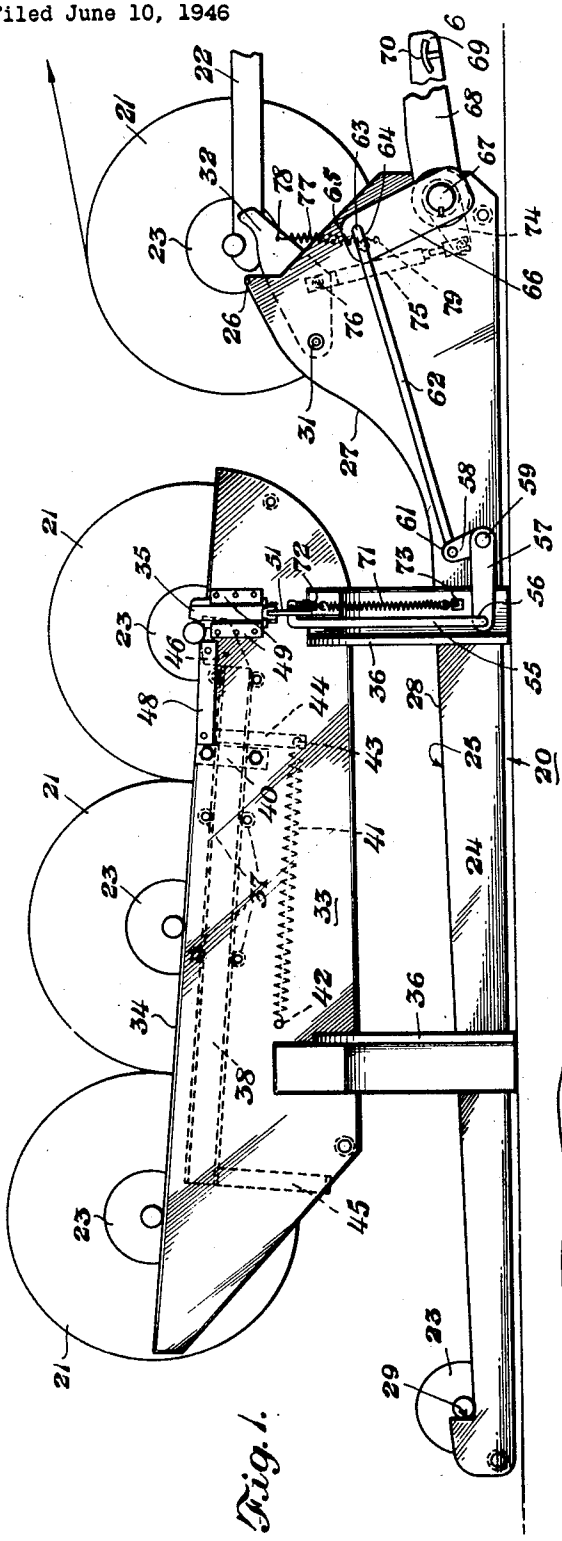


Fig. 1.

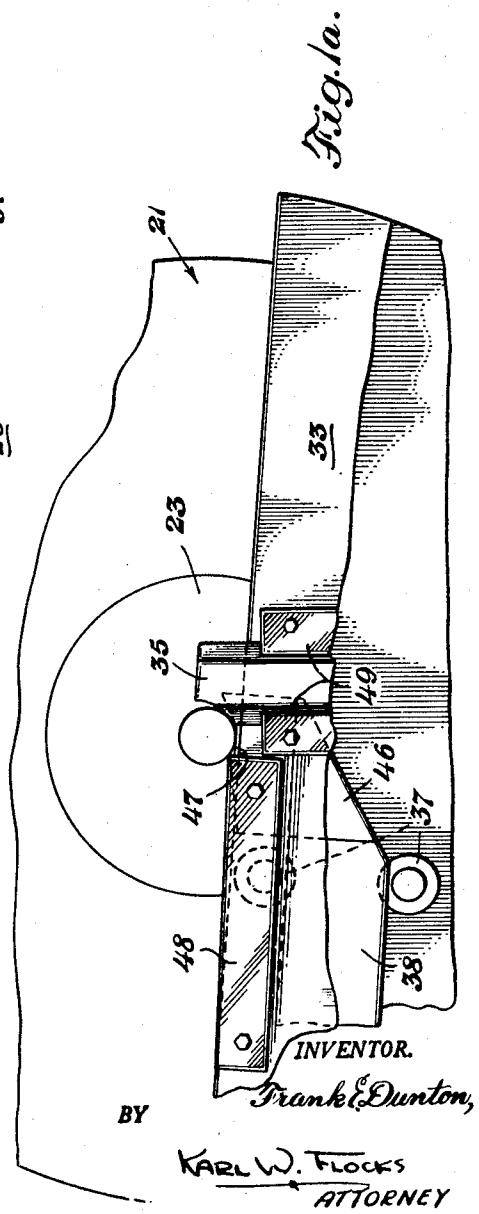


Fig. 1a.

INVENTOR.
Frank E. Dunton,
BY
KARL W. FLOCKS
ATTORNEY

May 23, 1950 F. E. DUNTON 2,508,566

WEB ROLL BACKSTAND

Filed June 10, 1946 7 Sheets-Sheet 2

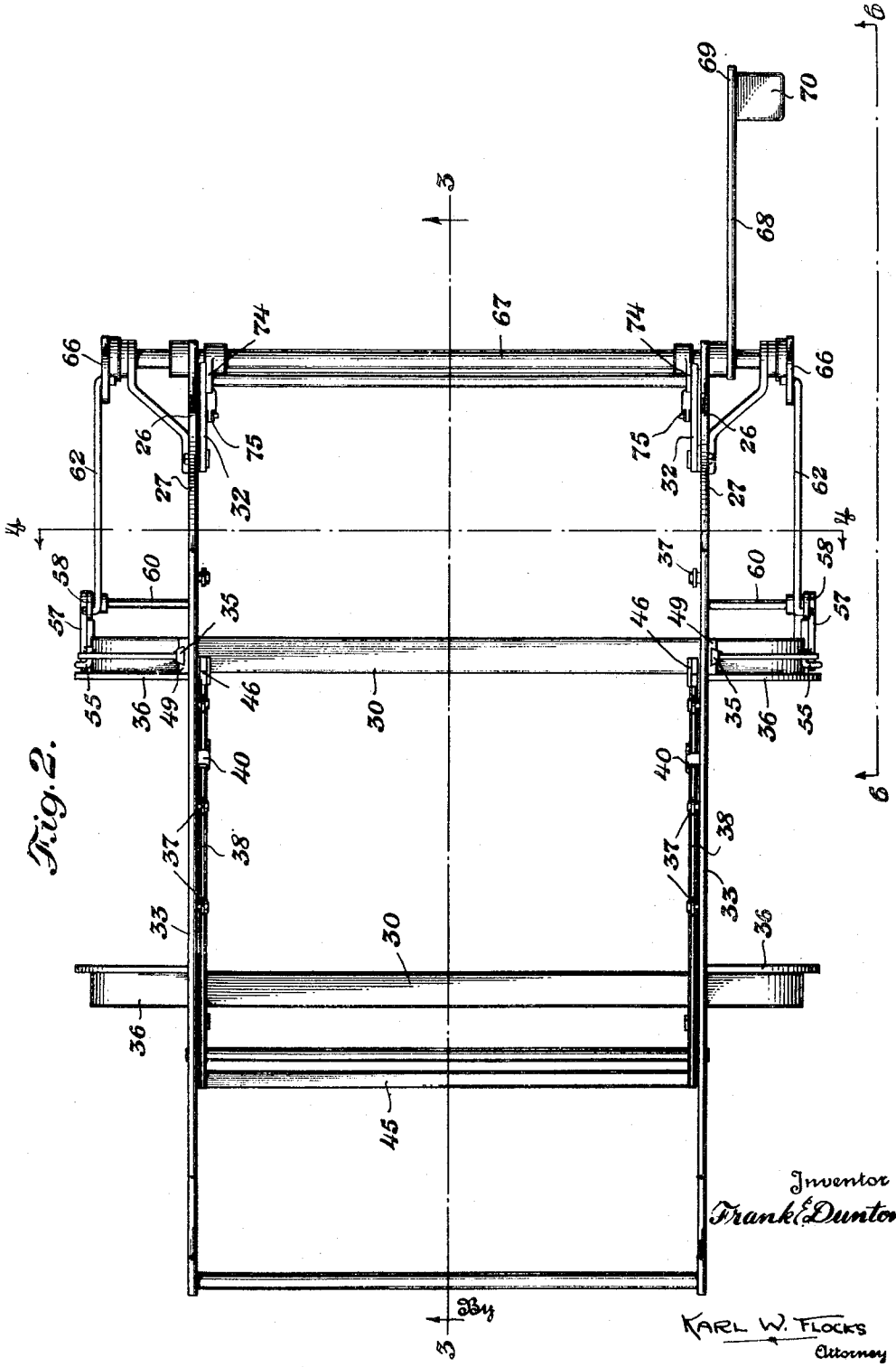


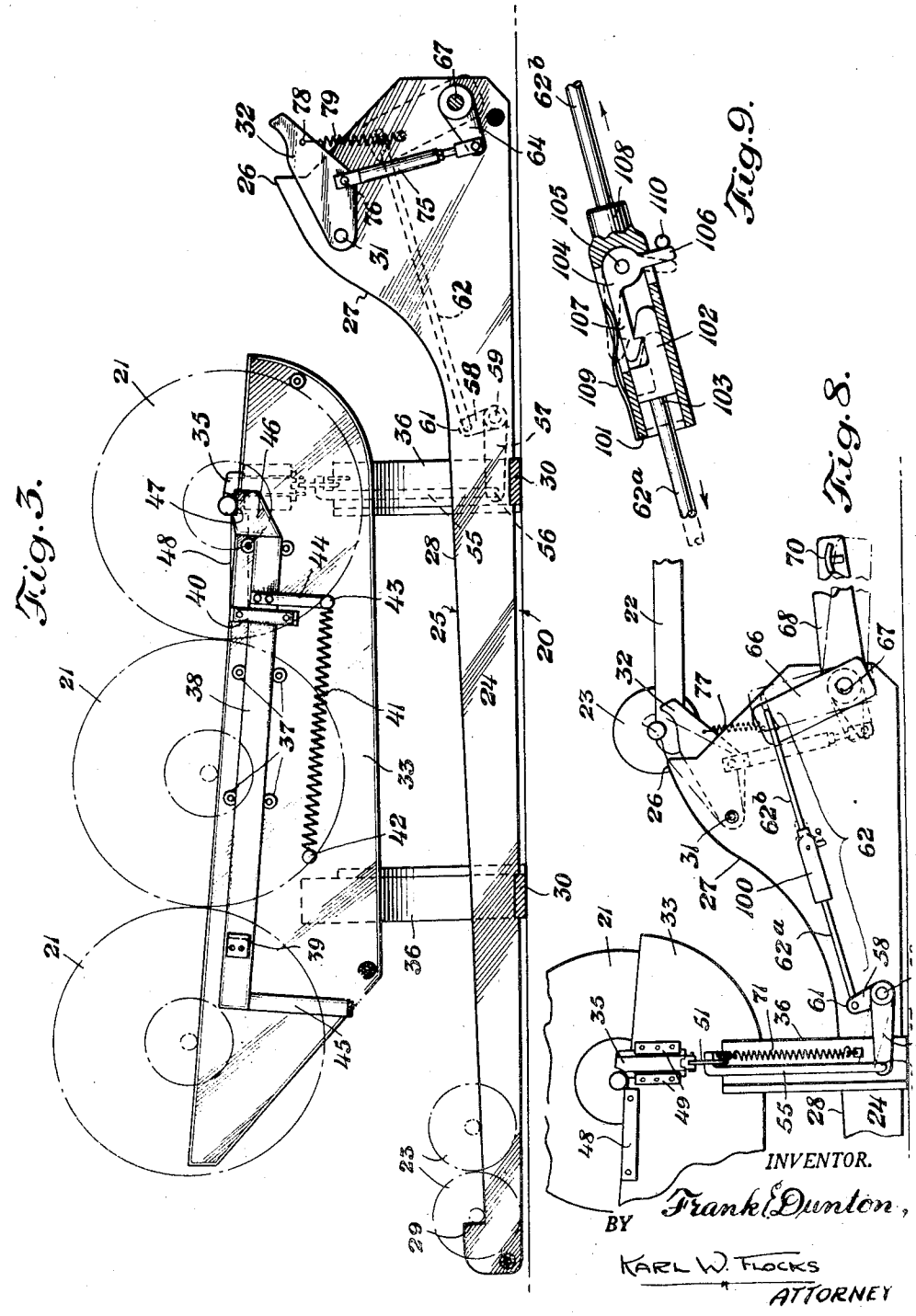
Fig. 2.

Inventor
Frank E. Dunton,
By
KARL W. FLOCKS
Attorney

May 23, 1950 F. E. DUNTON 2,508,566

WEB ROLL BACKSTAND

Filed June 10, 1946 7 Sheets-Sheet 3



INVENTOR.
Frank E. Dunton,
BY
KARL W. FLOCKS
ATTORNEY

May 23, 1950 F. E. DUNTON 2,508,566

WEB ROLL BACKSTAND

Filed June 10, 1946 7 Sheets-Sheet 4

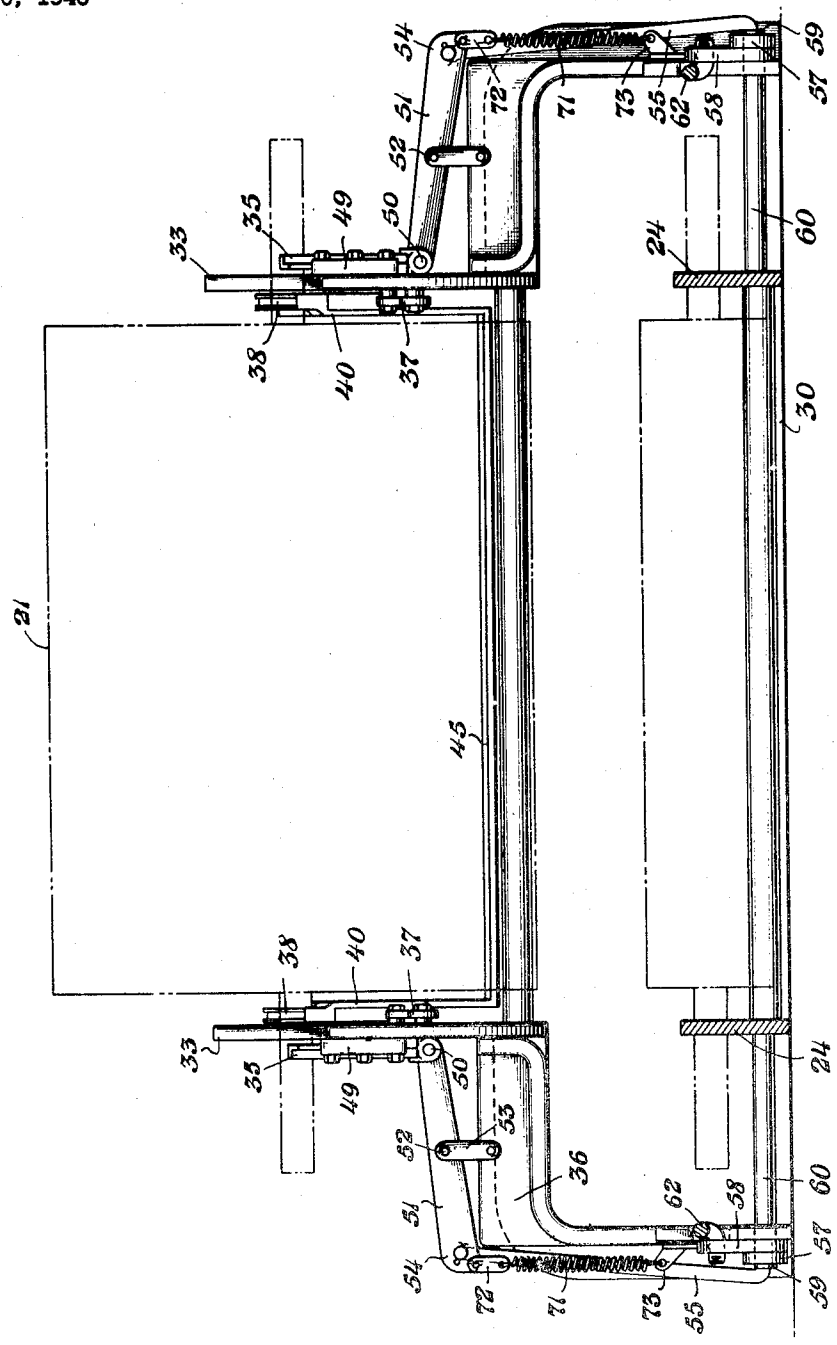


Fig. 4.

INVENTOR.

BY Frank E. Dunton,

KARL W. FLOCKS
ATTORNEY

May 23, 1950 F. E. DUNTON 2,508,566

WEB ROLL BACKSTAND

Filed June 10, 1946 7 Sheets-Sheet 5

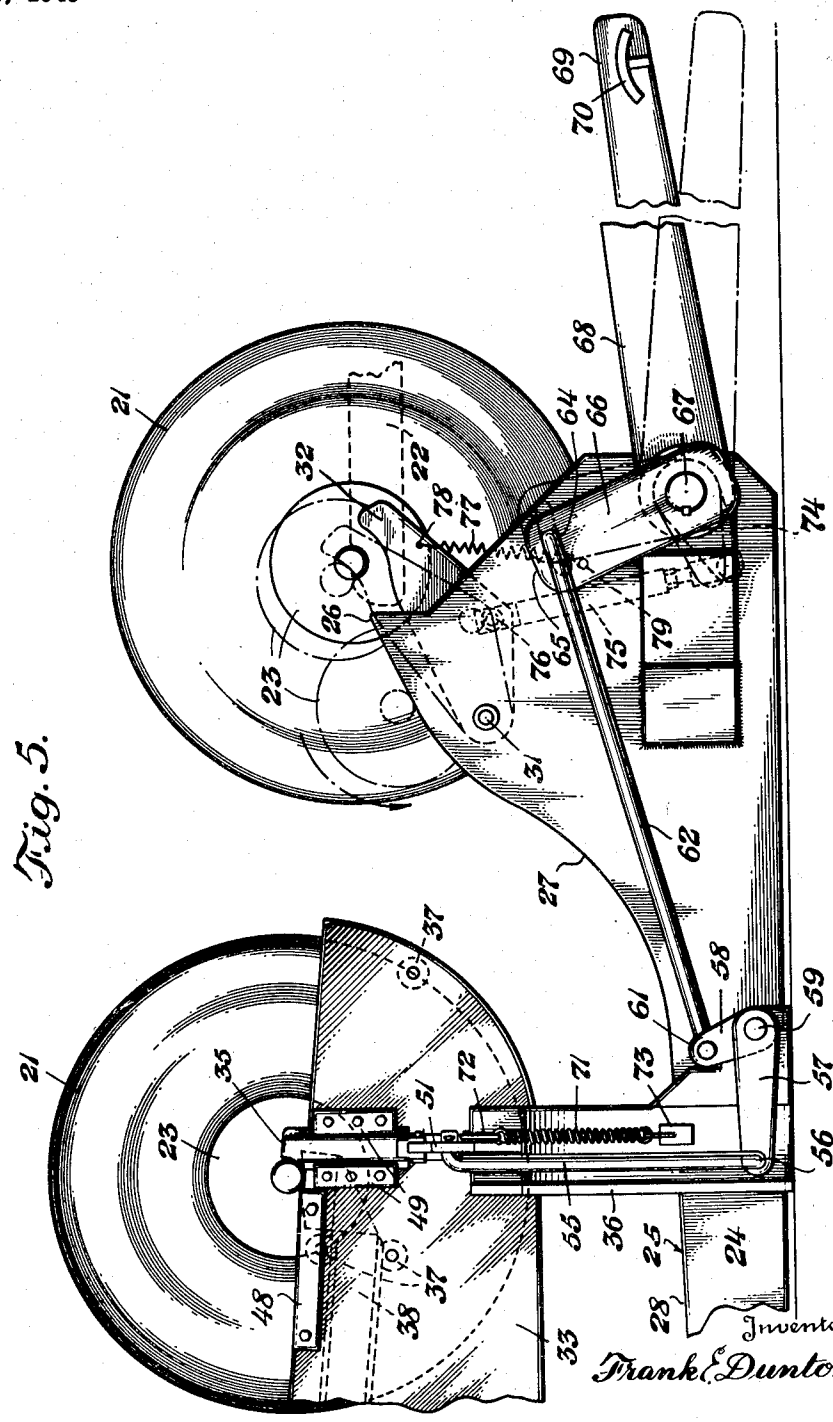


Fig. 5.

Inventor
Frank E. Dunton,

By

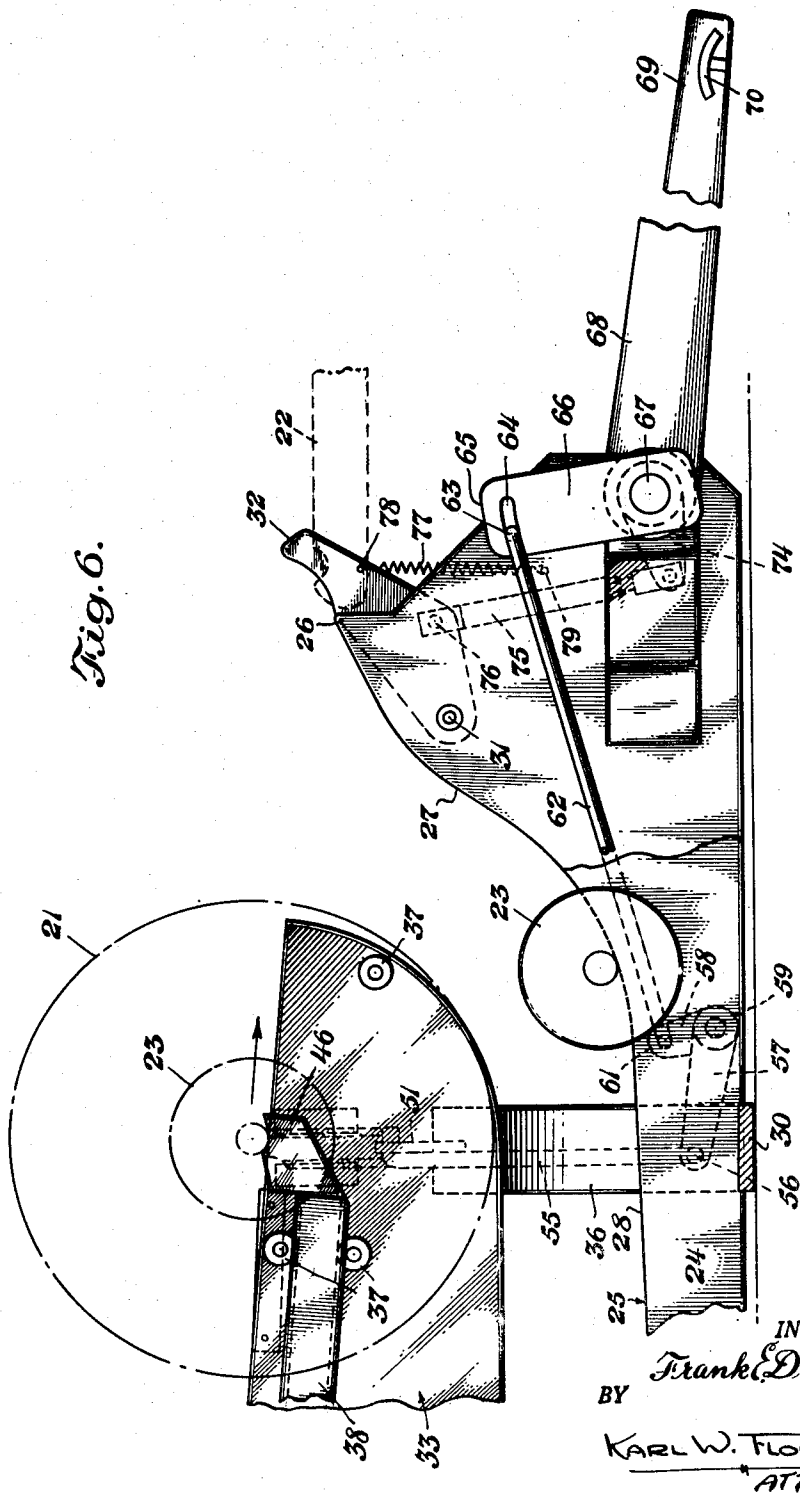
KARL W. FLOCKS
Attorney

May 23, 1950 F. E. DUNTON 2,508,566

WEB ROLL BACKSTAND

Filed June 10, 1946 7 Sheets-Sheet 6

Fig. 6.



INVENTOR.
Frank E. Dunton,
BY
KARL W. FLOCKS
ATTORNEY

May 23, 1950 F. E. DUNTON 2,508,566

WEB ROLL BACKSTAND

Filed June 10, 1946 7 Sheets-Sheet 7

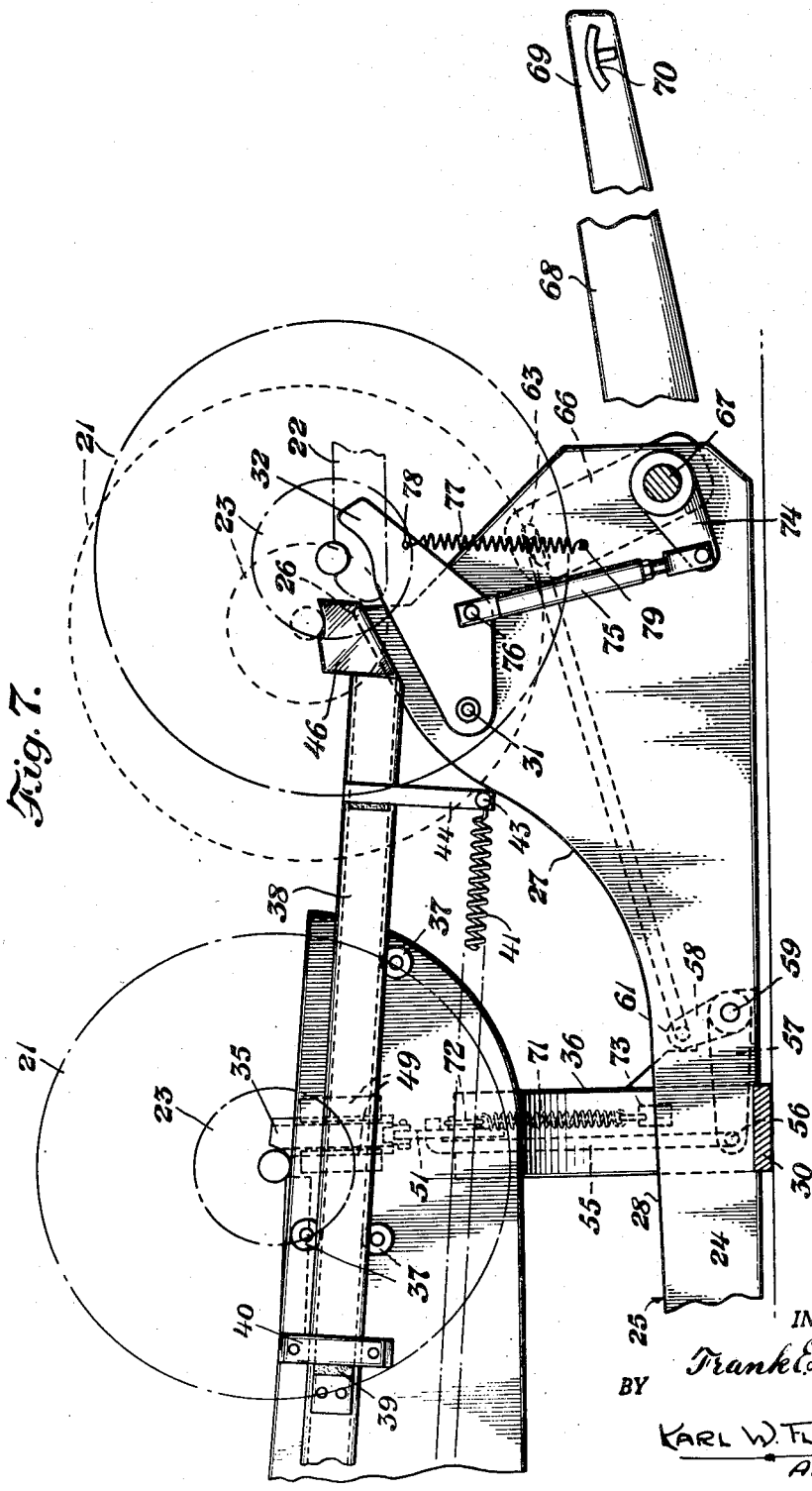


Fig. 7.

INVENTOR.
Frank E. Dunton,
BY
KARL W. FLOCKS
ATTORNEY

Patented May 23, 1950 2,508,566

UNITED STATES PATENT OFFICE

2,508,566

WEB ROLL BACKSTAND

Frank E. Dunton, Plattsburg, N. Y., assignor, by mesne assignments, to The Diamond Match Company, New York, N. Y., a corporation of Delaware

Application June 10, 1946, Serial No. 675,676

13 Claims. (Cl. 242—58)

1

This invention relates to the feeding of wound web rolls to a machine which receives, feeds, or operates on, sheet material from a relatively large or heavy roll and more particularly to the successive feeding of wound rolls to the machine and the successive removal of unwound rolls from the machine.

Prior to the instant invention, various types of devices have been utilized for placing wound rolls in unwinding position and for removing unwound rolls from the original unwinding position, but such prior devices have been large, cumbersome, expensive to manufacture, and difficult to operate in the manner desired.

It is an object of the instant invention to teach a novel method of feeding wound rolls to a machine wherein a roll of web material is unwound and for removing unwound rolls therefrom.

It is another object of the instant invention to provide a novel mechanism for feeding wound rolls to a machine wherein a roll of web material is unwound and for removing unwound rolls therefrom.

Other objects and the nature and advantages of the instant invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a side elevation of the device in accordance with the invention.

Fig. 1*a* is an enlargement of a portion of Figure 1.

Fig. 2 is a top plan view of a portion of the apparatus shown in Figure 1.

Fig. 3 is a vertical section taken along line 3—3 of Figure 2.

Fig. 4 is a transverse vertical section taken along line 4—4 of Figure 2.

Fig. 5 is a fragmentary side elevation of the apparatus shown in Figure 1.

Fig. 6 is a fragmentary vertical section taken along line 6—6 of Figure 2 showing the stop mechanism released and the roll about to be delivered to the machine wherein it is unwound.

Fig. 7 is a section similar to Figure 6 showing the roll bearing carriage extended and delivery being made to the unwinding mechanism.

Fig. 8 is a view similar to Figure 5 showing a modified form of operating mechanism.

Fig. 9 is a fragmentary elevation with parts shown in section and parts broken away illustrating a portion of the operating mechanism in Figure 8.

Referring to Figures 1–7, the backstand 20 is adapted to successively feed wound rolls 21 to the machine 22 wherein the rolls are unwound

2

and to remove the unwound rolls 23 from the machine 22. The backstand 20 comprises a pair of base plates 24, the upper surfaces 25 of which are trackways for guiding the unwound rolls or spools 23 from the uppermost portions 26 of the base plates 24 down the chute-like portions 27 across the inclined portions 28 to the stops 29. The base plates 24 may be welded or otherwise secured to the transverse frame members 30 as shown in Figs. 2 and 3. Pivotally mounted on the inside of each of the base plates 24 at 31 are the throw-out members 32 which are adapted to be moved in a counter-clockwise direction to transfer unwound rolls 23 from the machine 22 to the uppermost portions 26 of the base plates 24 from which the unwound roll slides or rolls down the chutes 27, down the inclined portions 28 to the stops 29 from which last place they may be removed.

The upper side plates 33 are located directly above and in spaced relation from the base plates 24. The upper surface 34 of each of the side plates 33 is inclined as shown in Fig. 1 so that the wound rolls 21 tend to roll downwardly and the lowermost wound roll 21 is maintained in position by the retractable stop elements 35. The side plates 33 are supported in the position described and shown in the drawings by the inverted L-shaped supports 36 which are secured at their inner upper ends to the side plates 33 and at their lower ends to the transverse frame members 30.

Mounted on the inside of each of the side plates 33 between stationary rotatable rollers 37 are the carriage arms 38. Secured to the inner side and near the rear of the carriage arms 38 are the stops 39 which cooperate with the bracket 40 when the carriage is in fully extended position in order to prevent further extension thereof. The tension springs 41 each have one end 42 secured to the side plates 33 and the other end 43 secured to the bracket 44 which is fixed to the carriage arm 38 serve to pull back the carriage from extended position as shown in Fig. 7 to the retracted position shown in Fig. 3, at which time the bracket 44 serves as a stop in cooperation with the fixed bracket 40 which is secured to the side plates 33. The U-shaped bracket 45 serves to connect the two carriage arms 38 so that they form an integral carriage unit. Each of the carriage arms 38 at their forward ends 46 are provided with a notched-out portion 47 for supporting the rolls 21. Secured to the outside at the top and near the end of each of the side plates 33 are the plate elements 48

which serve to raise the rolls 21 as they come down the inclined top surface 34 of the side plates 33 so that they will come to rest on the notched-out upper surface portion 47 of the end 46 of the carriage arms 38 as best shown in Fig. 1a.

Retractable stop elements 35 are adapted to slide vertically within the brackets 49 which are secured to the outside of the side plates 33, and the bottom of the elements 35 are pivotally connected at 50 to the levers 51, see Fig. 4, which levers 51 have their pivot points at 52 and are supported above the forward supporting brackets 36 by the supporting elements 53. Pivotally connected to the opposite ends 54 of the levers 51 are the vertical links 55 which are connected at their lower ends 56 to the bell crank arms 57, which bell crank arms 57 are connected to the bell crank arms 58 and both arms 57 and 58 are pivotally mounted at 59 on shafts 60 extending from the base plates 24 as best shown in Figs. 1 and 4. The upper ends 61 of the arms 58 are pivotally connected to the links 62 which have their ends 63 mounted in sliding relation within the slots 64 in the ends 65 of the bell crank arms 66 which are keyed to the shaft 67. Also, keyed to the shaft 67 is the bell crank arm 68 which has mounted on its end 69 a pedal 70 adapted to be engaged by the sole of the foot of the operator. Serving to pull the ends 54 of the levers downwardly are the tension springs 71 which have their upper ends secured to the link 72 which engages the ends 54 of the levers 51 and the lower ends of the springs 71 are connected to the brackets 73 which are secured to the forward supports 36.

Fixed to the shaft 67 on the inside of the base plates 24 are the arms 74 to which are pivotally secured the links 75, which in turn are pivotally secured at 76 to the throw-out members 32. Serving to pull the throw-out members in a clockwise direction about their pivot points 31 are the tension springs 77 which have their upper ends 78 secured to the throw-out members 32 and their lower ends 79 secured to the base plates 24.

Referring to Figs. 8 and 9, the links 62 are each provided with a clutch 100 comprising a cylindrical housing 101 within which is adapted to slide the hook element 102 which is integrally connected with the end 103 of the portion 62a of the link 62. Also within the housing 101 is located the bell crank hook element 104 which is pivoted at 105 to the housing 101 and has a stop arm 106 and a hooked arm 107. The portion 62b of the link 62 is secured to the end 108 of the link housing 101. Secured to the outside of the housing 101 is the leaf spring 109 which is adapted to push the hook arm 107 into locking engagement with the hook element 102. The clutch knock-out pins 110 are each mounted on the outside of each of the base plates 24 and serve to engage the arms 106 when the links 62 are moved upwardly and forwardly for a predetermined distance and cause the hook arms 107 to become disengaged from the hook elements 102. When the links 62 are moved backwardly and downwardly for a predetermined distance, the springs 109 cause engagement of the hook arm 107 with the hook element 102.

In the operation of the device, illustrated in Figs. 1–7 inclusive, the wound rolls of web material 21 are arranged on the trackways formed by the side plates 33 as shown in Figs. 1 and 4, and as shown in Fig. 1, a roll 21 in unwinding position is already located in the machine 22.

The foremost roll 21 which is in engagement with the stop 35 has been raised off the trackway formed by the side plates 33 by the plate elements 48 so that the roll 21, which is in engagement with the stop elements 35, is resting on the notched-out portions 47 of the ends 46 of the carriage arms 38 as best shown in Fig. 1a. When the roll 21 in the machine 22 is unwound so that no more web material is on the spool 23 in the machine 22, the operator steps on the pedal 70, shown in Figs. 1 and 2, and forces the lever 69 downwardly in a clockwise direction and causes the shaft 67 to rotate in a clockwise direction when the shaft 67 is viewed in the position of the observer looking at the elevation shown in Fig. 1. This rotation of the shaft 67 causes the arm 74 to rotate in a clockwise direction and move the link 75 upwardly, which in turn causes the throw-out members 32 to rotate in a counter-clockwise direction about the pivot 31 and transfer the spool or unwound roll 23 on to the base plates 24 so that the uppermost portions thereof 26 are cleared, see Fig. 5, and the unwound spool or roll 23 may roll down the chute-like portions 27, the inclined portions 28 until it reaches the stop 29 from which it may be removed from the base plates 24, which form a trackway for unwound spools or rolls 23.

While this action involving the removal of the unwound spool or roll 23 from the machine 22 has taken place, the arm 66 has been moving in a clockwise direction for a predetermined time and the end 63 of the link 62 has been sliding in the slot 64 in the arm 66 until the inner end of the slot 64 engages the link 62 and causes it to move upwardly and forwardly when viewed by an observer looking at the elevation in Fig. 1. This upward and forward motion of the link 62 causes the arm 58 to rotate in a clockwise direction about the pivot 59 and the arm 57 also to rotate in a clockwise direction about the pivot 59. The arm 57 causes upward movement of the link 55, which in turn causes an upward movement of the end 54 of the lever 51 which is pivoted at 52, see Fig. 4. This upward movement of the end 54 of the lever 51 causes a downward movement of the opposite end of the lever 51 and the retractable stop element 35 is moved downwardly, see Figs. 1, 4 and 6.

As shown in Fig. 6, the retractable stop element 35 has been pulled downwardly and the roll 21, which is entirely supported by the carriage arms 38, then moves generally forwardly and somewhat downwardly under the influence of gravity, as shown in Fig. 7, wherein it is also shown that the foot pedal 70 has also been released so that it has been returned to its upper position by the spring 71 which is under tension and has also caused the return of the retractable stop element 35 to its upper position as also is shown in Fig. 7. Continued extension of the carriage arms 38 takes place under the influence of gravity until the stop 39 engages the bracket 40 and thereupon the roll 21 will be thrown from the ends 46 of the carriage arms 38 to the machine 22. With the pedal 70 in its uppermost position, as shown in Fig. 7, the spring 77 which is under tension, has caused the return of the throw-out elements 32 to the position shown in Fig. 1 so that when the wound roll 21 is thrown from the ends 46 of the extended carriage arms 38 to the machine 22, the throw-out elements 32 will not be in the way. When the ends 46 of the carriage arms 38 have been relieved of their load 21, the springs 41,

which are under tension will return the carriage arms 38 to the position shown in Figs. 1 and 3.

With the new roll 21 in the machine 22, the unwinding operation may again take place until all the web material is removed therefrom, then the operator may again step on the pedal 70 and release same so as to first cause the unwound roll or spool 23 to be transferred from the machine 22 to the trackways formed by the base plates 24 and the foremost wound roll 21 which has been raised from the trackway formed by the side plates 33 by the plate elements 48 to the ends 46 of the carriage arms 38 will move forwardly with the carriage arms 38, immediately after the retractable stop elements 35 have been depressed, until the arms 38 are stopped by the engagement of the stop 39 with the bracket 40 and the roll 21 will be thrown from the carriage arms 38 to the machine 22 to repeat the cycle.

It will be observed that it is necessary for the operator to release the pedal 70 immediately after the same has been depressed in order to set the backstand, which then automatically effects the transfer of the unwound roll to the lower trackway and the transfer of the foremost roll on the upper trackway to the unwinding machine. This operation of depressing the foot pedal on the part of the operator is obviously readily accomplished with no difficulty whatsoever.

However, in order to make it unnecessary for the operator to time the release of the foot pedal 70 in order to make sure that the retractable stop element 35 is in its uppermost position after the foremost roll 21 has been released, the arrangement shown in Figs. 8 and 9 has been provided. In this arrangement, the link 62 is divided into two parts 62*a* and 62*b* and connected by releasable clutch 100. Accordingly, after the foot pedal 70 has been depressed, the portion 62*b* will be moved upwardly and forwardly until the arm 106 engages the stop 110, and during this interval the retractable stop element 35 has been retracted so that the foremost roll 21 may be released. Thereafter, further movement downwardly of the foot pedal 70 causes the hook 107 to be disengaged from the hook 102 so that the spring 71, which is under tension, may pull the lever 51 into the position shown in Fig. 4 so that the retractable stop element 35 may again take the position shown in Fig. 8 and prevent the next roll 21 from premature transfer. Then, as the foot pedal 70 is released, the portion 62*b* of the link 62 will again move downwardly and rearwardly and in cooperation with the spring 109, the hook 107 will again engage the hook 102.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification, but only as indicated in the appended claims.

I claim:

1. In a device of the class described, an inclined trackway for supporting a wound roll of web material, an inclined trackway for receiving rolls from which web material has been unwound, said first trackway being inclined downwardly and forwardly, said second inclined trackway being inclined downwardly and rearwardly, said first trackway being arranged above said second trackway, a movable carriage mounted for movement in a generally forward direction under the influence of gravity, means for moving said carriage in a backward direction, means for transferring a wound roll from said first trackway to said carriage while it is in its backward position.

2. The structure recited in claim 1, means for preventing transfer of a wound roll from said first trackway to said carriage, and means for rendering said preventing means inoperative.

3. The structure recited in claim 1, means for preventing transfer of a wound roll from said first trackway to said carriage, means for rendering said preventing means inoperative, and means for transferring an unwound roll to said second trackway.

4. In a device of the class described, an inclined trackway for supporting a wound roll of web material, an inclined trackway for receiving rolls from which web material has been unwound, said first trackway being inclined downwardly and forwardly, said second inclined trackway being inclined downwardly and rearwardly, said first trackway being arranged above said second trackway, a movable carriage mounted for movement in a generally forward direction under the influence of gravity, means for moving said carriage in a backward direction, means for transferring a wound roll from said first trackway to said carriage while it is in its backward position, means for preventing transfer of a wound roll from said first trackway to said carriage, means for rendering said preventing means inoperative, means for transferring an unwound roll to said second trackway, control means for first operating said means for transferring an unwound roll to said second trackway and then operating said means for rendering said preventing means inoperative.

5. The structure recited in claim 4, all of said means being incorporated in a unitary backstand frame.

6. The structure recited in claim 4, said means for transferring an unwound roll to said second trackway being located forwardly of said second trackway.

7. In a device of the class described, means for supporting a wound roll of web material in a first position, means for transferring said wound roll from said first position to a second position where it is adapted to be unwound, said transferring means comprising a movable carriage adapted to support in unattached relation said wound roll, said carriage being movable by the force of gravity when said wound roll is located thereon, means for abruptly stopping said carriage adjacent said second position whereby said wound roll may be thrown by the force of inertia from the carriage to said second position.

8. In a device of the class described, means for supporting a wound roll of web material in a first position, means for transferring said wound roll from said first position to a second position where it is adapted to be unwound, said transferring means comprising a movable carriage adapted to support in unattached relation said wound roll, said carriage being movable from adjacent said first position in a direction generally toward said second position, means for abruptly stopping said carriage adjacent said second position whereby said wound roll located on said carriage may be thrown by the force of inertia from the carriage to said second position.

9. In combination, means for supporting a wound roll of web material in one position and means for supporting an unwinding roll of material in a second position, means for first transferring said second roll to a third position, means for carrying and throwing said first roll to said second position, and a single actuatable means

actuating said first transferring means and said carrying and throwing means.

10. In a device of the class described, an inclined trackway for supporting a wound roll of web material, an inclined trackway for receiving rolls from which web material has been unwound, said first trackway being inclined downwardly and forwardly, said second trackway being inclined downwardly and rearwardly, said first trackway being arranged above said second trackway, a movable carriage for receiving wound rolls from said first trackway, and means for moving said carriage.

11. In a device of the class described, an inclined trackway for supporting a wound roll of web material, an inclined trackway for receiving rolls from which web material has been unwound, said first trackway being inclined downwardly and forwardly, said second trackway being inclined downwardly and rearwardly, said first trackway being arranged above said second trackway, a carriage for receiving wound rolls from said first trackway mounted for movement in a generally forward direction under the influence of gravity, and means for moving said carriage in a backward direction.

12. In a device of the class described, an inclined trackway for supporting a wound roll of web material, an inclined trackway for receiving rolls from which web material has been unwound, said first trackway being inclined downwardly and forwardly, said second trackway being inclined downwardly and rearwardly, said first trackway being arranged above said second trackway, a movable carriage for receiving wound rolls from said first trackway, means for transferring said wound rolls from said first trackway to said carriage.

13. The method of feeding a wound roll of web material to an unwinding machine comprising carrying a wound roll from a first position in the general direction of the unwinding position of said unwinding machine, accelerating the velocity of said carrying movement, decelerating the velocity of said carrying movement at a point adjacent said unwinding position and effecting the throwing of said wound roll in free motion to said second position.

FRANK E. DUNTON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,449,093	Finley	Mar. 20, 1923
1,655,226	Higgins et al.	Jan. 3, 1928
1,694,515	Nutting	Dec. 11, 1928
1,806,879	Lindgren	May 26, 1931
1,872,045	Smitmans	Aug. 16, 1932
2,210,531	Engelbaugh et al.	Aug. 6, 1940
2,262,118	Sieger	Nov. 11, 1941
2,288,621	Greer	July 7, 1942
2,301,674	Andrews et al.	Nov. 10, 1942