

April 19, 1949.

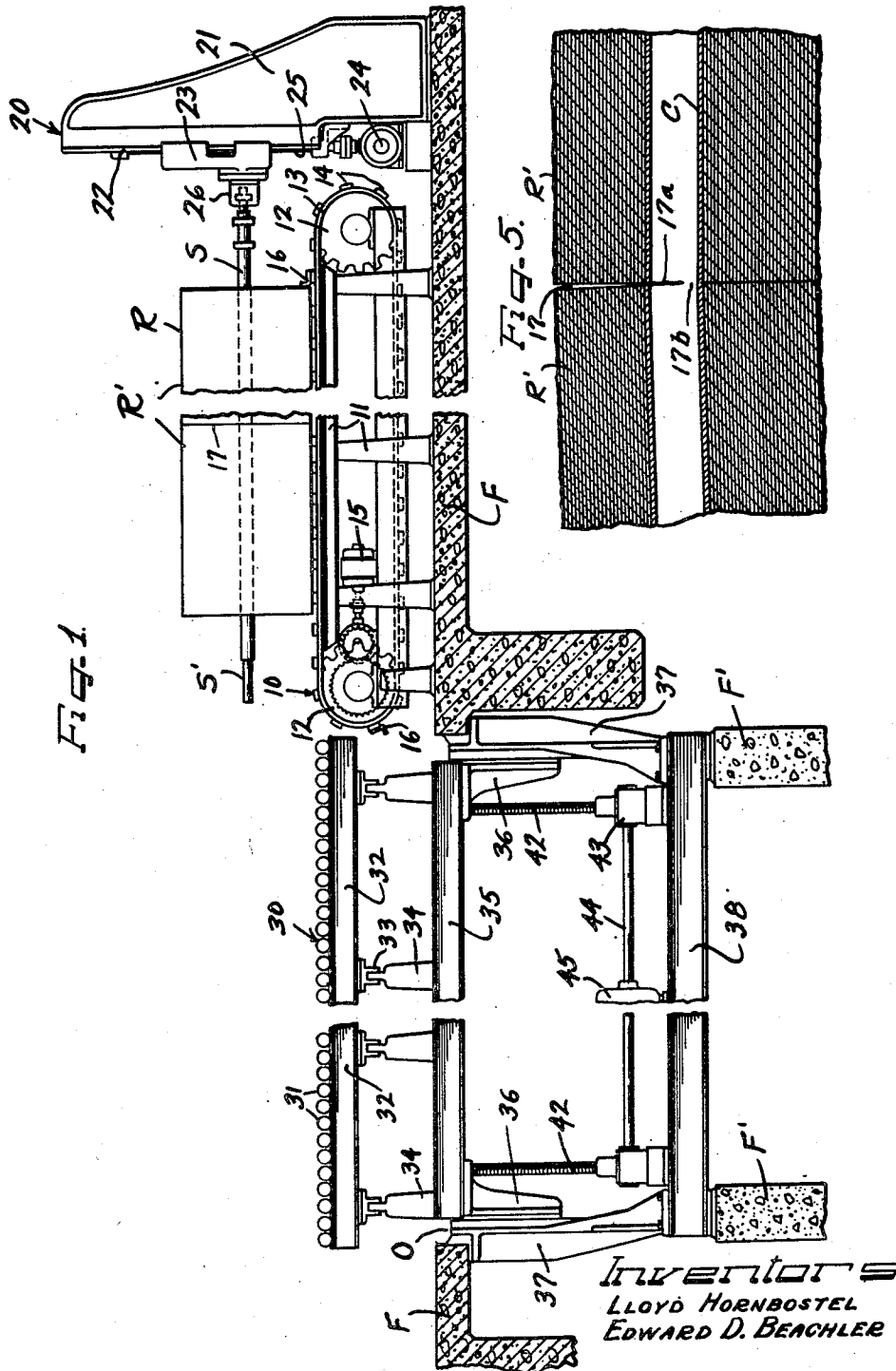
L. HORNOSTEL ET AL

2,467,555

ROLL UNLOADING APPARATUS

Filed April 9, 1945

3 Sheets-Sheet 1



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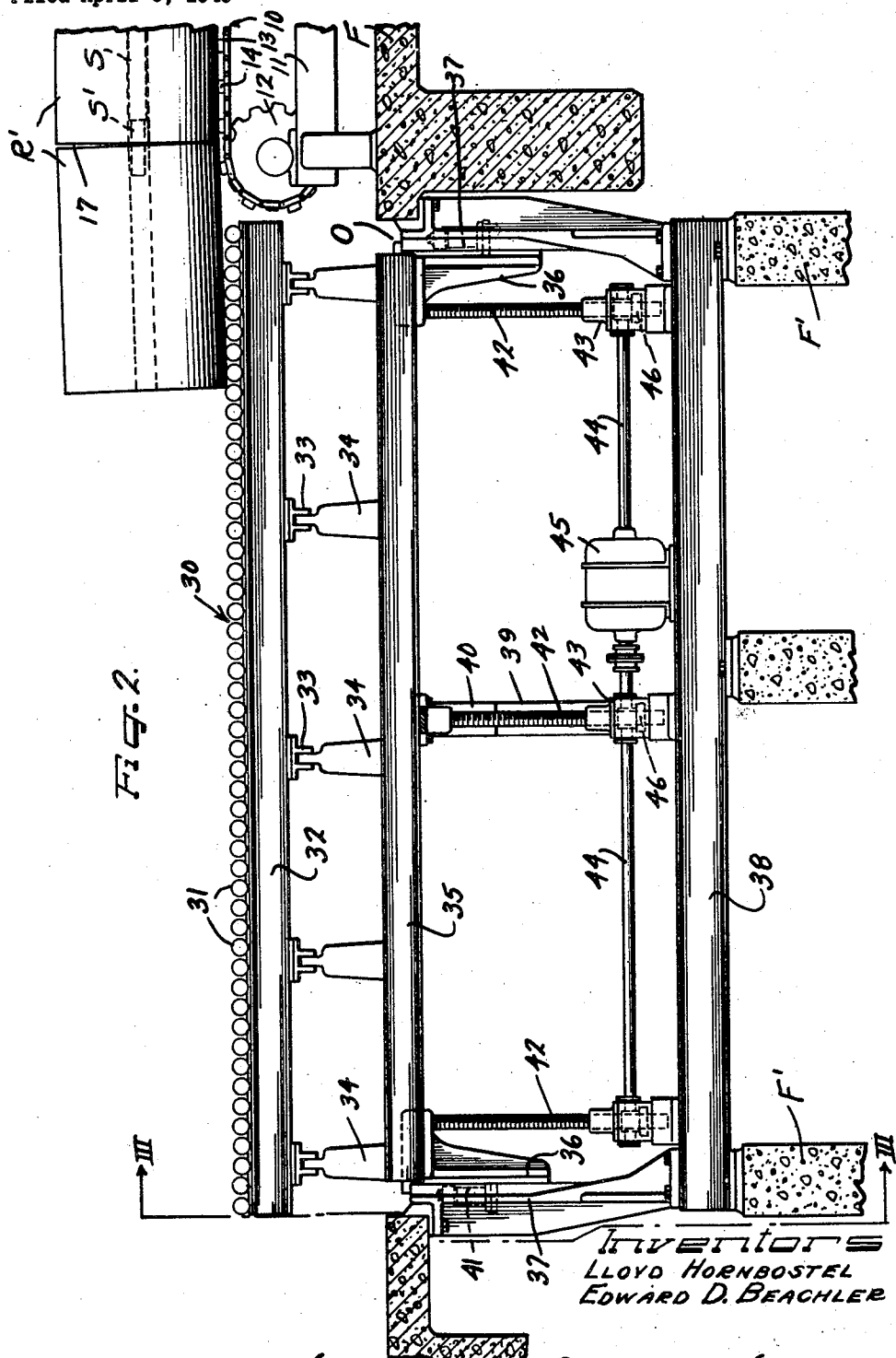
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Fig. 3.

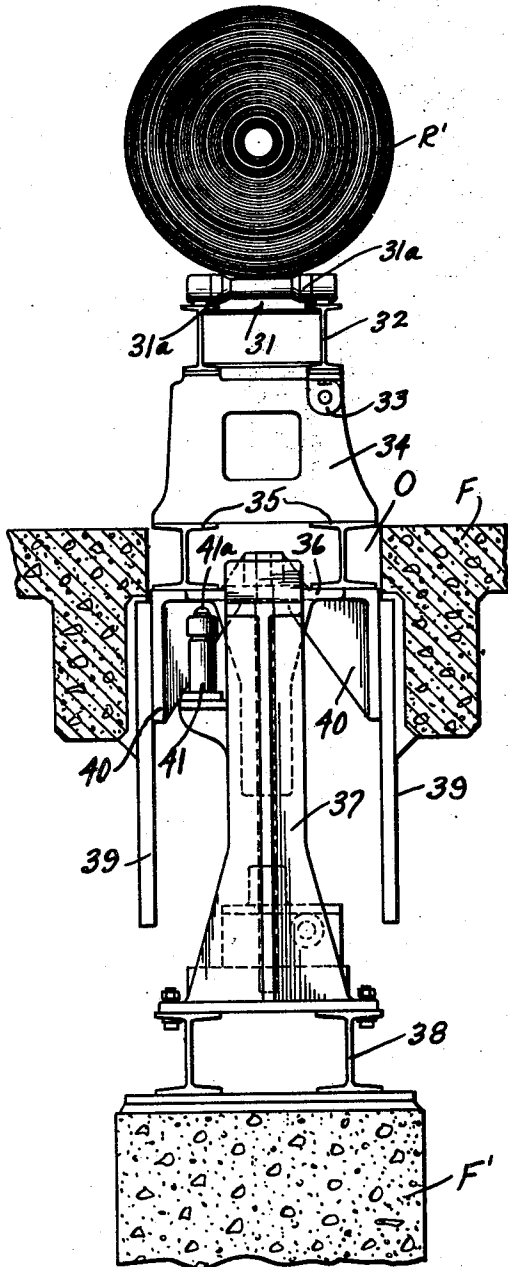
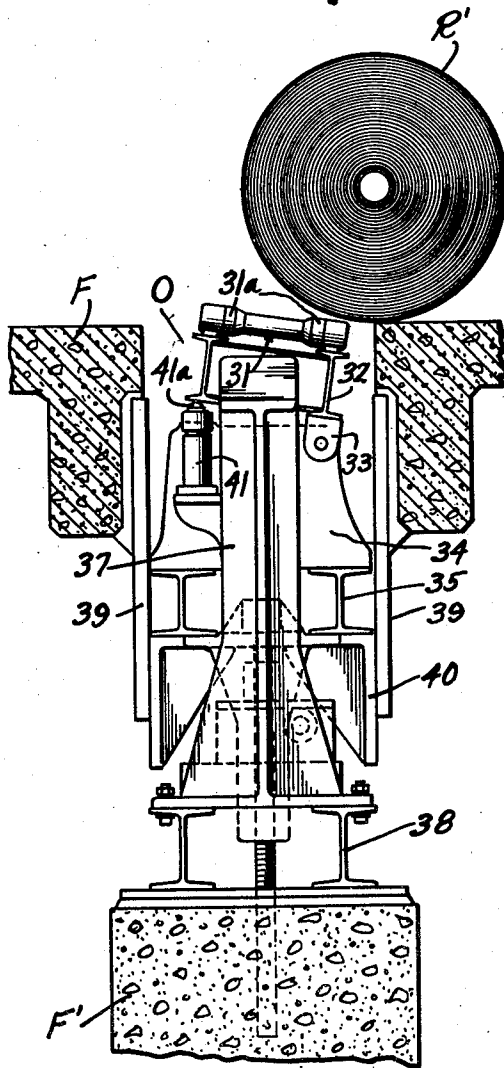


Fig. 4.



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UNITED STATES PATENT OFFICE

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ROLL UNLOADING APPARATUS

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8 Claims. (Cl. 242—81)

1 This invention relates to apparatus for unloading wound rolls from a shaft in such a manner as to insure separation of the rolls and delivery of the separated rolls at a desired level.

Specifically the invention deals with the stripping of wound paper rolls from a winder shaft by pulling the rolls off of the shaft and causing them to tilt or cock relative to each other for insuring complete separation of the paper in each roll.

The invention will hereinafter be specifically described in connection with the stripping of paper rolls from a winder shaft and feeding the rolls onto a receiving platform, but it should be understood that the invention is not limited to this use, being generally applicable to the unloading of rolls or the like.

The apparatus of the invention facilitates the handling of wound paper rolls, and is so arranged that the very act of delivering the rolls insures separation of the rolls from each other.

It is, then, an object of this invention to provide apparatus for unloading rolls to automatically insure separation of the rolls from each other.

Another object of the invention is to provide an apparatus for stripping wound rolls from a shaft while separating the rolls and delivering the separated rolls at a desired level.

A still further object of the invention is to provide apparatus for unloading a plurality of wound rolls of paper from a single winder shaft in such a manner as to completely separate the rolls from the shaft and from each other.

A specific object of the invention is to provide apparatus for stripping rolls of paper from winder shafts by depositing the wound rolls onto a driven conveyor, discharging the rolls off of one end of the conveyor while holding the shaft against movement with the rolls, and causing the leading roll to be cocked or tilted relative to the next adjacent roll.

Other and further objects of the invention will be apparent to those skilled in the art from the following detailed description of the annexed sheets of drawings, which, by way of a preferred example only, illustrate one form of the invention.

On the drawings:

Figure 1 is a broken fragmentary side elevational view, with parts in vertical cross section, of a roll unloading apparatus according to this invention.

Figure 2 is a view similar to Figure 1 on a larger scale illustrating the tilting or cocking of the

2 leading paper roll as it is deposited on the platform of the apparatus.

Figure 3 is a transverse cross-sectional view, with parts in end elevation, taken along the line III—III of Figure 2.

Figure 4 is a view similar to Figure 3 but illustrating the platform in lowered and tilted position for delivery of the rolls of paper at a desired level.

Figure 5 is a fragmentary diagrammatic view illustrating, in vertical cross section, the manner in which the apparatus of this invention operates to completely sever adjoining rolls in the event that the cores of the rolls are not completely severed.

As shown on the drawings:

In Figures 1 and 2 the reference character F designates a concrete floor on which part of the apparatus of this invention is mounted, while the reference character F' designates a floor or supports at a lower level than the floor F. An opening O is provided in the floor F above the floor F'.

A conveyor 10 is mounted on the floor F with the discharge end adjacent the opening O. The conveyor 10 includes a frame 11 carried by the floor F, sprockets 12, 12 rotatably supported by the frame 11, and a conveyor band 13 trained between the sprockets 12 and carrying flights 14. A motor 15 drives one of the sprockets 12 to propel the conveyor band 13. Pushers 16 are carried by some of the flights 14 to engage the end of a roll of paper R on winder shaft S. The roll R is deposited onto the upper run of the conveyor band 13 from a paper rewinder apparatus (not shown) and contains a plurality of roll segments R' cut, as shown at 17, from a single wide web of paper by the rewinder apparatus. Since the cut 17 may not be complete, especially in the first few turns of paper on the shaft S, or in the core on which the roll is wound, the present invention provides for complete severing of the roll segments R' from each other.

A shaft holding device 20 is mounted on the floor F at the end of the conveyor 10 that is remote from the opening O. This holder 20 includes a vertical frame 21 providing a way 22 on which a carriage 23 is mounted. A motor 24 drives a shaft 25 to raise and lower the carriage 23 on the way 22. The carriage 23 carries a gripper 26 for engaging one end of the winder shaft S. The carriage positions the gripper so that it will be level with the shaft.

The motor 15 actuates the conveyor band 13 to bring a pusher 16 into engagement with the end of the roll R as shown in Figure 1. The pusher and conveyor then move the roll R rela-

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tive to the shaft S which is held stationary by the gripper 28 to successively strip the roll segments R' off of the reduced diameter end S' of the shaft as shown in Figure 2.

A platform 30 is provided adjacent the discharge end of the conveyor 10 to receive the roll segments R' from the conveyor. This platform 30 includes a plurality of transverse rollers 31 at spaced intervals along the length thereof supported by a frame 32 composed of longitudinal and cross beams. One side of the frame 32 has depending lugs 33 at intervals along the length thereof pivoted to supports 34 adjacent one end of each support. The other side of the frame 32 rests on top of the supports 34 as best shown in Figure 3. The frame 32 is thus tiltably mounted on the supports 34.

The supports 34 are carried by an elevator 35 having depending brackets 36 at the ends thereof riding in grooves of tracks 37 carried by a sub-frame 38 on the floor F'. The floor F' also carries tracks 39, as best shown in Figures 3 and 4, for guiding brackets 40 of the elevator 35. As indicated in Figure 2, these tracks 39 and brackets 40 are midway between the tracks 37 and brackets 36.

Stops 41 are carried by the tracks 37 beyond the ends of the elevator 35. These stops 41 have vertically adjustable heads 41a for engaging the ends of the frame 32 on the side thereof remote from the pivot brackets 33 when the elevator 35 is in lowered position as shown in Figure 4 for tilting the platform 30 to discharge the roll segments R' off of the rollers 31 as will be more fully hereinafter described.

The elevator 35 is raised and lowered by means of screw rods 42 which extend into gear boxes 43 having gears actuated by shafts 44 which are driven by a motor 45 carried on the sub-frame 38. The screw rods 42 have stops 46 thereon limiting the top position for the platform 30 to a level slightly below the upper run of the conveyor 10, so that the leading roll segment R' will tilt downwardly onto the rollers 31 as it leaves the conveyor. This tilting action is highly desirable to open up the cut 17 between the roll segments R' and actually break the rolls apart by tearing the partially severed core or first few turns of paper as indicated at 17a in Figure 5. Thus, as shown in Figure 5, a tubular core C of cardboard or the like is not completely severed along the cut 17 but is uncut at 17c. As the leading roll R' tilts or cocks relative to its adjacent roll, this unsevered portion 17b will be broken to completely sever the roll segments into independent rolls. This action takes place automatically as the conveyor 10 delivers the roll segments R' onto the platform 30 and off of the shaft S. The reduced-diameter free end S' of the shaft permits free cocking of the leading roll segment R' in the event that this free end overlies the discharge point of the conveyor 10.

As shown in Figures 3 and 4, the rolls 31 have enlarged end portions 31a to center the roll segments R' therebetween. These rollers 31 are not driven but the platform 30 can be sloped downwardly from the conveyor 10 to facilitate movement of the roll segments R' along the length of the platform.

When all of the roll segments R' have been deposited onto the platform 30 and completely stripped off of the winder shaft S, the motor 45 is driven to lower the elevator 35 for carrying the platform 30 down to the level of the floor F' as shown in Figure 4. The heads 41a of the

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stops 41 then engage the frame 32 to tilt the platform 30 and discharge the roll segments R' onto the floor F'. The tilting movement is sufficient to raise one end of the rollers materially above the other end so that the roll segments R' will automatically roll by gravity onto the floor F'.

From the above descriptions it will be understood that the apparatus of this invention includes a conveyor for receiving wound paper rolls from a rewinder apparatus, a hold for gripping one end of the shaft on which the paper rolls are wound, and an elevator including a tiltable platform for receiving the stripped rolls from the conveyor. The elevator operates in a pit alongside of the discharge end of the conveyor and carries a tiltable platform to a top level which is lower than the conveyor level, so that the very act of discharging a roll segment onto the platform will cause the tilting or cocking of this roll segment to insure complete separation of the segment from its next adjacent segment in the event that the cut between the segments is not complete.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention as it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

We claim as our invention:

1. An apparatus for handling wound adjacent rolls in severed end to end relation which comprises a stripping part and a receiving part, said stripping part arranged for discharging rolls endwise onto the receiving part, and said receiving part being at a level lower than the stripping part for cocking the leading rolls relative to the rolls on the stripping part for completely severing the leading rolls from the trailing rolls.

2. Apparatus for handling wound adjacent paper rolls in severed end to end relation which comprises a conveyor having an upper run arranged to receive paper rolls in longitudinal relation thereon, a holding device adjacent one end of said conveyor for supporting longitudinally above the upper run of the conveyor a shaft on which the rolls are wound, a receiving device at the other end of said conveyor arranged at a level slightly lower than the upper run of the conveyor for causing the leading rolls to cock as they are deposited thereon, and means for driving said conveyor to strip the rolls from the winder shaft and force them off of the end of the conveyor onto the receiving device for completely severing the leading rolls from the trailing rolls.

3. Apparatus for stripping, severing, and delivering paper rolls which comprises a conveyor having an upper run arranged for receiving in longitudinal relation a plurality of roll segments severed in end to end relation on a single shaft, means at one end of said conveyor above the upper run thereof for holding the shaft against longitudinal movement, means at the other end of said conveyor for receiving the roll segments therefrom, said last mentioned means being at a level below the level of the upper run of the conveyor to cause the roll segments to tilt downwardly as they are deposited thereon, and means for driving the conveyor to strip the roll segments from the shaft and deposit them onto said means for receiving the roll segments and thereby completely severing the leading rolls from the trailing rolls.

4. The method of simultaneously stripping

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severed adjacent wound rolls from a shaft and separating the rolls from each other which comprises holding the shaft against longitudinal movement, supporting the rolls independently of the shaft moving the thus supported rolls longitudinally off of the end of the shaft, and tilting each roll relative to its adjacent roll for severing any portions joining the rolls.

5. The method of simultaneously stripping severed adjacent wound rolls from a shaft and separating the rolls from each other which comprises moving said rolls along said shaft in juxtaposed concentric relation along the longitudinal axis thereof, and tilting each roll with respect to said longitudinal axis of the shaft and with respect to the adjacent roll for severing any portions joining the rolls.

6. In combination with an elongated driven roll conveyor having a discharge end and a shaft holder carried at the other end thereof for supporting a roll shaft in cantilever fashion in longitudinally spaced relation above the conveyor whereby driving of the conveyor will move severed adjacent wound rolls thereon off of the free end of the shaft at the discharge end of the conveyor, a platform extending longitudinally from said discharge end of the conveyor at a lower level than said discharge end whereby rolls advanced by said conveyor off of the discharge end thereof will cock relative to the shaft and the next roll on the shaft as they are deposited on the platform for severing any connection with the next roll on the shaft, means for shifting said platform from said level to a discharge level, and means for tilting said platform when it reaches said discharge level for causing the rolls on the platform to move by gravity off of the platform.

7. Apparatus for unloading material wound on a shaft and severed into adjacent rolls which comprises in combination with a stripping device for stripping rolls off of the shaft and having a roll discharging end, a roll-receiving device at a level lower than said discharge end of the stripping device for causing the leading roll to cock as it is discharged off of said discharge end of the stripping device thereby completely severing

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the leading roll from its adjacent roll, means for raising and lowering said roll-receiving device, and means for transversely tilting said roll-receiving device as it reaches a predetermined level remote from the receiving level whereby the rolls thereon will shift by gravity off of said receiving device.

8. In combination with an elongated driven roll conveyor having a discharge end and a shaft gripper adjustably carried at the other end thereof to hold a roll shaft in cantilever fashion at variable levels above the conveyor in longitudinal relation therewith and extending to the discharge end thereof so that the weight of severed adjacent rolls on the shaft will be borne entirely by the conveyor, a platform extending longitudinally from said discharge end of the conveyor and having transversely extending freely rotatable rollers thereon providing anti-friction supports for rolls, means for raising said platform to position said rollers at a level slightly below the discharge end of said conveyor whereby rolls advanced by said conveyor off of the discharge end thereof will cock relative to the shaft and the next roll on the shaft to sever any connection with the next roll, means for lowering the platform to carry the rolls thereon to a discharge level lower than the discharge end of the conveyor, and means for automatically transversely tilting said platform when it reaches said discharge level to sufficiently incline the rollers thereon for causing the rolls supported thereby to roll by gravity off of the platform.

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