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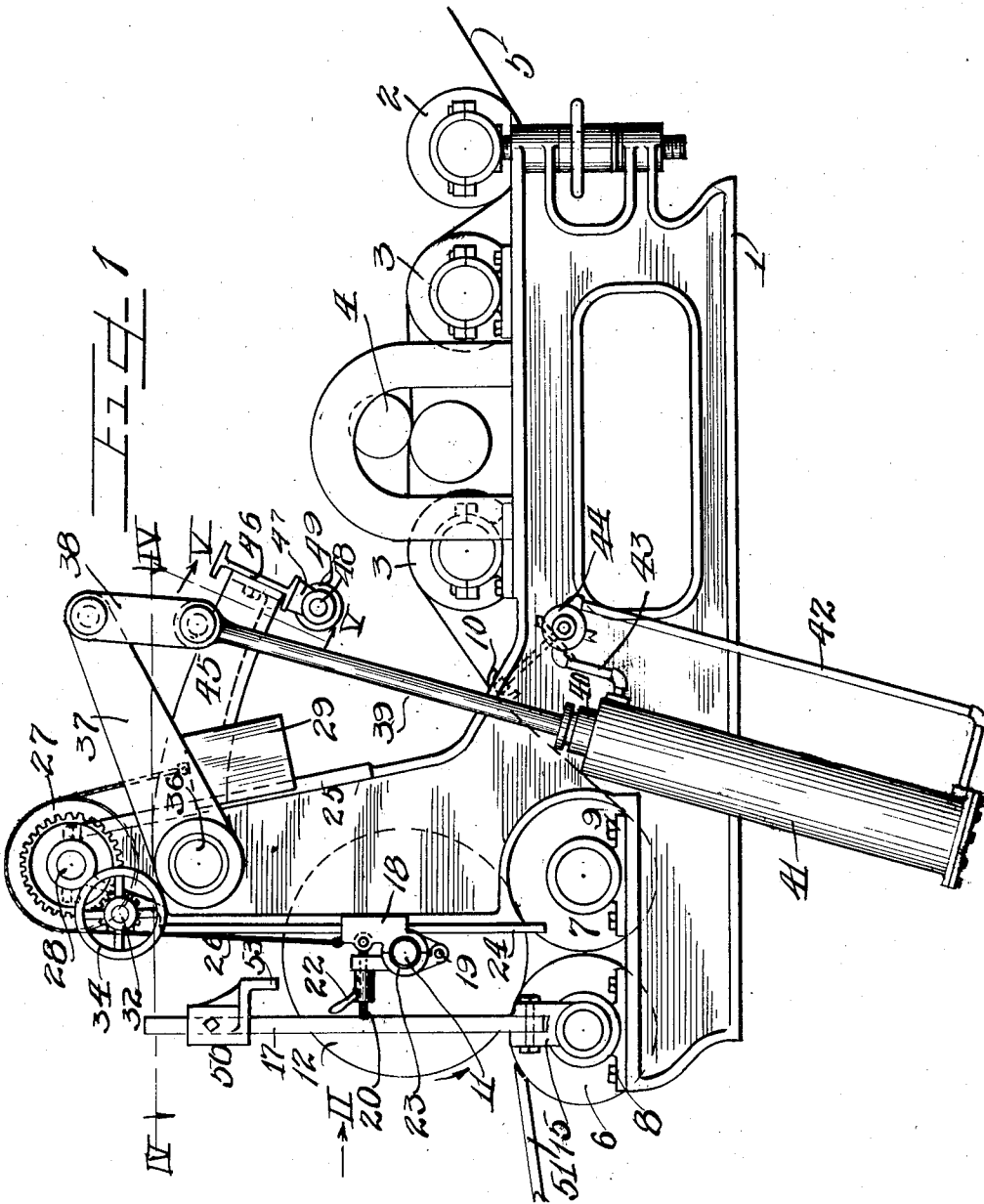
A. ALDRICH

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PAPER WINDING APPARATUS

Filed May 3, 1926

3 Sheets-Sheet 1



INVENTOR
Alonzo Aldrich.
Charles D. Kells
Attys.

Oct. 8, 1929.

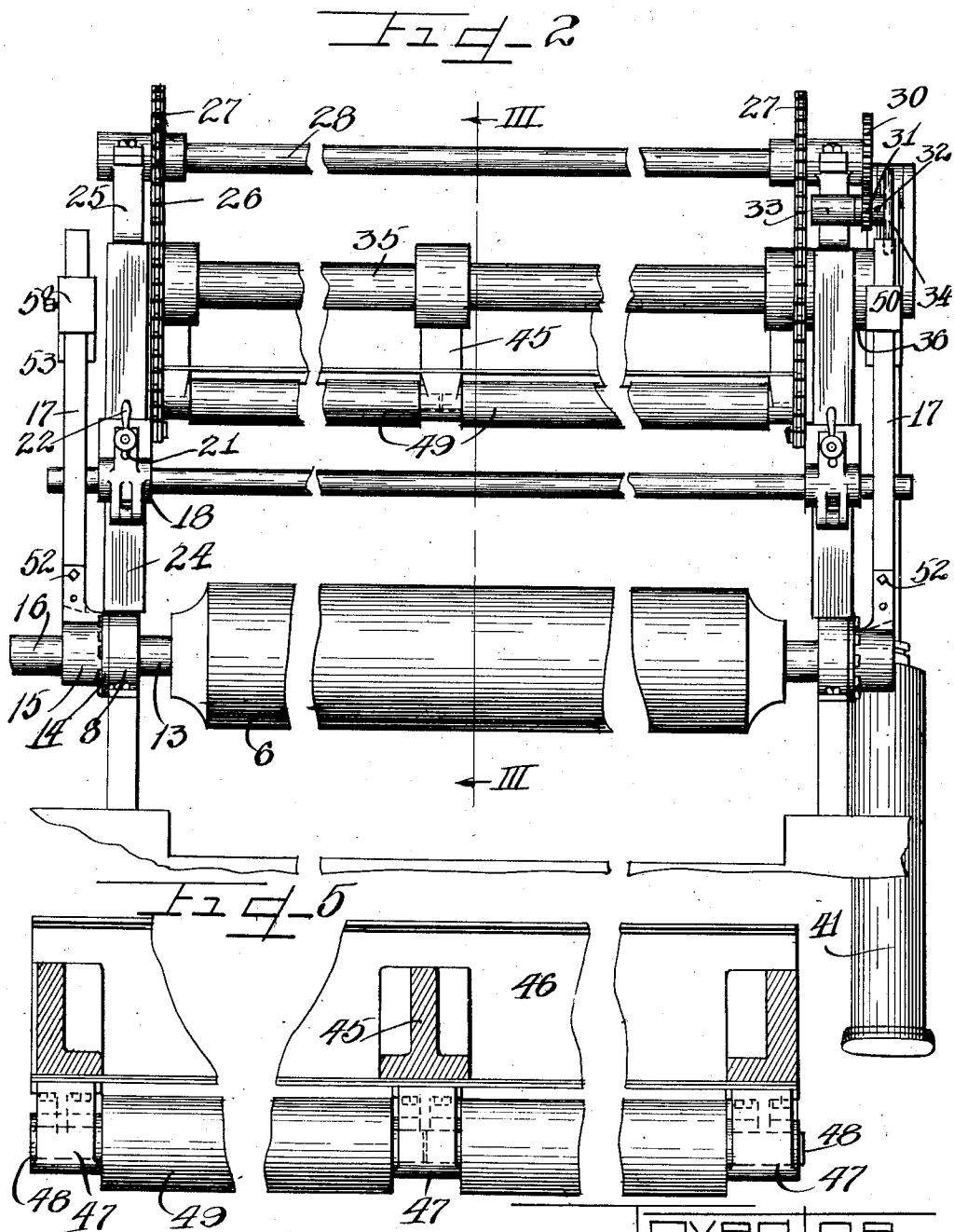
A. ALDRICH

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Alonzo Aldrich

Charles W. Hills

Atty.

Oct. 8, 1929.

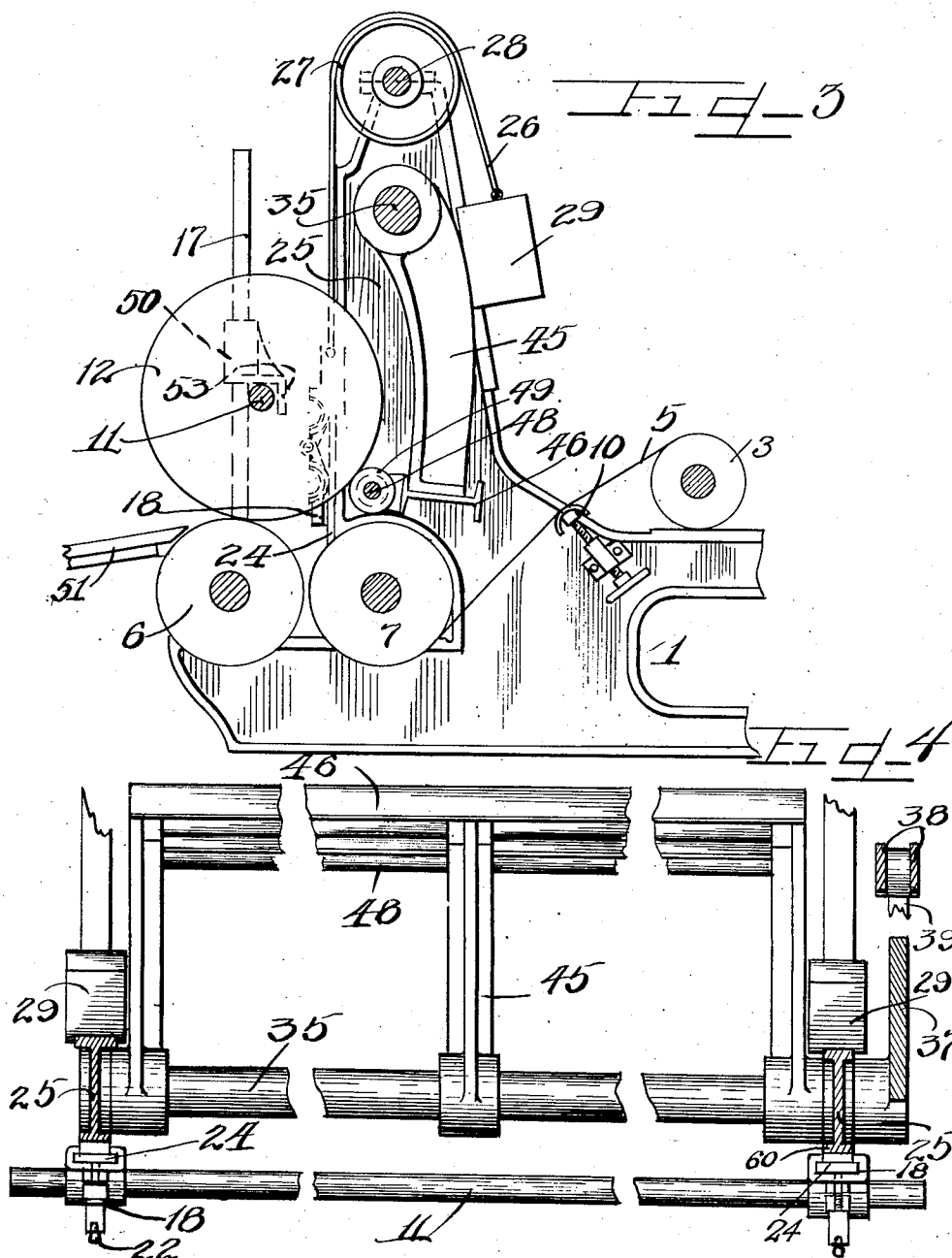
A. ALDRICH

1,730,552

PAPER WINDING APPARATUS

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3 Sheets-Sheet 3



Inventor
Alonso Aldrich
Charles D. Mills
by Attys

UNITED STATES PATENT OFFICE

ALONZO ALDRICH, OF BELOIT, WISCONSIN, ASSIGNOR TO BELOIT IRON WORKS, OF
BELOIT, WISCONSIN, A CORPORATION OF WISCONSIN

PAPER-WINDING APPARATUS

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This invention relates to paper winding apparatus and more especially to mechanism associated therewith for the purpose of effecting movement of the wound paper reel, as for instance in discharging the reel from the winding apparatus.

In modern paper making practice it has become increasingly difficult to handle the heavy rolls of paper on the winding apparatus, or as it is more commonly called "rewinder". As the newer paper machines are often as wide as 20 feet and upwards, reels of paper the full width of the machine must necessarily be very heavy and cumbersome to move about. Not only is this true, but the strain which such heavy rolls of paper put upon the core shafts upon which they are wound frequently results in permanent distortion of the shafts.

It is therefore an object of this invention to provide a paper winding apparatus in which means are provided for automatically effecting movement of the wound or partially wound reel of paper by applying a force equally distributed over the width of said reel of paper.

It is a further object of this invention to provide in a paper winding apparatus a pushing mechanism that may be power operated to effectuate movement of a reel of paper being wound upon the winding apparatus and to obviate the necessity of manually handling such reel of paper.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a side elevational view, partly diagrammatic, of a paper winding apparatus embodying the principles of my invention.

Figure 2 is a broken end view of the same, with parts omitted.

Figure 3 is a sectional view taken substantially on line III—III of Figure 2, showing the mode of operation and with parts in elevational.

Figure 4 is a broken sectional view taken on line IV—IV of Figure 1, with parts omitted.

Figure 5 is an enlarged broken sectional view taken substantially on line V—V of Figure 1.

As shown on the drawings:

The reference numeral 1 indicates a supporting frame of a paper winding apparatus, or as is more commonly known in the paper making art, a paper machine rewinder. Such a rewinder is commonly used in connection with the paper machine to rewind and slit the parent rolls of paper as they come from the paper machine into rolls of the required length and diameter. My invention is, however, equally applicable to apparatus or machines for winding any kind of web material, either in conjunction with another machine for making the web or as a separate operation.

The winding apparatus here shown includes an adjustable web guiding roll 2, carrying rolls 3, and a slitter mechanism 4, through which a web of paper 5 is adapted to be threaded. The winding mechanism proper comprises a pair of under drums 6 and 7 journaled in bearing brackets 8 and 9, respectively, secured to a portion of the frame 1. The web of paper 5 in its course through the winding apparatus passes over a tensioning device 10, under the drum 7, and between the drum 7 and a paper winding shaft 11. Said paper winding shaft 11 is adapted to carry cores on which the web of paper 5 may be wound to form a roll 12.

A suitable driving mechanism may be used to rotate the under drums 6 and 7. As here shown, the shaft 13 of the drum 6 is extended beyond one of its bearings 8 and is adapted to be engaged by suitable clutch mechanism on a drive shaft. The other drum 7 may be suitably driven from the same driving mechanism. The winding shaft 11, which is rotatably supported in normal position upon the under drums 6 and 7, will accordingly be caused to wind up the web of paper when the under drums 6 and 7 are set in motion. The ends of said winding shaft 11 are adapted to be clampingly engaged by clamping mem-

bers 18 comprising two sections hinged together as at 19, one of said sections being provided with a swinging bolt 20 and the other of said sections being slotted as at 21 to receive said bolt 20, said bolt 20 being held therein by a manually operated nut 22. Said clamping members 18 are each formed with inner circular bearings 23 in which the ends of said shaft 11 may be rotatably journaled. The rear section of each of said clamping members 18 is slotted to receive a vertical guide rod 24 upon which said clamps are each adapted to slide. Said guide rods 24 are each secured at their upper ends to the flanged edge 60 of an upright portion 25 of the frame (Figure 4).

Each of said clamping members 18 is adapted to be attached to one end of chain 26 which passes over a sprocket wheel 27, said wheels 27 being mounted at each end of a transverse bar 28 journaled in said upright portions 25 of the supporting frame 1. At the other end of each of said chains 26 is secured a counterweight 29 adapted to slide over the back side of said portion 25 of the supporting frame 1. On an extended end of said bar or shaft 28 there is mounted a sprocket gear 30 which meshes with a second sprocket gear 31 mounted on a stub shaft 32, said shaft 32 being rotatable mounted in a bearing 33 from the frame 25. A hand wheel 34 is provided to operate the stub shaft 32, whereby rotation of the shaft 28 may be effected through the meshing gears 30 and 31 to raise or lower the winding shaft 11. It will be apparent that as the roll of paper 12 increases in size, the winding shaft 11 will automatically rise and the counterweight 29 be lowered a corresponding amount. The counterweight 29 serves to partially counterbalance the weight of the roll 12.

Up to this point, the winding apparatus described embodies no novel features over the standard types of rewinders in common use. My invention, however, includes a pushing mechanism for effecting movement of the winding shaft 11 and the wound or partially wound roll of paper 12 thereon, in order either to discharge the roll 12 or to make possible the threading of a new end of the web of paper 5 between the under drum 7 and the partially wound roll of paper 12. Said pushing mechanism includes a shaft 35 journaled in the upright frame members, 25, one end of said shaft 35 extending through one of said frame members 25 to provide an extension 36. A rocker arm 37 is rigidly secured to said extension 36 at one of its ends and at its other end is pivotally connected through a link member 38 to a plunger rod 39. Said plunger rod 39 extends through a packing gland 40 into a cylinder 41, to the ends of which are connected piping 42 and 43 controlled by a suitable valve mechanism 44. Said valve mechanism 44 is adapted to

control the flow of some fluid, such as compressed air or water under pressure, into the cylinder 41 to operate the plunger rod 39 and in turn to effect limited rotation of the shaft 35. Said shaft 35 carries a plurality of pivot arms 45 each rigidly secured to said shaft at one end and at the other end to an I-beam 46. On the lower face of said I-beam 46 are bolted or otherwise secured a plurality of bearing brackets 47, bored to receive the journals 48 of rollers 49.

Another important part of my invention includes means for limiting and arresting the movement of the winding shaft 11 when employing the pushing mechanism. Said means comprises bars 17, each pivotally mounted as at 52 for outward swinging movement upon brackets 15, said brackets 15 being secured to the bearing brackets 8. A catch member 50 is slidably mounted on each of said bars 17 and is provided with a depending finger 53 adapted to fit over the shaft 11 for engaging said shaft, as will now be explained.

The operation is substantially as follows:

When the roll of paper 12 has assumed the desired proportions, or when a break has occurred on the rewinder, it becomes necessary to lift the roll 12 either completely or partially from the supporting drums 6 and 7. The general practice has heretofore been either to lift the roll manually, or if it is too heavy, to use a block and tackle thrown over the ends of the shaft 11. According to my invention, however, neither the arduous manual labor nor the tedious block and tackle method are necessary, since the lifting can be accomplished automatically by the pushing mechanism described. Before operating the mechanism, however, the bars 17 which are each pivoted at their lower ends to brackets 15 are swung up into vertical position and the clamping members 18 are released from the ends of the winding shaft 11. The valve mechanism 44 is then operated to move the plunger rod 39 downwardly. The movement of the plunger rod 39 is translated through the link member 38 and the rocker arm 37 into a rotational movement of the shaft 35. The pivot arms 45, which are keyed to said shaft 35, accordingly move downwardly to throw the rollers 49 into contact with the roll 12, thereby imparting a push, blow or kick to said roll 12 (Figure 3). As a result of this force, the roll 12 is moved off of the supporting drum 7 completely and on to the supporting drum 6, where it is held in place by slipping catch members 50, slidably mounted on each of the rods 17, down over the ends of the winding shaft 11. The stroke of the plunger rod 39 should be limited so that the pushing mechanism will not displace the roll 12 beyond the limits defined by the rods 17. While the roll 12 is held in its displaced position by means of

the catch members 50, the valve mechanism 44 is reversed to throw the rolls 49 out of engagement with the roll 12. It is now possible to thread a new end of the web of paper 5 between the under drum 7 and the partially wound roll 12 or to displace the roll 12 entirely, as the case may be.

In the case first supposed, after the new end of the web 5 has been joined to the end of the paper on the roll 12, the pushing mechanism is again operated to bring the rolls 49 in supporting contact with the roll 12. The catches 50 are now slid upwardly along the rods 17 out of engagement with the ends of the shaft 11, the valve mechanism 44 again reversed and the roll 12 allowed to drop back again on the supporting drums 6 and 7. After engaging the clamps 18 about the ends of said shaft 11, the winding apparatus 20 may be again set in motion.

In the latter case supposed, that of removing the roll 12 from its position, as shown in Figure 3, this may be easily done with slight manual effort by rolling said roll 12 over the crown of the under drum 6 onto a skid-way 51.

From the above description, it will be apparent to one skilled in the art of paper making that my present invention constitutes a decided improvement in the construction of rewinders over the present types of construction. Furthermore, it is apparent that my pushing mechanism may be easily adapted for use with the present type of rewinder 25 without involving any radical reconstruction.

I am aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

I claim as my invention:

1. In a winding apparatus, rotatable supports, winding means on which the material is to be wound rotatably supported thereby, and pivotally mounted means adapted to swing against a roll of wound material on said winding shaft to effect movement thereof out of operative relation with said supports.

2. In a paper winding apparatus, a frame, under drums rotatably supported thereon, a paper winding shaft rotatably supported by said drums, a transverse member journaled in said frame, pivot arms rigidly mounted on said transverse member, a cylindrical bar carried by said pivot arms, and means for effecting limited rotation of said transverse member to cause said bar to contact the paper on said winding shaft and to move the same over one of said drums and out of supporting relation with said other drum.

3. In a web winding apparatus, a pair of under drums, a winding shaft adapted to be

rotatably supported upon said drums for winding a web into a roll, a power operated mechanism for applying a force distributed throughout the length of the roll for moving said roll over the surface of one of said drums and out of contact with the other of said drums and pivotally mounted adjustable means for engaging and retaining said winding shaft in its removed position.

4. In a paper winding apparatus, a pair of rotatable under drums, a winding shaft on which a roll of paper is adapted to be wound by contact with said under drums, a power operated pushing mechanism adapted to be brought into contact with said roll of paper to effect movement thereof over one of said drums and out of supporting relation with said other drum and means for limiting said movement.

5. In a paper winding apparatus, a pair of rotatable under drums, a winding shaft on which a roll of paper is adapted to be wound by contact with said under drums, a pushing mechanism comprising a pivotally mounted bar adapted to be brought into contact with said roll of paper to effect movement thereof over one of said drums and out of supporting relation with said other drum and means for limiting said movement.

6. In a winding apparatus, rotatable supports, winding means on which the material is to be wound rotatably supported thereby and power operated pushing means associated therewith and adapted to be brought into contact with the wound material for effecting lateral movement of said winding means out of operative relation with said supports.

7. In a winding apparatus, rotatable drums, a shaft on which the material is to be wound rotatably supported thereby, and mechanism including a member adapted to be moved into contact with the wound material to apply a pushing force to the shaft therethrough to effect movement of the wound material out of supporting relation with one of said drums.

8. In a winding apparatus, rotatable supports, winding means on which the material is to be wound rotatably supported thereby, and pivotally mounted means associated therewith and adapted to be swung into contact with said wound material for effecting movement of said winding means to discharge said winding means from said supports.

9. In a winding apparatus for web material, a pair of rotatable under drums, a winding shaft on which the web is to be wound rotatably supported on said drums, a pushing mechanism pivotally mounted above said drums, and means for actuating said pushing mechanism into contact with said wound material to effect movement of said winding shaft over one of said drums and out of supporting relation with said other drum.

10. In a winding apparatus for web mate-

- rial, a pair of rotatable under drums, a winding shaft on which the web is to be wound rotatably supported on said drums, a pushing mechanism pivotally mounted above said drums, and means for applying an equally distributed force through said pushing mechanism to a roll of wound material on said winding shaft acting through said wound material to displace the same from said drums. 70
- 10 11. A paper winding apparatus comprising a frame, a pair of rotatable drums supported thereon, a paper winding shaft rotatably supported by said drums to wind a roll of paper, a pushing mechanism pivotally supported from said frame, and power operated means for swinging said pushing mechanism into contact with the wound paper to effect movement of said roll of paper over one of said drums and out of supporting relation with said other drum. 75
- 15 12. A paper winding apparatus comprising a frame, a pair of rotatable drums supported thereon, a paper winding shaft rotatably supported by said drums to wind a roll of paper, a pushing mechanism pivotally supported from said frame, and power operated means for swinging said pushing mechanism into contact with the wound paper to effect movement of said roll of paper over one of said drums and out of supporting relation with said other drum. 80
- 20 13. In a web winding apparatus, rotatable supports, winding means on which the web is adapted to be wound into a roll rotatably supported thereby, and mechanism including a member adapted to be moved into contact with the wound roll for applying an equally distributed force to the web on said winding means to effect movement thereof out of supporting relation. 85
- 25 14. In a winding apparatus, rotatable support elements, a winding member on which material is to be wound, positioned and rotatable upon said support elements and pushing mechanism associated with said member and including a member movable into contact with the wound material on said member and arranged so that it may initially be moved to apply an upward push on said wound member to move the latter up and clear of one of said elements and to thereafter push said wound member over the other of said elements. 90
- 30 15. In a winding apparatus, rotatable support elements, a winding member on which material is to be wound and positioned and rotatable upon said support elements and pushing means associated with said member and movable into contact with the wound material on said member for effecting movement of said member, when wound, out of operative relative with said elements, said pushing means including a lever fulcrumed over said elements and arranged so that its lower end may initially be moved to apply an upward push on said wound member to move the latter clear of one of said elements and to thereafter roll said wound member over the surface of the other of said elements. 95
- In testimony whereof I have hereunto subscribed my name. 100
- ALONZO ALDRICH. 105
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