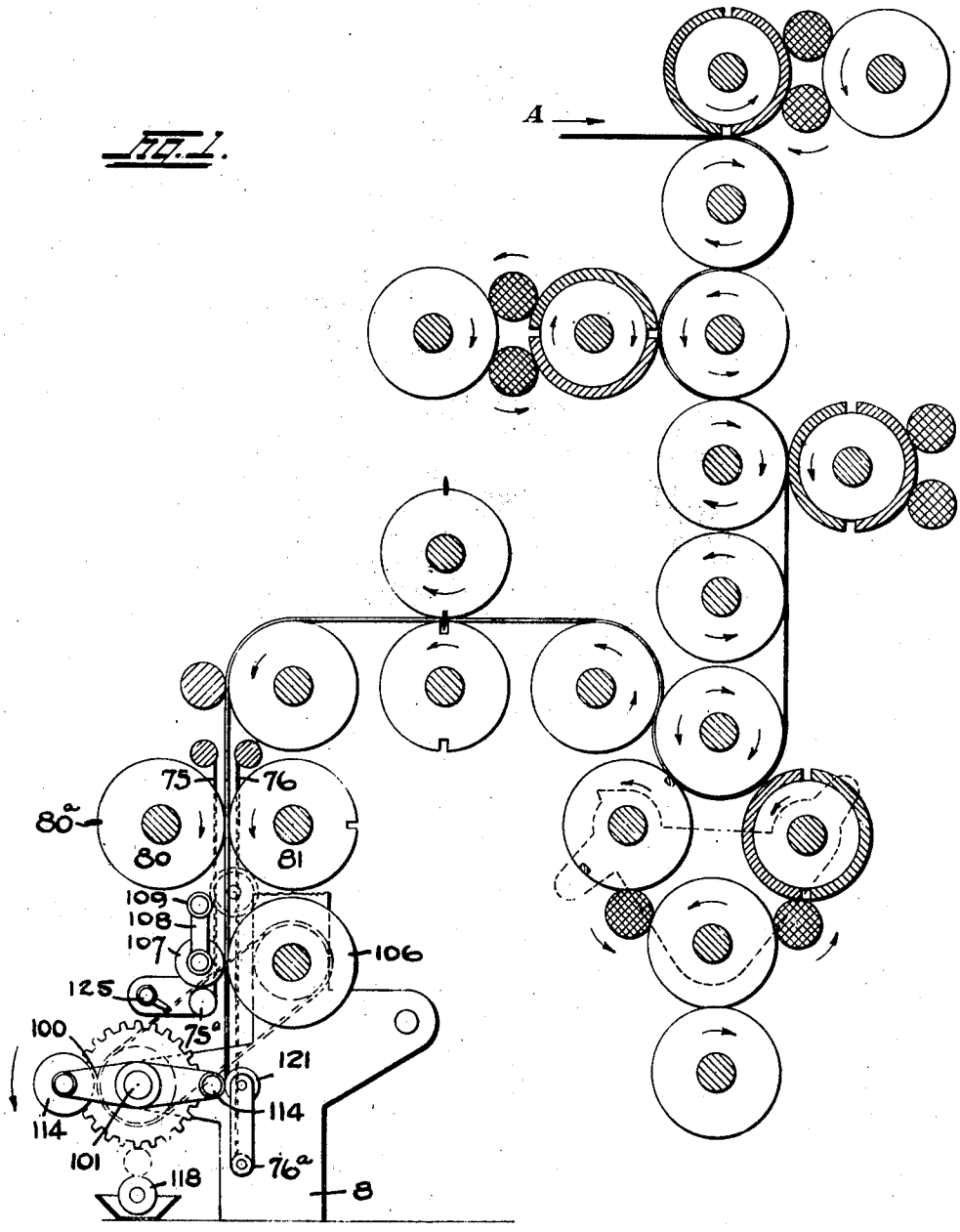
June 18, 1929. C. L. JOHNSTON 1,717,510

AUTOMATIC WEB WINDING MACHINE

Original Filed May 25, 1921 2 Sheets-Sheet 1

Fig. 1.



WITNESS
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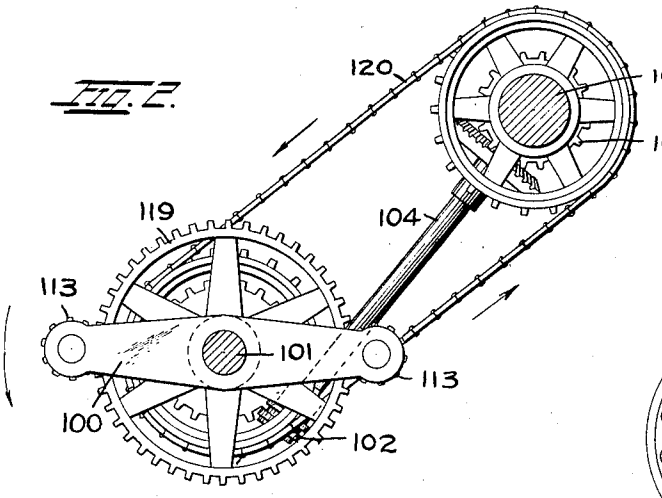
BY
White Frost & Kraus
his ATTORNEYS

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AUTOMATIC WEB WINDING MACHINE

Original Filed May 25, 1921 2 Sheets-Sheet 2

Fig. 2.



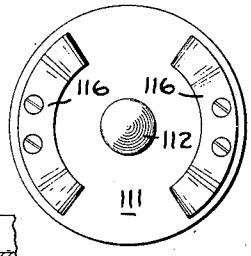


Fig. 4.

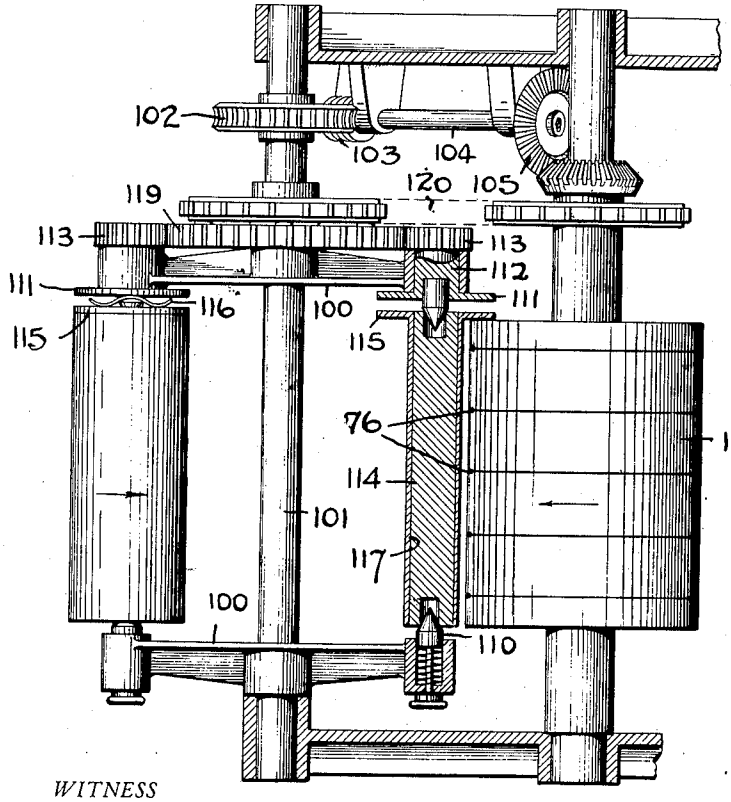


Fig. 3.

WITNESS

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UNITED STATES PATENT OFFICE.

CLARENCE L. JOHNSTON, OF NIAGARA FALLS, NEW YORK, ASSIGNOR TO AMERICAN SALES BOOK COMPANY, LIMITED, OF TORONTO, ONTARIO, CANADA, A CORPORATION OF ONTARIO, CANADA.

AUTOMATIC WEB-WINDING MACHINE.

Original application filed May 17, 1920, Serial No. 382,099. Divided and this application filed May 25, 1921, Serial No. 472,535. Renewed November 5, 1928.

This invention relates to machines for automatically winding sections of a web as they are successively cut from a continuous web of feed stock.

This application is a division of the application filed May 17, 1920, for autographic sales check printing machine, S. N. 382,099, Patent No. 1,480,395 to which reference is particularly made for a disclosure of a printing machine incorporating mechanism for successively winding strips of web as automatically cut from the continuously feeding stock in the machine.

The present invention has for an object to provide a simple practicable and automatically acting machine for taking up and winding on a core a strip of web-like material.

It is a further object of the invention to provide a reel adapted to receive a plurality of cores and to provide for the rotation of the cores about their own axes and through a given orbit toward a pick-up position.

A further object of the invention is to provide means automatically operative to wind each of the severed portions continuously and severally or bodily on a mandrel or support and to provide for the introduction and removal of these mandrels without interrupting the operation of the machine as a whole and without interrupting the operation of the winding mechanism.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be made manifest in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood that it is not intended to limit the invention to the embodiment shown by the said drawings and description as variations may be adopted within the scope of the invention as set forth in the claims.

Fig. 1 is a diagrammatic side elevation and partial sectional view in a vertical plane of a form of machine involving the invention.

Fig. 2 is a detail and side elevation and section of the drive mechanism for the reel.

Fig. 3 is a plan and sectional detail view of the reel and its operating mechanism, and

Fig. 4 is an end view of one of the friction driving discs of the reel.

A feature of the invention resides in means for automatically winding strips onto a core such for example as a spool or tube during the continued operation of a web machine and further feature provides for the ready introduction of the winding tubes or spools into the winding means without interrupting the operation of the apparatus as a whole. An embodiment of such winding means comprises a reel or core carrier consisting of a pair of axially spaced rings or plates, 100, secured on a shaft, 101, that is driven by a reduction gear, 102, engaging a complementary pinion, 103, on a shaft, 104, geared in desired ratio by change gears, 105, in the gear train of the web machine. This winding reel shaft, 101, is arranged below cutting off means, 80—81, between which means and the reel there is provided a holding means including a roller, 106, having an angular velocity equal to the stock feed and the stock, A, is pressed against the roller, 106, by a pressure roller, 107, yieldingly mounted as on a pair of carrier arms, 108, provided with a shaft, 109. The pressure roller, 107, is shown as operative just above the lower guide, 75ª, of the guide wires, 75, the latter wire being directed outwardly beyond the guide, 75ª. The reel plates 100 are provided with diametrically opposite clutch means such means comprising a yieldable pin or detent, 110, axially opposite to a clutch disc, 111, secured on a stub shaft, 112, on which is provided a driving pinion, 113. There is adapted to be readily interposed between one of the yielding pins or pivots, 110, and a clutch face, 111, a mandrel, 114, having a disc or head, 115, at one end to engage the clutch face, 111, preferably frictionally so that there may be a relative sliding movement between the driving clutch, 111, and the mandrel. Such frictional means may include yielding springs against which the head, 115, bears, the springs being indicated at 116.

The mandrels, 114, are provided with removable spools or tubes, 117, and when one of the mandrels is placed between the clutch means on the reel the mandrel is designed to be rotated into close juxtaposition to the downwardly extending portion of the guide wires, 76. Before reaching this position the applied tube, 117, is supplied with a coat of paste by a feed roller, 118, contacting with the surface of the tube, 117. As the man-

drels, 114, with their tubes, 117, are carried in an orbit about the shaft, 101, they are rotated at a speed substantially equal to the rate of travel of the web so that as a tube, 117, rolls into contact with the lower end of a web passing from the feed rollers, 107, and 106, the leading end of the web becomes attached by the paste to the tube, 117, and this latter is rotated so that the strip is continuously wound up. To secure the desired speed of rotation of the mandrel, 114, with its tube, 117, the pinions, 113, of the mandrels engage and are driven by a master gear, 119, which is driven as by a sprocket chain connection, 120, in equal speed with the feed roller, 106. The speed of the reel is such that by the time one of the mandrels, 114, has completed about 180° movement the entire strip will have been wound on one of the tubes, 117, the latter can be readily withdrawn from the clutch means and an empty tube applied. The pressure roller, 121, supports the web as it is picked up by a tube, 117.

Should the trailing end of the strip from the guide tend to curl, as it is released below the guide, 75ª, it may be held back against the wires, 76, by a blast of air from a nozzle, 125. It is obvious also that the leading end of the strip as it advances toward position to be attached to a core is retained in correct receiving position by means of this air blast.

The operation of the winding machine is as follows:

The web or stock A is delivered by the feeding means shown generally in outline in Fig. 1. This stock or web A is cut into sections as it is delivered by the cutting off means 80—81 thereby effecting the delivery of the web in successive sections.

The reel or core carrier including, as previously described, a shaft 101 rotatably mounted in the frame of the winding machine and plates 100 presenting core supporting members, fixed to the shaft is operated from the main driving member of the winding machine through the shaft carrying the feed roller 106 and a power transmission mechanism, constituting the core carrier actuating means, connected between the shaft of the roller 106 and the shaft 101. As the core carrier is operated, the cores mounted on mandrels 114 are placed in the core receiving means consisting of the stub shafts 112 and the yielding detent 110 carried by the core supporting members 100. The core receiving means or stub shafts 112 are driven through means carried by the core receiving means which in this instance are pinions 113. These pinions or operating means are engaged by an operating member such for example as the master gear 119 shown in Fig. 3 and are driven thereby. The master gear 119 is driven from the shaft of the feed roller 106 through the chain and sprocket connection 120. Therefore the core carrier is automatically operated as the machine operates and carries the cores through a fixed orbit moving them through a web receiving position and as the cores move in this orbit they are rotated by the core revolving means. After a core has been mounted in the core carrier, it is rotated on its axis while carried into contact with a roller 118 which applies paste or adhesive of any desired kind thereby providing for the attachment of the web to the core as the latter moves through the web receiving position adjacent the pressure roller 121. The actuating mechanism for the core carrier and the core revolving means are so arranged that the portion of the core coated with adhesive is presented to the web when the core arrives at its web receiving position adjacent the pressure roller 121. When the web has been attached to the core in this manner, the core continues in its orbit, and the core revolving means continues to function until the winding of the web section is completed. After the web section has passed from the feeding means, it is guided by the guide wires 75 and 76 and, after the guide wires cease to function, by the pneumatic means 125. After the web section has been completely wound on the core, the operator, by withdrawing the yielding detent 110, removes the roll from the carrier and inserts a new core.

What is claimed is:

1. In a device for winding webs on cores, in combination, a core carrier adapted to move a core through a web receiving position, means for feeding the free end of the web into position for contacting with said core when the latter is in web receiving position and core carrier actuating means automatically operable to effect the movement of the core as the winding device operates.

2. In a device for winding webs on cores, in combination, a core carrier operable to move a core through a web receiving position, core carrier actuating means adapted to effect the movement of the core, and means for guiding and directing the successive web ends, as they approach the core carrier, into contacting position with the passing core and being cooperative to effect the attachment of the web to the core as the core is moved through the web receiving position.

3. In a device for winding webs on cores in combination a core carrier adapted to move a core through a web receiving position, means for feeding the free end of the web into position for contacting with said core when the latter is in web receiving position, core carrier actuating means automatically operable to effect the movement of the core as the winding device operates, and core revolving means co-active to wind the web thereon.

4. In a device for winding webs on cores in combination a core carrier adapted to move

a core through a web receiving position, core carrier actuating means automatically operable to effect the movement of the core as the winding device operates, and means for guiding and directing the successive web ends, as they approach the core carrier, into contacting position with the passing core and being co-operative to effect the attachment of the web to the core as the core is moved through the web receiving position.

5. In a device of the character described for winding webs on cores, in combination, a core carrier adapted to move a core through a web receiving position, core carrier actuating means automatically operable to effect the movement of the core as the winding device operates, means for guiding and directing the successive web ends, as they approach the core carrier, into contacting position with the passing core and being co-operative to effect the attachment of a web to the core as the core is moved through the web receiving position and core revolving means co-active to wind the web.

6. In a device of the character described for winding webs on cores, in combination, a core carrier adapted to move a core through a web receiving position, core carrier actuating means operable to effect the movement of the core, means for guiding and directing the successive web ends, as they approach the core carrier, into contacting position with the passing core and being co-operative to effect the attachment of the web to the core as the core is moved through the web receiving position and core revolving means co-active to wind the web

7. In a device of the character described for winding webs on cores, in combination, a core carrier adapted to move a core through a web receiving position, means for feeding the free end of the web into position for contacting with said core when the latter is in web receiving position, core carrier actuating means operable to effect the continuous movement of the core and means co-operative to revolve the core as it moves to wind the web thereon.

8. In a device for winding webs on cores, in combination, a driving member, a core carrier adapted to move a core through a web receiving position, said carrier comprising a revolvably mounted frame presenting supporting members for the cores, and means carried by the supporting members for receiving and establishing frictional driving engagement with a core, and core carrier actuating means automatically operable to effect the movement of the cores as the winding device operates, said actuating means including power transmission mechanism connecting the carrier to the driving member of the winding device, said frictional core receiving means being operable to permit the insertion and removal of the cores.

9. In a device for winding webs on cores, in combination, a driving member, a core carrier comprising a revolvably mounted frame presenting supporting members for the cores, and means carried by the supporting members for receiving and establishing frictional engagement with a core, core carrier actuating means automatically operable to effect the movement of the cores as the winding device operates and including power transmission mechanism connecting the carrier to the driving member of the winding device, core revolving means co-active to wind the web on the core comprising a master gear, a pinion carried by the core receiving means adapted to be engaged by said master gear, and operating means comprising a chain and sprocket drive disposed to engage and rotate said master gear as the core carrier is actuated whereby the rotation of the cores as they are moved by the carrier is effected, and adhesive applying means disposed in the path of the core whereby adhesive is applied as the core moves.

10. In a device for winding webs on cores, in combination, winding means for successive strips cut away from the web, said means including a reel structure carrying a plurality of cores, means for rotating the cores at a rate of speed approximating that of the web feed, and means adapted to continuously rotate the reel structure so as to carry the cores in an orbit, the speed of revolution of the reel being regulated so that the successive cores pick up successive strips of the web.

11. In a device of the character described for winding successive strips of webs on cores, in combination, a plurality of spools adapted to rotate continuously axially and orbitally, means to effect such rotation, means to apply adhesive material to the spools, and means to guide the ends of the strips to the spools, whereby the strips are attached and wound around successive spools.

12. In a device for winding webs on cores, in combination, a plurality of spools, means for removably supporting the spools in spaced relation, means for continuously rotating the spools axially and orbitally toward and away from the webs, means to apply adhesive material to the spools, and means to guide the ends of the webs to the spools for automatic attachment thereto.

13. In a device of the character described, in combination, a frame, a rotatable shaft journaled in said frame, plates axially spaced from each other and rotatable with said shaft, sets of oppositely disposed bearing pins mounted on said plates, one pin of the respective sets being spring-pressed toward the other, means adapted to rotate said shaft, mandrels removably supported between the pins of said respective sets, winding spools removably mounted respectively on said mandrels and means adapted to rotate said mandrels relative to said shaft comprising a mas-

ter gear, a plurality of pinions each rotated by said master gear, and a clutch for each said winding spool including a frictional clutch member positioned for frictional engagement with the respective spool for effecting rotation thereof from said master gear.

14. In a device of the character described, in combination, a frame, a rotatable shaft journaled in said frame, plates axially spaced from each other and rotatable with said shaft, sets of oppositely disposed bearing pins mounted on said plates, one pin of the respective sets being spring-pressed toward the other, means adapted to rotate said shaft, mandrels removably supported between the pins of said respective sets, and means adapted to rotate said mandrels relative to said shaft comprising a master gear, a plurality of pinions each rotated by said master gear, means including a clutch for each mandrel for effecting rotation of said mandrels from said master gear, a strip winding spool removably mounted on each mandrel and rotatable therewith, and means disposed adjacent the path of movement of said spools with said plates adapted automatically to apply paste to said spools while the latter are being rotated by said master gear.

15. In a device for winding webs on cores, in combination, means for feeding said webs, a core-carrier operable to move a core through a web receiving position, core-carrier actuating means adapted to effect the movement of the core, and a guide including guide members positioned at either side of the path of feed of the advancing leading end of the web and extending substantially parallel to said path for guiding and directing the successive web ends as they approach the core carrier into contacting position with the passing core and being cooperative to effect the attachment of the web to the core at web-receiving position.

16. In a device for winding webs on cores, in combination, means for feeding said webs, a core-carrier operable to move a core through a web receiving position, core-carrier actuating means adapted to effect the movement of the core, and a guide including guide members positioned at either side of the path of feed of the advancing leading end of the web and extending substantially parallel to said path for guiding and directing the successive web ends as they approach the core-carrier into contacting position with the passing core and being cooperative to effect the attachment of the web to the core at web-receiving position, said guide also including a pneumatic device positioned adjacent said guide members.

In testimony whereof, I have hereunto set my hand.

CLARENCE L. JOHNSTON.