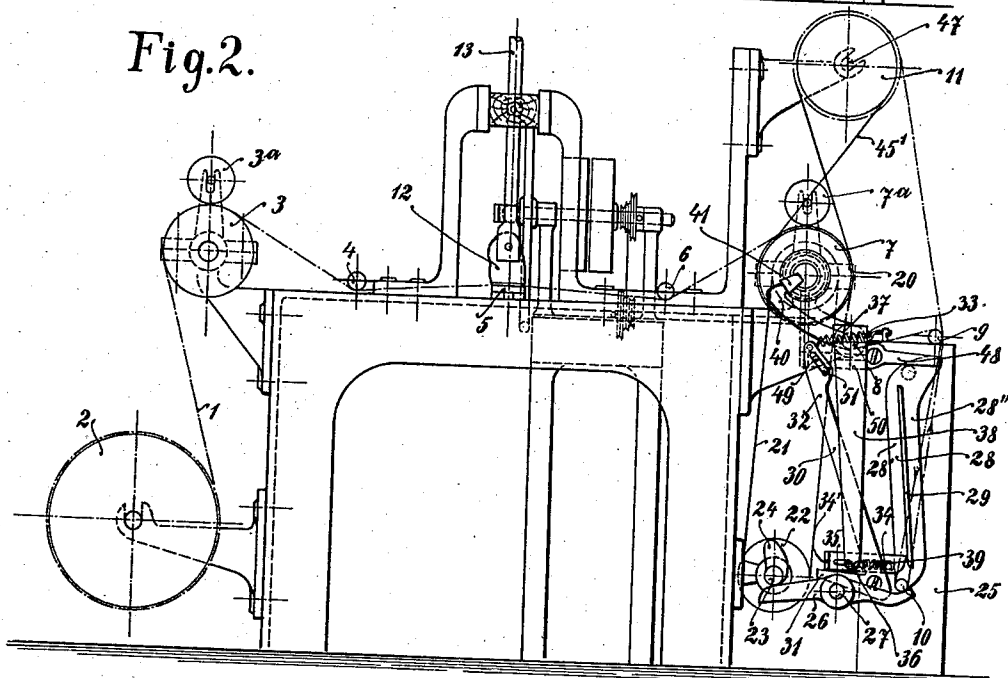
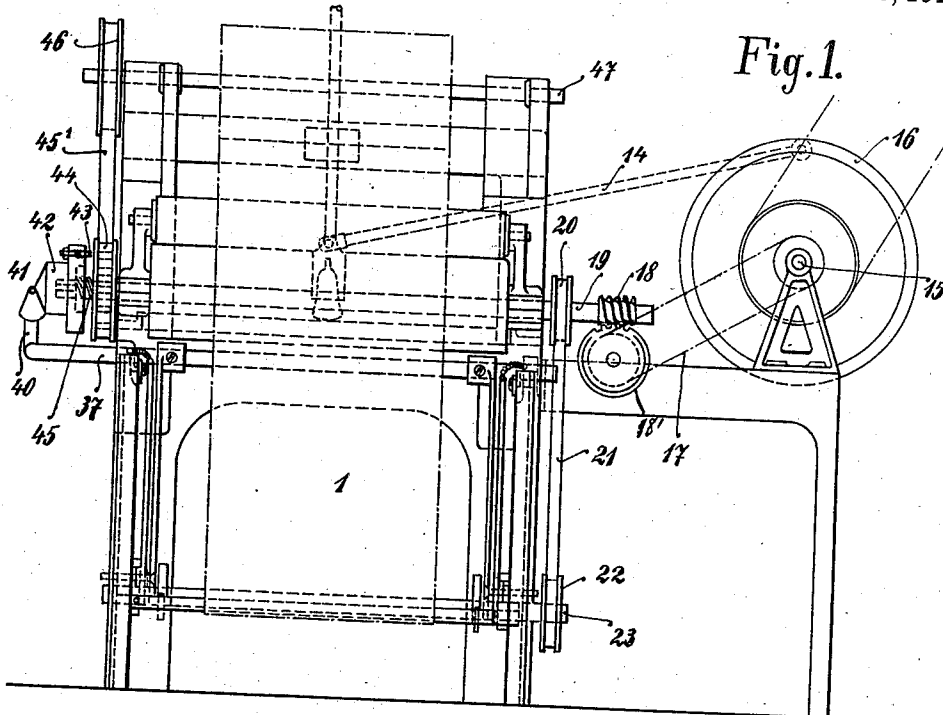


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WINDING APPARATUS FOR PAPER, CLOTH, OR THE LIKE.
APPLICATION FILED AUG. 6, 1910.

1,013,917.

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WITNESSES

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FRANZ ZWINZ, OF VIENNA, AUSTRIA-HUNGARY.

WINDING APPARATUS FOR PAPER, CLOTH, OR THE LIKE.

1,013,917.

Specification of Letters Patent.

Patented Jan. 9, 1912.

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To all whom it may concern:

Be it known that I, FRANZ ZWINZ, subject of the Emperor of Austria-Hungary, residing at 5 Marchfeldstrasse, Vienna XX, Austria-Hungary, have invented certain new and useful Improvements in Winding Apparatus for Paper, Cloth, or the Like, of which the following is a specification.

The present invention relates to a winding apparatus for paper, cloth or the like enabling material fed continually to the apparatus to be intermittently wound when the operation of the material fed has reached a certain length, and to automatically stop the winding operation when the paper has been wound to a predetermined size.

The principal features of the apparatus will more clearly appear from a description thereof in connection with a paper smoothing machine wherein the paper on being fed thereto from a paper roll is rendered smooth by means of ground stones drawn under pressure over the paper transversely to the direction of its movement, after which the paper is wound on to a roller.

As the feed movement of the paper, effected by the drawing rollers is irregular and moreover is dependent on the throw or pressure applied to the oscillating stone and further as the thickness of the paper, to be operated on, varies, or in other words as the diameter of the winding roller owing to the paper layers placed upon it changes constantly but not in a uniform or calculable manner and it is at all times necessary that no material pull should be exerted upon the paper in order to prevent its tearing, it is not desirable to arrange a continuously driven winding roller. According to the present invention a member such as a rod, roller or the like is provided which rests within and is entirely carried and supported by the loop of the paper formed in the web in the feed movement, this member being adapted to automatically throw the driving gear of the winding roller into operation upon the loop reaching a determined size, and throws it out of action when the loop has been reduced to a determined smaller size.

A constructional form of the invention is shown in the drawing in which—

Figure 1 is a front view of the winding device as used in a paper surfacing machine and Fig. 2 is a lateral elevation thereof.

The paper 1 to be surfaced is wound on a

roll 2 whence it travels over drawing rollers 3 and 3^a, beneath a tensioning rod 4, over the smoothing bar 5, and beneath a second tensioning rod 6, between drawing rolls 7 and 7^a, over guide rollers 8, 9, to the loop-carried rod 10, and from the latter to the winding roller 11. The roller 7^a, resting upon the roller 7, is capable of being vertically displaced by reason of its being journaled in a slotted bracket and the weight of the roller 7^a is so chosen that when the smoothing stone 12, secured to a lever 13, presses upon the paper, the pressure exerted on the paper and on the roller 7 by the roller 7^a is not so great as to prevent a sliding of the roller 7 underneath the paper thereby avoiding any breakage of the latter. These rollers can exert a pull on the paper and thereby effect its advance only when the stone 12, which is moved transversely to the direction of movement of the paper by means of the connecting rod 14 and crank wheel 16 continually driven by the main shaft 15, has left the edge of the paper so that the latter is relieved of the pressure of the stone.

Since the weight of the roller 7^a as mentioned must not be great, a pull would be immediately exerted upon the paper in the machine during the operation of the winding roller 11, were it not for the provision of the device hereinafter described.

The shaft 19 of the roller 7 is operated from the main shaft 15 (Fig. 1) by means of a pulley gear 17, a toothed gear 18' and a worm gear 18. Mounted upon this shaft 19 is a pulley 20, driving a shaft 23 by means of a belt 21, and a second pulley 22. Arranged on this shaft 23 on both sides and symmetrically to the central axis of the machine are cams 24, which thus are constantly rotated from the main shaft of the machine.

Arranged at each side of the paper web is a device hereinafter more fully explained.

Pivoted upon an axis 27 on a lateral standard 25 is a lever 26 of which one end extends into the path of the cam 24 and whose other end projects beyond the loop-carried rod 10, which at both sides is guided in guide grooves 28, arranged in the standard 25. In the example shown this guide groove is loop-shaped, a central web 29 being provided by which the rod 10 is compelled to rise along one side of the web, and to descend along its other side. Journaled in the standard 25 is a bell crank lever 30, of which

one arm 31 presses against the underside of a slide 34, by means of a tension spring 33 one end of which is secured to the second lever arm 32, and the other end of which is attached to the standard 25. The slide 34 projects with one end beyond the path of the loop-forming rod 10, and is provided with a slot 35 for guiding a pin 36 of a crank 38 keyed on the shaft 37. A spring 39 tends to draw the slide 34, in the event of its being displaced, constantly to the position shown.

Keyed on the shaft 37 is an arm 40, the free rectangularly bent end of which is provided with a conically shaped roller 41. Opposite this roller 41 and movably arranged on the shaft 19 is a coupling member 42, provided with a spring actuated coupling pin 43, which enters corresponding openings in a pulley 44, loosely arranged on the shaft 19, when the coupling member 42 is displaced on the shaft 19 in opposition to the action of a spring 45. This pulley 44 (Fig. 1) and a pulley 46 arranged on the shaft 47 of the winding roller 11 are connected by a belt 45', by which the movement of the shaft 19 is transmitted to the winding roller 11 upon the part 42 and pulley 44 being coupled.

Rotatably pivoted in the upper portion of the standard 25 (Fig. 2) is a lever 48, of which one arm projects across the guide groove 28, whose other arm 50, provided with a pin 49, is connected to the bell crank lever 30, by the pin 49 engaging with a slot 51 in the arm 32 of the lever 30.

The operation of the device is as follows: Assuming the loop-forming rod 10 to have been brought into the position shown by the advance of the paper effected by the drawing rollers 7 and 7^a, in which position the paper is to be wound on the winding roller 11, the levers 26 are oscillated by the continually driven cams 24, and in this movement raise, by means of their forward arms 27, the rod 10, into the portion 28' of the guide groove 28. The rod 10 in ascending presses the slide 34 which extends into its path back against the action of the spring 39, whereby the crank 38 owing to its connection with the slide 34, by the pin 36, is rocked in clockwise direction. The slide 34 is pressed back by the rod 10 to such an extent that the arm 31 of the bell crank lever 30 by the action of the spring 33 is raised so as to bear against the bent end 34', on the slide, thereby locking the slide in its retracted position. By the rocking of the crank 38 the shaft 37, and consequently the arm 40, are likewise rocked. In this movement the roller 41 is moved against the center of the conically tapering coupling member 42, which is thereby displaced along the shaft 19, thus causing the pin 43 to couple the pulley 44 with the member 42, so that the movement of the continually driven

shaft 19 is transmitted to the winding roller 11. The winding roller thus rotated exerts a pull upon the paper, and, with the paper, raises the rod 10 up to the end of the guide portion 28. At the moment in which the rod 10 has arrived at the upper end of the guide 28, and the paper under treatment has thus been wound on to a sufficient extent, the rod 10 presses against one arm of the lever 48 which is thereby rocked, and, owing to its pin connection with the arm 32, rocks the bell crank lever 30 in such a manner that its arm 31 is caused to be drawn away from the edge 34' on the slide 34. This slide, thus freed, is shot forward, by the action of its spring 39, to its initial position, carrying with it the crank 38, whose pin 36 engages in the slot 35, whereby the crank 38 is rocked back again. In this movement the arm 40 is likewise brought back to its initial position, that is to say the pressure exerted by it upon the coupling member 42 is relieved and the coupling member 42 returns to its initial position, under the influence of the spring 45, thus bringing about the uncoupling of the pulley 44, which, as already mentioned, is loose on the shaft 19. The driving of the winding roller 11 is thus stopped at the same moment in which the rod 10 has arrived at the end of its upward movement. The drawing rollers 7 and 7^a now again continue to feed the paper, and the rod 10, which, as before, is carried in a loop of the paper, now descends into the portion 28'' of the guide 28, until it enters the path of the rocking lever 26. At this moment the winding on of the paper must again take place as the advanced paper has reached a sufficient length. This winding on operation is effected by the raising of the rod 10 by means of the lever 26, and by the winding device, which has thereby been thrown into operation. During the operation of the winding roller 11 therefore no material pull of any kind can be exerted upon the paper present in the machine and consequently any risk of tearing the paper is avoided.

As already mentioned the operating mechanism for the coupling is arranged at each end of the loop-carried rod 10. It is however clear that it would suffice to provide only one such mechanism. The arrangement of two congruent devices of this kind which are positively connected has the advantage that in the case of an accident, such as during an oblique position of the paper and the rod due to irregular feed movement, in which the loop-carried rod may be caused to so perform its movement that its one end lies in the guide portion 28'' and the other in the guide portion 28', a completely correct operation of the device is nevertheless insured. In this case that end of the loop-carried rod which first ar-

rives at the lower end of the guide would be seized by the corresponding lever 26 and effect the throwing into action of the winding device and the opposite symmetrically arranged mechanism would be rendered operative by the positive connection.

What I claim and desire to secure by Letters Patent is:—

1. In winding apparatus for paper, cloth and the like, in combination, a winding roller, a shaft therefor, a pulley keyed on said shaft and connected by a belt with a loosely arranged pulley on a positively driven main shaft, mechanism for throwing the loosely arranged pulley in and out of action, a rod carried and supported by a loop of the paper formed in the paper web in the feed movement, a standard provided with guide grooves for said rod, and means for raising the rod to a certain height in said guide grooves for enabling the rod to actuate said mechanism.

2. In winding apparatus for paper, cloth and the like, in combination, a winding roller, a shaft therefor, a pulley keyed on said shaft and connected by a belt with a loosely arranged pulley on a positively driven main shaft, mechanism comprising a clutch for throwing the driving means in and out of action, a rod carried by a loop of the paper formed in the paper web in the feed movement, a continually driven cam, a rocking lever pivoted in the standard and extending into the lower part of the path of the rod and adapted to raise the rod on its upward movement for enabling the latter to actuate said mechanism.

3. In winding apparatus for paper, cloth and the like, in combination, a winding roller, a shaft therefor, a pulley keyed on said shaft and connected by a belt with a loosely arranged pulley on a positively driven main shaft, a conical tapering coupling member slidably mounted on said main shaft, a rod carried by a loop of the paper formed in the paper web in the feed movement, a continually driven cam, a rocking lever pivoted in the standard, and extending into the lower part of the path of the rod and adapted to raise the rod on its upward movement, a spring actuated slide extending normally into the path of the rod and pressed back by the rod, a crank connected with one end to the slide by means of a pin engaging a slot in the slide and keyed with the other end on an axis, an arm fixed thereto and having on its free end a conical roller pressing against the center of said conically tapering coupling member and having a spring actuated coupling pin engaging a hole of the loosely mounted pulley

when moved against it by the rocking of the arm and crank by means of the slide being pressed back thereby coupling the positively driven main shaft with the shaft of the winding roller, means for retaining the slide in its back position and means actuated by the rod for throwing the driving mechanism of the winding roller out of action.

4. In winding apparatus for paper, cloth and the like, in combination, a winding roller, a shaft therefor, a pulley keyed on said shaft and connected by a belt with a loosely arranged pulley on a positively driven main shaft, a conical tapering coupling member slidably mounted on said main shaft, a rod carried by a loop of the paper formed in the paper web in the feed movement, a continually driven cam, a rocking lever pivoted in the standard and extending into the lower part of the path of the rod and adapted to raise the rod on its upward movement, a spring actuated slide extending normally into the path of the rod and pressed back by the rod, a crank connected with one end to the slide by means of a pin engaging a slot in the slide and keyed with the other end on an axis, an arm fixed thereto and having on its free end a conical roller pressing against the center of said conically tapering coupling member and having a spring actuated coupling pin engaging a hole of the loosely mounted pulley when moved against it by the rocking of the arm and crank by means of the slide being pressed back thereby coupling the positively driven main shaft with the shaft of the winding roller, a bell crank lever journaled in the standard, a contractile spring connected to one arm of said lever and to said standard, said spring constantly pressing the other arm of said lever against said slide to lock the latter in position, a lever journaled in said standard, said lever having one of its ends in the path of the rod as it descends and having its other end operatively connected to said bell crank lever to rock same against the action of said contractile spring, whereby as the rod rises it will engage said lever to cause said bell crank lever to move out of engagement with said slide, thereby unlocking the latter and allowing it to return to its original position to uncouple the driving mechanism of the winding roller.

In testimony whereof I have affixed my signature in presence of two witnesses.

FRANZ ZWINZ.

Witnesses:

JOHANN LUX,
AUGUST FUGGER.