D. M. LEEN & A. BOOMERSHINE.

PAPER CONTROLLING DEVICE.

APPLICATION FILED DEC. 21, 1915.

1,213,771.

Patented Jan. 23, 1917.

2 SHEETS—SHEET 1.

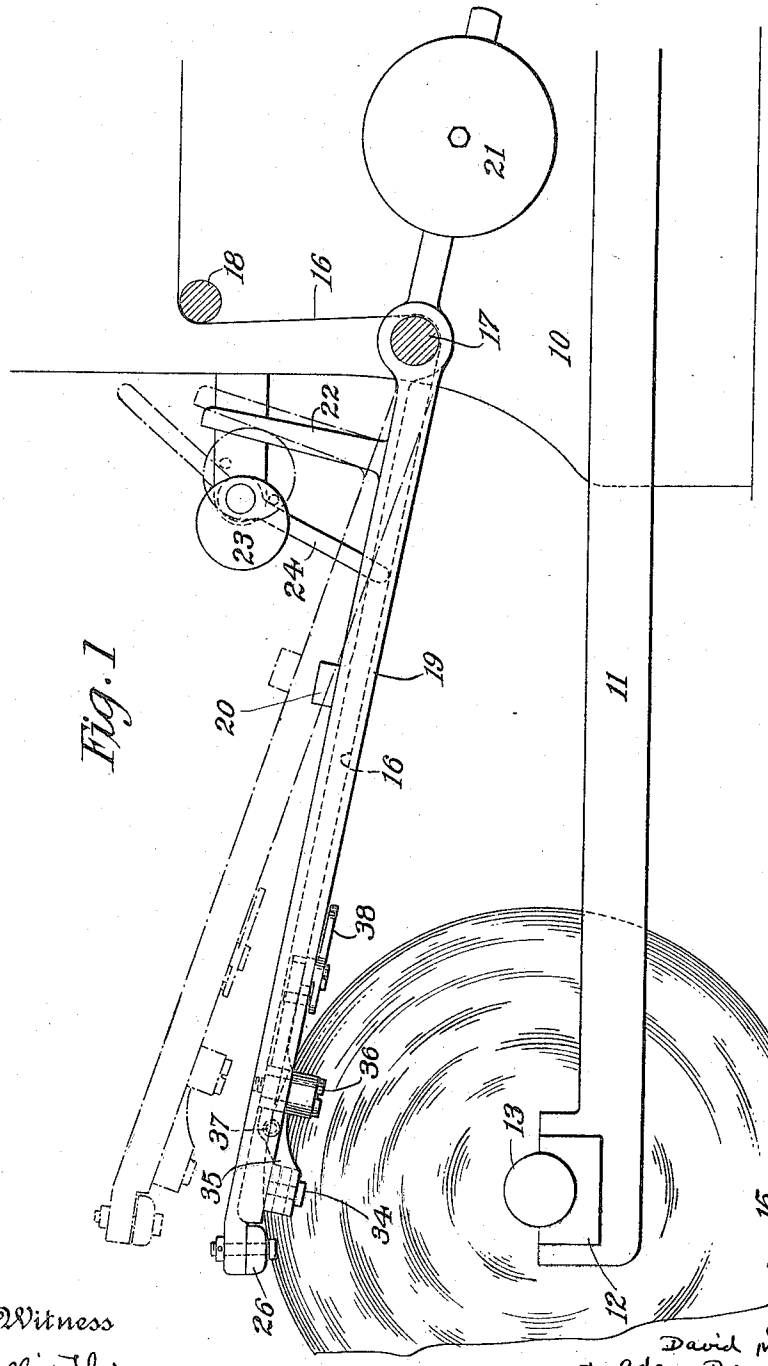


Fig. 1

Witness
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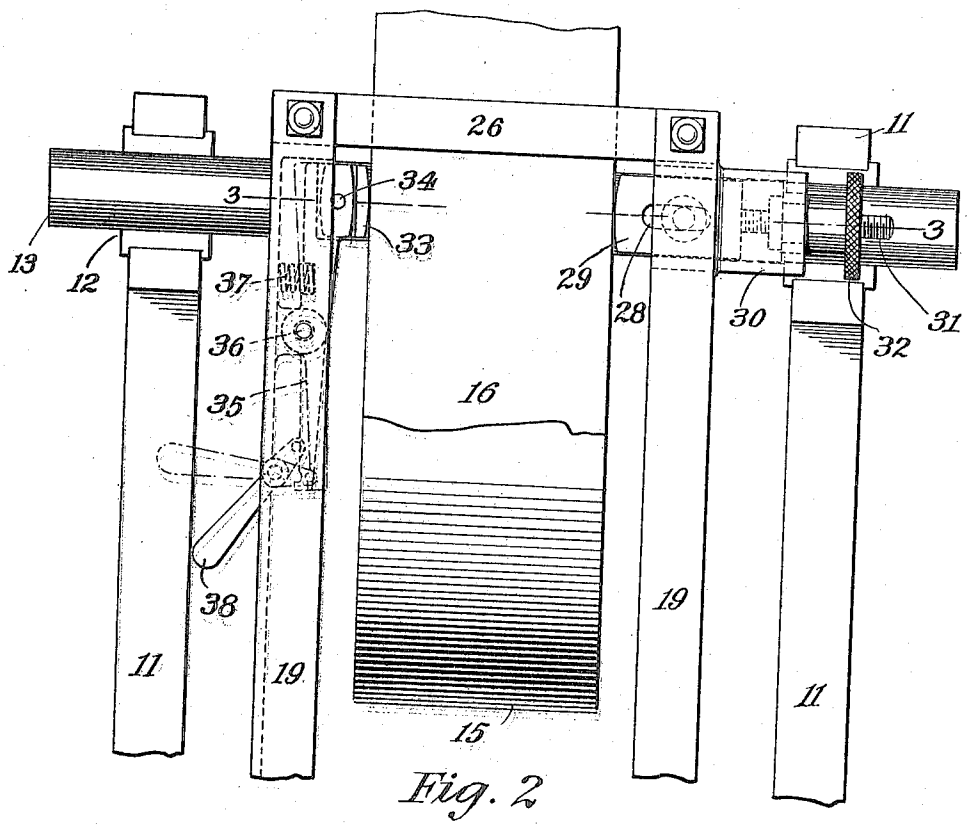


Fig. 2

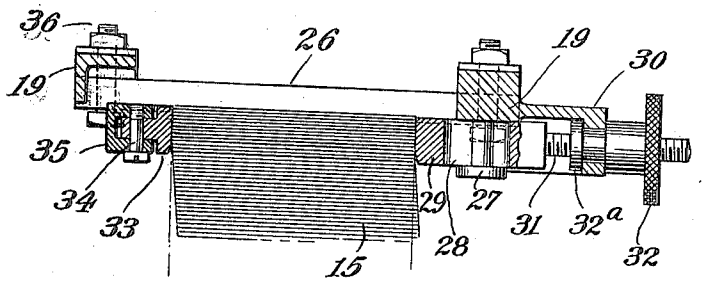


Fig. 3

Witness.
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UNITED STATES PATENT OFFICE.

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PAPER-CONTROLLING DEVICE.

1,213,771. Specification of Letters Patent. Patented Jan. 23, 1917.

Application filed December 21, 1915. Serial No. 67,968.

To all whom it may concern:

Be it known that we, DAVID M. LEEN and ADAM BOOMERSHINE, citizens of the United States, residing at Dayton, Montgomery county, Ohio, have invented certain new and useful Improvements in Paper-Controlling Devices, of which the following is a full, clear, and exact description.

This invention relates to certain new and useful improvements in paper controlling devices, particularly those adapted to guide and tension a web of paper which is withdrawn from a supply roll.

In former tensioning and guiding devices the proper lateral spacing of the paper web has been attempted with adjusting devices which coöperated with the paper roll shaft, or with the paper roll adjacent the shaft. The objection to these devices has been that a lateral thrust on the roll shaft tends to telescope the roll. When this occurs, it is an exceedingly difficult matter to give the paper web the proper lateral adjustment.

With this improved device the paper roll shaft is left free to shift laterally in the bearings, and all adjustments are made adjacent the point of tangency of the web or where the paper web leaves the supply roll. The arrangement is such that the adjusting devices always bear on the roll at such a point regardless of the amount of paper consumed.

Another feature of this improved device consists in providing one guide block with a resilient support which may be swung back when it is desired to replace the paper roll. This resilient guide block bears against one side of the paper roll and the other side of the roll abuts against a solid block which, however, may be given a lateral adjustment by means of an adjusting wheel. In this way the paper web can be brought to any desired lateral position.

Another feature of this invention consists in associating a tension bar with the paper guiding devices in such a way that uniform tension is applied to the paper just before the web leaves the roll.

In the drawings, Figure 1 shows a side view of the improved paper guide and tensioning device. Fig. 2 shows a top plan view of the parts shown in Fig. 1, which cooperate with the paper roll. Fig. 3 is a detail sectional view of parts shown in Fig. 2 taken on line 3—3 of Fig. 2.

In more detail, 10 is a frame of an envelop machine or any other machine which uses paper in rolls and in which it is necessary to control the paper web as it approaches said machine.

11 are bars which are rigidly secured to the frame 10 and which extend outwardly therefrom and carry on their upturned ends the bearing blocks 12. These bearing blocks are adapted to support a shaft 13 in such a manner that the shaft is free to move laterally in the frame of the machine.

15 is a paper roll which is supported on the shaft 13. From this roll a paper web 16 is led off, and passing under shaft 17 and cross shaft 18, extends into the machine where various operations are performed thereon. Shaft 17 also forms a pivotal support for the frame carrying the paper web guiding and tension devices. This frame comprises side members 19 suitably cross braced, as by one or more members 20. The bars 19 extend beyond their pivotal support and carry counterweights 21 of sufficient size to very nearly balance the weight of the frame and parts carried thereby which are at the left of the pivotal support 17. In order to lift the frame to swing the paper guiding and tensioning devices from the paper roll for replacing the paper roll, side bars 19 have upwardly extending arms 22. Eccentrics 23 operated by a hand lever 24 are provided which, when swung into contact with arms 22, force the arms rearwardly and thus lift the frame (frame in upper position shown in dotted lines). The arrangement of the eccentric device is such that when swung away from arms 22 there is sufficient clearance between the eccentrics and the arms to permit the frame to descend as the paper on roll 15 is consumed.

Web tensioning device.—Extending between bars 19 and below them at a point adjacent their ends, is a tension bar 26. This tension bar is fastened to the bars 19 in any suitable manner, as by the bolts shown. The connection is such that the tension bar and the side bars 19 are not rigidly secured together, but so that the tension bar 26 can move relatively to side bars to a slight extent (see parts in dotted lines in Fig. 1). The lower face of the tension bar is slightly rounded as shown so that there will be no tearing of the paper. This tension bar is adapted to press upon the roll of paper 15

and thus produce the proper tension on web 16. The degree of tension is of course dependent upon the weight of the frame at the left of pivot 17, which is not compensated for by the counterbalance 21. This of course can be varied by changing the position of the counterbalance 21, but once set for a certain tension it requires no further attention.

Paper guiding and controlling devices.— In machines of this sort it is of paramount importance that the web approach the machine in a uniform lateral position, otherwise the web would incorrectly register with the instrumentalities acting on the web in the machine. We have found that the proper place to control the web is closely adjacent the point of tangency of the web and the supply roll. By guiding the web at this point any telescoping of the paper (such as is shown in Fig. 3) can be corrected and the web can be passed into the machine in the proper manner. The parts should also be so arranged that the paper guiding devices preserve their position as the roll is consumed.

One of the side bars 19 carries a downwardly extending cap stud 27. This stud extends through a slot 28 in guide block 29, to slidably support the block upon bar 19. The block 29 extends toward the edge of the paper roll and is rounded at its corners to avoid tearing and scraping the paper. In order to adjust the guide block 29 in and out, the right hand bar 19 is provided with an extension 30. The block 29 has a threaded stud 31 integral therewith. A knurled hand wheel 32 is interiorly threaded to receive the stud and is provided with a collar 32ª which engages the inner side of extension 30. It will be seen that by turning the hand wheel the guide block 29 will move inward or outward. To guide the opposite side of the paper roll a guide block 33 is employed. This guide block has rounded corners similar to block 29, and is pivotally supported by stud 34 on a lever or arm 35, which is in turn pivotally supported by stud 36 on the left hand bar 19. The guide block 33 is normally urged toward the paper roll by means of a spring 37, which contacts with the pivoted lever and the side of the bar 19. This spring may be carried on either the pivoted lever 35 or the bar.

In order to withdraw the guide block 33 from contact with the paper when replacing the paper roll, a camming lever 38 is pivotally mounted on the left hand bar 19. This camming lever carries a pin which contacts against the side of the pivoted lever 35. When the camming lever is swung to withdraw the guide block from contact with the paper the pin preferably engages in a notch in the side of the pivoted lever. In this way the camming lever is prevented from slipping and allowing the guide block to reëngage the paper.

The left hand guide block 33 being spring pressed is, during the operation of the machine, always in engagement with the paper at a point adjacent the point of tangency of web and paper roll. The guide block 29 is also in engagement with the paper at a point exactly opposite from the spring pressed block 33. The block 29 can be moved in and out by the hand wheel 32, and the spring 37 will permit the block 33 to move to a corresponding extent. With these guiding devices it is thereby possible to adjust the paper exactly to any desired lateral position whereby the web may be properly fed into the machine. The pivotal mounting of the frame carrying the paper roll permits the guiding devices to swing downwardly as the paper roll is consumed and the diameter decreased. At the same time the paper rolls can be changed expeditiously by merely swinging back the spring pressed block and thereafter raising the carrying frame.

It is to be understood that our invention is not limited to the specific details shown and described, and that the terms used are terms of description and not of limitation.

What we claim as our invention is more particularly pointed out in the appended claims.

1. In a paper controlling device, in combination, a support for a roll of paper, a relatively fixed but manually adjustable guide block contacting with the side of the roll adjacent its periphery at the point where the web leaves the same, and a resiliently pressed guiding member contacting with the periphery of the roll at the side opposite from the aforesaid guide block.

2. In a paper controlling device, in combination, a relatively fixed guide contacting with the side of the roll of paper adjacent its periphery, a shifting guide contacting with the opposite side of the roll and means for maintaining the last mentioned guide in contact with the side of the roll at its periphery.

3. In a paper controlling device, in combination, a support for the roll of paper, an adjustable but relatively fixed guide block adjacent the periphery of the roll at the point where the web leaves the roll, a second shifting guide block adapted to contact with the edge of the roll at a point adjacent the periphery and opposite the first mentioned block.

4. In a paper controlling device, in combination, a support for a roll of paper, a guide block adjacent the periphery of the roll at the point where the web leaves the roll, a second guide block adapted to contact with the edge of the roll at a point adjacent the periphery and opposite the

first mentioned block, and means for resiliently maintaining the said last mentioned guide block in contact with the paper roll, the said first mentioned guide block being relatively fixed with respect to the second mentioned block as the paper is withdrawn from the roll.

5. In a device of the class described, means for controlling and tensioning a web of paper comprising, in combination a supporting frame, a relatively fixed but adjustable guide and a shifting guide, both of said guides contacting with the edge of the roll of paper adjacent the periphery thereof and adjacent the point where the web leaves the roll, and a tension bar attached to said frame and adapted to rest upon and tension the paper.

6. In a device of the class described, means for controlling and tensioning a web of paper comprising, in combination, a fixed guide and a shifting guide, both of said guides contacting with the edge of the roll of paper adjacent the periphery thereof and adjacent the point where the web leaves the roll, and means for withdrawing the shifting guide widthwise from the roll to replace the said roll.

7. A paper controlling device comprising a support for a roll of paper, a relatively fixed but manually adjustable guide adjacent the periphery of the roll at the point where the web leaves the roll, a guiding device adapted to contact with the opposite edge of the roll, resilient means for holding said last mentioned guiding device in contact with the roll, and manually operated means for withdrawing the said guiding device from the roll.

8. In a paper controlling device, a support for a roll of paper comprising a freely movable shaft, a frame pivoted at one side of the roll and extending thereover, a tension bar carried by said frame and contacting with the periphery of the aforesaid roll to tension the paper web, a guide block adjustable widthwise the frame and adapted to contact with the edge of a roll of paper adjacent the point of tangency of the web and roll, and a second guide block resiliently engaged against the opposite edge of the paper roll and carried by the aforesaid frame, said guide blocks coöperating to guide the paper web as it leaves the roll.

9. In a paper controlling device, a shaft forming a support for a roll of paper, a frame pivoted to one side of the roll of paper and extending thereover, a tension bar carried by said frame and contacting with the face of the roll, guide blocks carried by said frame and contacting with the edges of the roll adjacent the point of tangency of the web and the roll, means for withdrawing one block from contact with the roll when rolls are to be replaced, and means for raising the frame for replacing the paper roll.

10. In a paper controlling device, a support for a roll of paper, a frame for supporting paper tensioning and guiding devices, said frame being adapted to change its position automatically upon the decrease of diameter of the paper roll, guide blocks carried by said frame, one of said guide blocks being adjustable with respect to the frame for controlling the position of the paper web, and a second guiding block having a resilient engagement with the paper at the opposite side from the first mentioned block and a camming means for withdrawing said last mentioned block from contact with the paper.

11. In a paper controlling device in combination, a shaft forming a support for a roll of paper, a frame pivoted at one side of the roll and extending thereover and adapted to automatically descend as paper is withdrawn from the roll; guide members carried by the frame and each contacting with an edge of the roll adjacent the periphery and opposite from each other, and means for raising the frame for replacing the paper roll.

12. In a paper controlling device in combination; a support for a roll of paper; a frame pivoted at one side of the roll and extending thereover and adapted to automatically descend upon the decrease in diameter of the paper roll; a relatively fixed guide; and a shifting guide, both of said guides being carried by the frame and contacting with the edges of the roll of paper adjacent the periphery thereof and adjacent the point where the web leaves the roll.

In testimony whereof we affix our signatures.

DAVID M. LEEN.
ADAM BOOMERSHINE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."