J. W. MOORE.

MACHINE FOR MAKING DECKLE AND THIN EDGED PAPER.

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1,008,609. Patented Nov. 14, 1911.

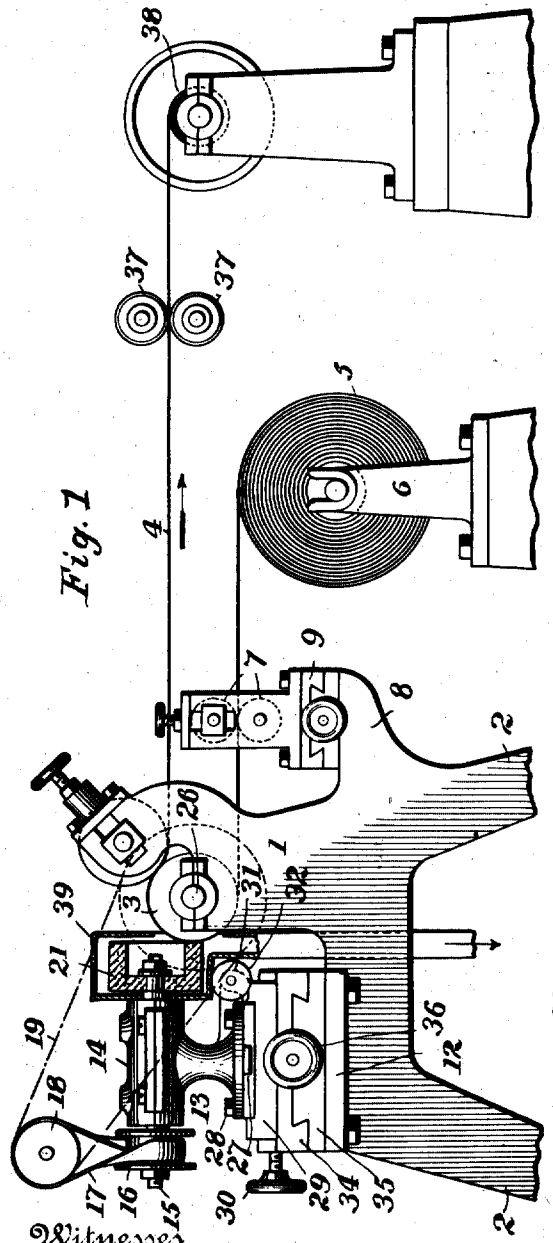

Fig. 1

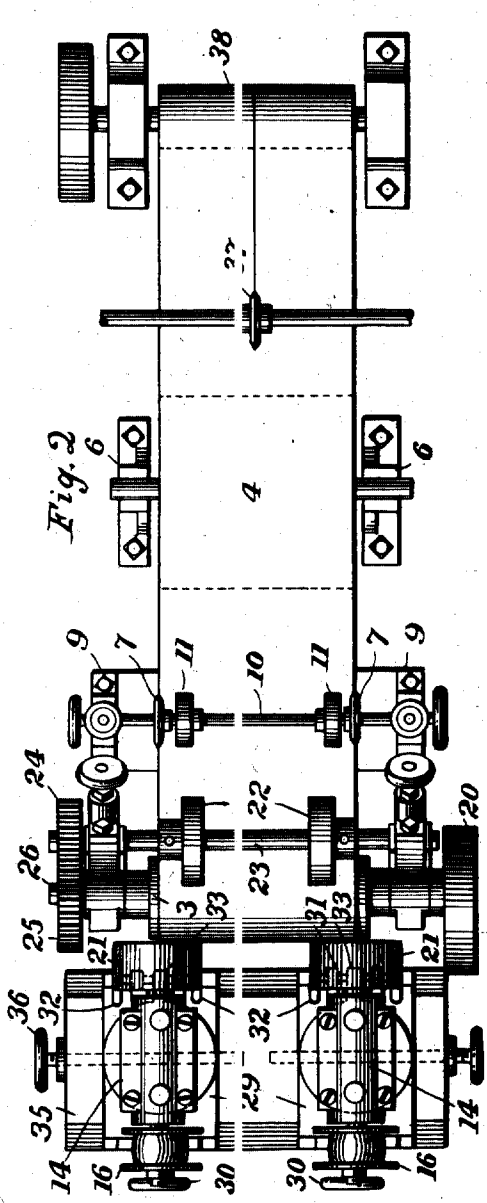

Fig. 2

Witnesses
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MACHINE FOR MAKING DECKLE AND THIN EDGED PAPER.

1,008,609. Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed March 29, 1910. Serial No. 552,196.

To all whom it may concern:

Be it known that I, JOSEPH W. MOORE, a citizen of the United States, and resident of Newton Highlands, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Machines for Making Deckle and Thin Edged Paper, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

For various purposes, such as book-binders' use, paper-tube winding, and various other places where it is desired to make an exceedingly tight, neat joint or pasted edge, it is desirable to have the edge of the paper thin or beveled, and preferably rough edged,—so-called "deckle edge." The process usually followed in getting the paper into this condition is to laboriously treat it to that end during the process of manufacture at the paper mill, thereby not only entailing some expense but considerably reducing the output or speed of manufacture, and hence indirectly making the paper expensive.

Accordingly my invention has for its object the provision of a machine for treating any paper which may be bought in the market, so as to produce the desired kind of an edge. The paper is simply passed through the machine, and the machine has provision for adjusting it so as to accommodate various widths and kinds of paper and so as to produce a thin edge at practically any bevel desired, besides producing a uniform bevel and such deckle edge as may be desired. To this end, I provide preferably means for truing the edge of the paper before it reaches the beveling device, and then I maintain the edge taut or under tension at the spot or region where it is being beveled, whereby all tendency of the paper to kink or pucker, and hence defeat the object in view, is prevented and at the same time the work is greatly facilitated.

In its preferred embodiment, my machine also contains means whereby if desired only one edge of the paper is treated and yet the tension on the paper is maintained uniform.

In the accompanying drawings, in which I have shown a preferred embodiment of the invention, Figure 1 represents the machine in side elevation; and Fig. 2 is a view thereof in top plan.

It will be understood that I have not undertaken herein to show the machine in all its minute details, nor, in fact, to show more than is necessary to convey clearly the main features of my invention so far as its novel points are concerned.

Journaled in uprights 1 of a suitable frame 2 is a feed drum 3, preferably metal, around which a web 4 of paper is led from a roll 5 supported in any suitable manner, as in a stand 6, said paper passing between truing devices or edge cutters 7 mounted on a bracket or rear bed piece 8 and adjustable at 9 widthwise of the machine, the shaft 10 which carries the upper cutters being preferably provided with tension rolls 11 for insuring accuracy of feed

At the front of the machine, on a horizontal bed plate 12, are mounted opposite stands 13 in whose heads 14 are journaled horizontal shafts 15 driven by fast pulleys 16 and belt 17 from a counter-shaft 18. This counter-shaft also preferably serves to drive the feed drum 3 by means of a belt 19 and pulley 20. On the inner ends of the shafts 15 are mounted grinding tools 21, herein shown as cup wheels of emery or other suitable grinding material, arranged to rotate as indicated by the arrows. Positively driven feed rolls or disks 22 are fast on a shaft 23 driven by gears 24, 25 from the shaft 26 of the drum 3, said disks being so arranged as to maintain under constant tension the paper at the region where it is engaged by the grinders. Each stand 13 is pivotally mounted at 27 to turn in a horizontal plane, being clamped in adjusted position by bolts 28. The pivot 27 is mounted in a base plate 29 which has a sliding movement longitudinally of the frame, being adjusted by a hand screw 30. Ears 31 project upwardly from this base plate 29 and are provided with opposite end screws 32 to engage an ear 33 projecting from the stand 13 for providing extremely fine swiveling adjustment for the grinders. Also the base 29 is mounted on a plate 34 which is given a lateral movement on a bed 35 by means of a hand screw 36. Preferably cutters 37 are provided for slitting the paper after its edges have been ground, the paper being delivered to any

suitable receiving mechanism as for instance a reel or winding mechanism 38. Also, as the operation of the machine produces a great deal of dust, I preferably provide dust-conveying mechanism 39, one only of those conveyers being herein shown, although two will be provided, one for each grinder.

In use, the paper passes through the machine as shown best in Fig. 1, and as it passes between the cutters 7, these cutters true the edges of the paper accurately. The paper then passes in a bend over the drum 3 and is given further tension by the feed rolls 22. This arrangement constitutes a preferred means for maintaining the opposite edges of the paper under tension at the tangential point where said edges are engaged by the grinding cup-wheels, as I have found that practically all the difficulties which I have experienced by attempts at flat grinding, feeding, etc., are eliminated simply by placing the work under continuous tension at the grinding point, and at the same time holding the paper at this point in firm contact with a suitable unyielding backing. A further important feature of my invention worthy of comment at this point is the provision of means, not necessarily restricted to cup wheels, however, for giving a straight-out grinding movement at the edge being ground. As each cup wheel rotates in the direction shown and engages the paper only at the lower edge of the wheel, it will be evident that the pull on the paper takes place simultaneously at the opposite edges in a strictly transverse direction to the length of the paper, so that, in the first place, there is no danger of ruffling the paper, and in the next place, the engagement is delicate, and finally all twisting tendency or tendency to distort the paper is done away with. With this construction, also, I have found that the machine can be run at very high speed so as to give a large output of product. By turning the stands 13 on their pivots 27, the grinding tools are correspondingly turned so as to grind the paper to any bevel desired, and this adjustment is further facilitated by the coöperating lateral and longitudinal adjustments through the hand wheels 30, 36. Also, the adjustments provided by the hand wheels 36, preferably independent, accommodate the grinders to varying widths of paper, and the longitudinal adjustment through the wheels 30 provides for all thicknesses of paper. If it is desired to grind only one edge of the paper, I prefer to handle a double width of paper, grinding its opposite edges the same as in a single width of paper, and then I bring the cutters 37 into action so as to slit the double width of paper into two single widths. By this means I am enabled to maintain both the cutters in action on the paper so as to get the full benefit of the simultaneous or opposing pull which they give away from the edges of the paper and the consequent high speed of operation which this aids in permitting.

The feeding of the machine is automatic, and in view of the maintenance of an unremitting and uniform tension on the paper at the region where it is being ground, there is no possibility of cutting through any wrinkles or kinks, inasmuch as it is impossible for wrinkles or kinks to form in the paper. This is of special advantage in the case of such papers as straw-board papers, the fiber of which is very weak, and the paper is very liable to break, tear, pucker, etc.

As already intimated, I wish it understood that I consider my invention as broadly novel in providing a machine for accomplishing what it has heretofore been considered necessary to accomplish at the paper mill when the paper is being manufactured.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine of the kind described, means for handling finished paper constructed to place successive portions thereof under tension, combined with means for progressively producing a predetermined deckle edge upon the paper while under tension by thinning the edge relatively to the rest of the sheet or roll.

2. In a machine of the kind described, means for feeding paper, constructed to place successive portions thereof under tension, combined with means operative on the side of the portion under tension for reducing the thickness thereof relative to the rest of the stock to produce a thin bevel terminating in a deckle edge.

3. In a machine of the kind described, the combination with a paper feed, of means for reducing an edge of the paper relative to the rest of the paper stock, and means for maintaining the paper under uniform tension at its operative position along the line of feed movement.

4. In a machine of the kind described, the combination with a paper feed, of means for reducing an edge of the paper, and means for maintaining the paper under tension by pulls exerted thereon in lines transverse of the line of feed movement at its operative position.

5. In a machine of the kind described, a paper feed, means for reducing an edge of the paper, means for maintaining the paper under uniform tension in the line of feed movement, and means for maintaining the paper under tension at its operative position transverse of the line of feed movement.

6. In a machine of the kind described, mechanism for handling the paper, and opposite tools for reducing opposite lateral

edges of the paper, said tools being arranged to coöperate in action upon the work to give a simultaneous outward pull on the edges of the paper.

7. In a machine of the kind described, a paper feed, and rotary reducing tools disposed adjacent the lateral edges of the paper and having their axes transverse of the line of feed movement, said tools being arranged and operable to maintain the paper under tension at its operative position.

8. In a machine of the kind described, a paper feed, and rotary reducing tools arranged to engage opposite lateral edges of the paper, said tools having their operative portions adapted to engage the paper in opposite directions transverse of the line of feed movement.

9. In a machine of the kind described, means for supporting and advancing paper, and opposite rotary reducing tools arranged to engage opposite edges of the paper, said reducing tools being mounted on axes transverse to the line of movement of the paper at the places of contact.

10. In a machine of the kind described, means for supporting and advancing paper under tension over a roller surface, and means arranged to operate on said paper as it passes over said roller surface for producing a deckle edge thereon.

11. In a machine of the kind described, means for supporting and continuously advancing paper under tension, a roller surface arranged for the tensioned portion of the paper to pass thereover and to serve as a backing for tool action, and a rotary reducing tool arranged to engage the paper opposite said roller surface to produce a deckle edge thereon.

12. In a machine of the kind described, means for supporting and advancing paper arranged to effect a tension along the line of feed, a roller disposed for the tensioned paper to be passed thereover, and rotary reducing tools arranged opposite said roller and substantially normal thereto for thinning the edges of the paper.

13. In a machine of the kind described, means for supporting and advancing paper, opposite rotary reducing tools arranged to engage opposite edges of the paper, said reducing tools being mounted on axes transverse to the line of movement of the paper at the places of contact, and means for adjusting said reducing tools transversely of the axes thereof.

14. In a machine of the kind described, means for supporting and advancing paper, a rotary reducing tool arranged to engage an edge of the paper and having its active portion substantially normal to the paper surface at the place of engagement.

15. In a machine of the kind described, means for supporting and advancing paper, a rotary reducing tool disposed to engage the paper and having its active portion substantially normal to the paper at the point of contact, and means for adjusting said reducing tool lengthwise of its axis.

16. In a machine of the kind described, means for supporting and advancing paper, a rotary reducing tool arranged to engage the paper and having its axis transverse to the paper at the point of contact, means for adjusting the reducing tool transversely of its axis, and means for adjusting the reducing tool longitudinally of its axis.

17. In a machine of the kind described, a hard backing for supporting the paper whose edge is to be reduced, grinding means for engaging the outer surface of the paper at the edge thereof in opposition to said backing, and means for varying the angle of said grinding means for correspondingly beveling the paper edge.

18. In a machine of the kind described, opposite grinders to engage the opposite edges of the paper, means to support the paper in position to be engaged, and means to adjust said grinders angularly with relation to the paper for varying the bevel thereof.

19. In a machine of the kind described, means for supporting and advancing paper under tension, and a rotary reducing tool disposed to act on the tensioned paper, said tool consisting of a cup-shaped member mounted to rotate at an angle to the surface of the paper.

20. In a machine of the kind described, means for supporting and advancing paper under tension, and a rotary reducing tool consisting of a cup-shaped member mounted to rotate at an angle to the paper surface and to engage the same in a line contact.

21. In a machine of the kind described, means for supporting and advancing paper under tension around a roller surface, and a rotary reducing tool mounted opposite said roller surface to engage the paper, said tool consisting of a cup-shaped member engaging the paper in a line contact.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOSEPH W. MOORE.

Witnesses:
M. J. SPALDING,
EDWARD MAXWELL.