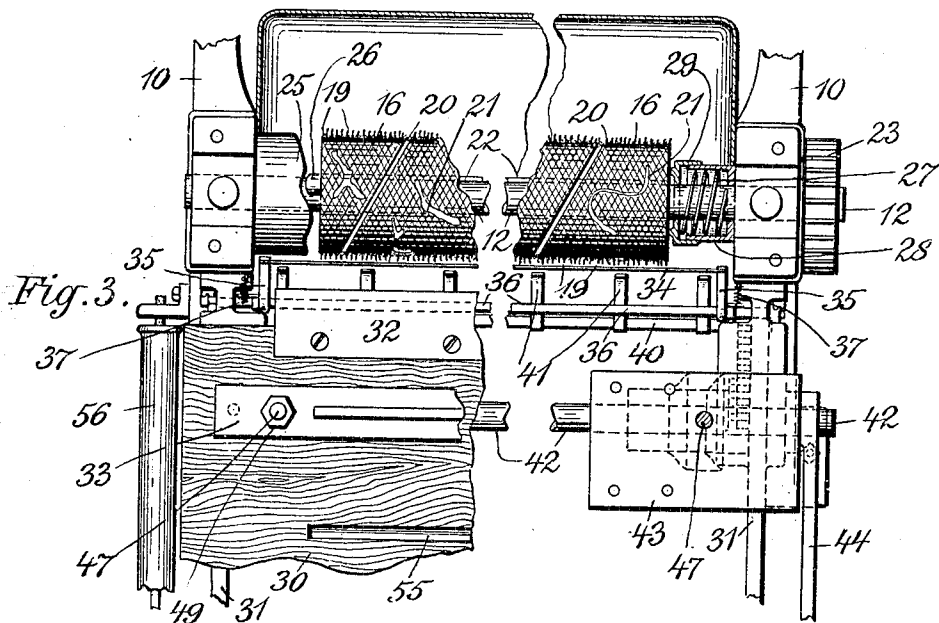
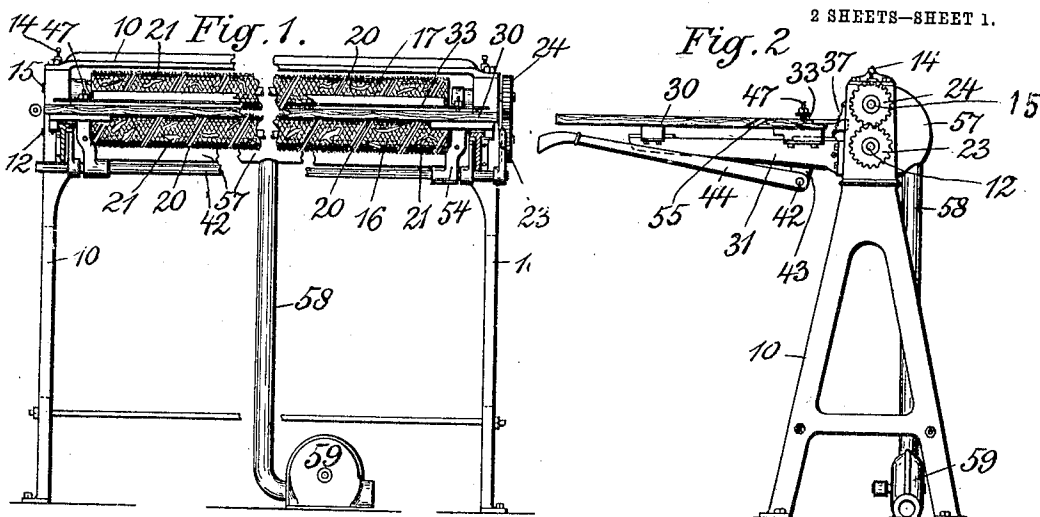


No. 843,138.

PATENTED FEB. 5, 1907.

C. H. DUNNING.
MACHINE FOR SHAPING PAPER.
APPLICATION FILED JUNE 16, 1905.



Witnesses
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2 SHEETS—SHEET 2.

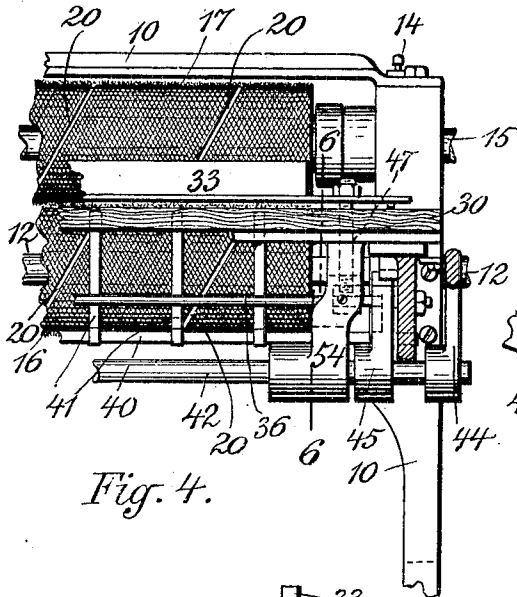


Fig. 4.

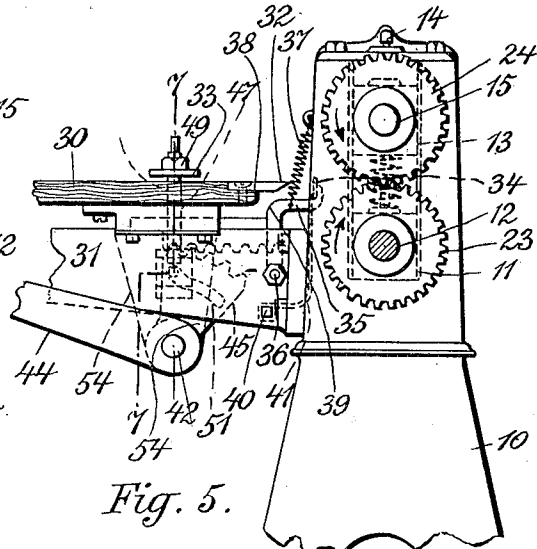


Fig. 5.

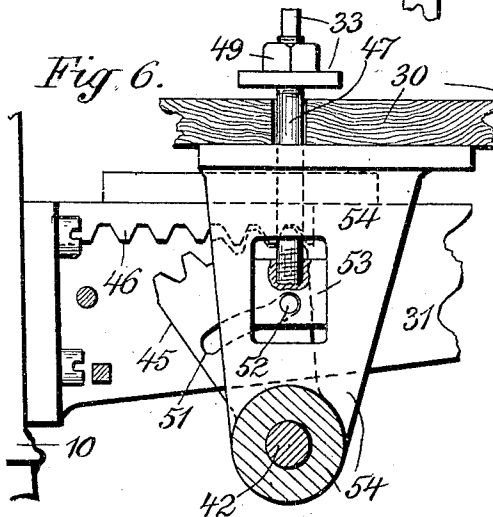


Fig. 6.

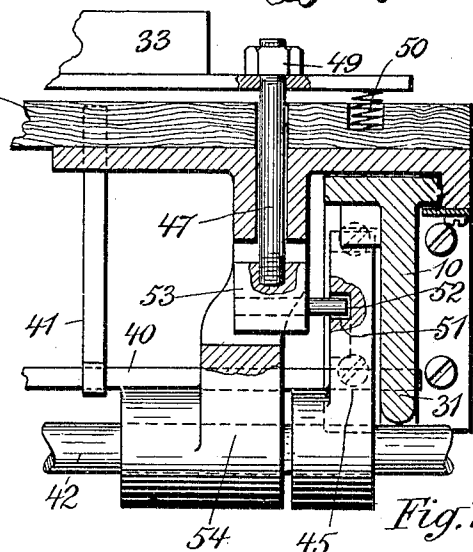


Fig. 7.

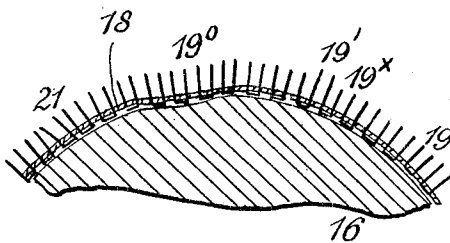


Fig. 8.

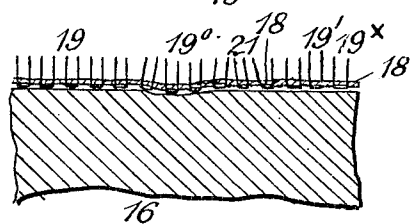


Fig. 9.

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UNITED STATES PATENT OFFICE.

CARROLL H. DUNNING, OF NEW YORK, N. Y.

MACHINE FOR SHAPING PAPER.

No. 843,138.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed June 16, 1905. Serial No. 265,585.

To all whom it may concern:

Be it known that I, CARROLL H. DUNNING, a citizen of the United States, and residing at New York, in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Machines for Shaping Paper, of which the following is a specification.

My invention refers to machines for producing a deckle edge on paper, leather, cloth, leatherette, or any other material made in layers or sheets, and as paper with deckle edges is used very generally I will in the following specification and claims refer to the producing of such edges on paper without, however, intending to confine myself in employing my appliances to the production of deckle edges on paper.

Originally deckle edges were produced altogether during the making of the paper, the deckle edges representing the margins or untrimmed edges of the sheets. In my United States Patent No. 775,330, issued November 22, 1904, I have illustrated and described a machine for converting the straight and smooth edges of paper into such deckle edges; and the objects of my present invention are to provide proper means for producing deckle edges of such irregular configurations as will more closely resemble the untrimmed edges of paper as produced during the manufacture of the latter and to preserve the strength and the grain of the paper in the deckled edges so produced.

Further objects are to provide ready means for placing the paper in a proper position upon the apparatus, so as to treat it there to best advantage and to subject the edge of the paper to a proper extent to the tearing action of the apparatus, also to withdraw and dispose of the fragments of the paper directly they have been torn off by the machine and to provide proper means for withdrawing the paper from the table after the deckle edges have been produced.

I accomplish these and other useful objects by the means hereinafter specified, and set forth more particularly in the claims.

In the accompanying drawings, wherein corresponding reference-figures refer to corresponding parts, Figure 1 is a front view, and Fig. 2 a side view, of an apparatus embodying my improvements, while Fig. 3 is a ground plan, partly in section, of the same.

Fig. 4 is a portion of a front view of the apparatus with parts broken away, and Fig. 5 a portion of a side view. Fig. 6 is a section along line 6 6 in Fig. 4 looking toward the right, and Fig. 7 a section along line 7 7 in Fig. 5. Fig. 8 is a portion of a cross-section, and Fig. 9 a portion of a longitudinal section, of a roller employed by me for tearing off portions of the paper.

In said drawings, 10 is a frame upon which my improved apparatus is mounted. The same carries the bearings 11 11 for a shaft 12 and above the same spring-supported bearings 13, capable of slight up and down adjustments, by means of screw 14, for adjusting the position of a shaft 15, mounted in said bearings. On shafts 12 and 15 are mounted the rollers 16 and 17, respectively, between the circumferences of which the edge of the paper which is to be treated is inserted. Said rollers are preferably made of hard wood and having wound spirally around their surfaces strips of leather, as 18, to which are secured yielding and elastic metallic projections or wire points 19, as in carding-cloth used for covering the rollers in machines for carding wool, &c.

20 20 are narrow spaces left between successive turns of the cloth, so as to produce there greater spaces between the wire points of adjoining portions of the cloth than are normally provided between neighboring projections on said cloth. For the purpose of producing the irregular effects on the edges of the paper above referred to I may also at irregular intervals and at locations, as 21 21, deflect some of the wire points from their radial directions.

The upper roller 17 is made fast to its shaft 15, while roller 16 is adapted to slide along a guide 22 on its shaft 12.

23 is a gear-wheel on shaft 12, and 24 a gear-wheel on shaft 15, the two gear-wheels being made meshing and shaft 12 receiving revolving movement from any suitable source of power.

25 is a cam fixedly secured to frame 10, and 26 a pin at the end of roller 16 opposite to said cam.

27 is a spiral spring placed around shaft 12 and resting against a support 28, fixedly attached to frame 10, while 29 is a shoe actuated by said spring and telescoping with part 28 while resting against the end of

roller 16, so as to constantly force said roller toward cam 23 without, however, revolving with said roller. This will, owing to the travel of pin 26 over said cam-surface, produce a more or less irregular longitudinal movement of said roller along its shaft, according to the configuration given to said cam while shaft and roller revolve together, and as the distances between the two shafts are so adjusted that a sheet of paper having its edge placed approximately in a plane containing the axis of roller 16 and that of roller 17 will have irregular portions of said edge torn off by contact with the wire points on the two rollers contacting therewith during revolutions of said rollers it will be seen that the simultaneous movement of roller 16 along its shaft and the irregularities and differences in the distances between the wire points on the rollers and in the directions of said wire points with reference to the circumferences of the rollers will produce the irregularities desired in the work. Further and for the same purpose, I may also slightly vary the wire points in length, as at 19' and 19^x, or instead I may produce similar results by making the circumferences of the wooden rollers slightly irregular, while closely fitting them to the cloth 18, provided with projections 19 of equal lengths—as, for instance, shown at 19^o.

For the support of the paper prior to and during the deckling operation I provide the following appliances: 30 is a table capable of sliding horizontally along suitable guides provided on brackets 31, fixedly attached to frame 10, toward and away from rollers 16 and 17, its edge nearest to said rollers having attached to it a thin horizontal strip of metal 32. While moving said table toward the rollers I also, by means hereinafter described, simultaneously clamp the sheet of paper which is to be deckled between said table and a bar 33, placed above the same, and for the purpose of insuring the placing of the paper in its proper position on the table I provide a gage comprising a bar 34, running parallel with the rollers, and two brackets 35 35, capable of swinging around a journal 36 underneath table 30. 37 37 are two spiral springs attached to frame 10 and to said gage and adjusted to normally hold the latter in its elevated operative position. Shoulder 38 on the under side of the table is adapted to contact with points 39 39 on brackets 35 as the table is being moved toward the rollers and to thereby swing the gage downward and out of the way of the paper clamped to the table. 40 is a bar of angular cross-section running parallel with the rollers, along which bar fingers 41 41, mounted thereon, are capable of sliding, so as to have their rear ends, which are of the same elevations as the upper surface of strip 32, support the edges of sheets of paper of different widths after gage

34 has been swung downward and while the table is moving toward the rollers and toward the rear ends of said fingers. For actuating the table and clamping the paper I provide a shaft 42, having its bearings on a bracket 43, fixedly attached to table 30. To said shaft is keyed a handle-lever 44 and at each end a toothed sector 45, engaging with a ratchet 46, secured to a horizontal bracket 31. 47 47 are studs, one near each end of bar 33. The same pass downward through said bar and through said table. At their upper ends they are provided with screw-nuts 49. 50 50 are two spiral springs, each seated within a recess near the end of the table and resting against said bar for normally holding the same out of contact with the table. 51 is a curved slot in sector 45. The forward portion of said slot is eccentric with shaft 42, it approaching said shaft abruptly for a short distance as it extends rearward or toward rollers 16 and 17, while its rear portion is concentric with said shaft. 52 is a pin passing through said slot and into a block 53, which is guided vertically in a slot in a bracket 54, firmly attached to the under side of the table. Studs 47 pass through said brackets, and their lower ends are screwed into said blocks.

Rollers 16 and 17 having had imparted to them rapid revolving motions in the directions of the arrows in Fig. 5 and the paper having been placed between the table and bar 33 with the edge which is to be treated resting against gage 34, the handle portion of the lever is swung downward, whereby the rear end of sector 45 will be swung upward, and as its rear teeth successively engage with the rear teeth of ratchet 46 the table will be moved toward the rollers, and simultaneously pins 52 will move toward the rear portions of slots 51, thereby drawing down studs 47 and nuts 49, so as to force bar 33 against the paper and to securely clamp the latter in its proper position. Meantime, in manner as described above, shoulder 39 has swung gage 34 out of the path of the paper, so as to permit the latter to enter between the rollers and to be treated there by the yielding projections 19 thereon tearing off portions of the paper and reducing adjoining portions thereof in thickness, so as to produce the deckle edge desired.

55 is a slot with sloping sides in table 30 and having its upper edge nearest to and parallel with rollers 16 and 17 rounded off to permit smaller sheets of the paper after its edge has been deckled to be dropped through said slot, while larger sheets may be run off of the table over a roller 56, placed along one of the sides of the table. Said roller may receive revolving movement from any suitable source of power.

For the purpose of withdrawing from the apparatus the portions of the paper torn off

during the deckling operation I provide an air-chamber 57, closed at its ends along the rear sides of rollers 16 and 17, connecting said chamber by means of a duct 58 with a suction-fan 59, operated either from shaft 12 or from any other suitable shaft.

I do not wish to confine myself to the details and detail combinations herein set forth, as it will be seen that the same might be varied materially without departing from the spirit of my invention. Thus in place of one of the rollers 16 and 17 a stationary support, round or flat and with or without wire points, as 19, or other projections, might be employed. Instead of attaching the yielding wire points to cloth or leather said points might be secured to rollers 16 and 17 direct. Instead of giving to the lower roller 16 longitudinal reciprocating movement by means of the cam mechanism, as described, the same might have imparted to it such movement and at a more moderate speed by any other suitable mechanism. Instead of inserting between the deckling-rollers only one sheet of paper two or even more might be inserted and treated at the same time. Of course the pliable points 19 on rollers 16 and 17 might all be made of the same lengths and directions and placed at regular intervals throughout the lengths of said rollers; but the work produced thereby would be apt to be much more uniform than where the improvements above set forth are employed. Roller 17 might be made to also slide along its shaft in same manner as described above with reference to shaft 16.

I claim—

1. In a machine for shaping paper, the combination with a supporting-frame, of yielding means for tearing irregular parts of paper from the margin of the main body thereof, means for actuating said tearing appliances, and means for feeding and holding the paper.

2. In a machine for shaping paper, the combination with a supporting-frame, of elastic means for reducing the thickness of parts of the edge portion of a sheet of paper and for tearing off other parts thereof, means for actuating said reducing and tearing appliances, and means for feeding and holding the paper.

3. In a machine for shaping paper, the combination with a supporting-frame, of a horizontally-slidable support for the paper, a body having a multiplicity of flexible projections, mechanism for imparting movements to said body, and means for holding the paper in contact with said projections during such movements.

4. In a machine for shaping paper, the combination with a supporting-frame, of a horizontally-slidable support for the paper, a body provided with a multiplicity of yielding projections, said projections extending

under different angles from the surface of said body, mechanism for imparting movements to said body and said projections, and means for enforcing contact of the paper with said projections during such movements.

5. In a machine for shaping paper, the combination with a supporting-frame, of a support for the paper, a body provided with a multiplicity of projections, and means for moving said body in different directions with reference to said support.

6. In a machine for shaping paper, the combination with a supporting-frame, of a support for the paper, a body provided with a multiplicity of projections, and means for simultaneously moving said body and its projections lengthwise and crosswise with reference to and in proximity to said support.

7. In a machine for shaping paper, the combination with a supporting-frame, of a support for the paper, a body having a multiplicity of yielding projections, irregular spaces being provided between said projections, mechanism for imparting movements to said body and its projections, and means for horizontally advancing the paper for contact with said projections during such movements, and means for clamping the paper on the support.

8. In a machine for shaping paper, the combination with a supporting-frame, of a support for the paper, a roller mounted upon the frame and provided with yielding projections, mechanism for revolving said roller in proximity to said support, means for horizontally advancing and retracting the support, and means for clamping the paper thereon.

9. In a machine for shaping paper, the combination with a supporting-frame, of a roller mounted upon the frame and provided with yielding projections extending in radial directions and with other yielding projections extending therefrom in different directions, means for revolving said roller in close proximity to said support, and means for clamping the paper in position upon the support.

10. In a machine for shaping paper, the combination with a supporting-frame, of a support for the paper, a roller mounted upon said frame, a strip of fabric with yielding wire points secured thereto spirally wound upon said roller, mechanism for revolving said roller, means for horizontally advancing the paper for contact with said wire points and means for clamping the paper in its position upon the support while said roller is being revolved.

11. In a machine for shaping paper, the combination with a supporting-frame, of a support for the paper, a roller having a multiplicity of projections mounted upon said frame and adapted to revolve and also to move lengthwise, mechanism for enforcing such lengthwise movement of the roller,

mechanism for revolving said roller, and means for clamping the paper in position during such movements of the roller.

12. In a machine for shaping paper, the combination with a supporting-frame, of a movable support for the paper, a body provided with projections for tearing off portions of such paper, a gage for adjusting the paper in its position upon said support and means for simultaneously moving said support toward said body and for moving said gage out of its operative position.

13. In a machine for shaping paper, the combination with a supporting-frame, of a movable support for the paper, a body provided with projections for tearing off portions of such paper, means for actuating said body, a gage for adjusting the paper in its position upon said support, and means for moving said support toward said body and simultaneously enforcing contact between said support and said gage for moving the latter out of its operative position.

14. In a machine for shaping paper, the combination with a supporting-frame, of a movable support for the paper, a body provided with projections for tearing off portions of such paper, mechanism for actuating said body, and joint means for simultaneously clamping the paper to its support and for moving said support toward said roller.

15. In a machine for shaping paper, the combination with a supporting-frame, of devices for tearing portions of a sheet of paper from the main body, a table, a clamping-bar, studs in engagement with said table and said bar, shoes on said studs, guides being provided on the table in which said shoes slide, a shaft, a lever and a toothed sector secured to said shaft, a ratchet on said frame in engagement with said sector, an eccentric slot being provided in said sector, and a pin adjusted to travel in said slot and secured to said shoe.

16. In a machine for shaping paper, the combination with a supporting-frame, of a movable support for the paper, a body provided with projections for tearing off portions of the paper, means for actuating said body, adjustable stationary supports for the paper, and means for moving said movable support toward said body.

17. In a machine for shaping paper, the combination with a supporting-frame, of a pair of rollers each provided with projections for tearing off portions of the paper, a table

for supporting the paper having its upper surface substantially even with the plane in which the projections of the rollers meet, and means for moving said table toward said rollers.

18. In a machine for shaping paper, the combination with a supporting-frame, of a body provided with projections for tearing off portions of the paper, a table for supporting the paper, and means for moving the table toward the roller, a slit being provided in the table for withdrawing the paper through the same.

19. In a machine for shaping paper, the combination with a supporting-frame, of a body provided with projections for tearing off portions of the paper, a table for supporting the paper, means for moving the table toward said body, and a roller placed along an edge of said table for guiding the paper.

20. In a machine for shaping paper, the combination with a supporting-frame, of a support for the paper, two rollers mounted upon said frame each provided with a multiplicity of yielding projections, mechanism for revolving said rollers in close proximity with each other, and means for holding said paper in its position while said rollers are revolving in contact therewith.

21. In a machine for shaping paper, the combination with a supporting-frame, of appliances for tearing parts of the edge portion of the paper from the main body, mechanism for actuating said appliances and means for creating an air-current for withdrawing the portions of the paper so torn off.

22. In a machine for shaping paper, the combination with a supporting-frame, of a roller provided with a multiplicity of projections, a support for the paper, mechanism for revolving said roller, means for enforcing contact of the paper with said projections, an air-chamber extending along said roller, and an air-suction device for withdrawing the portions of paper torn off by said projections through said chamber.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of June, 1905.

CARROLL H. DUNNING.

Witnesses:

HUGO R. M. MOELLER,
C. L. HORACK.