No. 855,621. PATENTED JUNE 4, 1907.

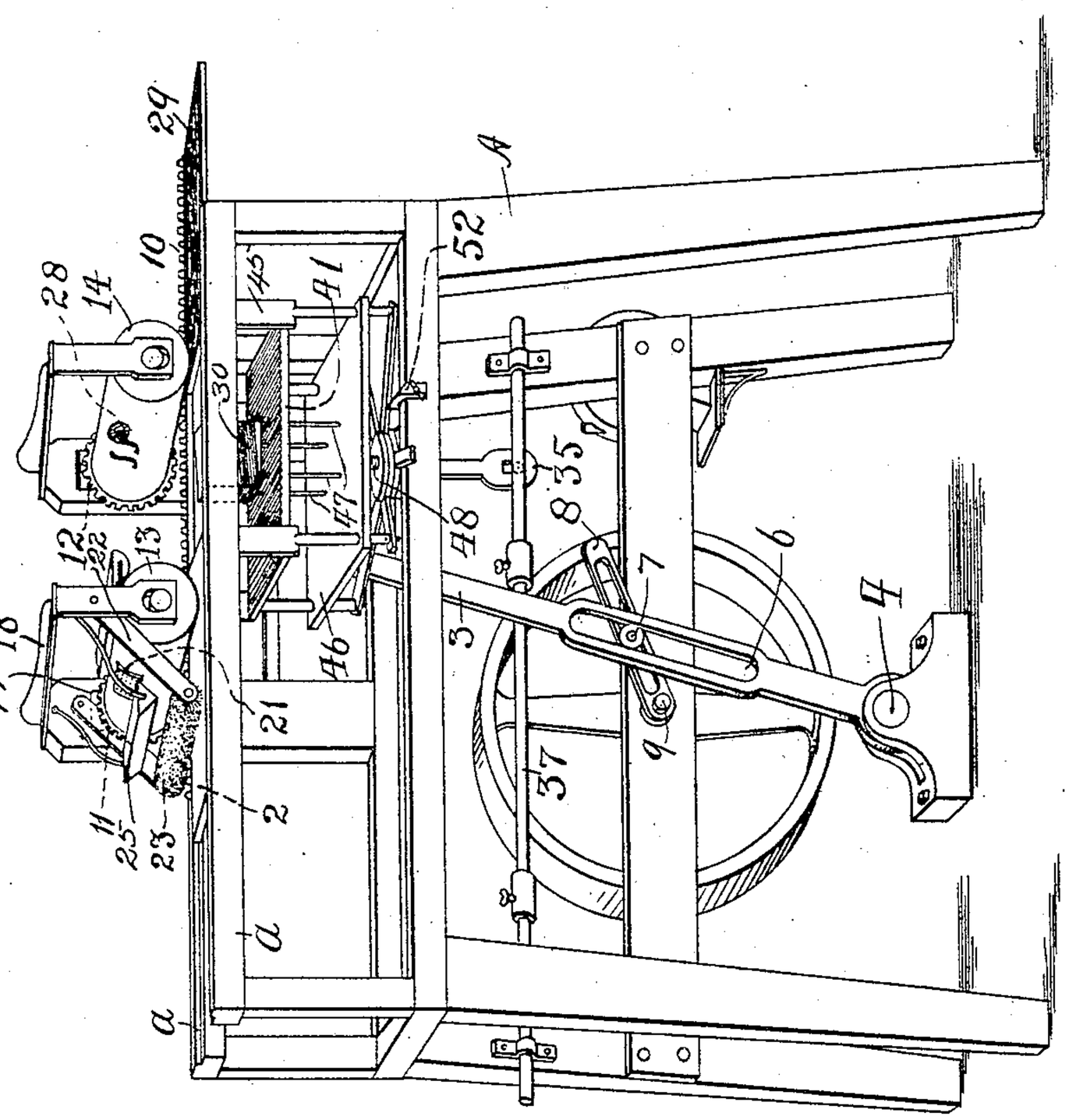
L. W. DANIELS.

BOOKBINDER'S LEAF APPLYING MACHINE.

APPLICATION FILED OCT. 25, 1904.

3 SHEETS—SHEET 1.

Fig. 1.



Attest:
Edgeworth Greene
Thos. Rigell

Inventor:
Leroy W. Daniels,
by Richard W. Barkley,
Atty.

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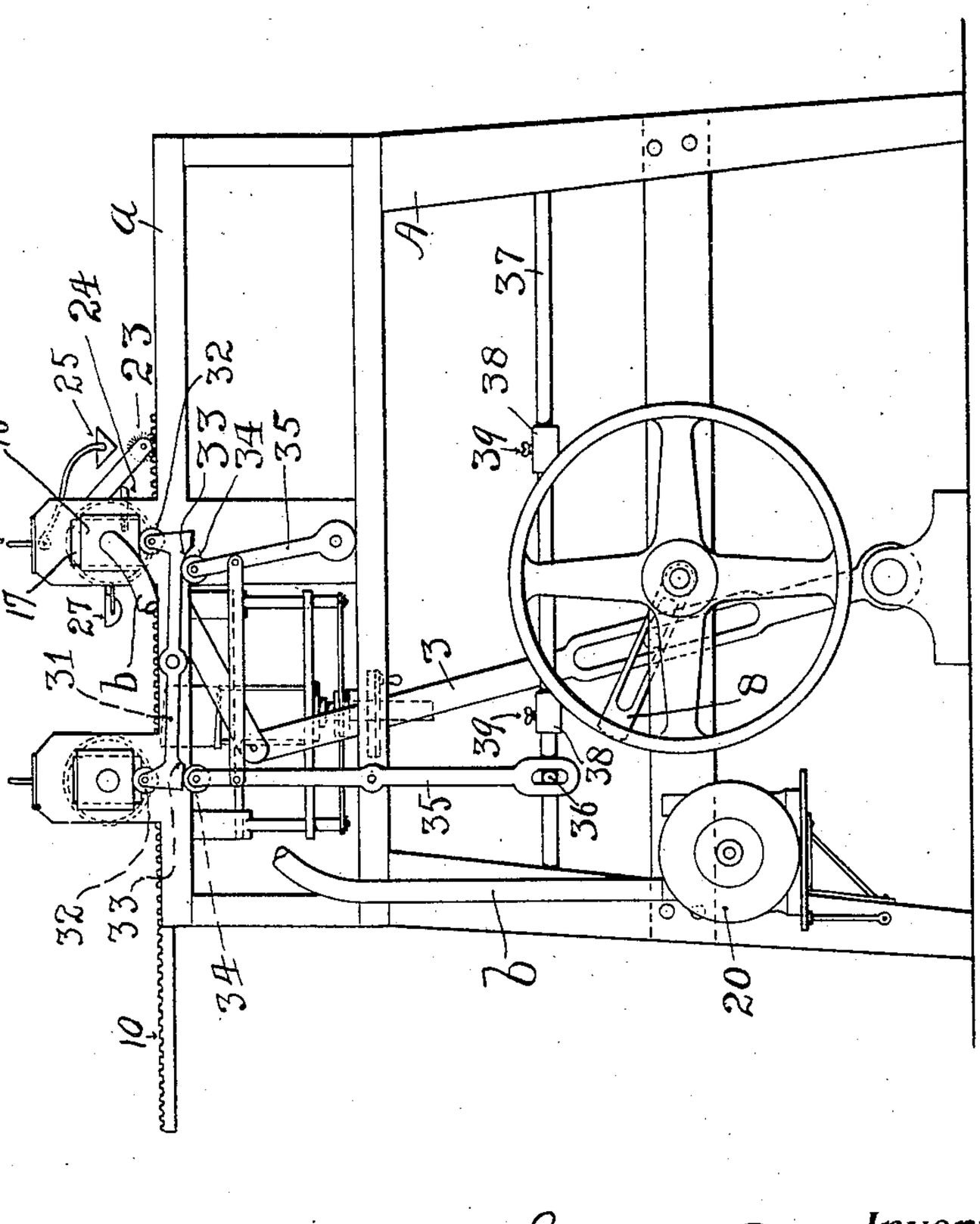
3 SHEETS—SHEET 2.

Fig. 2.



Attest:
Edgarworth Greene
Hans Ryall

Inventor:
Leroy W. Daniels,
by Richard W. Barkley,
Atty.

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3 SHEETS—SHEET 3.

Fig. 11.

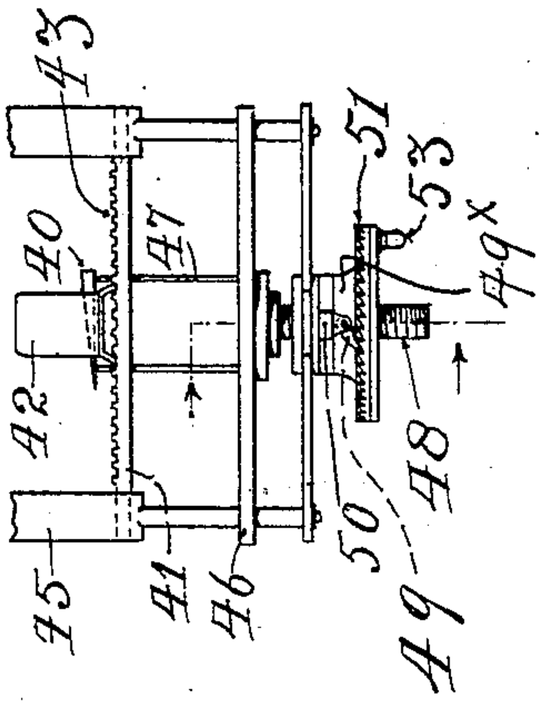


Fig. 12.

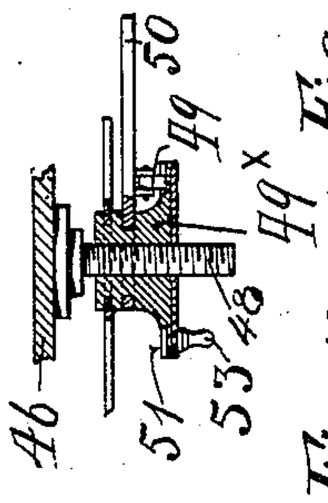


Fig. 13.

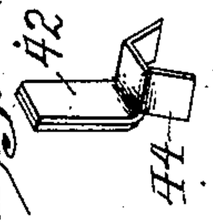


Fig. 10.

Fig. 4.

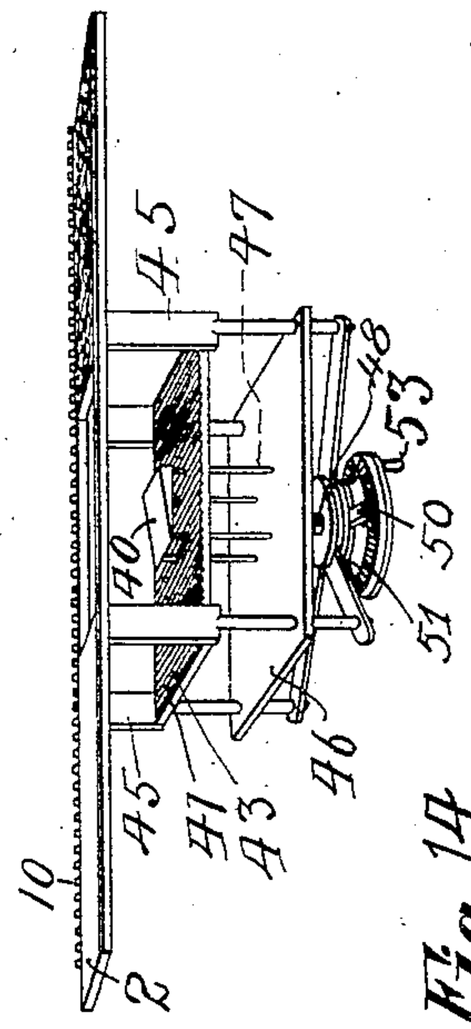


Fig. 7.

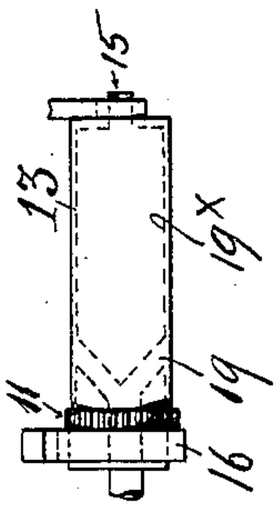


Fig. 9.

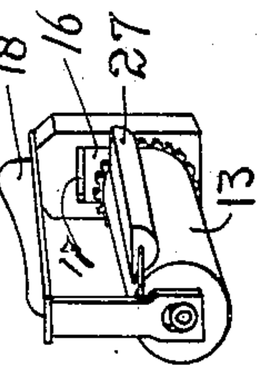


Fig. 5.

Fig. 6.

Fig. 8

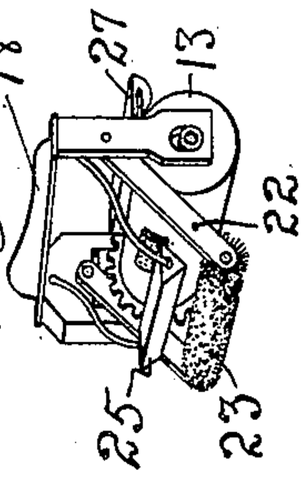


Fig. 14.

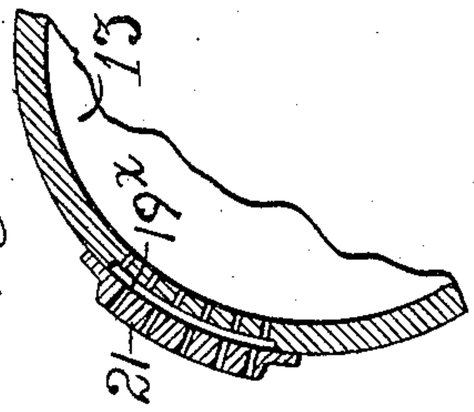
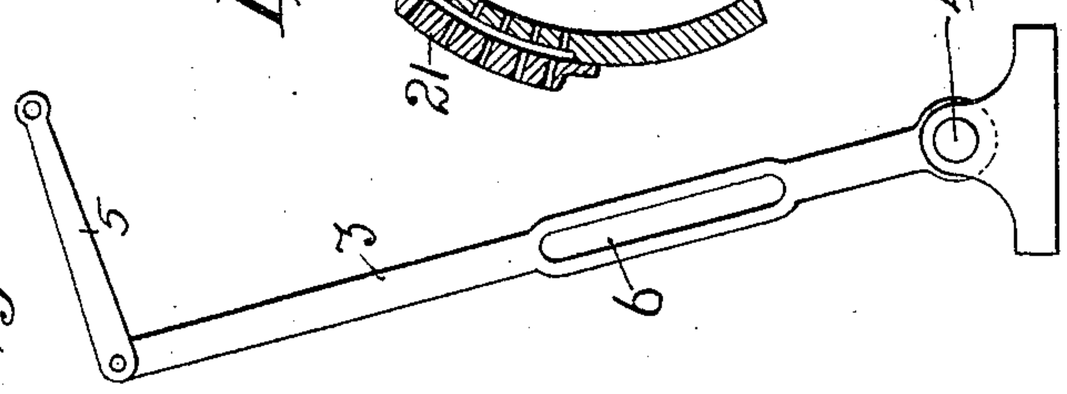


Fig. 3.



Attest:
Edgewood Greene
Louis Ryall

Inventor:
Leroy W. Daniels
by Richard W. Barkley,
Atty.

UNITED STATES PATENT OFFICE.

LEROY WILSON DANIELS, OF BROOKLYN, NEW YORK.

BOOKBINDER'S-LEAF-APPLYING MACHINE.

No. 855,621. Specification of Letters Patent. Patented June 4, 1907.

Application filed October 25, 1904. Serial No. 229,924.

To all whom it may concern:

Be it known that I, LEROY WILSON DANIELS, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Bookbinder's-Leaf-Applying Machines, of which the following is a specification.

This invention relates to mechanism for laying book-binder's metal leaf, as gold-leaf, on the covers of books previous to the branding process, the primary object of the invention being the more rapid and economical placing of such leaf than is possible with prior methods or apparatus.

The invention consists of features of construction and combinations of devices hereinafter described and more particularly pointed out in the appended claims.

One embodiment of the invention is illustrated in the accompanying drawings, forming part hereof, in which—

Figure 1 is a perspective view from the front side of the machine; Fig. 2 is a rear elevation of the same; Figs. 3, 4, 5, 6, and 7 are detail views of parts shown in Figs. 1 and 2; Figs. 8 and 9 are perspective views of the leaf-applier shown in Figs. 1 and 2; Fig. 10 is a perspective view of a scraper and catch for the paper; Figs. 11 and 12 are views of mechanism for raising stacks of metal-leaf; and Fig. 13 is a perspective view of a leaf-holder and guide; while Fig. 14 is a section of the leaf-applier through the perforated pad.

In the drawings, the reference letter A marks a suitable framework on which the moving parts are mounted in manners severally appropriate thereto.

The reference *a* denotes guides or rails for a to and fro movable table or support 2 on which the bindings are to be laid.

The reference 3 designates an arm or lever, fulcrumed at 4, which is connected with the table 2 in any suitable manner, as by a link 5 which is pivotally connected to the lever and the table. The lever 3 is slotted at 6 to receive a wrist-pin 7 which is adjustably connected to a slotted crank arm 8 which is fast on a shaft 9. The shaft 9 may be driven in any suitable manner, by power, hand, or foot. The throw of the lever 3, and so the length of the path traveled by the table or support 2, is determined by the position of the pin 7 along the arm 8.

The table or support 2 has a rack 10 along one edge which meshes with gear 11 12 on a leaf-applying roller 13 and on a leaf-moistener roller 14. The roller 13 is rotatable on an axis 15 which is mounted and secured in boxes 16, which are, in the instance shown, arranged to slide up and down in slots 17 of the overhanging standard 18. The axis 15 is provided with air-channels 19, or is hollow and provided with perforations at numerous points, and the roller 13 is sleeved thereon to rotate and is provided with numerous perforations; or the axis may have, in addition to the perforations, a series of circumferential exterior channels $19^{\times}$ or grooves which communicate with the exhaust apparatus; the perforations of the roller 13 are placed so as to register with the grooves or perforations of the axis. An exhaust pipe *b* connects the air-channels of the axis with a blower 20. Or the axis 15 may have longitudinal grooves which connect with the blower, and the roller 13 be provided with perforations so placed that several adjacent circumferentially located perforations will always have one or another thereof opening over one or another of the said grooves.

The reference 21 marks a pad adapted to be secured to the roller 13 in any desired position thereon, the perforations, or some of them, in the roller 13 being screw-threaded for this purpose. The pad 21 is perforated to register with perforations in the roller 13 and is secured to the latter after it has been covered with paper to close all opening therein, after which the desired openings are made in the paper by punching through the holes in the pad, thus opening communication with the exhaust through said pad 21.

Hinged to the standard and overhanging arm 18 are the arms 22 for carrying an oiler roller or brush 23, and 24 are arms on the boxes 16 for lifting said roller 23 as hereinafter described.

25 marks an oil-fountain above the brush with which the brush is brought in contact when raised and from which the roller or brush 23 takes oil or other adhesive, to be later applied to the covers to cause the leaf to adhere thereto rather than to the tissue paper.

26 is a scraper for removing the paper from the pad, and 27 is a basin for catching said paper, and from which the paper may be removed by hand, or by automatic mechanism, as desired. The scraper 26 is in position to coact with the pad 21 and roller 13 when the latter is raised as hereinafter described, said

scraper being carried, in such case, by the standard 18. But where the roller 13 is not lifted, the scraper may be tilted as the roller goes forward to lay the leaf so as not to scrape the leaf, and be tilted back to remove the paper as the roller returns.

The moistener roller 14 shown in the drawing is provided with spring fingers 28 for touching a wet pad 29 on the table 2 and applying the moisture so taken to the upper corner of a stack or pile 30 of leaf. The roller 14 may be, and preferably is, liftable in like manner as the roller 13. Any convenient means for raising and lowering the said rollers 13 14 may be employed. The mechanism shown for this purpose comprises a rocking lever 31 which is provided with anti-friction rollers 32 for acting on the lower ends of the boxes 16, said lever being provided with cams 33 for coaction with anti-friction rollers 34 on the connected levers 35. As the levers 35 swing in one direction, they lower roller 13 and raise roller 14, and as they move in the reverse direction, they lower roller 14 and raise roller 13. The levers 35, as shown in the drawing, are operated by a pin 36 on a tappet-rod 37 which slides on the frame A, and which rod is operated by tappets 38 thereon and the lever 3. The tappets 38 are adjustable along the rod 37 by any suitable means, as set screws 39. Other devices may be substituted for those shown for operating the rollers 13 and 14 in the manner described.

The leaf, with the usual paper for separating the sheets, is cut into packs of the required or desired size and shape, and the packs, composed of metal leaf and sheets of paper in alternation, is laid upon the supporting wedge-shaped blocks 40 (see Fig. 6) which are placed upon the support 41. Rubber-faced retainers 42 are inserted in the grooves 43 of the support 41, and bear against the sides of the pack 30. These retainers 42 exert a slight pressure against the sides of the pack by reason of their resilient nature, being made, preferably, of spring-metal. The spring feet 44 of the retainers 42 allow the retainers to be placed at any point on the support or carrier 41. It is remarked that these feet may embrace the ribs formed by the grooves 43, or they may be shaped to exert an outward pressure and be inserted in said grooves.

The support 41 is suspended from the table 2 by means of hangers 45. Below the support 41 is a plate 46 which is slidable up and down on said hangers 45. On the table or plate 46 are set rods 47 which pass through suitable holes in the support 41 and bear against the bottom of the blocks 40. By lifting the table 46, the rods 47 are caused to lift the block or blocks 40 and the pack or packs thereon. Any suitable means may be used to operate the table 46 so as always to keep the upper corner or corners of the pack or packs 30, which packs are tilted by the blocks 40, at the desired level so that the moisteners 28 will barely touch the meeting edges of the top sheet of paper and the leaf next under it to cause them to adhere during the subsequent operation of lifting the leaf from the pack and laying it on a binding. Thus, a screw 48, working through a nut $49^{\times}$ rotatable on a bar supported on the hangers, may push up the table 46, being itself automatically operated by any suitable means, as by a pawl and ratchet mechanism comprising a pawl 49 pivoted or mounted on a lever 50 and engaging with a ratchet 51 on the periphery of the screw-nut $49^{\times}$. The lever 50 is drawn against a stop (which may be adjustable) by a spring or weight, and is actuated, as table 2 moves forward, by striking a fixed, but adjustable, abutment 52 on the frame A. A suitable dog may be used to prevent reverse motion of the nut $49^{\times}$, while a stop or locking arm may be used to prevent overthrow of the nut. A handle 53 is provided for quickly lowering the table 46, the dog being released at the same time by any suitable means and so also of the pawl 49; or the dog may consist of a roller which bears upon two adjacent teeth of the ratchet-wheel on the nut, in which case the nut may be turned without releasing the dog; and the pawl 49 may be normally disengaged from the ratchet. This pawl and ratchet mechanism, it will be noted, is very similar in principle to the platen rotating mechanism long in use on a well-known class of typewriting machines.

The machine may be designed in the first instance to accommodate one or more operators, one of whom may be at the left hand end of the machine shown in Fig. 1 and another in front. The table 2 being provided with suitable stops against which the operators place the covers, and retainers 42 are placed so as to locate the packs of leaf in the positions required for placing the leaf at the desired points on the covers. With the parts in the positions shown in Figs. 1 and 2, the first step on starting up the machine by power or by hand is, as the table 2 returns, to lower the roller 13 as the table reaches the limit of its return stroke, at the same time elevating the roller 14. As the table 2 moves forward, the operator or operators placing the covers as the table stops its return stroke, the brush 23 applies adhesive to the covers, and the roller 13, which has picked up a leaf by means of the suction-pad 21, rolls the leaf on the cover to which the metal leaf adheres while the paper continues to adhere to the suction-pad. As the table 2 reaches the end of its forward stroke, the roller 14 is lowered and the roller 13 is lifted; during the forward strokes of the table 2, the moisteners 28 take water from the pad 29 and apply it during return strokes of the car-

riage to the upper corners or edges of the packs as hereinbefore described. The rollers 13 and 14 are raised and lowered at the ends of the strokes of the table 2 by the mechanism hereinbefore described. At the end of each forward stroke of the table 2, the lever 50 actuates the nut 49× and so causes the plate 46 to move upward very slightly, for the purpose hereinbefore set forth.

Many changes may be made in the arrangement of parts and by substituting mechanical equivalents for the mechanisms herein shown and described, without departing from the spirit of this invention and the scope of the claims.

The fingers 28 may be detachably and adjustably connected with the roller 14, (as by screw-threading them, and making the roller 14 of wood) and may be placed wherever required. More than one roller 13 may be used, as when applying leaf in strips tandemwise or to overlap.

What I claim as new and desire to secure by Letters Patent of the United States is—

1. In a machine for applying leaf to book-covers, etc., the combination of a to and fro moving carriage provided with a support for book-covers and a support for a pack of leaf, with appliances for taking leaf from the pack and laying it on the covers.

2. In a machine for applying leaf to book-covers, etc., the combination of unitary movable means for supporting book-covers and a stack of leaf, with appliances for taking leaf from the stack and laying it on the covers, and means for causing relative motion of said means and said appliances.

3. In a machine for applying leaf to book-covers, etc., the combination of a carriage provided with a support for the covers and with a vertically movable support for the stack of leaf, with appliances for taking leaf from said stack and laying it on the covers, and means for raising said stack-support.

4. In a machine for applying leaf to book-covers, etc., the combination of a to and fro moving table for supporting the covers, a leaf-support carried thereby and vertically movable thereon, means for moving said support vertically, and a roller geared to said table and provided with means for taking leaf from said leaf-support and laying it on the covers on said table.

5. In a machine for applying leaf to book-covers, etc., the combination of a to and fro movable table for supporting the covers, a leaf-support carried thereby and vertically movable thereon, means for moving said support vertically, a roller geared to said table and provided with means for taking leaf from said leaf-support and laying it on the covers on said table, and means for raising said roller during return strokes of the table.

6. The combination of a reciprocating flat cover-support, means thereon for supporting and raising a stack of leaf, and means for taking leaf from said stack and laying the same on book-covers on said cover-support.

7. The combination with a to and fro moving cover-support, and means for applying adhesive to the covers, of means for supporting and elevating a stack of leaf, and means for taking leaf from said stack and laying the same on covers on said support.

8. The combination with a to and fro moving cover-support, of a leaf-applying roller geared thereto, and a leaf-carrier attached to said support.

9. The combination with a to and fro moving cover-support, of a leaf-applying suction-roller geared thereto.

10. The combination with a to and fro moving cover-support, of a leaf-applying roller geared thereto, means for giving a rising and falling motion to said roller, and a leaf-carrier attached to said support.

11. The combination with a to and fro moving cover-support, of a leaf-applying suction-roller geared thereto, and means for giving a rising and falling motion to said roller.

12. The combination with a to and fro moving cover-support, and a leaf-applying roller geared thereto, of a means for applying adhesive to covers on said support, and means for lifting and lowering said roller and said adhesive-applying means.

13. The combination with a cover-support provided with stack-supporting and stack-raising means and with a moist pad, of a rotary moistener, a rotary leaf-applier, and means for giving relative motion, in the direction of the length of said cover-support, to said support and the moistener and the leaf-applier.

14. The combination with a support and lifter for a stack of paper and metal leaf, of a leaf-moistener for moistening the top sheet of paper and the metal leaf next thereto to cause adherence between them, and mechanism for taking said adhering paper and leaf and applying the same to covers.

15. The combination with a to and fro moving cover-support, provided with a leaf-support and elevator and a pad, of a leaf-moistener and a leaf-applier both geared to said reciprocating support.

16. The combination with a to and fro moving cover-support provided with a leaf-support and elevator and a pad, of a leaf-moistener and a leaf-applier both geared to said cover-support, and means for raising and lowering said moistener and said applier.

17. The combination with a to and fro moving cover-support carrying a leaf-support and also a pad, of a leaf-moistener and a leaf-applier both geared to said cover-support, and a cover-oiler.

18. The combination of a to and fro moving cover-support, carrying a leaf-support

and elevator and also a pad, with a leaf-moistener and a leaf-applier both geared to said support, a fountain for adhesive, a roller or brush for applying adhesive to the covers, and means for raising and lowering said moistener, leaf-applier, and adhesive roller or brush.

19. The combination with an inclined support for a stack of paper and metal leaf, of a leaf-moistening device for moistening an upper edge of the stack, a cover-support means for taking the upper layer of paper and metal leaf from said stack and laying the same upon a cover, and automatic mechanism for raising said stack and its support.

20. The combination of a grooved support, with stack-retainers detachably connected with said support, and a support for a stack of leaf vertically movable relatively to said grooved support and said retainers.

21. The combination with a roller, of spring-fingers detachably and adjustably connected thereto, a carriage, and a pad on said carriage from which said fingers may take moisture.

22. The combination of a to and fro moving table for supporting book-covers, etc., an inclined support for a stack of paper and metal leaf attached to and vertically movable with relation to said support, a leaf-moistener geared to said table, means for taking the upper layer of paper and metal-leaf from the stack on said inclined support and laying the same upon a cover, and automatic mechanism for raising said inclined support.

Signed at New York city in the county of New York and State of New York this 22d day of October A. D. 1904.

LEROY WILSON DANIELS.

Witnesses:
FRANK RYALL,
R. W. BARKLEY.