(No Model.) 2 Sheets—Sheet 1.

J. J. SULLIVAN.

BOOK BINDING MACHINE.

No. 427,931. Patented May 13, 1890.

Fig. 1.

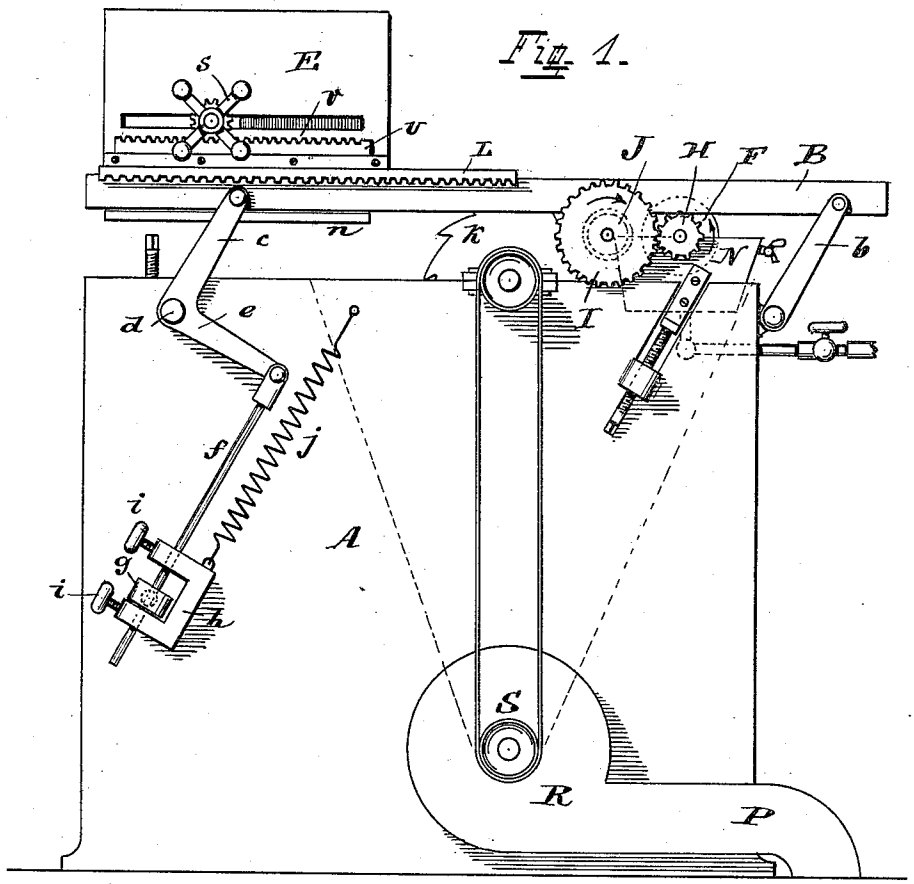
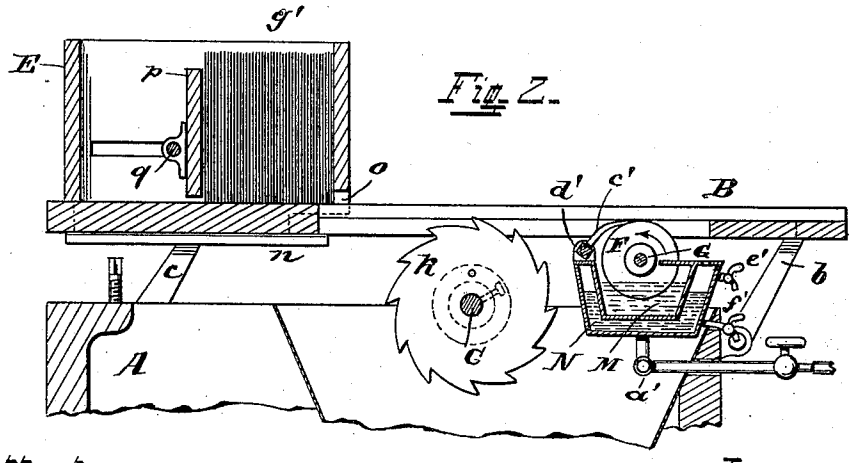


Fig. 2.



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Fig. 3.

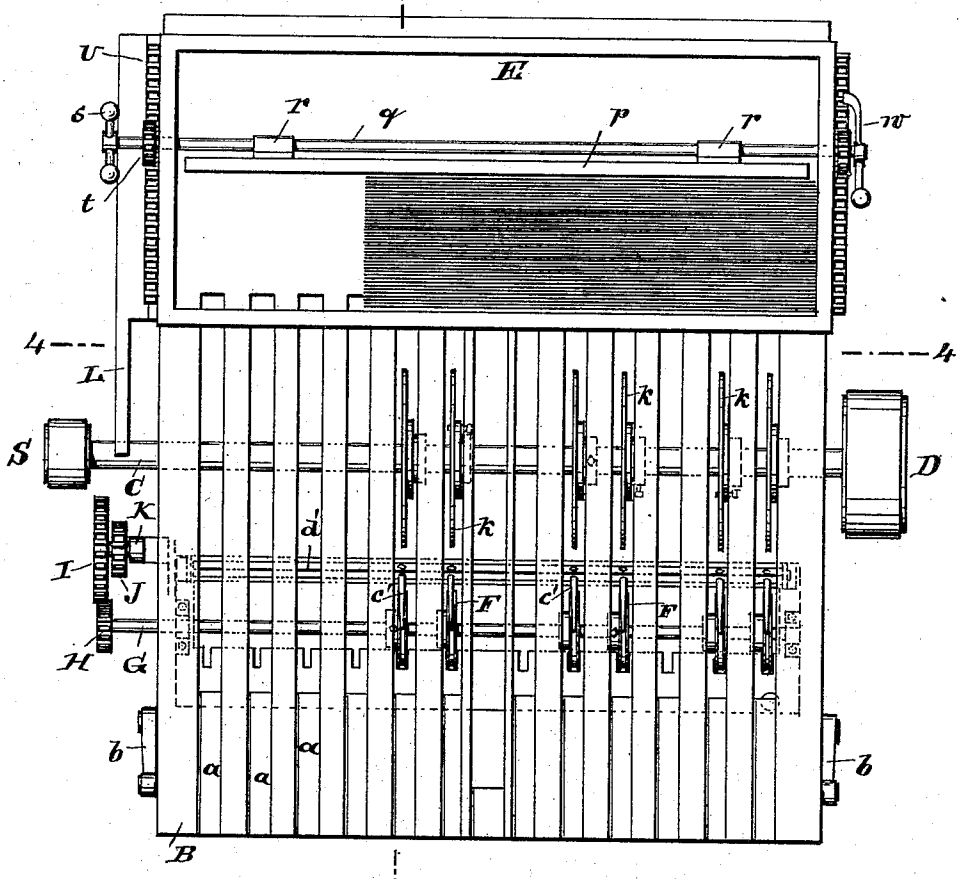


Fig. 4.

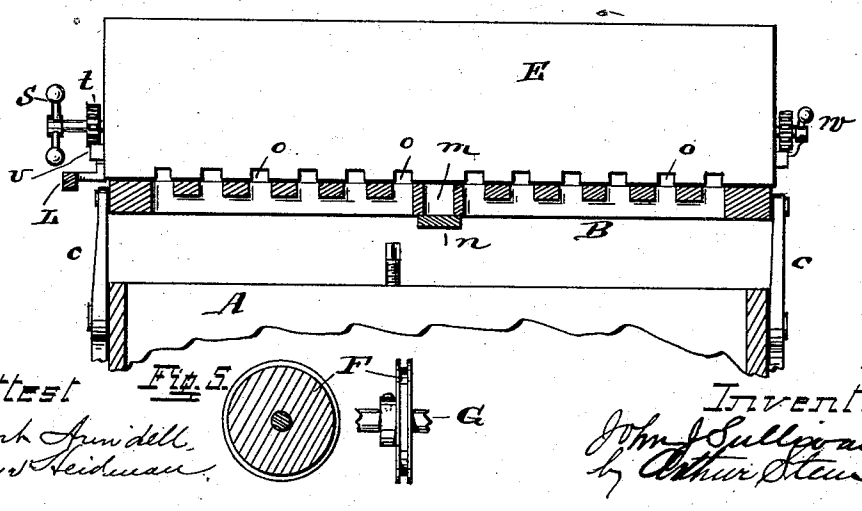


Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN J. SULLIVAN, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO THOMAS W. GRAYDON, OF SAME PLACE.

BOOK-BINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 427,931, dated May 13, 1890.

Application filed October 11, 1889. Serial No. 326,673. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. SULLIVAN, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Book-Binding Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a machine for binding all kinds of books, but more particularly pamphlets and light books; and it consists in means or machinery for cutting in the back edges of the leaves or signatures to be bound at the points where they are to be attached to one another, grooves extending across them all, and of means for filling these grooves with liquid glue or some other adhesive substance.

In the drawings, Figure 1 is a side elevation of the machine; Fig. 2, a longitudinal section showing the table, saws, and gluing device, taken on the line Y Y, Fig. 3. Fig. 3 is a top plan view; Fig. 4, a cross-section on the lines X X, Fig. 3. Fig. 5 is one of the grooved disks for applying the glue.

A is the frame or body of the machine, supporting the various working parts, rectangular in shape.

B is the top of the table, which is provided with a series of longitudinal openings *a*, to allow for the passage of the saws and gluing-disks. This table B is supported at one end by the swinging arms *b*, pivoted to the sides of the table and the frame, and the other end is pivoted to and supported by the arms or levers *c* on each end of the rock-shaft *d*, journaled in the frame of the machine. The opposite arms *e* of this rock-shaft are rigidly connected at their forward ends with rods *f*, which extend downward on each side of the machine in a line about parallel with the arms *c*. These rods pass down through central openings in the bolts or pins *g*, which are attached to the frame of the machine, but so that they can be rotated to allow play for the rod when the rock-shaft is turned.

Above and below the bolt *g* on the rod *f*, and secured thereto by the set-screws *i*, are the two arms of the clevis-shaped box *h*, which box *h* is attached to the frame-work of the machine by the coiled spring *j*. The operation of this device for supporting the table is that when the table is not being used the coiled spring *j* will draw up the clevis-shaped box *h* and with it raise the rod *f*, which in turn rotates the rock-shaft until the lower arm of the box comes in contact with the bolt *g*, and the table will be in its normal unused position. When the operator presses upon the table as the machine is used, the table will in the same way swing forward and downward until the upper arm of the box is brought in contact with the bolt *g* against the action of the spring *j*. By moving the clevis *h* along the rod *f* and holding it by the set-screws the table can be raised or lowered, as desired, and the depth of the grooves cut regulated by the distance the saw-teeth extend above the plane of the table-top.

Journaled in the frame in suitable bearings is the saw-shaft C, operated by the band-pulley D. On this shaft a series or gang of circular saws *k* are fixed, held by collars and set-screws. This gang of saws is arranged to work within the longitudinal openings *a* in the table and is fixed at such a height that when the table is in its normal position the tops of the saws will be below the surface of the table; but when the table is pressed downward, as above described, the saws will extend slightly above the surface of the table. Upon this table is a sliding frame or holder E, which consists of a box open at top and bottom. This box slides in the central groove or opening in the table *l*, a strip *m* attached to the holder fitting within this groove, and the holder is held upon the table by the strip *n*, which extends beyond the inner edges of the table B. The lower sides of the holder E are grooved, as shown at *o*, Fig. 4, corresponding with the saws and of a size to permit the saws to pass readily through them.

Within the holder is the clamping-board *p*. A small shaft *q* passes loosely through collars *r r*, attached to this clamping-board and through openings *v* in the sides of the holder, and is revolved by the wheel or handle *s*. Upon this shaft is mounted the gear-wheel *t*, which engages with the rack *u*, fixed to the sides of the table, and thus the clamping-

board can be brought into close contact with the leaves to be bound by turning the handle *s*. The clamp can then be held in position, pressing tightly the signatures to be bound by the catch *w*, which drops into the notches of the rack on that side and prevents the gear-wheel from turning in the other direction. In the rear of the saws are a corresponding series of disks F, mounted on a shaft G, so that the upper edges of the disks will be in the same horizontal plane with the upper edges of the saws. These disks are rotated rapidly by a series of gear-wheels H, I, and J. The wheels I and J are mounted on a stub-axle K, and receive their motion from the rack L, affixed to the holder E. When the table is pressed down and the holder slid forward, the rack L comes into engagement with the inner and smaller wheel J, while the outer and larger wheel meshes with the small wheel H, and thus the disks are revolved with great rapidity. These disks F are partly immersed in a reservoir M, containing a liquid glue or paste or any desirable adhesive material, and this reservoir is in turn incased within a larger reservoir N, containing water, (or other suitable liquid,) which is kept heated by a series of gas-jets supplied by the pipe *a'*, and in this way the glue kept in a liquid state. The peripheries of these disks are preferably grooved, as shown at *b'*, Fig. 5, and extending from the front over the top of each disk are the fingers *c'*. These fingers are arranged on a shaft *d'*, so that they can be turned back from the peripheries of the disks, when desired, for cleaning or otherwise.

The operation of my machine is as follows: A number of the books or signatures *g'* are placed in the holders E with their back edges resting on the table and at right angles to the face of the saws. The books are then securely pressed together by the clamping-board *p* and held there while the operator presses upon the table, thus bringing the edges of the saws and disks above the surface of the table. He then slides the holder forward until it passes over the saws, which cut grooves across the edges of the leaves. The holder E is then pushed still farther until it comes over the disks F. The rack L, in contact with the gear-wheels, as the holder is advanced causes the disks to revolve rapidly, and the glue stopped at the top of the disks by the fingers *c'* is deposited within the grooves, and when this glue is dried the leaves are firmly attached together, as securely as by thread and stitching. The large quantity of dust which arises from sawing the grooves in the leaves I remove through pipe P by means of a rotary fan or blower R, which is operated by belt and pulley D from the saw-shaft.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A book-binding machine consisting of a table with a series of saws or cutters extending above the plane of the top of the table for the purpose specified, in combination with a corresponding series of disks to convey to the grooves cut by the saws a supply of glue or other suitable adhesive substance, substantially as and for the purpose specified.

2. In a book-binding machine, a series of cutters in combination with a corresponding series of grooved disks partly immersed in glue, substantially as and for the purpose set forth.

3. A book-binding table swinging on arms controlled by a spring provided with a series of saws or cutters and a corresponding series of revolving disks extending above the plane of the table-top when the table is pressed down in combination with a sliding frame or holder, substantially as and for the purpose described.

4. A book-binding table supported at one end by swinging arms, in combination with a rock-shaft having opposite arms or levers, a fixed spring for rotating said rock-shaft attached to one of said arms, and a stop or guide for limiting the rotation thereof, substantially as and for the purpose described.

5. In a book-binding machine, the combination, with a series of saws or cutters, of a table supported by parallel swinging arms and adjustable by set-screws, and a sliding frame or holder E on said table, substantially as shown and described.

6. In a book-binding machine, the table B, in combination with the parallel swinging arms *b c* supporting the same, the opposite arms *e*, the rods *f*, guides *g*, and springs *j*, for controlling the swing of said arms, substantially as and for the purpose described.

7. In a book-binding machine, the combination, with revolving disks for supplying the glue, of fingers extending over the top of each disk to collect the glue, substantially as shown and described.

8. In a book-binding machine, the combination, with the table, a frame or rack sliding thereon, and a series of saws or cutters, of a rotary fan or blower R, for removing the dust caused by the cutting of the grooves, substantially as and for the purpose described.

9. In a book-binding machine, a sliding frame or holder, in combination with a clamping-board, rod journaled thereto, pinion on said rod, and rack affixed to said holder with catch to hold said board in any desired position, substantially as shown and described.

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Witnesses:
JOHN HAVLIN,
W. J. SULLIVAN.