

D. M. SMYTH.

GUMMING MECHANISM FOR BOOK SEWING MACHINES.

(Application filed Jan. 23, 1899. Renewed May 8, 1900.)

(No Model.)

2 Sheets—Sheet 1.

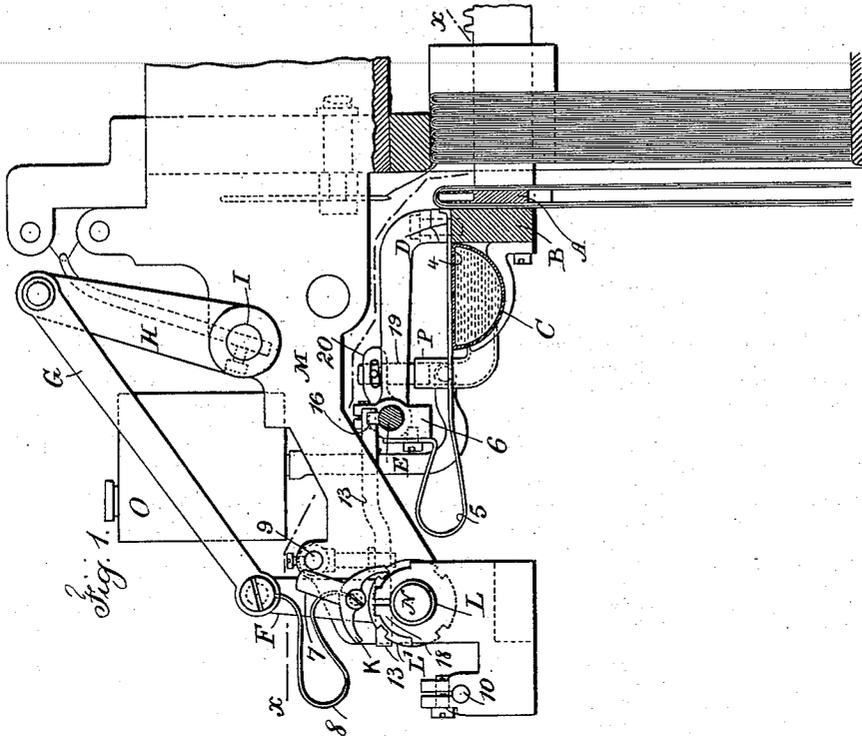
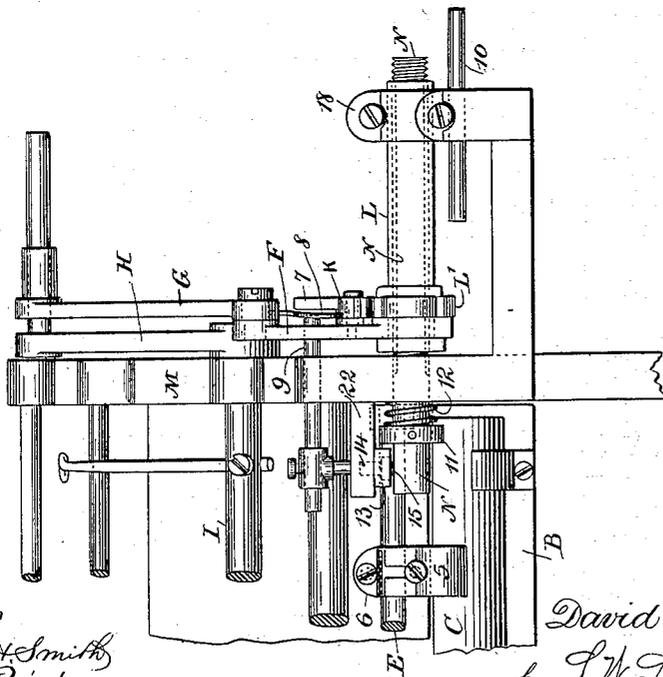


Fig. 2.



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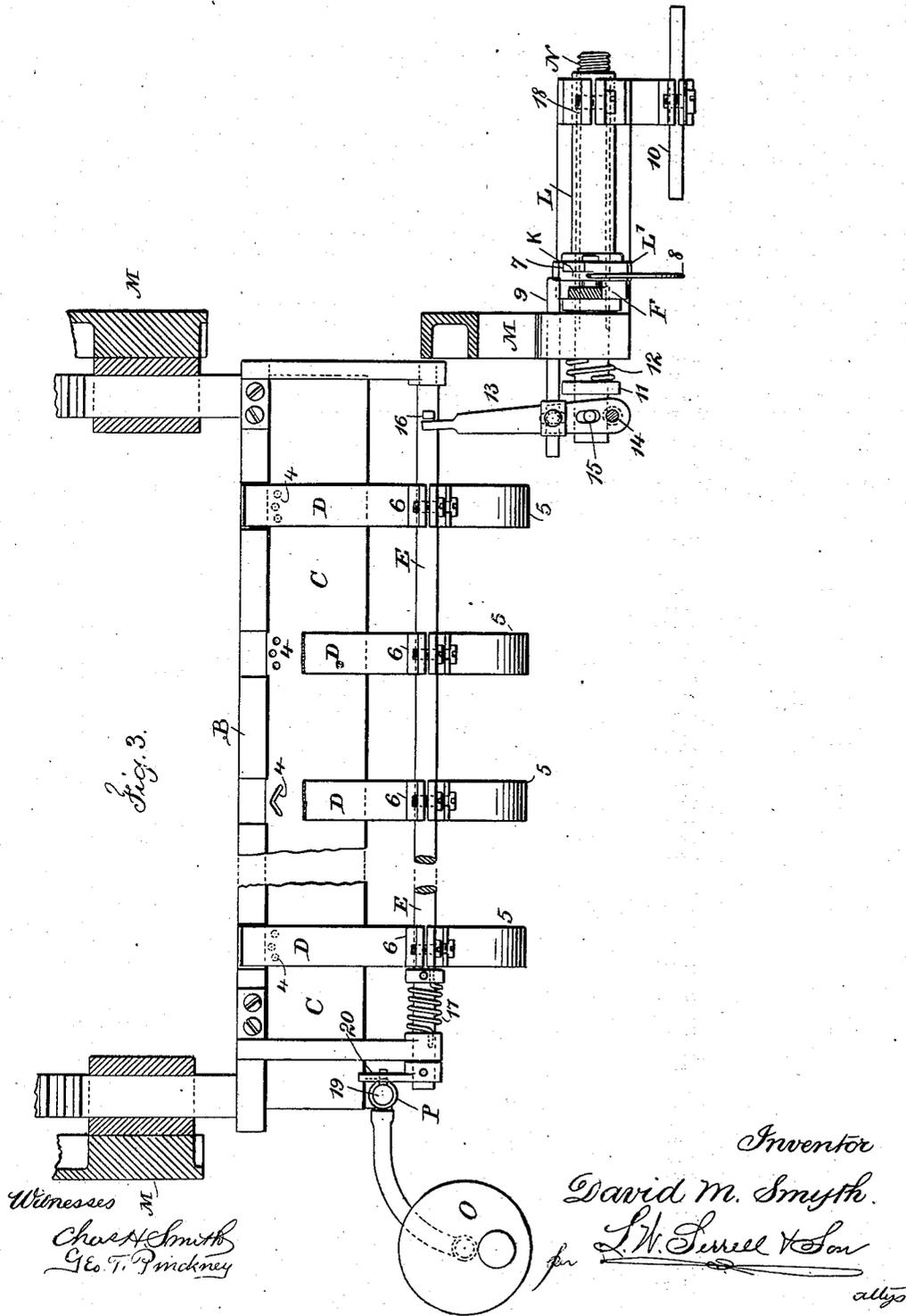
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2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

DAVID M. SMYTH, OF PASADENA, CALIFORNIA, ASSIGNOR TO FRANK C. BOLT, TRUSTEE, OF SAME PLACE.

GUMMING MECHANISM FOR BOOK-SEWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 664,300, dated December 18, 1900.

Application filed January 23, 1899. Renewed May 8, 1900. Serial No. 15,979. (No model.)

To all whom it may concern:

Be it known that I, DAVID M. SMYTH, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented an Improvement in Gumming Mechanism for Book-Sewing Machines, of which the following is a specification.

Books have been extensively sewed by machinery, and reference is hereby made to Letters Patent No. 220,312, granted to me October 7, 1879, as illustrating a machine that has been thus employed.

Where the signatures are sewed and connected together substantially continuously, there has been difficulty in determining the place where the signatures are to be separated into volumes, and in some instances adhesive material has been applied by hand to the last two signatures of the volume and also to the first two signatures of the next volume, thereby holding the sewing-threads and enabling the binder to separate the volumes between these pairs of signatures without the threads loosening in the signatures. The present improvement is made for the purpose of applying the adhesive material automatically to the threads as the signatures are sewed and for adapting this apparatus to volumes with varying numbers of signatures.

In the present improvement there is a sliding gummer that takes sufficient of the adhesive material from a fount to apply the same to the sewed or interlaced threads on the signature, so as to cause their adhesion to the paper and to cause the signatures to adhere as the added signature is pressed against the one previously sewed, and with this apparatus I make use of a regulator that brings into action the automatic device for applying the adhesive material after the desired number of signatures have been sewed, and I usually combine along with the aforesaid devices means for allowing one signature to be presented and sewed without adhesive material being applied to the same, and when the second signature is presented and sewed and adhesive material applied to the same there will be two pairs of signatures united together and an intervening

space where there is no adhesive material, thus indicating clearly to the bookbinder the end of one volume and the beginning of the next.

In the drawings, Figure 1 is an elevation, partially in section, illustrating the present improvement and the parts of the book-sewing machine with which it is made use of. Fig. 2 is a front elevation at one end of the machine, and Fig. 3 is a sectional plan at about the line *xx* of Fig. 1.

The folded-back edges of the signatures are brought up to position by the signature-holding arm A, and while they are held in position the sewing mechanism is brought into action; but this forms no part of the present invention, and the sewing mechanism may be such as shown in Patent No. 220,312 or in any of the other numerous patents on book-sewing devices.

After the signature has been sewed the pusher B is usually brought into action to push the sewed signature to the rear to give space for the introduction of the next signature, as usual, and to this pusher I connect a hollow holder C, in which is contained mucilage, paste, or other suitable material, and in the top of this holder there are narrow slots or small holes, as illustrated at 4, through which the adhesive material passes up, and the sliding cut-offs or pasters D are adapted to slide closely across over the holder C, so that the ends of each of these gummers gather the proper quantity of adhesive material and carry it across and deposit it upon the signature, close to the back-folded edge thereof and upon the sewed threads, so that when the next sheet is brought up and sewed and pushed back the adhesive material causes the two signatures to adhere together, and the adhesive material unites the loops of thread together and to the paper, so that the sewing will not loosen when the threads are cut in separating the volumes. These gummers D correspond in number and location to the lines of sewing and are actuated by any suitable mechanism. I find it advantageous to connect these gummers by the folded springs 5 with arms 6 upon the rock-shaft E, and these parts go backward and forward with the pusher; but the rock-shaft E is only brought

into action periodically to draw back the gummers for taking the adhesive material, and this is carried automatically by the gummers to the place where the gum is applied to the signature.

An arm F is swung by a link G every time the sewing of a signature is completed. This may be accomplished by any suitable mechanism. I have represented the link G as connected to an arm H at the end of the rock-shaft I, and this rock-shaft is found in many of the book-sewing machines and carries the thread-tightening devices, so that when the threads are tightened up in completing the sewing the arm F receives a motion, and there is upon this arm F a double-ended pawl K, having a lever 7 and a spring 8, and this pawl engages notches or teeth in the head L', that is attached to the screw-sleeve L, and there is a stop 9, so that when the lever 7 of the pawl K comes into contact with this stop the pawl is thrown over to bring into action the opposite end, and hence the sleeve L will be rotated in an opposite direction, and when the lever-arm K comes into contact with the stop 10 it is thrown back into the first position and rotates the sleeve L the other way. The screw N within the sleeve L passes through the frame M of the machine and has around it a collar 11 and a spring 12, and there is a lever 13 pivoted at 14 to an arm 22, (shown in Fig. 2,) projecting from the frame M, and said lever 13 is acted upon by a pin 15 upon the screw N, and the end of this lever 13 is adjacent to a lug 16 upon the rock-shaft E. The operation of this part is as follows: The sleeve L is turned progressively one notch of its ratchet-wheel L' every vibration of the arm F, and when the parts are working in the position shown in Fig. 1 the sleeve will be screwed along toward the frame M, and when the end of the sleeve comes into contact with said frame the screw N will be moved endwise against the action of the spring 12 and turn the lever 13 so as to come into contact with the lug 16 upon the rock-shaft E, and thereby such rock-shaft will be turned as it and the pusher are moved back together and the gummers are drawn back to uncover the holes in the gum-holder and allow the gum to ooze out, and then the gummers move forward as the pusher moves up against the sewed signature to push it back, and in so doing the gum is applied at each line of sewing or looping and the gummers remain over the holes and close them until the operations are repeated. If the gum is to be applied to one sheet only, the reversal of the pawl K by contact with the stop 9 causes the reversal of rotation of the sleeve L and allows the lever 13 to move back from and out of contact with the lug 16. The lever 13 does not act again until the pawl K has come into contact with the stop 10, by which it is reversed, and the sleeve L is screwed back and comes against the frame M, so that the operations before described are repeated. If the gum is to be

applied to several signatures in succession, the lug 16 must be of sufficient width for the end of the lever 13 to contact with the lug 16 the desired number of times, and some of the signatures will be gummed before the reversal by the pawl K takes place and the balance after the reversal takes place, when the screw N is being moved back by the spring 12 as the sleeve L is moved away from the frame M.

It is to be understood that the number of times the lever 13 contacts with the lug 16 is determined by the position of the stop 9, which stop 9 is adjustably connected to and moves with said lever 13. In one position of said stop after the sleeve L comes against the frame M the screw N is moved only the distance for the lever 13 to strike the lug 16 once before the reversal takes place by the pawl K coming in contact with 9. If the stop 9 is moved back slightly, the screw N will be moved, so that the lever 13 strikes the lug 16 twice before the pawl F strikes the pawl 9 and reverses the movement of the parts; and so on. Thus the movement given to the lever 13 by the screw N places the stop 9 in the position to reverse the pawl K at the right time. If the gum is to be applied to one or two signatures and then to miss one signature, so that there will not be gum between one volume and the next; then the screw-sleeve L continues its movement, and by the movement given to the screw N, as before explained, the end of the lever 13 is moved past the lug 16; so that said lever does not bring the gumming into action when one signature is sewed and pushed back, and at this time the stop 9 acts to reverse the pawl K and cause the screw-sleeve to rotate the other way and bring the end of the lever 13 back against the lug 16 to cause the gummer to act during the pushing back of either one or two more of the sewed signatures.

The stop 10 is movable endwise in a clamp, so that it can be brought into action after any desired number of signatures have been sewed, according to the size of the volume, and as the sleeve L is caused to move first in one direction and then in the other the adjustable stop 10 must be so placed as to reverse the action of the pawl after half the number of signatures comprising the volume have been sewed, so that the parts may be brought into position to apply the adhesive material to the surface of the signature for uniting one or two signatures at the end of one volume and one or two signatures at the beginning of the next volume, and at the same time apply the gum for holding the threads.

I remark that the tubular connection between the link G and the pin on the arm H should be sufficiently loose to slide along on said pin as the sleeves and the parts carried by it move from one position to another.

If the gum is to be applied to each signature as sewed, it is only necessary to detach the link G from the pin on the arm F and al-

low the lever 13 to remain in the path of the lug 16, and if the gumming is only to be omitted between one volume and the next the parts are to be adjusted so as only to move the lever 13 by the screw-sleeve L out of the way of the lug 16 while one signature is being pushed back at the end of the volume, the lever 13 remaining in position to act upon the lug 16 at all other times. The clamp 18 may be employed to apply a friction to the screw-sleeve L to prevent looseness that might allow the sleeve to be turned by the back movement of the pawl.

In Fig. 3 a spring is represented at 17 around the rock-shaft E for turning the same back to a normal position and projecting the gummets as the lever 13 separates from the lug 16 or the lug 16 and rock-shaft are moved away from the lever.

I have represented a reservoir at O, with a pipe leading to the gum-holder C, and this reservoir may be at a height sufficient for the necessary pressure to force the gum up through the holes in the holder when the gummets are drawn back; but it is advantageous to use a cylinder P and a plunger 19 therein moved by a connection to a moving part of the machine. I have shown an arm 20 on the rock-shaft E for moving the plunger 19. The parts are so located that the plunger applies a pressure to the gum in the holder C as the gummets are drawn back, so that the gum may rise through the holes and then be taken by the gummets and carried to the proper place on the signature as the gummets are moved forward with the pusher. On lifting the plunger the gum is drawn back from the holes.

I claim as my invention—

1. The combination with the pusher-bar in a book-sewing machine, of a receptacle for adhesive material carried by said pusher-bar, said receptacle having openings in its top surface for the escape of said adhesive material, gummets in the form of spring-plates covering the openings in said receptacle, a rock-shaft to which the gummets are connected and means for moving said shaft periodically and bringing the gummets into action substantially as specified.

2. The combination with the pusher-bar in a book-sewing machine, of a receptacle C for

adhesive material carried by said pusher-bar, said receptacle having openings in its top surface for the escape of said adhesive material, gummets in the form of spring-plates covering the openings in said receptacle, a rock-shaft to which the gummets are connected, means for moving said rock-shaft periodically, a reservoir for adhesive material and a pump between the reservoir and the holder C said pump being operated by aforesaid rock-shaft for forcing the adhesive material into the holder C, substantially as set forth.

3. The combination in a book-sewing machine with a receptacle for adhesive material and having openings for the escape thereof and a support for said receptacle, of gummets formed as spring-plates upon the surface of said receptacle and covering the openings therein, a rock-shaft to which the spring-plates are connected and means for periodically moving said rock-shaft to cause the said plates to slide over the surface of said receptacles to alternately expose and cover the openings therein, substantially as specified.

4. The combination with the book-sewing mechanism, of a receptacle for adhesive material, gummets, a rock-shaft with which the gummets are connected, a double-acting pawl and reversing devices for the same, a screw-sleeve and a lever moved by the same for actuating the rock-shaft periodically, substantially as set forth.

5. The combination with the book-sewing mechanism, of a receptacle for adhesive material, gummets, a rock-shaft with which the gummets are connected, a double-acting pawl and reversing device for the same, a screw-sleeve and a lever moved by the same for actuating the rock-shaft periodically, a screw to which the sleeve gives endwise motion and a spring for allowing the lever to move after it has acted upon the rock-shaft and to act a second time upon the return motion for bringing the gummets into action a second time after the intervention of the second signature, substantially as set forth.

Signed by me this 20th day of December, 1898.

DAVID M. SMYTH.

Witnesses:

JOHN McDONALD,
C. U. BUNNELL.