A. BREDENBERG.

BOOK BINDING OR COVERING MACHINE.

APPLICATION FILED SEPT. 7, 1917.

1,252,879.

Patented Jan. 8, 1918.

2 SHEETS—SHEET 1.

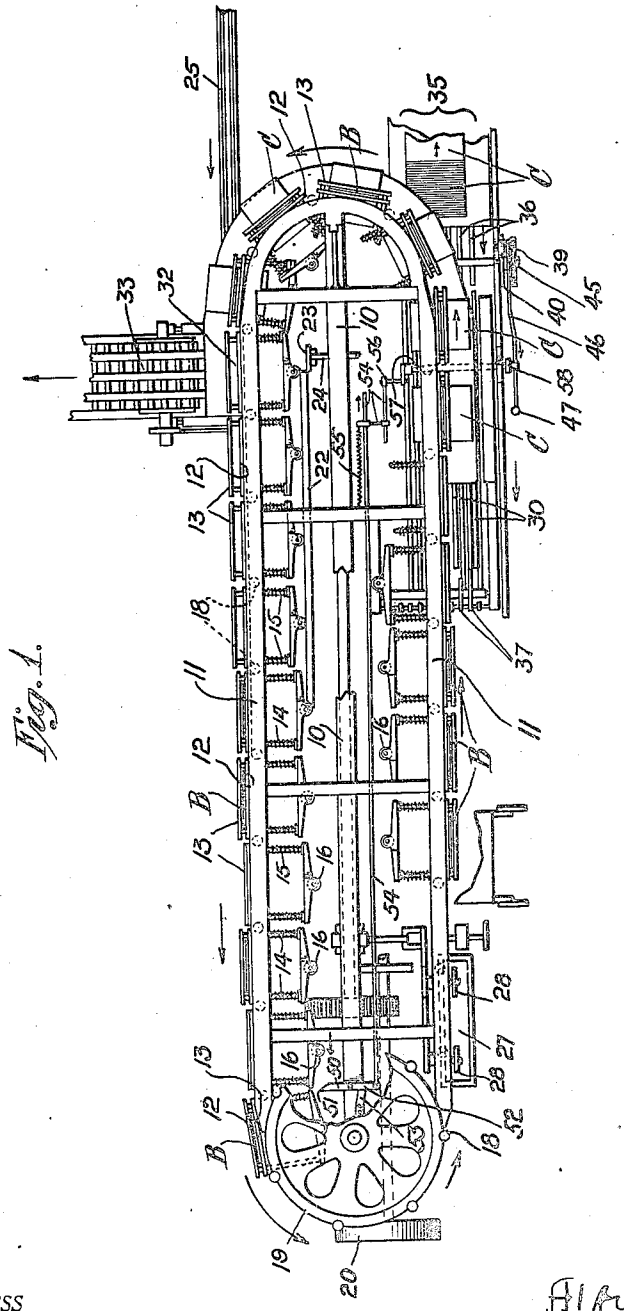

Fig. 1.

WITNESS

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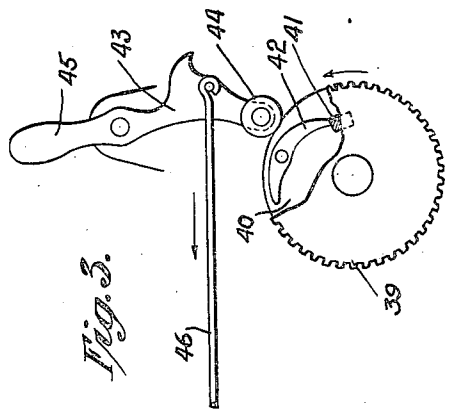


Fig. 3.

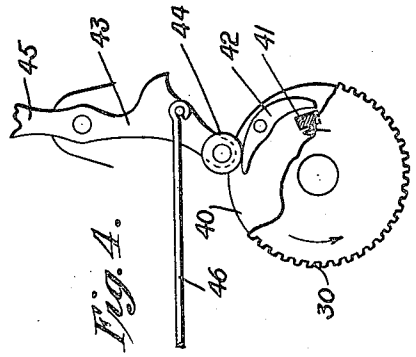
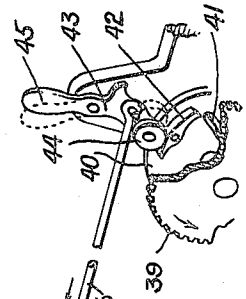


Fig. 4.



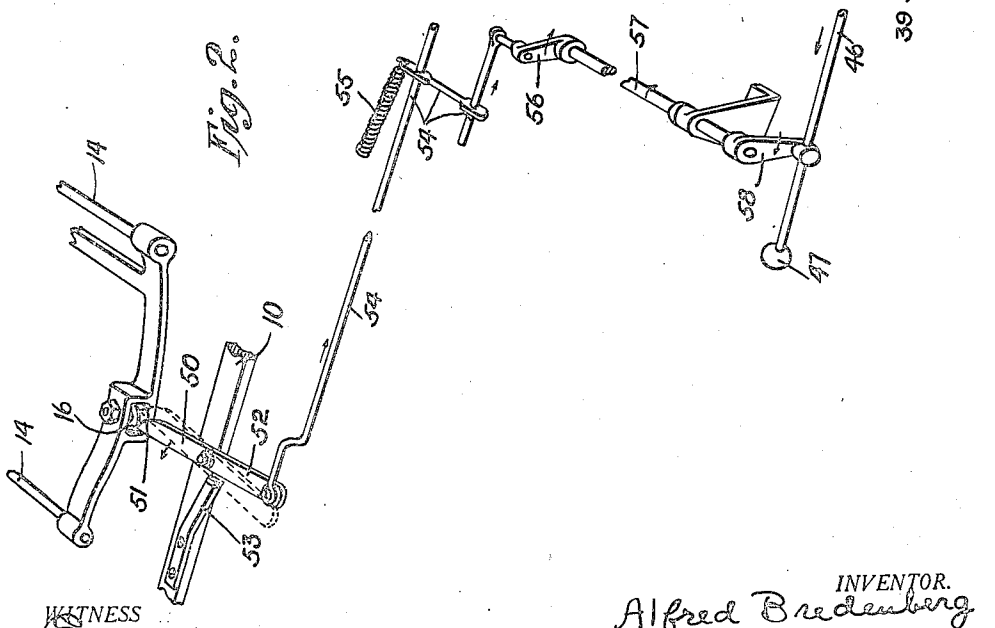


Fig. 2.

WITNESS

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UNITED STATES PATENT OFFICE.

ALFRED BREDENBERG, OF CHAMPLAIN, NEW YORK, ASSIGNOR OF ONE-HALF TO THE SHERIDAN IRON WORKS, A CORPORATION OF NEW YORK, AND ONE-HALF TO T. W. & C. B. SHERIDAN COMPANY, A CORPORATION OF NEW YORK.

BOOK BINDING OR COVERING MACHINE.

1,252,879. Specification of Letters Patent. Patented Jan. 8, 1918.

Continuation in part of Patents Nos. 1,243,252 and 1,243,254, dated November 27, 1917. This application filed September 7, 1917. Serial No. 190,170.

To all whom it may concern:

Be it known that I, ALFRED BREDENBERG, a citizen of the United States, residing at Champlain, in the county of Clinton and State of New York, have invented certain new and useful Improvements in Book Binding or Covering Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to bookbinding or covering machines, and more particularly to certain auxiliary contrivances for preventing difficulties and giving more perfect coordination, notwithstanding possible abnormal or accidental occurrences in the operation of the machine. Examples of machines for binding or applying covers to books or pamphlets are those shown in my copending applications Serial No. 108,994, filed July 13, 1916, and Serial No. 120,133, filed September 14, 1916, and for purposes of illustration the present improvements are shown as applied to machines of such type in which a traveling train of book holding clamps is employed, a succession of books being advanced by the clamps, and at a suitable stage in the operation having a backing applied or glued upon the back of each book. The glue is usually applied first to the back of the traveling book, rather than to the backing, and subsequently the backing is applied. The backing may sometimes be pervious in nature, or may sometimes be impervious, and in the latter case if the backing is of the proper length and width it is adapted to be subsequently bent around the sides of the pamphlet so as to form the cover. The usual procedure is to first apply glue and then a pervious backing, and then the paper cover which may be broken into position before the completed pamphlet is discharged; but the pervious backing is usually omitted when the machine is merely for covering pamphlets that have been bound or secured together.

In such machines occasionally there is a failure to properly feed a book into one of the successive clamps, and in that case, while normally the clamps will travel around carrying the books, there will occasionally be an empty clamp. Before this invention the mechanisms for applying backings have operated whether the clamp be occupied or empty, with the consequence that the loose backings have had to be removed by hand or the machine stopped in order to prevent impairment of the operation or output and resulting difficulties.

To the overcoming of such objections the bookbinding or covering machine hereof comprises a traveling train of book-holding clamps adapted to receive and advance a succession of books to be bound or covered, means for applying glue preferably to the books themselves, and a mechanism further along in the line of travel of the books for supplying backings such as paper covers to the successive books, and means controlled by the presence of a book in each clamp or the position of the parts of the clamp after leaving its book receiving position, whereby, when a particular clamp is left empty, the cover supplying mechanism is prevented from supplying a cover corresponding to the empty clamp.

Looking at the invention from the aspect of the particular mechanism by which the improvement is carried out, it involves a feeler or detector, which is preferably operated not by the book, but by some part of the clamp itself when the clamp is empty, thus detecting the empty condition of the clamp. The clamp being spring-closed, the position of its parts is changed when empty. One of the usual parts of such a clamp is a roller by which the opening and closing of the clamp is controlled, and this roller takes a different lateral position when the clamp is empty. According to the present invention, this roller is caused to meet and to actuate a feeler located at the extremity of a pivoted bar or rock arm, so that the roller of an empty clamp displaces the arm, causing it to swing and to thereby operate through lever and link connections to prevent the feed of a backing. The mechanism for successively feeding and applying the backings may be operated, for example, through a rotating shaft by connections which can be unclutched, so as to prevent rotation and feed. Thus, the connections from the feeler or detector may render the

feed ineffective by disengaging the driving and driven parts of the clutch, the parts being so timed that a backing will be applied when a clamp carries a book, but the backing that would otherwise be applied will fail to be fed when an empty clamp comes to position.

In the accompanying drawings showing one form in which the present invention may be embodied, Figure 1 is a general plan view of a bookbinding or covering machine containing the invention.

Fig. 2 is a perspective showing in skeleton certain of the parts in which the invention is embodied.

Fig. 3 is an elevation showing more particularly some of the details thereof, and Fig. 4 is a similar view showing the same parts in a different position.

In the drawings will be seen several books B, B, and several covers C, C, therefor, inasmuch as the invention is herein shown as used for applying a cover rather than a different form of backing to the book.

Among the frame parts is the central longitudinal frame member 10, and spaced at opposite sides of the machine are the parallel frame members 11, 11, constituting also guides for the book clamps. Each clamp comprises an inner member 12, which has no movement except that of advance, and an outer clamp part 13, which is relatively movable toward and from the other clamp part, being guided by parallel shanks 14, 14, which are surrounded by springs 15, 15, such as to normally hold the clamp tightly closed upon the book. Each clamp also has a follower or roller 16 by which it may be opened.

A continuous or endless series of such self-closing clamps is indicated and may as a whole be designated the carrier or book holding conveyer.

The successive clamps may be connected together by vertical hinge pins 18, and the train of clamps by the aid of these pins travels progressively around the ends of the machine, at one end of which is provided a driving sprocket wheel 19 suitably geared to the belt pulley 20.

In order to automatically open and close the successive clamps at the proper time, I have shown a device or bar 22 coöperating with the roller 16, and a movable pusher 23 suitably swung by a lever 24. The operation is that, as each clamp roller 16 arrives at the pusher 23, it is pushed outwardly to open the clamp and the roller thereupon travels along the bar 22 until at the left end it passes off, permitting the closing of the clamp.

Each clamp is supposed to have a book fed into it during the period of its travel along the bar 22, and, while this may be done by hand, I have indicated an automatic infeeding conveyer 25, which may lift the books slantingly into the successive clamps.

As the successive books pass around the machine, they eventually come to the glue vessel 27, above which are glue rolls 28, which the book contacts so as to receive adhesive. Of course the glue might be applied to the covers instead. The glue mechanism may be preceded or succeeded by various other mechanisms, according to whether the machine is to bind or merely to cover the pamphlets.

Further along in the line of travel of the books is a cover applier or platen 30, which coöperates with mechanism, hereinafter to be described, for supplying and feeding the covers one at a time to the platen to be lifted into contact with the successive books.

Succeeding the cover applier may follow a cover breaking mechanism, and thereafter at the position 32 clamps are opened, as already described, to discharge the books to a delivery mechanism 33.

Many forms of sheet feeding mechanism are available for supplying the covers one at a time to the applier or platen 30. An example of a sheet feeding mechanism is the well known Cross feeder 35, the general nature of which may be ascertained by reference to the various Cross patents such as 613,793 of November 8, 1898; 637,324 of November 21, 1899; 690,702 of January 7, 1902; 812,260 of February 13, 1906; 887,314 of May 12, 1908; 1,109,902 of September 8, 1914, and 1,169,129 of January 25, 1916. This Cross feeder operates on the principle of combing the stack of cover sheets into a position from whence they may be one at a time thrust forwardly to be engaged by rollers and tapes and conveyed to the desired position. Thus, in Fig. 1 tapes 36 are shown leading from the sheet feeding mechanism 35, and these are in line with further tapes 37 provided specially for the book machine, and which serve as a conveying means to carry the successive covers one a time to the platen 30. The sheet feeding mechanism 35 may be placed in any convenient location, and at a suitable distance from the cover applying point, so as to coöperate with the detector mechanism hereinafter to be described.

It is unnecessary to describe in detail the mechanism of the Cross feeder, as no claim to the same *per se* is made herein. Suffice it to say that one of the driving elements by which the mechanism is operated is the gear 39, shown in all the figures. This gear is constantly rotating counterclockwise, and normally would cause the feeding mechanism to pass out covers at regular and quickly consecutive intervals. To this end

the gear 39 normally drives a disk 40, mounted concentrically with it, and the disk 40 in turn operates the combing and outfeeding devices. A sort of a clutch device is interposed between the gear and the disk, and this is shown as taking the form of a lug 41 on the driving gear and a pivoted dog 42 on the driven disk. Fig. 3 shows these in their normal or engaged position when the sheet feeding mechanism is operating continuously. The dog is so arranged that it can be easily tripped, and when so tripped obviously the gear will make a rotation without driving the mechanism, so that one sheet will be omitted. A convenient tripping mechanism for the clutch 41, 42 is the trip lever 43, having a roller 44, which when desired may be swung into the path of the dog 42. Thus, in Fig. 4, the trip lever has been swung to its operative position and the disk 40 has traveled around until the dog 42 by contact with the trip roller has been swung out of engagement with the driving lug 41. Obviously, so long as the trip lever is maintained in the Fig. 4 position the outfeeding of sheets will cease. The moment the lever is restored to the Fig. 3 position it loses control, and slightly later the dog will resume its normal position by gravity and the feed will recommence. It should be stated that this action of cutting off the outfeeding of a sheet from the Cross feeder does not interfere with the continued travel along the tapes 37 of the covers which have already been started on their journey.

The trip lever 43 may be actuated by means of the hand extension 45 at the top, and a rod 46 is also shown extending from the lever leftward to where it is provided with a knob 47, more easily accessible to an operative standing near the cover applier.

I will now refer to a device or mechanism controlled by the presence of a book in each clamp or the position of the parts of the clamp after leaving its book receiving position, whereby when a particular clamp is left empty the cover supplying mechanism is prevented from supplying a cover corresponding to the empty clamp. Instead of coöperating directly with the book I prefer the feeler to coöperate with a part of the clamp, and a very advantageous arrangement is to employ the same roller 16, which has to do with the automatic clamp opening and closing, as already described.

For this purpose the detector 50, shown in the form of a swinging arm, is so positioned that its feeling end 51 normally stands in a position shown dotted in Fig. 2, to be contacted by the roller 16 of each empty clamp, it being understood that the roller takes a different position, as shown in Fig. 1, when a clamp has received a book. The detector or feeler is located at such a point along the orbit or path of book travel that its distance from the place of application of covers to the book corresponds with the distance of the sheet feeder therefrom. Consequently each clamp, by reason of the abnormal position of its roller, due to its empty condition, brings about the tripping of the cover feed mechanism clutch so as to prevent the supplying of a cover corresponding to such clamp.

I will now describe how the feeler 50 may be caused to operate the trip lever 43. The feeler is provided beyond its fulcrum with an arm 52, which normally rests against a fixed stop 53, as indicated in dotted lines in Fig. 2. The detector and the stop are mounted on the central frame part 10. A long and bent connecting rod 54 extends to the right from the arm 52, and a spring 55 at a suitable point tends to hold the detector in its normal position. The rod 54 is connected to a rock arm 56 so as to cause the rocking of a shaft 57, which is provided with a second rock arm 58 connected to the rod 46, already mentioned, by which the trip lever may be moved to the left to unclutch the feeding mechanism.

In the position of the parts in Figs. 2 and 4 an empty clamp is supposed to have come along, its roller 16 having contacted and swung the detector arm 50 to the extreme of its swinging movement and being about to pass it by. This action serves to move each of the connections 54, 56, 57, 58 and 46 in the directions of the arrows in Fig. 2. The trip roller 44 is thereby held in its operative position, shown in Figs. 2 and 4, sufficiently long to permit its co-action with the trip dog 42, so that the dog is disengaged from the lug 41, permitting the latter and the driving gear to turn without effect. This prevents the sheet being fed, which would correspond to the empty clamp. The moment the roller has passed by the detector arm, the spring 55 causes the parts to resume their original position, and, assuming that the next succeeding clamp is occupied by a book, the clutch will engage at the next rotation of the gear and the feed of cover sheets will be resumed.

This application is in part a continuation of my copending application which has resulted in my Patent No. 1,248,252 of November 27, 1917, and which, beginning at page 5, line 100 describes generally a mechanism controlled by the presence of a book in the clamp after leaving receiving position, consisting of a suitable feeler to detect those occasional cases where a book may not be placed in the conveyer, operated preferably by some part of each clamp when closed, such as the clamp roller, which takes different positions according to whether the clamp is open or closed, and suitable connections

extending to the cover supplying mechanism further along in the machine; and is in part a continuation of my other copending application which has resulted in my Patent No. 1,248,254, of the same date, and which illustrates in Figs. 2 and 5, and describes, beginning page 3, line 110, an advantageous form of feeler coöperating with the clamp roller and specific connections therefrom acting to prevent the feed of a backing for the book when the book is missing.

It will thus be seen that I have described a book binding and covering machine embodying the principles and attaining the objects and advantages of the present invention. Details omitted herefrom may be constructed in accordance with my aforesaid copending application. Since many matters of combination, design, arrangement, detail and other features may be variously modified without departing from the underlying principles of the invention, I do not wish to restrict the invention to such features except in so far as set forth in the appended claims.

What is claimed is:

1. In a bookbinding or covering machine, a traveling train of book holding clamps adapted to receive and advance a succession of books to be found or covered, means for applying glue to the successive books, a mechanism farther along in the line of travel of the books for supplying covers or backings to the successive books, and means controlled by the position of the parts of each clamp after leaving its book receiving position, whereby when a particular clamp is left empty the cover supplying mechanism is prevented from supplying a cover corresponding to the empty clamp.

2. In a book binding or covering machine, a traveling train of book holding clamps adapted to receive and advance a succession of books, mechanism for supplying backings to the successive books, means for applying glue to cause the book and backing to adhere, and means controlled by the position of the parts of any clamp after leaving its book receiving position, whereby the backing-supplying mechanism is prevented from supplying a backing corresponding to any empty clamp.

3. In a bookbinding or covering machine, a traveling book holding carrier adapted to receive and advance a succession of books, mechanism for supplying backings to the successive books, means for applying glue to cause the book and backing to adhere, and means controlled by the position of the parts of the carrier beyond book receiving position whereby the backing supplying mechanism is prevented from supplying a backing corresponding to the missing book.

4. In a bookbinding or covering machine, a traveling book holding carrier adapted to receive and advance a succession of books, mechanism for supplying backings to the successive books comprising a sheet-feeding mechanism having a controlling trip-clutch and conveying means therefrom to the path of the books, means for applying glue to cause the book and backing to adhere, and means controlled by the position of the parts of the carrier beyond the book receiving position, whereby the controlling clutch is tripped and the backing supplying mechanism is prevented from supplying a backing corresponding to the missing book.

5. In a bookbinding or covering machine, a traveling train of book holding clamps each having a closing means and adapted to hold and advance one of a succession of books, mechanism for timing the opening and closing of the successive clamps, mechanism for supplying backings to the successive books, a feeler for detecting any clamp that is empty after leaving its book receiving position, and feeler-controlled connections whereby the backing supplying mechanism is prevented from supplying a backing corresponding to the empty clamp.

6. In a bookbinding or covering machine, a traveling train of book holding clamps each having a closing means and adapted to hold and advance one of a succession of books, mechanism for timing the opening and closing of the successive clamps, mechanism for supplying backings to the successive books, and a feeler coöperating with parts of the clamps for detecting any clamp that is empty after leaving its book receiving position, and connections therefrom whereby the backing-supplying-mechanism is prevented from supplying a backing corresponding to the empty clamp.

7. In a bookbinding or covering machine, a traveling train of book holding clamps each having a closing means and adapted to hold and advance one of a succession of books, mechanism for timing the opening and closing of the successive clamps, sheet feeding mechanism for supplying backings to the successive books operated by a trip clutch, and a feeler coöperating with parts of the clamps for detecting any clamp that is empty after leaving its book receiving position, and connections therefrom to said trip clutch whereby the backing-supplying mechanism is prevented from supplying a backing corresponding to the empty clamp.

8. In a bookbinding or covering machine, a traveling train of book holding clamps movable along a definite path and each having a closing means for the movable clamp member and a roller partaking of the opening and closing movements of said member, mechanism co-acting with said roller for causing the opening or closing of the suc-

cessive clamps, mechanism for feeding and applying backings to the successive books, a swinging feeler arm standing in the path the roller will take when a clamp is empty, and connections from said feeler arm to said feeding mechanism for rendering the latter inoperative, said feeler and feeding mechanisms being at such distances respectively from the point of application, that no backing will be supplied or fed corresponding to an empty clamp.

In testimony whereof, I have affixed my signature hereto.

ALFRED BREDENBERG.