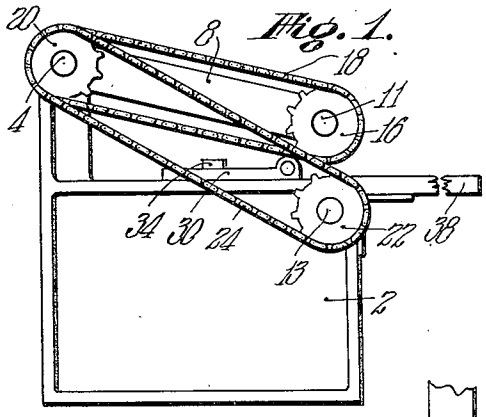
Dec. 7, 1937. P. W. BIDWELL 2,101,804

BOOKBINDING

Filed June 17, 1935

Fig. 1.



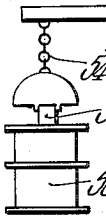


Fig. 3.

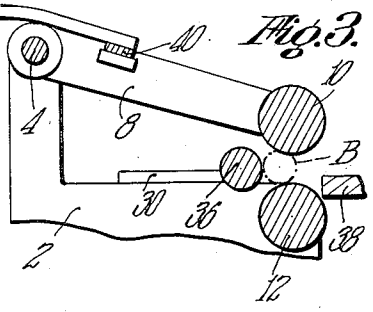


Fig. 5.

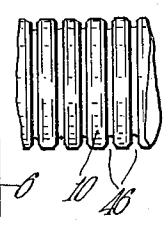


Fig. 2.

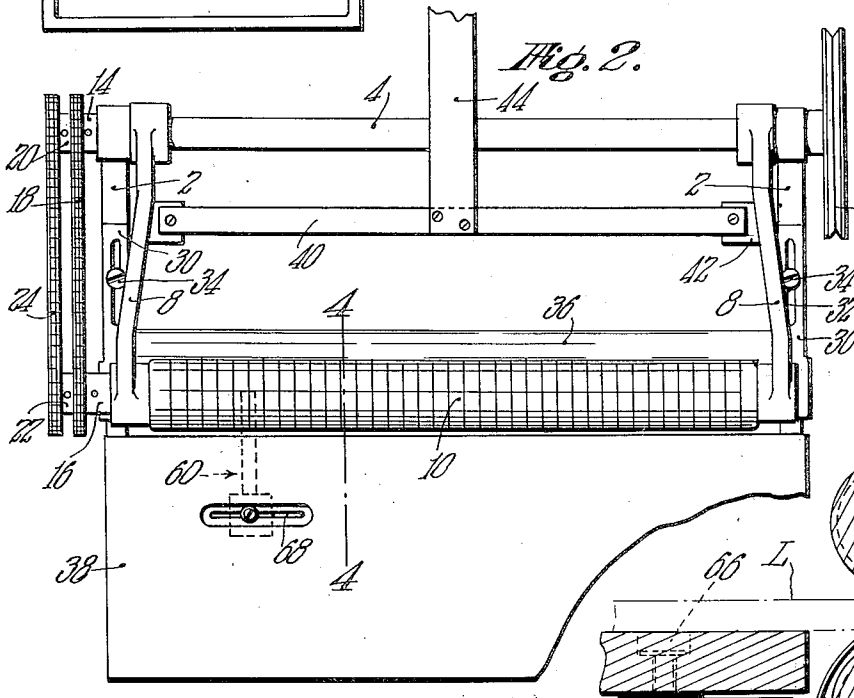
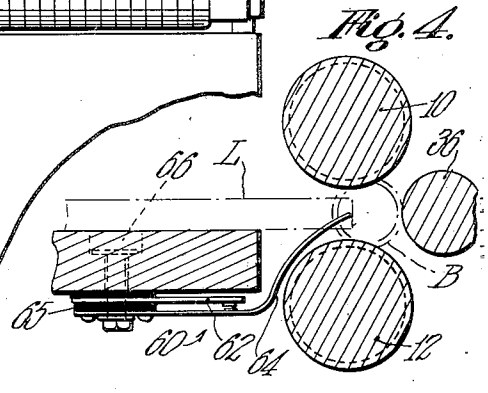


Fig. 4.



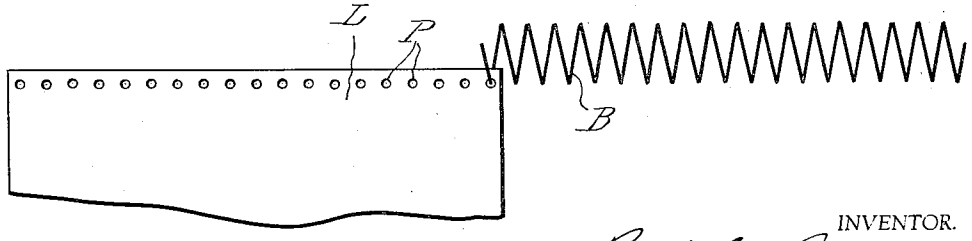


Fig. 6.

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UNITED STATES PATENT OFFICE

2,101,804

BOOKBINDING

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Application June 17, 1935, Serial No. 26,893

3 Claims. (Cl. 11—1)

This invention relates to improvements in book binding and is directed more particularly to improvements in apparatus for assembling spiral bindings and perforated leaves of a book.

The principal objects of the invention are directed to the provision of a novel apparatus for screwing a helical or spiral binding member into a row of perforations provided adjacent the edge of a stack of leaves to form a book.

According to special features of the invention, the apparatus is constructed and arranged in a novel manner so as to be capable of efficiently and easily screwing a helical or spiral binding into the perforations of a stack of leaves of a book and there is provided automatic means for stopping the operation of the apparatus when the binding member has been screwed into the perforations to the desired extent.

Various other novel features and advantages of the invention will be hereinafter more fully referred to in connection with the preferred form of the invention, reference being had to the accompanying drawing wherein:

Fig. 1 is a side elevational view of an apparatus embodying the novel features of the invention;

Fig. 2 is a plan view of the apparatus shown in Fig. 1;

Fig. 3 is a partial transverse sectional elevational view of the apparatus shown in Figs. 1 and 2;

Fig. 4 is an enlarged sectional fragmentary view to explain certain features of the invention;

Fig. 5 is a partial elevational view of one of the rolls of the apparatus; and

Fig. 6 is a plan view of the upper portion of a book showing the leaves perforated with spaced openings and a binding element which is screwed into the perforations by the apparatus of this invention.

Referring now to the drawing more in detail the invention will be fully described.

Side frames 2 are provided and these are arranged in spaced relation as shown. A driving shaft 4 is journalled in the frames 2 for rotation and a pulley such as 6 may be provided on the shaft 4 which may be belted to a motor or other source of power. Of course, other means for driving the shaft 4 may be provided, if desired.

Lever arms 8 are oscillatable on the shaft 4 and their forward ends have a roll 10 journalled therein. A roll 12 is journalled in the side frames 2 below the roll 10.

A sprocket 14 provided on the shaft 4 and a sprocket 16 provided on the roll 10 are connected by a chain 18 extending therearound so that the roll 10 is driven from the shaft 4. However, as stated, the arms 8 are oscillatable on the shaft 4 so that they and the roll 10 may still swing up and down for a purpose to be described.

Another sprocket 20 is also provided on the shaft 4 while a sprocket 22 is disposed on roll 12. These sprockets 20 and 22 are connected by a chain 24 extending therearound so that the lower roll 12 is also driven from the shaft 4.

Brackets 30, provided on the upper side of the side frames 2, are slotted, as at 32, and adjusting screws or bolts 34 extend through the slots into engagement with the frames to provide a means for securing the brackets 30 in various positions of adjustment. What may be called a guide roll 36 is journalled for rotation in the brackets 30.

A table 38 is disposed at the forward side of the apparatus and is adapted to support a book or books. The levers 8 have ears 42 and a bar 40 has its ends secured to the ears 42. From this bar 40 there extends a bar such as 44.

The rolls 10 and 12 are provided with grooves, such as 46, which are adapted to receive the convolutions of a helical or spiral binding member B such as shown in Fig. 6. The grooves may take different forms and may be arranged to accommodate spirals of different diameters and binding members made from wire of various diameters.

In the form of the invention shown, with reference to Figs. 4 and 6 a book represented by L, which is provided with a row of perforations P, is placed on the table 38 with the end of the binding B started in the perforations, as shown. The convolutions of the binding are caused to bear against the guide roll 36 so as to position the binding B with reference to the lower roll 12, somewhat after the manner shown in Fig. 4.

Then the arms 8 and roll 10 are allowed to be lowered so that the upper roll 10 engages the binding B. That is, the roll 10 is caused to contact the binding B so that the convolutions of the binding member are engaged by the grooves 46 of the roll 10. With the book L and binding member B thus disposed with reference to the rolls 10 and 12, which, as stated, are being rotated, the binding member B is caused to rotate and screwed into the perforations P.

When the binding member has been screwed into the perforations the arms 8 are elevated to move the roll 10 upwardly so that the member B is no longer rotated. The arms 8 may be moved downwardly and upwardly by any suitable means but, in the form of the invention shown, the arms

8 and its associated roll 10 tend to assume the operative position shown in Figs. 1, 3, and 4 by means of gravity.

In order to move the arms 8 and roll 10 upwardly there is provided a solenoid or magnet 50 having an armature 52 which is connected by a chain or the like 54 to the bar member 44. When the member 50 is energized to draw the armature 52 downwardly, the arms 8 carrying roll 10 are swung upwardly to an inoperative position. The solenoid or magnet 50 may be energized by connecting to a source of energy and a manually-operated switch may be provided to open and close the circuit.

It is desired according to one feature of this invention that the said circuit be opened when the binding member B has been screwed into the perforations P to the desired extent. That is, when the leaves L and binder B have been assembled so that a book is formed, it is desirable to cease the screwing action in order that the member B does not screw too far to project beyond the last perforation in the row. Also, it is just as desirable that the screwing action continue long enough so that the binder B extends the entire length of the row.

To this end there is provided a circuit-closing device indicated generally by 60 associated with the table 38. This may consist of a contact 62 and a yieldable contact member 64, the latter of which extends inwardly from the table 38 so that a free end thereof lies in the path of the binding B. The said members 62 and 64 are preferably suitably insulated as at 65 and a bolt 66 extends through a slot 68 provided in the table in order that the circuit-closing device may be adjusted longitudinally of the table. The device 60 is preferably connected in series with the solenoid 50.

The leaves L and binder B are associated in the manner shown in Fig. 6 and then located on the table 38 in some definite position relative to the device 60, as by means of a line or mark on the table or by guides. Then the rotating rolls 10 and 12 are caused to engage the member B and rotate the same until it is screwed into the perforations P forming the book to the point where the foremost end of the member B contacts the member 64 of the circuit-closing device.

At this point the said device, being connected in series with the solenoid 50, closes the circuit to energize the solenoid and cause the arms 8 and the roll 10 to be elevated. In this way the rotation of the binding member B is stopped and it is possible to prevent the binding being carried beyond a predetermined point with reference to the leaves.

While I have described the invention in great detail and with respect to a preferred form thereof, it is not desired to be limited thereto since many changes and modifications may be made therein without departing from the spirit and scope of the invention. What it is desired to claim and secure by Letters Patent of the United States is:

1. An apparatus for binding the perforated leaves of a book with a preformed spiral binding member comprising in combination, a horizontal support for said book, a grooved roll journalled for rotation adjacent said support, an arm swingable relative to said support, a second grooved roll journalled for rotation therein for co-operating with the first-named roll to advance a spiral binding along the perforations of the leaves of a book on said support, electrically operated means to swing said arm to separate said rolls when a binding has advanced along said support a predetermined distance, the said means including a circuit-closing device on said support engageable by and actuated by the spiral binding as the same is advanced along the support a predetermined distance and a circuit connected to the electrically-operated means and circuit-closing device, all adapted and arranged whereby the circuit-closing device is actuated by a spiral binding when the same has advanced along the support a predetermined distance to cause the said rolls to be separated.

2. An apparatus for binding the perforated leaves of a book with a preformed spiral binding member comprising in combination, a horizontal support for said book, a grooved roll journalled for rotation adjacent said support, an arm swingable relative to said support, a second grooved roll journalled for rotation therein for co-operating with the first-named roll to advance a spiral binding along the perforations of the leaves of a book on said support, electrically operated means to swing said arm to separate said rolls when a binding has advanced along said support a predetermined distance, the said means including a circuit-closing device on said support engageable by and actuated by the spiral binding as the same is advanced along the support a predetermined distance and a circuit connected to the electrically-operated means and circuit-closing device, all adapted and arranged whereby the circuit-closing device is actuated by a spiral binding when the same has advanced along the support a predetermined distance to cause the said rolls to be separated, the said circuit-closing device including relatively movable contact points and means to facilitate adjustment of the device along said support.

3. An apparatus for binding the perforated leaves of a book with a preformed spiral binding member comprising in combination, a horizontal support for said book, a grooved roll journalled for rotation adjacent said support, an arm swingable relative to said support, a second grooved roll journalled for rotation therein for co-operating with the first-named roll to advance a spiral binding along the perforations of the leaves of a book on said support and electrically operated means to swing said arm to separate said rolls when a binding has advanced along said support a predetermined distance, the said means including a solenoid having a slidable member connected to said arm.

PAUL W. BIDWELL.