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MACHINE FOR BINDING BOOKS


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6 Claims. (Cl. 91—55)

This invention relates particularly to an improved machine for gluing books whereby a firmer bond is obtained between the glue and the pages of the books, and is adapted to be used with a bookbinding and covering machine of the type shown in the patent to Bredenberg No. 1,248,252, granted November 27, 1917.

Therefore, in applying glue to the freshly cut back of the book, great care has been exercised to have the glue of the proper consistency and at the right temperature to insure a proper union between the glue and the back of the book, and later in the operation, between the glue and the cover. It is difficult in practice to get a glue of a consistency to perform properly both of these functions. A glue of the right consistency to enter the spaces between the edges of the sheets is much too thin to hold the cover, if it is of a proper consistency to hold the cover, it is much too heavy to afford a firm bond between the leaves of the book.

An object of this invention is to overcome this difficulty and to provide a machine for applying glue which will be of the proper consistency for both operations.

This and other objects, as will hereinafter appear, are accomplished by this invention which is fully described in the following specification, and shown in the accompanying drawings.

Figure 1 is a top plan view of a machine embodying the invention;
Figs. 2 is a partial enlarged side elevation of the same;
Figs. 3, 4 and 5 are partial enlarged sections on the lines 3, 4 and 5 respectively of Fig. 1;
Fig. 6 is a partial enlarged perspective of the trough as viewed on the line 6 of Fig. 5; and
Fig. 7 is a partial enlarged section on the line 7 of Fig. 1.

This is a continuation-in-part of our application for Letters Patent, Serial No. 321,818, filed November 28, 1928, which matured into Patent 1,804,392. The present invention is shown as applied to the machine of the patent to Bredenberg No. 1,248,252. For the sake of clearness and to save unnecessary repetition, those parts of the patented machine which are not altered are shown sketchily or are omitted altogether.

The machine comprises a frame having upper and lower tracks or guides 10 (Figs. 1, 7) supported on suitable legs as 11, 12 carried on a base 13. Between the upper and lower guides 10 run the links 14 of a continuous chain which serves to carry the book to be bound through the machine, and which is propelled by means of a sprocket 15. Broadly, the invention consists in cutting the backs of the books which are previously "gathered" or assembled from a series of signatures. This cutting operation severs and separates all of the sheets so that they are now held in the form of a tablet and require that this cut edge be glued, after which a "super" and cover are applied thereto. The present invention relates, primarily, to an improved machine for performing this gluing operation.

Speaking generally, the book A gripped by the chain while being carried forward is trimmed on the back by means of a suitable cutter, such as the hand saw B, after which it passes to the first glue pot C. The trimmed back is given a coat of thin glue which, as will later be described, is worked into the leaves at the back of the book. The book then passes through a chilling device D where the thin glue from the glue pot C will be chilled, and thereby considerably thickened, after which the book is given a second coating of thicker glue as it passes over the glue pot E, after which a super is applied by a mechanism F. The book is then passed on to any form of suitable cover conveyor H where the book is released and the machine is then ready to receive another book to be bound.

The carrier chain of the machine comprises a series of links 14 hingedly connected together by means of pins 16, on the upper and lower ends of which are mounted rollers 17, 18 which pass between the upper and lower channel shaped guides 10. These links 14 are provided with longitudinally spaced and laterally offset openings through which pass guide pins 19 which are attached to opposite ends of clamping plates 20. These plates are normally drawn toward the links 14 by means of springs 21 on the inner ends of the guide pins 19, these springs acting upon a cross bar 22 which is attached at its two ends to the two pins 19. This cross bar carries near its center a roller 23 which is pivotally mounted, and which serves, when pressed outwardly, to force the plate 20 away from the link so as to release the book A held therebetween.

The chain 14 and sprocket 15 travel in a counter-clockwise direction. As the rollers 23 encounter the cam 24 carried by the main frame, the plate 20 is forced outwardly, thereby releasing a book held thereby, and this plate remains in this open position until the roller runs off the opposite end of the cam. The sprocket 15 is mounted upon a shaft 25 which is journaled in
suitable bearings carried by the main frame, and has engaged thereon a bevel gear 26 which is meshed with a driving gear 27 on a shaft 28.

This shaft has a gear 29 meshing with a gear 30 on a shaft 31 which is driven by means of suitable reduction gearing (not shown) from any suitable source of power, such as a motor.

The shaft 29 is provided with a suitable worm and worm wheel, (not shown) which are contained within a gear case 32, and which serve to drive a shaft 33. This shaft drives, through suitable sprockets and a chain 34, a shaft 35 which drives the glue feeding mechanism of the glue pot C. The shaft 35 in turn drives a shaft 36 at the rear end of the glue pot C by means of suitable sprockets and a chain 37 which runs thereover.

The shaft 35 has a bevel pinion 38 keyed thereon which meshes with bevel gears 39, 40, these gears being keyed on shafts 41, 42 respectively which are suitably journaled in the glue pot C.

These shafts carry spiral gears 43, 44 which lie immediately beneath the path of the book A to be bound, and dip into the glue of the glue pot and serve to spread the glue up, and to wipe it across the bottom cut back of the book. It will be observed that the direction of travel of these gears is in opposite direction across the bottom of the book, so that these projecting edges “C” spread first in one direction from normal, and then in the other so as to cause this glue to be thoroughly worked into the back and to both surfaces of the sheets closely adjacent their back edges.

This glue is made quite thin and is kept hot by any desired means (not shown) so as to better enable it to penetrate the sheets. Following the gluing gears 43, 44 is a gluing wheel 45 which is carried on a shaft 46 which has a bevel gear 47 meshing with another gear 48, which is carried on a shaft 49 which has a bevel gear 50 meshing with the bevel gear 47. The gluing wheel 45 adds a fresh amount of the thin glue to the bottom of the book and assists further in working the glue in between the sheets.

As the book then proceeds it passes through between oppositely disposed pressing idler rollers 51, 52 (see Fig. 3). These rollers are mounted upon vertical pivots carried by the glue pot C and serve to press the laterally spread edges of the sheets A from the dotted line position to the full line position of Fig. 3, at the same time squeezing out some of the glue which is held between the edges of these sheets.

The glue pot C is advantageously carried on standards C.

As the book A passes these rollers it passes over a roller scraper 53 which is mounted on the shaft 56, this scraper being rotated so as to scrape the surface of the glue wheel 45 to the grinding wheel 46, all of which are carried on a shaft 57.

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As the book A passes these rollers it passes over a roller scraper 53 which is mounted on the shaft 56, this scraper being rotated so as to scrape the surface of the grinding wheel 46, all of which are carried on a shaft 57.

Such is the manner in which the book A next passes over the mechanism F by means of which a super is fed to the glued back of the book. This mechanism is shown in side elevation in Fig. 4, and is operated in timed relation to the positioning of the book A by means of a cam 50 on the shaft 58. This cam serves to operate a lever 71 pivotally mounted at 72. An operating rod 73 is pivotally connected to the opposite end of the lever 71, the upper end of this rod 73 being connected to a sliding block 74 which is normally retracted, as shown.

A roll of open mesh gauze 75 is mounted upon a suitable reel 76 which is carried by the frame 77 of the super mechanism. This gauze passes between two feed rolls 78, 79, the latter being driven by means of a ratchet 80 and a spring pressed pawl 81 which is carried on an upper lever 82, which is pivotally mounted on the shaft of the roller 79, the outer end of the lever 82 being pivotally connected to a rod 83 which is adjustably connected to the end of the lever 71.

Thus it will be seen that as the rod 83 is raised, the pawl 82 will move the ratchet 80, and then as the rod 83 drops the pawl will engage the teeth of the ratchet thereby rotating the roller 79 a part of a revolution in a counterclockwise direction. Thus the gauze 75 is forced through by the feed rollers and it passes underneath a fixed block 84 which has a sharp shearing rear edge, the opposite member of the shear being carried by the block 74. Thus as the block raises it cuts off the portion 85 of the gauze 75, and the portion so severed serves as a "super". This super is then raised by the block 74, and is near the bottom of the book A a blast of air from a pipe 86, connected to a blower, (not shown) serves to lift the super 85 into contact with the glued back of the book where it adheres and is carried forward by the book. As the rods 72 and 83 then fall a new portion of the gauze is forced through to be cut to form the next super.

The book then passes on to the cover feeding and applying means G which is not shown herein in detail, but which is shown in the Bredenberg patent above referred to. The cover J is then applied as described therein, or in any other desired way, the book and cover then passing around the rounded guides 87.
As the rollers 23 strike the cam 24, the rollers ride up on the cam forcing the plates 20 outwardly and releasing the bound and covered books which drop on the delivery conveyor H, by which they are carried off.

Referring now to Fig. 2, the "gathered" but uncut and unbound books A' are carried to the chain 14 by means of a conveyor 88 which runs in timed relation to the chain 14 so that each book A' is fed to one of the chain links 14 while it is held open by the cam 24. On running off the upper end of this conveyor the book A' is positioned by the horizontal table 89 carried by the main frame at which time the roller passes off the end of the cam 24 thereby gripping the book to be bound.

This book is then trimmed by the band saw B which is driven by the pulley B' on the shaft 28 and runs over another pulley (not shown). This trimmed book is then ready to be glued as previously described. Thus it will be seen a machine is provided for applying a suitable thin glue for holding the leaves of the book, and for satisfactorily applying thereto a heavy glue which is well adapted to hold the cover of the book under conditions which will insure the two kinds of glue adhering to the book.

While we have shown and described but a single embodiment of our invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made which do not depart from the spirit and scope of the invention as disclosed in the appended claims.

We claim:

1. In a mechanism for gluing the back edges of books and the like, means for applying glue to the edges of the books, a housing through which the glued portions of the books pass, means for chilling the housing, and means for applying glue to the glued edges subsequent to chilling the same.

2. In a mechanism for gluing the back edges of books and the like, means for applying glue to the edges of the books, a housing through which the glued portions of the books pass, means for chilling the housing, and means for applying glue to the glued edges subsequent to chilling the same.

3. In a mechanism for gluing the back edges of books and the like, means for applying glue to the edges of the books, a housing through which the glued portions of the books pass, said housing having means for holding a refrigerant for chilling the glued portions, and means for applying glue to the glued edges subsequent to chilling the same.

4. In a mechanism for gluing the back edges of books and the like, means for applying glue to the edges of the books, means for scraping off excess glue, means for chilling the glued portions, and means for applying glue to the glued edges subsequent to chilling the same.

5. In a mechanism for gluing the back edges of books and the like, means for applying glue to the edges of the books, a U-shaped housing through which the glued portions of the books pass, a perforated passage communicating with said housing, and a chamber for holding a refrigerant communicating with the passage.

6. In a mechanism for gluing the back edges of books and the like, means for applying relatively thin hot glue to the edges of the books, means for simultaneously spreading the leaves at the point of application of the glue, means for applying the pressure to the sides of the book adjacent the glued portions to force the glued edges together, a housing through which the glued portions of the books pass, means for chilling the housing, and means for applying a heavier glue over the chilled glue.

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