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HARLEY C. ALGER AND PHILIP A. FRAZIER, OF CHICAGO, ILLINOIS, ASSIGNORS TO R. R. DONNELLEY & SONS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

METHOD OF BINDING BOOKS

Application filed November 26, 1928. Serial No. 321,818.

This invention relates particularly to an improved method of and apparatus 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 1,073,324, granted September 16, 1913.

Heretofore, in applying glue to the cut edges 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 edges 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 method of 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, in which—

Figure 1 is a diagrammatic plan view of a machine embodying the invention;

Fig. 2 is a side elevation of the first gluing box as viewed on the line 2 of Fig. 1;

Fig. 3 is a partial enlarged transverse section on the line 3 of Fig. 1;

Fig. 4 is a partial enlarged section on the line 4 of Fig. 1; and

Fig. 5 is a partial enlarged perspective on the line 5 of Fig. 4.

This invention is disclosed as applied to a bookbinding and covering machine of the type shown in the patent to Bredenberg No. 1,073,324, in which the books A to be bound are carried by means of a traveling chain 10 each link of which carries a clamping member 11 which is pressed toward its chain link 10 by means of a spring 12.

The chain is advanced by means of sprockets 13 and 14 which are suitably driven by mechanism as in the Bredenberg patent. The chain and sprockets move in a counterclockwise direction, and pick up the books A as they are fed to the machine at the right-hand end. These books are of the type commonly used as telephone directories, mail order house catalogues, and the like, wherein the signatures are received in bundles from the gathering machine, each bundle being the pages necessary for one book.

The mechanism for trimming the back of these signatures, while held firmly gripped by the clamping members 10 and 11 of the chain, forms no part of the present invention, and consequently is shown only diagrammatically at B.

Briefly, the description of the present invention is this; the signature A having been trimmed on the back by the trimmer B passes over gluing mechanism C in which a coating of thin and preferably hot glue, or the like, is applied to the trimmed back edges of the sheets in such a way as to cause this thin glue to work its way a short distance up between each of the adjacent sheets. This thin glue and the adjacent portion of the book is now thoroughly chilled by passing it through a housing D which is cooled by means of carbon dioxide snow, or the like, after which a heavy glue is applied over the chilled thin glue by means of gluing mechanism E. This thorough chilling of the thin glue makes it possible for the heavy glue to adhere thereto.

To repeat in more detail, the gluing mechanism C consists of a glue pot 15 containing glue into which dip two reversally angled spiral gear members 16 and 17, both of which are set at an angle to the direction of the travel of books A. These gears are driven by mechanism not shown, the angle of the spiral teeth at the point of contact with the books being substantially that of the leaves of the books, so that the teeth have a wiping action directly across the book while the book is continuously fed forward. This has a tendency to spread the leaves of the book at the bottom as shown by means of dotted lines A' (Fig. 3). At the same time this wiping

action of the spiral gears 16 and 17 assists greatly in working the thin glue up between the edges of the leaves which are thus temporarily spread.

5 As the book advances, it passes over a felt gluing roller 18 which gives the book another coating of the same thin glue, the book then passing on between the lateral pressing rollers 19 and 20, which are shown in Figs. 1, 2
10 and 3. A scraper 21 serves to scrape off any excess of glue and to return it to the glue pot 15 which is suitably heated to the desired temperature.

After leaving the scraper 21, the books A
15 pass through the housing D where the lower glued portion of the book is thoroughly chilled. The housing D consists of a box which is semi-circular in form as it is placed beneath the chain at the point where it passes
20 around the sprocket 13. This box 22 which is illustrated as U-shaped in the cross section has an upper compartment 23 and a lower compartment 24 separated by means of a horizontal partition 25, in which are placed
25 a series of holes 26 connecting the compartments. The lower compartment 24 connects through a passage 27 with a receptacle 28 which is adapted to hold a quantity of carbon dioxide snow, or the like 29, the receptacle 28 having a removal cover 30.

The receptacle 28 has a tube 31 leading thereto for the circulation of air. As air enters the tube 31 it passes down through the carbon dioxide snow 29, thereby evaporating
35 a small quantity of the snow and chilling the air to a point in the neighborhood of -100° F. This chilled air then slowly passes around through the compartment 24 and up through the openings 26 to the upper compartment 23.
40 Being chilled as it is, it is much heavier than the surrounding air and consequently flows by gravity through the upper compartment 23, and gradually passes out into the surrounding atmosphere. During the time, however, that it is in the upper compartment 23
45 it comes in contact with the lower glued portion A² of the book A, and the glued portion emerges from the lower right-hand end of the compartment 23 chilled to a point where
50 a heavy glue suitable for holding the cover can then be applied thereto. The chilling means D may be dispensed with under certain circumstances, such as when sufficient time is allowed to permit some of the moisture of the
55 thin glue to be absorbed by the sheets of the book, thereby automatically thickening the glue on the book before the next gluing roll is reached. In either case the thickening of the first thin glue is desired.

60 One or more gluing rollers 32 are mounted in any well known manner in the glue pot E which serve to spread a thicker and cooler glue upon the previously glued back of the book than that supplied by the glue pot C.
65 After passing the glue pot E, the book passes

over the mechanism F where a suitable "super" is applied to the glued back, after which the book passes over the glue pot G where a third gluing of the back is effected. If desired, this may be even heavier glue than
70 that supplied by the glue pot E.

Following this, another "super" feeding mechanism H applies another "super" to the back of the book, after which the book passes on to the mechanism J where a cover is applied and pressed firmly into place thereby
75 forcing the glue through the supers and insuring a good bond between the leaves of the book, the supers and the cover. Applying the super in this way to the first glue helps to thicken it and to hold the second application of a thicker glue. This is true also of the second super, the glue in this case being made progressively thicker. If desired, the glue
80 pot E may be omitted, the super feeder F following the first gluing operation with means for thickening the first glue as described.

After passing the cover-applying means J, the book is advanced until it is immediately over the rack K when it is released from the
85 chain clamps 10 and 11 and dropped upon the rack. Thus it will be seen that a simple and effective means is provided whereby the leaves at the back of a book are thoroughly glued together under conditions which make for the strongest bond between adjacent leaves of the book, and at the same time a means is supplied for applying to the previously glued
90 portion a heavier glue which is suitable for holding the "super" and cover on the book.

The word "glue" as used in this specification is intended to cover generically all adhesives applicable to this purpose.

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.
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We claim:

1. The method of binding books comprising applying a relatively thin glue to the back of the book, chilling said back and glue, and applying a coating of heavier glue to the
105 back after the first glue is chilled.

2. The method of binding books comprising applying a relatively thin glue to the back of the book, scraping off the excess glue, thickening said glue, and applying a coating
120 of heavier glue to the back after the first glue is thickened.

3. The method of binding books comprising applying a relatively thin glue to the back of the book, simultaneously spreading the
125 leaves at the point of application of the glue, thickening said glue, and applying a coating of heavier glue to the back after the first glue is thickened.

4. The method of binding books comprising

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ing applying a relatively thin glue to the back of the book, simultaneously spreading the leaves at the point of application of the glue, pressing the edges of said leaves inwardly, chilling said back and glue, and applying a coating of heavier glue to the back after the first glue is chilled.

5. The method of binding books comprising applying a relatively thin glue to the back of the book, chilling said back and glue by means of carbon dioxide snow, and applying a coating of heavier glue to the back after the first glue is chilled.

6. The method of binding books comprising applying a hot relatively thin glue to the back of the book, thickening said glue, and applying a coating of heavier glue to the back after the first glue is thickened.

7. The method of binding books comprising applying a relatively thin glue to the back of a book, removing excess glue, and subsequently applying a coating of heavier glue to the back.

8. The method of binding books comprising applying a relatively thin glue to the back of a book, removing excess glue, subsequently applying a coating of heavier glue to the back, and spreading the leaves at the point of one of said applications of glue.

9. The method of binding books comprising applying a relatively thin glue to the back of a book, removing excess glue, subsequently applying a coating of heavier glue to the back, spreading the leaves at the point of one of said applications of glue, and pressing the edges of said leaves together.

10. The method of binding books comprising applying thin glue to the back of a book, and subsequently applying a coating of heavier glue to the back.

11. The method of binding books comprising applying a thin glue to the back of a book, subsequently applying a coating of heavier glue to the back and spreading the leaves at a point in one of said applications of glue.

12. The method of binding books comprising applying a thin glue to the back of a book, subsequently applying a coating of heavier glue to the back, spreading the leaves at a point in one of said applications of glue, and pressing the edges of said leaves together.

In testimony whereof, we have hereunto set our hands this 23d day of November, 1928.

HARLEY C. ALGER.
PHILIP A. FRAZIER.