

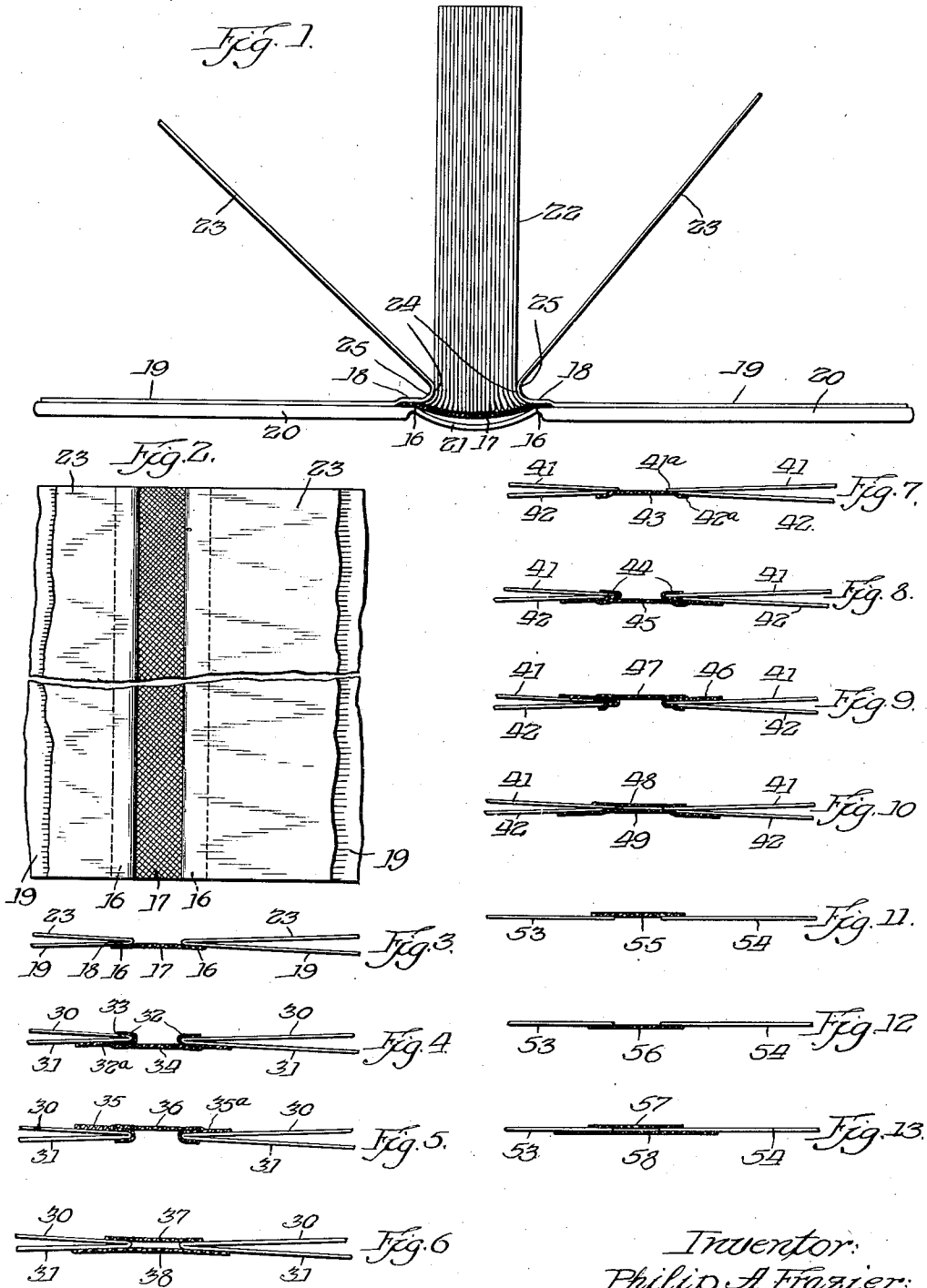
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METHOD OF BINDING BOOKS

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METHOD OF BINDING BOOKS

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This invention relates to bookbinding and more particularly to a continuous method of fabricating a machine-made book.

In building a book it is the contemporary practice to attach a super or liner and sometimes a headband to the back of a group of signatures including end sheets tipped or pasted to the first and last signature, after the signatures have been gathered, stitched, rounded and backed, and before being "cased in" or enclosed in covers.

The groups of signatures comprising the book first are arranged in proper order after end sheets have been tipped to the first and last signature. The stacked signatures are then "smashed" to flatten the group and bound together in any suitable fashion; for example, they may be patent bound, secured by side sewing or by the Smythe sewer. The signatures are then glued in bunches and dried. During the drying operation the plurality of signatures forming a single book are separated manually. The books are trimmed to size and rounded and backed, that is, the front and rear edges are shaped and a joint is formed adjacent the rear edge by compressing the sides of the books between jaws.

The books then go to a "lining up" machine which again glues the backs of the signatures and secures a super or lining strip thereon. The super may be composed of a single strip or a plurality of strips of the same or different material. In some instances headbands are secured to the top and bottom edges of the back of the signature group. When the glue has dried, the books are put through a "casing in" machine which pastes the outer pages of the end sheets and applies a prepared casing to the books. The casing usually comprises a pair of boards the outer sides of which are enclosed in covering material. The book is secured to the casing by pasting the end sheets to the inner sides of the cover board. The casings are then pressed to conform with the joint along the inner edge of the signatures.

For carrying out these operations, several pieces of machinery are employed. These are: first, a gathering machine; the next machine is a sewing machine; the next is a trimming machine; then a rounder and back; a super and liner machine or device and a headband machine if the books are to be provided with a headband; and next, a "casing-in" machine. The operation of these machines is not continuous in that the signatures or books are manually passed from one machine to the other, and, since the machines do not operate at the same rate, there is an accumula-

tion of books at various points in the assembling operation.

Furthermore, the several gluing and drying steps are necessarily slow and costly, since the books must be handled frequently and allowed to dry prior to proceeding with the next step in their assembly. The maximum output of any of the contemporary methods is forty books per minute.

An object of the present invention is the provision of a continuous method of fabricating machine-made books.

A further object is the provision of a method of binding machine-made books that is speedier and less expensive than the contemporary methods and produces durable books of the conventional type.

A further object of the invention is the provision of a method of fabricating books in which the end sheets are joined by a "super" or strip of reinforcing material before the end sheets are fastened to the assembled signatures.

A further object of the invention is the elimination of one gluing operation by the application of the reinforcing material concurrent with the first gluing operation.

A further object is the elimination of the pasting operation of glued bunches of books by gluing them individually and applying a covering so that they may proceed to the next operation immediately.

A further object is the elimination of the pasting operation of glued bunches of books by gluing them individually and applying a covering so that they may be stacked for the next operation without adhering to each other.

A further object of the invention is the provision of reinforcing material secured to the back of the assembled signatures and adapted to stretch when the signatures are rounded and backed.

The invention will be readily understood from the following description in conjunction with the accompanying drawing, in which:

Fig. 1 is an end view of a book fabricated in accordance with the improved method;

Fig. 2 is a broken, fragmentary plan view of end sheets joined by a super in accordance with the improved method;

Fig. 3 is an end view of end sheets joined by a super;

Figs. 4 to 10, inclusive, are end views of modified forms of joining four-page end sheets with supers; and

Figs. 11 to 13, inclusive, are end views of modi-

fied forms of joining two-page end sheets with supers.

In accordance with the improved method of fabricating a book herein described, the signatures comprising the book are gathered and smashed in the conventional manner except that end sheets are not tipped to the first and last signatures. The signatures may be stitched by sewing machines or secured together by the so-called "patent binding" as is customary. If the signatures are side-sewed or Smythe sewed, they must be removed from the line, as this method is slower than the "patent binding." Concurrently with the gathering and sewing steps, end sheets are joined together by a strip of reinforcing fabric. The reinforcing material or super is preferably formed of closely woven textile fabric in sheet form with the warp and woof arranged angularly with relation to the length of the strip, so that this backing is possessed of the desired flexibility and distensibility, for reasons hereinafter stated. As shown in Figs. 1, 2 and 3, wherein a four-page end sheet is employed, a portion 16 of the super 17 extends somewhat beyond the fold of the end sheets and is glued to the under edge portion 18 of the outer end sheet 19. Prior to the gluing step the end sheets are spaced apart in parallel arrangement the width of the back of the signatures. An additional strip of lining material may be secured to the reinforcing strip 17 if desired, but in most instances it is not deemed necessary, since the reinforcing strip is formed of strong fabric. The end sheets joined in the manner indicated are then applied as a unit to the back of the signatures. Glue is applied to the back of the group of signatures and the lining strip secured thereto. The back longitudinal edge portions of the first and last pages of the group of signatures are likewise glued to the inner edge portion 24 of the inner end sheet 23. The book comprising the signatures and end sheets joined by the reinforcing strip is then passed through a trimming machine, where the pages are cut to size, and is then rounded and backed, that is, the front edges of the sheets are curved and a joint 25 is formed along the back edge by compressing the sides of the book between jaws. In forming the joint, the back of the book is distended, increasing its width; by cutting the reinforcing strip 17 along the bias, the reinforcing strip may be distended sufficiently during the backing step to avoid tearing.

It should be noted that the reinforcing material or liner is applied to the book without smashing it. When the book is compressed between the jaws of the backer, the reinforcing material tends to prevent compression of the back of the book, leaving the back of the book full and rounded suitable for the formation of the joint.

The book then passes to a "casing-in" machine where it is inserted and secured to a previously prepared casing comprising cover boards 20 enclosed in covering material 21. The book is secured to the casing by pasting the outermost face of the end sheet 19 to the inner side of the cover boards 20. If headbands are desired they may be secured to the book, prior to the casing-in step.

It is to be understood that the method is continuous in that the signatures pass from a gathering machine to a sewer, an end-sheet applying machine, a trimmer, a rounder and backer and a casing-in machine. Frequent handling and accumulation of books in piles between steps as in the contemporary practice is avoided, since the books move continuously from one machine to

the next without handling. However, if the signatures are sewed, the books are removed from the line, since this method of binding is slower than the step of patent-binding.

In Fig. 1 a book fabricated in accordance with the improved method is shown. The book comprises a group of signatures 22 sewed together, four-page end sheets 19 and 23 joined together by reinforcing strip 17, and a casing including cover boards 20 and a covering fabric 21.

Figs. 4 to 6, inclusive, illustrate different forms of uniting four-page end sheets by means of a super to form a "closed" joint. Throughout the Figures 4 to 6 the inner and outer end sheets will be designated by the reference characters 30 and 31, respectively. In Fig. 4 strips 32 of reinforcing material are bent over the folded edge 33 of the end sheets in a U-shaped manner and are adhesively secured to the edge portion of the end sheets. This strip 32 is preferably formed of a strip of tape having pressure or heat sensitive adhesive on one surface. Any strip of sheet material, however, may be employed and the adhesive applied thereto immediately prior to securing the strip to the end sheet. In this manner a very strong and durable junction is formed between the end folds of the end sheets and the super 34 adhesively secured to the lower surface 32a of the folded strip 33.

In Fig. 5 reinforcing strips 35 are likewise folded in a U-shaped manner over the folded edges of the end sheets and adhesively secured to the outer surfaces thereof. In this form, however, the super 36 is adhesively secured to the upper surface 35a of the reinforcing strips 35.

In the embodiment of Fig. 6 reinforcing strips or supers 37 and 38 are adhesively secured to the inner and outer pages of the end sheets 30 and 31, respectively, joining the opposed end sheets in spaced relation. A particular advantage of the construction shown in Figs. 5 and 6 is that the inner end sheet 30 is reinforced along the portion where the groove 25 or hinge is formed.

Figs. 7 to 10, inclusive, illustrate an open joint end sheet construction. In this construction the inner and outer end sheets are formed of separate sheets 41 and 42, respectively, and the inner edge 41a of sheet 41 slightly overlies the inner edge 42a of the outer sheet 42. In Fig. 7 the reinforcing strip 43 is adhesively secured to the inner edge portions of the outer surfaces of sheets 41 and 42, disposed in spaced relation.

In Fig. 8 U-shaped reinforcing strips 44 are folded over the inner edge of the sheets 41 and adhesively secured to the portions of the sheets adjacent to the inner edge. The super 45 is shown glued to the outer surface of sheet 42 and to the lower surface of the reinforcing strip 44.

In Fig. 9 U-shaped reinforcing strips 46 are folded over the inner edge of sheets 41 and are adhesively secured to the portions of the sheets 41 and 42 adjacent to their inner edge. A super 47 joining the opposed pair of end sheets in spaced relation is adhesively secured to the U-shaped strip 46 along its inner, upper edge portion.

In Fig. 10 the spaced pairs of end sheets 41 and 42 are secured by a pair of supers 48 and 49. Super 48 is glued to the inner edge portions of the inner surface of end sheets 41 while super 49 is glued to the inner edge portion of the lower surface of sheets 42.

Figs. 11 to 13, inclusive, illustrate a construction employing two-page end sheets. In Fig. 11 end sheets 53 and 54 are held in spaced relationship by a reinforcing strip 55 glued to the inner

edge portions of their inward surface. In Fig. 12 the reinforcing strip or super 56 is adhesively secured to the edge portions of the outer surface. In Fig. 13 the end sheets are maintained in spaced relationship by reinforcing strips 57 and 58, the reinforcing strip 57 being glued to the edge portions of the inner surface of the sheets, and the strip 58 being glued to the edge portions of the outer page of the sheets.

It will thus be seen that a very marked advantage of the improved method of fabricating machine-made books is that it is continuous and fast, avoids accumulating books in piles between the several steps in contemporary methods, and eliminates one gluing operation. It has been found that by employing the improved method as many as 2,000 books can be fabricated in an hour.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitation should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

I claim:

1. The method of fabricating a book, which comprises securing a strip of reinforcing material to the inner margins of a pair of spaced end sheets and then gluing said reinforcing strip to the back of a group of bound signatures, and then trimming, rounding, and backing said signatures.

2. The method of fabricating a book, which comprises gathering a predetermined group of signatures, sewing said group of signatures together, joining a pair of end sheets spaced apart the width of the back of said group of signatures by adhesively applying a liner to the inner margins of said end sheets, securing said liner to the back of said signatures and the inner margin of said end sheets to the first and last pages of said group of signatures by means of adhesive, then trimming, rounding and backing said group of signatures and pasting the outer surfaces of said end sheets to the inner surfaces of a casing.

3. The method of fabricating a book, which comprises gathering a group of signatures, sewing said signatures, adhesively attaching the inner margins of a pair of end sheets joined by a reinforcing strip to the inner margins of the first and last pages of said group of signatures and adhesively securing the said strip of reinforcing material to the back of said group of signatures, trimming said book, rounding and backing said book and pasting the outer pages of said end sheets to the inner surfaces of a preformed book casing.

4. The method of fabricating a book, which comprises gathering a predetermined group of signatures, sewing said signatures, joining a pair of end sheets spaced apart the width of the back of said group of signatures by securing a super to the inner margins of said end sheets by means of adhesives, gluing said super to the back of said group of signatures, trimming said book, rounding and backing said book and adhesively securing the outer pages of said end sheets to the inner surfaces of a preformed book casing.

5. In a method of bookbinding, the steps comprising folding reinforcing strips over the inner edges of a pair of end sheets, adhesively securing said strips to the inner margins of said end sheets, joining said end sheets in predetermined spaced apart relationship by adhesively securing a super to the inner margins of said end sheets securing

said super to the back of a group of gathered signatures, and then trimming and backing said book.

6. In a method of bookbinding, the steps comprising folding reinforcing strips over the inner edges of a pair of spaced end sheets, adhesively securing said strips to the inner margins of said end sheets, joining said end sheets by adhesively securing a super to the inner margins of said end sheets and the outer portions of said reinforcing strips securing said super to the back of a group of gathered signatures, and then trimming and backing said book.

7. In a method of bookbinding, the step of joining four-page end sheets, comprising adhesively securing a liner to the inner margin of the inner pages of said end sheets in a predetermined spaced apart relationship, adhesively securing a liner to the inner margins of the outer pages of said end sheets in said spaced relation, securing said liner to the back of a group of gathered signatures and then trimming and backing said book.

8. In a method of bookbinding, the steps of joining a pair of spaced end sheets, which comprise folding strips of reinforcing material over the inner folds of said end sheets, adhesively securing said strip to the inner margins of said end sheets, joining said end sheets by adhesively securing a liner to the inner portions of said reinforcing strips, and then securing said liner to a group of bound signatures.

9. In the method of fabricating a book, the steps which comprise joining a pair of spaced end sheets by adhesively securing a super formed of closely woven fabric cut along the bias to the inner margins of said end sheets, gluing said super to the back of a group of bound signatures, and then trimming, rounding and backing said group of signatures.

10. The method of fabricating a book, which comprises gathering a group of signatures, sewing said group together, joining a pair of spaced end sheets by adhesively securing a super to the inner margin of the inner pages of said end sheets and adhesively securing a second super to the inner margin of the outside pages of said end sheets, gluing said super to the back of said signatures to form a book, trimming said book, forming a joint in said book along the reinforced portions of said inner end sheets, and pasting the outer pages of said end sheets to the inner surfaces of a preformed casing.

11. The method of fabricating a book, which comprises gathering a group of signatures, sewing said signatures into book form, joining a pair of spaced end sheets by adhesively securing a super to the inner margin of the inner pages of said end sheets, thereby forming reinforced margins on said inner pages of said end sheets, gluing said super to the back of said book, trimming said book, forming a joint in said book along said reinforced margin of said end sheets, and pasting the outer pages of said end sheets to the inner surfaces of a preformed casing.

12. The method of fabricating a book, which comprises first forming a unitary bookbinding element by adhesively securing the end sheets intended for the respective sides thereof to reinforcing material, said reinforcing material including a portion adapted to extend across the back of said book between said end sheets, thereafter adhesively securing said described portion of reinforcing material to the back of a group of bound signatures, then folding said end sheets

to lie flat against the sides of said book, and then trimming said book.

13. The method of fabricating a book, which comprises first forming a unitary bookbinding element by securing the end sheets intended for the respective sides thereof to reinforcing material, said reinforcing material including a portion adapted to extend across the back of said book between said end sheets, said portion being made of bias-cut cloth, thereafter adhesively securing said described portion of reinforcing material to the back of a group of bound signatures, and then trimming and backing said book.

14. The method of fabricating a book, which comprises first forming a unitary bookbinding element by adhesively securing the end sheets intended for the respective sides thereof to reinforcing material, said reinforcing material including a portion adapted to extend across the back of said book between said end sheets, said portion being made of extensible material, thereafter adhesively securing said described portion of reinforcing material to the back of a group of bound signatures, then backing said book.

15. The method of fabricating a book, which comprises first forming a unitary bookbinding element by adhesively securing the end sheets intended for the respective sides thereof to reinforcing material, said reinforcing material including a portion adapted to extend across the back of said book between said end sheets, said portion being made of extensible material, thereafter

coating the back of a group of bound signatures with glue, then adhering said described portion of the reinforcing material to the glued back of the bound signatures, then folding said end sheets to lie flat against the sides of said book, and then immediately backing said book.

16. The method of fabricating a book, which comprises first forming a unitary bookbinding element by adhesively securing the end sheets intended for the respective sides thereof to reinforcing material, said reinforcing material including a portion adapted to extend across the back of said book between said end sheets, said portion being made of extensible material, and then binding said book by carrying out consecutively the following steps: coating the back of a group of bound signatures with glue, adhering the described portion of reinforcing material to said back of said group of bound signatures, folding said end sheets to lie flat against the sides of said group of bound signatures, trimming said book before rounding and backing said book and thereafter casing in said book.

17. In a method of bookbinding, the steps comprising spacing the inner edges of the end sheets of a book the width of the back of said book from each other, securing a super to the inner margins of said spaced end sheets, securing said super to the back of a group of gathered signatures, and then trimming and backing said book.

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