

Dec. 14, 1948.

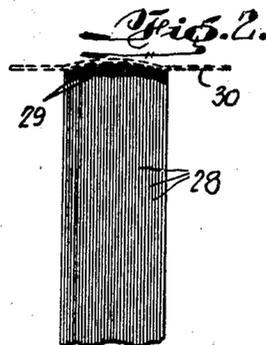
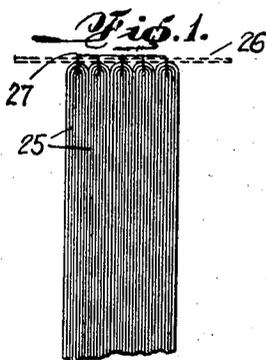
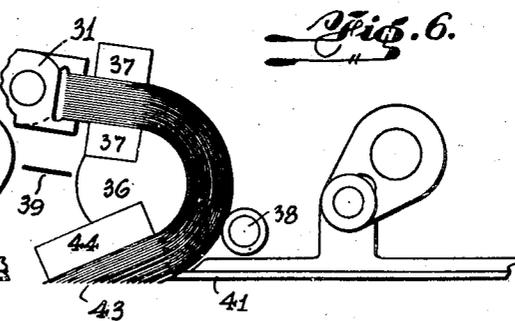
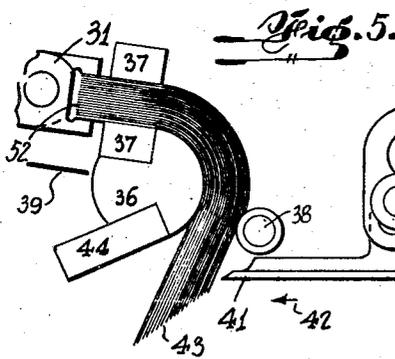
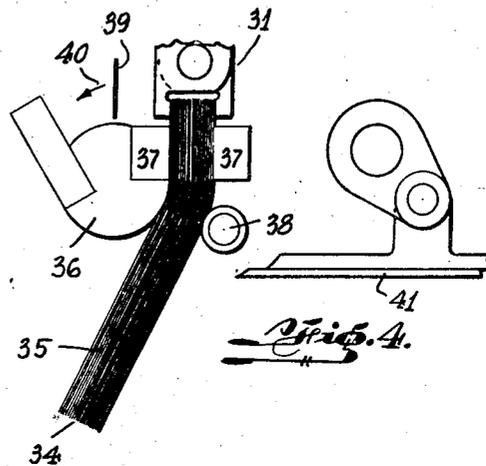
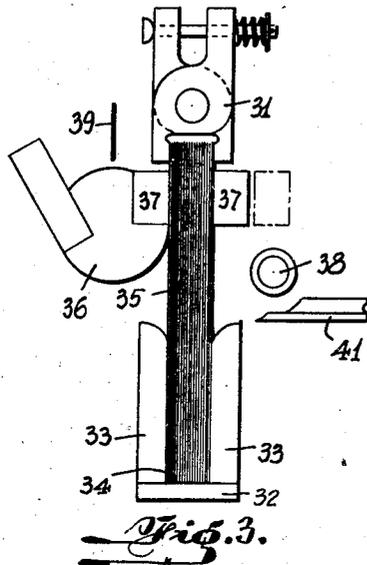
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2,455,971

BOOKBINDING AND METHOD OF PRODUCING THE SAME

Filed Nov. 4, 1947

3 Sheets-Sheet 1



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2,455,971

BOOKBINDING AND METHOD OF PRODUCING THE SAME

Filed Nov. 4, 1947

3 Sheets-Sheet 2

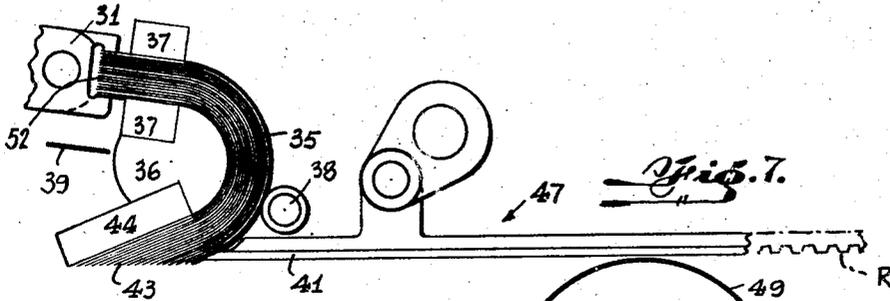


Fig. 7.

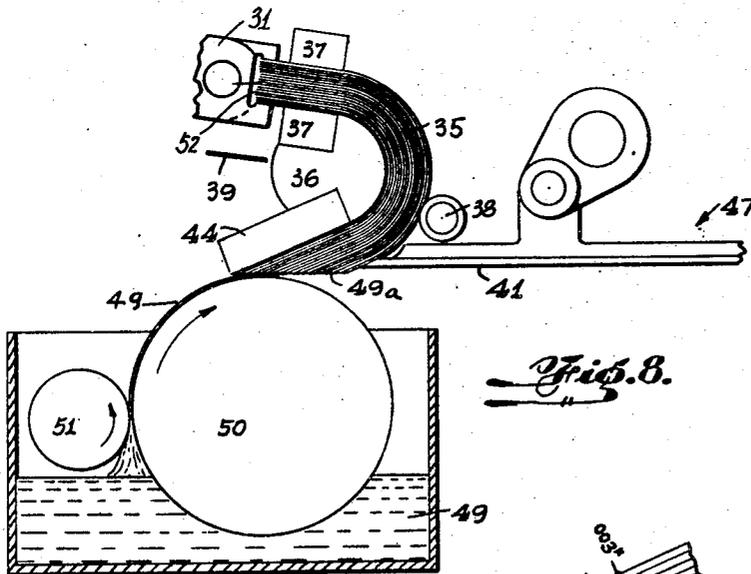


Fig. 8.

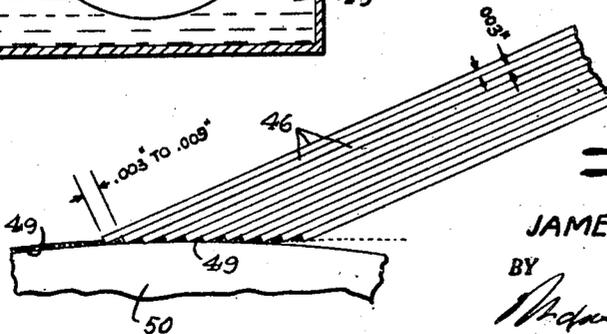


Fig. 9.

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BOOKBINDING AND METHOD OF PRODUCING THE SAME

Filed Nov. 4, 1947

3 Sheets-Sheet 3

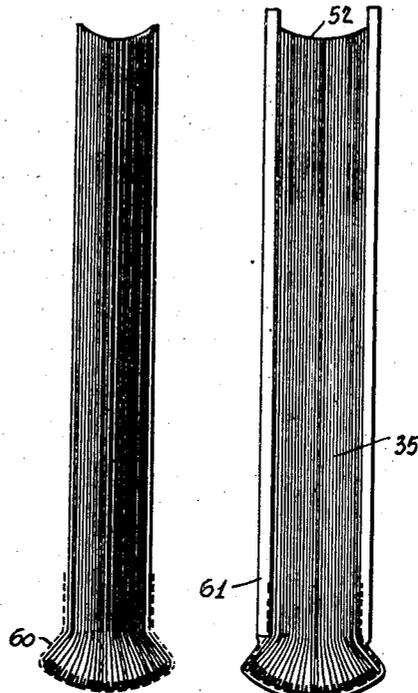
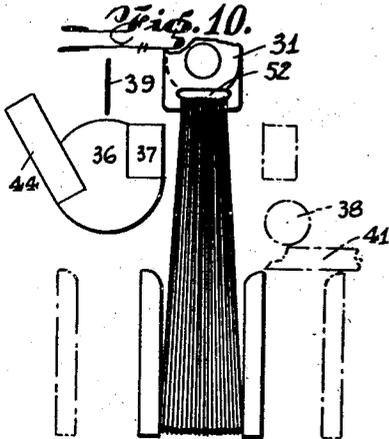
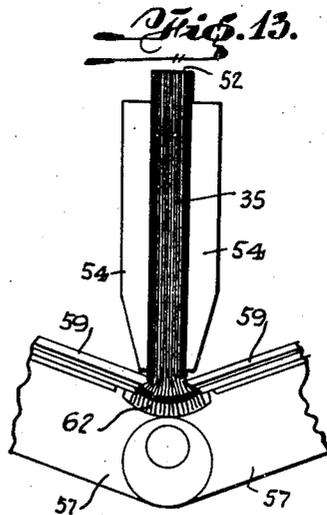
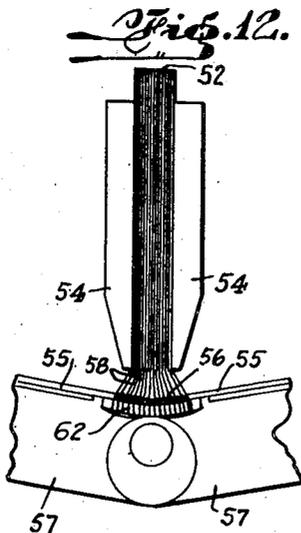
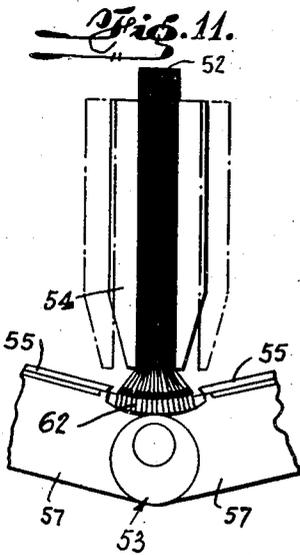


Fig. 14. *Fig. 15.*



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UNITED STATES PATENT OFFICE

2,455,971

BOOKBINDING AND METHOD OF PRODUCING THE SAME

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Application November 4, 1947, Serial No. 783,974

5 Claims. (Cl. 11-1)

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This invention relates to improvements in the manufacture of books.

The manufacture of books has in its essence not been changed since the first book of the present day type was produced. The manufacture of books, as we know it today, requires many operations done mechanically, with manual operations in between the various manufacturing steps.

The present day customary steps in the manufacture of books are the collecting of signatures, sewing them together through the back fold, placing the sewn-together book in a press. Now the sides are trimmed or sheared to the size of the book. The book is now inserted into a rounding and backing machine after the book has been previously glued at the back. This dried glue will act as a lubricant for the forming plates during the rounding process. Back strips of fabric, called crash, are now applied together with head bands and the backing kraft paper. The book is now ready for insertion into the casing. There are many costly and time-consuming operations needed between these various steps. The various partly-completed books have to be stacked on trucks for delivery, within the plant, to the next operating machine.

It is a purpose of this invention to produce a book, which will consist of single sheets rather than signatures, which can be manufactured in a machine in a continuous process.

It is a still further object of this invention to provide a machine, which will securely grip all the pages needed for the book, turn the pages over a mandrel, thus exposing the back surfaces of each page about one to three times the paper thickness, and apply glue thereto.

Still another object of this invention is to provide a book which may be economically manufactured, and the back of which cannot readily be broken to produce an unsightly condition as is liable to happen with present books.

It is a still further object of this invention to apply the glue between the pages and at the edges thereof, instead of to the outside back thereof only, as at present with cheap books, such as catalogues, phone books, etc., therefore adapting this process to any standard, expensive book as well.

This application is intended to cover a method of bookbinding, the general principles of means for producing the same, and a produce produced thereby.

It is intended that a further application for patent be filed covering the complete machine in

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detail for producing such bookbinding, therefore all figures in the drawings herein depicted are only diagrammatical.

The aforesaid purpose and objects will be accomplished by new method and means in which the individual pages of the book are, at the back thereof, moved from one to three times the thickness of the paper, in relation to each sheet, at which time glue is applied and the sheets are returned to their normal relation to each other.

Thus, glue is actually placed between the sheets instead of on the surface only.

It is a further object of the present invention to provide a method of bookbinding by applying a flexible glue between each sheet of a stack of sheets at a marginal edge thereof while said edges are maintained in a straight line and separated from one another to the extent of from one to three times the thickness of each sheet, a further object being to provide the means for arranging the edges of said stack in a straight line with the sheets separated from one another to the extent of from one to three times the thickness of each sheet, and for applying the flexible adhesive between each sheet of the stack of sheets at a marginal edge thereof.

It is a further purpose of this invention, also, to produce a book in a continuous process from the commencement of the binding operation to the time the book is ready for its cover.

It is a still further object of this invention to do away with the process of sewing the various signatures.

An even further object of this invention is to produce a book from pages or from signatures, in a novel, practical and economical manner.

These and other objects and advantages of the invention and the means for their attainment will be more apparent from the following detailed description taken in connection with the accompanying drawings illustrating one embodiment by which the invention may be realized and in which:

Fig. 1 is a diagrammatic view of the present conventional back;

Fig. 2 is a diagrammatic view of the back of a book produced in accordance with this invention;

Fig. 3 shows the pages inserted in the clamping and gauging carriage;

Fig. 4 shows the press roll applied to the sheets, pressing sheets to the form roll;

Fig. 5 shows the mechanism and roll in its final position;

Fig. 6 shows the mechanism with the press plate in position;

Figs. 7 and 8 show the gluing roller applied to the back edge of the books;

Fig. 9 is an enlarged diagrammatic view of the glue roller, with glue, against the paper edges;

Fig. 10 is a diagrammatic view of the pages of the book in the clamping machine;

Fig. 11 is a diagrammatic view of the back-forming mechanism in its first operation;

Fig. 12 is a diagrammatic view of the back-forming mechanism in a successive operation;

Fig. 13 is a diagrammatic view of the back-forming mechanism in a still further and final operation;

Fig. 14 is an end view of a book, produced in accordance with the invention, when ready for the cover; and

Fig. 15 is an end view of a book, produced in accordance with the invention, inserted in its cover.

Fig. 1 illustrates diagrammatically a conventional method of the better type of manufacturing books and Fig. 2 illustrates diagrammatically a type of binding according to the invention. In Fig. 1, the signatures 25 are sewed to each other and secured to a strip of cotton crash 26 by means of the stitches 27. Glue is applied after the sewed book is placed in a press (not shown). Fig. 2 shows the individual sheets 28, glued together as at 29 and glued to a strip of cotton crash 30. The invention disclosed herein in its principle, covers the application of glue between each page to about the depth of one to three thicknesses of the paper. For this purpose the printed sheets are arranged in sequence and secured at their front ends by a clamp 31. Three sides of the book are now trimmed. The rear edges 34 of the sheets are now placed against a gauge plate 32 within the guide plates 33. This operation of gauging the lengths of the pages from the clamp 31 is very important and must be accurate. The pages of book 35 are now clamped against the forming roll 36 by means of the clamps 37. A roll 38 is now brought into contact with the pages 35 and pressed against them. A so-called index lever 39 is now turned in the direction of the arrow 40 to a predetermined position, shown in Fig. 5. A press-plate 41 is now applied in the direction of the arrow 42, causing a face of the book 35 to be pressed against the backing plate 44. The press-plate 41 is moved, for example, by a rack R (Fig. 7) and gear arrangement, not shown. Referring now to Figs. 7, 8 and 9, the edges 43 of the book 35 are now separated, as previously mentioned, anywhere from one to three thicknesses of the individual sheets 46 (Fig. 9). The carriage 47 with the book 35, press-plate 41, forming roll 36, etc., is now moved over a glue-pot 48, containing a flexible glue or adhesive 49. A glue roller 50 will carry the glue 49a up, towards and between the passing edges 43. The thickness of the glue to be applied is controlled by a doctor roll 51. After the glue has been applied, the steps herein described are reversed. The press-plate 41 is removed from the book 35, the index lever 39 is moved back to original position shown in Fig. 3. The book 35 is now removed from the gluing carriage 47. The edge 52 is now trimmed and the book 35 is inserted into a back-rounding apparatus 53 (Figs. 11 to 13) and secured by means of clamps 54. Plates 55 are applied at this time to the glued edge 56. Forming jaws 57 are now moved several times so as to deform the sheets 58 between the clamps

54 and the dipped end 56. This moving of the jaws 57 is done increasingly until the glued edge 56 is given a rounded form. A secondary hammer plate 59 is now brought into vibrating contact with the book 35 through a space between the glued edges and the clamps 54. After the desired shape has been obtained, the book 35 is removed from the rounding apparatus 53 and the book is now completed in the conventional manner by applying glue to the back of the book, applying crash book lining 60 and head bands, and inserting the book 35 into a premade casing 61.

It is evident, that this method herein described was invented for the purpose of complete mechanization, in a continuous manner, for the economical fabrication of books. The features of the machine itself will be incorporated in a separate application.

Although the drawings and the above specification disclose the best modes in which I have contemplated embodying my invention, I desire in no way to be limited to the details of such disclosure, for in the further practical application of my invention many changes in the forms and proportions may be made as circumstances require or experience suggests without departing from the spirit of the invention within the scope of the appended claims. More particularly, as suggested above, the herein described method of bookbinding may be applied to stacked signatures rather than to stacks of individual sheets.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A method of bookbinding which comprises the steps of assembling sheets in a predetermined order to form a stack, clamping said stack adjacent one edge thereof, trimming at least the edge of said stack opposite said one edge, clamping a part of the stack adjacent the clamped edge thereof against a forming device, pressing the unclamped portion of the stack against said forming device, bending the unclamped portion of the stack by turning a portion of said forming device about an axis parallel to said one edge, whereby marginal portions of said sheets along said opposite edge will be exposed, pressing said stack in proximity to said exposed marginal portions against a pressure plate, mechanically applying a predetermined layer of adhesive to said marginal portions, and returning the stack to its original, straight condition.

2. A method of bookbinding which comprises the steps of assembling signatures in a predetermined order to form a stack, clamping said stack adjacent one edge thereof, trimming at least the edge of said stack opposite said one edge, clamping a part of the stack adjacent the clamped edge thereof against a forming device, pressing the unclamped portion of the stack against said forming device, bending the unclamped portion of the stack by turning a portion of said forming device about an axis parallel to said one edge, whereby marginal portions of said signatures along said opposite edge will be exposed, pressing said stack in proximity to said exposed marginal portions against a pressure plate, mechanically applying a predetermined layer of adhesive to said marginal portions, and returning the stack to its original, straight condition.

3. A method of bookbinding which comprises the steps of assembling signatures in a predetermined order to form a stack, clamping said stack adjacent one edge thereof, trimming the remaining edges of said stack to form sheets, in-

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serting said stack into a forming device, clamping a part of the unclamped portion of the stack against said forming device, pressing the unclamped portion of the stack against said forming device, bending the unclamped portion of the stack by turning a portion of said forming device about an axis parallel to said one edge, whereby marginal portions of the sheets along said opposite edge will be exposed, pressing said stack in proximity to said exposed marginal portions against a pressure plate, mechanically applying a predetermined layer of adhesive to said marginal portions, unclamping said stack, and returning the stack to its original, straight condition.

4. An apparatus for binding stacked sheets or signatures, comprising a cylinder, clamping means extending longitudinally of said cylinder and adapted to secure a stack to said cylinder, a backing plate having a surface substantially flush with the periphery of said cylinder and extending tangentially therefrom, a pressure roller parallel to and spaced from said cylinder, said roller being displaceable in a direction toward said cylinder for engaging a clamped stack at points intermediate said clamping means and said backing plate, actuating means for rotating said cylinder about its axis, and a pressure member displaceable toward said backing plate, said pressure member being positioned so as to engage the forward portion of a clamped stack opposite

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said backing plate after rotation of said cylinder by a predetermined angle, whereby to clamp said portion between said backing plate and said pressure member.

5. An apparatus according to claim 4, further comprising a carriage supporting said pressure member, said roller and said cylinder, and adhesive mechanical applicator means adapted to apply an adhesive to an exposed edge of said forward portion of the stack clamped between said pressure member and said backing plate, said carriage and said applicator means being displaceable relative to each other.

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