Oct. 16, 1934. P. A. FRAZIER 1,976,845

STITCHLESS BOOK

Filed July 11, 1932 2 Sheets-Sheet. 1

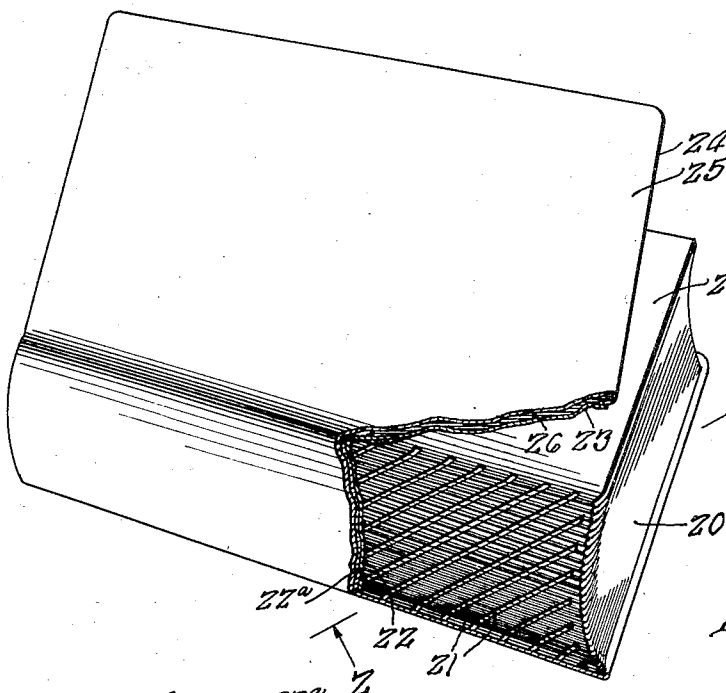


Fig. 1

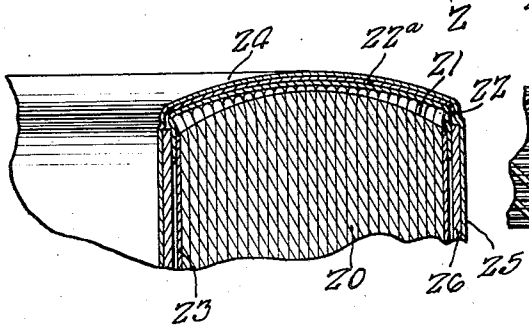


Fig. 2

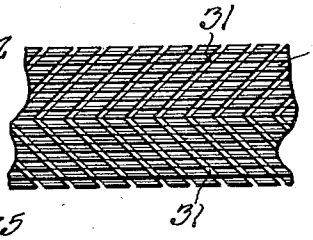


Fig. 4

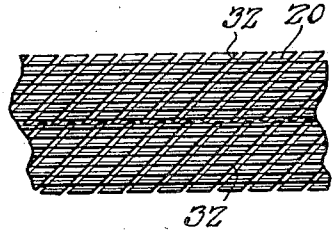


Fig. 5

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STITCHLESS BOOK

Filed July 11, 1932 2 Sheets-Sheet. 2

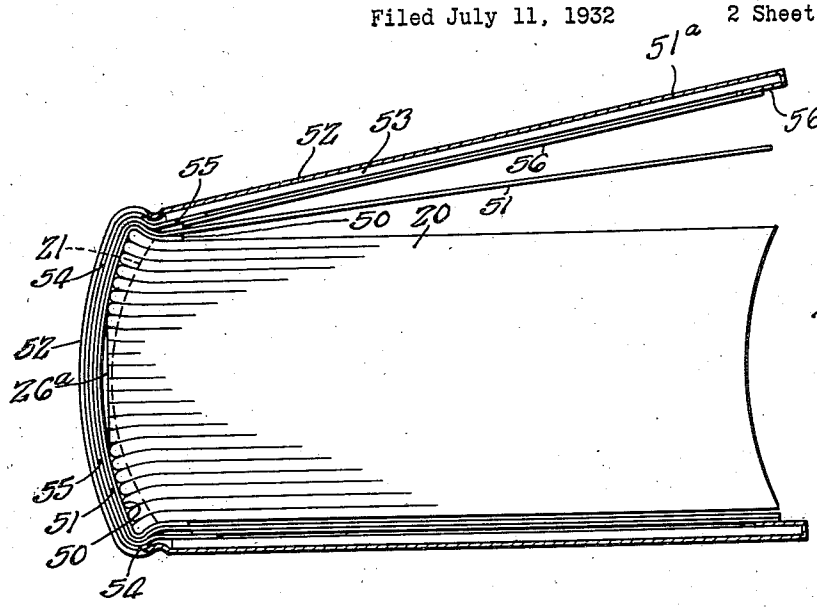


Fig. 3

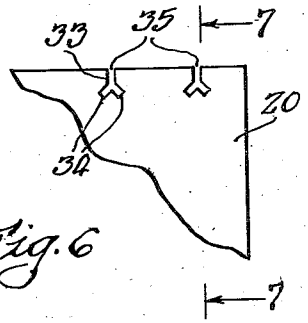


Fig. 6

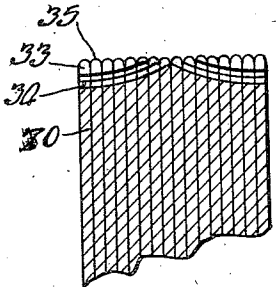


Fig. 7

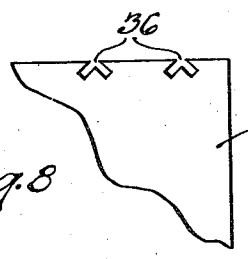


Fig. 8

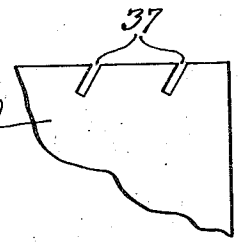


Fig. 9

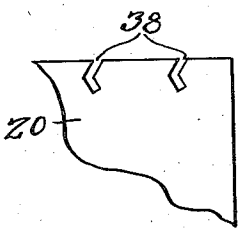


Fig. 10

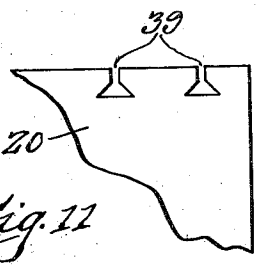


Fig. 11

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Patented Oct. 16, 1934 1,976,845

UNITED STATES PATENT OFFICE

1,976,845

STITCHLESS BOOK

Philip A. Frazier, Oak Park, Ill.

Application July 11, 1932, Serial No. 622,004

7 Claims. (Cl. 281—26)

This invention relates to book binding and has to do more particularly with a novel means for holding a group of signatures together, such means including the grooving of the back of the group of signatures for the reception of an adhesive material to hold said signatures in a selected assembly.

It is an object of the present invention to provide an efficacious method of book binding which eliminates stitching or stapling signatures one to another.

Another object of the present invention is to effect in the back of a group of signatures which have been accumulated in a desired formation a series of novel grooves traversing said signatures.

Another object of the present invention is to provide a series of slots which extend uniformly deeper into the body of the signatures as the grooves progress from the center of the group to the outermost signatures.

Still another object of the present invention is to provide, as a method for assembling a group of signatures, a series of channels diagonally traversing the signatures at their alined back edges and filling the channels thus formed with an adhesive material.

Another object of the invention is to combine with the so-called "patent bound" book a modified form of assembly and treatment.

These objects and other desirable objects will be made apparent in the following description when taken in connection with the two sheets of drawings hereby made a part of this specification, and in which:

Figure 1 is a view in perspective of a book with a part of the back cover removed to expose the scores in the signatures;

Figure 2 is a fragmentary oblique cross section of a book embodying one form of the invention taken at the line 2—2 of Figure 1;

Figure 3 is a fragmentary view of a book embodying the present invention in a different form;

Figure 4 is a fragmentary view of a back of a group of signatures showing one form of groove structure therein;

Figure 5 is a fragmentary view of the back of a group of signatures showing a different form of groove structure;

Figure 6 is a fragmentary side view of a book near its back edge showing in cross section the form of the grooves therein;

Figure 7 is a sectional view taken along the lines 7—7 of Figure 6; and

Figures 8, 9, 10 and 11 illustrate in views similar to Figure 6 groove structures of different contours.

Like reference characters throughout the description indicate identical parts which are shown in the drawings.

In Figure 1 a section of the cover of the book is shown removed. A group of signatures 20 comprising the pages within the book is exposed. The signatures pursuant to assembling the book may be gathered in a gathering machine into a selected formation with their backs alined and then clamped to such selected arrangement by clamps (not shown). While held by the clamps the signatures have cut therein by means of a saw or other suitable means, a series of grooves 21.

It is desired that the grooves 21 be of less depth at the center of the book back than at the edges of the back, or, at the faces of the book. To accomplish this, the signatures when gathered may be arranged with the backs forming a concave configuration. Then if a saw or knife is moved into the back of the book from the faces toward the center for cutting the grooves, the outermost of the signatures will be cut deeper than those at the center of the book. The backs of the signatures need be arranged in a concave formation only when the saw teeth or the end of a blade used for cutting the grooves moves in substantially a straight line normal to the plane of the signatures. When a blade is passed angularly to the plane of the book a groove can be made deeper at the faces of the book when the backs of the signatures are alined in a single plane. After the groove cutting operation if the fronts of the signatures are alined, the grooves 21, as seen in section in Figure 2, will assume a curved form.

Subsequent to the cutting of the grooves 21, and while the signatures are held in the heretofore mentioned clamps, a thin hot glue is applied to the backs of the signatures to run into the grooves, thus binding the signatures together. While the glue is still hot a "super" or reinforcing strip 22 may be placed over the backs of the signatures to be there held by the glue. The reinforcing strip 22 assists the glue in retaining the signatures in their assembled positions. To the back of the super is glued a liner 22*a*.

End sheets 23 are usually assembled with the signatures and are held in position by the glue and by the "super" 22. After the liner 22*a* has been placed on the back of the book the cover 24 may then be placed over the liner and "super". The cover may consist of a cloth cover material 25 and cover boards 26.

The cover is held to the book by pasting the inner faces of the cover boards 26 to the end sheets 23. A narrow strip of glue may be placed between the opposite longitudinal edges of the liner 22*a* and the back of the cover to assist the end sheets to hold the cover. It is not strictly uniform practice, however, that the back of the cover be glued to the liner 22*a*, and it is only in tight back books where glue is applied to the entire contiguous surfaces of the liner and the material at the back of the casing or cover. It is common practice to assemble the cover with the cover-boards before gluing the former to the group of signatures. Instead of cloth, the material designated by the number 25 may be leather or any other material suitable for a book cover.

To make a more durable book to be cased in, four page end sheets 60 may be substituted for the end sheets 23, and be pasted to the outer sides of the forwardly turned edges of the super 22. A second super 61 in such a case may replace the reinforcing strip 22*a* and be of a width to extend beyond the back of the book and forwardly along the back margin of the outer sheets of the four page end sheets for an inch or so and to be glued or pasted thereto. The end sheets 60 are in this manner held firmly between the two supers. The book is then cased-in in the usual way, i. e., the outer pages of the end sheets 60 are pasted to the cover boards and the inner pages of the said end sheets are left free.

It will be noted in the drawings that the grooves 21 are cut diagonal to the back of the book. However, the grooves are not limited to include only those which are diagonal. In certain instances and particularly to different classes of books, the straight grooves serve as well as the diagonal. Grooves 21 terminate adjacent the ends of the signatures. Lessening the depth of the grooves 21 adjacent the center of the book provides for easy opening of the book.

In Figure 3 is an illustration of effecting a lesser depth to the grooves 21 at the center of the book's back. While the signatures 20 are still in the clamps as taken from the gathering device, a planer or saw is used to remove the backs of the signatures along the plane 26*a*. So that the book may retain its strength when the backs of the trimmed signatures contain so shallow a groove or in some instances no groove whatsoever, the center signatures are "patent bound", that is, after the signatures are assembled and trimmed to expose the page edges, a narrow strip of glue is applied to the pages adjacent their back edges at a margin. The backs of the center pages are then conglomerated for mass support.

The pages comprising the signatures not patent bound may be treated along a narrow portion at their backs with glue while being consolidated in the folding machine. This treatment binds the sheets to one another to assist the glue in the grooves in the back of the book to hold the sheets in place.

A different type of cover is shown in Figure 3. In said figure, a different method of preparing the book to receive the cover is illustrated. Subsequent to the application of the glue to the backs of the signatures 20, a super 50 is attached in the same manner as the above described super 22. Pasted or glued to the back of the super 50 is a paper cover 51 the ends of which serve as end sheets. The cover 51 is of a width to project beyond the super 50 approximately three-sixteenths of an inch at the top and bottom of the book.

Before the cover is placed at the back of the book, it is pre-assembled. The cover 51*a* consists of a covering 52 which may be of any suitable material such as cloth or leather. Cover boards 53 are attached to the cover 51*a* in a conventional manner. Laid to the inner surface of the cover between the cover boards is a case back lining strip 54 which may be attached to the material 52 along its edges by means of glue. The strip 54 may be glued to the material 52 over the entire opposed surfaces of the two members but this is done only in the case of a tight back book which is of a less popular type.

Reinforcing material 55, which may be of cloth, is commonly glued to the inner surface of the case back lining strip 54. The reinforcing strip 55 is wider than the back of the book and extends beyond the strip 54 to be glued to a margin along the inner edges and inner face of the cover boards. A case lining sheet 56 is glued or pasted to the inner face of each cover board to hold the edges of the strip 55 and the turned-in margins 56*a* of the covering material 52 in place. Thus prepared, the cover is secured to the back of the book by means of glue between the reinforcing strip 55 and the back part of the paper cover 51 providing end sheets.

Other ways of arranging the grooves in the backs of the signatures are illustrated in Figures 4 and 5. In Figure 4 are shown grooves 31 in a herring-bone arrangement. Grooves 31 may be arranged so that they penetrate the backs of the signatures to a greater degree near the edges of the book than at the center.

Figure 5 illustrates grooves 32 which reach from the center of the book diagonally to the plane thereof and in staggering relationship. Care is taken in cutting the grooves so that the ends thereof will not lead to an exposed part of the book so as to preclude the pervasion of glue therefrom to disfigure the appearance of the book. A specific example of this construction is depicted in Figure 1 where it will be observed that the diagonal grooves 21 stop near the ends of the book.

Furthermore, the ends of the grooves 21 reaching to the opposite faces of the book are covered by one of the end sheets 23. Thus, no glue can run either to the end of the book or to an exposed position upon the front or back faces of the book.

The grooves 21, 31 or 32 need not be of a uniform cross section. In Figure 6 which is a section of a book taken normal to grooves therein are shown grooves 33 in the shape of an inverted Y. When grooves of this type are employed, the glue, when hardening within the parts 34 offset from the opening 35, produces a keying effect.

Grooves 33 may be placed in the backs of the signatures while the latter remain within the clamps heretofore mentioned. Any mechanical means may be provided for effecting the grooves 33.

In Figure 8 a different type of groove 36 is shown. Figure 9 discloses a further type of groove 37. The grooves 37 are of a simple conformation and may be formed by a circular saw or blade rotating about an axis oblique to the back of the book. A slight modification of the groove 37 is shown in the groove 38 of Figure 10. Groove 38 is angular to the back of the book and may be formed by any suitable mechanical means.

An under-cut groove 39 is shown in Figure 11 and may be formed in the same manner as the groove 38 but with a differently shaped head upon the die. The head upon the die for making the

grooves will, of course, be of a cross section like the respective grooves formed thereby.

A limited number of grooves being under-cut and having parts offset from the entrance to the grooves have been shown. It will be understood, however, that any type of an irregular groove shallower at the center of the book and deeper at the edges thereof is foremost in the mind of the inventor.

In the drawings all grooves shown are diagonal to the plane of the book. The invention relates to grooves traversing the back of the signatures in a manner truly normal to the plane thereof as well as angular to that plane.

What is claimed as new and is desired to be secured by Letters Patent of the United States is:

1. A book comprising signatures and having grooves, and glue, said grooves traversing said signatures at the back of said book and being of a greater depth as the edges of said book are approached, and said glue being disposed within said grooves.

2. A book comprising signatures and having grooves, and glue, said grooves being of increasing depth as the faces of the book are approached and diagonally traversing said signatures at the back of said book, and said glue being disposed within said grooves.

3. A book comprising signatures having two sets of grooves in the back thereof and with the grooves in one of said sets being staggered with respect to the grooves in the other of said sets, said grooves extending substantially from the center of said back to either edge thereof and traversing said signatures at a greater depth as said edges are approached, and glue in said grooves.

4. A book comprising a group of signatures with their backs selectively arranged, the signatures at the center of said group being trimmed along their backs to provide a plane surface exposing the leaves in said trimmed signatures, and there being grooves in the backs of the untrimmed signatures and extending from an edge of said plane surface to the edge of said back and progressing more deeply into said signatures as the edge of said back is approached.

5. A book comprising a group of signatures having their back edges trimmed to provide a plane surface and a group of untrimmed signatures on either side of said trimmed group, the leaves of said untrimmed signatures being adhesively joined together at an area along the fold adjacent to the back of said signatures, said signatures having grooves arranged transversely to the backs thereof to extend more deeply thereinto as the faces of said book are approached.

6. A book comprising in part signatures having their back edges trimmed to provide a plane surface and in part untrimmed signatures, the latter including leaves adhesively joined one to another at their folded sections, an adhesive material for holding the signatures in assembly, the untrimmed signatures being disposed on either side of the trimmed signatures, and there being grooves traversing the back of said signatures for receiving such adhesive material.

7. A book comprising in part signatures having their back edges trimmed and in part untrimmed signatures including leaves adhesively joined one to another along their folds, the untrimmed signatures being disposed on either side of the trimmed signatures, and an adhesive material at the back of the book between the leaves of trimmed signatures and between the untrimmed signatures.

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