May 1, 1951 S. K. BOYAJIAN 2,551,555

BOOKBINDING

Filed Nov. 10, 1947 3 Sheets-Sheet 1

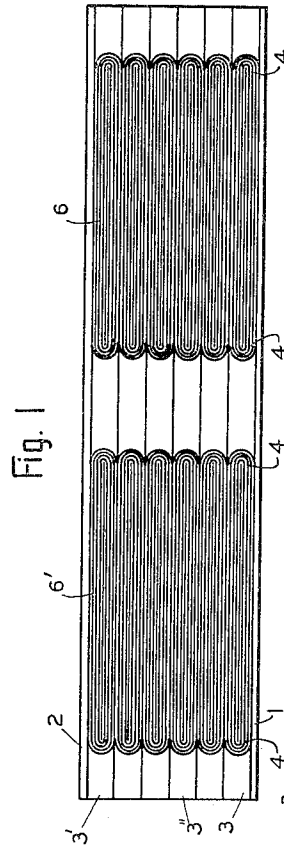

Fig. 1

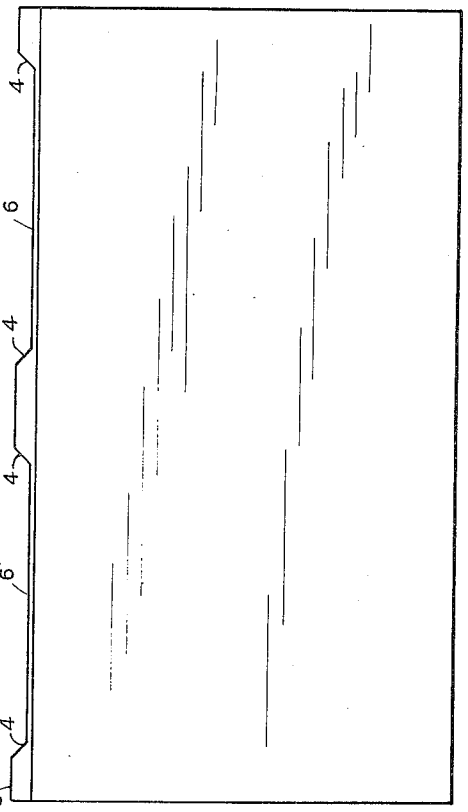

Fig. 2

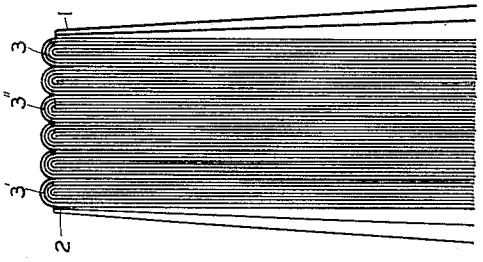

Fig. 3

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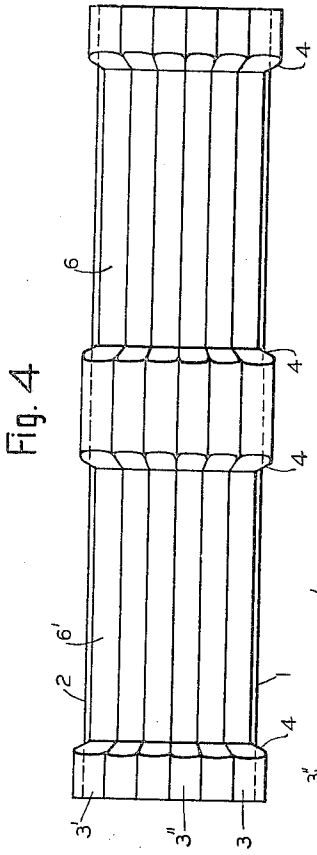

Fig. 4

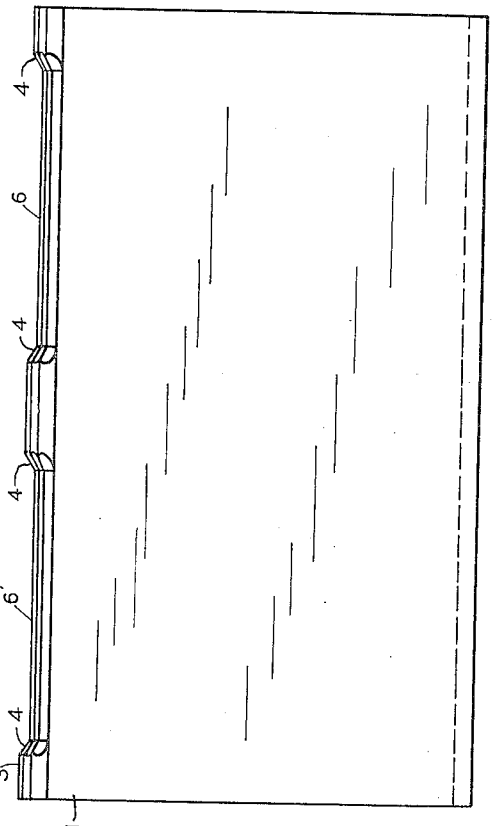

Fig. 5

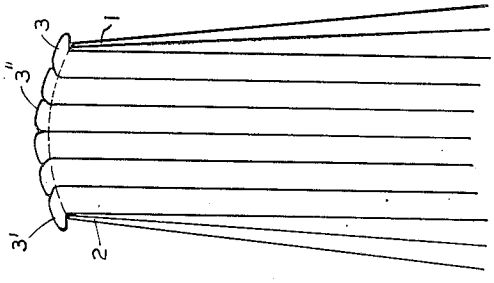

Fig. 6

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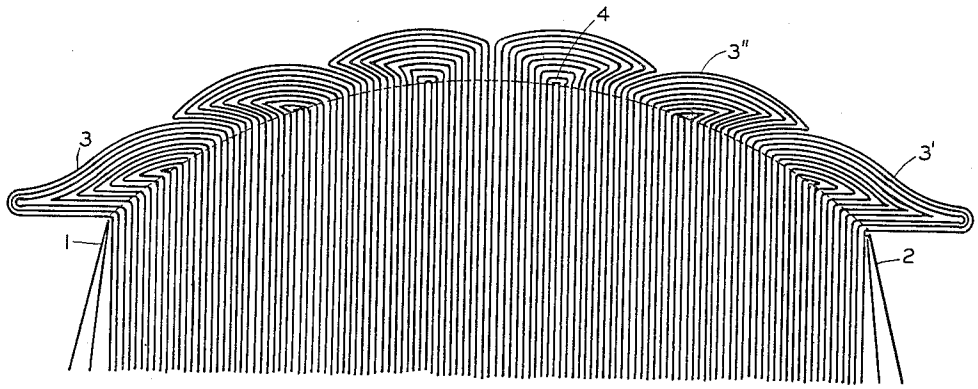

Fig. 7

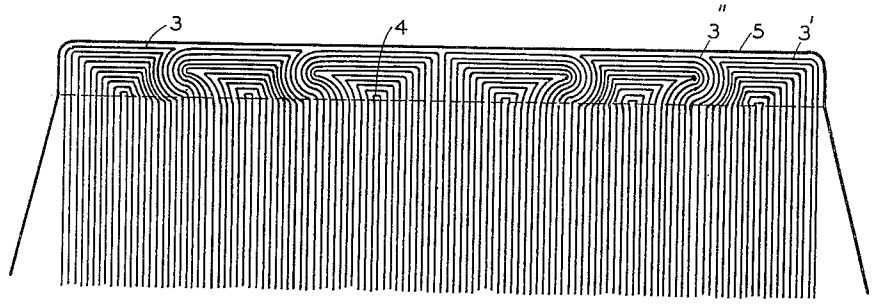

Fig. 8.

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UNITED STATES PATENT OFFICE

2,551,555

BOOKBINDING

Setrak K. Boyajian, Worcester, Mass.

Application November 10, 1947, Serial No. 785,076

7 Claims. (Cl. 281—21)

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My invention pertains to the art of binding books. Heretofore books and the like have largely been bound by collating and securing signatures together by sewing, or by side stitches or staples which pass from side to side near their lines of fold; or by a method which is known to the trade as "perfect binding," which comprises of collating the signatures, trimming the same at their folded edges so that all the leaves in such signatures are completely detached from one another, and securing the so detached leaves together by applying adhesive and one or more layers of reinforcing material, such as paper or cloth, to their so trimmed edges. Of the foregoing three methods, sewed books have hitherto been the most generally used, and it has been the conventional method for all cased-in books—but the operations involved are both slow and costly. The scope of use of side stitched books is, on the other hand, while perhaps the least costly to bind books, very limited, particularly owing to the difficulty in keeping them in a readable position when open. The scope of "perfect bound" books is also limited, and resides chiefly in paper covered books and pamphlets, telephone directories, mail order catalogues and the like. Even in these limited fields, "perfect bound" books are objectionable in that the leaves, being secured only by glue at their edges, are not, even when such edges are "roughed," securely bound, and may readily become detached during the course of ordinary usage; and once a leaf has become so detached, adjacent leaves follow suit. In the case of thin books, "perfect bound," there is also the danger of breaking their backs in opening them to readable position; and in the case of thick books, such as larger telephone directories, the backs become concaved with use, which condition makes them difficult to handle. Moreover, attempts have been made heretofore to produce cased-in books with rounded backs by "perfect binding" method, but such attempts have either been wholly unsuccessful, or have yielded only objectionable results. The object of my invention is to provide a new and improved method of binding books which possesses all of the desirable features of the hitherto employed methods without any of their objectionable features, and to produce books more speedily and economically. My method, for example, employs no stitching or stapling whatsoever, yet books produced thereby possess all of the advantages of sewed books, whether cased-in or paper covered, square or rounded back, and in many respects even display superiority, as it will hereafter appear.

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The basic feature of my invention is that instead of cutting or trimming the backs of the collated assemblage of signatures completely so as to detach all of the leaves of such assemblage from one another, as exercised heretofore by said "perfect binding" method, only parts of such backs are trimmed off, preserving the identity of each signature, as illustrated in the accompanying drawings, in which:

Figure 1 is a back view of an assemblage of collated signatures constituting the filler of a book, parts of the back of which have been trimmed off, showing the back edges of the leaves in such trimmed portions. Figures 2 and 3 are side and end views, respectively, of Figure 1.

Figure 4 is a view similar to Figure 1, but after it has been glued off, rounded, and backed, and made ready for lining and then casing-in operations, as in sewed books (glue and leaf-lines are not shown to insure clarity of drawing). Figures 5 and 6 are side and end views, respectively, of Figure 4.

Figure 7 is an enlarged sectional view of Figure 6 taken at one of the trimmed portions and looking toward the center, endwise, showing diagrammatic details of the interlockings of the untrimmed portions of the back of the signatures after the assemblage has been glued off, rounded and backed.

Figure 8 is an enlarged sectional view of a square-backed paper covered book taken at one of the trimmed portions and looking toward the center, endwise, showing diagrammatic details of the interlockings of the untrimmed portions of the back of the signatures after the assemblage has been compressed, glued off, and paper covered.

Similar numerals refer to similar parts throughout the several views in these drawings.

The art of "perfect binding" has in recent years been considerably advanced mechanically, but no marked improvements have been made in books so produced by way of eliminating their objectionable features heretofore mentioned. A "perfect binder" is a very efficient machine in the standpoint of production within its said limited scope. It is, in effect, a combination of gathering, jogging, trimming, gluing, and covering machines. By my invention not only the books which have hitherto been considered as conventional "perfect binder" products, such as telephone directories and the like, will be greatly improved so as to remove their heretofore mentioned objectionable features, but also the scope of such "perfect binder" will be greatly enlarged thereby in that all types of conventional books

may be speedily and economically bound on it, including cased-in, rounded back edition books.

It must be clearly borne in mind that my invention is in no way based upon any existing machine, device, or means, for the method revealed by it may be readily understood and adapted to any means, device, or machine by those skilled in the art. Since my invention pertains to the art of binding books by a new and improved way of securing the component parts together, thereby producing a new article, the means for accomplishing it are matters of expediency and skill in so far as this invention is concerned. Existing machines, such as a "perfect binder," are here mentioned or described for the purpose of illustration only, to help describe my invention. Other means and machines, both present and future, not mentioned here, may bring about equal or even better results.

In the accompanying drawings two general types of books have been illustrated. One of these is the square-backed, usually paper covered, books, such as a telephone directory. Hitherto such books have been bound on a "perfect binding" machine by gathering, collating, jogging, and automatically delivering, backs downward, the assemblage of signatures into a traveling clamp which then moves into the successive operations of cutting, roughing, and gluing the backs, and subsequently covering the book and discharging it into a hopper. The cutting in this case has hitherto been accomplished either by means of a single, straight-bladed knife which engages the back of the book at right angle in a gyratory movement while the book is in motion, or by means of a circular saw at a similar angle. My method, on the other hand, requires a cutter mounted on a straight-pulling carriage, engaging the back of the book while the latter is stationary or while the cutting mechanism and the said book are in synchronized motion; or a rotary cutter, similarly mounted, in each case with trimming result as shown in Figure 1. Thereafter the back of the book is compressed by passing it over, while still in clamp, a series of compression rolls. Then the book is glued and covered as hitherto. When so compressed, the untrimmed portions of the backs of the signatures flatten and intertwine into one another. Telephone directories, mail-order catalogues, and the like, bound in my method will have much longer life, and retain permanently square backs, and even very thin books of this kind will open flat.

The other, and vastly more important, type of books illustrated in the drawings is the rounded back, cased-in, edition type of books. Gathering, collating, trimming, and gluing operations of this type or books may also be performed on a "perfect binding" machine, as above described (omitting the back-compressing and covering), by employing a fast drying or quick-jelling or coagulating adhesive, or by applying a fine film of dry flexible gelatine over the glued back, and/or passing the freshly glued back over a chilled roll, and/or treating such glued back with a coagulating fluid, to prevent its sticking to the contact parts of the machine. Thereafter, the book is treated as any sewed book—by rounding, backing, lining, and casing-in, after first trimming its edges.

Apart from any means or machine, my invention involves, in brief, the following operations:

End-leaves 1, 2 are pasted on the first and last signatures 3, 3', respectively, in the usual

manner, with the exception that they are so pasted ⅛ to ¼ inch (depending on the type and size of the book) from the backs of such signatures so as to clear the trimming and thereby preserve conventional one-piece end leaves. Such end-leaves may also be applied after the signatures have been gathered, a portion of the backs trimmed, and adhesive applied as heretofore described. Thereafter the signatures are gathered and collated. The next step is trimming portions 6, 6' of the back. This trimming is to be deep enough to cut through the back of all the inserts in each signature. Where larger backs are desired, a deeper cut may be made. Ordinarily, the depth of the trim may vary from $\frac{1}{16}$ to $\frac{3}{16}$ of an inch, depending on the style and thickness of the book, the substance of the paper, etc. The length of the trimmed portion may also vary accordingly. Consistent with preserving the identity of each signature, such trimmed portions may be at any part of the back of the book. It is preferred, however, that this trimming be no less than ½'' from each end, and, except in very large books in which case three or more such portions may be trimmed, at least ½ of an inch from the center. After such trimming, a suitable adhesive is applied to the entire back. It is preferred that such adhesive be both in high tensile strength and flexibility. It is desirable that such adhesive have sufficient fluidity so as to penetrate between the inserts 4 at either end of the trimmed portion. Thereafter the books are backed (after first trimming its edges) in the usual manner, and lined and cased-in.

I claim:

1. A book comprising an assemblage of gathered, collated, and jogged signatures, the first and last of which signatures having end-leaves attached substantially ⅛ inch above the backs, a major portion of the back of such assemblage being trimmed off to a depth just sufficient to expose the back edges of all the leaves in each signature at such trimmed portion, but clear the backs of said end leaves, there being a small portion in the middle and a like portion on each end untrimmed; an adhesive on the entire back of such assemblage; said back being rounded, expanded, and spread, sideways and forward, said trimmed portion to a lesser degree, while said untrimmed portion to a greater degree, forming a permanent arch and preserving the roundness of said back, the inserts in each signature being interlocked and adjacent signatures secured together at the said untrimmed portion, said book being lined and cased-in.

2. A book filler comprising an assemblage of gathered, collated, and jogged signatures, the first and last of which signatures having end-leaves attached substantially ⅛ inch above the backs, a major portion of the back of such assemblage being trimmed off to a depth just sufficient to expose the back edges of all the leaves in each signature at such trimmed portion, but clear the backs of said end-leaves, there being a small portion in the middle and a like portion on each end untrimmed; adhesive on the entire back of such assemblage; said back being rounded, expanded, and spread, sideways and forward, said trimmed portion to a lesser degree, while said untrimmed portion to a greater degree, forming a permanent arch and preserving the roundness of said back, the inserts in each signature being interlocked and adjacent signatures secured together at such untrimmed portion.

3. A book filler comprising an assemblage of gathered, collated, and jogged signatures, the first and last of which signatures having end-leaves attached substantially ⅛ inch above the back, a major portion of the back of such assemblage being trimmed off to a depth just sufficient to expose the back edges of all the leaves in each signature at such trimmed portion, but clear the backs of said end-leaves, there being a small portion in the middle and a like portion on each end untrimmed, adhesive on the entire back of such assemblage.

4. A book filler comprising an assemblage of gathered, collated, and jogged signatures, a major portion of the back of such assemblage being trimmed off to a depth just sufficient to expose the back edges of all the leaves in each signature at such trimmed portion, there being a small portion in the middle and a like portion on each end untrimmed, adhesive on the entire back of such assemblage, end-leaves being secured on each side of said assemblage adjacent to said trimmed portion of the said back, which back being rounded, expanded, and spread, sideways and forward, said trimmed portion to a lesser degree, while said untrimmed portion to a greater degree, forming a permanent arch and preserving the roundness of the said back, the inserts in each signature being interlocked and adjacent signatures secured together at such untrimmed portion.

5. A book filler comprising an assemblage of gathered, collated, and jogged signatures, a major portion of the back of such assemblage being trimmed off to a depth just sufficient to expose the back edges of all the leaves in each signature at such trimmed portion, there being a small portion on each end untrimmed, adhesive on the entire back of such assemblage, end-leaves being secured on either side of said assemblage adjacent to the said back.

6. A book signature, a major portion of the back of which signature being trimmed off to a depth just sufficient to expose the back edges of all the leaves in such signature at such trimmed portion, there being a small portion at least on each end untrimmed.

7. A "perfect bound" book comprising an assemblage of gathered, collated, and jogged signatures, a major portion of the back of such assemblage being trimmed off to a depth just sufficient to expose the back edges of all the leaves in each signature at such trimmed portion, there being a small portion in the middle and a like portion on each end untrimmed, said back being compressed, inward and forward, said trimmed portion to a lesser degree, while said untrimmed portion to a greater degree, the inserts in each signature being interlocked and adjacent signatures secured together in such untrimmed portion, adhesive on the entire back, said book being covered.

SETRAK K. BOYAJIAN.

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