March 8, 1949. G. H. HIGGINS 2,463,769

METHOD OF PRINTING AND BINDING BOOKS

Filed Feb. 21, 1945

2 Sheets—Sheet 1

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METHOD OF PRINTING AND BINDING BOOKS


Application February 21, 1945, Serial No. 579,121

6 Claims. (Cl. 270—4)

1 This invention relates to a method of printing and binding books and magazines and more particularly to an improved method for producing and covering signatures, to form a book or magazine in which the grain of the paper runs parallel to the binding.

Books and magazines, as heretofore produced on rotary printing machines equipped with jaw folders, have been printed from plates arranged with "columns across" the cylinder, as compared to the herein described method wherein the plates are arranged with "columns around" the cylinder. The heretofore known method has produced books and magazines in which the grain of the paper is perpendicular to the binding thereof, and it is well known in the trade that books and magazines of this type are not so acceptable as ones in which the grain of the paper is parallel to the binding. Therefore it is an object of the invention to provide a new method, using a rotary printing machine equipped with a jaw folder, for producing books and magazines in which the grain of the paper and the binding are parallel.

Another object of the invention is to provide a new and improved method of producing books and magazines in which two magazines are completely assembled, bound, and covered before they are trimmed or cut apart.

The method herein disclosed includes printing a web of paper from plates that are arranged with "columns around" the cylinder, cutting the web into sheets, folding the sheets crosswise as with a jaw type folder to produce signatures of a selected number of pages, assembling the proper number of these signatures, binding them on two opposite edges, covering the bound signatures, and finally cutting apart the doubly bound signatures and trimming them.

A preferred method of practicing the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a diagrammatic view of the sheet cutting and folding portion of a web fed rotary printing machine suitable for producing signatures to be bound in accordance with the invention;

Figure 2 is a view of a printing cylinder suitable for printing a web that is to be cut and folded in practicing the invention;

Figure 3 is a perspective view of a signature produced by the mechanism diagrammatically illustrated in Figure 1;

Figure 4 is a perspective view of a group of associated signatures;

Figure 5 is a perspective view of the group of signatures after they have been bound;

Figure 6 is a perspective view of the bound signatures associated with a cover;

Figure 7 is a perspective view of the signatures after the cover has been folded and glued; and

Figure 8 is a perspective view of the finished products produced by trimming and cutting the covered signatures illustrated in Figure 7.

The drawings illustrate a preferred method of producing books or magazines in which the grain of the paper runs parallel to the binding. Figure 2 illustrates a typical printing cylinder equipped with printing plates made and arranged with the columns extending around the cylinder. As shown, the cylinder is provided with four plates "around" and six plates "across," although it will be understood that other plate arrangements may be used. Each of the printing plates shown, prints four pages of a book and is made with "columns around" the cylinder. With this arrangement the columns are positioned lengthwise of the web and the lines of printing run transversely to the direction of movement of the web, and thus perpendicular to the grain of the paper.

Figure 1 shows the cutting and folding portion of a web fed printing machine. Although not shown, it will be understood that a web of paper is perfected by the printing machine having a plurality of printing cylinders similar to the printing cylinder, and that after the web is printed, it is slit into a plurality of ribbons, each printed with two pages abreast. As shown, each printed ribbon is led around one of a plurality ofturning bars, a first guide roller, a compensating roller, and where necessary, around additional guide rollers, after which the plurality of turned ribbons are associated with their side edges in substantial alignment and led between feeding rollers and . Thereafter the associated ribbons are cut into sets of sheets by cooperating cutting cylinders and 22 that cut the associated ribbons perpendicular to their side edges, and the cut sheets are then taken by a combination collecting and folding cylinder, that cooperates with a jaw cylinder to fold the sheets intermediate their cut edges and across their direction of travel. The folded sheets or signatures, are then taken by a delivery cylinder and deposited on a conveyor or other delivery mechanism. It will be noted that the fold of each of the signatures (Figures 1 and 3) is perpendicular to the original direction
of ribbon travel and thus perpendicular to the grain of the paper. For convenience, small double ended arrows \( \#1 \) have been placed at various points on the drawing to indicate the grain of the paper.

As herein shown, a book or magazine is made by collating a plurality of differently printed signatures, for example signatures 26a, 26b and 26c (Figure 4). These signatures may be printed simultaneously by one large printing machine, or separately by one or more smaller printing machines. A group of differently-printed signatures 26a, 26b and 26c are assembled or collated and their open opposite side edges 32 and 33, that run parallel to the grain of the paper, are then bound. While Figure 5 shows these edges, bound with staples \( \#4 \), it will be understood that they may be bound by stitching, by gluing, or in any suitable manner.

Figure 6 shows the doubly bound signatures associated with a cover sheet 36 of a size suitable for covering two books, and it will be assumed that the bound edges 32 and 33 have previously been roughened and provided with a suitable glue. The various portions of the cover sheet 36, leading from left to right are: a front cover 37, a back edge 38, a back cover 39, a second front cover 40, a second back edge 41, and a second back cover 42.

After the cover sheet and bound signatures have been properly associated, the cover and back portions 37, 38, and the cover and back portions 42, 41 are bent upward around the signatures until they assume the position shown in Figure 7. This secures the cover to the bound signatures by attaching the inside portions of the two back edges 38 and 41 to the previously glued portions 32 and 33. Thereafter the top and bottom edges 43 and 44, respectively, of the covered signatures are trimmed, after which a single or double cut is made half way between and parallel to the vertical bound edges 32 and 33, thus separating the doubly bound and covered signatures into two separate books indicated by the numerals 46 and 47.

As shown in Figures 7 and 8, the left hand book 46 will have its front cover 37 on top, whereas the right hand book 47 will be reversed with its back cover 42 on top. This is the preferable method of assembly, although other arrangements are possible.

The word "book" as used herein, is intended to include various types of books, generally referred to as a magazine, and to other similar publications.

It will be understood that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, reference being made to the claims rather than to the foregoing description for an indication of the scope of the invention.

What I claim is:

6. A method of simultaneously producing two books, which comprises associating a plurality of ribbons slit from printed webs so that the side edges of the ribbons are in substantial alignment, cutting the associated ribbons perpendicularly to the side edges and to the paper grain, to form sets of sheets having two pages long and two pages wide, having cut edges and side edges, folding each set of cut sheets substantially midway between the cut edges to form a signature, collating groups of such signatures and binding each group at both side edges, and cutting each thus bound group in the direction of the paper grain and substantially midway between its two bound edges.

7. The method of simultaneously producing two books, which comprises associating a plurality of ribbons slit from a printed web so their side edges are in substantial alignment, cutting the associated ribbons across the paper grain and perpendicularly to the side edges to form sets of sheets each two pages long and two pages wide and having cut edges and side edges, folding each set of cut sheets substantially midway between the cut edges and across the paper grain to form a signature, collating a plurality of such signatures and binding them at both side edges, wrapping a sheet of cover material about the bound signatures and securing it to the bound edges of each thus bound product, and cutting each such product substantially midway between its two bound edges.

8. The method of producing books in which the paper runs parallel to the binding, which comprises printing a web of paper with columns of printing positioned lengthwise thereof in the direction of the paper grain, cutting the web into booklets, folding the cover material substantially midway, collating a plurality of said sheets and producing signatures by folding the cut sheets transversely of the grain of the paper, assembling a plurality of such signatures in proper sequence, binding the assembled signatures on two opposite unfolded edges, covering the bound signatures, and cutting the thus doubly bound signatures midway between the bound edges and along the paper grain to produce two books.

9. The method of producing books which comprises printing a travelling web of paper with columns of printing running lengthwise thereof and in the direction of the paper grain, cutting the web into sheets at least two pages long and two pages wide and collecting a plurality of said sheets, folding the cut sheets transversely of their direction of travel to form signatures, binding a group of such signatures on two opposite unfolded edges, assembling the bound signatures with material for two covers, securing the cover material to the bound signatures, and cutting the thus doubly bound signatures between and substantially parallel to the bound edges to produce two books.

10. The method of simultaneously producing two books which comprises collecting sets of printed sheets each two pages long and two pages wide with the lines of printing running transversely of the paper grain, folding each set of sheets parallel to the lines of printing and on a line substantially midway between opposite edges of the said sheets to form a signature, assembling a plurality of such signatures and binding them together on two opposite edges that parallel the grain of the paper, and cutting through the thus doubly bound signatures between and substantially parallel to the bound edges, thereby producing two bound books in which the grain of the paper runs parallel with the binding.
wrapping and securing a piece of cover material around the bound signatures, covering the first and last pages and the bound edges thereof, and cutting through the thus doubly bound signatures between pages and substantially parallel to the said bound edges.

GILBERT H. HIGGINS.

REFERENCES CITED

The following references are of record in the file of this patent:

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>664,574</td>
<td>North</td>
<td>Dec. 25, 1900</td>
</tr>
<tr>
<td>702,413</td>
<td>Dressel</td>
<td>June 17, 1902</td>
</tr>
<tr>
<td>804,283</td>
<td>Wood</td>
<td>Nov. 14, 1905</td>
</tr>
<tr>
<td>1,046,064</td>
<td>Goss</td>
<td>Dec. 3, 1912</td>
</tr>
<tr>
<td>1,132,215</td>
<td>Roessen</td>
<td>Mar. 16, 1915</td>
</tr>
<tr>
<td>2,255,087</td>
<td>Sawdon et al.</td>
<td>Sept. 9, 1941</td>
</tr>
</tbody>
</table>