METHOD OF MAKING A BOOK

5 Claims, 9 Drawing Figs.

ABSTRACT: A method of making a book having both permanent and nonpermanent or removable leaves. The method comprises the steps of providing a plate for printing a plurality of leaves of a book on a first side of a sheet; printing the leaves on the first side of the sheet; providing a plate for printing a plurality of leaves of a book on the reverse side of the sheet; providing a plurality of perforating members for perforating the plurality of leaves on the sheet which are to be nonpermanent adjacent the margin thereof; printing the reverse side of the sheet and simultaneously perforating the sheet on the nonpermanent leaves. The sheet is folded about the leaves to form a signature. Finally, a plurality of signatures are bound together and are cut together to form a book.
METHOD OF MAKING A BOOK

This application is a continuation-in-part of my application Ser. No. 756,712, entitled Education Aid for Travel, filed Aug. 7, 1968, which is a continuation of application Ser. No. 577,411, entitled Bound Volume, filed Sept. 6, 1966, now abandoned.

This invention relates generally to a method of making a book and more particularly to making a book having both permanent and nonpermanent or removable leaves.

Therefore existing methods for making books having both permanent and nonpermanent leaves have been inadequate in that it is very costly to make such a book. That is, in order to make a book having both permanent and nonpermanent pages, it has been necessary in the most economical operations to print a plurality of pages of the book on a first side of a sheet, then print the reverse sides of the plurality of pages on the reverse side of the sheet and then provide perforations along the margins of the pages which are to be on the nonpermanent leaves. The perforations have been provided in two ways. The first method is to use a wheel with teeth and impress the perforations at the desired points. The second method is to use a diecutting machine. The sheet is then folded to provide one of the signatures of a book.

It can therefore be seen that to provide a plurality of signatures for a book each printed and die-cut in the same manner as illustrated above is very expensive. It is therefore an object of this invention to overcome the aforementioned disadvantages.

Another object of the invention is to provide a new and improved method of making a book in which a plurality of pages are printed simultaneously with selected ones of the pages being perforated to form weakened lines on the pages to aid removability.

Another object of the invention is to provide a new and improved method of making a book having permanent and nonpermanent leaves which requires only two printing steps for making the signatures which comprise the book.

Another object of the invention is to provide a new and improved method of offset lithography a signature for a book in which both permanent leaves and nonpermanent leaves are formed simultaneously with the printing of said signature.

Another object of the invention is to provide a new and improved method of making a book having both permanent and nonpermanent pages in which an offset lithographing system is used with a plurality of perforating members provided on the impression roller of the offset printing press for providing perforations along the margins of a plurality of pages of the signatures.

These and other objects of the invention are achieved by providing a method of making a book having both permanent and nonpermanent leaves which comprises the following steps: printing a plate for printing a plurality of leaves on a first side of a sheet; printing the leaves on the first side of the sheet; providing a plate for printing a plurality of leaves of a book on the reverse side of the sheet; providing a plurality of perforating members for perforating the plurality of leaves on the sheets which are to be nonpermanent adjacent the margin thereof; printing the reverse side of the sheet and simultaneously perforating the sheet on the nonpermanent leaf; folding the sheet about the leaves to form a signature; binding a plurality of signatures together; and cutting the plurality of bound signatures to form the book.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a diagrammatic perspective view of an offset lithographing press utilized in the method embodying the invention;
FIG. 2 is a diagrammatic side elevational view of the offset lithographing press with a sheet of paper being run through and shown in phantom;
FIG. 3 is an enlarged fragmentary view taken along the line 3-3 in FIG. 2;
FIG. 4 is a fragmentary perspective view taken from the top of a perforating member utilized in the method embodying the invention;
FIG. 5 is an enlarged perspective view taken from the bottom of the perforating member;
FIG. 6 is a top plan view of a blank sheet which is used in the method embodying the invention for making a book;
FIG. 7 is a top plan view of the top surface of the sheet after it has been printed on its first side;
FIG. 8 is a top plan view of the reverse side of the sheet after it has been printed and perforated; and
FIG. 9 is a perspective view of a book made by the method embodying the invention with one of the nonpermanent pages being ripped out along a perforated line.

Referring now in greater detail to the various figures of the drawing wherein similar reference characters refer to similar parts, an offset lithographing press is diagrammatically illustrated for use in the method embodying the invention at 20 in FIGS. 1 and 2.

The offset lithography press 20 illustrated in FIGS. 1 and 2 basically comprises a plate cylinder 22, a blanket cylinder 24, an impression cylinder 26 and a transfer cylinder 28. A plate is wrapped around the plate cylinder 22 which is adapted to print a plurality of pages of a book on a single sheet. A rubber blanket is attached to the blanket cylinder 24 for transferring the ink from the plate 24 to a sheet which is to be printed on.

Impression cylinder 26 carries the paper and presses it against the blanket cylinder during the transfer of ink from the blanket to the paper. The transfer drum 28 transfers the paper from the impression cylinder to a deliver pile. Water rollers 30 are also provided for transferring water from a supply of water 32 to the plate cylinder 22. Ink rollers 34 are provided for evenly transferring ink from a source of ink 36 to the plate 22.

In addition to the conventional portions of an offset lithography press which have hereinbefore been described, a plurality of perforating members 38 are adhesively secured to the impression cylinder 26 at predetermined locations about the periphery of the impression cylinder 26.

Perforating members 38 are best seen in FIGS. 3, 4 and 5. Each of the perforating members 38 is comprised of an elongated rectangular planar strip 40 and a plurality of teeth 42 which are integral with strip 40 but which are disposed transversely to the plane of strip 40 in an upward direction. Each of the teeth 52 is triangularly shaped and planar having the apex thereof at the uppermost portion thereof.

As best seen in FIG. 5, a pressure-sensitive adhesive 44 is preferably provided on the lowermost surface of strip 40. Perforating members 38 are thus removably secured to the surface of the impression cylinder 26 where perforation is required during a printing operation. Where only a printing operation is required, the perforating members 38 are removed from the impression cylinder.

The method embodying the invention is illustrated in connection with the making of a book as shown in FIG. 9 having permanent and nonpermanent leaves interspersed throughout the book. The book 46 preferably has printed material on the nonpermanent leaves 48 and the permanent leaves 50 of the book are preferably blank for the reception of handwriting 52 and mementos or photographs 54. The nonpermanent leaf 48 shown in FIG. 9 is being ripped out along a perforated line which facilitates such ripping. By ripping out the nonpermanent leaves 48, the book 46 maintains its trim shape even though mementos 54 are pasted onto the permanent pages.

The book 46 basically comprises a plurality of signatures, each of which is folded and are then gathered or collated together to be sewn and are then trimmed to size the book. Referring to FIG. 6, a signature is formed from a rectangular blank sheet of paper 56 as set forth hereinbelow.

A plate is provided on plate cylinder 22 which can simultaneously print eight pages of a book on a first side 58 of the paper sheet 56.
As best seen in FIG. 2 with sheet 56 in phantom, the blank sheet is then run through the offset lithography press without the perforating members being provided on the impression cylinder.

The sheet 56 enters in the direction of arrow 60 (FIG. 2) and is transferred by impression cylinder 26 between the impression cylinder 26 and the blanket cylinder 24 which rotate in the directions of arrows 62 and 64, respectively. The impression cylinder 26 carries the sheet 56 past the blanket 24 to the transfer cylinder 28 which rotates in the direction of arrow 66 and transfers the paper via conventional transfer means to a delivery pile.

As the sheet 56 passes between the impression cylinder 26 and the blanket cylinder 24, ink on the blanket is transferred from the blanket to the first side of the sheet 56. Ink is applied to the blanket cylinder 24 by the plate 22 which rotates in the directions of arrows 68 and applies the ink from the plate to the blanket as their surfaces meet tangentially.

As best seen in FIG. 7, the top sheet 58 of FIG. 7 is printed in selected portions to produce printed pages 70 through 76. As will hereinafter be seen, the printed pages 70 through 76 are provided on the nonpermanent leaves of the book. The remaining pages 78, 80, 82 and 84 which are produced on the first side of the sheet 58 are blank and, as will hereinafter be seen, are placed on the permanent leaves of the book.

The plate which is used for printing the first eight pages on the first side 58 of sheet 56 is removed from the plate cylinder 22 and a second plate is placed on the cylinder 22 which is used for printing the pages on the reverse side 86 of sheet 56. Perforating members 38 are then provided on the impression cylinder 26. The perforating members 38 are provided on the impression cylinder in accordance with the positions on sheet 56 that perforations are required in order to make the leaves nonpermanent. The perforating members 38 are thus provided on the impression cylinder 26 at the points where impression cylinder 26 contacts the perforated lines, 88, 90, 92 and 94 of the sheet 56 as seen in FIG. 8.

Since four leaves of the eight leaves produced on sheet 56 are to be nonpermanent, four weakened or perforated lines are formed on the sheet. As best seen in FIGS. 1 and 2, a first pair of perforating members 38 is placed on the surface of the impression cylinder 26 on one side and a second pair is placed diametrically opposite the first pair on the surface of the impression cylinder. Each pair is positioned axially with one perforating member extending from one end of the impression cylinder to the center of the cylinder and the other perforating member extending from the center to the other end of the cylinder. The perforating members of each pair are also spaced from each other in longitudinal alignment in order to form the perforated lines spaced from the margin of the nonpermanent leaves.

Sheet 56 is then inserted into the offset lithography press in the direction of arrow 60 with the reverse side 86 of sheet 56 facing upward. The plate 68 applies ink to the blanket 24 and the blanket 24 transfers the ink to the reverse side 86 of sheet 56. As the perforating members on the surface of the impression cylinder 26 are at the position at which the impression cylinder 26 is tangential with the blanket 24, the teeth of the perforating members 38 penetrate the sheet 56 to form perforated lines.

The printed and perforated sheet 56 continues to the transfer drums 66 and is then fed to the delivery pile.

It can therefore be seen that in the second step of the printing operation, printed pages 96, 98, 100 and 102 are produced. The remaining pages 104, 106, 108 and 110 of the reverse side 86 of sheet 56 are blank and are provided on the permanent leaves of the sheet.

The sheet 56 is then folded at the positions shown in phantom lines 112, 114, 116 and 118 in FIG. 8 to form a signature with eight leaves or 16 pages.

The signature is formed by folding sheet 56 at line 116 so that pages 80 and 76 of the first side of sheet 56 are placed against pages 70 and 82, respectively, of the first side of the sheet 56. The sheet 56 is then folded along line 112 which thereby brings pages 104 and 96 against pages 100 and 98, respectively. The sheet 56 is then folded again thereby forming folds along lines 114 and 118 with page 98 being folded against page 106.

A signature is thereby formed which includes eight leaves of 16 pages with a completely permanent and nonpermanent leaves provided therein in the following order: A first blank leaf is formed with page 110 on the obverse or front side and page 80 on the reverse side. The second leaf is a nonpermanent leaf as a result of perforated line 88 being provided thereon with printed page 70 being on the obverse side and printed page 100 being printed on the reverse side. The next leaf is blank and is comprised of page 104 on the obverse side and page 82 on the reverse side.

The fourth leaf is a nonpermanent leaf as a result of perforated line 94 being produced thereon. The obverse side of the page is printed page 76 and the reverse side is printed page 96. The fifth leaf is blank having page 106 on the obverse side and page 84 on the reverse side. The sixth leaf is a nonpermanent leaf as a result of perforated line 90 being provided thereon with a printed page 74 on the obverse side of the leaf and printed page 96 forming the reverse side of the leaf. The seventh leaf of the signature is a blank permanent leaf with pages 108 and 78 being on the front and reverse sides. The eighth and last leaf of the signature is also a nonpermanent leaf as a result of perforated line 92 being provided thereon with page 72 being printed on the obverse side and page 102 being printed on the reverse side.

Each of the plurality of signatures of the book 46 is printed and perforated in accordance with the method embodying the invention. A plurality of these pages are sewn together, the edges of the pages are trimmed after the plurality of signatures are bound together and the book 46 is thereby formed with permanent and nonpermanent leaves being alternately interspersed throughout the book.

It can therefore be seen that a new and improved method of making a book has been provided. The book is inexpensive to produce in that only two printing operations are required with the perforations for the nonpermanent leaves being formed during the second printing operation. Moreover, diecutting machines are obviated as well as other methods of providing perforations in the nonpermanent leaves. The method utilizes offset lithography which has the advantage of maintaining plates longer, allows less water to contact the paper, enables the resilient rubber cylinder to print finer copy on the paper and the speed of a rotary press.

It should be understood that this method is not limited to books comprised of signatures of 16 pages but may be made of signatures of four, eight, 32 and other suitable numbers of pages.

Moreover, the number of nonpermanent pages may be varied in a signature by removing or adding perforating members which are to be associated with the perforated lines used on the nonpermanent pages. That is, the perforated members are provided on the impression cylinder at the position that it contacts the leaf which is to be provided with a perforated line adjacent its margin. Where additional leaves are to be perforated, additional perforating members are provided on the impression cylinder. Similarly, if less leaves are nonpermanent, less perforating members are provided on the impression cylinder.

Without further elaboration, the foregoing will so fully illustrate my invention that others may by applying current or future knowledge, readily adapt the same for use under various conditions of service.

What I claim as my invention is:

1. A method of making a book having both permanent and nonpermanent leaves, said method comprising the following steps:

   - providing an offset lithographic press for printing a plurality of pages of a book on a sheet;
   - providing a plate for printing a first portion of said pages on a first side of said sheet;
printing on said first side of said sheet; providing a second plate for printing the remaining ones of said plurality of pages on the reverse side of said sheet; providing a plurality of perforating members for perforating said plurality of leaves on said sheet which are to be non-permanent adjacent the margin thereof, said perforating members being secured to the impression cylinder of said offset press, said perforating members forming perforated lines on said nonpermanent leaves when said sheet passes between the impression cylinder and the blanket cylinder of said offset press; printing said reverse side of said sheet and simultaneously perforating said sheet on said nonpermanent leaves along lines transverse to the direction of flow of said sheet past said cylinder; folding said sheet about the borders of said leaves to form a signature; binding a plurality of signatures together and trimming said plurality of bound signatures to form said book.

2. The invention of claim 1 wherein each of said perforating members comprises an elongated strip having a plurality of upwardly extending triangularly shaped teeth.

3. The invention of claim 2 wherein said strips include a pressure-sensitive adhesive on their lowermost surface for securement to a smooth surface.

4. A method of making a book having both permanent and nonpermanent leaves, said method comprising the following steps:

5. The invention of claim 4 wherein said permanent leaves and said nonpermanent leaves are alternately interspersed.