METHOD OF PREPARING A PRINTING PLATE WITH A SUBTRACTIVE INDICIA SYSTEM

ABSTRACT: An improved subtractive indicia system utilizing the initial provision of a grid or excess indicia and a subtractive system of accumulating information by selective removal of certain indicia. Lands occupying coded positions are applied to an offset printing plate as an improved system for accumulating information in the publishing of successive issues of a bulletin or catalog using the same printing plate. The information is accumulated in code by obliterating or removing one or more of said lands prior to printing each issue. By subtracting lands to form a negative code current printing information constitutes a permanent part of the plate.
METHOD OF PREPARING A PRINTING PLATE WITH A SUBTRACTIVE INDICIA SYSTEM

This application is a continuation of U.S. application Ser. No. 659,494, filed on Aug. 9, 1967 now abandoned.

The present invention utilizes a subtractive indicia system of accumulating and reproducing information. In the ordinary writing of a message, it is usual to begin with a blank surface and then to place characters upon it to form the message. Such a system can be called an additive system. In general such systems are satisfactory for the initial generation of a record, and also for the subsequent modification of certain records such as pen and ink entries in ledgers and the like. However, in accordance with this invention the record begins with a surface upon which an entire range of relevant information is contained. Then, by eliminating selected portions of the information, the intended message can be conveyed. Such a system is herein called a subtractive system.

Particularly in the reprinting of publications, the use of the subtractive system may be utilized to advantage to accumulate information on a single plate. It is thus unnecessary to destroy the old plate and make a new one for subsequent editions.

In one embodiment of the invention described herein, a rectilinear indicia grid is formed on the face of a printing plate for use in offset presses and the like. It is one of the objects of the present invention to provide a system of subtractive notation which facilitates the generation of permanent and reproducible data.

It is a further object to provide an offset plate having a negative rectilinear grid on which information concerning successive issues may be accumulated and printed in cumulative form.

It is another object to provide an offset plate which may be reused in printing successive issues of bulletins, catalogs and the like with added issue information.

It is a further object to provide a record medium on which information concerning the entire range of record values is produced and specific data may be accumulated by erasure or obliteration of characters on the medium.

Accordingly, in one embodiment of the invention an offset plate is provided with a rectilinear indicia grid which includes a plurality of perpendicularly intersecting axes forming removable lands between the axes. Coded information is accumulated on said plate by obliteration or removal of one or more of said lands. By thus subtracting material from the negative grids, information as to the successive issues of the particular document can readily be made a part of the plate.

Other objects and advantages of the invention will be apparent from an examination of the following detailed specification, and of the accompanying drawings, in which:

FIG. 1 is a representative issue data page bearing an issue data grid in the lower right corner in an enlarged form for illustrative purposes;

FIG. 2 is an enlarged view of the portion of an offset plate for printing the issue data grid shown in FIG. 1;

FIG. 3 is an alternative form of the portion of the offset plate as shown in FIG. 2; and

FIG. 4 is a second alternative form of the portion of the offset plate as shown in FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing, there is shown in FIG. 1 an issue data page 10, bearing an issue data grid 12, in the lower right corner. This may be the final page of a booklet or a one sheet publication. It is the purpose of the issue data grid 12 to indicate the number of times the particular document has been reprinted and the dates of reprinting. Other pertinent data could also be contained therein such as the number printed.

Shown in FIG. 2 is a portion of an offset plate 14, used for printing the issue data page 10 and particularly grid 12. Only a portion of the offset plate 10 is shown in the drawing, since further materials which may appear on other portions of the plate form no part of the present invention.

A rectilinear indicia grid 16 is disposed on the plate. Such a grid may be formed of suitable ink receptive materials, which are well known in the printing art, and may be impressed on the plate by suitable stamping processes to raise the characters to be printed to a plane separated from the plane of the body of the plate. The term "grid" is used here in its broad sense to define pattern on a printing surface which may either be transferred to a printed sheet in reverse, or, by suitable processes such as conventional offset processes, in a positive form with exactly the same vacant and solid areas as on the plate. In offset printing, for example, the matter to be printed will appear in ink receptive material in the same form on the plate and on the printed page. The ink receptive material picks up the ink, transfers it to a printing roll where it is in a reverse form, and the ink is transferred from the printing roll to the finished product where it is oriented in the proper manner for easy reading. The areas having ink receptive material or raised material are generally referred to herein as "lands."

In the indicia grid 16 a plurality of perpendicularly intersecting axes are formed, such as horizontal axes 18 and vertical axes 20 to form a plurality of lands 22 between the axes. The axes 18 and 20 will be free of the ink receptive material 21 and thus will comprise a relief background and will not print. The printing of the indicia grid and thus each land will appear on the page to be printed. Arranged adjacent the orthogonally disposed lands thus formed along the abscissa and ordinate are informational characters 24 which give significance to the order of the lands. For example (as shown in FIG. 2) a horizontal row of twelve lands may be used to designate the 12 months of the year and a series of vertically arranged horizontal rows of lands may be used to designate a series of years. In this example the informational characters are shown in an ordinary or plain language form, but it will be apparent that encoded informational characters may be used.

The ink receptive material disposed upon plate 14 is removable from the plate so that a portion of the lands may be removed and will not be printed. A sharp stylus, or a knife, may be used, for example, to scrape a land from the plate. Alternatively, if the indicia grid has been formed in the plate by stamping or embossing means, a strong instrument such as an awl may be used to deform one or more of the lands below the plane of the remaining lands to be printed, thereby preventing the deformed lands from receiving or transferring ink. If this indicia technique is used in cast printing environments, the lands may be removed by cutting, chiselling or the like.

It will be apparent from the foregoing that the indicia grid is operated in the following manner. Assuming that the printer wishes to designate the first issue of printed material as having been printed in July of the year 1968, he will remove the land which stands for the seventh month of that year leaving a readable gap 23. Thereafter, the issue will be printed and the plate stored for possible future use. Should more copies of the publication be required in Nov. 1968, the printer need only remove the land which designates that month from the original plate producing a second readable gap or void 25. The original plate may then be reused for the second printing, and the resultant printed matter will show both the date of the original issue and the date of the reissue. Subsequent reissue dates may thus be shown, limited only by the number of lands provided originally in the indicia grid.

Alternative forms of the invention are shown in FIGS. 3 and 4. In FIG. 3 indicia grids 26 and 28 are shown in offset plate 30. Vertical borders 32 perpendicularly intersect horizontal borders 34 to form relief backgrounds 36a, 36b and 36c. Coded issue information, represented by characters 38 comprising lands, appears on the printing face of each of these relief backgrounds. The advantage of utilizing alphanumeric lands is the ability to convey additional information. While the system of FIG. 3 is digitalized and, in this case, decimal in character, the system of FIGS. 1 and 2 is essentially binary in character. In order to convey the pertinent information con-
To encode the first issue, one or more of the character lands 38 is removed so that a blank will appear on the printed page in place of the normal complete set of the coded lands. The remaining lands can thereafter be read easily and can be decoded from an appropriate chart. One typical example of issue coding utilizing the three blocks illustrated in FIG. 3 is as follows:

<table>
<thead>
<tr>
<th>Block 36a Code</th>
<th>Quantity</th>
<th>Block 36b Code</th>
<th>Month</th>
<th>Block 36c Code</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>1</td>
<td>Jan.</td>
<td>1</td>
<td>1965</td>
</tr>
<tr>
<td>2</td>
<td>250</td>
<td>2</td>
<td>Feb.</td>
<td>2</td>
<td>1966</td>
</tr>
<tr>
<td>3</td>
<td>500</td>
<td>3</td>
<td>Mar.</td>
<td>3</td>
<td>1967</td>
</tr>
<tr>
<td>4</td>
<td>750</td>
<td>4</td>
<td>Apr.</td>
<td>4</td>
<td>1968</td>
</tr>
<tr>
<td>5</td>
<td>1,000</td>
<td>5</td>
<td>May</td>
<td>5</td>
<td>1969</td>
</tr>
<tr>
<td>6</td>
<td>1,250</td>
<td>6</td>
<td>June</td>
<td>6</td>
<td>1970</td>
</tr>
<tr>
<td>7</td>
<td>1,500</td>
<td>7</td>
<td>July</td>
<td>7</td>
<td>123</td>
</tr>
<tr>
<td>8</td>
<td>2,000</td>
<td>8</td>
<td>Aug.</td>
<td>8</td>
<td>123</td>
</tr>
<tr>
<td>9</td>
<td>3,000</td>
<td>9</td>
<td>Sept.</td>
<td>9</td>
<td>123</td>
</tr>
<tr>
<td>10</td>
<td>4,000</td>
<td>10</td>
<td>Oct.</td>
<td>10</td>
<td>123</td>
</tr>
<tr>
<td>11</td>
<td>5,000</td>
<td>11</td>
<td>Nov.</td>
<td>11</td>
<td>123</td>
</tr>
<tr>
<td>12</td>
<td>6,000</td>
<td>12</td>
<td>Dec.</td>
<td>12</td>
<td>Blank</td>
</tr>
<tr>
<td>13</td>
<td>7,000</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>8,000</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>9,000</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>10,000</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thus, it will be immediately apparent that the initial issue grid of FIG. 3 indicates an issue of 5,000 copies in Nov. 1967. When a succeeding issue is printed then, from the same plate, indicia grid 28 may be blocked out in a similar manner. This is done of course by scratching or otherwise removing certain of the characters or lands to encode the desired information. Such later issue will thus bear a cumulative record of issue data, and correspondingly the plate will carry an accumulation of such data. The issue grids may extend across the bottom of the entire sheet for multiple reissues.

In FIG. 4 a further form of the invention is shown. On the edge of an offset plate 40, an encoded indicia grid 42 includes vertical borders 44 and intersection horizontal borders 46 which define a plurality of relief backgrounds 47. A land 48 printable from the plate is formed within each relief background 47. When a first issue of a bulletin or the like is printed, an appropriate land is removed or deformed, as at block 50, and a further land or lands, as at block 52, may be removed when subsequent issues are printed from the same plate. Removal of the lands may also be effectively accomplished in some cases by masking them with appropriate ink rejecting materials such as duabbs of fluids or chips adhesively supplied. This form of grid indicium negative shown in FIG. 4 particularly lends itself to use along the vertical margins of pages to be printed and may be continuous or almost continuous and thereby undetectable by the average observer. If desired the regular pattern of relief backgrounds and lands may be broken at as reference point 53 for purposes of reference or providing a code base.

Each of the above described forms of the invention accumulates issue data information on the offset plate first used to print a publication. However, many forms of printing, utilizing plates are readily susceptible to the form of indicia grids described herein. By using the term, "offset plate," it is intended that such plates shall be understood and included. Thus, it will be clear that mats, whether of paper fiber or otherwise, plastic and metal sheet materials are also included in the above use of the term offset plate.

Furthermore, certain of the broader principles of the invention can be advantageously applied in other fields. For example, a machine tool or cabinet could be unobtrusively coded by utilizing the set of relief backgrounds and lands especially as shown in FIG. 4. Serial numbers, purchase dates and the like can be chiselled or cut into such equipment by this subtractive system with a high degree of security.

While several particular embodiments of this invention are shown above and described, it will be understood, of course, that the invention is not to be limited thereto, since many modifications may be made, and it is contemplated, therefore, by the appended claims, to cover any such modifications as fall within the true spirit and scope of this invention.

I claim:

1. A method of preparing printing plates for duplicating a publication as a plurality of issues of said publication, each issue carrying coded information uniquely identifying the issue, said plurality of issues being printed by a printing plate, said coded information being generated by a subtractive indicia system applied to said printing plate, said method comprising

preparing an original printing plate having a pattern of ink receiving lands for printing said publication, defining a relief background on said printing plate, establishing a plurality of coded positions each containing a land within said relief background, assigning a unique value to each of said coded positions, and obliterating selected ones of said lands occupying said coded positions before the printing of an issue of said publication.

2. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, and code cracks, indicating the year of printing.

3. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the month of printing.

4. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the week of printing.

5. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the day of printing.

6. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the day of the week of printing.

7. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the hour of printing.

8. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the minute of printing.

9. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the second of printing.

10. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the day of the month of printing.

11. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the number of minutes past the hour of printing.

12. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the number of seconds past the minute of printing.

13. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the number of fractions of the second of printing.

14. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of copies printed.

15. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of months or years since the issue.

16. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of weeks or days since the issue.

17. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of hours or minutes past the hour or day of printing.

18. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of seconds past the minutes or hours of printing.

19. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of fractions of the second of printing.

20. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of months or years since the issue.

21. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of weeks or days since the issue.

22. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of hours or minutes past the hour or day of printing.

23. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of seconds past the minutes or hours of printing.

24. A method as claimed in claim 1, said plurality of issues being printed by an offset plate, including code cracks, indicating the number of copies printed, code cracks, indicating the year of printing, and code cracks, indicating the position of the decimal point in the number of fractions of the second of printing.