

[54] TWO TRACK EMBOSSING PRODUCT
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[73] Assignee: United States Banknote Corporation, New York, N.Y.
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[58] Field of Search.....235/61.12 R, 61.12 T, 235/61.115, 61.114, 61.6 E; 35/36, 37; 340/146.3; 101/150

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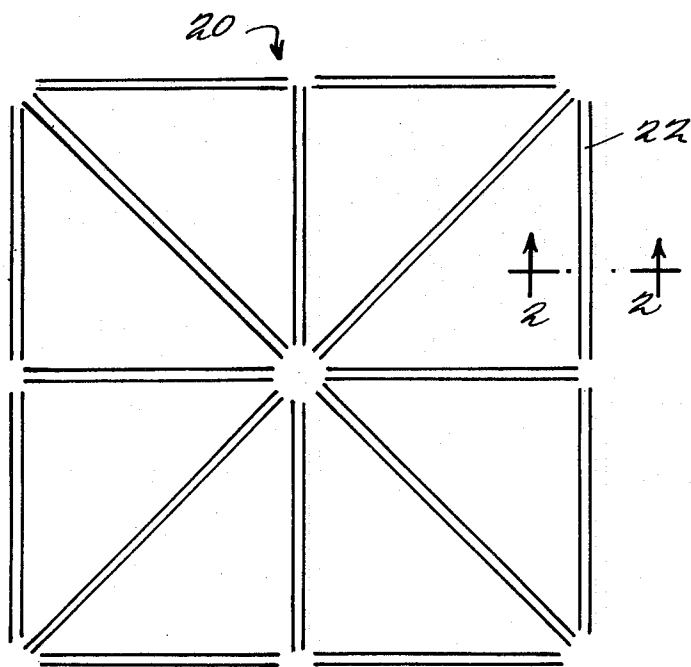
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[57] ABSTRACT

A method of producing a matrix or similar structure adapted for being used to manually produce alpha-numerical characters in a form suitable for quick and accurate reading by a relatively simple optical scanner or similar device whereby each character is formed by manually tracing over a combination of traceways in the matrix and whereby each traceway is bounded by two rails or tracks, raised with respect to the traceway so as to guide the writer in manually following each traceway with a marker to form the alpha-numerical characters so that the characters can be manually produced quickly, accurately and easily. The tracks or rails can be themselves elevated or the traceway can be formed as a groove in paper or other medium. The two raised tracks or the groove can be formed on paper or other medium by thermographic processes, reverse intaglio, blind embossing, intaglio printing, dye stamping, impressing hot or cold rolling die against a paper or foil printing as discussed below.

8 Claims, 6 Drawing Figures



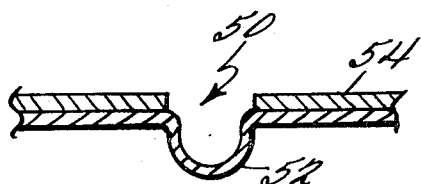
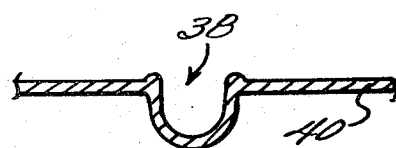
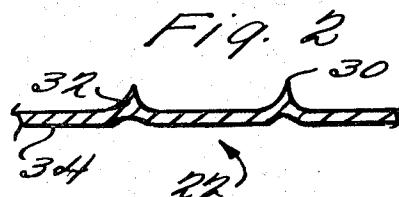
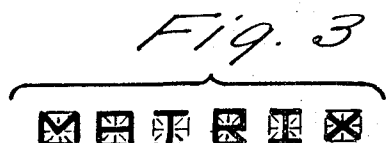
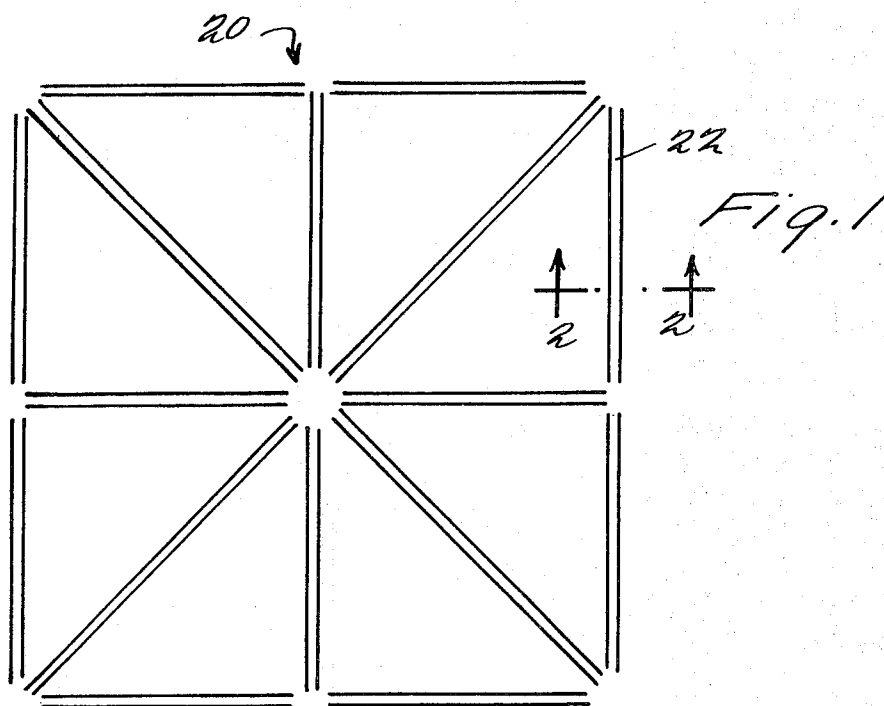


Fig. 5

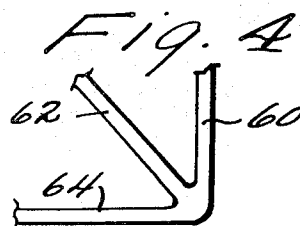


Fig. 6

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TWO TRACK EMBOSSING PRODUCT

BRIEF DESCRIPTION OF THE PRIOR ART AND SUMMARY OF THE INVENTION

The invention relates to a method for manually producing alpha-numeral characters on a matrix, a method for producing a matrix having a number of traceways each bounded by two rails or tracks for guiding a marker following the traceway and the combination of one or more such matrices on paper or other media.

Translating manually written information in the form of alpha-numerical or other characters into a form suitable for use by a digital computer or other machine has hitherto been a time consuming, laborious and relatively expensive operation. Normally, hand-written data must be manually converted into electrical or physical patterns on punched cards, tapes or other common storage devices and the cards or taper then read by suitable electrical, optical or mechanical devices to generate electrical signals which a computer or other similar machine can digest and use. Machines capable of scanning manually written characters and translating the information they contain into signals which can be used directly by a computer or similar device have been developed, but because they must deal with the substantial variations in handwriting which exist between different individuals, such machines are necessarily so complex and expensive as to be normally impractical for most operations.

One way in which individual eccentricities in handwriting can be eliminated and manually-written information comprised of alpha-numerical characters formed in a way which a relatively simple optical reading device can readily, quickly and inexpensively scan and produce electrical signals bearing the information of the characters which is acceptable to a digital computer and other devices is to form the characters on a universal matrix having a number of traceways so that almost all alpha-numerical characters can be readily formed by manually tracing with a marker over some combination of the traceways. One such matrix which has proved to be especially versatile and useful is simply a square having two traceway lines on each side and also having four traceway lines extending from each of the corners of the square to the center of the square and four traceway lines extending from the midpoints of each of the sides of the square to the center. If the 16 traceway lines which make up this matrix are printed in light reflective ink against a dark background or vice versa, then any alpha-numerical characters can be easily generated by manually tracing with a pen or pencil over a given combination of the traceway lines of the matrix to form a representation of that character as it is normally printed which is not only easily recognizable to the untrained eye, but is also easily read by a simple optical scanner, which can detect either the traceways which were traced with the marker or the traceways which were not traced.

However, manually forming such characters by manually tracing with a marker over the appropriate traceways is more difficult than simply printing the characters on paper because of the necessity to cover at least most of the traced matrix lines with the reflective or non-reflective material of the marker. A great deal of fairly intense concentration and attention is required to make sure the manual tracing adequately cover the traceways. Because some lines are inevitably not ade-

quately covered, entry of information into the matrices takes place with less than the desired degree of accuracy and manual formation of the characters is slower than it would be if the traceways did not have to be carefully followed.

The novel invention of this application resolves this problem by providing that each traceway line of the matrix is bounded by two raised rails or tracks running along each traceway which guide the pen, pencil or other marker as the characters are manually formed and prevent it from wandering away from each line as it is traced in forming each character. Thus, information can be entered much more accurately and with considerably more speed and ease than before.

These two tracks or guides can be generated in a variety of ways including printing by the intaglio process to generate raised tracks bounding each traceway line, thermography, blind embossing by hot or cold plates, reverse intaglio printing, dye stamping to produce a groove confirmation, cold or hot rolling dye against a hard backer and foil printing using metallicized plastic stock or a blind embossing press.

Many other objects and purposes of the invention will become clear from the following detailed description of the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a detailed view of one type of matrix having the dual track arrangement according to this invention for guiding a handstroke.

FIG. 2 shows a cut-away view of one traceway of the matrix of FIG. 1 along the line 2—2.

FIG. 3 shows a sample of alphanumerical characters generated with a matrix such as illustrated in FIG. 1.

FIG. 4 shows a cut-away of a traceway formed as a groove.

FIG. 5 shows a cut-away view of a traceway formed as a groove in paper covered with plastic stock.

FIG. 6 shows a portion of a matrix wherein the tracks join to form rounded corners.

DETAILED DESCRIPTION OF THE DRAWINGS

Reference is now made to FIG. 1 which shows a matrix 20, with which the novel method and product of this invention is preferably used as discussed below. As mentioned above, matrices like matrix 20 have been shown to be particularly useful for assisting manual formation with a marker of alpha-numerical characters which not only resemble such characters as they are normally printed but which also can be read by a relatively simple optical reader or similar device. Matrix 20 is comprised of a square having two traceway lines per side and also having four traceway lines extending from the center of the square to each of the corners of the square and four traceway lines extending from the center of the square to the midpoints of each of the sides of the square. The traceway lines are not normally joined but are left blank as shown in order to permit any person manually forming characters by tracing with a marker over some combination of traceways to round the corners of his characters in a natural fashion.

The matrix illustrated in FIG. 1 has been termed COMPRIITE by the Comprite Corporation, 200 W. 58th Street, New York, New York 10019 and relatively simple devices capable of quickly, simply and inexpensively deriving information from characters manually formed on such matrices are available from the above

corporation, as well as other sources, although anyone of ordinary skill in the art will appreciate that any suitable optical reader can be employed. The optical scanner can either detect those traceways which have been manually covered with either light reflective material if the traceways are originally of non-reflective material or non-reflective material if the traceways are originally of reflective material or detect those traceways which have not been covered. However, it is not contemplated that optical reading bundles will be required. A simulated hand-written sample showing how alphanumerical characters can be formed on such a matrix is shown in FIG. 3.

Further, as can be seen in FIG. 2, which is a view of one of the traceway lines, all of which are substantially the same, along the lines 2-2', each traceway line is bounded by two rails or tracks which guide the marker as it is moved manually down the traceway and prevent the marker from straying off the traceway and failing to adequately cover the traceway with reflective or non-reflective material so that the optical reader fails to recognize the character of which that traceway is a part, and at the same time permit the characters to be manually formed quickly, easily and simply. In the embodiment of FIGS. 1 and 2, each traceway, such as traceway 22, is produced by forming two separated tracks 30 and 32 each comprising a mound of ink extending the length of the traceway and printed on plain paper or other media 34 so that the traceway is simply the hollow between the two mounds. While tracks 30 and 32 can be as high as desired or necessary to guide a particular hand, it has been observed that an intaglio signature line of approximately 0.001 to 0.0015 inches yields discernable resistance and it is believed that a track height of 0.005 would be effective to guide a sharp pencil and a light hand.

Preferably, the pair of rails or tracks bounding each traceway of each matrix are placed on paper or other media by intaglio printing. As shown in FIG. 2, the nature of intaglio printing causes stretching of the paper as it is driven into the ink containing incisions on the intaglio plate and this stretching forms a raised plane on which the ink mass is deposited. Thus a groove which is the traceway is formed from two such impressions in close parallel proximity.

Further, it should be apparent that the ink which makes up the rails itself can be non-reflective and the traceway made of white reflective paper so that tracing along the traceway between the tracks with a marker obscures the white paper and provides a readily detectable condition which a simple optical scanner can detect. Conversely, the ink comprising each track can be made of the reflective material while the paper is made non-reflective, so that movement of the pen, pencil or other marker along the groove then obscures the ink comprising the rails, similarly providing a readily detectable condition. Thus, when the track or rail lines are spaced apart so the material deposited by a hand held pen or other marker of reflective or non-reflective character as it moves down the traceway just covers the reflective or non-reflective space between the rails or on the sides of the rails, the traceway can be changed from reflective to non-reflective or vice versa with a single simple hand stroke made quickly and easily under the guidance of the two adjacent guiding surfaces, which in this embodiment are the raised rails or tracks.

An alternative arrangement in a matrix such as is shown in FIGS. 1 and 2 is to use non-reflective paper and track ink with a reflective or special ink which is deposited by a special pen, pencil or other marker which is used by the operator to manually form the alphanumerical characters.

Another manner in which a pair of raised ink tracks can be formed on a paper of other media is by thermographic processes. In fact, while intaglio printing is preferred any way in which raised guide tracks of ink or other material can be formed on the paper or other media is an alternative to intaglio printing.

Of course it is not necessary that the two rails be formed by actually producing raised mounds on a paper and, if desired, a groove can be formed in the paper or other medium so that the roughly vertical sides of the groove function in the same way as the raised mounds shown in FIG. 2 to guide the marker as it is manually moved along the traceway. One such arrangement is illustrated in FIG. 4, wherein a groove 38 is formed in the paper 40 with the roughly vertical walls of groove 38 bounding the traceway in the same way as the raised mounds in FIG. 2. Such grooves can be generated by means of blind embossing by hot or cold plates or cylinders as well as reverse intaglio techniques without the use of inks. As in the other embodiments, reflective grooves can be transformed from light reflective to light absorbative when traced by a pen, pencil or other marker and conversely light absorbative paper and grooves can be transformed to light reflective when traced by a special pen, pencil or other marker.

Dye stamping can also be used to produce a groove conformation in paper or other media and in addition hot or cold rolling dye against a hard backing can be employed to impress the matrix form within the stock thickness. This method would be particularly applicable to existing computer card forming and printing machines whereby relatively thick card stocks offer permanently compressed thicknesses to establish the needed differential.

According to another aspect of the invention, foil printing using metallicized plastic stock on a blind embossing press could be used to generate a groove 50, such as shown in FIG. 5, in paper 52 or other media covered by a sheet of plastic stock material 54. Forming the groove in the paper removes the covering sheet 54 in the groove so that this arrangement has the added advantage of offering a friction differential between the traceways and the adjacent no-write areas since the receptive paper is in the grooves and the non-receptive plastic overlies the no-write areas.

While it is preferred that the junctions between the matrix tracks be left open as shown in FIG. 1, it is also possible to join the tracks together. For example, in FIG. 6 a portion of a matrix is shown whereby three tracks 60, 62 and 64 join, leaving rounded corners for permitting the corners of the alphanumerical characters to be easily and naturally formed.

From the above, it should be apparent that many changes and modifications in the embodiment of the invention illustrated above can be made without departing from the scope of the invention. Accordingly, the scope of the invention is intended to be limited only by the scope of the appended claims.

What is claimed is:

1. A combination for use in manually forming alphanumerical characters with marking means comprising:

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a relatively flat medium, and
a plurality of traceways on said medium each being
a roughly straight line having a roughly uniform
width and defining a matrix so that different char-
acters can be formed by manually tracing with said
marking means over certain combinations of said
traceways, each said traceway including and being
bounded by two traceway portions having a higher
elevation than the portion of said traceway covered
by said marking means for guiding said marker in
tracing over that traceway, and each traceway por-
tion being a raised mound of ink rising above the
level of the surrounding medium to an extent suffi-
cient to yield discernible resistance to deviation of
said marker from said traceway and extending
roughly parallel to that line at the extremities of
said width so as to define a groove between said
mounds to be covered by said marking means as it
is manually moved along said traceway.
2. A combination as in claim 1 wherein said medium
is paper.
3. A combination as in claim 1 wherein said matrix
is comprised of 16 roughly straight traceways, eight

forming a square with two traceways per side, 4 con-
necting the center of said square to roughly the mid-
points of the sides of said square and four connecting
the center of said square to the corners of said square.

4. A combination as in claim 3 wherein the traceways
do not contact each other but leave spaces between
them for rounding said characters.

5. A combination as in claim 1 wherein said marking
means deposits material on said traceways having a re-
flective character differing substantially from the re-
flective character of said traceway.

6. A combination as in claim 5 wherein said material
deposited by said marking means is reflective ink and
said traceways are non-reflective.

7. A combination as in claim 5 wherein said material
deposited by said marking means is non-reflective ink
and said traceways are reflective.

8. A combination as in claim 1 wherein the height of
the top of said portions above the portion of said trace-
way covered by said marking means is roughly 0.005
inches.

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