

[54] RECORD FOR MACHINE SCANNING

[72] Inventor: Ernest Wildhaber, 124 Summit Drive,
Brighton, N.Y. 14620

[22] Filed: May 12, 1970

[21] Appl. No.: 36,610

[52] U.S. Cl.235/61.12 N

[51] Int. Cl.G06k 19/00

[58] Field of Search235/61.12, 61.12 C, 61.12 NP,
235/61.12 M

[56] References Cited

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3,505,501 4/1970 Ruddock et al.....235/61.12

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Primary Examiner—Daryl W. Cook

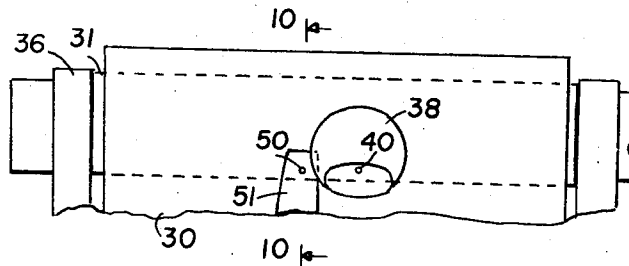
Attorney—Shlesinger, Fitzsimmons and Shlesinger

[57]

ABSTRACT

This record for machine scanning contains characters arranged in lines on both sides thereof, front and rear. On one side are conventional characters readily legible with human eyes from left to right. On the opposite side the characters are symbols legible by machine with a minimum of circuitry. The lines of symbols are arranged from right to left, starting at the right, so as to permit simultaneous application of the characters on both sides of the record.

5 Claims, 12 Drawing Figures



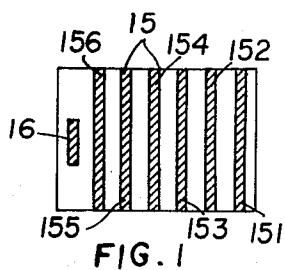


FIG. 1

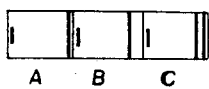


FIG. 2



FIG. 3

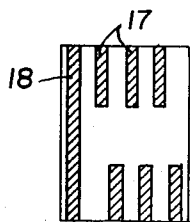


FIG. 4

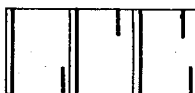


FIG. 5



FIG. 6

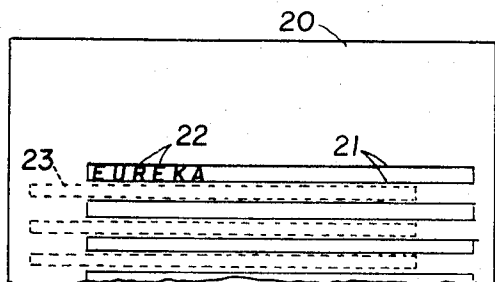


FIG. 7

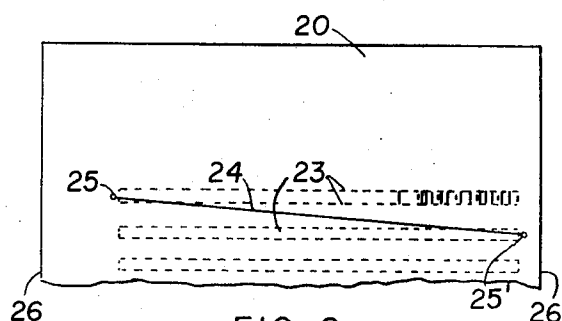


FIG. 8

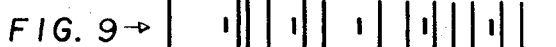


FIG. 9

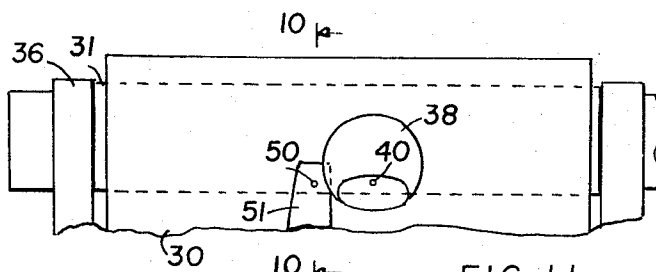


FIG. 10

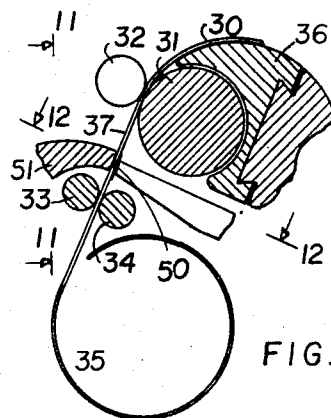


FIG. 11

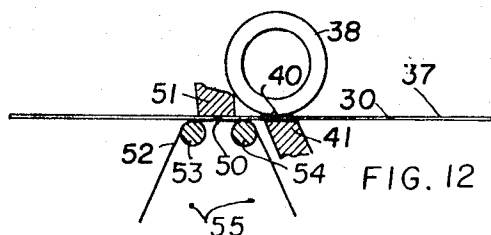


FIG. 12

INVENTOR:

Ernest Wildhaber

RECORD FOR MACHINE SCANNING

The present invention relates to records for optical and other machine scanning. It is used for transmission by electric current fluctuations for instance to a computer, to tape, or to a distant point.

One object of the invention is to provide a record in machine language that can be scanned with a low-cost machine and that is accompanied by conventional explanatory text but economizes on space required.

Another object is to provide a record containing symbols facilitating machine scanning on one side, and conventional text explanatory of the symbols on the opposite side, so that the side read by human eyes is not cluttered up with symbols.

Other aims will appear in the course of the specification and in the recital of the appended claims.

The invention will be described with reference to the drawing, in which

FIG. 1 is an enlarged view showing the character space of one form of symbol that may be used on the record of the invention, indicating all the bars that may be selectively applied in such a character space.

FIG. 2 shows symbols representing the letters A, B, C in a binary notation, using character spaces and marks as shown in FIG. 1.

FIG. 3 spells out the word EUREKA with such symbols.

FIG. 4 is an enlarged view of a character space modified from that of FIG. 1.

FIG. 5 shows symbols representing the letters A, B, C using character spaces and marks as shown in FIG. 4.

FIG. 6 spells out the word EUREKA with symbols corresponding to FIGS. 4 and 5.

FIG. 7 is a fragmentary view of a record sheet showing character lines in conventional script, the height of the lines and the pitch of the characters being exaggerated. It also shows in dotted lines the location of the corresponding symbol lines on the opposite side.

FIG. 8 is a view of said opposite side, showing the lines of symbols.

FIG. 9 is a magnified view of symbols of FIG. 8, that make up the word EUREKA. It appears in reverse, to be scanned from right to left.

FIGS. 10 to 12 are diagrams of parts of a typewriter such as may be used for simultaneously applying the characters on both sides of the record. By pressing a single key a conventional character is applied in front and the corresponding symbol is simultaneously applied in the rear of the record sheet. FIG. 10 is a cross-section of the roll over which the record is intermittently fed and of parts adjacent thereto. The section is taken along lines 10—10 of FIG. 11. FIG. 11 is a view taken in direction 11—11 of FIG. 10. FIG. 12 is a section taken along lines 12—12 of FIG. 10.

FIGS. 1 to 3 show symbols of the type described in my patent application "Record For Machine Scanning" filed Mar. 9, 1970, Ser. No. 17,791.

The symbols are made up of parallel straight bars selected among the equally spaced bars 15 of FIG. 1. A mark 16 of reduced length indicates the start of a character. Bars 151, 152, 153, 154, 155 of FIG. 1 have binary values of 1, 2, 4, 8, 16 respectively. The letters are marked in their alphabetic order. Thus letter A, FIG. 2, the first letter of the alphabet, contains only bar 151 in addition to short mark 16, that repeats on all symbols. Letter B contains only bar 152 having a binary value of 2. Letter C, the third letter of the alphabet contains bars 151 and 152, valued at $1+2=3$, and so on.

The bars may be slightly inclined, from 1° to 5° to the vertical direction that coincides with the direction of the parallel sides of the record sheet, to keep them at right angles to the scanning line. In scanning a plurality of lines the scanning line extends generally between opposite ends of adjacent character lines. The inclination of the bars is however a matter of choice rather than of necessity.

FIGS. 4 to 6 describe a modified symbol. Here the bars 17 occupy separated upper and lower portions, but are also uniformly spaced laterally. Each bar has a different lateral

position. Mark 18 signifies the start of a symbol. This form of symbol cuts down the width of the character space while increasing its height.

The described symbols are intended to serve merely as examples. Any symbols may be used on my record, provided only that they facilitate identification or help reliability.

Opposite sides, front and rear, of a record sheet 20 are shown fragmentarily in FIGS. 7 and 8. FIG. 7 shows double lines 21 bearing conventional characters 22. A single word is spelled out. The dotted lines 23 indicate the lines on the opposite side of the record sheet. They mark the position of the lines, although they are invisible from the front of the opaque sheet. For convenience they are shown intermediate the double lines 21. They can be placed in any desired vertical location and could coincide vertically with the lines 21. When applied as outlined hereafter they are shifted lengthwise, in the direction of the character lines, with respect to lines 21. The lines 21 and 23 are displaced principally in the direction of the lines with respect to each other.

The vertical spacing of the lines is exaggerated in the drawing. It can be chosen at will.

FIG. 8 shows the symbol lines on the opposite side of the record sheet. The symbols are to be scanned backwards, that is from right to left.

An "Optical Scanning Apparatus" has been described in my patent application filed Mar. 9, 1970, Ser. No. 17,792.

For use with this apparatus, and in many other cases, the scanning line 24 passes approximately through opposite ends 25, 25' of adjacent symbol lines 23. The instantaneous scanning region moves from right to left relatively to the record, while continuous relative motion is effected in the (vertical) direction of the parallel sides 26, 26' of the record 20. Because of the exaggerated vertical spacing of the symbol lines 23 and their short length the scanning line 24 appears at an exaggerated inclination to lines 23.

The record 20 moves upwardly at a uniform rate with respect to the scanning line, or the scanning line moves downwardly when the record stands still. As the instantaneous scanning region has passed over the line 23 with end point 25, a further instantaneous scanning region is about to start scanning at point 25' on the next line; and so on.

The record may also be used with any desired other scanning method. When scanning is not approximately continuous the record feed rate is altered and with it the required inclination of the scanning line. This will be readily understood in the art.

FIG. 9 shows the symbols spelling out the initial word on the record at a larger scale. It reads EUREKA from right to left. This inversion permits simultaneous application of the characters on both sides of the record. Machine-scanning is just as easy as scanning from left to right.

One way of applying the characters simultaneously on both sides of a record sheet will now be described with FIGS. 10 to 12.

The record 30 is inserted bottom first past main roll 31, while the pressure rollers 32 and 33, 34 are slightly separated. It is let to curl up at the bottom, at 35. The pressure rollers are then advanced into operating position. Main roll 31 and pressure roller 32 are mounted on the carriage 36 that is operated in conventional manner. On the front 37 of the record sheet conventional characters, such as text and numerals, are applied in an established way, for instance with a type-ball 38 acting through a ribbon, (not shown). It acts on a straightened-out portion of the record sheet, at a spot 40 backed up by a stationary portion 41, (FIG. 12).

The symbols are applied from the rear at a spot 50 backed up by a stationary portion 51 in front. The types move selectively to point 50 to print through a ribbon 52 fed over rollers 53, 54. The types are movable in any desired way, for instance along straight lines that include various angles with the drawing plane of FIG. 10. They move within the tapered space 55 shown in FIG. 12. FIGS. 10 to 12 are diagrams only and are understood to be incomplete.

The centers 40 and 50 of the printing areas are displaced from each other principally in the direction of the character lines, that is the direction of the axis of roll 31.

If desired any other ways of applying the symbols may be used, for instance by heat radiation, as described in my patent application "Ray Typewriter" filed May 1, 1969, Ser. No. 820,958, or any modifications thereof. In this case one side of the record sheet may be treated to become slightly heat sensitive.

For definition of the scope of the invention it is relied on the appended claims.

I claim:

1. A record sheet for machine scanning having typed characters arranged in a plurality of parallel lines on both sides thereof, the characters on the one side of the record sheet being code symbols for machine scanning and arranged from right to left, and the characters on the opposite side of said record sheet being conventional characters corresponding to and

identifying the characters on said one side of the sheet and being readily readable with human eyes and being arranged from left to right so that the characters on the two sides of the record sheet are applicable simultaneously to both sides of the record sheet as it is displaced in the direction of said lines.

2. A record according to claim 1, whereon said symbols are based on a binary system.

3. A record according to claim 1, whereon said symbols are made up of parallel straight bars.

4. A record according to claim 3, whereon said straight bars are inclined to the parallel sides of the record at an angle between 1° and 5°.

5. A record sheet according to claim 1 whereon the lines of characters on opposite sides of the record sheet are displaced with respect to one another, so that looking in a fixed direction at the record sheet the margin at the left is different on the front and rear faces of the sheet.

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