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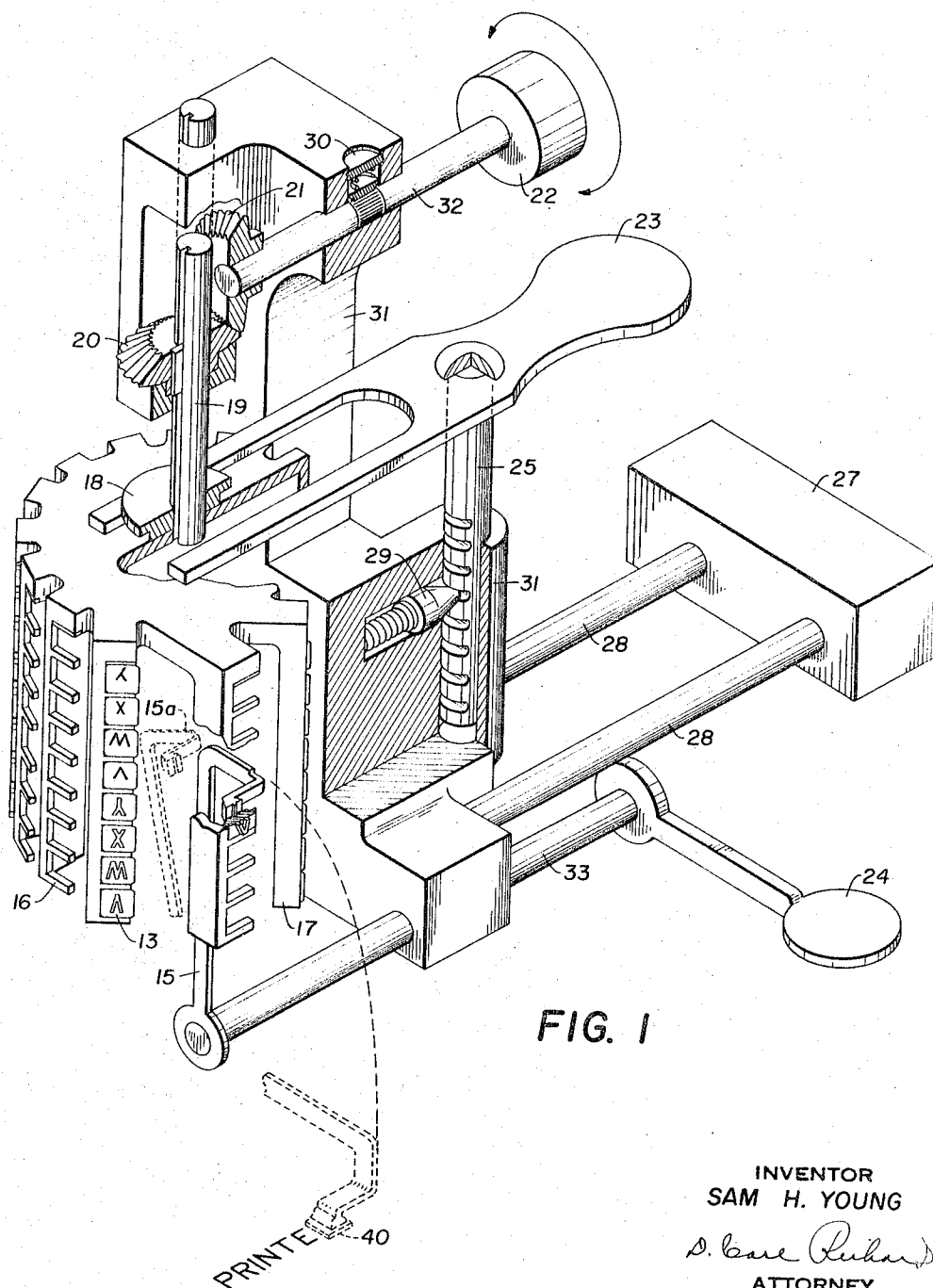
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HOVERING PRINTER HAVING MAGNETICALLY HELD TYPE ELEMENTS

Filed Feb. 11, 1964

2 Sheets-Sheet 1



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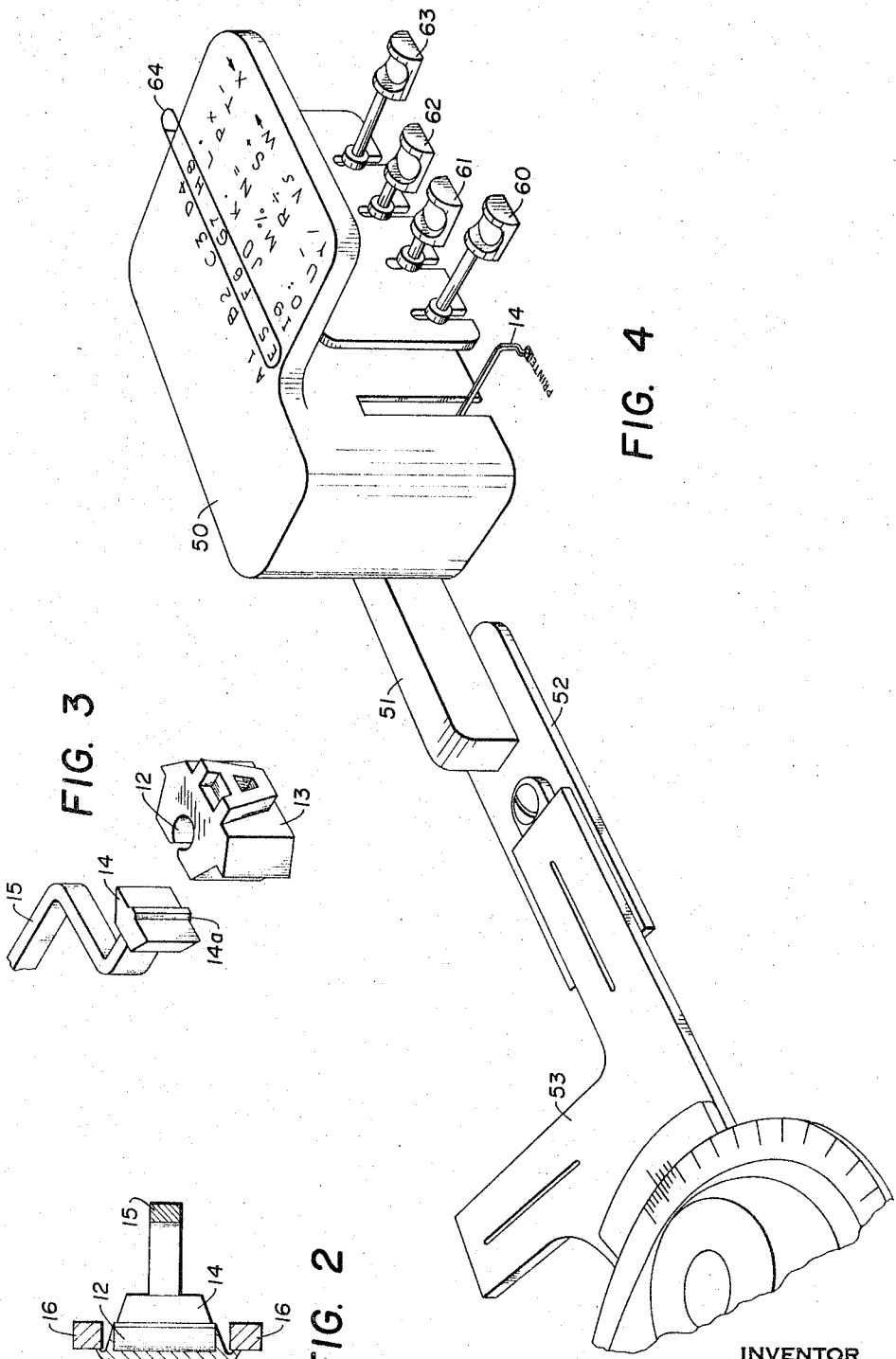


FIG. 4

FIG. 2

FIG. 3

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HOVERING PRINTER HAVING MAGNETICALLY HELD TYPE ELEMENTS

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This application is a continuation-in-part of prior application Serial No. 150,410, filed November 6, 1961, for Hand Operated Printer, now Patent No. 3,228,507.

This invention relates to a printer adapted to be supported or to hover over a work surface for hand operation, and more particularly to an improved system for the support and control of type elements. In a more specific aspect, the invention relates to a turret in which a plurality of type elements are nested and which are selectively transported from a nested position to a printing site.

In the preparation of machine drawings and the like, various expedients have been resorted to in order to print letters, reference characters and other symbols in a neat, uniform array. Carriages, such as used in typewriters, have been modified to accommodate sheets of drawing paper of substantial size in order that such legends can be applied directly through use of conventional units. However, such machines are not adaptable to special tasks without an undue amount of labor and time-consuming effort. On many drawings, much of the work involves the application of legends and impressions of like character which is not line work. It has been found desirable to provide a printing device which may have some of the attributes of the more well-known typewriter, but which can be positioned at any point over a drawing board, clip board, or other sheet material, and operated to provide clear, concise and uniformly appearing legends. The device must be capable of being readily moved from one location to another and must be adaptable to various environments in order to be of greatest utility.

The present invention is directed particularly to an improved system for the support and control of printing elements and for the actuation thereof to impress selected configurations such as type or punctuation and the like at a given selected printing site.

In accordance with the present invention, there is provided a platenless printer which comprises turret-mounted rows and columns of nested type bits. The columns are mounted for rotational movement and for translation along the axis of rotation. A first linkage provides for rotation of a column containing a selected character to a print position. A second linkage is provided for moving the turret along its axis for registration between said character and a striker bar to remove the character from the turret to a selected location.

For a more complete understanding of the present invention and for further objects and advantages thereof, reference may now be had to the following description taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a perspective view of a system embodying the present invention;

FIGURE 2 is a vertical sectional view illustrating the engagement of a striker bar and printing block;

FIGURE 3 is an asymmetric view showing the printing block and striker bar; and

FIGURE 4 illustrates one embodiment and use of the invention.

FIGURE 1 illustrates a type turret 18, journaled in frame block 31. Turret 18 carries a multiplicity of removable printing type blocks or bits 13. Turret 18 is mounted on a shaft 19 for rotation about a vertical axis. Shaft 19 is slidable vertically along its axis and through a

miter gear 20 to which it is keyed. A second miter gear 21, rotatable by a hand knob 22, provides for indexing the turret to bring any one bar of the plurality of vertical type holder bars such as bar 17 into position for subsequent selection for printing with any selected one of a plurality of type bits, such as bit 13, which are supported in the selected column. A spring-loaded plunger 30, acting as a detent, is provided to hold the turret position by friction. The end of plunger 30 fits into a set of grooves milled in shaft 32. The grooves are milled in a pattern corresponding to the radial index positions of bars 17 in turret 18. This maintains the selected one of bars 17 in the printing position.

Also shown is a hand lever 23 attached rigidly to vertical bar 25. Bar 25 is slidable in frame block 31. The opposite end of lever 23 is slotted to fit under a flange on turret 18 in such manner that the turret may rotate about the axis of shaft 19. Lever 23 may be raised or lowered to set the vertical index position of turret 18. A second spring-loaded detent 29, through friction engagement with slots in bar 25, maintains the vertical set index position of the turret 18 to position a chosen type bit 13 at a loading station where it is picked up by a printing striker 15. The slots in bar 25 are in a pattern corresponding to the vertical type positions of type bits in the bars 17.

A striker mechanism is provided to engage and move a selected type bit from its nest between tines 16 in an indexed holder bar 17 to a printing location 40. More particularly, an operating lever 24 is coupled to a shaft 33 which is journaled in the frame element 31. The shaft 33 extends horizontally from the operating lever 24 and supports at the opposite end thereof a striker arm 15. The striker arm 15 normally is at the position 15a, shown dotted. The striker arm 15 has an offset element having a face member 14 to engage the type bits. Upon engagement of the type bit, the bit is removed from its nest in the holder 17 and travels through an arc traversed by the end of the striker bar 15 which terminates at a print position 40.

A typical type bit is illustrated in FIGURES 2 and 3. The bits are normally maintained or latched in the turret bar 17 by suitable means such as utilization of magnetic forces. As illustrated, a short bar magnet 12 extends vertically through the type bit 13. The ends of the bar magnet are positioned adjacent to the horizontal tines of the turret bar 17. Tines 16 are shown in section in FIGURE 2. The type bit may be made of a suitable plastic material in which the magnet 12 is embedded. The striker member 14 is also of magnetic material where it engages the rear surface of the type bit. By depressing the striker lever 24, the striker arm 15 is brought into engagement with the rear face of the type bit 13 carrying the same from its nested position in the turret bar 17 to impress the same at the printing location 40. As illustrated in FIGURE 3, the striker bar 15 carrying the striker element 14 may include a rib 14a which may be indexed in a groove in the rear face of the type bit 13 to enhance the holding or latching action of the magnet 12 with member 14 and at the same time properly position the element for registration with the tines on the turret bar 17.

The shaft 33 carrying the striker arm 15 is spring-biased, by means not shown, to return the striker arm 15 to its normal at rest position inside the turret and to return the type bit to its nest in the turret bar 17.

Parallel bars 28 are fixed in the frame 31 and are slidable in a block 27, which may be affixed to the table or drafting machine or to a portable weight to provide a reference position for the printing unit.

The system may be supported as on a drafting machine shown in FIGURE 4. The mechanism shown in FIG-

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URES 1-3 may be housed in a case 50 which is mounted on an arm 51 having a coupling 52 to adapt the same to a drafting machine 53. Four keys 60, 61, 62, and 63 extend from the face of the housing 50 and are coupled by linkages, such as generally disclosed in the aforesaid co-pending application, to impart the rotational movement to shaft 32 to index a given turret bar to the print position and to impart vertical motion as to the vertical bar 25 to select a given element in the turret bar 17. The upper surface of the housing 50 may carry a suitable legend corresponding with the positions of the type bits in the turret and at indicator 64 to indicate the position of the turret. The housing 50 may be stepped along the border 51 by a suitable detent or guiding arrangement so that the striker bar 15 will be moved along the work site as the printing operation proceeds. The foregoing is described in said co-pending application and for that reason is not detailed in the present case. The principal feature of the present invention involves the support and positioning of type bits in a turret which is rotatable and translatable about and along its central axis with means for supporting and delivering the type bits to the printing location.

Thus, in accordance with the invention, there is provided a turret type bit holder with vertical arrays of type bits removably mounted in the bit holder. The holder is selectively movable to position any type bit for registration with a striker bar to move the type bit from the turret to an impact station.

Having described the invention in connection with certain specific embodiments thereof, it is to be understood that further modifications may now suggest themselves to those skilled in the art and it is intended to cover such modifications as fall within the scope of the appended claims.

What is claimed is:

1. In a printing mechanism, the combination which comprises:

- (a) a type bit holder in the form of a turret for supporting type bits in a circular array of angularly spaced bars, said holder having a plurality of bars extending parallel to the axis of said array, with a plurality of tines extending circumferentially from each of said bars to form vertical arrays of bit nests,
- (b) a plurality of type bits, one latched in each of said nests,
- (c) means for rotating and for translating said turret on the axis of said array for selectively moving any one of said bits into registration with a loading station, and
- (d) a striker bar which, in its traverse from a rest position to an impact station, passes through said loading station to unlatch and carry the bit at said loading station to a printing station.

2. The combination in claim 1 in which said bits are magnetically nested and supported between magnetic tines forming portions of said bars wherein said tines extend circumferentially of said array.

3. The combination set forth in claim 1 in which said striker bar is mounted for passage between two adjacent bars in its trajectory to said impact station.

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4. The combination in claim 1 in which said bits are magnetically nested and supported between magnetic tines forming portions of said bars wherein said tines extend circumferentially of said array and in which said striker bar has a magnetic end portion for engaging each bit.

5. In a printing mechanism, the combination which comprises:

- (a) a type bit holder in the form of a turret for supporting type bits in a circular array of angularly spaced bars, which bars extend parallel to the axis of said array, with a plurality of tines extending circumferentially from each of said bars to form vertical arrays of bit nests,
- (b) a plurality of type bits, one latched in each of said nests,
- (c) means for rotating and for translating said turret on the axis of said array for selectively moving any one of said bits into registration with a loading station, and
- (d) a striker bar rotatable about an axis spaced from said loading station having an end portion which, in its traverse from a rest position to an impact station, passes through said loading station to unlatch and carry the bit at said loading station to a printing station.

6. In a printing mechanism, the combination which comprises:

- (a) a type bit holder in the form of a turret for supporting type bits in a circular array of angularly spaced bars, which bars extend parallel to the axis of said array, with a plurality of tines extending circumferentially from each of said bars to form vertical arrays of bit nests,
- (b) a plurality of type bits, one latched in each of said nests,
- (c) means for rotating and for translating said turret on the axis of said array for selectively moving any one of said bits into registration with a loading station, and
- (d) a striker bar rotatable about a second axis perpendicular to the axis of said array and which is spaced from said loading station, said bar having an arm extending parallel to said tines which arm, in its traverse from a rest position to an impact station, passes between the tines adjacent to said loading station to unlatch and carry the bit at said loading station to a printing station.

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