United States Patent [19]

Harding

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[54] **STENOGRAPHIC BRAILLE MACHINE**

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[52] **U.S. Cl.** **197/6.1;** 197/9; 101/18

[51] **Int. Cl.²** **B41J 3/32**

[58] **Field of Search** 197/1, 6.0, 6.1, 6.2, 9; 101/18, 19, 20, 375, 22, 23

[56] **References Cited**

UNITED STATES PATENTS

852,788	5/1907	Ilch	101/18
2,680,507	6/1954	Frey et al.	197/6.1
3,534,846	10/1970	Watari	197/6.1
3,793,946	2/1974	Sheffield	101/18

Primary Examiner—Clifford D. Crowder

Assistant Examiner—R. T. Rader

[57] **ABSTRACT**

The specification discloses a stenographic machine which will imbraille a medium so that it can be read both visually and tactually.

5 Claims, 5 Drawing Figures

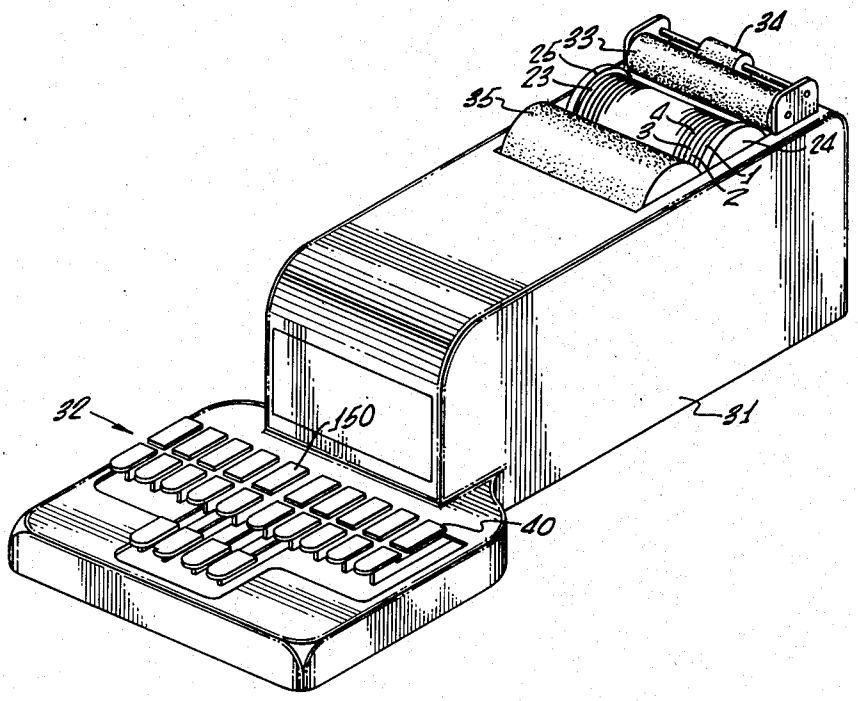


FIG. 1.

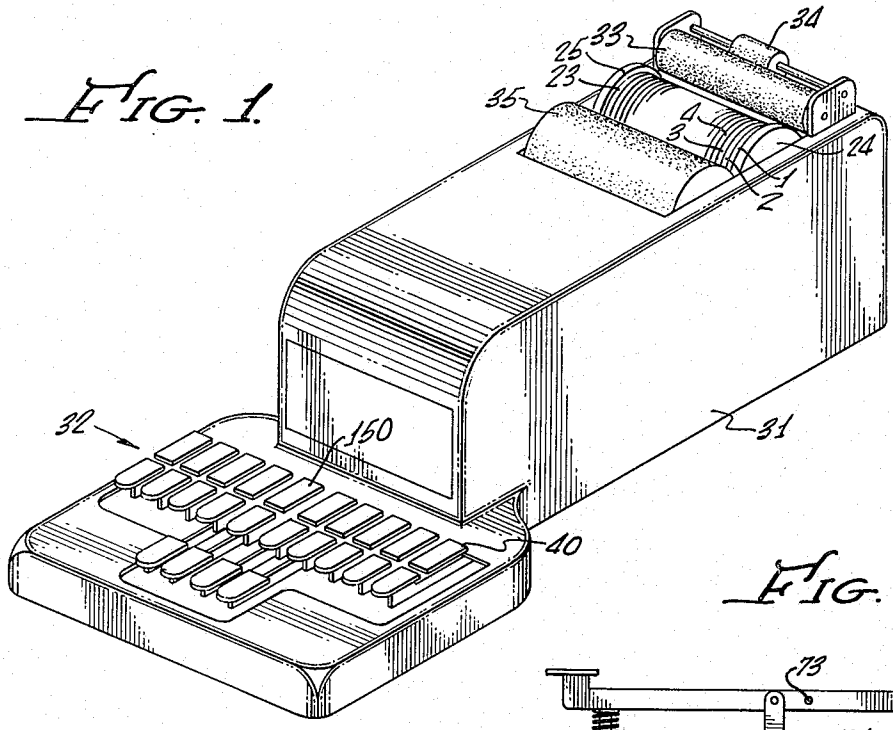


FIG. 5.

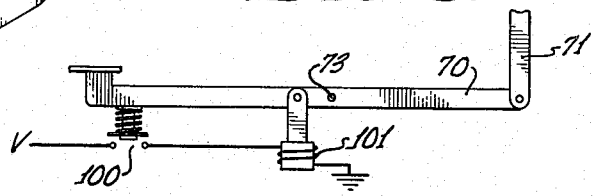


FIG. 2.

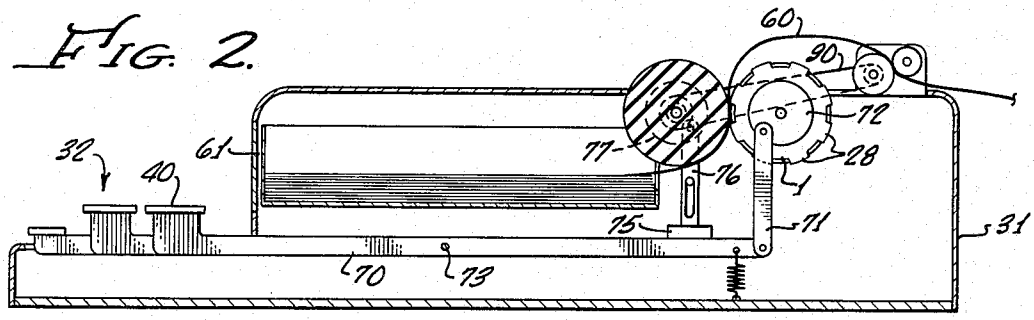


FIG. 3.

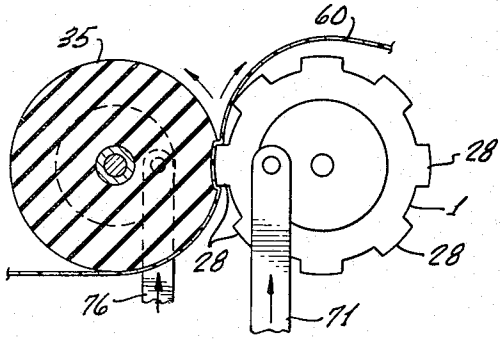
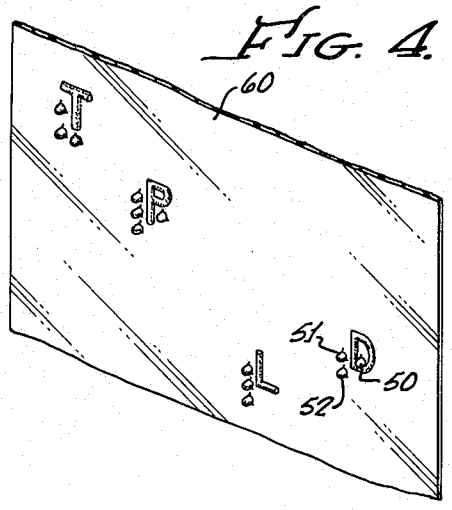


FIG. 4.



STENOGRAPHIC BRAILLE MACHINE

BACKGROUND OF THE INVENTION

Blind persons, and those with partially impaired sight have, in the past, had little opportunity to compete with persons of ordinary sight in such fields as secretarial work and court reporting. A paramount reason for this lies in the fact that, in many instances, the secretary or court reporter will be called upon to "read back" what is just been said, or to translate shorthand notes, or to provide reported information to a third person for typing, transcription, and the like. In an attempt to open this field of endeavor to the blind, various devices have been proposed to aid such person. As background information, reference is made to the following U.S. Pat. Nos.:

Patent No. 3,032,164 by Masaharu Watari Issued May 1, 1962	Patent No. 1,264,014 by C. L. Chinnock Issued April 23, 1918
Patent No. 2,680,507 by E. Frey et al Issued June 8, 1954	Patent No. 2,412,183 by W. P. Taylor, Jr. Issued Dec. 3, 1946
Patent No. 2,393,781 by C. W. Johnson et al Issued Jan. 29, 1946	Patent No. 977,237 by A. Swindler Issued Nov. 29, 1910
Patent No. 1,822,938 by J. A. B. Smith Issued Sept. 15, 1931	Patent No. 800,150. by J. B. Hammond Issued Sept. 26, 1905
Patent No. 3,243,031 by T. I. Przysiecke Issued March 29, 1966	Patent No. 3,235,055 by W. H. Pagenkopf Issued Feb. 15, 1966
Patent No. 1,141,651 by J. J. O'Regan Issued June 1, 1915	Patent No. 3,254,750 by E. M. Goldner Issued June 7, 1966

Particular attention is called to U.S. Pat. No. 2,393,781 which describes a novel clutch. The contents of that patent are incorporated by reference in the present application.

For the purposes of anticipating the present invention, the most relevent of the above patents are Chinnock, Frey and Watari. It will be noted however, that in each case, the embossing of the medium is accomplished by striking hammers. This conventional typewriter approach, whether manually or solenoid operated, always produces noise. It is therefore not suitable for courtroom use and has only limited application as a secretarial dictating machine.

What is actually desired is a quiet stenotype machine which will simultaneously produce a visual record and an embossed braille equivalent.

Accordingly, a primary object of the present invention is to provide a quiet stenotype braille machine.

Another object of the present invention is to provide an apparatus which will allow a blind person to read what has been recorded with the same ease as a person with unimpaired vision.

It is another object of the present invention to provide a machine which will produce a visual character and its corresponding braille character with the one keystroke.

It is another object of the invention to provide a quiet embossing stenotype machine which utilizes the same keyboard and coding arrangement as is used on conventional, standard stenotype machines.

It is another object of the present invention to provide an embossing stenotype machinne having a touch which is comparable with existing non-embossing stenotype machines.

It is an object of one embodiment of the present invention to provide manually operated embossing stenotype machine having a touch and speed comparable to existing stenotype machines.

It is another object of the present invention to provide a system which will enable a blind person to take dictation, which can be read either by a blind person or a person who has vision, but is not able to understand Braille.

Other objects and advantages of the present invention will be obvious from the detailed description of a preferred embodiment given herein below.

SUMMARY OF THE INVENTION

The aforementioned objects are realized by the present invention which comprises a standard stenotype keyboard, each key of which is connected via a lever arrangement to advance a separate disk and a common platen. Each disk has a plurality of raised embossing elements about its circumference. The recording medium passes between the platen and the disks, and is advanced each time a key is struck. As the disk and platen rotate, the embossing heads are quietly pressed into the recording medium so as to leave both a visual and tactual impression.

DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a perspective view of the Braille stenotype machine.

FIG. 2 shows a cross-section of the mechanical structure for actuating the disks and platen.

FIG. 3 shows a cross-section illustrating how the medium is embossed by the compression wedge formed by the embossing head of the disk.

FIG. 4 shows a perspective view of how the visual and braille counter-part would appear on the medium.

FIG. 5 shows an alternative embodiment utilizing a solenoid assist mechanism.

DESCRIPTION OF A PREFERRED EMBODIMENT

Adverting to the drawings and particularly FIG. 1, a preferred embodiment of the invention comprises a case **31**, a 24 key keyboard **32** which (except for deletion of the numeral bar) has the same keys and location arrangement as a standard Stenotype keyboard, (namely **23** alpha-symbolic keys and a space key), a pair of paper guide rollers **33** and **34**, a platen **35**, and a plurality of separate embossing disks **1–23** each of which corresponds to, and is actuated by, one of the twenty-three alpha-symbolic keys. As shown in FIG. 2, each of the embossing disks (such as disk **1**) has a plurality of embossing heads **28**. Each of the embossing heads **28** on disk **1** will imprint the same character. For example, if the key **40** corresponds to the letter D each of the heads **28** on disk **1** will include a slightly raised letter D and the three dots which correspond to the Braille equivalent. It is contemplated that the Braille dots will be raised higher than the visual portion, and slightly shifted with respect to the visual counterpart in order to facilitate reading. The shift of the Braille information with respect to the visual should be kept small however, in order to minimize the width of the medium **60** as well as its rate of advance. The situation is illustrated in FIG. 4 which shows a section of the medium **60** as it would appear if the keys T, P, D anad L are struck in succession. The Braille information (dots **50**, 51 and **52**) are shifted only slightly to the left, and slightly downwardly from the visual character.

FIG. 2 shows the details of the linkage mechanism. Each of the keys is connected to an associated disk (for example, key **40** is connected to disk **1**) via a link and ratchet clutch arrangement **70, 71** and **72.** The link **70** is pivotally mounted at a point **73** so as to cause the disk to advance one-eighth of a revolution when depressed the full keystroke distance (approximately five-eighths of an inch). Each key also actuates a 1/8 revolution of platen **35** via the common bar **75,** link **76,** and ratchet clutch **77.** The ratchet clutches **72** and **77** may be any one of a number of prior art clutch devices such as the type described in U.S. Pat. No 2,393,781 referred to above. When an alpha-symbolic key is depressed, its associated disk and the platen rotate together so as to cause one of the eight protruding embossing heads **28** to form a visual and imbrailled impression on the recording medium **60.** Platen **35** is preferrably made of a resilient material so that it can elastically deform, whereas the medium **60** is a plastically deformable material. As shown in FIG. **3,** the spacing between the disk **1** and platen **35** is such as to cause the protruding head to force a depression on the medium **60** against the surface of the platen **35.** At the end of the keystroke, both clutches **72** and **77** release automatically without imparting any reverse rotation of either platen **35** or disk **1,** and allow the key to return to its original position.

The space key **150** is not connected to an embossing disk. It does however, function to actuate the platen **35** via a link (such as **70**) and the common bar **76.** The freely rotatable spacing disks **24** and **25** have a diameter such that they and the platen will be in contact with, and capture the medium **60** at all times. When the platen is caused to rotate by the depression of any key, the medium **60** will be advanced accordingly. Thus, if one of the twenty-three alpha-symbolic keys are depressed, one of disks **1–23** will be caused to rotate, as well as the platen and spacing disks **24** and **25.** If the spacing key only is depressed, only the platen **35** and spacing disks **24** and **25** will rotate. In either case, the medium **60** will be advanced a distance equal to one-eighth the circumference of the platen. The medium **60** also passes between rollers **33** and **34,** which function as a takeup, being moved by springband **90** each time the platen **35** is incremented. The medium **60** then passes to a hopper (not shown) where it stacks in a manner identical to the way in which it is stored in the magazine **61.**

When none of the keys are depressed, each of the twenty-three embossing disks **1–23** will be positioned as shown in FIG. **2,** so that none of the embossing heads will be in contact with the recording medium **60.** When a key is struck, only the platen and the disk associated with the depressed key will rotate. When a plurality of keys are depressed simultaneously, (in stenographic work, there may be as many as eight keys struck at once), the platen and those disks associated with the depressed keys will be rotated. The remaining disks will remain stationary. After completion of the keystroke, disks which have been actuated by keystrokes will have rotated one-eighth of a revolution, so that none of the eight embossing heads will be in contact with the recording medium. At this point, the ratchet clutch will release (as described in U.S. Pat. No. 2,393,781) leaving all of the disks with no embossing head **28** in contact with the medium **60.** The recording medium will have a visual alphabetic character and a braille equivalent at that location on the line which corresponds to the position of the embossing disks which have been rotated by the simultaneous depression of their associated keys.

The medium **60** is preferrably a triple ply paper plastic laminate. The center portion should be fabricated of a dark colored material which will leave a visual impression as when embossed. Common stencil paper will provide adequate results, although it is not necessarily optimum.

FIG. **6** shows an alternative embodiment of the invention utilizing an electrical assist. Each key is arranged to have a separate contact **100** which provides power through solenoid **101,** so as to lighten the touch required for rapid steno work. It is contemplated that the power would be supplied from an AC source or a portable power pack.

The embossing heads **28** are preferrably of a size comparable with existing stenotype characters. Since the Braille portion of the information is to be shifted only slightly with respect to the visual data, the size of the entire head need not be greater than ¼inch × ¼inch square. It is contemplated that the character information for visual reading will be raised approximately one-thirty second of an inch (sufficient to produce a visual pressure image on a stencil type paper) whereas the Braille dots will be raised approximately three-thirtyseconds of an inch (sufficient to produce a permanent deformation of the medium). The platen **35** is preferrably made of a rubberized material, which will not permanently deform when repeatably subjected to the impressing force of the heads **28.** Alternatively, the platen may be made of a rigid material, but contain eight complimentary recesses about its periphery for each of the twenty-three disks, which correspond to the information on each disk. In other words, the platen could contain the female half of an embossing mold and the heads **28** could function as the male half of the mold. In this alternative embodiment, it is of course necessary to maintain perfect syncronization between the position of the platen and disks. The can be accomplished by eliminating elements **76** and **77** and substituting a gear arrangement for incrementing the platen **35** each time one of the disks is actuated.

The present invention is not limited in its application to conventional stenotype keyboards or machines. It may be utilized in conjunction with typewriters, calculators, and other business machines to provide a visual and Braille record of information. Nor is the design limited to the particular structure shown. For example, depending upon the characteristics of the recording medium, it may be desirable to superpose the Braille information directly on top of the visual data — rather than shift it as indicated in FIG. **4.** Furthermore, the platen and disks may be of different diameters, and the medium may be stored on and taken up on a roller — rather than in a stacking hopper. Thus, although a preferred embodiment has been shown and described, it will be understood that the invention is not limited thereto, and that numerous changes, modifications, and substitutions may be made without departing from the spirit of the invention.

I claim:

1. An apparatus for recording visual and tactual information comprising:

a keyboard having a plurality of keys;

a cylindrical platen;

means for journalling said platen so as to permit rotation about the axis of the cylinder;

a plurality of cylindrical disks each journalled for rotation about an axis parallel to the axis of said cylindrical platen;

linkage means responsively connecting each of said keys with one of said disks so as to cause said disks to rotate when the associated key is struck;

means responsive to each key for rotating said platen each time that a key is depressed;

and ratchet clutch means for disengaging said disks and said platen when said key is released whereby said disk and platen will remain in the position effected when said key is fully depressed;

a plurality of embossing heads on the circumference of each of said disks;

means for feeding a pressure sensitive recording medium between said platen and said disks;

means for positioning the journalled axis of each of said disks so as to cause said embossing heads to exert pressure on the recording medium when said disk and platen are rotated by the depression of a key.

2. The apparatus recited in claim **1** wherein said means for rotating said platen comprises:

an elongated bar positioned so as to rest in contact with each of said linkage means for actuating said disks;

means connecting said bar with said cylindrical platen whereby the depression of any key will cause said bar to move said platen.

3. The apparatus recited in claim **1** wherein said embossing heads comprise:

a raised alphabetic character, and;

a raised Braille equivalent.

4. The apparatus recited in claim **3** wherein said platen includes an elastically deformable surface.

5. The apparatus recited in claim **4** wherein each disk includes a plurality of identical embossing heads.

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