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**DE-A-3 037 317**  
**GB-A-2 098 929**  
**US-A-3 534 846**

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## Description

The present invention relates to a sheet material embossing machine for generating a line of embossed characters, comprising a support for a sheet of embossable material, embossing means for embossing a sheet supported in the support and drive means operable to move the support in step-wise manner relative to the embossing means to present successive areas of a sheet for embossing. The sheet material may be paper, for instance. A machine embodying the invention may be used for a variety of purposes, including serving as an aid for blind and partially-sighted people.

Blind people can learn to read by touch, by running a finger over a line of characters embossed in a sheet of paper. Several character systems have been devised. In one of them, the Braille system, characters are made up of embossed dots. Each character is formed by embossing a unique combination of dots selected from an array of six dots. The same six dot array is used for all characters.

The number of distinct characters available in the Braille system makes Braille versatile. Furthermore, since all Braille characters are formed on the same array of dots, the printing of Braille is not difficult. Braille has been widely adopted and a large volume of printed material is available. However, Braille characters bear little or no resemblance to their Roman type equivalents. This makes Braille a difficult system to learn, particularly for those who lose their sight late in life.

Several proposes have been made for machines for embossing Braille characters. US Patent no 3 534 846 and British patent specification no 2 098 929A disclose typewriters adapted to enable a typist to generate Braille script on a sheet of embossable paper, using a different key for each character. West German patent specification no. 30 47 317 discloses a stenographer's machine for generating a line of Braille characters along a strip of paper, using a different key for each of the six Braille dots.

The Moon system is an alternative system of embossed writing and was invented in 1847. The characters incorporate embossed lines and curves, and many characters are the same as or closely related to their Roman type equivalents. This makes Moon easier to learn for readers who have had sight, but more difficult to print. It is printed in a way analogous to settable type printing. Each piece of type is an embossing head for embossing one character. The type is assembled to form a page of script which is embossed onto a sheet of paper in one pressing action. Moon material is much slower to print than Braille material, and as a result, a much smaller selection is available to the reader.

Furthermore, the type-setting method has been the only method used for producing Moon material, up to the present date.

A machine according to the present invention is

characterised in that the embossing means comprises an embossing stylus movable with respect to the support into and out of a position in which it impresses a sheet held in the support, a describing member movable to describe the outline of a character to be embossed, and a coupling between the describing member and the stylus or support causing relative movement between the stylus and support, the relative movement following movement of the describing member.

The invention transforms the Moon system from a reading system to a system in which the user can write as well as read. Using a machine embodying the invention, blind Moon readers can write letters to each other, for instance, without having to rely on a sighted person to write the letter in ordinary handwriting, and a sighted person to read the letter to the recipient. The invention also enables Moon writers to write notes for themselves, or shopping lists, for instance, and to prepare labels for jars of food or medicine, for instance.

Preferably the coupling couples the stylus to the describing member and the drive means moves the support while the stylus remains stationary. A pantograph mechanism is preferably incorporated in the coupling so that the relative movement between the stylus and the support is reduced in amplitude with respect to the movement of the describing member.

Preferably the support comprises a roller around which a sheet of embossable material may be coiled, and from around which the sheet may be uncoiled to take up a position in which an area of the sheet is presented to the stylus.

To facilitate coiling and uncoiling of paper around the roller, the machine may further comprise a guide plate movable between a first position in which it guides paper to the roller, for coiling around the roller, and a second position in which it guides paper uncoiled from the roller to the stylus, for embossing. Such a guide plate preferably carries an anvil of resilient material against which the stylus is urged when the stylus is in its sheet-impressing position and the guide plate is in its second position, to emboss a sheet positioned between the stylus and the anvil.

One example of a machine embodying the invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 is a side elevation of the internal mechanism of the machine;

Fig. 2 is a plan view of part of the mechanism of Fig. 1;

Fig. 3 is a partial end elevation of the mechanism of Fig. 1, viewed from the left in Fig. 1.

Fig. 1 shows a sheet material embossing machine 10 for generating a line of embossed characters. The machine 10 may be used to emboss paper. The machine 10 comprises a support 12 for a sheet of embossable paper. An embossing stylus 14 is vertically movable into and out of a position in which it impresses paper held in the support 12. A describing member 16 is movable to describe the outline of a character to

be embossed. A coupling 18 between the describing member 16 and the stylus 14 causes the stylus 14 to move relative to the support 12, so as to follow movement of the tracing member 16. Drive means 20 is operable to move the support 12 in a

The paper support 12 is an adaptation of the carriage mechanism of a typewriter. The support 12 comprises a paper roller 22, rotatable about its cylindrical axis. Arcuate paper guides 24 allow paper to be coiled or uncoiled from around roller 22 (between the surface of the roller 22 and the guides 24). A paper guide plate 26 is hinged at the roller axis and can move between two extreme positions, shown respectively in solid and in ghosted lines in Fig. 1. When the guide plate 26 is in the near vertical position shown ghosted in Fig. 1, the plate 26 guides the leading edge of a sheet of paper offered to it into the space between the roller 22 and the arcuate guide 24, where it may wrap around the roller.

When the guide plate 26 is lowered to its horizontal position, shown in solid lines in Fig. 1, the guides 24 move it, so that the roller 22 may be rotated in the reverse direction to feed paper out along the underside of the plate 26 from around the roller 22. The paper passes between an anvil 28 and the stylus 14. The anvil 28 is a strip of resilient material secured to the underside of the plate 26. The anvil extends along the plate 26 parallel to the axis of the roller 22, and has substantially the same length as the roller axis.

A releasable locking catch 30 is provided to hold the guide plate 26 in its horizontal position.

The stylus 14 is mounted on a frame 32 and is movable vertically, by means described later, into and out of a position in which it is urged against the anvil 28, so as to impress the paper interposed between the stylus and anvil. The stylus 14 is also movable in a horizontal plane, by means described below. Thus, when the stylus is in its raised position, and is impressing a paper sheet, embossed lines or curves such as those forming a Moon character may be produced in the paper by appropriate movement of the stylus.

The horizontal position of the stylus is controlled by the user of the machine. The describing member 16 is a ring 16 (see Fig. 2) of suitable size to accommodate a finger of a user. The ring 16 is positioned above a fingerboard 34, and may move in a horizontal plane above the fingerboard 34.

The coupling 18 couples the stylus to the ring 16 and causes the stylus to follow horizontal motion of the ring 16. As the user describes a shape or character by running his finger over the fingerboard 34 (with his finger in the ring 16), the same character is described by the stylus 14. If the stylus 14 is in its raised position, the character described on the fingerboard 34 is reproduced as an embossed character in the paper sheet. The fingerboard 34 may have grooves, or ridges or other formations to guide the user's finger, so as to facilitate describing characters. When the

machine is to be used to emboss characters having common components, for instance vertical, horizontal or diagonal strokes, or arcuate curves, grooves representing all these components may be formed on the fingerboard, so that the user's finger is guided to describe an element correctly once the finger is positioned in the appropriate groove.

The coupling 18 will now be described in more detail with reference to Figs. 1, 2 and 3. A first portion of the coupling 18 is a pantograph mechanism 36 shown most clearly in Fig. 2, and comprising a driving bar 38 in which the ring 16 is formed at one end, and a following bar 40. Two intermediate bars 42, 44 are pivotally connected to the driving bar 38 and to the following bar 40. The separations of the pivot points on the bars 38 and 40 are the same, and the separations of the pivot points on the bars 42, 44 are the same. Accordingly, the bars 38, 40, 42, 44 always form a parallelogram. The intermediate bar 42 extends from the driving bar 38 beyond the following bar 40 to a fixed pivot point 48 of the pantograph, where the bar 42 is fixed to the casing of the machine.

The following bar 40 is connected to the overlying frame 32, on which the stylus 14 is carried, by a ball and socket joint at 50.

The frame 32 is supported at one end by a support mechanism 54, shown in Figs. 1 and 3, but not in Fig. 2.

The support mechanism 54 comprises a bracket 56 fixed to the casing of the machine. A rectangular frame 58 is hung from the bracket 56 by ball joints 60 which allow the frame 58 to pivot about a horizontal axis 62 transverse to the machine, that is, perpendicular to the plane of Fig. 1. At its lower end, the frame 58 is pivotally connected about the horizontal axis 64 to the frame 32. The axis 64 is parallel to the axis 62.

The pivots 62 and 64 allow the frame 32 to move fore and aft in the machine (that is, in the plane of Fig. 1). Transverse movement (out of the plane of Fig. 1) is accommodated by a bar 66 fixed, for instance by brazing, to the frame 58 and slidably received in holes in the sides of the frame 32. Springs 68 act between the frames 32, 58 to provide some resistance against relative movement of the frames and tend to centre the frame 58 with respect to the frame 32.

The pantograph mechanism 36 serves to reduce the magnitude of the movements of the joint 50, as compared with the ring 16. The reduced amplitude motion is transmitted to the stylus 14. Thus, large movements of the ring 16 are required to produce standard size embossed characters. The necessary larger movements make it easier for a user to emboss a character accurately.

Referring again to Fig. 1, the paper support 12 is mounted on a slider 70 which is slidable on a track 72. The track 72 is transversely oriented in the machine 10, so that the support 12 may move transversely, i.e. perpendicular to the plane of Fig. 1. Movement of the support 12 along the track 72

is controlled by drive means 20, which is an escapement mechanism. The escapement, track and slider may be from an ordinary typewriter.

Each time the escapement mechanism 20 is operated by the user, the support 12 moves one step along the track 72 to present a fresh area of paper to the stylus 14 for embossing. Thus, a line of embossed characters may be generated by repeated operation of the escapement mechanism 20, a character being embossed each time the support 12 is stationary. At the end of a line, the roller 22 may be rotated to feed a new strip of paper under the anvil 28 and the support 12 may be moved back to its original position on the track 72. These actions are the same as the actions taken when the end of a line of typing is reached on a typewriter. A new line of characters can then be embossed on the new strip of paper under the anvil 28. Preferably the escapement mechanism is the tabulation part of a typewriter mechanism. Moon characters are larger than ordinary typewritten characters, and the tabulation mechanism can be set during manufacture to step the support 12 by several normal typewriter spaces at each operation, so that embossed characters are not superimposed on each other.

The describing member 16, its associated mechanism and its use have already been described. Other operator controls are shown in Figs. 1 and 2.

A stylus control key 76 controls the vertical position of the stylus 14. The key is fixed to a first end of a lever 80 which is pivoted part way along its length at 82, and carries a pin 84 at its end remote from the key 76. The pin runs in a slot 86 in a bracket 88 mounted on the bottom of the frame 32. When the key 76 is depressed, the pin 84 is lifted, the frame 32 rocks on the joint 64 (about a horizontal axis transverse to the machine), moving up against the action of a tension spring 89. Thus, the stylus 14 rises, to a position in which it is urged against the anvil 28, and impresses paper between it and the anvil 28. Only a small range of vertical movement of the stylus 14 is required. As the stylus rises, a small amount of movement of the coupling at 50 and rotation of the frame 58 about the axis 62 is required.

A paper movement key 90 allows the operator to operate the escapement mechanism 20, to move the support 12 step-wise along the track 72. The key 90 is mounted on a bar 92 pivoted at 94 and loosely connected to a slider bar 96. The slider bar 96 is connected to a rod 98 via a lever 100 and a bracket 102. When the key 90 is depressed, the rod 98 is raised and operates the escapement mechanism 20 to move the support 12 one step along the track 72. The support 12 is moved as the key 90 is released.

A third key 104 may be incorporated. This key simply operates both keys 76, 90, so that the stylus 14 is raised when the key 104 is depressed and the support 12 is moved when the key 104 is released.

The machine is used as follows. A sheet of

paper is fed in around the roller 22 as described above. The support 12 and roller 22 are then moved until the area of paper on which the first character is to be embossed is presented to the stylus 14. This area is represented to the user by the fingerboard 34. The user places his finger in the ring 16 and moves the ring to the point on the fingerboard at which he wishes to begin tracing a character. The stylus 14 follows, moving to a position beneath the equivalent point in the area of paper available for embossing. One of the keys 76, 104 is then depressed to raise the stylus 14, and the operator describes the desired character on the fingerboard 34. The stylus follows, moving with reduced amplitude and embossing the character on the paper.

When the character is finished, the key 76 or 104 is released, lowering the stylus 14. If the key 104 was used, the escapement 20 moves the support 12 by one step, so that embossing of the next character can begin.

If the key 76 was used, the key 90 must be depressed to move the support 12. The reason for having both keys 76 and 104 is as follows. Some Moon characters comprise a single line or curve only. These can be produced in a single embossing action, and it is convenient if the support moves as soon as the action ends. For these characters, the key 104 is used to raise the stylus.

Other characters comprise a line or curve, and one or more dots, for instance. For these characters, the stylus is raised using the key 76 to emboss the first part of the character. The stylus is then lowered, moved and raised again to emboss the second part of the character, without the support 12 having been moved. When the final part of the character is to be embossed, the stylus may be raised by the key 104 so that the support 12 moves when the key is released.

The machine described is intended to be used by blind people for writing Moon script. However, other uses are possible, for instance other embossed scripts could be produced. Wide variations of the mechanisms described, especially those for controlling the position of the stylus, are possible within the scope of the claims.

Some of the mechanisms of the machine described may be from an ordinary typewriter. Conveniently, the machine may be built in the casing of the typewriter, after the unwanted parts of the typewriter have been removed.

## Claims

1. A sheet material embossing machine (10) for generating a line of embossed characters, comprising a support (12) for a sheet of embossable material, embossing means (14) for embossing a sheet supported in the support (12), and drive means (20) operable to move the support in step-wise manner relative to the embossing means (14) to present successive areas of a sheet for embossing, characterised in that the embossing means (14) comprises an embossing stylus (14) movable with respect to the support (12) into and

out of a position in which it impresses a sheet held in the support (12), a describing member (16) movable to describe the outline of a character to be embossed, and a coupling (18) between the describing member (16) and the stylus (14) or support (12) causing relative movement between the stylus (14) and support (12), the relative movement following movement of the describing member (16).

2. A machine according to claim 1, characterised in that the coupling (18) couples the stylus (14) to the describing member and in that the drive means (20) moves the support (12).

3. A machine according to claim 1 or 2, characterised in that the relative movement between the stylus (14) and the support (12) is reduced in amplitude with respect to the movement of the describing member (16).

4. A machine according to claim 3, characterised in that the coupling (18) comprises a pantograph mechanism (36) for reducing the amplitude of movement.

5. A machine according to any preceding claim, characterised in that the describing member (16) is movable in a plane, the stylus (14) is movable in a plane parallel to the plane of movement of the describing member (16) and the stylus (14) is mounted on a frame pivotable about an axis parallel to the movement planes, to move the stylus (14) into and out of its sheet-impressing position.

6. A machine according to any preceding claim, characterised in that the support (12) comprises an anvil (28) of resilient material against which the stylus (14) is urged, when in its sheet impressing position, to impress a sheet positioned between the stylus (14) and the anvil (28).

7. A machine according to any preceding claim, characterised in that the support (12) comprises a roller (22) around which a sheet of embossable material may be coiled, and from around which the sheet may be uncoiled to take up a position in which an area of the sheet is presented to the stylus (14).

8. A machine according to claim 7, characterised by further comprising a guide plate (26) movable between a first position in which it guides paper to the roller (22), for coiling around the roller (22) and a second position in which it guides paper uncoiled from the roller (22) to the stylus (14), for embossing.

9. A machine according to claim 8, characterised in that the guide plate (26) carries an anvil (28) of resilient material against which the stylus (14) is urged when the stylus (14) is in its sheet-impressing position and the guide plate (26) is in its second position, to emboss a sheet positioned between the stylus (14) and the anvil (28).

10. A machine according to any preceding claim, characterised by a first control key (76) operable to move the stylus (14) into its sheet-impressing position and a second control key (90) operable to cause the drive means (20) to move the support (12) relative to the stylus (14).

11. A machine according to claim 10 charac-

terised by a third control key (104) operable to operate the first and second control keys (76, 90).

12. A machine according to any preceding claim, characterised in that the describing member (16) comprises a ring for receiving a finger of a user so that the describing member follows movement of the finger.

13. A machine according to claim 12 characterised by further comprising a fingerboard (34) across the surface of which the finger may be moved while in the ring, the fingerboard (34) being provided with surface formations for guiding the finger.

14. A machine according to claim 13, characterised in that the surface formations are grooves corresponding to elements of characters of an embossed writing system.

15. A machine according to any preceding claim, in which the drive means (20) comprise a typewriter escapement.

#### Patentansprüche

1. Prägemaschine zum Erzeugen einer Reihe von geprägten Schriftzeichen auf einem Blatt, mit einer Halterung (12) für ein Blatt prägsamen Materials, einer Prägeeinrichtung (14) zum Prägen des in der Halterung (12) gehaltenen Blatts und einer Antriebseinrichtung (20), die die Halterung stufenweise gegenüber der Prägeeinrichtung (14) bewegen kann, um aufeinanderfolgende Bereiche des Blatts dem Prägevorgang auszusetzen,

dadurch gekennzeichnet, daß die Prägeeinrichtung (14) eine Prägenadel (14) aufweist, die gegenüber der Halterung (12) in und aus einer Position bewegbar ist, in der sie ein in der Halterung (12) gehaltenes Blatt eindrückt, und daß ein Schreibbauteil (16), das die Linienführung eines zu prägenden Schriftzeichens darstellt, und eine Kupplung (18) zwischen dem Schreibbauteil (16) und der Nadel (14) oder der Halterung (12) angeordnet sind, die eine relative Bewegung zwischen der Nadel (14) und der Halterung hervorruft, wobei diese relative Bewegung der Bewegung des Schreibbauteils (16) folgt.

2. Maschine nach Anspruch 1, dadurch gekennzeichnet, daß die Kupplung (18) die Nadel (14) mit dem Schreibbauteil (16) koppelt und daß die Antriebseinrichtung (20) die Halterung (12) bewegt.

3. Maschine nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die relative Bewegung zwischen der Nadel (14) und der Halterung (12) in ihrer Amplitude bezüglich der Bewegung des Schreibbauteils (16) reduziert ist.

4. Maschine nach Anspruch 3, dadurch gekennzeichnet, daß die Kupplung (18) einen Pantographenmechanismus (36) zur Verringerung der Bewegungsamplitude aufweist.

5. Maschine nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Schreibbauteil (16) in einer Ebene bewegbar ist, daß die Nadel (14) in einer Ebene parallel zur Ebene der Bewegung des Schreibbauteils (16)

bewegbar ist und daß die Nadel (14) an einem Rahmen befestigt ist, der um eine Achse drehbar ist, die parallel zu den Bewegungsebenen verläuft, um die Nadel (14) in und aus ihrer Eindrucksposition zu bewegen.

6. Maschine nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Halterung (12) einen Amboß (28) aus einem elastischen Material aufweist, gegen den die Nadel in ihrer Eindrucksposition gedrückt wird, um ein zwischen der Nadel (14) und dem Amboß (28) angeordnetes Blatt einzudrücken.

7. Maschine nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Halterung (12) eine Rolle (22) aufweist, auf die ein Streifen eines prägsamen Materials aufgewickelt und von der der Streifen abgewickelt werden kann, um eine Position einzunehmen, in der ein Bereich des Streifens der Nadel (14) ausgesetzt ist.

8. Maschine nach Anspruch 7, dadurch gekennzeichnet, daß eine Führungsplatte (26) zwischen einer ersten Position, in der sie Papier zu der Rolle (22) führt, um dieses auf die Rolle (22) aufzuwickeln, und einer zweiten Position bewegbar ist, in der sie von der Rolle (22) abgewickeltes Papier zum Prägen zu der Nadel (14) führt.

9. Maschine nach Anspruch 8, dadurch gekennzeichnet, daß die Führungsplatte (26) den Amboß (28) aus elastischem Material trägt, gegen den die Nadel (14) gedrückt wird, wenn sie sich in der Eindrucksposition befindet, und daß die Führungsplatte (26) ihre zweite Position einnimmt, um ein Blatt zu prägen, das zwischen der Nadel (14) und dem Amboß (28) angeordnet ist.

10. Maschine nach einem der vorhergehenden Ansprüche, gekennzeichnet durch eine erste Steuertaste (76), mit der die Nadel (14) in ihre Eindrucksposition bewegt werden kann, und eine zweite Steuertaste (90), mit der die Antriebseinrichtung (20) veranlaßt werden kann, die Halterung (12) gegenüber der Nadel (14) zu bewegen.

11. Maschine nach Anspruch 10, ferner gekennzeichnet durch eine dritte Steuertaste (104), die bedienbar ist, um die erste und die zweite Steuertaste (76, 90) zu betätigen.

12. Maschine nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Schreibbauteil (16) einen Ring aufweist zur Aufnahme eines Fingers eines Benutzers, so daß das Schreibbauteil der Bewegung des Fingers folgt.

13. Maschine nach Anspruch 12, ferner gekennzeichnet durch eine Fingertafel (34), über deren Oberfläche der in dem Ring befindliche Finger bewegt werden kann, wobei die Fingertafel (34) mit Oberflächenformen zum Führen des Fingers versehen ist.

14. Maschine nach Anspruch 13, dadurch gekennzeichnet, daß die Oberflächenformen Nuten sind, die den Elementen der Schriftzeichen eines Prägeschreibsystems entsprechen.

15. Maschine nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Antriebseinrichtung (20) eine Schreibmaschinen-auslösung aufweist.

## Revendications

1. Machine (10) d'estampage ou gravure de matière en feuille pour générer une ligne de caractères gravés, comprenant un support (12) pour une feuille de matière repoussable, des moyens de repoussage (14) pour graver une feuille supportée dans le support (12) et des moyens d'entraînement (20) qui agissent pour déplacer le support pas-à-pas par rapport aux moyens de repoussage (14) afin de présenter des surfaces successives d'une feuille pour gravure, caractérisé en ce que les moyens de repoussage (14) comprennent une pointe de gravure (14) déplaçable par rapport au support (12) dans et hors d'une position dans laquelle elle forme une empreinte dans une feuille tenue dans le support (12), un élément de tracé (16) déplaçable de manière à décrire le contour d'un caractère à graver, et une transmission (18) entre l'élément de tracé (16) et la pointe (14) ou le support (12) pour entraîner un mouvement relatif entre la pointe (14) et le support (12), le mouvement relatif suivant le mouvement de l'élément de tracé (16).

2. Machine suivant la revendication 1, caractérisée en ce que la transmission (18) relie la pointe (14) à l'élément de tracé et en ce que les moyens d'entraînement (20) déplacent le support (12).

3. Machine suivant la revendication 1 ou 2, caractérisée en ce que le mouvement relatif entre la pointe (14) et le support (12) est réduit en amplitude par rapport au mouvement de l'élément de tracé (16).

4. Machine suivant la revendication 3, caractérisée en ce que la transmission (18) comprend un mécanisme à pantographe (36) pour réduire l'amplitude de mouvement.

5. Machine suivant l'une quelconque des revendications précédentes, caractérisée en ce que l'élément de tracé (16) est déplaçable dans un plan, la pointe (14) est déplaçable dans un plan parallèle au plan du mouvement de l'élément de tracé (16), et la pointe (14) est montée sur un cadre qui peut pivoter autour d'un axe parallèle aux plans de mouvement, de manière à amener la pointe (14) dans et hors de sa position de formation d'empreinte sur la feuille.

6. Machine suivant l'une quelconque des revendications précédentes, caractérisée en ce que le support (12) comprend une enclume (28) en matière élastique contre laquelle la pointe (14) est poussée, lorsqu'elle est dans sa position d'impression de feuille, de manière à former une empreinte dans une feuille placée entre la pointe (14) et l'enclume (28).

7. Machine suivant l'une quelconque des revendications précédentes, caractérisée en ce que le support (12) comprend un rouleau (22) autour duquel une feuille de matière repoussable peut être enroulée, et à partir duquel la feuille peut être déroulée pour prendre une position dans laquelle une surface de la feuille est présentée à la pointe (14).

8. Machine suivant la revendication 7, caractérisée en ce qu'elle comprend en outre une plaque

de guidage (26) mobile entre une première position, dans laquelle elle guide le papier vers le rouleau (22) pour enroulement autour du rouleau (22), et une deuxième position dans laquelle elle guide le papier déroulé du rouleau (22) vers la pointe (14), pour gravure.

9. Machine suivant la revendication 8, caractérisée en ce que la plaque de guidage (26) porte une enclume (28) de matière élastique contre laquelle la pointe (14) est poussée lorsque la pointe (14) est dans sa position de formation d'empreinte dans la feuille et lorsque la plaque de guidage (26) est dans sa deuxième position, pour graver une feuille placée entre la pointe (14) et l'enclume (28).

10. Machine suivant l'une quelconque des revendications précédentes, caractérisée en ce qu'elle comprend une première touche de commande (76), actionnable pour amener la pointe (14) dans sa position de formation d'empreinte dans la feuille, et une deuxième touche de commande (90) actionnable pour commander les moyens d'entraînement (20) afin de déplacer le support (12) par rapport à la pointe (14).

11. Machine suivant la revendication 10,

caractérisée en ce qu'elle comprend une troisième touche de commande (104) manœuvrable pour actionner les première et deuxième touches de commande (76, 90).

12. Machine suivant l'une quelconque des revendications précédentes, caractérisée en ce que l'élément de tracé (16) comprend un anneau pour recevoir un doigt d'un utilisateur, de sorte que l'élément de tracé suit le mouvement du doigt.

13. Machine suivant la revendication 12, caractérisée en ce qu'elle comprend en outre un clavier (34) à la surface duquel le doigt peut être déplacé pendant que le doigt est dans l'anneau, le clavier (34) comportant des formations de surface pour guider le doigt.

14. Machine suivant la revendication 13, caractérisée en ce que les formations de surface sont des rainures correspondant aux éléments de caractères d'un système d'écriture gravée.

15. Machine suivant l'une quelconque des revendications précédentes, dans laquelle les moyens d'entraînement (20) comprennent un échappement de machine à écrire.

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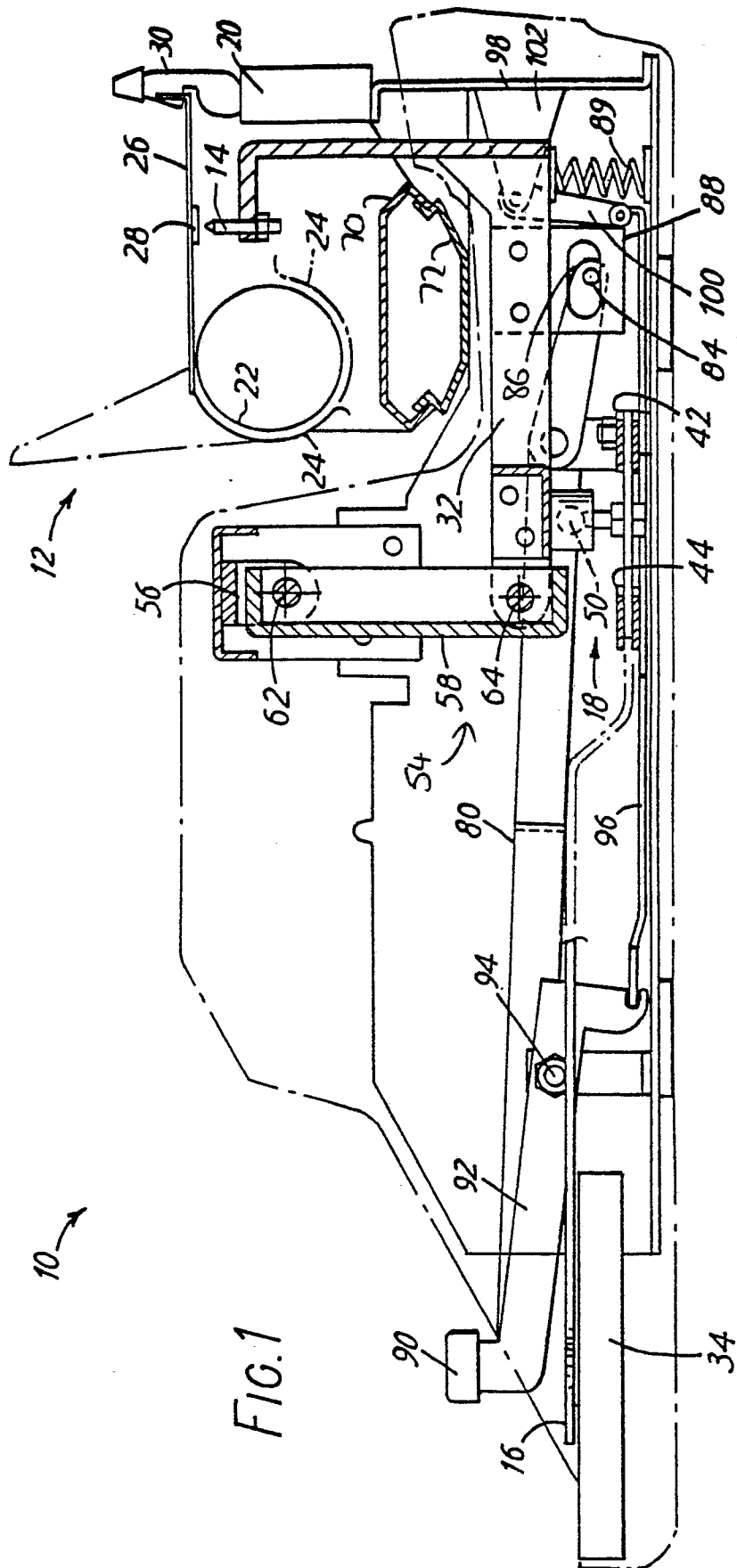
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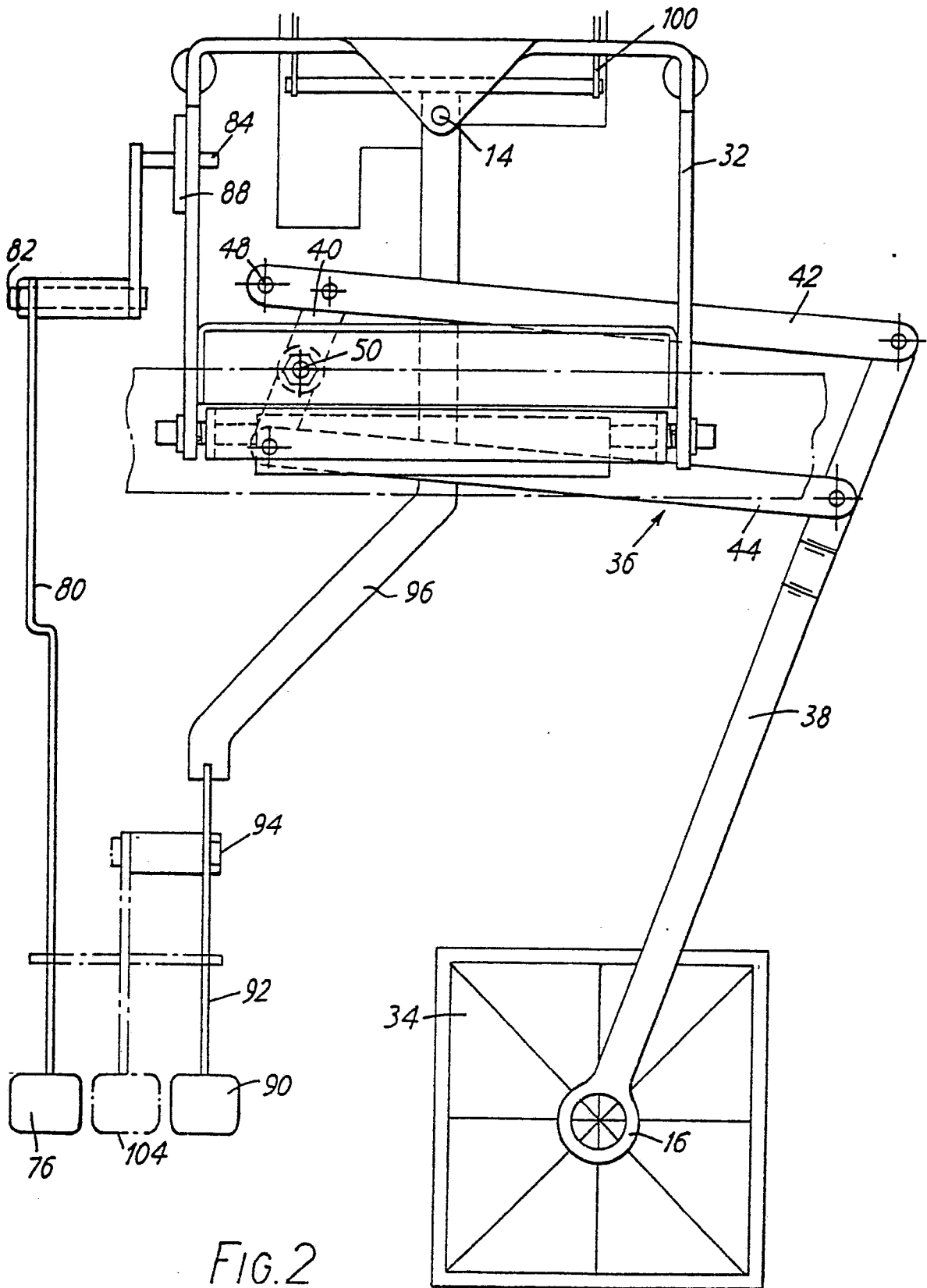


FIG. 2

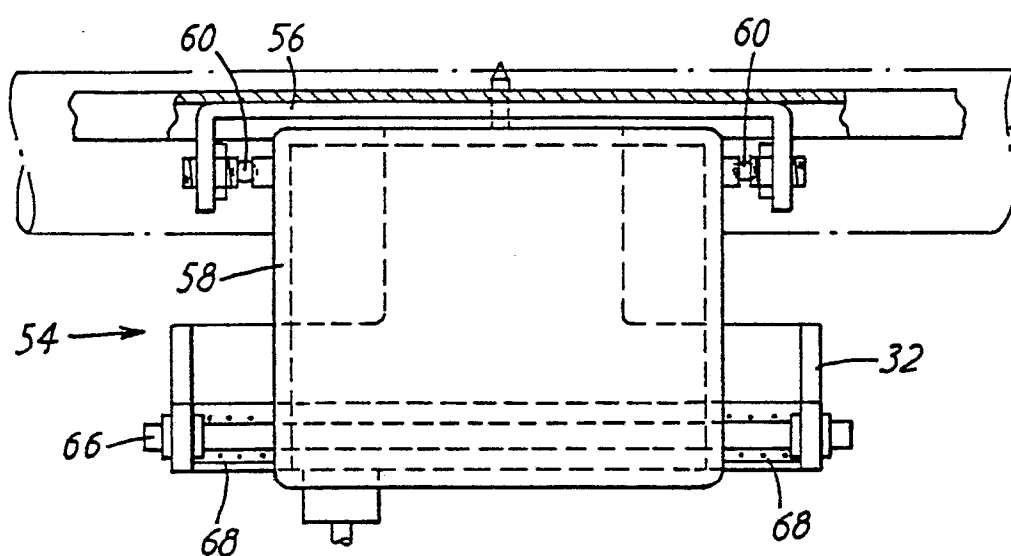


FIG. 3