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(54) **MACHINE FOR PERSONALIZING SUBSTRATES FOR CARDS SUCH AS IDENTITY CARDS**

MASCHINE ZUR PERSONALISIERUNG VON SUBSTRATEN FÜR KARTEN, WIE ZUM BEISPIEL
IDENTITÄTSKARTEN

MACHINE POUR PERSONNALISER DES SUBSTRATS POUR DES CARTES TELLES QUE LES
CARTES D'IDENTITE

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Description

[0001] The present invention relates in general to the processing of substrates designed to be used as identity cards, such as credit cards, bank debit cards, membership cards, loyalty cards, national health service cards and so forth.

[0002] Specifically, the invention relates to machines used for the mechanical personalizing of such substrates, the expression "mechanical personalizing" here meaning the production, on these substrates, of alphabetic or numeric characters or strings of characters, or more generally of symbols, alphabetic or otherwise, such as ideograms, showing for example the card bearer's name, the card number and the card expiry date, and other information (conversely, electrical or magnetic personalizing is done by storing similar data in a magnetic strip or in a small integrated circuit provided on the card substrate).

[0003] Mechanical personalizing usually takes the form of embossing, and the symbols are made in relief on the active surface of the card.

[0004] In a scenario such as the current scenario in which the use of identity cards is becoming widespread, and cards are being produced in very large volumes, one very important aspect of the processing of the card substrates is the matter of the operating speed of the machines that do the substrate personalizing, since this speed has a significant impact on total productivity.

[0005] The embossing operation is typically performed by embossing machines that comprise a so-called character drum rotating about a vertical axis, in which two circumferential rows of seats are formed in the vicinity of two vertically opposed peripheral edges of the drum, a groove between the edges accommodating a card for mechanical personalizing lying in a horizontal plane. Each seat houses, movably along the drum axis, a punch and a corresponding complementary die, both actuated by suitable striking members. When the card to be embossed is inserted, in a horizontal plane, into the drum groove, and the drum rotated to select the desired character and place it between the striking members, operation of the relevant punch and die pair causes the character to be embossed on the surface of the card.

[0006] The various symbols to be impressed into the card are selected by rotating the character drum about its axis, while the points of the card where the symbols are to be impressed are normally selected by moving the card relative to the drum in two orthogonal directions, referred to in this text as X and Y the first parallel to the long side of the card and the second to the short side, in the plane in which the card lies. For the purposes of moving the card within the plane in which it lies, and positioning it relative to the character drum, one known solution uses grippers, typically made of metal, connected to a carriage that moves along the two directions X and Y.

[0007] The card, arriving for example from a card feeder, or from a processing station upstream, such as for

example a magnetic card personalizing station, is gripped by the grippers, which have first been moved to a card receiving and loading position. Once the new card is gripped by the grippers, the mechanical personalizing process begins, during which the carriage supporting the grippers is moved as appropriate along the X and Y axes under the control of an electronic control unit, in order as required to position the desired point of the card between the striking members. Rotating the character drum, likewise under the control of the control unit, positions the punch and die pair corresponding to the desired character in line with the striking members. Actuation of the punch and die pair thus embosses the selected character at the desired point of the card. The process is repeated for all the characters to be impressed into the card.

[0008] When it has been mechanically personalized, the card, still held by the grippers moved about by their carriage, is moved to a discharge position, from where it is taken by the downstream processing station, or, if this is the end of its processing, is expelled. Only after the card has been discharged can the carriage with the grippers be returned to the loading position to collect the next card for personalization.

[0009] It has been observed that this process has significant limits in terms of operational speed. In particular, in order to be able to load the next card, not only must the previous card have finished being mechanically personalized, but also the personalized card must have already been discharged and, following this discharge, the grippers must have been returned to the loading position. As a result, it often happens that a new card ready for personalizing is kept waiting at the entry of the embossing station even though the embossing operation on the previous card has been completed. This represents unproductive time which reduces the machine's productivity and is therefore a bottleneck in terms of raising the productivity of card processing equipment.

[0010] Also, to be able to hold the card firmly during processing, the grippers are usually provided with teeth, which, because of the pressure that has to be exerted to grip the card, inevitably leave unwanted dents in the finished card. This is usually much disliked by card users.

[0011] EP 1486336 discloses a mechanical card personalizing unit with a card moving and positioning device comprising two belts extending and jointly movable along the X axis, the distance between them being such that they can receive, accommodate and grip the card between themselves even by friction alone. Meanwhile, the relative movement between the card and the personalizing unit in the Y direction is effected by mounting the character drum (including its striker members) on a slide which moves in this direction towards or away from the card to be personalized.

[0012] The present Applicant has observed that moving the entire personalizing unit, including among other things the character drum and the striker members, and their various motors, though perhaps advantageous in some applications involving many similar units arranged

in series in the X direction, generally makes the machine complicated and increases its cost. Such complication would appear to be especially unjustified when producing a machine consisting of a single embossing unit.

[0013] In view of the prior art outlined above, it has therefore been an object of the present invention to make improvements to known machines for the mechanical personalizing of substrates for identity cards such as credit/debit cards, particularly in order to increase their operating speed and so increase productivity while maintaining constructional simplicity and therefore keeping costs low while ensuring the quality of the finished product.

[0014] In accordance with the present invention, this and other objects are achieved by means of the machine for the mechanical personalizing of substrates of the identity card type as defined in the accompanying Claim 1.

[0015] In summary, the machine comprises:

- a supporting frame,
- mounted on the said supporting frame a mechanical card personalizing unit capable of interacting with a card that is to be personalized mechanically in order to produce strings of symbols on a surface of the card, and
- a unit for moving and positioning the cards that are to be personalized mechanically with respect to the said mechanical personalizing unit, in which the said card moving and positioning unit comprises means for moving the card along a first direction in a plane containing the card to be personalized, the said means for moving the card along the said first direction being actuated by motor means and being carried by a card supporting and moving carriage in a second direction of the said plane that is transverse to the first direction and actuable for moving the card along the said second direction.

[0016] The said motor means are mounted on the said supporting frame, so as not to increase the weight of the carriage, and drive means are provided for transmitting the drive from the said first motor means to the said means of moving the card along the first direction with the possibility of reciprocal translational movement along the said second direction.

[0017] The features and advantages of the present invention will be made clearer by the following detailed description of a practical embodiment, presented purely by way of example, no limitation being implied. The description will be given with reference to the attached plates of drawings, in which:

Figure 1 is a first schematic axonometric general view of a mechanical card personalizing unit in one embodiment of the present invention;

Figure 2 is a second schematic axonometric general

view of the mechanical card personalizing unit shown in Figure 1;

Figure 3 is a third schematic axonometric general view of the mechanical card personalizing unit of the previous figures, with a corresponding punching element removed for greater clarity;

Figure 4 is a plan view from above of the mechanical card personalizing unit of Figures 3; and

Figure 5 is a cross section taken on the plane marked V-V in Figure 4.

[0018] Referring to the drawings, a mechanical personalizing unit in one embodiment of the present invention, for the mechanical personalizing of substrates for identity cards, particularly an embossing unit, is given the general reference 100, and comprises a frame 103 designed to support, statically or movably, the various component parts of the embossing machine.

[0019] In particular, the frame 103 supports, through a yoke 104, a character drum 105. The character drum 105, which is basically circular, can be rotated about a vertical axis (which by convention will be termed the Z axis in this text) by an electric motor 107 mounted on the frame 103, the shaft of which forms, or on the shaft of which is mounted, the hub of the character drum 105. Alternatively, rather than have the drum 105 mounted directly on the shaft of the motor 107, suitable drive transmission means may be provided, such as for example a belt and pulley drive, a gear drive or the like.

[0020] The character drum 105 comprises an upper ring and a lower ring positioned one above the other in the direction of the Z axis and separated by an annular gap. Around the outer edges of the upper and lower rings of the character drum 105 runs a circumferential series of mating punch and die pairs: each punch and die pair is capable of embossing, on a substrate of a typical plastic used for making identity-type cards such as credit/debit cards, of a particular alphabetic or numerical character or, more generally, a particular symbol, alphabetical or otherwise, for example an ideogram. The punch and die pair can be operated individually to emboss their character/symbol by means of a striking member comprising an upper rocker 109a and a lower rocker 109b, each of which carries, its end above (or below) the edge of the upper (or lower) ring of the drum 105, its own striker capable of striking the punch (or die) of whichever punch and die pair is in the active position at a given moment, i.e. is aligned with the strikers of the rockers 109a, 109b. The rockers 109a and 109b pivot at an intermediate point along their length on brackets mounted on the frame 103, and, near the opposite end from that with the strikers, the rockers 109a and 109b also each have a pin 111a, 111b designed to be acted on by a cam 113 mounted on a shaft turned by an electric motor 115, such as a stepper motor, mounted on the frame 103. Elastic return means,

such as a helical spring 117, act basically on the said opposite ends of the rockers 109a and 109b tend to pull their strikers away, in the direction of the Z axis, from the edges of their respective rings of the drum 105. The rockers 109a and 109b thus act as cam followers in relation to the cam 113.

[0021] The embossing unit 100 also includes, in front of the character drum 105, a unit 119 which moves and positions the card 121, requiring to be embossed, along the directions of two mutually transverse (especially orthogonal) axes. These axes, identified by convention as X and Y in the drawings, lie in a horizontal plane in which, during operation, the card 121 to be personalized lies, and along which, during operation, the long side and short side, respectively, of the card extend.

[0022] The movement unit 119 positions the card 121, which is basically rectangular (standard ISO 7810 requires that cards be rectangular, with short and long sides of predetermined length, especially 86 mm by 54 mm), with respect to the character drum 105 in order to produce on the card 121 one or more strings of embossed characters, each parallel to the X axis (i.e. to the long side of the card), and separated from each other in a direction parallel to the Y axis.

[0023] In a practical embodiment of the present invention, the movement unit 119 comprises a carriage 123. This has runners 124 running in a horizontal plane on a pair of tracks 125 fixed to the frame 103 and extending in the direction of the Y axis. The carriage 123 is moved along the tracks 125 by an electric motor 127 (such as a stepper motor) mounted on the frame 103, which motor turns, via for example a belt drive 129, a screw 131 turning inside a tapped hole 132 in the carriage 123 in such a way that its rotation causes the carriage 123 to move translationally along the tracks 125.

[0024] To move the card in the X direction, the carriage 123 is provided with two belts 133a, 133b that extend, one being positioned above the other relative to the direction of the Z axis, along the direction of the X axis. The two belts 133a and 133b, which may advantageously but not necessarily be internally toothed belts, extend, and are substantially stretched, between respective pairs of wheels (which in the example are toothed) supported rotatably by a vertical panel of the carriage 123.

[0025] One of the toothed drive wheels of the belt 133a, in this example the toothed wheel 134a, is turned by an electric motor 135, while the toothed wheel 134b that drives the belt 133b is driven, via suitable drive means, such as gearing, with the toothed wheel 134a. The other two end wheels of the belts 133a and 133b are idle. Both belts 133a and 133b can thus be driven by the one motor 135. It should be emphasized however that there is no reason why a separate motor, similar to the motor 135, should not be used in order to turn one of the two toothed wheels 134a and 134b autonomously (though synchronously).

[0026] In accordance with the present invention, the motor 135 is connected to the frame 103, and not to the

carriage 123, so as not to add to the weight of the latter. The drive from the motor 135 to the drive wheel(s) 134a, 134b of the belts 133a, 133b takes the form of suitable drive members capable of transmitting a torque about the Y axis, but at the same time capable of allowing mutual translational movement in the direction of the X axis, for instance a telescopic coupling, using, in the example considered here, a splined shaft, in which the motor turns a primary drive shaft 139 of noncircular, e.g. square, hexagonal, etc., section around which fits a hollow secondary shaft 141 capable of accommodating the primary drive shaft, in such a way as to be turned by the latter but free to translate along the axis of the primary shaft 139. Alternatively, the coupling may be made by providing a pin for example on the primary shaft, engaging an axial groove formed in an internal cavity of the secondary shaft, or by means of gears, of sufficient axial extent to ensure engagement even if they are translated axially relative to each other.

[0027] The two belts 133a and 133b, or at least their backs (corresponding to the outside, the side that does not have the teeth), are made in, or coated with, a material with a relatively high coefficient of friction, such as rubber. For example, it is possible to use commercially available toothed belts with profile AT5, their backs being coated with a material with a high coefficient of friction, such as nitrile rubber. This friction material coating must be such as not to cause variations in the pitch diameter (for example, the layer of nitrile rubber is subject to stretching when the belt is curved).

[0028] The distance along the Z axis between the centres of the two pairs of toothed wheels which support the belts is such that the outer surface of the lower horizontal run of the upper belt 133a and the outer surface of the upper horizontal run of the lower belt 133b are close together, substantially in contact with each other, or, at the most, these surfaces are separated in the vertical direction by a distance that is sufficiently small, and in particular that is less than or at the most equal to the typical thickness of the card, so that the card can be held between the two belts even by friction alone.

[0029] In front of the two belts 133a and 133b, between the belts and the character drum 105, there extends in a horizontal plane, in the direction of the X axis, and mounted on the carriage 123, a table 143 whose upper surface, arranged at a height approximately equal to that of the outer surfaces of the vertically opposed horizontal runs of the belts 133a and 133b, forms a supporting surface for the cards to slide along. In particular, the table 143, whose width is approximately equal to the short side of the card, is provided, along its edge facing the drum 105, with a turned-up lip 145 to contain the card in the direction of the Y axis and guide it as it travels along the X axis. Additionally opposite the character drum 105 the table 143 possesses a basically V-shaped notch with the opening facing the drum 105, to allow the punch and die pairs of the drum 105 to act on the card.

[0030] The embossing unit 100, and in particular the

motors 107, 115, 127 and 135, are controlled by a control unit (not shown in the drawings) comprising for example an industrial personal computer suitably programmed to run a prescribed card processing program. The motors 107, 115, 127 and 135 are all equipped with suitable means, typically encoders, capable of sensing and supplying to the control unit information about the angular positions of the motors. Furthermore, at least at the entrance of the embossing unit 100, or preferably at both its entrance and exit, there are suitable means, of for example optical type such as photoelectric cells, for detecting the movement of the cards. The information supplied by the card sensor means and by the encoders working on the motors 127 and 135 is used by the control unit to calculate, instant by instant, the position in the directions of the X and Y axes of the generic card as it is worked on.

[0031] The arrangement of the pair of belts 133a and 133b is such as to enable these belts to grip, between the two outer surfaces of their respective vertically opposed horizontal runs, by friction alone, the cards to be embossed. Actuation of the motor 135 moves both belts 133a and 133b in one or other of the two directions of the X axis, and hence moves the card, a longitudinal strip of which on the upper surface and a corresponding strip on the lower surface are held by friction between the belts 133a and 133b. As it moves along the X axis, the card is guided by the table 143 and by its lip 145. It is thus possible to load a new card and position it with respect to the drum. Actuation of the motor 127 in turn moves the carriage 123 in the two directions of the Y axis, for correct positioning of the carriage 123, and hence of the card to be embossed, with respect to the drum 105 in the direction of this Y axis. Actuation of the motor 107 turns the drum 105 about the Z axis for selection of the desired character to be embossed: the corresponding punch and die pair are brought into the active position between the strikers of the rockers 109a, 109b. Actuation of the motor 115 causes, by the rotation of the cam 113, actuation of the strikers mounted at the ends of the rockers 109a and 109b. These strikers strike the selected punch and die pair, now in the active position, and cause the selected character to be embossed on the surface of the card.

[0032] In other words, the point on the card, along the X axis, where a character is to be embossed is selected by the belts 133a and 133b, while the point where the character is to be embossed along the Y axis is selected by the carriage 123. The drum 105 is rotated about the Z axis to select the character that is to be embossed.

[0033] Since the drive motors for positioning the card along the Y and Z axes are both mounted on the frame 103, the carriage 123 which carries the card to be embossed has very little mass. This makes it easier to move and therefore, by reducing inertia, enables the machine to work faster even if low-powered motors are used.

[0034] Preferably, in association with the two belts 133a and 133b, it is possible to arrange the parts in such a way as to ensure that the card, once captured by the

belts 133a and 133b, is held firmly and moved correctly, and in particular that a given angle of rotation of the motor 135 in one direction or the other corresponds to a predetermined movement of the card along the X axis, in such a way as to ensure that any loss of adhesion and consequent slippage of the surfaces of the belts 133a and 133b on the card (possible because of dirt, deterioration of the belts, and the fast speed of movement of the card) do not cause incorrect positioning of the card with respect to the drum 105.

[0035] It should be emphasized that although the present invention has been described in relation to the mechanical personalizing of cards by embossing, it also applies to other methods of personalizing cards mechanically, as for example by etching, in which the characters are impressed by a stamp driven into the active surface of the card and simultaneously inked by the interposition of an inked tape between the stamp and the active surface of the card.

[0036] Again, the use of belts for moving the cards along the X direction is to be understood as a possibility which, though preferred, is not limiting.

[0037] Those skilled in the art will be able to make numerous modifications to the embodiments described, and to devise other embodiments of the present invention, without thereby departing from the scope of the invention defined in the accompanying claims.

Claims

1. Machine for the mechanical personalization of substrates for identity cards, comprising:

- a supporting frame (103);
- mounted on the said supporting frame a mechanical card personalizing unit (105, 107, 109a, 109b, 113, 115, 131) capable of interacting with a card (121) that is to be personalized mechanically in order to produce strings of symbols on a surface of the card ;
- a unit (119) for moving and positioning the cards that are to be personalized mechanically with respect to the said mechanical personalizing unit (105, 107, 109a, 109b, 113, 115, 131), in which the said unit (119) for moving and positioning the cards comprises means (133a, 133b) for moving the card along a first direction (X) in a plane (XY) containing the card to be personalized;

the said means for moving the card along the said first direction being actuated by motor means (135); **characterized in that:** the unit (119) for moving and positioning the cards comprises a card supporting and moving carriage (123) in a second direction (Y) of the said plane that is transverse to the first direction

said means (133a, 133b) for moving the card along the said first direction (X) being carried by said card supporting and moving carriage (123) in a second direction (Y) and said second direction moving carriage (123) is actuatable for moving the card along the said second direction (Y),

the said motor means are mounted on the said supporting frame, and drive means (139, 141) are provided for transmitting the drive from the said motor means to the said means of moving the card along the first direction with the possibility of reciprocal translational movement along the said second direction.

2. Machine according to Claim 1, in which the said drive means comprise a telescopic coupling.
3. Machine according to Claim 2, in which the said telescopic coupling comprises a splined shaft coupling.
4. Machine according to Claim 1, 2 or 3, in which the said means for moving the card along the first direction comprise a pair of striplike elements (133a, 133b) extending and jointly movable along the said first direction and separated by a distance, in a third direction (Z) orthogonal to the said plane, such as to enable the said pair of striplike elements to receive, accommodate and grip the card between themselves by friction.
5. Machine according to Claim 4, in which the said pair of striplike elements comprises a pair of parallel belts extending in the said first direction and having respective opposing surfaces that cooperate to accommodate and grip the card, the said cooperating opposing surfaces being made of a material with a relatively high coefficient of friction.
6. Machine according to any one of the preceding claims, in which the said mechanical personalizing unit comprises punches actuatable by striker means in order to produce the said symbols by plastic deformation of the card surface, the said striker means being carried by a rocker (109a, 109b) actuated by cam means (113).
7. Machine according to any of the preceding claims in which said mechanical card personalizing unit (105, 107, 109a, 109b, 113, 115, 131) comprises a character drum (105), supported on the frame (103) through a yoke (104).

Patentansprüche

1. Maschine zur mechanischen Personalisierung von Trägern für Identifikationskarten mit

- einem Tragwerk (103);

- einer auf dem Tragwerk aufgestellten Einheit zur mechanischen Kartenpersonalisierung (105, 107, 109a, 109b, 113, 115, 131), die mit einer mechanisch zu personalisierenden Karte (121) in Wechselwirkung stehen kann um eine Symbolzeichenfolge auf der Oberfläche der Karte zu erzeugen,

- einer Einheit (119) zur Bewegung und Positionierung der Karten, die mechanisch personalisiert werden müssen, in Bezug auf die genannte Einheit zur mechanischen Personalisierung (105, 107, 109a, 109b, 113, 115, 131), wobei die genannte Einheit (119) zur Bewegung und Positionierung der Karten Mittel (133a, 133b) zur Bewegung der Karte entlang einer ersten Richtung (X) in einer Ebene (XY) umfasst, die die zu personalisierende Karte enthält;

wobei die genannten Mittel zur Bewegung der Karte entlang der genannten ersten Richtung von Antriebsmitteln (135) betätigt sind;

dadurch gekennzeichnet dass die Einheit (119) zur Bewegung und Positionierung der Karten einen kartentragenden und kartenbewegenden Schlitten (123) umfasst, der in einer zweiten Richtung (Y) der genannten zur ersten Richtung transversalen Ebene liegt,

wobei die genannten Mittel (133a, 133b) zur Bewegung der Karte entlang der genannten ersten Richtung (X) von dem genannten kartentragenden und kartenbewegenden Schlitten (123) in einer zweiten Richtung (Y) getragen werden und wobei der genannte sich in der zweiten Richtung bewegende Schlitten (123) zur Bewegung der Karte entlang der genannten zweiten Richtung (Y) betätigbar ist, wobei die genannte Antriebsmittel auf dem genannten Tragwerk aufgestellt sind und wobei Steuerungsmittel (139, 141) zur Übertragung der Steuerung von den genannten Antriebsmitteln an die Mittel zur Bewegung der Karte entlang der ersten Richtung vorgesehen sind, wobei eine gegenseitige Bewegung entlang der zweiten Richtung möglich ist.

2. Maschine nach Anspruch 1, wobei die genannten Steuerungsmittel eine ausziehbare Kupplung umfassen.
3. Maschine nach Anspruch 2, wobei die genannte ausziehbare Kupplung eine Keilwellenkupplung umfasst.
4. Maschine nach Anspruch 1, 2 oder 3, wobei die genannten Mittel zur Bewegung der Karte entlang der ersten Richtung ein Paar bandähnliche Elemente (133a, 133b) umfassen, die sich entlang der genannten Richtung erstrecken und gemeinsam bewegbar und voneinander beabstandet sind, in einer dritten

Richtung (Z) orthogonal zu der genannten Ebene, um dabei zu ermitteln dass das Paar bandähnlichen Elemente die Karte unter Reibung empfangen, aufnehmen und festhalten.

5. Maschine nach Anspruch 4, wobei das genannte Paar bandähnlichen Elemente ein Paar parallele Riemen umfasst, die sich in der genannten ersten Richtung erstrecken und jeweils zwei entgegengesetzte Oberflächen haben die zur Aufnahme und zum Festhalten der Karte zusammenarbeiten, wobei die genannten zusammenarbeitenden entgegengesetzten Oberflächen aus einem Material mit einem relativ hohen Reibungskoeffizient gefertigt sind.

6. Maschine nach einem der vorhergehenden Ansprüche, wobei die genannte Einheit zur mechanischen Personalisierung Stanzen umfasst, die von Stößel zur Erzeugung der genannten Symbolzeichen mittels plastischer Verformung der Kartenoberfläche betätigbar sind, wobei die genannten Stößel auf einem Kipphebel (109a, 109b) getragen sind der von Nockenmittel (113) betätigt ist.

7. Maschine nach einem der vorhergehenden Ansprüche, wobei die genannte Einheit zur mechanischen Kartenpersonalisierung (105, 107, 109a, 109b, 113, 115, 131) eine Typentrommel (105) umfasst, die durch einem Joch (104) auf dem Tragwerk (103) getragen ist.

Revendications

1. Machine pour la personnalisation mécanique de substrats pour cartes d'identité, comprenant:

- un châssis de support (103);
- une unité mécanique de personnalisation (105, 107, 109a, 109b, 113, 115, 131) de cartes monté sur ledit châssis de support qui peut interagir avec une carte (121) qui doit être personnalisée mécaniquement pour produire des séries de symboles sur une surface de la carte,
- une unité (119) pour déplacer et positionner les cartes qui doivent être personnalisées mécaniquement par rapport à ladite unité de personnalisation mécanique (105, 107, 109a, 109b, 113, 115, 131), où ladite unité (119) pour déplacer et positionner les cartes comprend des moyens (133a, 133b) pour déplacer la carte le long d'une première direction (X) dans un plan (XY) contenant la carte qui doit être personnalisée;

lesdits moyens pour déplacer la carte le long de ladite première direction étant actionnée par des moyens à moteur (135);

caractérisée en ce que:

l'unité (119) pour déplacer et positionner les cartes comprend un chariot de support et de déplacement (123) des cartes dans une deuxième direction (Y) dudit plan qui est transversal à ladite première direction,

lesdits moyens (133a, 133b) pour déplacer la carte le long de ladite première direction (X) étant supportés par ledit chariot de support et de déplacement (123) des cartes dans une deuxième direction (Y), et ledit chariot mobile (123) dans la deuxième direction peut être actionné pour déplacer la carte le long de ladite deuxième direction (Y),

lesdits moyens à moteur sont montés sur ledit châssis de support, et des moyens d'actionnement (139, 141) sont fournis pour transmettre l'actionnement desdits moyens à moteur auxdits moyens de déplacement de la carte le long de ladite première direction avec la possibilité de mouvement de translation mutuelle le long de ladite deuxième direction.

2. Machine selon la revendication 1, dans laquelle lesdits moyens d'actionnement comprennent un couplage télescopique.

3. Machine selon la revendication 2, dans laquelle ledit couplage télescopique comprend un couplage à arbre cannelé.

4. Machine selon la revendication 1, 2 ou 3, dans laquelle lesdits moyens pour déplacer la carte le long de la première direction comprend une paire d'éléments de type à bande (133a, 133b) s'étendant et étant mobiles conjointement le long de ladite première direction et séparés par une distance, dans une troisième direction (z) orthogonal audit plan, de manière à permettre à ladite couple d'éléments de type à bande de recevoir, loger et saisir la carte entre eux par friction.

5. Machine selon la revendication 4, dans laquelle ladite paire d'éléments de type à bande comprend une paire de courroies parallèles s'étendant dans ladite première direction et ayant des respectives surfaces opposées qui coopèrent pour loger et saisir la carte, lesdites surfaces opposées qui coopèrent étant d'un matériel avec un coefficient de friction relativement élevé.

6. Machine selon l'une quelconque des revendications précédentes, dans laquelle ladite unité mécanique de personnalisation comprend des poinçons qui peuvent être actionnés par des moyens percuteurs pour produire lesdits symboles par déformation plastique de la surface de la carte, lesdits moyens per-

cuteurs étant portés par un balancier (109a, 109b) actionné par des moyens à came (113).

7. Machine selon quelconque des revendications précédentes, dans laquelle ladite unité de personnalisation mécanique (105, 107, 109a, 109b, 113, 115, 131) comprend un tambour (105) à caractères, supporté sur le châssis (103) par un joug (104).

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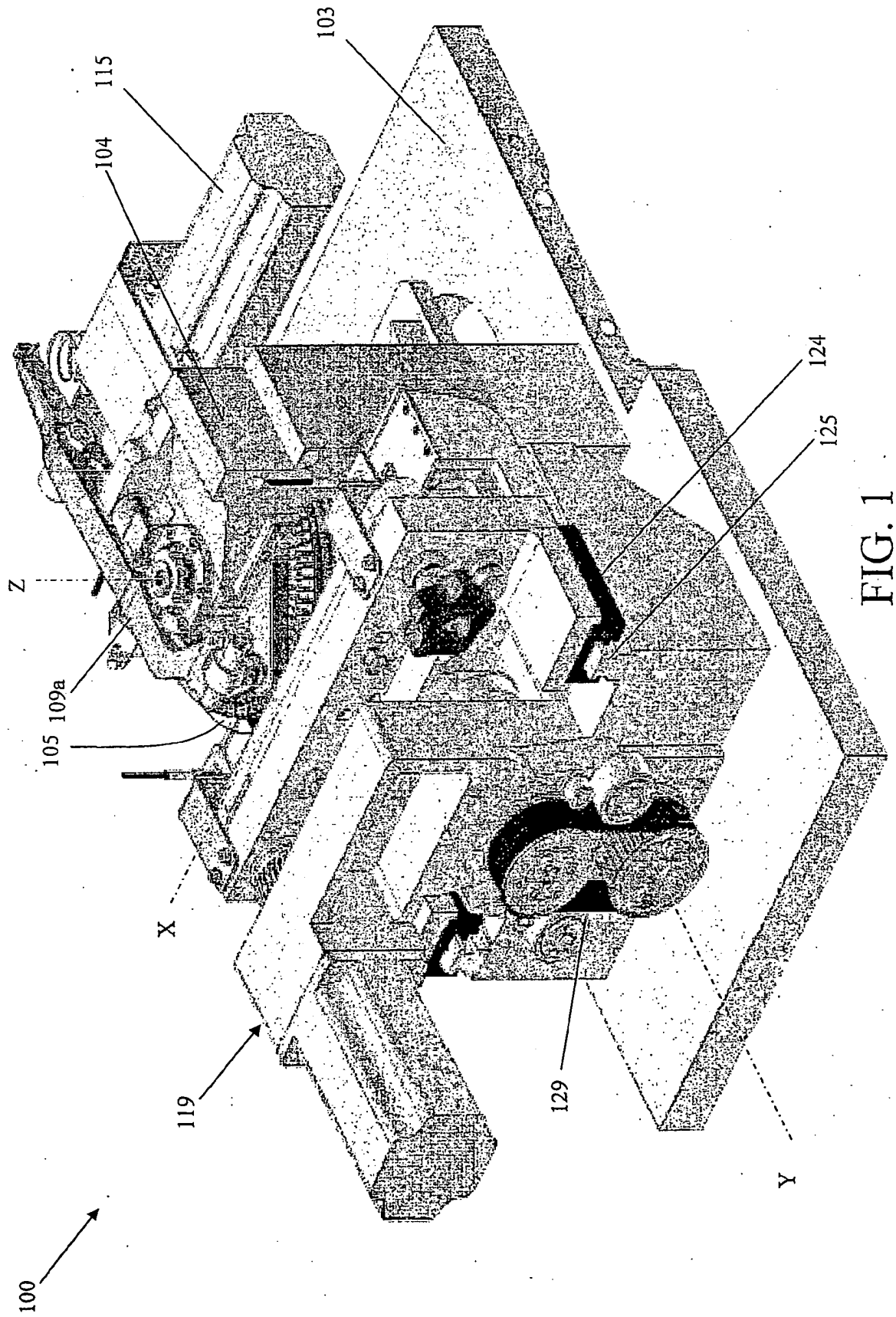


FIG. 1

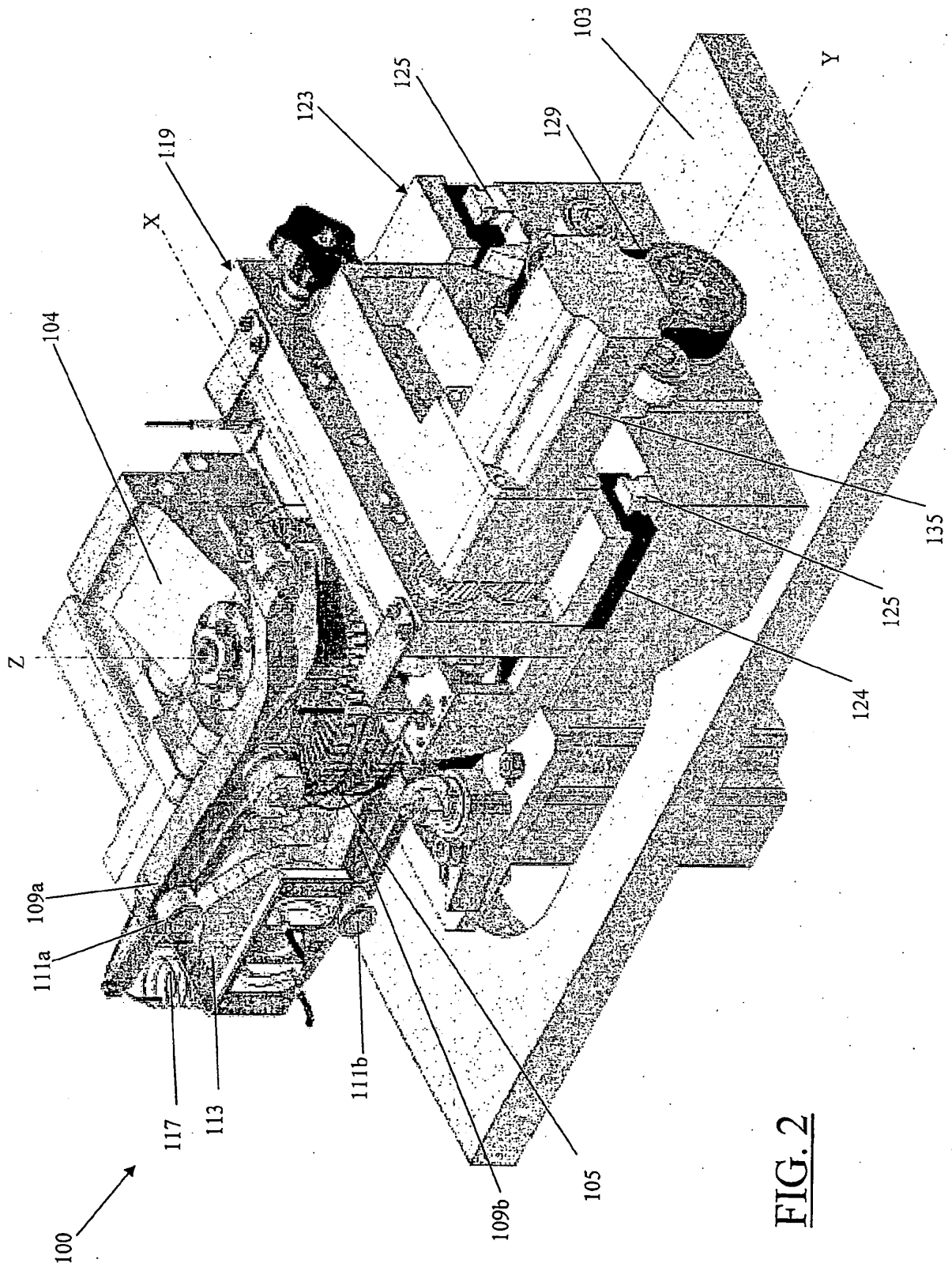
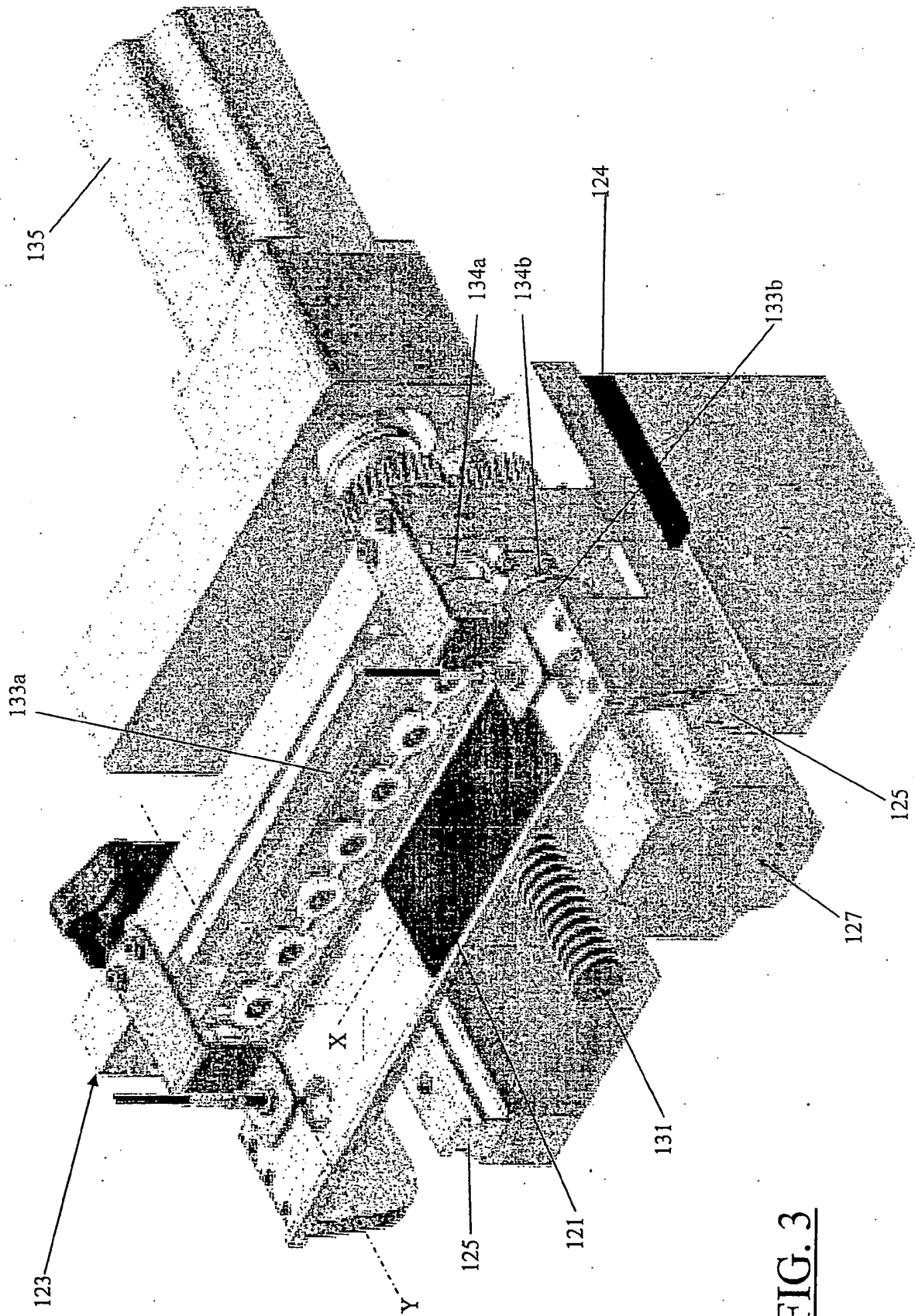
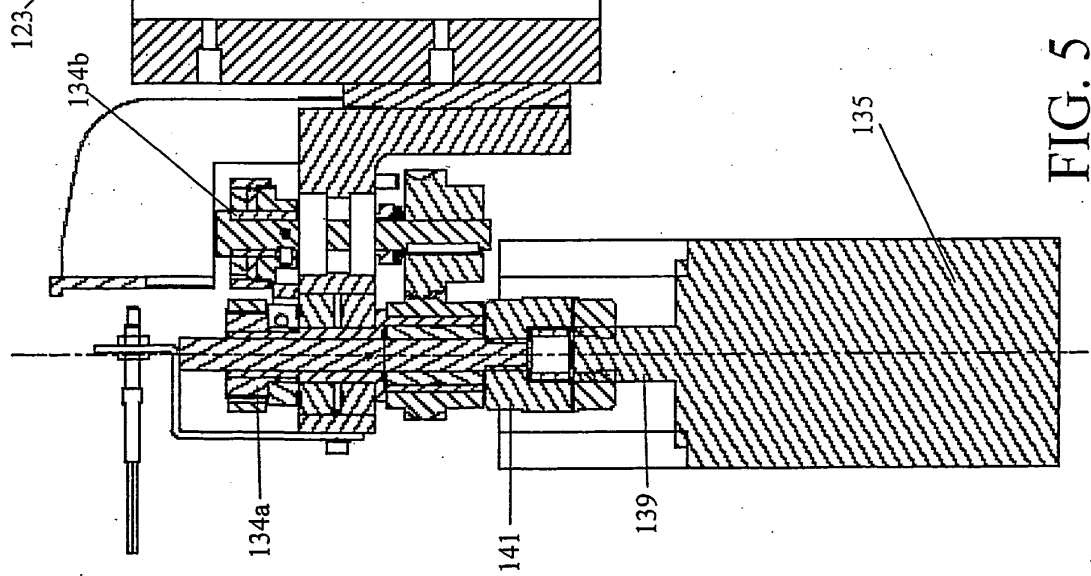
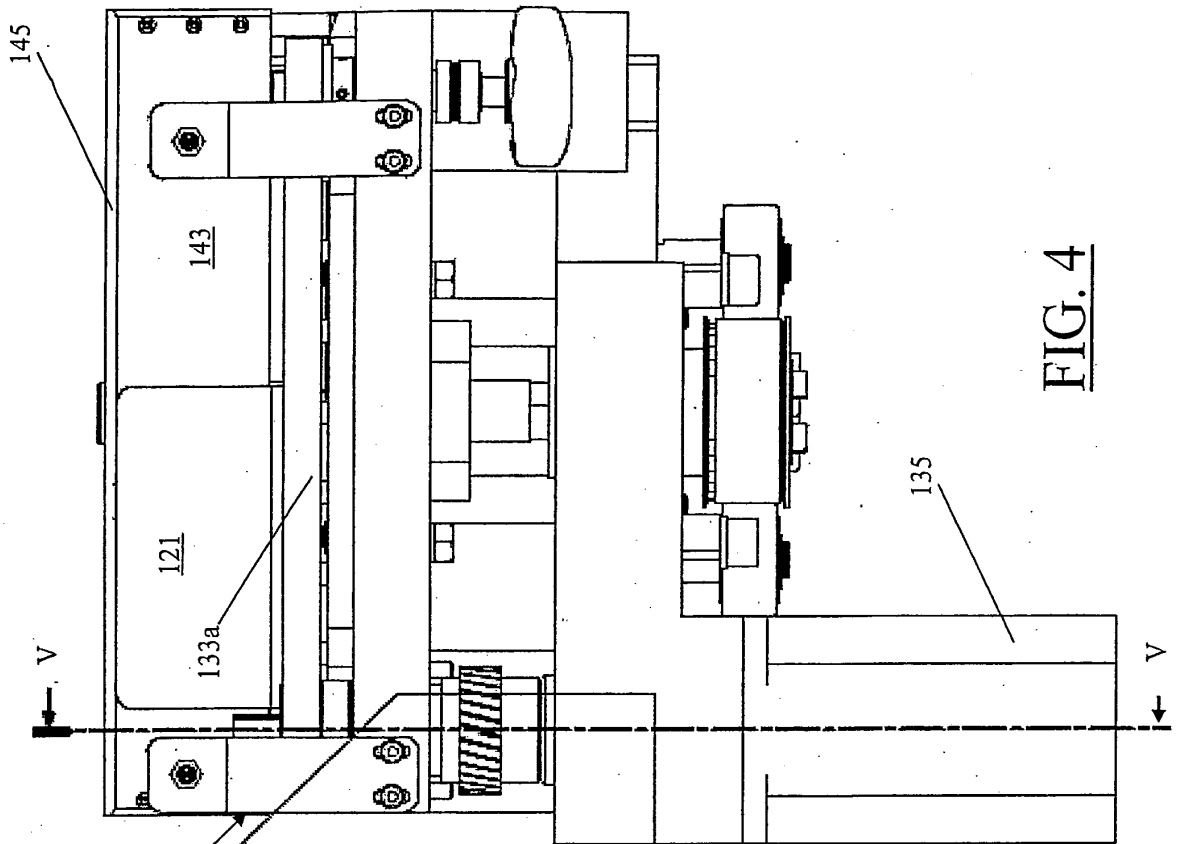


FIG. 2





REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1486336 A [0011]