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(54) **LINERLESS LABEL APPLYING SYSTEM**

SYSTEM ZUM AUFBRINGEN VON TRÄGERBANDLOSEN ETIKETTEN

DISPOSITIF D'APPLICATION D'ETIQUETTES DEPOURVUES D'UNE DOUBLURE SUPPORT

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(73) Proprietor: **Bell & Howell Documail Systems
Company**
Lincolnwood, IL 60645-2785 (US)

- **HAAS, David**
Schaumburg, IL 60173 (US)
- **RABINDRAN, K., George**
Morton Grove, IL 60053 (US)

(74) Representative: **Newstead, Michael John et al**
Page Hargrave
Southgate
Whitefriars
Lewins Mead
Bristol BS1 2NT (GB)

(72) Inventors:

- **CHODACKI, Richard**
Bartlett, IL 60103 (US)
- **PIOQUINTO, Jose**
Des Plaines, IL 60016 (US)
- **VANDERSYDE, Gary**
Naperville, IL 60563 (US)

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Description

[0001] The present invention relates generally to document handling systems, and more particularly to a linerless label applying system for applying a source of continuous length label material to documents, such as mail pieces, as the documents are conveyed on edge along a predetermined path.

[0002] The volume of mail handled daily by large businesses, institutions and government entities, such as the postal service, credit card companies, utilities, mail order houses and other advertisers has steadily increased due in part to both an increase in population and a greater volume of business correspondence. Typically, the envelopes containing the material to be mailed are addressed and then sorted into common destination groups for mailing. Similarly, mail received by such entities is commonly sorted into groups based on identifiable subject matter on the received material. A third category of such envelopes is the returned mail category, the creation of which is primarily due to the addressee having moved from a particular address, or a smeared or non-readable bar code, resulting in the envelope being undeliverable. The present invention is directed to a system for solving the latter type of problem, namely, the correction of the address and/or destination code on an envelope by application of a secondary label to the envelope, with a correct forwarding address or destination code either pre-printed on the label or applied to the label after it is affixed to the envelope to cover an invalid or non-readable address or bar code. Preferably, the label material inhibits the passage of light, whereby a bar code or address material beneath the label cannot be read by a bar code reader or an optical character reader.

[0003] Several different types of machines have been developed to assist in the handling of such mail, other than manual review and correction by an individual mail carrier. These prior art devices typically comprise an envelope feeder, a read station, a label selection station where a supply of labels permits selection of an appropriate label and its application to an envelope, and a sorting and storage device. See, for example, U.S. Patent No. 5,076,879. While some of the prior art machines and systems have proven satisfactory, many are relatively large unwieldy machines that require not only a large amount of space but also require frequent replenishment of a vast array of pre-printed labels and maintenance of the applying equipment. Also, labels furnished in a roll or fan where pre-cut labels are adhesively adhered to a substrate are expensive compared to the cost of linerless or substrate-free label material.

[0004] According to the present invention, there is provided a linerless label applying system for applying a source of continuous length linerless label material to documents being conveyed in a non-overlapping sequential on-edge fashion along a first predetermined path through the system, the label material having an adhesive surface and an opposite non-adhesive surface

adapted to have indicia printed thereon, the system comprising:

a conveyor for transporting said documents along said first predetermined path in a non-overlapping sequential on-edge fashion;

a label feeder adapted for effecting progressive longitudinal movement of the label material along a second predetermined path so that a leading edge of the label material is in a predetermined juxtaposed relation to the first path;

a cutter station positioned in predetermined relation to the label feeder, the cutter station including cutting means operative to sever the label material generally transversely thereof a predetermined selectable distance from the leading edge so as to create a label of pre-selected height; and

a paddle assembly including a moveable paddle member supported adjacent the cutter station and adapted to engage the non-adhesive side of the label material between the leading edge of the label material and the cutting means, the moveable paddle member operative to support and releasably retain the severed label and press the adhesive surface of the label against a face of an on-edge document as the document travels in a continuous on-edge, non-overlapping, and non-interrupted manner along the first path through the label applying system.

[0005] The system could include control means operative to actuate said cutting means and cut a transverse leading reference edge on said label material.

[0006] For a source of linerless label material which is a roll having an axial opening therethrough, said label feeder could further include a pair of freely rotatable rollers extending through said axial opening in use of the system in a parallel spaced relation to a rotational axis of the roll, said roll being supported by said rollers so as to enable free rotation of said roll as the linerless label material is drawn therefrom. In this case, said label feeder could be operative to effect progressive movement of said linerless label material longitudinally from said roll through a looped path, said label feeder further including sensors operative to sense said looped path and advance said looped path and advance the label material if the label material length through said looped path shortens so as to deviate from said looped path.

[0007] Said paddle member could be operative to apply a suction attachment to the label material to releasably retain the label material as the label material is severed by said cutting means. In this case, said paddle member could comprise an elongated paddle pivotally supported adjacent one end for pivotal movement between a first position spaced from said first path and a second position closely adjacent said first path, said paddle having a hollow interior and a label engaging surface having at least one vacuum orifice communicating

with said hollow interior, said paddle further having a valve orifice communicating with said hollow interior and adapted for connection to a source of vacuum so as to create a vacuum orifice and said valve orifice being operative to apply vacuum to said vacuum orifice when said paddle is in first position and isolate said vacuum orifice from said vacuum source when said paddle is in said second position.

[0008] Said cutter station could include a guide plate having a guide surface disposed in a generally vertical plane, said guide surface lying in said second path so that said label material slides over said guide surface as said label material approaches said cutting means. In this case, said guide surface could have at least one vacuum orifice connected to a source of vacuum, and including a control valve associated with said source of vacuum and operative to apply a vacuum to the or each vacuum orifice to secure said label material to said guide surface as said cutting means severs the label material and said control valve being operative to disconnect said vacuum source from the or each orifice during advancement of said label material along said second path after each severing of the label material to create a label.

[0009] Said cutter station could include a stripper bar supported in substantially parallel spaced relation to said cutting means so as to define an opening therebetween through which said label material passes, said stripper bar being moveable with said cutting means and operative to return each newly formed transverse leading edge of the continuous length label material to a position preparatory to advancing the label material longitudinally and severing the next successive label from the label material.

[0010] Said cutting means could include a cutting edge inclined to the plane of the label material disposed in said cutter station so as to progressively sever the label material transversely thereof in creating a label.

[0011] Said paddle member could be moveable between a position spaced from a document disposed in said label applying station and a position closely adjacent thereto, said cutting means being coordinated with said paddle member so as to complete severing of said label material after from movement of said paddle member to initiate pressing the label being severed against a document traversing the label apply station.

[0012] The cutting means could include a fixed blade and a moveable blade, including an actuating drive operatively associated with the moveable blade so as to effect reciprocating movement of the moveable blade to sever a label from the label material in timed relation to longitudinal movement of the label material to said cutter station.

[0013] The cutting means could include a fixed blade and a moveable blade, said moveable blade being disposed in a predetermined orientation relative to the fixed blade and operative to sever the label material transversely as the label material passes between the fixed blade and the moveable blade.

[0014] The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

FIG. 1 is a fragmentary perspective view of a linerless label applying system constructed in accordance with a preferred embodiment of the present invention;

FIG. 2 is a plan view of the linerless label applying system illustrated in FIG. 1;

FIG. 3 is a fragmentary vertical sectional view taken substantially along line 3-3 of FIG. 2 with portions broken away for purposes of clarity;

FIG. 4 is a fragmentary elevational view taken substantially along line 4-4 of FIG. 1 and looking in the direction of the arrows;

FIG. 5 is a fragmentary perspective view taken from the opposite side of the apparatus shown in FIG. 3;

FIG. 6 is a fragmentary perspective view illustrating a label material web guide and advancing assembly for advancing a web to a cutter station;

FIG. 7 is a perspective view of a cutter blade and stripper bar assembly removed from the base plate of the label applying system illustrated in FIG. 1;

FIG. 8 is a fragmentary plan view illustrating a label applying paddle member and associated actuator and vacuum supply;

FIG. 9 is a fragmentary elevational view taken substantially along line 9-9 of FIG. 2;

FIG. 10 is a logic diagram illustrating the sequence of operation of the various operating functions of the label applying system;

FIG. 11 is a schematic diagram of one aspect of the label material feed operation sequence; and

FIG. 12 is a schematic diagram of paddle vacuum sensor apparatus.

[0015] Referring now to the drawings, and in particular to FIGS. 1-3, a linerless label applying system constructed in accordance with the present invention is indicated generally at 10. As will be described more fully below, the linerless label applying system 10 is operative to apply linerless labels to documents, such as mailing envelopes and the like, as the documents are conveyed on edge in a generally vertical orientation along a predetermined horizontally extending path established by a conveyor belt system, indicated generally at

12 in FIG. 2. The label applying system 10 finds particular application in conjunction with mail handling systems requiring a facility for applying a corrective address label or a bar code or the like to an envelope having an incorrect or defective address or bar code thereon which requires correction. The linerless label system 10 may be used as a stand-alone label applying system operative to create linerless labels of varying size and apply them to mailing envelopes and like documents manually fed into the system, or may be utilized with conventional mail sorting machines to create and apply labels to mailing envelopes conveyed on edge from an upstream processing station in which the improper or defective address or bar code is detected and from which the document is passed through the conveyor belt system 12 for applying a linerless label thereto.

[0016] Briefly, the linerless label applying system 10 includes a source or supply of continuous length linerless label material, such as in the form of a roll 14 of linerless label web material 16. The linerless label material 16 has an adhesive surface on one side, such as the inwardly facing surface of the wound web, and a non-adhesive outwardly facing surface on the opposite side adapted to have indicia printed thereon, such as an address or a bar code. The address or bar code may be printed on the non-adhesive side of a linerless label by a conventional printer (not shown) either prior to applying a label to a mailing document or after applying the label thereto. The label applying system 10 includes a label feeder means, indicated generally at 20, which is cooperative with the label material web 16 for effecting unwinding from the roll 14 and feeding the label material web longitudinally along a looped path to a cutter station, indicated generally at 22. The cutter station 22 is operative to sever the label material web generally transversely of its longitudinal axis to create labels of selectively variable height. A label applying means in the form of a paddle member 24 is supported adjacent the cutter station 22 and is operative to engage the non-adhesive surface of a cut label and hold the label by vacuum while moving it into engagement with a mailing document being conveyed along the conveyor belt system 12 in juxtaposed relation to the paddle member. As will be described, the paddle member 24 is operative to initially lightly press the leading edge of a label against a document juxtaposed to the label applying paddle member and progressively adhere the remainder of the label against the document as the document and the label advance downstream from the paddle member.

[0017] Turning now to a more detailed description of the linerless label applying system 10, the various components are supported on or suspended from a generally planar base or top plate 28. The base plate 28 is preferably supported at a convenient operator height. When used with other mail document handling apparatus, the base plate 28 is positioned so that the conveyor belt system 12 is aligned with an upstream conveyor belt system operative to convey mailing documents and the

like in sequential order to the linerless label applying system 10. The base plate 28 supports the roll 14 of linerless label web material 16 through an upstanding support arm 30 which is fixed at its lower end to the plate 28. The support arm 30 supports a pair of parallel spaced horizontal support rollers 32a and 32b which extend through an axial opening 14a of the roll 14 so as to support the roll and enable free rotation of the roll during unwinding of the linerless label web material 16. Enlarged diameter discs on the outer ends of the rollers 32a,b prevent inadvertent release of the roll 14 from the support rollers.

[0018] As illustrated in FIG. 1, the label web material 16 is guided from the roll 14 through a feed nip defined between a driven feed roller 34 and a spring loaded pinch roller 36. The feed roller 34 is connected through a suitable gear drive to an electric motor 38 which, when energized, is operative to advance the label web material 16 from the roll 14. The label web material 16 is fed from the feed roller 34 downwardly through a suitable opening in the base plate 28 to form a loop 16a (FIG. 3) as the label web material is passed to a web material guide and advance assembly, indicated generally at 40. The web length between the roll 14 and web guide and advance assembly 40 is controlled by a set of photosensors, indicated schematically at 41a and 41b in FIG. 3, which sense the presence of the loop 16a and are connected in circuit with the feed motor 38 to advance the web and maintain a loop 16a so as to float approximately six to eight inches beneath the top plate 28. The web loop 16a forms a buffer loop so that the web hangs free at the point of entry into the web guide and advance assembly 40. As illustrated in FIG. 5, a fan 42 and air deflector plate 44 may be mounted beneath the base plate 28 to blow air onto the upwardly facing surface of the label material web loop 16a to assist in maintaining the loop path.

[0019] In addition to the loop photosensors 41a and 41b, a sensing system is provided to detect depletion of label web material 16 from roll 14, and to provide a signal to a main conveyor drive control to halt the introduction of new documents into the label applying station after a short delay, for purposes to be explained. Referring to FIG. 3, a pair of beam or photosensor elements indicated schematically at 46a and 46b, or other suitable sensors, are supported on opposite sides of the web material 16 where it passes through the base plate 28 so that the web material normally breaks the beam extending between the sensor elements as it advances longitudinally to the cutter station 22. As the roll 14 becomes depleted, the end of web 16 passes beyond sensor elements 46a,b, creating a signal which is relayed to the conveyor system control to halt the further advance of mailing envelopes or other documents in the conveyor system 12. Because there is still a sufficient amount of label material in loop 16a to supply labels to documents already in the conveying system, the document conveyor system 12 is permitted to continue to advance a small

number of additional documents, such as approximately 5-10, after receiving a web depletion signal from sensors 46a,b before the conveyor system actually stops.

[0020] Referring to FIGS. 5 and 6, taken in conjunction with FIG. 3, the label web material guide and advance assembly 40 includes a generally vertically disposed guide plate or manifold 48 having a generally vertical planar surface 48a bounded by a pair of laterally spaced parallel edge guides 50a and 50b. The edge guides 50a,b are spaced apart a distance generally equal to the lateral width of the label web material 16 and define an open channel to receive the lateral marginal edges of the web material so as to guide it along the planar surface 48a as the web material is advanced to the cutter station 22. A pair of laterally spaced side plates 52 and 54 are secured to the laterally opposite edges of the guide plate 48 so as to lie in parallel planes and extend rearwardly from the guide plate. The side plate 52 has its lower edge mounted on and slidable along a guide rod 56 which is suitably supported below the base plate 28 in parallel relation thereto. The side plate 54 has a cam follower or roller 58 mounted on its outer surface which is received within a rectilinear groove or channel formed in a guide plate 60 secured in normal relation to the underside of the base plate 28 so that the guide channel is parallel to the longitudinal axis of the guide rod 56. In this manner, the side plates 52 and 54 cooperate with the guide plate or manifold 48 to form a horizontally slidable carriage which may be moved along the guide rod 56 to a rearward position facilitating initial or replacement threading or guiding of the label web material between the edge guides 50a and 50b and along the planar surface 48a of the guide plate 48.

[0021] To facilitate selective feeding or advancing of the label web material 16 upwardly along the guide plate surface 48a, a web advance or feed roll 64 is supported on a transverse drive shaft 66 so that feed roll 64 is positioned within a recess formed generally centrally in guide plate 48. The opposite ends of drive shaft 66 are journaled in the side plates 52 and 54 so that the outer peripheral surface of feed roll 64 extends slightly forwardly from the planar guide plate surface 48a and engages the non-adhesive surface of the label web material as it passes upwardly along the guide plate. As illustrated in FIG. 5, the drive shaft 66 extends through the side plate 52 and has a timing belt pulley 68 fixed thereon which is connected through a timing belt 70 to a drive pulley 72 mounted on the output shaft of a stepping motor 74 supported on the inner surface of side plate 52. A ribbed pinch roller 76 is supported below the base plate 28 to cooperate with the feed roll 64 when in its forward position to advance the label web material in response to energizing the stepping motor 74. As will be described, the stepping motor 74 enables selective incremental advance of the label web material 16 to create labels of varying height, such as 15.8 mm (5/8 inch) height labels for bar coding and 31.7 mm (1¼ inch)

height labels for address labels.

[0022] The guide plate or manifold surface 48a includes a plurality of vacuum orifices 48b which are connected to a source of vacuum through a control valve (not shown). A relatively low vacuum is applied to the orifices 48b so as to lightly retain the label web material in sliding contact with the guide plate surface 48a during cutting by the cutter blade 82 to create labels and subsequent feeding of additional web material 16 to cutter station 22.

[0023] The label web material 16 is advanced by the web guide and advance assembly 40 to a predetermined vertical position relative to the cutter station 22 which is operative to sever the label web material transversely of its longitudinal axis and create labels of any desired height. The cutter station 22 comprises a cutter blade assembly, indicated generally at 80, which includes a cutter blade 82 having a forward cutting edge 82a. The cutter blade 82 is secured to and carried by a precision ball slide 84 mounted on a horizontal plate 86a of a generally U-shaped support frame 86 secured to the underside of the base plate 28. The cutting blade 82 is adapted for horizontal rectilinear movement in a path normal to the guide plate surface 48a and lying in a vertical plane containing the longitudinal axis of the label web material 16.

[0024] Reciprocating movement of the cutter blade 82 is effected through a toggle link actuating mechanism indicated generally at 90. Referring to FIGS. 2 and 3, the toggle link actuating mechanism 90 is mounted below the base plate 28 and includes a pneumatic actuating cylinder 92 having a piston 92a which, in response to pneumatic pressure being applied to the actuating cylinder 92, acts through a coil compression spring 94 to move a slide block 96 in the axial direction of the piston 92a. The slide block 96 is biased in a direction toward the operating cylinder 92 by a coil compression spring 98 which is partially received within a blind bore in a support block 100 fixed to the underside of the base plate 28. The end of the coil compression spring 98 disposed within the support block 100 seats against a ball 102 which enables pivotal movement of the spring. The opposite end of compression spring 98 is received within a shallow recess or blind bore in the opposing end of the slide block 96 and biases the slide block toward the adjacent end of the operating cylinder 92 and against the compression spring 94. The opposite end of the operating cylinder 92 is pivotally interconnected through a ball 106 to a support block 104 fixed to the underside of base plate 28.

[0025] A pair of substantially identical actuating links 110 and 112 are pivotally connected to the slide block 96 at 110a and 112a, respectively. The opposite end of actuating link 110 is pivotally connected at 110b to a block 114 fixed to the underside of base plate 28. The opposite end of pivot link 112 is pivotally connected at 112b to the ball slide 84. With the slide block 96 positioned as illustrated in FIG. 2, pressurizing the actuating

cylinder 92 will extend the piston 92a and effect movement of the slide block in a right-hand direction against the force of spring 98. This causes the actuating links 110 and 112 to undergo a toggle-like movement with link 110 pivoting about its fixed pivot connection 110b and link 112 moving the ball slide 84 and thereby cutter blade 82 in the longitudinal direction of the ball slide. The ball connections 102 and 106 accommodate slight lateral movement of the slide block 96 as the link 110 pivots about its pivot connection 110b. Release of pressure from the actuating cylinder 92 allows the coil spring 98 to return the slide block 98 to its home or initial position, which also returns the cutter blade to its original position. The geometry of the links 110 and 112 is selected to rapidly move the cutter blade through a cutting stroke of approximately 3.2 mm (1/8 inch).

[0026] As illustrated in FIGS. 2, 3 and 7, the cutter blade 82 is supported so that its cutting edge 82a is spaced a predetermined distance above the upper surface of the base plate 28 as determined by the spacing desired between the lower edge of a mailing envelope being conveyed by the conveyor belts 126 and 128 and the lower edge of a label applied to the envelope. The cutter blade is also configured so that when it is in its rearward non-cutting position, as illustrated in FIG. 2, the cutting edge 82a is spaced slightly rearwardly from the plane of the planar surface 48a on the guide plate 48 and from the label web material 16 being fed upwardly along the guide surface by feed roll 64. During a cutting stroke, the cutting edge 82a cooperates with a stationary shearing blade 120 to sever the material web 16 transverse to its longitudinal axis. The shearing blade 120 is generally rectangular and is supported on the upper surface of the base plate 28 through a spacer 121 and bolts 120a so that a forward lower edge of the shearing blade cooperates with the cutting edge 82a to effect shearing of the label web material. The cutting edge 82a is formed on the cutter blade 82 to be slightly inclined to the plane of the material web, as considered in FIG. 2, so that the cutting edge effects a progressive cutting of the web material beginning with the right-hand edge as viewed in FIG. 2 and terminating with the left-hand edge as the cutter blade is fully extended in a cutting stroke.

[0027] It will be appreciated that as the cutter blade 82 is moved through a web severing stroke responsive to actuation of the actuating cylinder 92, the newly formed leading edge of the web material 16 will be moved slightly underneath the stationary shearing blade 120. To insure that the newly formed leading edge of the label web material 16 returns to a position enabling advance of the web material to create the next successive label without interference with the cutting blade, a stripper bar 122 is interconnected to the cutter blade 82 so as to lie in generally parallel spaced relation forwardly from the cutting edge 82a to enable the label web material to pass between the cutting edge 82a and the stripper bar. To this end, the stripper bar 122 has a rearward edge surface 122a which is spaced closely adjacent the

cutting edge 82a and extends slightly into the path of the label web material 16 when the cutter blade is in its retracted position. When the cutter blade 82 is actuated to sever the label web material, the stripper bar moves with the cutter blade and slides under the stationary shearing blade 120. When the cutter blade 82 has completed a label severing stroke, the stripper bar 122 follows its return path and pushes the newly formed leading edge of the web material back into the original label path, thereby enabling advancement of the web material for creating the next successive label. The stripper bar 122 is preferably generally U-shaped and secured to the cutter blade 82 by pins 124 (FIG. 2). The stripper blade may be made of a suitable plastic material, such as DELRIN, and has an elongated pocket 122b formed in its upper surface to receive a wicking material which holds a lubricant, such as a lubricating oil. As the stripper bar 122 moves forward and back with the cutting blade 82, the lubricant is deposited on and lubricates the surrounding components so as to prevent the accumulation of adhesive from the web material 16 as it is severed into labels.

[0028] As illustrated in FIG. 2, the conveyor belt system 12 includes a pair of endless conveyor belt 126 and 128 each of which is reeved about a plurality of idler rollers, such as indicated at 130. The belts 126 and 128 define a run or reach of juxtaposed conveyor belts 126a and 128a and an entering nip 132 to receive mailing envelopes and the like from an upstream conveyor or other conveying means (not shown) and convey them in a downstream direction, or from left-to-right as considered in FIG. 2. It will be understood that a drive roller is provided for each of the conveyor belts 126 and 128 so as to drive them at the same longitudinal speed. In the illustrated embodiment, a backup conveyor belt 134 is supported on a pair of idler rollers 136 so as to establish a reach of the conveyor belt 134 rearwardly of and engaging the conveyor belt reach 126a as it traverses a path past the cutter assembly 22. The idler rollers 130 and 136 are supported on the upper surface of the base plate 28 so that the corresponding conveyor belts 126, 128 and 134 are spaced above the base plate sufficiently to expose the lower surface areas of mailing documents being conveyed by the belt reaches 126a,b for applying labels to the exposed areas.

[0029] As briefly aforescribed, the paddle member 24 is operative in conjunction with severing of each successive label from the label web material 16 by the cutter assembly 22 so that the paddle member holds each label as it is being severed and moves the label to a position adhering it to a document being conveyed by the conveyor belt reaches 126a and 128a. Referring to FIGS. 8 and 9, taken in conjunction with FIG. 2, the paddle member 24 comprises an elongated hollow paddle member having a generally rectangular transverse cross-section defined by a planar forward label contact surface 140 which terminates in an outer curved end surface 140a a rearwardly planar wall surface 142, and

upper and lower planar wall surfaces 144a and 144b, respectively. Paddle member 24 has a hollow internal vacuum chamber 146 adapted to be connected to a source of vacuum through an oblong port 148 formed in the top wall 144a. The paddle member 24 is fixed on the lower end of a vertical pivot shaft 150 which forms the output shaft of a fluid pressure controlled actuator 152. The actuator 152 is mounted on a base plate 28 so that the paddle member 24 is spaced above the height of the cutting edge 82a for pivotal movement in a plane parallel to the base plate 28. The actuator 152 is of the type commercially available from MAC, Inc. under its model number 912B-PM-611BA.

[0030] The actuator 152 includes a four-way pneumatic control valve which enables time rotational oscillation of the pivot shaft 150 and thereby pivotal movement of paddle member 24 about the longitudinal axis of shaft 150. The actuator 152 is operative to pivot the paddle member between a position wherein the forward surface 140 is spaced slightly behind the plane of planar surface 48a of the web material guide plate, and a forward position wherein the curved outer end 140a of the paddle member contacts the lower exposed areas of mailing envelopes or the like being conveyed by the conveyor belt reaches 126 a and 128a.

[0031] The vacuum port 148 in the upper wall 144a of the paddle member 24 is adapted for registration with a vacuum orifice 156 formed in a bottom horizontal wall 158a of a vacuum block 158. The vacuum block 158 is supported in overlying relation to the paddle member 24 so that the upper wall 144a of the paddle member is in sliding contact with the opposed lower wall 158a of the vacuum block. As illustrated in FIG 8, the vacuum orifice 156 is configured so as to register with the vacuum port 148 in the paddle member 24 when the paddle member is in its rearward position behind the label web material 16 advanced by the label feed roller 34, and continues to remain in communication with port 148 until the paddle member reaches substantially its forward position, as shown in phantom in FIG. 8, at which time the vacuum port 148 no longer underlies the vacuum orifice 156. With this arrangement, a vacuum created within the internal vacuum chamber 146 of the paddle member 24 and acts through a plurality of vacuum orifices 140b formed in the forward wall surface 140 of the paddle member to engage and hold label as it is being severed from the label material web 16 by the cutter blade 82. Simultaneously with severing of a label from the web material, the paddle member is pivoted in a counter clockwise or forward direction about the pivot rod 154, as considered in FIG. 8, by actuation of the pneumatic actuator 152 so that the leaving edge of the label engages and is adhered to a document being conveyed in juxtaposed relation to the paddle member. When the paddle member 24 reaches its outermost pivotal position with the outer end 140a engaging a label against an envelope or the like, the vacuum port 148 is no longer in registration with the vacuum orifice 156 so that vacu-

um chamber 146 is no longer subjected to vacuum. As the mailing envelope to which the label is being applied advances, it draws the label along the surface 140 of the paddle member to expose the leftmost orifice 140b in the paddle member to atmosphere. This allows the label to release from the paddle member and allows the curved paddle end 140a to progressively lightly adhere the remaining length of the label to the passing envelope. The paddle member 24 is then returned to its initial position by actuation of the actuator 152 preparatory to severing and applying the next successful label. The paddle member 24 is preferably positioned approximately one inch from the conveyor path traversed by mailing envelopes when the paddle member is in its rearward position.

[0032] The present invention includes several sensor systems to initiate and control the operation of the linerless label applicator 10. As seen in FIG. 2, straddling conveyor belt reaches 126a and 128a of the incoming document path are a plurality of sensor elements, indicated schematically at A, B, C, and D, each of which emits a signal to the electronic system operating label applicator 10 when an advancing document passes between the respective sensor elements. As a document is advanced along the document path formed by conveyor belt reaches 126a and 128a from left to right, sensor element A is initially actuated by the leading edge of an advancing document. Sensor A is one of a plurality of sensor elements disposed linearly along the document path of the overall document handling system (not shown) of which the label applicator 10 forms a part. These sensor elements A provide a tracking function to maintain control over the location of each document as it is advanced through the entire document handling system.

[0033] Sensor element B is an activate sensor which also emits an electronic signal when the leading edge of an advancing document is detected. As illustrated in the timeline diagram of FIG. 10, the signal produced by sensor element B initially performs two functions simultaneously. First, the stepping motor 74 operating stepping feed roll 64 is energized to advance web 16 twenty five steps upward (each step equals 0.58 mm (.023 inches) in the preferred embodiment) between stationary shearing blade 120 and moveable cutter blade 82 to place the top of web 16 adjacent paddle element 24. For this purpose, the stepping motor 74 operates for approximately 12 milliseconds, which places the forward end of web 16 at the proper distance above cutter blades 82, 120 to form a label of the appropriate height. The timing of the operation of stepping motor 74 can be varied to adjust the height of the label to any predetermined amount. Second, the control system inhibits operation of paddle member 24 for approximately 28 milliseconds from the start of the sequence for the purpose of preventing the paddle from striking the web 16 after the web has been advanced twenty five steps and is located in the path of the paddle.

[0034] After the web 16 has been advanced for 12 milliseconds with the paddle initially inhibited, the air valve (not shown) operating movable cutter blade 82 is activated for approximately 25 milliseconds to cut the up-standing web material above the cutter blades 82, 120

[0035] Sensor elements C and D are similar in function to each other. However, sensor C is configured to emit an electronic signal when the leading edge of an advancing document is detected, and sensor element D is configured to emit an electronic signal when the trailing edge of an advancing document is detected. During operation, the operator selects which sensor C or D will be operative, since in certain document handling processes, the label must be placed dimensionally from the leading edge, and in other processes, the label is placed dimensionally from the trailing edge of the document.

[0036] When either sensor element C or D is triggered by the advancing document, a short delay in actuation of the paddle element 24 is programmed into the system to compensate for the distance between the sensor C or D and the label applying station, taking into account the speed of the advancing document. Then, as schematically shown in FIG. 10, the previous paddle inhibit function is then terminated. Next, the valve associated with the pneumatic actuator 152 for powering paddle element 24 is activated for approximately 25 milliseconds, causing paddle 24 to pivot outwardly whereby the label cut from web 16 is held by vacuum force to the paddle with the adhesive side of the web facing the document conveyor path. The label is then adhered to the advancing document as previously described. At the same time, sensor C or D initiates a signal which inhibits activation of the control for the web advance sequence for 21 milliseconds after detection of the advancing document by sensor C or D for the purpose of insuring that the remaining web material doesn't advance upward into the cutter station while the paddle 24 is moving back and forth.

[0037] The web feed and cutter activation control sequence under the influence of sensor element B causes the movable cutter blade 82 to return to its original or stand-by position under spring force after 25 milliseconds of operation. At the same time the movable cutter blade 82 begins movement to its return position, a delay signal is applied to the web advance motor 74 to delay further web movement until the movable cutter blade 82 clears the path along which the next length of web will advance. In this manner, the movable cutter blade will not interfere with the web material advance.

[0038] At the end of this 12 millisecond delay, the web advance inhibit function under the influence of sensor C or D is terminated, and the web material 16 is moved downward three steps and then immediately upward five steps over a period of 12 milliseconds. The purpose of this slight downward and then upward movement of the web at this juncture can be explained with reference

to FIG. 11 which schematically illustrates the position of the movable cutting blade 82 immediately after a label 16b has been severed from the web material 16 and the label is being held by vacuum force to face 140 of paddle 24. As the movable cutter blade 82 moves in direction "a" following a cutting operation, the adhesive on face "b" of web 16 causes the uppermost tip of the uncut web to adhere to the underside of the movable cutting blade, as shown at "x" in FIG. 11. Allowing the web 16 to remain in this position would substantially inhibit subsequent upward advance of the web 16 by means of the stepping roller 64 and ribbed pinch roller 76, and prevent proper forming of subsequent labels.

[0039] To prevent this problem from occurring, the control system for the label applicator 10, under the influence of sensor B, following each cutting operation, drives stepping roller 64 three steps backward in a period of 12 milliseconds after the movable cutter blade 82 begins its movement back to its original position. During this 12 millisecond period, the movable cutter blade 82 moves out of the way of the web path indicated at "y", and cannot interfere with subsequent web advancement. As the stepping roller 64 moves the web down, the tip of the uncut web breaks free from the inclined underside of movable cutter blade 82, and is drawn leftward (as viewed in FIG. 11) by vacuum force towards and against manifold 48. Once free from any adhesive grip with movable cutter blade 82, the web is now free to advance upward towards the cutter station and paddle without interference.

[0040] Next, stepping roller 64 rapidly advances web 16 upward five steps to place the newly formed top or leading edge of the remaining label material 16 at a plane "z" vertically adjacent the approximate mid-height of fixed cheering blade 120, which is below the lower wall 144b of paddle member 24. At this time, paddle member 24 has returned to its original position by action of the paddle actuator 152. The paddle member 24 and movable cutter blade 82 are now in their starting positions, and the label web material 16 has been advanced above the cutting plane and into position ready for the next label advance and application cycle. This sequence is repeated to apply each successive label.

[0041] Referring to FIG. 12, a vacuum sensor is illustrated schematically at 180 connected to a vacuum line 182 to the panel member 24 through the vacuum block 158. Sensor 180 detects whether a label 16b cut from the label web material 16 is in proper position against the paddle forward surface 140 immediately following each label cutting operation, and also detects whether the label feed system is jammed or otherwise dysfunctional. The vacuum line or conduit 182 supplying vacuum to hollow chamber 146 of paddle 24 includes an orifice 184 to which the vacuum sensor 180 is operatively connected. The vacuum sensor 180 detects the vacuum level in conduit 182 and is programmed to emit a warning signal if the vacuum source falls below a pre-established threshold amount. In the illustrated embodiment,

the vacuum source is supplied at approximately 381 mm (15 inches) Hg. Sensor 180 is programmed to emit a signal when the vacuum in conduit 182 falls to approximately 127 mm (5 inches) Hg.

[0042] When a label 16b is disposed against the forward face 140 of paddle 24, the surface of the label prevents leakage of vacuum from hollow vacuum chamber 146 through ports 140b, and the vacuum in the chamber 146 and conduit 182 is maintained at 381 mm (15 inches) Hg. If label 16b is not present on the forward face of paddle 24, vacuum pressure leaks from unobstructed ports 140b, and the vacuum source immediately drops to 127 mm (5 inches) Hg, causing sensor 180 to emit a signal which is conveyed to the document feed control system to halt the advance of documents towards the document labeling station. Upon correction of the error by an operator, the label application system 10 resumes its normal functions.

[0043] While a preferred embodiment of the present invention have been illustrated and described, it will be understood by those skilled in the art that changes and modification may be made therein without departing from the invention as defined in the following claims.

Claims

1. A linerless label applying system (10) for applying a source of continuous length linerless label material (16) to documents being conveyed in a non-overlapping sequential on-edge fashion along a first predetermined path through the system, the label material (16) having an adhesive surface and an opposite non-adhesive surface adapted to have indicia printed thereon, the system comprising:

a conveyer for transporting said documents along said first predetermined path in a non-overlapping sequential on-edge fashion;
 a label feeder (20) adapted for effecting progressive longitudinal movement of the label material (16) along a second predetermined path so that a leading edge of the label material is in a predetermined juxtaposed relation to the first path;
 a cutter station (22) positioned in predetermined relation to the label feeder, the cutter station (22) including cutting means (82) operative to sever the label material (16) generally transversely thereof a predetermined selectable distance from the leading edge (82a) so as to create a label of pre-selected height; and
 a paddle assembly (24) including a moveable paddle member (24) supported adjacent the cutter station (22) and adapted to engage the non-adhesive side of the label material (16) between the leading edge of the label material and the cutting means, the moveable paddle mem-

ber operative to support and releasably retain the severed label and press the adhesive surface of the label against a face of an on-edge document as the document travels in a continuous on-edge, non-overlapping, and non-interrupted manner along the first path through the label applying system (10).

2. A system according to claim 1 including control means operative to actuate said cutting means (82) and cut a transverse leading reference edge (82a) on said label material (16).
3. A system according to claim 1 or 2, wherein for a source of linerless label material which is a roll (14) having an axial opening (14a) therethrough, said label feeder (20) further includes a pair of freely rotatable rollers (32a, 32b) extending through said axial opening (14a) in use of the system in a parallel spaced relation to a rotational axis of the roll, said roll being supported by said rollers so as to enable free rotation of said roll as the linerless label material (16) is drawn therefrom.
4. A system according to claim 3, wherein said label feeder (20) is operative to effect progressive movement of said linerless label material (16) longitudinally from said roll (14) through a looped path (16a), said label feeder (20) further including sensors (41a, 41b) operative to sense said looped path (16a) and advance said looped path (16a) and advance the label material (16) if the label material (16) length through said looped path (16a) shortens so as to deviate from said looped path (16a).
5. A system according to any preceding claim, wherein said paddle member (24) is operative to apply a suction attachment to the label material (16) to releasably retain the label material (16) as the label material (16) is severed by said cutting means (82).
6. A system according to claim 5, wherein said paddle member (24) comprises an elongated paddle (24) pivotally supported adjacent one end for pivotal movement between a first position spaced from said first path and a second position closely adjacent said first path, said paddle having a hollow interior (146) and a label engaging surface having at least one vacuum orifice (156) communicating with said hollow interior (146), said paddle (24) further having a valve orifice (148) communicating with said hollow interior (146) and adapted for connection to a source of vacuum so as to create a vacuum at said vacuum orifice (156) and said valve orifice (148) being operative to apply vacuum to said vacuum orifice (156) when said paddle (24) is in first position and isolate said vacuum orifice (156) from said vacuum source when said paddle (24) is in said

second position.

7. A system according to any preceding claim, wherein said cutter station (22) includes a guide plate (48) having a guide surface (48a) disposed in a generally vertical plane, said guide surface (48a) lying in said second path so that said label material (16) slides over said guide surface (48a) as said label material (16) approaches said cutting means (82). 5
8. A system according to claim 7, wherein said guide surface (48a) has at least one vacuum orifice (156) connected to a source of vacuum, and including a control valve associated with said source of vacuum and operative to apply a vacuum to the or each vacuum orifice (156) to secure said label material (16) to said guide surface (48a) as said cutting means (82) severs the label material (16) and said control valve being operative to disconnect said vacuum source from the or each vacuum orifice (156) during advancement of said label material (16) along said second path after each severing of the label material (16) to create a label. 10
9. A system according to any preceding claim, wherein said cutter station (22) includes a stripper bar (122) supported in substantially parallel spaced relation to said cutting means (82) so as to define an opening therebetween through which said label material (16) passes, said stripper bar (122) being moveable with said cutting means (82) and operative to return each newly formed transverse leading edge of the continuous length label material (16) to a position preparatory to advancing the label material (16) longitudinally and severing the next successive label from the label material (16). 15
10. A system according to any preceding claim, wherein said cutting means (82) includes a cutting edge (82a) inclined to the plane of the label material (16) disposed in said cutter station (22) so as to progressively sever the label material (16) transversely thereof in creating a label. 20
11. A system according to any preceding claim, wherein said paddle member (24) is moveable between a position spaced from a document disposed in said label applying station (10) and a position closely adjacent thereto, said cutting means (82) being coordinated with said paddle member (24) so as to complete severing of said label material (16) after from movement of said paddle member (24) to initiate pressing the label being severed against a document traversing the label apply station (10). 25
12. A system according to any preceding claim, wherein the cutting means (82) includes a fixed blade and a moveable blade, including an actuating drive 30

(152) operatively associated with the moveable blade so as to effect reciprocating movement of the moveable blade to sever a label from the label material (16) in timed relation to longitudinal movement of the label material (16) to said cutter station (22). 35

13. A system according to any preceding claim, where the cutting means (82) includes a fixed blade and a moveable blade, said moveable blade being disposed in a predetermined orientation relative to the fixed blade and operative to sever the label material (16) transversely as the label material (16) passes between the fixed blade and the moveable blade. 40

Patentansprüche

1. System (10) zum Aufbringen von trägerbandlosen Etiketten zum Aufbringen einer Quelle aus trägerbandlosem Endlosetikettenmaterial (16) auf Dokumente, die nicht überlappend, sequentiell und kantengenau entlang eines ersten festgelegten Weges durch das System befördert werden, wobei das Etikettenmaterial (16) eine Klebefläche und eine gegenüberliegende kleberfreie Fläche aufweist, auf die Zeichen druckbar sind, wobei das System Folgendes umfasst: 45

einen Förderer zum Befördern der Dokumente entlang des ersten festgelegten Weges in nicht überlappend, sequentieller, kantengenaue Weise, 50

eine Etikettenszuführung (20) zum Ausführen der allmählich fortschreitenden Längsbewegung des Etikettenmaterials (16) entlang eines zweiten festgelegten Weges, so dass eine führende Kante des Etikettenmaterials in einer festgelegten benachbarten Relation zum ersten Weg steht, 55

eine Schneidestation (22), die in einer feststehenden Relation zur Etikettenszuführung angeordnet ist, wobei die Schneidestation (22) ein Schneidemittel (82) aufweist, das dazu dient, das Etikettenmaterial (16) im Allgemeinen quer in einem vorher festgelegten wählbaren Abstand zur führenden Kante (82a) abzutrennen, um ein Etikett mit einer vorher eingestellten Höhe herzustellen, und

eine Schaufelanordnung (24) mit einem beweglichen Schaufelelement (24), das neben der Schneidestation (22) angeordnet ist und die kleberfreie Seite des Etikettenmaterials (16) zwischen der führenden Kante des Etikettenmaterials und dem Schneidemittel in Eingriff bringt, wobei das bewegliche Schaufelelement

dazu dient, das abgetrennte Etikett zu tragen und lösbar zu halten und die Klebefläche des Etiketts gegen eine Seite eines kantengenauen Dokumentes zu drücken, wenn sich das Dokument fortlaufend, kantengenau, nicht überlap-

2. System nach Anspruch 1 mit einem Steuermittel, das dazu dient, das Schneidemittel (82) zu betätigen und eine querverlaufende führende Bezugs-

3. System nach Anspruch 1 oder 2, wobei die Etikettenzuführung (20) bei einer Quelle aus trägerbandlosem Etikettenmaterial, bei der es sich um eine Rolle (14) mit einer durch diese hindurchgehenden axialen Öffnung (14a) handelt, darüber hinaus ein Paar frei drehbarer Walzen (32a, 32b) aufweist, die sich durch die axiale Öffnung (14a) beim Betrieb des Systems parallel in einem Abstand relativ zu einer Drehachse der Rolle erstrecken, wobei die Rolle von den Walzen getragen wird, so dass die Rolle frei drehbar ist, wenn das trägerbandlose Etikettenmaterial (16) von ihr abgezogen wird.

4. System nach Anspruch 3, wobei die Etikettenzuführung (20) dazu dient, die fortschreitende Bewegung des trägerbandlosen Etikettenmaterials (16) in Längsrichtung von der Rolle (14) durch einen gewundenen Weg (16a) auszuführen, wobei die Etikettenzuführung (20) weiterhin Sensoren (41 a, 41 b) umfasst, die dazu dienen, den gewundenen Weg (16a) zu erfassen und den gewundenen Weg (16a) vorwärts zu bewegen und das Etikettenmaterial (16) vorwärts zu bewegen, wenn sich das Etikettenmaterialstück (16) durch den gewundenen Weg (16a) derart verkürzt, dass es von dem gewundenen Weg (16a) abweicht.

5. System nach einem der vorhergehenden Ansprüche, wobei das Schaufelelement (24) eine Saughaftung auf das Etikettenmaterial (16) aufbringt, um das Etikettenmaterial (16) lösbar festzuhalten, während das Etikettenmaterial (16) durch das Schneidemittel (82) getrennt wird.

6. System nach Anspruch 5, wobei das Schaufelelement (24) eine längliche Schaufel (24) umfasst, die schwenkbar neben einem Ende angeordnet ist, zur Ausführung einer Schwenkbewegung zwischen einer ersten Stellung in einem Abstand von dem ersten Weg und einer zweiten Stellung dicht neben dem ersten Weg, wobei die Schaufel ein hohl ausgeführtes Inneres (146) aufweist und eine etiketten-

umöffnung (156) aufweist, die mit dem hohl ausgeführten Inneren (146) in Verbindung steht, wobei die Schaufel (24) weiterhin eine Ventilöffnung (148) aufweist, die mit dem hohl ausgeführten Inneren (146) in Verbindung steht, zur Verbindung mit einer Vakuumquelle, um ein Vakuum an der Vakuumöffnung (156) zu erzeugen, und wobei die Ventilöffnung (148) dazu dient, ein Vakuum auf die Vakuumöffnung (156) aufzubringen, wenn sich die Schaufel (24) in der ersten Stellung befindet, und die Vakuumöffnung (156) von der Vakuumquelle zu isolieren, wenn sich die Schaufel (24) in der zweiten Stellung befindet.

7. System nach einem der vorhergehenden Ansprüche, wobei die Schneidestation (22) eine Führungsplatte (48) mit einer Führungsfläche (48a) aufweist, die in einer im Allgemeinen senkrechten Ebene angeordnet ist, wobei die Führungsfläche (48a) auf dem zweiten Weg liegt, so dass das Etikettenmaterial (16) über die Führungsfläche (48a) gleitet, wenn sich das Etikettenmaterial (16) dem Schneidemittel (82) nähert.

8. System nach Anspruch 7, wobei die Führungsfläche (48a) mindestens eine Vakuumöffnung (156) aufweist, die mit einer Vakuumquelle verbunden ist, und ein Steuerventil umfasst, das der Vakuumquelle zugeordnet ist und dazu dient, ein Vakuum auf diese oder jede Vakuumöffnung (156) aufzubringen, um das Etikettenmaterial (16) an der Führungsfläche (48a) zu befestigen, wenn das Schneidemittel (82) das Etikettenmaterial (16) abtrennt, und wobei das Steuerventil dazu dient, die Vakuumquelle von dieser oder jeder Vakuumöffnung (156) abzukoppeln, während das Etikettenmaterial (16) nach jedem Abtrennen des Etikettenmaterials (16) zur Herstellung eines Etiketts entlang des zweiten Weges vorwärts bewegt wird.

9. System nach einem der vorhergehenden Ansprüche, wobei die Schneidestation (22) eine Abziehstange (122) aufweist, die im Wesentlichen parallel in einem Abstand relativ zu dem Schneidemittel (82) angeordnet ist, zur Ausbildung einer zwischenliegenden Öffnung, durch die das Etikettenmaterial (16) hindurchläuft, wobei die Abziehstange (122) zusammen mit dem Schneidemittel (82) bewegbar ist und dazu dient, jede neu gebildete querverlaufende Führungskante des Endlosetikettenmaterialstücks (16) in eine Stellung zurückzuführen, in der der Vorschub des Etikettenmaterials (16) in der Längsrichtung und das Abtrennen des nächsten folgenden Etiketts von dem Etikettenmaterial (16) vorbereitet wird.

10. System nach einem der vorhergehenden Ansprüche, wobei das Schneidemittel (82) eine Schneide-

kante (82a) aufweist, die zur Ebene des in der Schneidestation (22) angeordneten Etikettenmaterials (16) hin geneigt ist, um das Etikettenmaterial (16) schrittweise quer dazu zur Herstellung eines Etiketts abzutrennen.

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11. System nach einem der vorhergehenden Ansprüche, wobei das Schaufelelement (24) zwischen einer Stellung in einem Abstand zu einem Dokument, das in der Etikettenaufbringstation (10) angeordnet ist, und einer Stellung dicht daneben beweglich ist, wobei das Schneidemittel (82) mit dem Schaufelelement (24) zusammenwirkt zum Zwecke des vollständigen Abtrennens des Etikettenmaterials (16) nach der Bewegung des Schaufelelementes (24) und zur Einleitung des Vorgangs des Aufdrückens des abgetrennten Etiketts auf ein Dokument, das die Etikettenaufbringstation (10) durchquert.
12. System nach einem der vorhergehenden Ansprüche, wobei das Schneidemittel (82) eine feststehende Klinge und eine bewegliche Klinge aufweist, die einen Betätigungsantrieb (152) aufweisen, der mit der beweglichen Klinge zusammenwirkt, um die Pendelbewegung der beweglichen Klinge auszuführen, um ein Etikett von dem Etikettenmaterial (16) in zeitlicher Abstimmung mit der Längsbewegung des Etikettenmaterials (16) zur Schneidestation (22) abzutrennen.
13. System nach einem der vorhergehenden Ansprüche, wobei die Schneidevorrichtung (82) eine feststehende Klinge und eine bewegliche Klinge aufweist, wobei die bewegliche Klinge in einer festgelegten Ausrichtung gegenüber der feststehenden Klinge angeordnet ist und dazu dient, das Etikettenmaterial (16) quer abzutrennen, wenn das Etikettenmaterial (16) zwischen der feststehenden Klinge und der beweglichen Klinge hindurchläuft.

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Revendications

1. Dispositif d'application d'étiquettes dépourvues de doublure support (10) destiné à appliquer une source de matériau (16) d'étiquettes dépourvues de doublure support de longueur continue à des documents transportés de manière séquentielle sur le bord sans se chevaucher, le long d'une première trajectoire prédéterminée à travers le dispositif, le matériau (16) des étiquettes ayant une surface adhésive et une surface opposée non adhésive prévue pour recevoir des inscriptions imprimées, le dispositif comprenant :

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un transporteur destiné à transporter lesdits documents le long de ladite première trajectoire prédéterminée de manière séquentielle sur le

bord sans se chevaucher ;

un chargeur d'étiquettes (20) prévu pour engendrer un mouvement longitudinal progressif du matériau (16) des étiquettes le long d'une deuxième trajectoire prédéterminée de sorte qu'un bord avant du matériau des étiquettes soit en relation juxtaposée prédéterminée par rapport à la première trajectoire ;

un poste de découpage (22) positionné en relation prédéterminée par rapport au chargeur d'étiquettes, le poste de découpage (22) comportant un moyen de découpage (82) fonctionnant de manière à couper le matériau (16) des étiquettes généralement transversalement à celui-ci à une distance sélectionnable prédéterminée du bord avant (82a) de manière à créer une étiquette ayant une hauteur présélectionnée ; et

un ensemble à pale (24) comportant un élément de pale mobile (24), supporté à proximité du poste de découpage (22) et prévu pour engager le côté non adhésif du matériau (16) des étiquettes entre le bord avant du matériau des étiquettes et le moyen de découpage, l'élément de pale mobile fonctionnant pour supporter et retenir de manière détachable l'étiquette découpée et presser la surface adhésive de l'étiquette contre une face d'un document sur le bord à mesure que le document se déplace de manière continue sur le bord, sans chevauchement et sans interruption le long de la première trajectoire à travers le dispositif d'application d'étiquettes (10).

2. Dispositif selon la revendication 1, comportant des moyens de commande fonctionnant de manière à activer ledit moyen de découpage (82) et à découper un bord transversal avant de référence (82a) sur ledit matériau (16) des étiquettes.

3. Dispositif selon la revendication 1 ou 2, dans lequel, pour une source de matériau d'étiquettes dépourvues de doublure support qui est un rouleau (14) ayant une ouverture axiale (14a) le traversant, ledit chargeur d'étiquettes (20) comporte en outre une paire de rouleaux tournant librement (32a, 32b) s'étendant à travers ladite ouverture axiale (14a) lors du fonctionnement du dispositif en relation espacée parallèle par rapport à un axe de rotation du rouleau, ledit rouleau étant supporté par lesdits rouleaux de manière à permettre une rotation libre dudit rouleau à mesure que le matériau (16) d'étiquettes dépourvues de doublure support en est extrait.

4. Dispositif selon la revendication 3, dans lequel ledit

chargeur d'étiquettes (20) fonctionne de manière à générer un mouvement progressif dudit matériau (16) d'étiquettes dépourvues de doublure support longitudinalement depuis ledit rouleau (14) à travers une trajectoire en boucle (16a), ledit chargeur d'étiquettes (20) comportant en outre des capteurs (41a, 41 b) fonctionnant de manière à détecter ladite trajectoire en boucle (16a) et à faire avancer ladite trajectoire en boucle (16a) et à faire avancer le matériau (16) des étiquettes si la longueur du matériau (16) des étiquettes à travers ladite trajectoire en boucle (16a) se raccourcit de manière à dévier de ladite trajectoire en boucle (16a).

5. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ledit élément de pale (24) fonctionne de manière à appliquer une fixation par succion au matériau (16) des étiquettes de façon à retenir de manière détachable le matériau (16) des étiquettes à mesure que le matériau (16) des étiquettes est coupé par ledit moyen de découpage (82).
6. Dispositif selon la revendication 5, dans lequel ledit élément de pale (24) comprend une pale allongée (24) supportée à pivotement à proximité d'une extrémité afin d'assurer un mouvement de pivotement entre une première position espacée de ladite première trajectoire et une deuxième position très rapprochée de ladite première trajectoire, ladite pale ayant un intérieur creux (146) et une surface d'engagement des étiquettes ayant au moins un orifice de vide (156) communiquant avec ledit intérieur creux (146), ladite pale (24) ayant en outre un orifice de valve (148) communiquant avec ledit intérieur creux (146) et prévu pour la connexion avec une source de vide de manière à créer un vide au niveau dudit orifice de vide (156) et ledit orifice de valve (148) fonctionnant de manière à appliquer du vide audit orifice de vide (156) lorsque ladite pale (24) est dans la première position et à isoler ledit orifice de vide (156) de ladite source de vide lorsque ladite pale (24) est dans ladite deuxième position.
7. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ledit poste de découpage (22) comporte une plaque de guidage (48) ayant une surface de guidage (48a) disposée dans un plan généralement vertical, ladite surface de guidage (48a) se trouvant dans ladite deuxième trajectoire de sorte que ledit matériau (16) des étiquettes glisse par-dessus ladite surface de guidage (48a) à mesure que ledit matériau (16) des étiquettes s'approche dudit moyen de découpage (82).
8. Dispositif selon la revendication 7, dans lequel ladite surface de guidage (48a) a au moins un orifice de vide (156) connecté à une source de vide, et

comportant une valve de commande associée à ladite source de vide et fonctionnant de manière à appliquer un vide à l'orifice ou à chaque orifice de vide (156) afin de fixer ledit matériau (16) des étiquettes à ladite surface de guidage (48a) à mesure que ledit moyen de découpage (82) découpe le matériau (16) des étiquettes et ladite valve de commande fonctionnant de manière à déconnecter ladite source de vide de l'orifice ou de chaque orifice de vide (156) à mesure que ledit matériau (16) des étiquettes avance le long de ladite deuxième trajectoire après chaque découpage du matériau (16) des étiquettes afin de créer une étiquette.

9. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ledit poste de découpage (22) comporte une barre de dénudage (122) supportée en relation espacée substantiellement parallèle par rapport audit moyen de découpage (82) de manière à définir une ouverture entre eux à travers laquelle ledit matériau (16) des étiquettes passe, ladite barre de dénudage (122) pouvant se déplacer avec ledit moyen de découpage (82) et fonctionnant de manière à ramener chaque bord avant transversal nouvellement formé du matériau (16) des étiquettes de longueur continue dans une position préparatoire à l'avance du matériau (16) des étiquettes longitudinalement et découpant l'étiquette suivante successive dans le matériau (16) des étiquettes.
10. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ledit moyen de découpage (82) comporte un bord de coupe (82a) incliné par rapport au plan du matériau (16) des étiquettes disposé dans ledit poste de découpage (22) de manière à découper progressivement le matériau (16) des étiquettes transversalement à celui-ci en créant une étiquette.
11. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ledit élément de pale (24) peut se déplacer entre une position espacée d'un document disposé dans ledit poste d'application d'étiquettes (10) et une position très rapprochée de celui-ci, ledit moyen de découpage (82) étant coordonné audit élément de pale (24) de manière à terminer le découpage dudit matériau (16) des étiquettes après le mouvement dudit élément de pale (24) pour commencer à presser l'étiquette en cours de découpage contre un document traversant le poste d'application d'étiquettes (10).
12. Dispositif selon l'une quelconque des revendications précédentes, dans lequel le moyen de découpage (82) comporte une lame fixe et une lame mobile, comportant un entraînement d'actionnement (152) associé en fonctionnement à la lame mobile

de manière à produire un mouvement de va et vient de la lame mobile pour découper une étiquette dans le matériau (16) des étiquettes en relation temporelle par rapport au mouvement longitudinal du matériau (16) des étiquettes par rapport audit poste de découpage (22). 5

13. Dispositif selon l'une quelconque des revendications précédentes, dans lequel le moyen de découpage (82) comporte une lame fixe et une lame mobile, ladite lame mobile étant disposée dans une orientation prédéterminée par rapport à la lame fixe et fonctionnant de manière à découper le matériau (16) des étiquettes transversalement à mesure que le matériau (16) des étiquettes passe entre la lame fixe et la lame mobile. 10 15

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FIG. 1

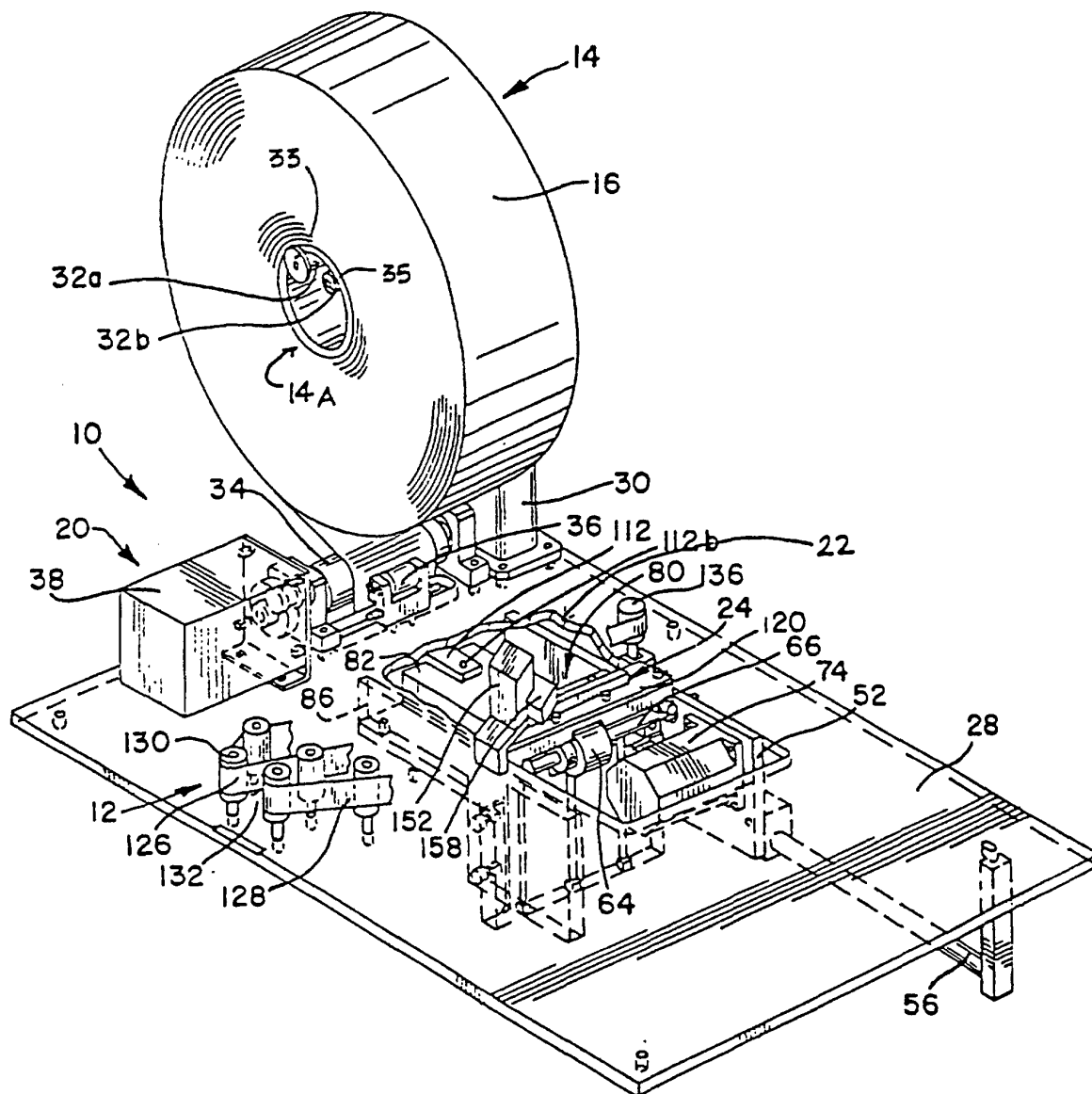


FIG.2

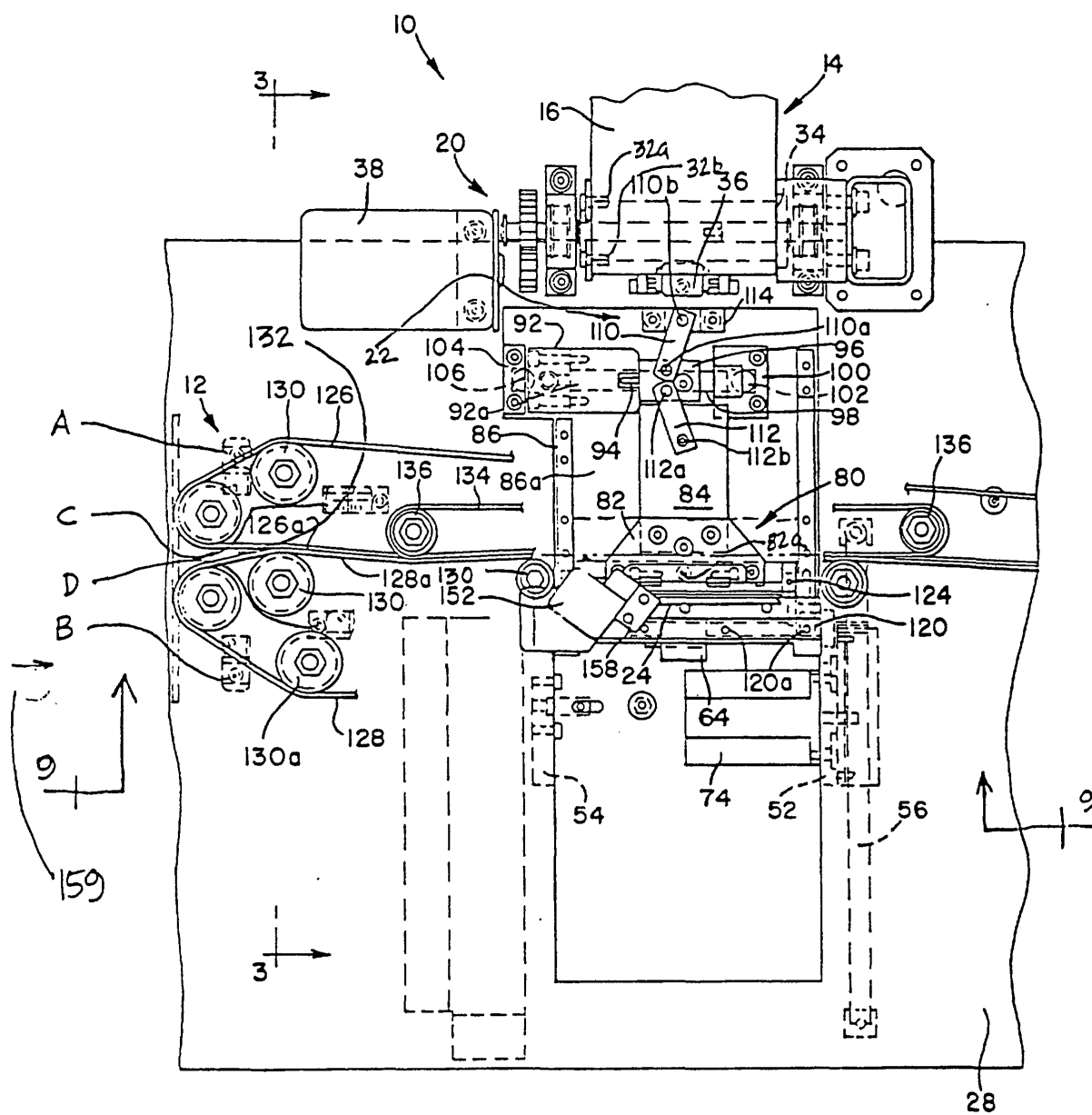


FIG.3

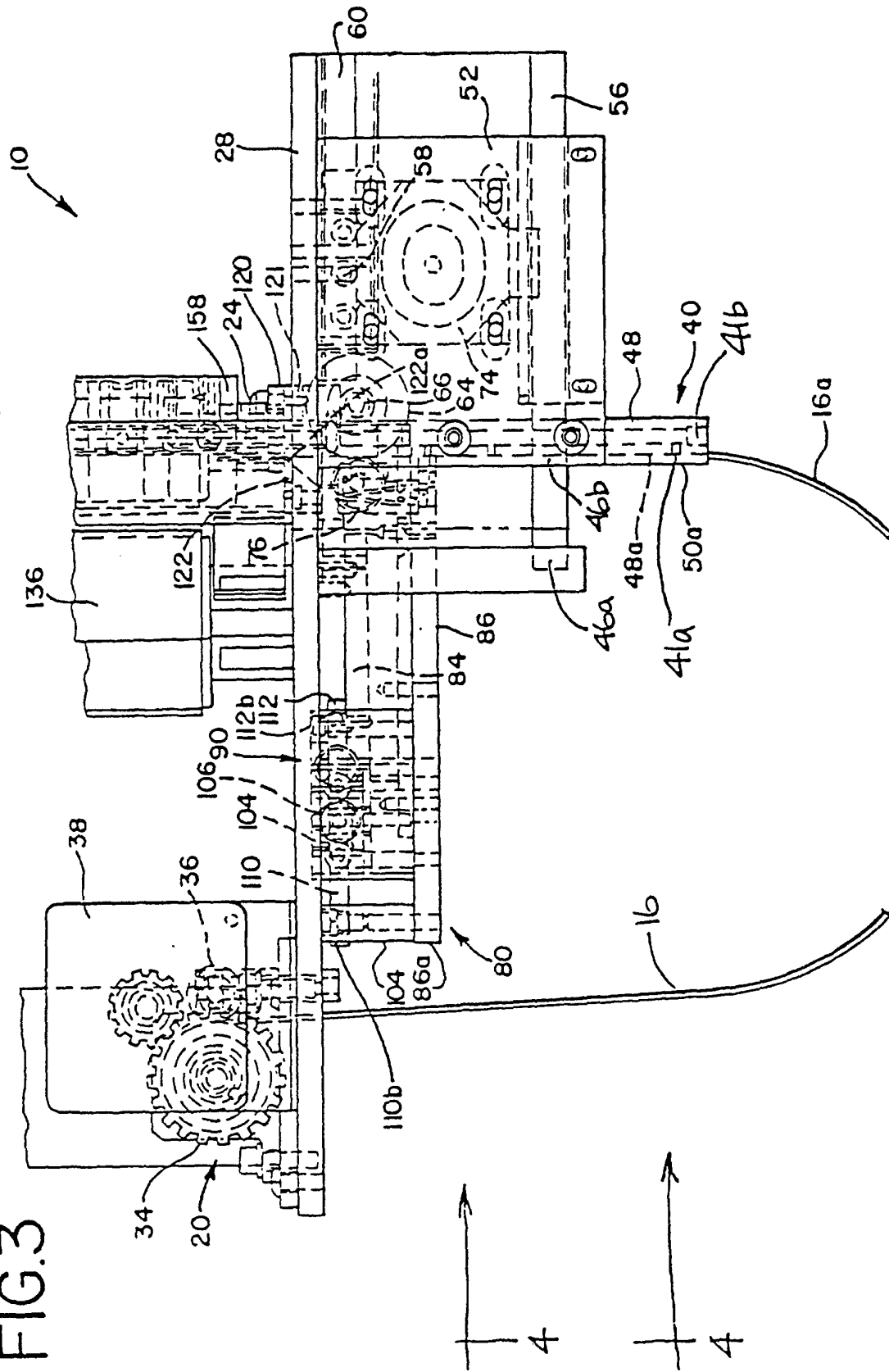


FIG.4

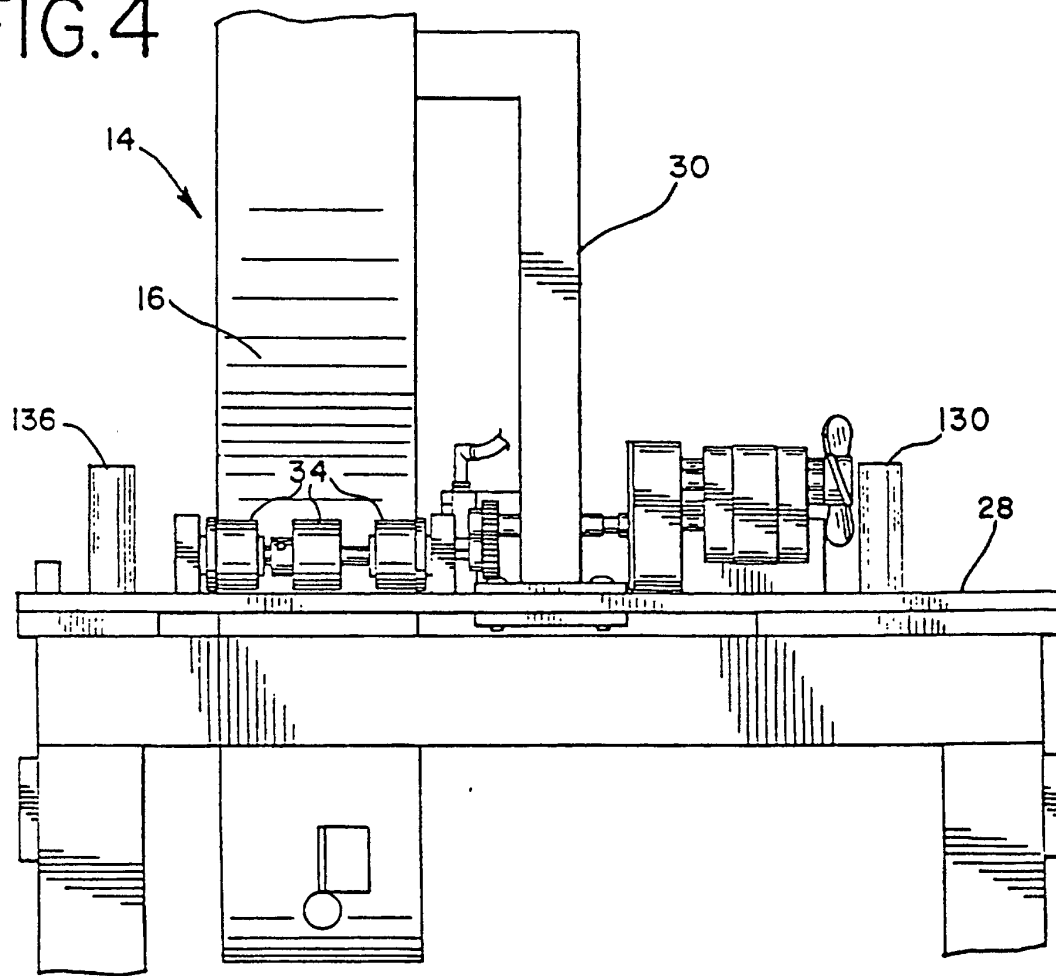


FIG.5

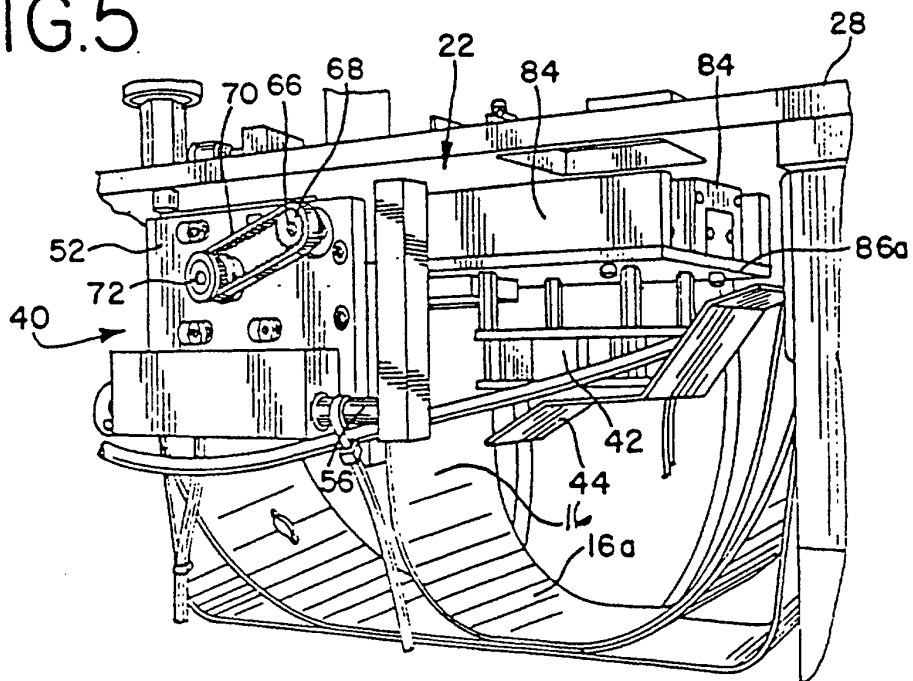


FIG.6

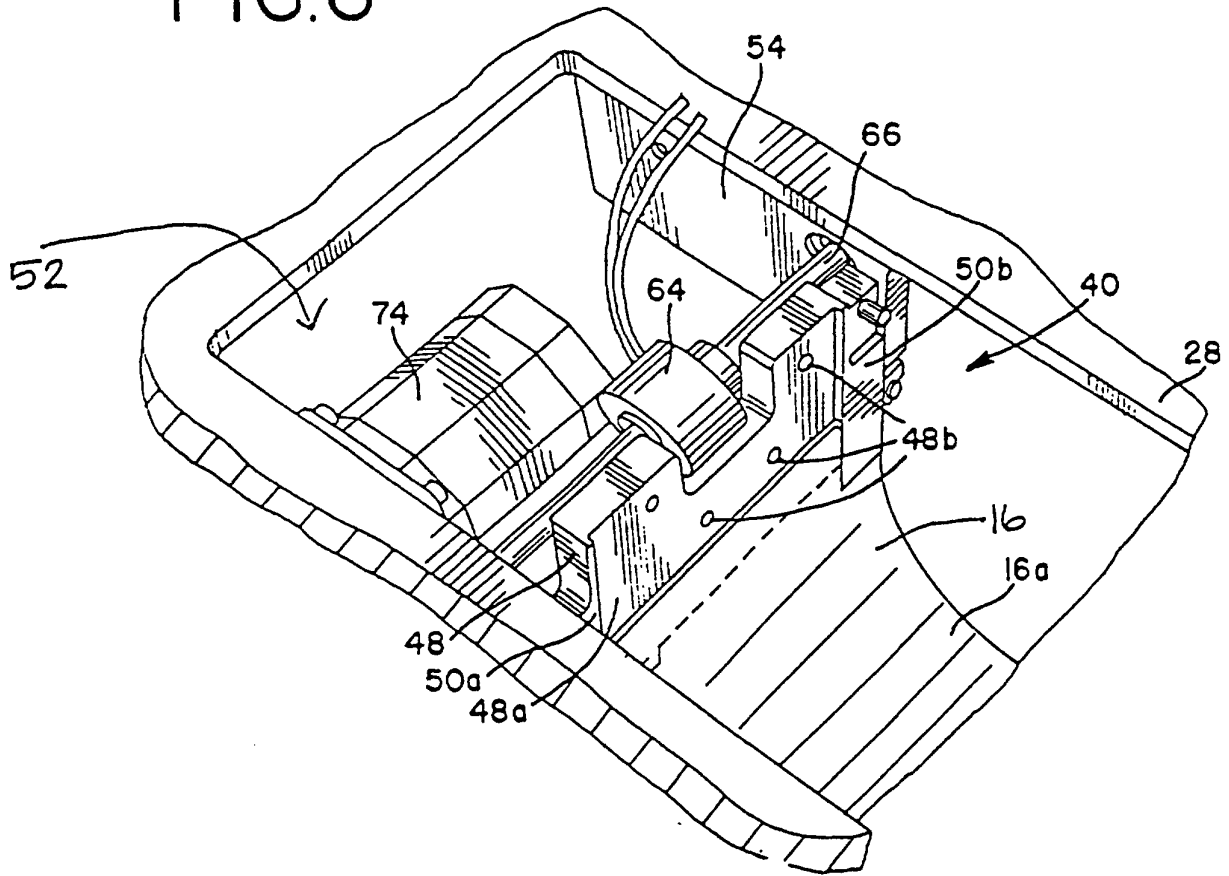
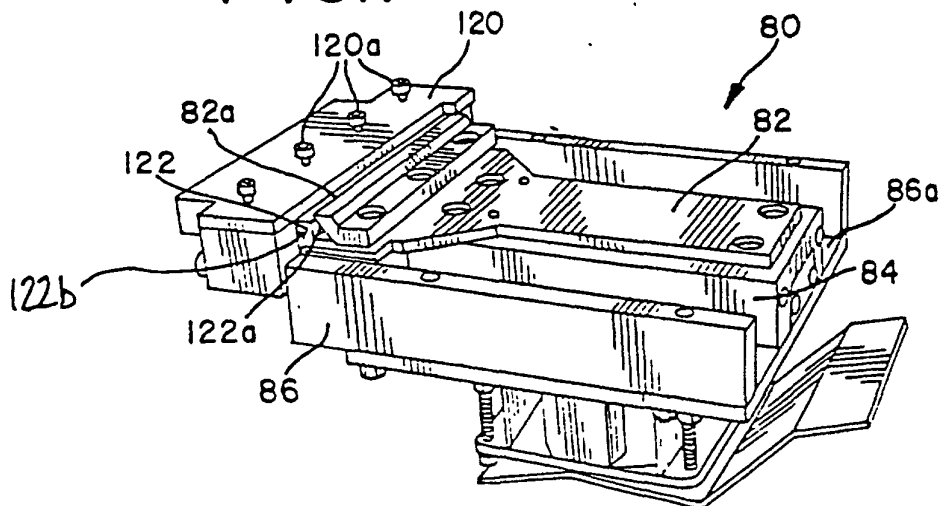


FIG.7



22

FIG.9

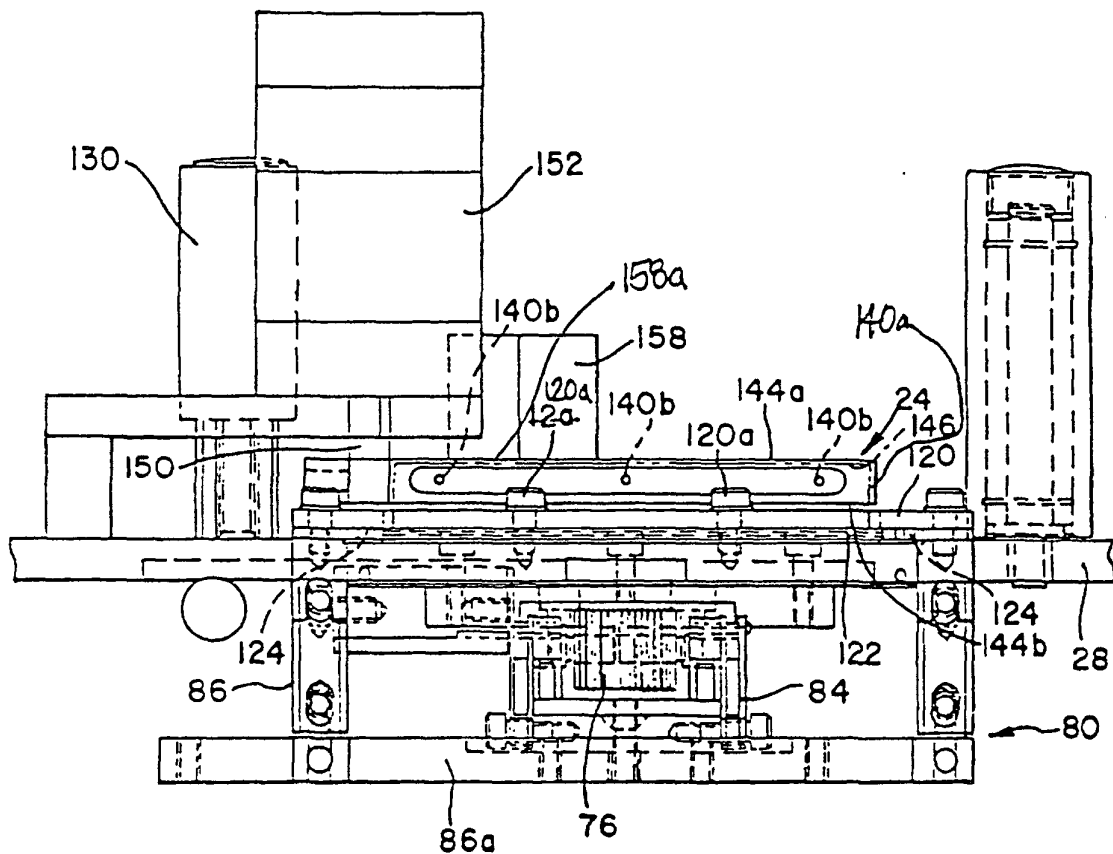


FIG.8

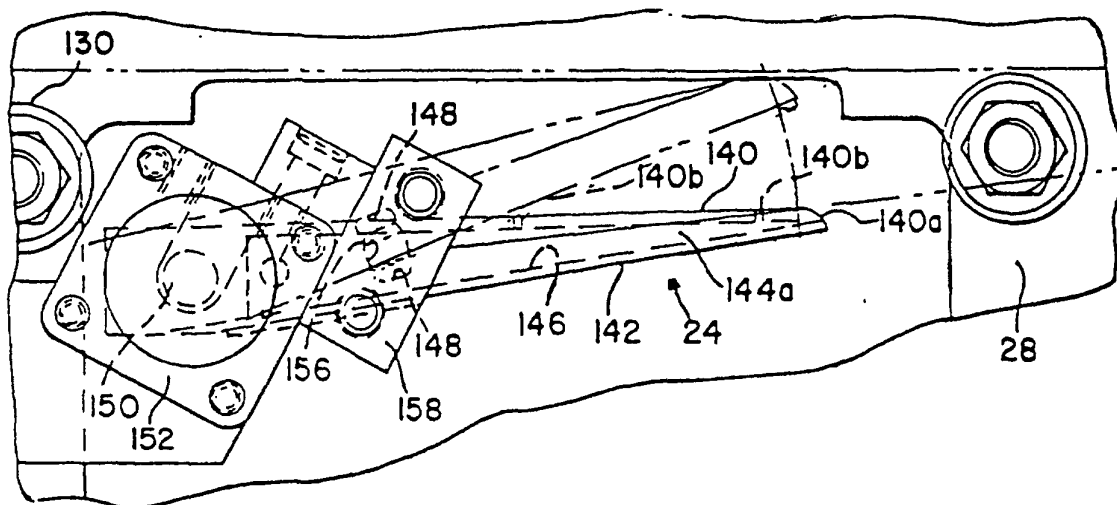


FIG.10

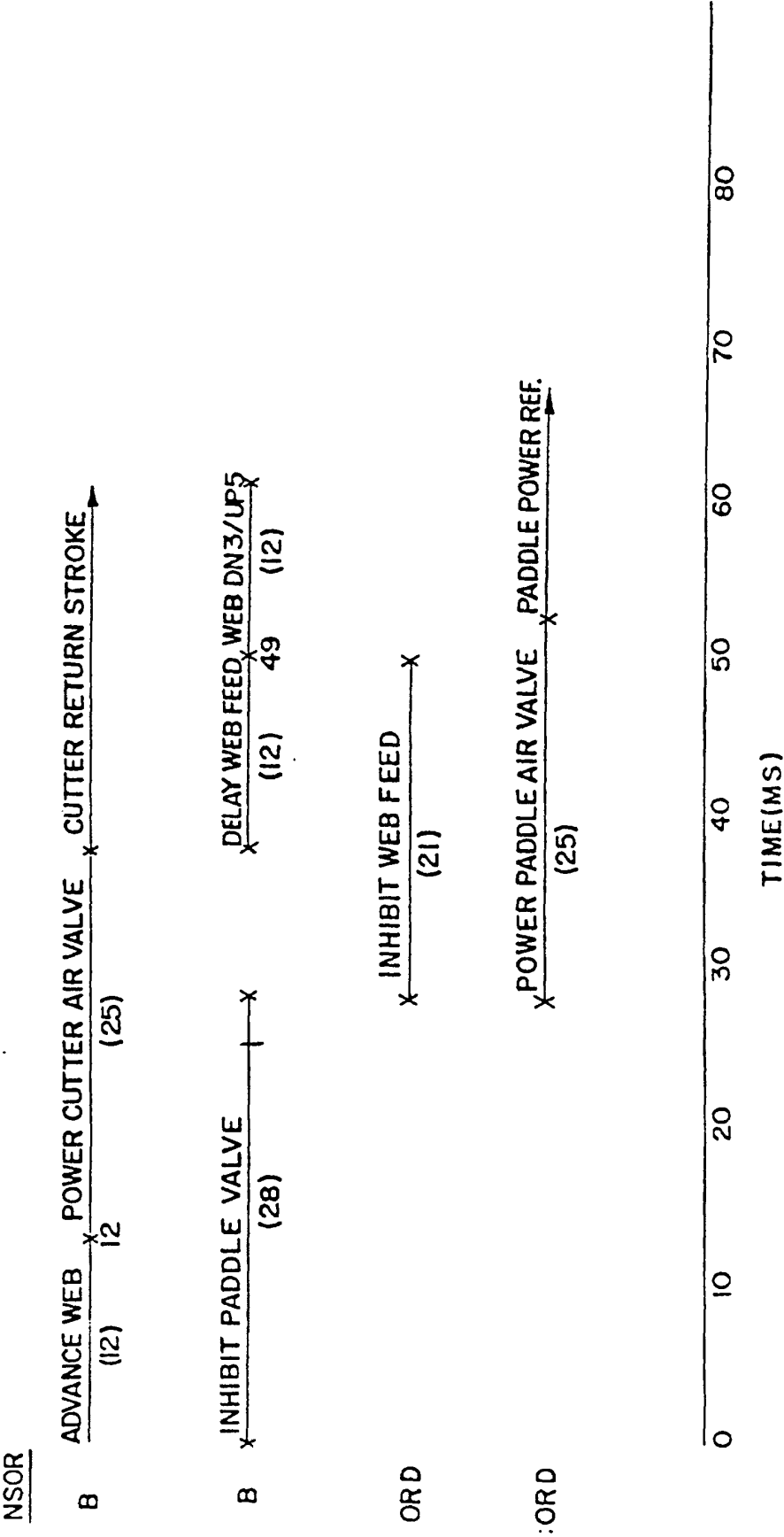


FIG. 11

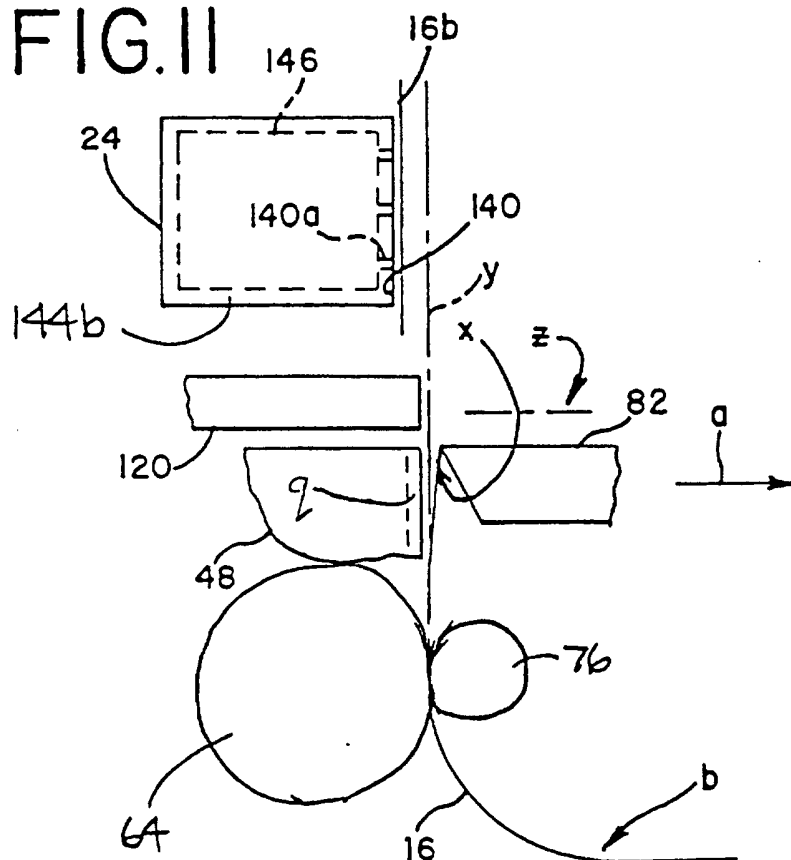


FIG. 12

