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⑤④ **Automatic passbook front cover turning mechanism.**

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⑤⑥ References cited:
GB-A-2 103 585

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57 83885 (OKI DENKI KOGYO K.K.)(25-05-1982)**

⑦③ Proprietor: **International Business Machines
Corporation
Old Orchard Road
Armonk, N.Y. 10504 (US)**

⑦② Inventor: **Kanno, Tetsuo
2-7 3-chome, Matsugaoka Kugenuma
Fujisawa-shi Kanagawa-ken (JP)**
Inventor: **Tsukamoto, Katsura
1-2-38 Fujimigaoka Ninomiya-cho
Nakagun Kanagawa-ken (JP)**

⑦④ Representative: **Blutke, Klaus, Dipl.-Ing.
Schönaicher Strasse 220
D-7030 Böblingen (DE)**

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Description

The invention relates to an automatic passbook front cover turning mechanism.

In a conventional automatic transaction apparatus, when the last line of a passbook is reached in printing the transaction records in the passbook, it is discharged to the customer with a message urging him to request the issuance of a new passbook. Then, the customer requests a teller to issue the new passbook, and to print unregistered transactions, if any. This is inconvenient, because the details of the transaction cannot be known until the new passbook is delivered.

As an approach to solving this, Japanese published unexamined patent application No. 57-83885 discloses an automatic passbook issuing device, in which new passbooks are stacked in a state that the first printing page of each passbook is opened and, when a new one is to be issued, one of the passbooks is fed to a printing section to be printed with predetermined items on the front cover and then turned over as it is by a turnover mechanism to be printed with the transaction records on the opened page. Therefore, this device requires a large passbook hopper because all of the new passbooks must be opened and stacked, and an extra load to open the page at stacking them.

It is therefore the object of the invention to provide for an automatic transaction apparatus a mechanism for automatically turning the front cover, whereby the new passbook is enabled to be stacked in closed state.

This object of the invention is achieved by the features specified in the characterizing part of claims 1 and 2. According thereto, only the front cover is released from the engaging mechanism by repulsive force caused in the passbook by being bent, so that the front cover is turned. Therefore, the new passbook can be issued by the simple procedure of the customer bringing the passbook to the teller counter to get thereon the certification stamp and the registration stamp and so on.

Embodiments of the invention are depicted in the drawings and will be described in detail below.

The drawings show the following:

Figure 1 a schematic view showing an automatic cash dispenser;

Figure 2 a block diagram of the mechanism for handling the passbook in the automatic cash dispenser of Figure 1;

Figures 3A and 3B side cross sectional views of the passbook hopper;

Figure 3C a bottom plan view of the passbook hopper, showing the passbook feeding-out mechanism;

Figures 4A through 4F schematic views showing the automatic front cover turning mechanism and its operation;

Figures 5A through 5C schematic views

showing another embodiment of the automatic front cover turning mechanism; and

Figures 6A through 6C perspective views of the various embodiments of the separator portion in Figure 5A.

Figure 1 shows an automatic cash dispenser 1 as one example of the devices that can embody the invention. When a customer wants to have cash dispensed (in accordance with the instruction displayed on the guidance display 2 on the front operating panel), he first inserts his cash card into the card port 3 and keys in by the keyboard 4 his PIN (personal identification number) and amount to be dispensed. Then, he inserts from the passbook port 5 his passbook being opened on a page to be printed and waits for the dispensing process by a host computer. If the host computer determines that the request from the customer is valid, the dispenser discharges the card from the card port 3, a receipt printed with the transaction records from the receipt port 6, the passbook printed with the transaction records and cash corresponding to the requested amount from the cash port 7 respectively. In this case, the passbook is printed with any previously unrecorded transactions. If it reaches the last print line at the printing of the passbook, that is, if the passbook is used up, it is dispensed to the passbook port 5, and the dispenser 1 takes out a new passbook stacked therein, prints the predetermined items on its cover and the unrecorded transactions on the first printing page and dispenses it to the passbook port 5.

Figure 2 schematically shows a mechanism performing the above passbook processing operation. The customer inserts the passbook into the passbook port 7, opening the page to be printed with the transactions records. When the sensor 8 detects the insertion of the passbook, the passbook transporting mechanism 9 operates to transport it to the printing mechanism 12 through the magnetic label read/write mechanism 10 and the automatic page reading/print line detecting mechanism 11. In this case, the magnetic label read/write mechanism 10 reads the content of the magnetic label attached to the passbook (account number, page number, and printing line number). The automatic page reading/print line detecting mechanism 11 recognizes the opened page, and detects the last printed line. If the detection data matches the contents of the magnetic label or the data previously stored in the host computer on the account, printing is performed on the next print line by the printing mechanism 12. However, if the page number does not match this indicates that a wrong page is opened, the passbook is sent to the automatic page turning mechanism 13 to open the correct page, then the printing is made by the printing mechanism 12. When the printing is completed, the passbook is returned to the passbook port 5 by the passbook transporting mechanism 9 and, during the transportation,

the content of the magnetic label is updated through the magnetic label read/write mechanism 10. If, in such printing operation for the passbook, it is detected that the last print line in the last page of the passbook has been printed, the passbook is dispensed to the port 5 and, for issuing a new passbook, one of the passbooks in the passbook hopper 14 stacked in closed state is fed to the printing mechanism 12 where its cover is printed with the predetermined items such as the name of the branch office, the account number, or the customer number. Then, it is fed to the automatic cover turning mechanism 15 and its cover is turned thereby. After the first print page is thus opened by such turning of the cover, the passbook is fed to the printing mechanism 12, where unrecorded transactions are printed, and dispensed to the passbook port 5. Because this new passbook is not stamped with the certification stamp of the bank, or the registered stamp of the customer, it may be arranged to instruct the customer by a display or voice that the passbook should be brought to the teller counter. Also, because the customer may misunderstand that the operation is completed at the time when the old passbook is dispensed, it may be arranged to inform the customer in the same arrangement that the new passbook will be issued, or to dispense the cash card and the cash after dispensing of the new passbook.

Figures 3A through 3C show an example of the passbook hopper 14 and the passbook feeding-out mechanism. As shown in Figure 3A, the new passbooks 32 are stacked in closed state in the passbook stacking portion 31, with the weight 33 being placed on the passbooks. The bottom plate of the stacking portion 31 is provided with a groove, through which the pawl 34 engages with one end of the lowest passbook, and moves horizontally to feed it out to the passbook transporting mechanism as shown in Figure 3B. Figure 3C shows in detail the passbook feeding-out mechanism mounted on the bottom plate of the stacking portion 31. When the solenoid 35 is energized, the arm 36 is pulled to the position 36'. The biforked end of the arm horizontally moves the pawl 34 by length L through the stud 37 mounted thereon to push the passbook out to the transporting mechanism 9 (Figure 2). Then, the solenoid 35 is deenergized, the arm 36 is returned to its original position by the spring 38. The pushed-out passbook is caught by the transporting mechanism 9 consisting of a conventional belt or roller (detail not shown), and transported to the printing mechanism 12 (Figure 2).

The printing mechanism 12 may be of any conventional type of the passbook printing mechanism.

Figures 4A through 4F show the automatic front cover turning mechanism and its operating state. The feed rolls 41 and 43 of the rolls 41 through 46 are caused to press against the rolls 42 and 44 respectively by springs. The roll 45 is supported by the pivot arm 47 and caused to press against the roll 46 when the arm 47 is moved to the

position 47' by a solenoid (not shown) or other means.

In Figure 4A, the passbook 32 is fed with its spine in the lead in the direction indicated by the arrow A through the printing mechanism. After the sensor 48 detects its leading edge, the arm 47 rotates at the time when the passbook 32 advances further by the length 1, so that it is bent by the roll 45 and held between the rolls 45 and 46. The passbook is fed as it is by these feed rolls, and abuts against the stopper plane 50 provided on the guide 49, as shown in Figure 4B. At the moment when the sensor 51 detects the passbook 32, the rotation of the feed rolls 41—46 is stopped and the arm 52 is rotated in the direction of the arrow B (Figure 4B) or in clockwise direction by a solenoid (not shown) or other means. This arm 52 is formed with the U-shaped groove 53 into which the trailing or loose edge of the passbook 32 enters when the arm rotates. As the arm 52 rotates in the clockwise direction, the passbook 32 with its center being held between the rolls 45 and 46 and being bent by holding its spine with the guide 49 releases only its front cover, which is thicker and more resilient than the paper for each page, from the U-shaped groove 53 by its repulsive force against the bending, as shown in Figure 4C. After the arm 52 rotates at such an angle that each page and the back cover of the passbook can be held in the U-shaped groove 53 by its repulsive force against the bending, as shown in Figure 4C, only the front cover can be released. Then the arm 52 is returned to its original position as shown in Figure 4D. Thus, such a condition is attained that only the front cover rests on the arm 52. Then, the feed rolls 41—46 rotate in the opposite direction to move the passbook to the right, and the roll 45 returns to its original position as shown in Figure 4E. Further, the continuous rotation of each roll feeds the passbook 32 to the automatic page turning mechanism in such a state that the front cover is completely opened, as shown in Figure 4F.

Although there is such a possibility in the page turning operation that not only the front page but also the inner page are turned, it may be designed that the automatic page read mechanism reads the number of the opened page to cause the automatic page turning mechanism to turn the desired page, in this case, the first print page.

Figures 5A through 5C show another embodiment of the automatic front cover turning mechanism according to this invention. This embodiment applies to a device that is arranged in such a manner that a passbook 67 to be newly issued is fed into the automatic cover turning mechanism from the hopper through the printing mechanism, then to the automatic page turning mechanism that is mounted over the cover turning mechanism wherein the passbook is fed in the direction of the arrow C, and fed out in upward direction as shown by the arrow D after the cover is opened.

This automatic cover turning mechanism comprises the feed roll 60 and the pinch roll 61 for

feeding in the passbook, and is provided with the stopper plate to receive the passbook fed by them. Said stopper plate 62 is pivotally (64) mounted to the arm 63 that is pivotally (68) mounted on the machine frame. In addition, the bottom surface of the stopper plate 62 is mounted with the flexible plate 65, whose other end is mounted on the top end of the curved plate 66 fixed on the machine frame.

As shown in Figure 5A, the arm 63 is rotated in counterclockwise direction around the pin 68 by a solenoid (not shown) or other means, when the leading edge or the spine of the passbook fed into by the feed roll 60 and the pinch roll 61 abuts against the stopper plate 62, and stops. At that moment, since the loose edge of the passbook is contacted with and held by the separator rolls 69 mounted coaxially with the pinch roll 61 (see Figure 6A), the passbook is bent together with the flexible plate 65 along the curved plate 66 as the arm 63 rotates as shown in Figure 5B. As the arm 63 further rotates, the loose edge of the passbook is released from the separator roll 69 by the repulsive force of the covers and each page of the passbook, and contacts the separator plate 70. Finally, only the front cover with the highest resilience is released from the separator plate 70, and contacts the feed roll 71 as shown in Figure 5C. The arm 63 stops to rotate at an angle providing such state, and the pinch roll 72 is moved against the feed roll 71 to hold the front cover therebetween, thereby feeding the passbook out toward the direction of the arrow D.

Instead of the separator rolls shown in Figure 6A it is possible to use the grooved metal roll 73 as shown in Figure 6B or the grooved plate 74 as shown in Figure 6C. In addition, it is of course possible to eliminate the separator plate 70 by arranging the automatic page read mechanism and the automatic page turning mechanism to open the desired page even if any undesired page was opened together with the front cover.

Claims

1. Automatic passbook front cover turning mechanism, comprising feed rolls, a pivotable element and a curved path with a stopper, so arranged that

the closed passbook (32), with its spine as the leading element, is guided through a first pair of feed rolls (42, 44)

behind which is situated the said pivotable element (52) to separate the passbook cover from the passbook pages, and

the said curved path (49) with the stopper (50) for the passbook spine,

the arrangement also being such that on its transport to this stopper (50) the passbook is bent onto the curved path (49) by a second pair of feed rolls (45, 46) with one of these feed rolls being mounted on a pivotable arm (47)

so that after the passbook has left the first pair of feed rolls (43, 44), that part of the passbook which is under bending stress and opposite the

passbook spine causes the pivotable element (52) to execute a pivoting movement away from the curved path

and thus to engage in a U-shaped groove (53) of the pivotable element (52) in such a manner

that when said pivotable element (52) pivots back again the passbook cover, owing to its elasticity, snaps out of the U-shaped groove (53), with its bending stress being released,

and that the pivotable element (52), upon continued back-pivoting, adopts a position between the inner face of the passbook cover and the rest of the passbook

and that if the passbook is returned through the second (45, 46) and subsequently through the first (43, 44) pair of feed rolls, with the said pivotable arm (47) carrying one of the feed rolls of the second pair of feed rolls being lifted out of the curved path

said passbook is opened by counter-pressure of the pivotable element (52) against the inner face of the passbook cover, while the rest of the passbook is fed through the first pair of feed rolls (43, 44).

2. Automatic passbook front cover turning mechanism, comprising feed rolls, a pivotable passbook receiving frame, a curved path and a separator element, so arranged that the closed passbook (67), with its spine as the leading part, is transported through a first pair of feed rolls (60, 61) into the said pivotable passbook receiving frame (63) which has a stop for the spine of the passbook;

that after the insertion of the passbook into this frame and after the passbook has left the first pair of feed rolls, the frame is pivotable against the said curved path (66) so that on this path the passbook is bent in such a manner that the cover and the pages of the passbook are successively opened by a continuous (69) separating roller (73) or multiple short rollers (69) provided on the axis of one of the first pair of feed rolls;

that the cover and the pages are applied to a grooved second separator (70, 72), so that, owing to its bending stress, only the passbook cover with its higher elasticity compared to that of the passbook pages is released by the second separator (70, 74) and then applied to a second pair of feed rolls (71, 72) one roll (72) of which is pivotable into the area between the second separator and the inner face of the passbook cover, pushing it against the other (71) feed roll,

and that the second pair of feed rolls (71, 72) transports initially only the opened passbook cover, and subsequently the rest of the opened passbook.

Patentansprüche

1. Automatische Vorrichtung zum Umblättern des Deckblattes eines Sparbuches, mit Transportwalzen, einem schwenkbaren Element und einer gekrümmten Führungsstrecke mit einem Anschlag, die so angeordnet sind,

daß das geschlossene Sparbuch (32) mit dem

Rücken voran durch ein erstes Paar von Transportrollen (43, 44) geführt wird, hinter welchem das schwenkbare Element (52) zur Trennung des Deckblattes von den Buchseiten sowie die gekrümmte Führungsstrecke (49) mit dem Anschlag (50) für den Sparbuchrücken derart angeordnet sind,

daß bei dem Sparbuch-Transport zum Anschlag (50) das Sparbuch durch ein zweites Paar Transportrollen (45, 46) auf die gekrümmte Führungsstrecke (49) gebogen wird, wobei eine der Rollen auf einem schwenkbaren Arm (47) derart angebracht ist, daß nach Austritt des Sparbuchs aus dem ersten Transportrollenpaar (43, 44) derjenige Teil des Buches, welcher sich unter Biegedruck und gegenüber dem Buchrücken befindet, das schwenkbare Element (52) zum Ausführen einer Schwenkbewegung von der gekrümmten Führungsstrecke hinweg veranlaßt, und daß dabei dieser Teil des Buches in eine U-förmige Nut (53) des schwenkbaren Elements (52) eingreift, und daß beim Zurückschwenken des schwenkbaren Elements (52) das Deckblatt des Sparbuchs aufgrund seiner Elastizität aus der U-förmigen Nut (53) mit Freiwerden der Biegespannung herauspringt, und

daß das schwenkbare Element (52) bei weiterem Zurückschwenken eine Position zwischen der Innenseite des Deckblattes und dem Rest des Sparbuchs einnimmt, und

daß bei der Rückführung des Buches durch das zweite (45, 46) und anschließend durch das erste (43, 44) Transportrollenpaar, der schwenkbare Arm (47) mit einer der Rollen des zweiten Rollenpaares von der gekrümmten Führungsstrecke abhebt und das Deckblatt durch Gegendruck des schwenkbaren Elements (52) gegen dessen Innenseite geöffnet wird, während der Rest des Buches durch das erste Paar von Transportrollen (43, 44) geführt wird.

2. Automatische Vorrichtung zum Umblättern des Deckblattes eines Sparbuchs, mit Transportrollen, einem schwenkbaren Buchaufnahme-rahmen, einer gekrümmten Führungsstrecke und einem Separator, die so angeordnet sind,

daß das geschlossene Sparbuch (67) mit dem Rücken voran durch ein erstes Paar von Transportrollen (60, 61) in den schwenkbaren Buchaufnahme-rahmen (63) gebracht wird, welcher einen Anschlag für den Buchrücken aufweist,

daß nach Einführung des Buches in diesen Rahmen, und nach seinem Austritt aus dem ersten Paar von Transportrollen dieser Rahmen gegen die gekrümmte Führungsstrecke (66) schwenkbar ist, so daß auf dieser Strecke das Buch derart gebogen wird,

daß Deckblatt und Seiten nacheinander von einer umlaufenden (73) oder mehreren kurzen Separator-Rollen (69) geöffnet werden, welche auf der Achse einer Rolle des ersten Rollenpaares angeordnet ist (sind),

daß Deckblatt und Seiten einer zweiten, mit Nuten versehene Separatorvorrichtung (70, 74) derart zugeführt werden, daß aufgrund der Biegespannung nur das Deckblatt mit seiner im Ver-

gleich zu den Seiten höheren Elastizität von der zweiten Separatorvorrichtung (70, 74) freigegeben und dann einem zweiten Paar von Transportrollen (71, 72) zugeführt wird, von denen eine Rolle (72) in den Bereich zwischen der zweiten Separatorvorrichtung und der Innenseite des Deckblattes schwenkbar ist und dieselbe gegen die andere (71) Transportrolle drückt, und

daß das zweite Paar von Transportrollen (71, 72) anfänglich nur das Deckblatt des geöffneten Sparbuchs und anschließend den Rest des geöffneten Buches transportiert.

Revendications

1. Mécanisme automatique pour tourner la couverture supérieure d'un carnet de transactions, comprenant des rouleaux d'alimentation, un élément pivotant et un guidage courbe muni d'une butée, agencés de sorte que le carnet fermé (32), dont le dos ou pli est placé comme élément de tête, est guidé à travers une première paire de rouleaux d'alimentation (43, 44) à l'arrière desquels est situé le dit élément pivotant (52) afin de séparer la couverture de carnet des pages du carnet, et ledit guidage courbe (49) présentant la butée (50) pour le dos ou pli du carnet, l'agencement étant également tel que, lors de son transport vers cette butée (50), le carnet est courbé sur le guidage courbe (49) par une deuxième paire de rouleaux d'alimentation (45, 46), l'un de ces rouleaux d'alimentation étant monté sur un bras pivotant (47) de sorte que, lorsque le carnet a quitté la première paire de rouleaux d'alimentation (43, 44), la partie du carnet qui est sous contrainte de flexion et à l'opposé du pli du carnet provoque un mouvement de pivotement de l'élément pivotant (52) à l'opposé du guidage courbe et s'engage ainsi dans une gorge à profil en U (53) de l'élément pivotant (52), d'une manière telle que, lorsque ledit élément pivotant (52) pivote à nouveau en sens inverse, la couverture du carnet s'échappe, du fait de son élasticité, de la gorge en U (53) et sa contrainte de flexion est relâchée; et que l'élément pivotant (52), lors de la poursuite du pivotement en sens inverse, prend une position entre la face intérieure de la couverture du carnet et le reste du carnet; et que, si le carnet repasse à travers la deuxième paire (45, 46) puis à travers la première paire (43, 44) de rouleaux d'alimentation, ledit bras pivotant (47) qui porte l'une des rouleaux d'alimentation de la deuxième paire de rouleaux d'alimentation étant soulevé et dégagé du guidage courbe, ledit carnet est ouvert par la contre-pression de l'élément pivotant (52) contre la face intérieure de la couverture du carnet, tandis que le reste du carnet est avancé à travers la première paire de rouleaux d'alimentation (43, 44).

2. Mécanisme automatique pour tourner la couverture supérieure d'un carnet de transactions, comprenant des rouleaux d'alimentation, un cadre pivotant de réception de carnet, un guidage courbe et un élément de séparation, agencés de sorte que le carnet fermé (67), dont le

dos ou pli constitue la partie de tête, est transporté à travers une première paire de rouleaux d'alimentation (60, 61) et arrive dans ledit cadre pivotant (63) de réception de carnet qui est muni d'une butée pour le pli du carnet; de sorte que, après l'insertion du carnet dans ce cadre et après que le carnet ait quitté la première paire de rouleaux d'alimentation, le cadre peut pivoter contre ledit guidage courbe (66) afin de courber le carnet sur ce guidage d'une manière telle que la couverture et les pages du carnet sont successivement ouvertes par un rouleau de séparation continu (73) ou une pluralité de rouleaux courts (69) prévus sur l'axe d'un rouleau de la première paire de rouleaux d'alimentation; que la couverture et les

pages sont appliquées à un deuxième séparateur strié (70, 74) de manière à ce que, grâce à sa contrainte de flexion, seule la couverture de carnet dont l'élasticité est supérieure à celle des pages de carnet soit libérée par le deuxième séparateur (70, 74) et appliquée ensuite à une deuxième paire de rouleaux d'alimentation (71, 72) dont un rouleau (72) peut pivoter dans la région comprise entre le deuxième séparateur et la face intérieure de la couverture de carnet, pour pousser celle-ci contre l'autre rouleau d'alimentation (71); et que la deuxième paire de rouleaux d'alimentation (71, 72) entraîne initialement seulement la couverture de carnet ouverte et ensuite le reste du carnet ouvert.

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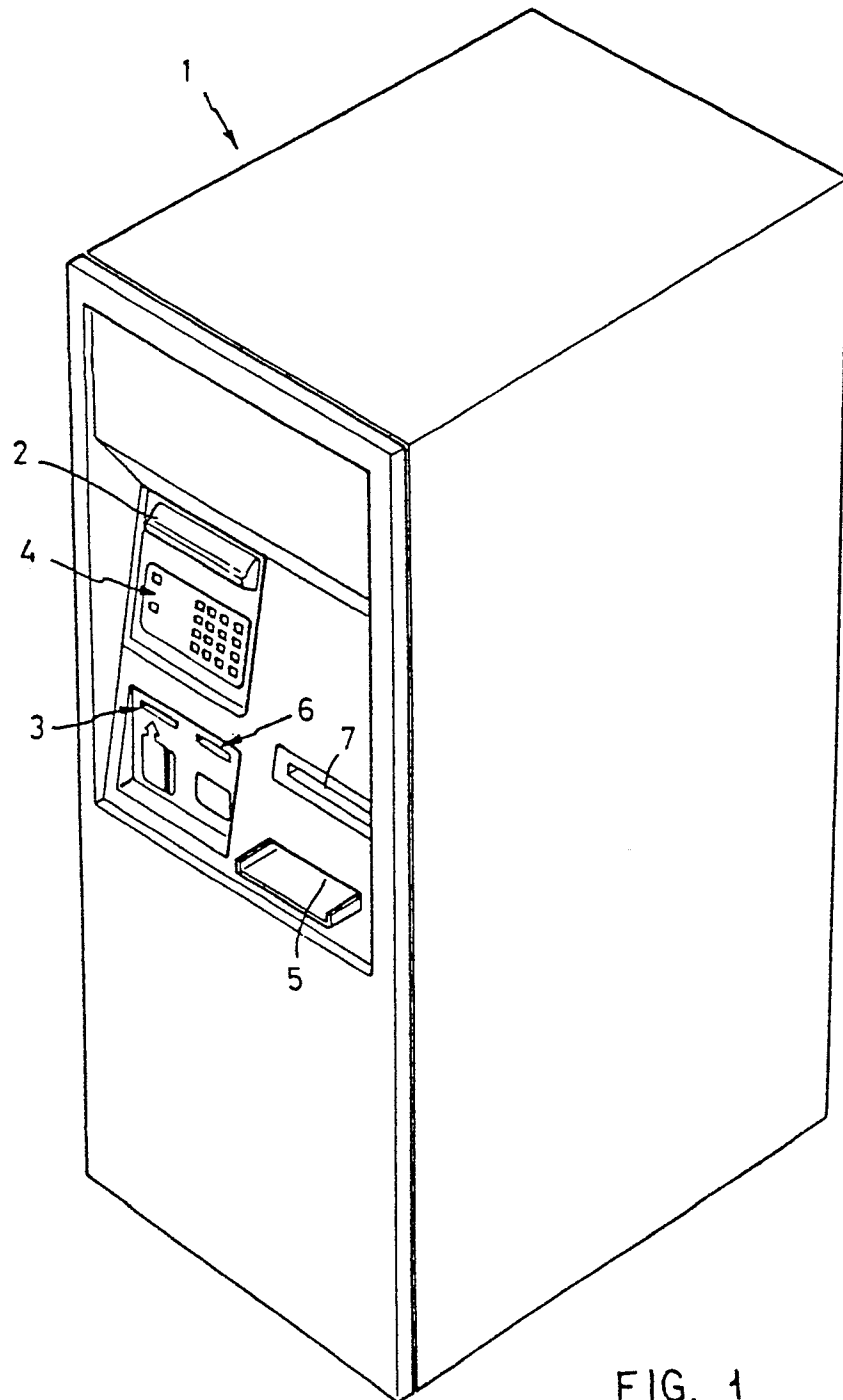


FIG. 1

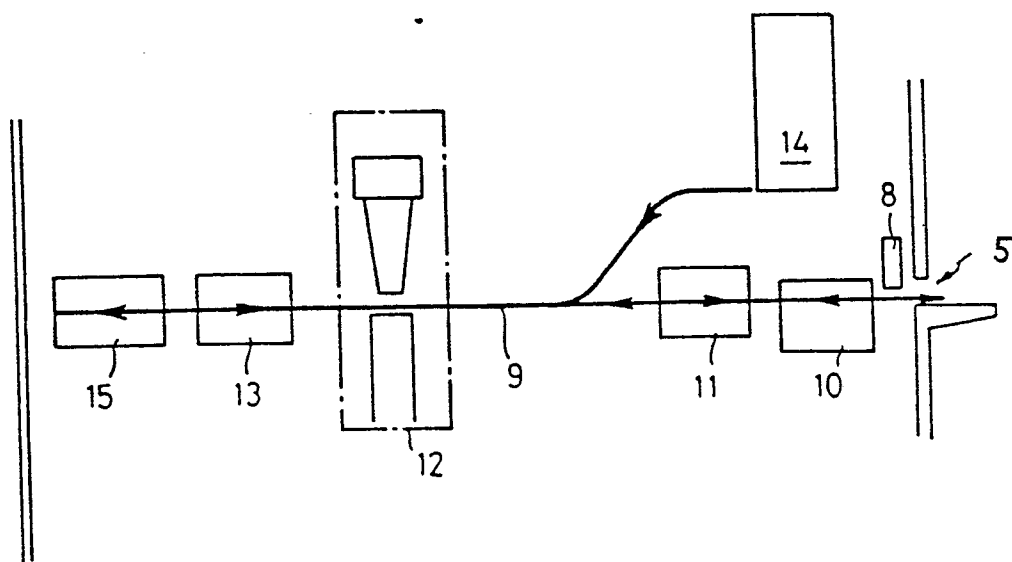


FIG. 2

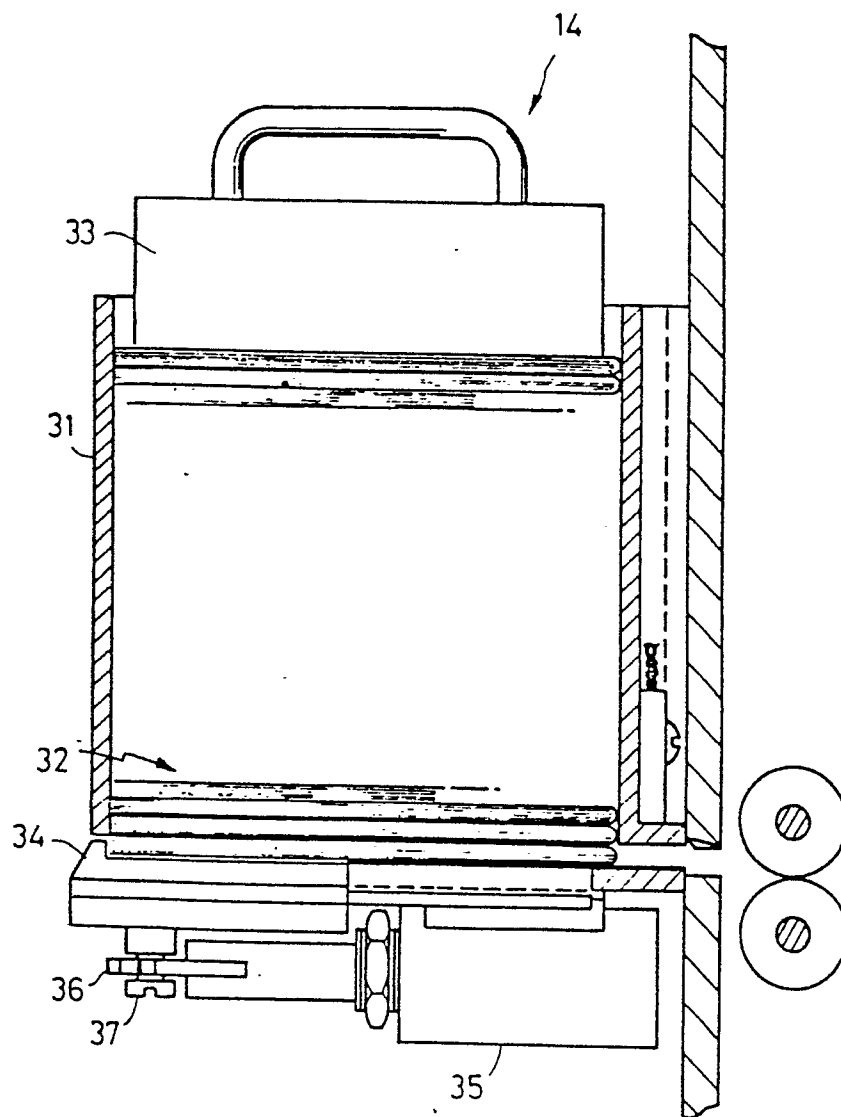


FIG. 3A

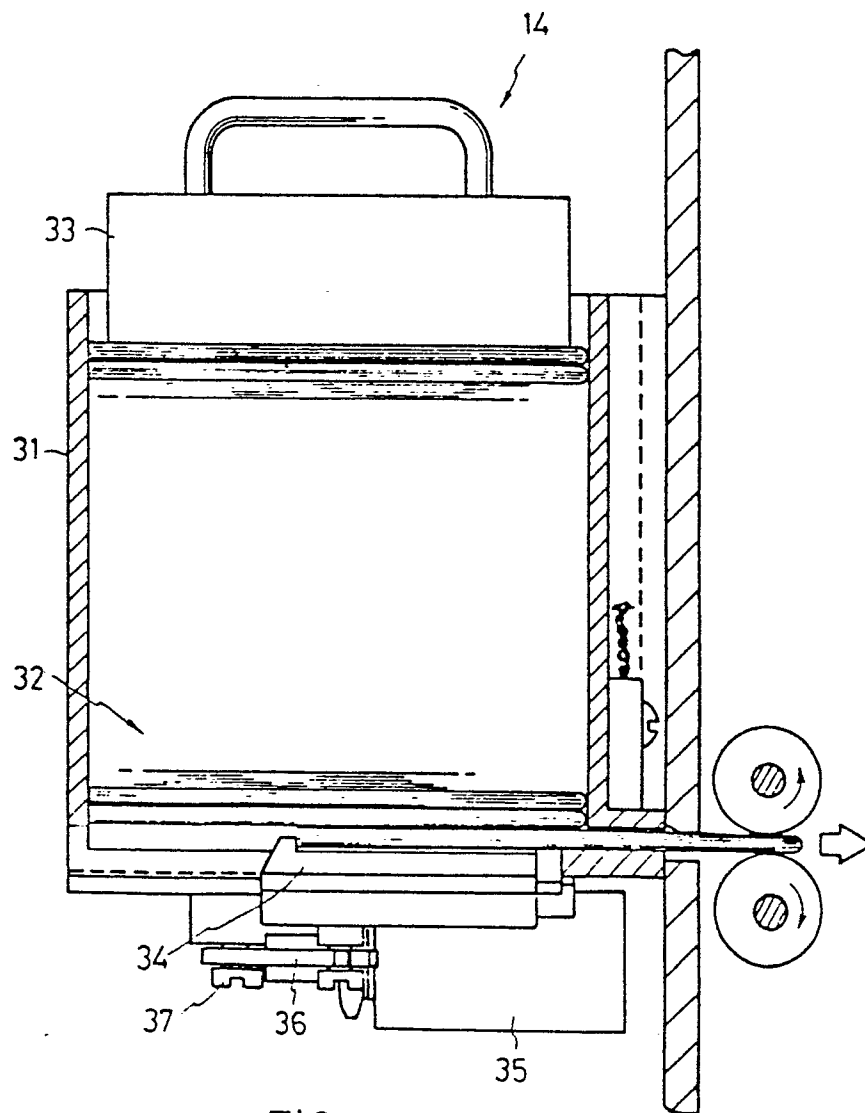
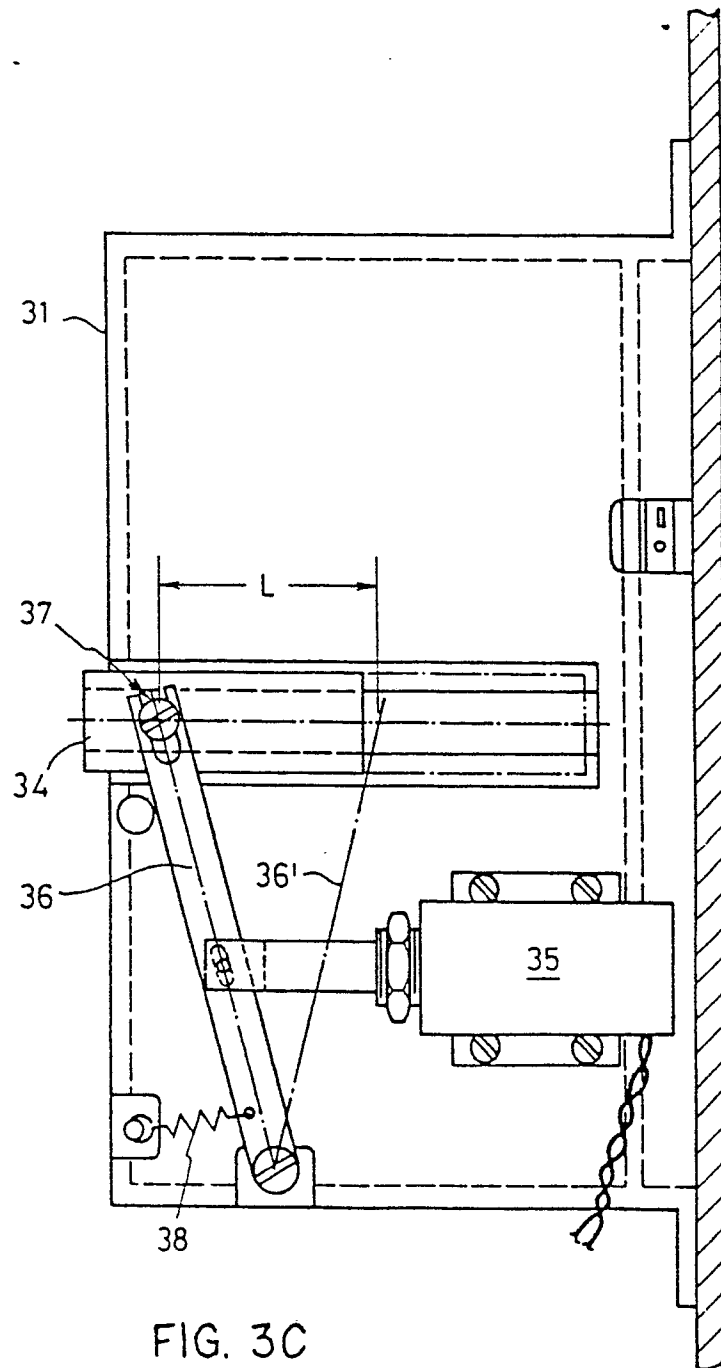


FIG. 3B



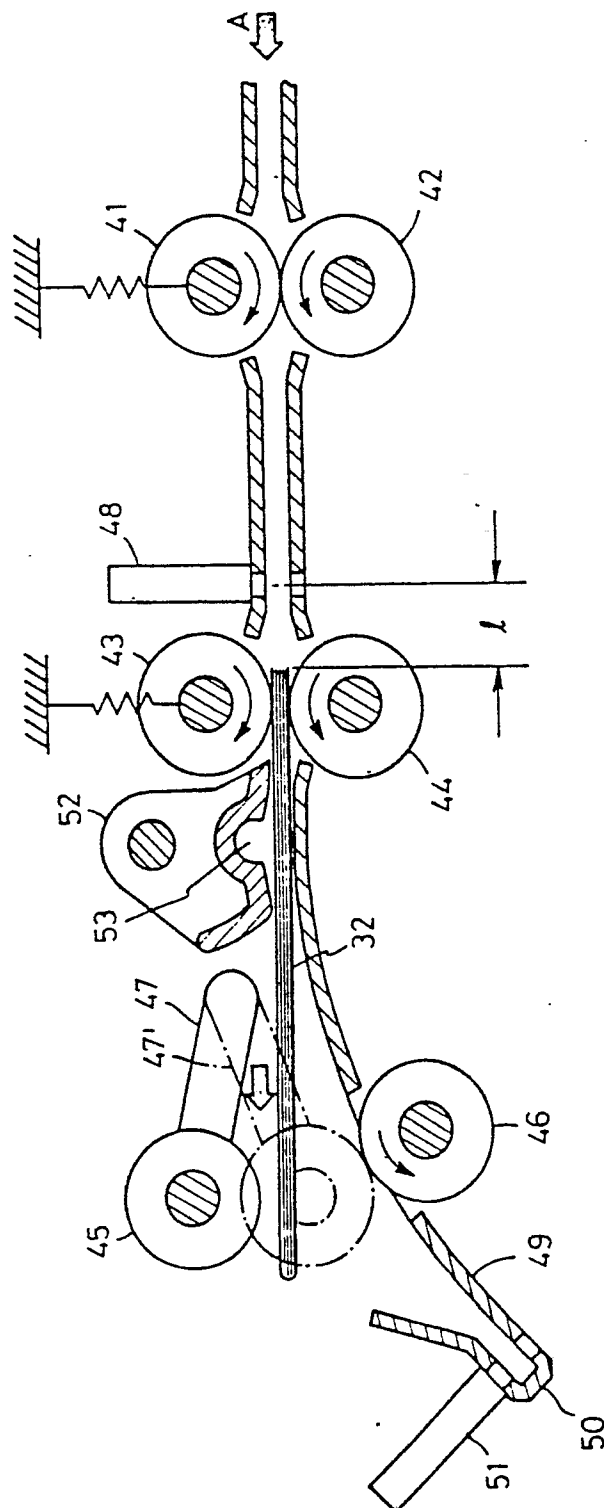


FIG. 4A

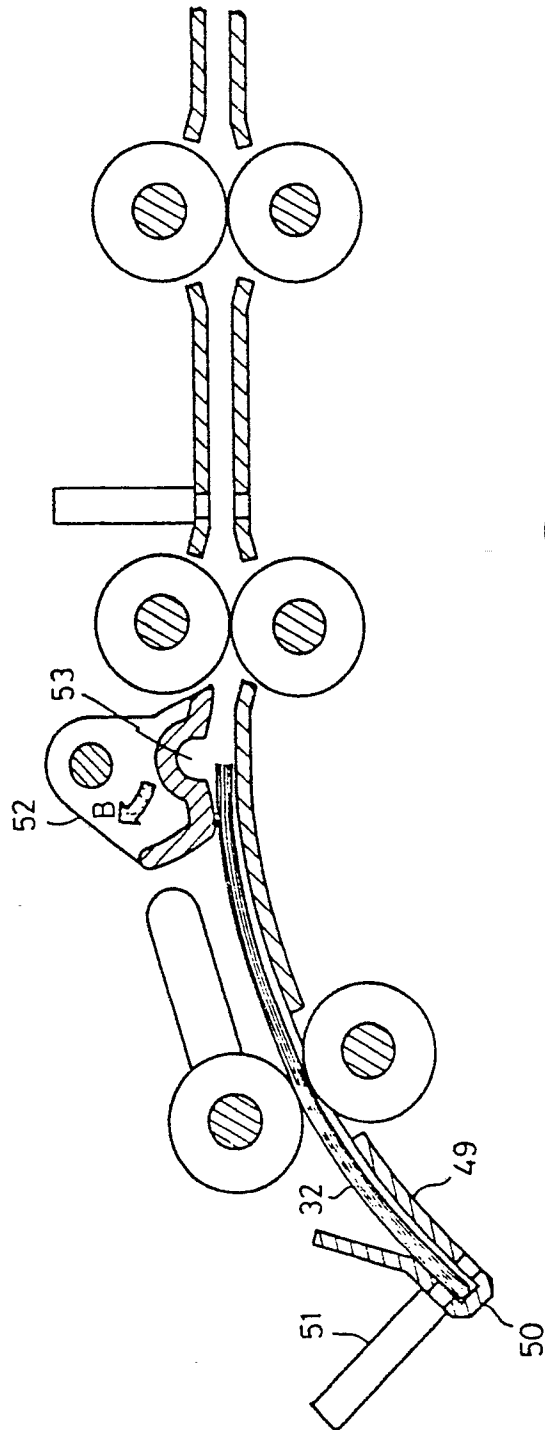
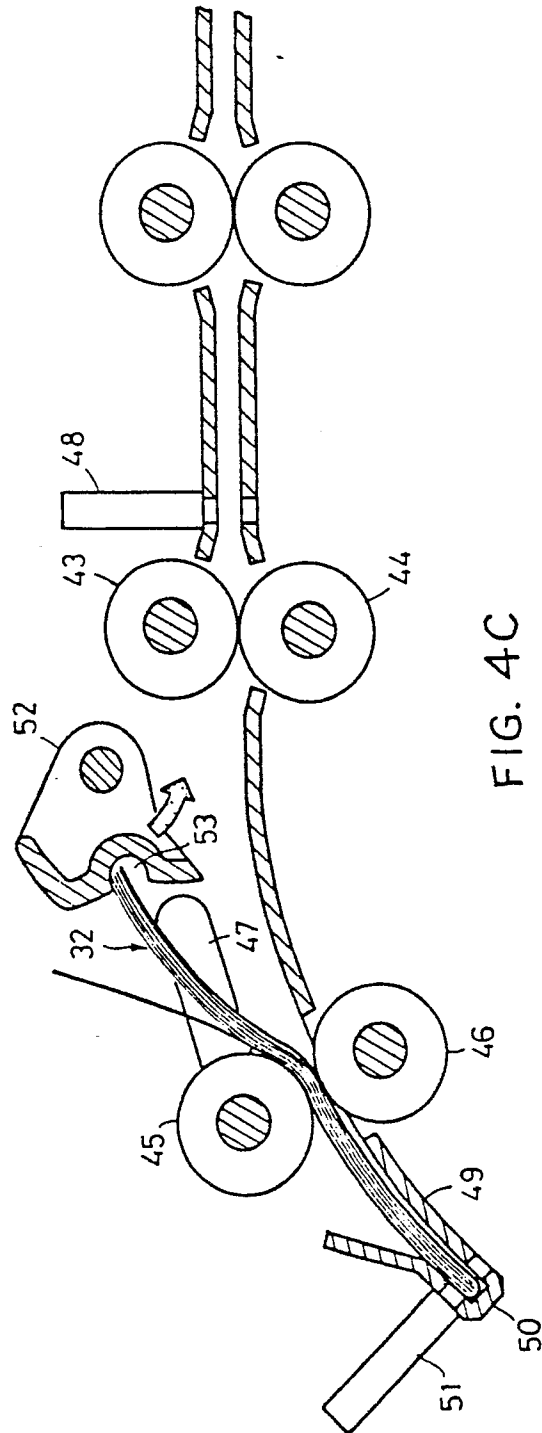


FIG. 4B



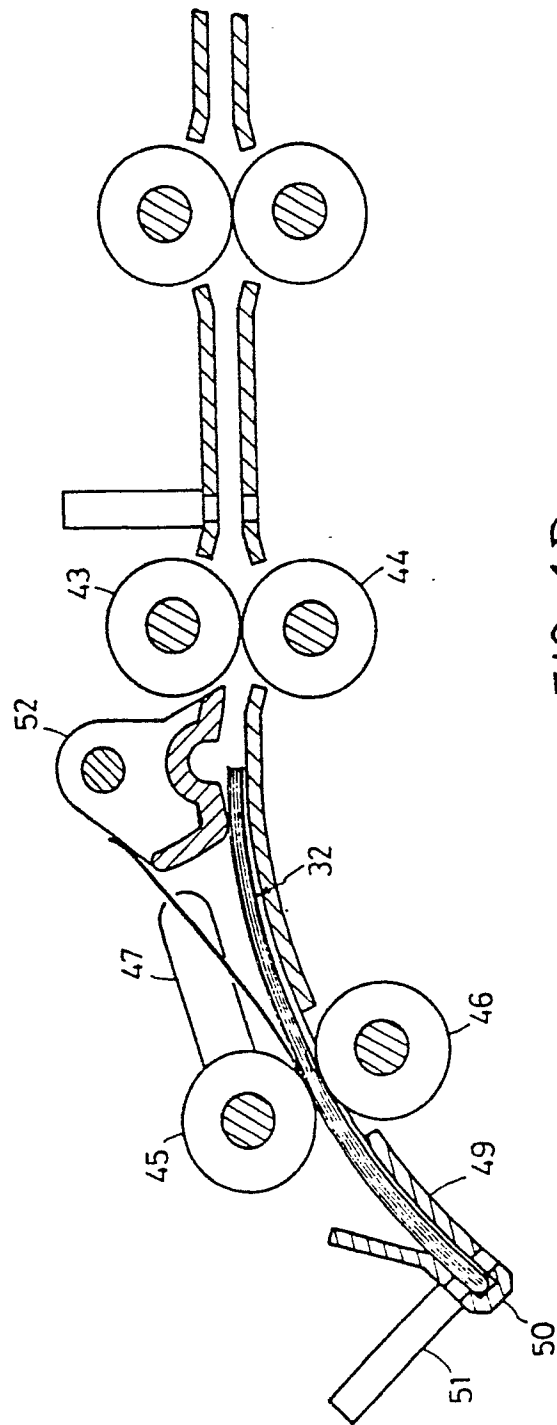


FIG. 4D

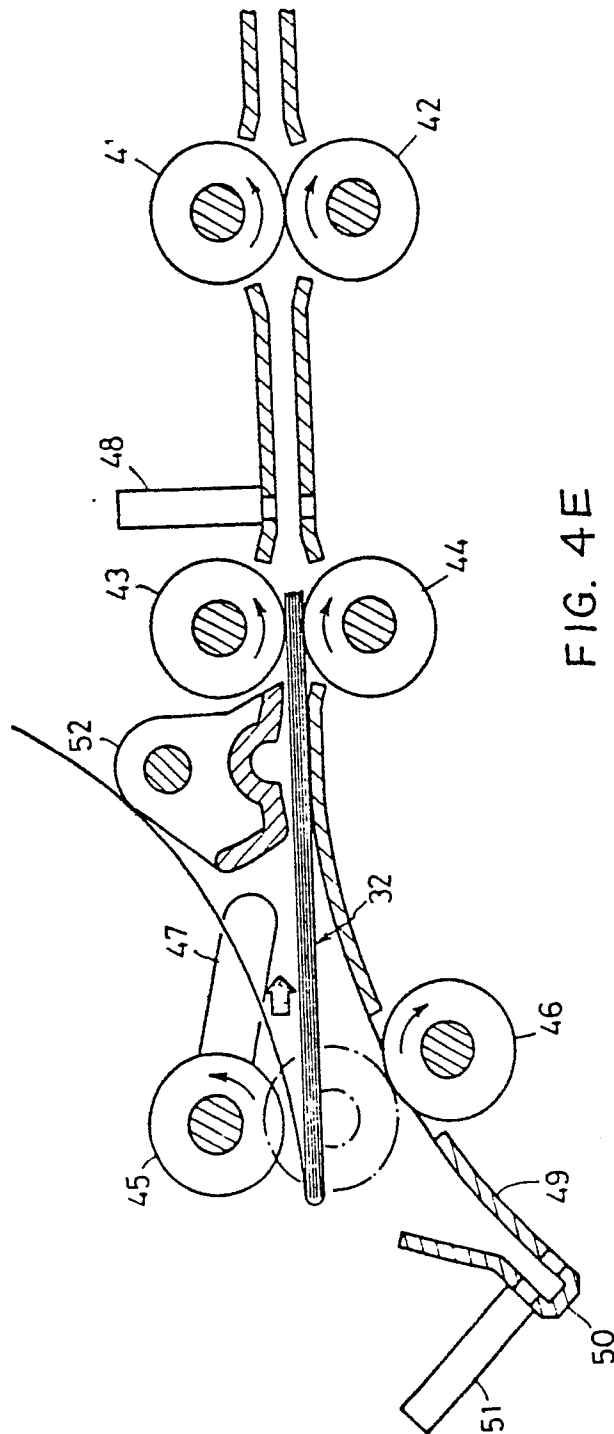


FIG. 4E

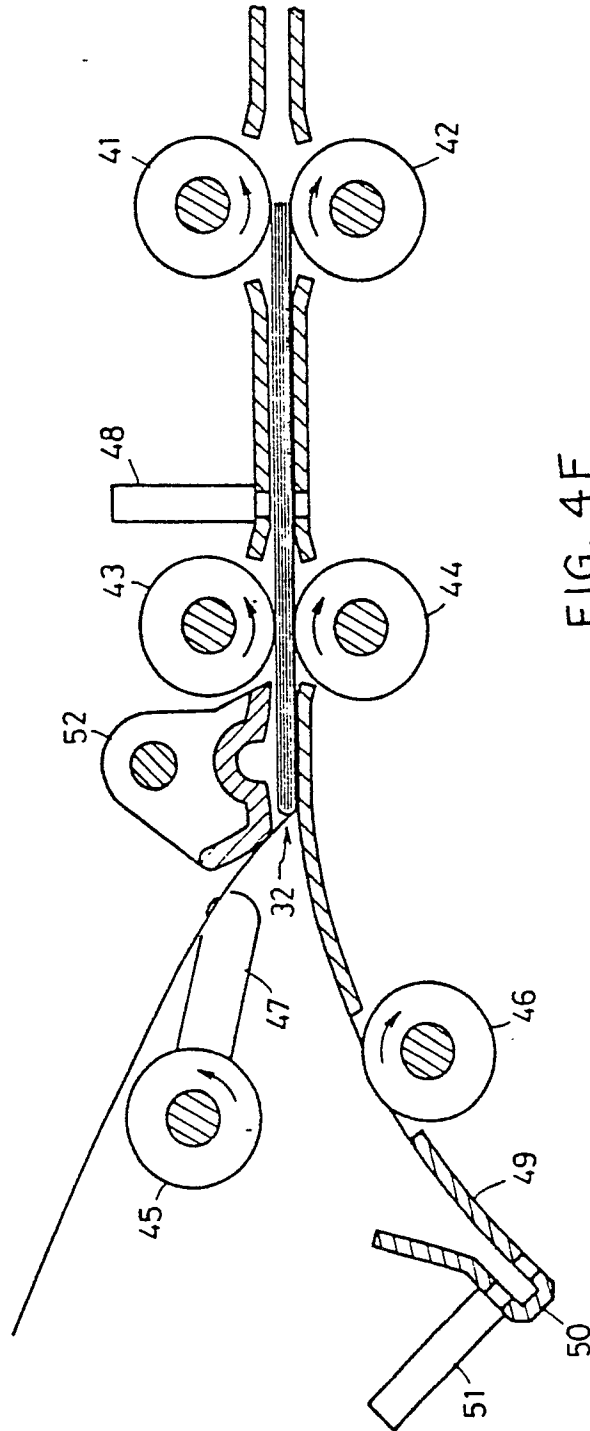


FIG. 4F

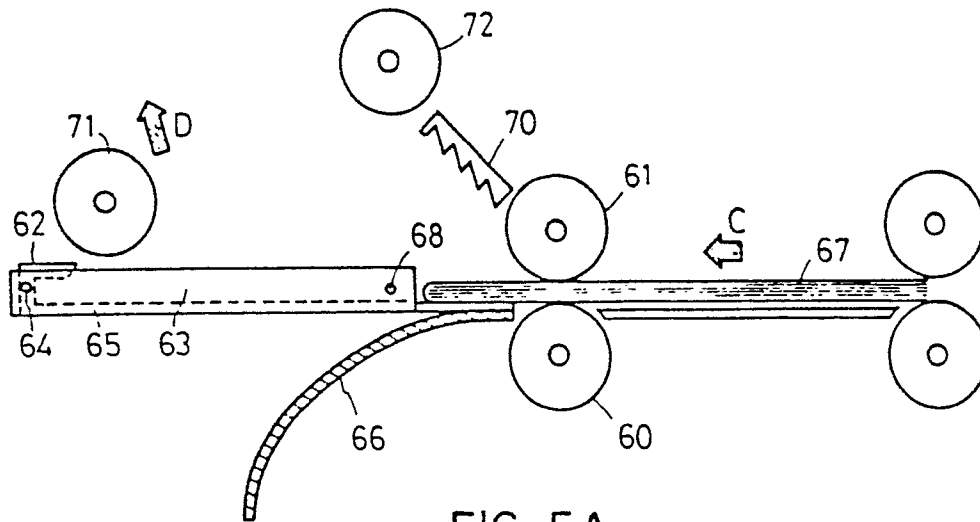


FIG. 5A

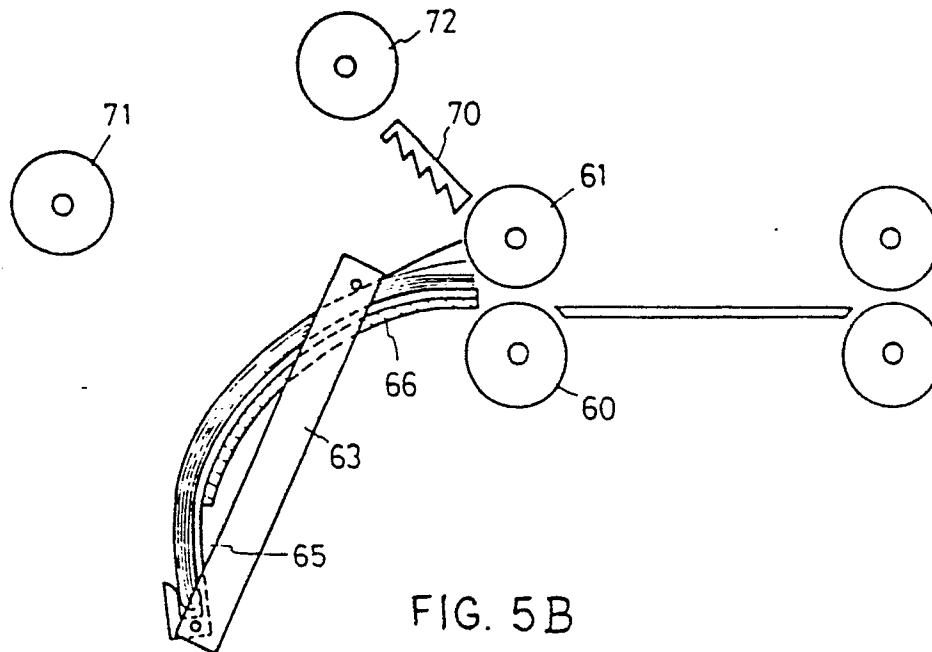
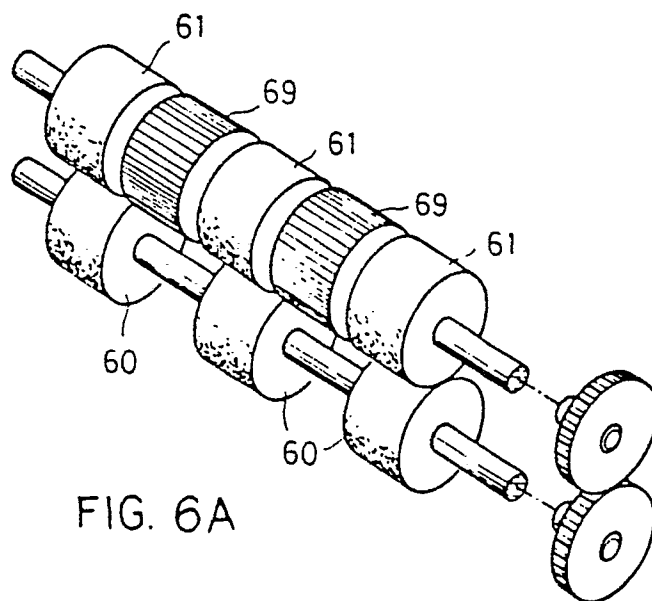
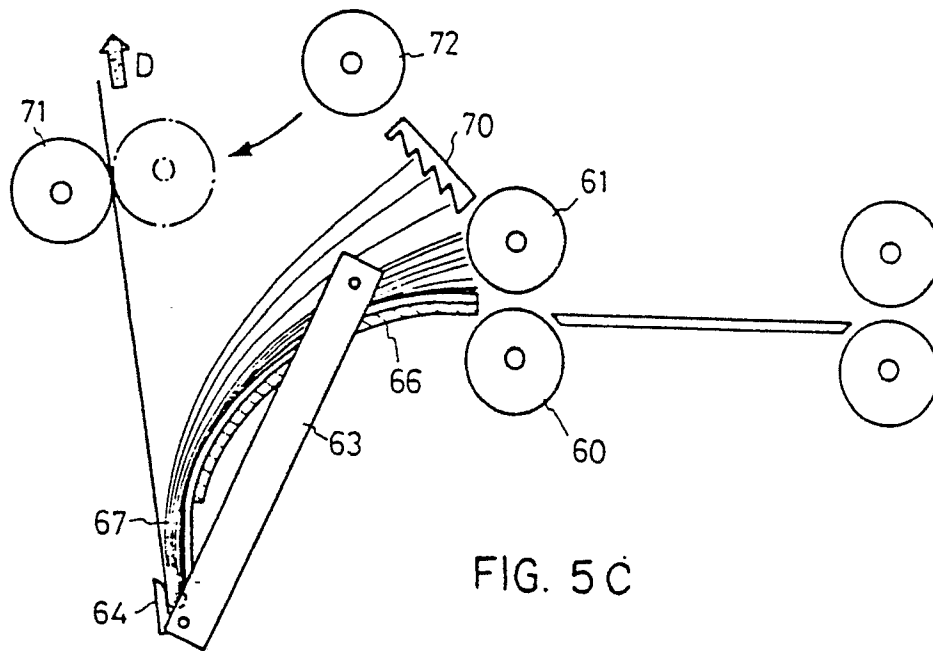


FIG. 5B



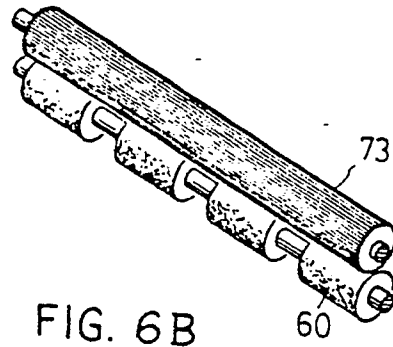


FIG. 6B

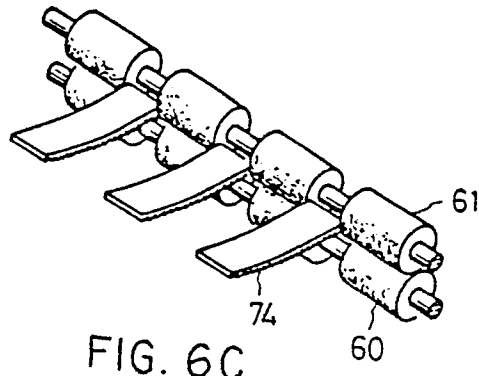


FIG. 6C