(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 089 540 B9**

(12) **CORRECTED EUROPEAN PATENT SPECIFICATION**

(15) Correction information:
Corrected version no 1 (W1 B1)
Corrections, see Description

(48) Corrigendum issued on:
20.08.2008 Bulletin 2008/34

(45) Date of publication and mention of the grant of the patent:
27.02.2008 Bulletin 2008/09

(21) Application number: **00125829.2**

(22) Date of filing: **24.11.2000**

(51) Int Cl.:
H04N 1/00 *(2006.01)*

(54) **Automated sheet delivery to selected paths using active gate and drag clutch**

Automatische Blattförderung in ausgewählten Pfaden mit aktiver Tor- und Zugkupplung

Sortie de feuille automatique à des chemins sélectionnés utilisant un embrayage à porte active et à traction

(84) Designated Contracting States:
DE FR GB

(30) Priority: **03.03.2000 US 518460**

(43) Date of publication of application:
04.04.2001 Bulletin 2001/14

(73) Proprietor: **Hewlett-Packard Company**
(a Delaware Corporation)
Palo Alto, CA 94304 (US)

(72) Inventor: **Bokelman, Kevin**
La Jolla, CA 92037 (US)

(74) Representative: **Schoppe, Fritz**
Schoppe, Zimmermann, Stöckeler & Zinkler
Patentanwälte
Postfach 246
82043 Pullach bei München (DE)

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EP-A- 0 488 126 **US-A- 5 915 157**

EP 1 089 540 B9

Printed by Jouve, 75001 PARIS (FR)

Description

Background of the Invention and Prior Art

[0001] The present invention relates to the transport of individual cut sheets of flat flexible media such as paper, vellum, transparencies or the like through a transport path which may have various branches for the delivery of sheets such as printed sheets of media from an input location to a desired location. For the purposes of illustration but not limitation, the invention will be described in the context of a document scanning apparatus having a sheet transport path which extends from a stack of document sheets to be scanned to and through a scanning location to a scanned document location where the scanned sheets are stacked. More particularly, the invention is concerned with the guiding and movement of sheets in a scanning apparatus or printer capable of duplex scanning or printing wherein one side of a media sheet is first scanned or printed and then, if desired, the individual sheets may then be turned over and routed back to the scanning or printing region for scanning or printing the other side of the sheet. The teachings of the invention are applicable generally to any office or business machine in which flexible media sheets must be moved to selected paths.

[0002] As used herein, the term "sheet processing apparatus" is therefore intended to broadly include, but not necessarily be limited to, printers, stand alone document copiers, facsimile machines, document scanning machines and combinations of such units.

[0003] EP 0 488 126 A1 describes a document feeder enabling a two-sided scanning operation at a nip between a document support drum and an original glass plate. In order to reverse the side of the original document, which faces the scanning unit placed below the original glass plate, a reversing transport section is provided. This reversing transport section accommodates for different sizes of the original documents by permitting a reversing guide to move backward in a direction at a speed slightly slower than one-half of a transport speed of the respective document, such that this document is transported from an inside of the reversing transport path to an exposure-use transport section.

[0004] An arrangement of three rollers on the one hand and lever on the other hand cooperate to divert input sheets to one of two nips defined by the three rollers. In particular, the lever is pivotally movable between two positions by a solenoid activation of the level.

[0005] The present invention provides a method of processing sheet media in a sheet processing apparatus comprising the steps of:

a) moving individual media sheets from a first location to a processing location in said sheet processing apparatus;
b) processing a first face side of a media sheet at said processing location;
c) moving said sheet from said processing location into a sheet guide channel in a pivotally mounted active gate extending across a media path;
d) rotating a sheet transport roller in a selected direction to cause said roller to frictionally engage and pivotally move said gate to a first position in which said guide channel is aligned with one of two nips extending to spaced sheet delivery paths; and
e) gripping said sheet in a selected one of said nips and rotating said transport roller in a direction to transport said sheet away from said processing location through said guide channel into one of said spaced sheet delivery paths.

[0006] In apparatus terms, the present invention comprises a sheet media processing apparatus which includes:

a) a sheet media input support;
b) a sheet media processor;
c) a processed sheet media support;
d) sheet guides defining a media transport path extending from said input support past said processor to said processed sheet media support;
e) sheet transport means for moving individual media sheets along said path; and
f) an active sheet routing gate and drag clutch which includes a sheet routing channel which is moveable in said media transport path in a space between an input and first and second output branches;

said sheet transport means including a driven sheet transport roller and a power drive for rotating said transport roller in opposite directions to move said leading edge of said sheet along a selected output branch, said gate and drag clutch being engaged with said transport roller to move said sheet routing channel to extend from said input toward a selected one of said first and second output branches.

Brief Description of the Drawings

[0007]

Figures 1a and 1b are side elevation views of a document scanning apparatus which incorporates the teachings of the present invention including an active sheet routing gate and drag clutch, the gate being in a lower position if Fig. 1a and in an upper position in Fig. 1b.

Figures 2a and 2b are perspective views of a transport roller assembly comprised of a series of spaced coaxially arranged sheet drive rollers and pinch rollers with the active gate and drag clutch engaged with the transport rollers at each end of the assembly at the sides of a sheet media path, the gate being in a lower position in Fig. 2a and in an upper position in

Fig. 2b.

Figures 3a and 3b are enlarged schematic side elevation views, partly in cross section, of the active sheet routing gate and drag clutch operating in conjunction with the reversible sheet transport output roller assembly.

Description of the Preferred Embodiment

[0008] As shown in the drawings, a document scanning apparatus 10 includes a generally flat horizontally extending glass table or platen surface 12 for single sheet scanning having a region 14 at one end thereof through which a moving document to be scanned can be viewed by conventional document scanning components of the device. An inclined frame 20 is provided for supporting a stack 24 of documents to be fed to the scanning components. An inclined surface or guide 26 on the frame 20 and stationary media sheet guides 27, 28 on the frame together define a sheet media path extending from the media stack 24 to the scan region 14 and thence around a scanning roller 40 and document output sheet transport roller assembly 50 to a scanned document output location at which a tray 34 is provided for receiving a stack of scanned documents. Circumferentially spaced pinch rollers 42 hold the document sheet against the scanning roller. The apparatus for feeding individual sheets from the stack 24 to the scan region 14 includes the inclined media support or feed tray 22, upper and lower opposed media pick rollers 30, 32 and a suitable drive mechanism for moving the rollers 30, 32. The drive mechanism may be arranged to drive the rollers 30, 32 in the same forward direction of rotation (e.g., clockwise) for uppermost sheet picking and in the same reverse direction (e.g., counterclockwise) for lowermost sheet picking as described in commonly owned co-pending application Serial No. 09/405,991 (HP Docket 10991829-1) filed September 27, 1999.

[0009] Figs. 2a and 2b respectively show perspective views of a transport roller assembly 50 comprised of a rotatable shaft 52 having a plurality of sheet transport rollers 54 affixed thereto at axially spaced locations along the shaft 52. Each of the rollers 54 is preferably identical to the other rollers 54 and has a rubberized or other frictional surface. As used herein, the term "roller" is intended to include a single elongated roller and the mechanical equivalents of two or more axially spaced rollers on a common shaft or axis as shown. The transport roller assembly may be molded of plastic with a plurality of elongated ribs 70 and circumferential rings 72 to provide support as necessary to the media sheet.

[0010] Pinch rollers 62 and 64 are respectively positioned above and below the transport roller assembly 50 and tangentially engage the rollers 54 to provide nips and media sheet delivery paths above and below the transport roller assembly 50. Only the upper pinch rollers 62 are shown in the perspective views of Figs. 2a and 2b but the lower rollers 64 are also seen in Figs. 1a and 1b as well as in Figs. 3 and 4. The lower pinch rollers 64 are, like the upper pinch rollers 62, engaged tangentially with selected ones of the transport rollers 54. Preferably, the pinch rollers 62, 64 are spaced on diametrically opposite sides of the transport roller assembly 50 although it is not essential to do so. A suitable power drive, not shown, is provided for rotating the transport roller assembly 50 in either the clockwise or the counterclockwise direction as desired.

[0011] Since rollers 54 are primarily used for transporting the sheet of media through nips defined between the rollers 54 and the pinch rollers 62, 64, preferably all of the transport rollers 54 and pinch rollers 62, 64 are provided with traction surfaces suitable for gripping and transporting media sheets through the nips as is conventional. The pinch rollers 62, 64 may be spring biased into engagement with the transport rollers 54 and comprise idlers which are only rotatable when the power driven transport roller assembly 50 is rotated. The opposed drive and pinch rollers 54, 62, 64 in surface contact provide one way of defining sheet transport nips as is well known; however, in the context of referring top nips defined by rollers, the term "roller" is also intended and specifically defined to include mechanical substitutes having opposed surfaces which define nips such as opposed continuous belts trained around rollers or an opposed roller and belt which together define a nip.

[0012] An active gate and drag clutch 70 best seen in Figs. 2a and 2b is located in a space in the media transport path between an input to the gate and clutch 70 from the document drive roller 40 and first and second media output branches above and below the transport roller assembly 50. The active gate and clutch 70 is comprised of a pair of end plates 72, 74 rotatable about a common axis 76 which extends parallel to shaft 52. The document path between the end plates 72, 74 of the active gate and drag clutch 70 is bridged by upper and lower sheet guides 80, 90 of plastic or light weight sheet metal affixed to the end plates whereby the guides 80, 90 define a sheet routing or guide channel 82 (Fig. 3) therebetween for guiding the leading edge of a sheet from the top surface of the document drive roller 40 to either one of a lower nip or nips between the document delivery roller or rollers 54 and the lower pinch rollers 64 or to an upper nip between the document delivery roller or rollers 54 and the upper pinch rollers 62 depending upon the position of the gate and drag clutch 70. An arcuate side edge 78 on each end plate 72, 74 frictionally engages the cylindrical surface of the axially outermost transport rollers 54 or other similarly moveable portions of the transport roller assembly 50 such that rotation of the transport roller assembly 50 including the rollers 54 determines the position of the active gate and drag clutch 70. Clockwise rotation of shaft 52 causes counterclockwise pivotal motion of gate 70 about its axis 76 until gate 70 reaches its uppermost limit position shown in Figs. 1b, 2b and 3b following which slippage between the arcuate surfaces

78 of the gate end plates and the transport rollers 54 holds the active gate 70 in the selected position. Gate motion limit stops (not shown) are provided at the desired locations on the scanning apparatus to limit the motion of the gate and drag clutch 70 between the positions shown in figs. 1a and 1b. The lower sheet guide 90 includes a lower portion 92 as shown for a purpose which will be described with reference to Fig. 4.

[0013] Figure 4a shows the initial movement of a sheet of paper or other media from the top or bottom of the stack 24 by the opposed pick rollers 30, 32. In the position shown in Figure 4a, the leading edge of the sheet has been driven by the document drive roller 40 through the sheet processing location 14, the leading edge of the sheet having reached a location in the sheet guide channel 82 between the gate sheet guides 80, 90. As the leading edge of the sheet, moved by the document drive roller 40 approaches the active gate 70, but before it enters channel 82, a timing circuit actuates the power drive to cause rotation of the transport roller assembly 50 in the counterclockwise direction as seen in Figure 4a to move the gate 70 to its downward position. Continued movement of the leading edge of the media sheet causes the leading edge to enter the lower nip or nips between the transport rollers 54 and the lower pinch rollers 62 to transport the leading edge of the sheet through the channel 82 into the lower output path between the stationary guide 27 and transport roller assembly 50. The rotation of the nip between the sheet transport roller or rollers 54 and the lower pinch rollers 64 continues to move the sheet to the right below the transport roller assembly 50 thus causing the trailing portion of the sheet to move entirely through and away from the processing location 14 and document drive roller 40 toward the processed sheet location or tray 34 as seen in Figure 4b.

[0014] In Figure 4c the direction of rotation of the transport roller assembly 50 is reversed such that the roller assembly 50 now begins to rotate in a clockwise direction before the trailing edge of the sheet has passed the nip between the transport rollers 54 and lower pinch rollers 64 from the sheet position seen in Fig. 4b. This causes the sheet to move back toward the processing location 14 in face inverted orientation so that the other face side of the document sheet can now be scanned or printed upon. Clockwise rotation of the transport roller assembly 50 causes movement of the active gate and drag clutch 70 to the upper position seen in Fig. 4c. this causes movement of the lower portion 92 of the lower gate guide 90 to a position spaced from and generally parallel to stationary guide 27 to guide the sheet back to the document drive roller 40. During scanning or printing of the second face side of the sheet, the document drive roller 40 continues to rotate in the clockwise direction moving the sheet through the sheet processing region 14 until the leading edge of the sheet (previously the trailing edge) enters the guide channel 82 between the gate guides 80, 90 and moves into the nip or nips between the transport roller or rollers 54 and upper pinch rollers 62 so that the document sheet, now having been duplex scanned or printed, may be passed over the transport roller assembly 50 to the tray 34.

[0015] In its broadest aspects, the invention involves the use of the active gate and drag clutch 70 to guide the leading edge of a moving media sheet to one of two output paths which, in the arrangement shown, are above and below the transport roller assembly 50. There is of course no reason that these teachings need be limited to a horizontally oriented transport roller assembly 50 since the principles of the invention will clearly be applicable to the handling of sheet media moving with its flat surfaces in a non-horizontal path provided that appropriate minor modifications are made. In the preferred embodiment shown, separate transport rollers 54 and associated pinch rollers 62, 64 transport the sheet past the transport roller assembly 50 on the selected upper or lower side depending upon the direction of rotation of the transport roller assembly 50.

[0016] The active sheet guide gate and drag clutch 70 can be molded or otherwise fabricated of plastics or other light weight materials. The details of a suitable drive arrangement for rotating the roller assembly 50 in the desired directions of rotation at the desired time are well within the skill of persons skilled in the art and is therefore not described herein. Persons skilled in the art will also appreciate that various additional modifications can be made in the preferred embodiment shown and described above and that the scope of protection is limited only by the wording of the claims which follow.

Claims

1. A method of processing sheet media in a sheet processing apparatus comprising the steps of:

a) moving individual media sheets from a first location to a processing location (14) in said sheet processing apparatus;
b) processing one side of a media sheet at said processing location;
c) moving said sheet from said processing location into a sheet guide channel (82) in a pivotally mounted active gate (70) extending across a media path wherein the pivotally mounted active gate (70) is pivotally movable between a first position in which said guide channel is aligned with a first one of two nips formed by an engagement of a sheet transport roller (50) with a first opposed surface, extending to a first one of two spaced sheet delivery paths, and a second position in which said guide channel is aligned with a second one of the two nips formed by an engagement of the sheet transport roller (50) with a second opposed surface, extending to a second one of the two spaced sheet delivery paths;
d) rotating the sheet transport roller (50) in a

selected direction to cause said roller to frictionally engage and pivotally move said gate to the first position; and
e) gripping said sheet in the first one of said nips and rotating said transport roller (50) further in the selected direction to transport said sheet in a direction away from said processing location through said guide channel into one of said spaced sheet delivery paths.

2. The method of claim 1, further comprising:

f) reversing the direction of rotation of said transport roller (50) before a trailing edge of said sheet passes through said first nip to rotate said gate (70) to the second position in which a sheet guide (92) on said gate assists in feeding said sheet back to said processing location in face inverted orientation for processing opposite face side of said media sheet and to align said channel with the other one of said nips;
g) processing the other face side of said sheet at said processing location and moving said sheet from said processing location into said sheet guide channel in said gate; and
h) gripping opposite face sides of said moving sheet in said second one of said nips and rotating said transport roller in the reversed direction to transport said sheet from said processing location through said guide channel into another one of said sheet delivery paths.

3. The method of claim 2, further comprising moving said sheet in engagement with said transport roller (50) in vertically spaced output paths which extend over and under said transport roller to a processed sheet delivery location by using vertically spaced pinch rollers (62, 64) engaged with said transport roller to comprise said nips.

4. The method of claim 3, wherein said processing comprises scanning of sheet media.

5. The method of claim 3, wherein said processing comprises printing of sheet media.

6. A sheet media processing apparatus which includes:

a) a sheet media input support (12);
b) a sheet media processor (14);
c) a processed sheet media support (34);
d) sheet guides (27, 28) defining a media transport path extending from said input support past said processor to said processed sheet media support;
e) sheet transport means (40, 42, 50) for moving individual media sheets along said path said sheet transport means (40, 42, 50) comprising a driven sheet transport roller (50); and
f) an active sheet routing gate and drag clutch (70) which includes a sheet routing channel (82) which is moveable in said media transport path in a space between an input and first and second output branches;
g) a first nip, in the first output branch, formed by an engagement of said sheet transport roller with a first opposed surface and a second nip, in the second output branch, formed by an engagement of said sheet transport roller with a second opposed surface;

said sheet transport means further including a power drive for rotating said transport roller in opposite directions to move said leading edge of said sheet along a selected output branch, said gate and drag clutch (70) being engaged with said transport roller (50) to move said sheet routing channel (82) to extend from said input toward the selected one of said first and second output branches.

7. The sheet processing apparatus of claim 6, wherein said gate and drag clutch comprises a pair of end plates (72, 74) and first and second sheet guides (80, 90) extending between said end plates defining said routing channel therebetween, said end plates being mounted for pivotal movement around a common axis parallel to the axis of said sheet transport roller, said input to said gate being proximate said axis.

8. The sheet processing apparatus of claim 7, wherein said sheet guides (80, 90) include substantially parallel portions defining said routing channel.

9. The sheet processing apparatus of claim 8, wherein one of said sheet guides further includes a portion for guiding sheet media toward said sheet media processor.

10. The sheet processing apparatus of claim 9, wherein said transport roller (50) comprises a plurality of axially aligned sheet transport rollers, and further comprising pinch rollers (62) in surface engagement with at least some of said transport rollers (50) to define a nip for receiving a leading edge of a media sheet and for moving said leading edge along a first one of said output branches.

11. The sheet processing apparatus of claim 10, further comprising second pinch rollers (64) in surface engagement with at least some of said transport rollers (50) to define a second nip for receiving a leading edge of a media sheet and for moving said leading edge along a second one of said output branches.

12. The sheet processing apparatus of claim 11, further

comprising stationary guides proximate said pinch rollers for guiding a media sheet into said output branches.

13. The sheet processing apparatus of claim 12, wherein said pinch rollers are biased into engagement with said drive rollers.

14. The sheet processing apparatus of claim 12, wherein said processor comprises a scanner.

15. The sheet processing apparatus of claim 12, wherein said processor comprises a printer.

16. The sheet processing apparatus of claim 6, wherein said sheet transport means comprises a sheet media feeder for feeding individual media sheets from a stack on said input support into said media transport path.

Patentansprüche

1. Ein Verfahren zum Verarbeiten von Blattmedien in einer Blattverarbeitungsvorrichtung, das folgende Schritte aufweist:

a) Bewegen von einzelnen Medienblättern von einer ersten Stelle zu einer Verarbeitungsstelle (14) in der Blattverarbeitungsvorrichtung;
b) Verarbeiten einer Seite eines Medienblattes an der Verarbeitungsstelle;
c) Bewegen des Blattes von der Verarbeitungsstelle in einen Blattführungskanal (82) in einem schwenkbar befestigten aktiven Tor (70), das sich über einen Medienweg erstreckt, wobei das schwenkbar befestigte aktive Tor (70) schwenkbar zwischen einer ersten Position, in der der Führungskanal mit einem ersten von zwei Nips ausgerichtet ist, die durch eine Ineingriffnahme einer Blatttransportrolle (50) mit einer ersten gegenüberliegenden Oberfläche gebildet sind, sich zu einem ersten von zwei beabstandeten Blattzuführwegen erstreckend, und einer zweiten Position, in der der Führungskanal mit einem zweiten der zwei Nips ausgerichtet ist, die durch eine Ineingriffnahme der Blatttransportrolle (50) mit einer zweiten gegenüberliegenden Oberfläche gebildet sind, sich zu einem zweiten der zwei beabstandeten Blattzuführwege erstreckend, bewegbar ist;
d) Drehen der Blatttransportrolle (50) in eine ausgewählte Richtung, um zu bewirken, dass die Rolle das Tor reibungsmäßig in Eingriff nimmt und schwenkbar zu der ersten Position bewegt; und
e) Greifen des Blattes in dem ersten der Nips und Drehen der Transportrolle (50) weiter in die ausgewählte Richtung, um das Blatt in eine Richtung von der Verarbeitungsstelle weg durch den Führungskanal in einen der beabstandeten Blattzuführwege zu transportieren.

2. Das Verfahren gemäß Anspruch 1, das ferner folgende Schritte aufweist:

f) Umkehren der Drehrichtung der Transportrolle (50), bevor ein hinterer Rand des Blattes durch den ersten Nip läuft, um das Tor (70) in die zweite Position zu drehen, in der eine Blattführung (92) an dem Tor dabei hilft, das Blatt zum Verarbeiten der entgegengesetzten Seite des Medienblattes zurück in die Verarbeitungsstelle in einer seiteninvertierten Orientierung einzuspeisen, und den Kanal mit dem anderen der Nips auszurichten;
g) Verarbeiten der anderen Seite des Blattes an der Verarbeitungsstelle und Bewegen des Blattes von der Verarbeitungsstelle in den Blattführungskanal in dem Tor; und
h) Greifen von entgegengesetzten Seiten des sich bewegenden Blattes in dem zweiten der Nips und Drehen der Transportrolle in die umgekehrte Richtung, um das Blatt von der Verarbeitungsstelle durch den Führungskanal in einen anderen der Blattzuführwege zu transportieren.

3. Das Verfahren gemäß Anspruch 2, das ferner ein Bewegen des Blattes in einen Eingriff mit der Transportrolle (50) in vertikal beabstandete Ausgangswege, die sich über und unter der Transportrolle erstrecken, zu einer Verarbeitetes-Blatt-Zuführstelle durch ein Verwenden von vertikal beabstandeten Klemmrollern (62, 64), die mit der Transportrolle in Eingriff sind, um die Nips aufzuweisen, aufweist.

4. Das Verfahren gemäß Anspruch 3, bei dem das Verarbeiten ein Abtasten von Blattmedien aufweist.

5. Das Verfahren gemäß Anspruch 3, bei dem das Verarbeiten ein Drucken von Blattmedien aufweist.

6. Eine Blattmedienverarbeitungsvorrichtung, die folgende Merkmale umfasst:

a) eine Blattmedieneingangsstütze (12);
b) einen Blattmedienprozessor (14);
c) eine Verarbeitete-Blattmedien-Stütze (34);
d) Blattführungen (27, 28), die einen Medientransportweg definieren, der sich von der Eingangsstütze an dem Prozessor vorbei zu der Verarbeitete-Blattmedien-Stütze erstreckt;
e) eine Blatttransporteinrichtung (40, 42, 50) zum Bewegen von einzelnen Medienblättern entlang des Weges, wobei die Blatttransportein-

richtung (40, 42, 50) eine angetriebene Blatttransportrolle (50) aufweist; und

f) ein aktives Blattlenktor- und Ziehkupplung-Element (70), das einen Blattlenkkanal (82) umfasst, der in dem Medientransportweg in einem Raum zwischen einem Eingang und einer ersten und zweiten Ausgangsverzweigung bewegbar ist;

g) einen ersten Nip in der ersten Ausgangsverzweigung, der durch eine Ineingriffnahme der Blatttransportrolle mit einer ersten gegenüberliegenden Oberfläche gebildet ist, und einen zweiten Nip in der zweiten Ausgangsverzweigung, der durch eine Ineingriffnahme der Blatttransportrolle mit einer zweiten gegenüberliegenden Oberfläche gebildet ist;

wobei die Blatttransporteinrichtung ferner einen Leistungsantrieb zum Drehen der Transportrolle in entgegengesetzte Richtungen umfasst, um den vorderen Rand des Blattes entlang einer gewählten Ausgangsverzweigung zu bewegen, wobei das Tor- und Ziehkupplung-Element (70) mit der Transportrolle (50) in Eingriff ist, um den Blattlenkkanal (82) zu bewegen, damit sich derselbe von dem Eingang zu der ausgewählten der ersten und zweiten Ausgangsverzweigung hin erstreckt.

7. Die Blattverarbeitungsvorrichtung gemäß Anspruch 6, bei der das Tor- und Ziehkupplung-Element ein Paar von Endplatten (72, 74) und eine erste und zweite Blattführung (80, 90), die sich zwischen den Endplatten erstrecken und den Lenkkanal zwischen denselben definieren, aufweist, wobei die Endplatten für eine Schwenkbewegung um eine gemeinsame Achse herum parallel zu der Achse der Blatttransportrolle befestigt sind, wobei der Eingang zu dem Tor in der Nähe dieser Achse ist.

8. Die Blattverarbeitungsvorrichtung gemäß Anspruch 7, bei der die Blattführungen (80, 90) im Wesentlichen parallele Abschnitte umfassen, die den Lenkkanal definieren.

9. Die Blattverarbeitungsvorrichtung gemäß Anspruch 8, bei der eine der Blattführungen ferner einen Abschnitt zum Führen von Blattmedien zu dem Blattmedienprozessor hin aufweist.

10. Die Blattverarbeitungsvorrichtung gemäß Anspruch 9, bei der die Transportrolle (50) eine Mehrzahl von axial ausgerichteten Blatttransportrollen aufweist, und die ferner Klemmrollen (62) in einer Oberflächenineingriffnahme mit zumindest einigen der Transportrollen (50) aufweist, um einen Nip zum Empfangen eines vorderen Randes eines Medienblattes und zum Bewegen des vorderen Randes entlang einer ersten der Ausgangsverzweigungen zu definieren.

11. Die Blattverarbeitungsvorrichtung gemäß Anspruch 10, die ferner zweite Klemmrollen (64) in einer Oberflächenineingriffnahme mit zumindest einigen der Transportrollen (50) aufweist, um einen zweiten Nip zum Empfangen eines vorderen Randes eines Medienblattes und zum Bewegen des vorderen Randes entlang einer zweiten der Ausgangsverzweigungen zu definieren.

12. Die Blattverarbeitungsvorrichtung gemäß Anspruch 11, die ferner in der Nähe der Klemmrollen stationäre Führungen zum Führen eines Medienblattes in die Ausgangsverzweigungen aufweist.

13. Die Blattverarbeitungsvorrichtung gemäß Anspruch 12, bei der die Klemmrollen in einen Eingriff mit den Antriebsrollen vorgespannt sind.

14. Die Blattverarbeitungsvorrichtung gemäß Anspruch 12, bei der der Prozessor einen Abtaster aufweist.

15. Die Blattverarbeitungsvorrichtung gemäß Anspruch 12, bei der der Prozessor einen Drucker aufweist.

16. Die Blattverarbeitungsvorrichtung gemäß Anspruch 6, bei der die Blatttransporteinrichtung einen Blattmedieneinspeiser zum Einspeisen von einzelnen Medienblättern von einem Stapel auf der Eingangsstütze in den Medientransportweg aufweist.

Revendications

1. Procédé de traitement de supports sous forme de feuilles dans un appareil de traitement de feuilles, comprenant les étapes consistant à :

a) déplacer des supports individuels sous forme de feuilles depuis une première position vers une position de traitement (14) à l'intérieur dudit appareil de traitement de feuilles ;

b) traiter un côté d'un support sous forme de feuille au niveau de ladite position de traitement ;

c) déplacer ladite feuille depuis ladite position de traitement à l'intérieur d'un canal de guidage de feuilles (82) dans une porte active montée de façon pivotante (70) qui s'étend sur un chemin de support sous forme de feuille, dans lequel la porte active montée de façon pivotante (70) est mobile de façon pivotante entre une première position dans laquelle ledit canal de guidage est aligné avec une première d'entre deux lignes de contact formée par une mise en prise d'un rouleau de transport de feuilles (50) avec une première surface opposée qui s'étend vers

un premier d'entre deux chemins de sortie de feuille espacés l'un par rapport à l'autre, et une deuxième position dans laquelle ledit canal de guidage est aligné avec une deuxième d'entre deux lignes de contact formée par une mise en prise du rouleau de transport de feuilles (50) avec une deuxième surface opposée qui s'étend vers un deuxième d'entre deux chemins de sortie de feuille espacés l'un par rapport à l'autre ;
d) faire tourner le rouleau de transport de feuilles (50) dans une direction sélectionnée de façon à amener ledit rouleau à mettre en prise par friction et à déplacer de façon pivotante ladite porte vers la première position ; et
e) saisir ladite feuille dans la première desdites lignes de contact et faire tourner ledit rouleau de transport (50) plus avant dans la direction sélectionnée de façon à transporter ladite feuille dans une direction d'éloignement par rapport à ladite position de traitement au travers dudit canal de guidage à l'intérieur de l'un desdits chemins de sortie de feuille espacés l'un par rapport à l'autre.

2. Procédé selon la revendication 1, comprenant par ailleurs les étapes consistant à :

f) inverser le sens de rotation dudit rouleau de transport (50) avant qu'un bord arrière de ladite feuille ne passe au travers de ladite première ligne de contact pour faire tourner ladite porte (70) vers la deuxième position dans laquelle un guide de feuille (92) sur ladite porte aide à faire avancer ladite feuille en retour vers ladite position de traitement dans une orientation de face inversée pour traiter un côté de face opposée dudit support sous forme de feuille et pour aligner ledit canal avec l'autre desdites lignes de contact ;
g) traiter la face de l'autre côté de ladite feuille au niveau de ladite position de traitement, et déplacer ladite feuille depuis ladite position de traitement à l'intérieur dudit canal de guidage de feuille dans ladite porte ; et
h) saisir lesdites faces de côtés opposés de ladite feuille en mouvement dans ladite deuxième desdites lignes de contact et faire tourner ledit rouleau de transport dans une direction inverse de façon à transporter ladite feuille depuis ladite position de traitement au travers dudit canal de guidage à l'intérieur de l'autre desdits chemins de sortie de feuille.

3. Procédé selon la revendication 2, comprenant par ailleurs l'étape consistant à déplacer ladite feuille en prise avec ledit rouleau de transport (50) dans des chemins de sortie espacés verticalement qui s'étendent en dessus et en dessous dudit rouleau de transport vers une position de sortie de feuille traitée en utilisant des rouleaux pinceurs espacés verticalement (62, 64) en prise avec ledit rouleau de transport pour composer lesdites lignes de contact.

4. Procédé selon la revendication 3, dans lequel ledit traitement comprend une numérisation de supports sous forme de feuilles.

5. Procédé selon la revendication 3, dans lequel ledit traitement comprend une impression de supports sous forme de feuilles.

6. Appareil de traitement de supports sous forme de feuilles, qui comprend :

a) un support d'entrée de support sous forme de feuille (12) ;
b) un dispositif de traitement de support sous forme de feuille (14) ;
c) un support de support sous forme de feuille traitée (34) ;
d) des guides de feuille (27, 28) définissant un chemin de transport de support qui s'étend depuis ledit support d'entrée jusqu'au support de support sous forme de feuille traitée en passant par ledit dispositif de traitement ;
e) des moyens de transport de feuille (40, 42, 50) pour déplacer des supports individuels sous forme de feuilles le long dudit chemin, lesdits moyens de transport de feuille (40, 42, 50) comprenant un rouleau de transport de feuille mené (50) ; et
f) un embrayage à porte active et à traction d'avance de feuille (70) qui comprend un canal d'avance de feuille (82) qui peut se déplacer sur le chemin de transport de support sous forme de feuille à l'intérieur d'un espace entre une branche d'entrée et des première et deuxième branches de sortie ;
g) une première ligne de contact dans la première branche de sortie, formée par une mise en prise dudit rouleau de transport de feuille avec une première surface opposée, et une deuxième ligne de contact dans la deuxième branche de sortie, formée par une mise en prise dudit rouleau de transport de feuille avec une deuxième surface opposée ;

lesdits moyens de transport de feuille comprenant par ailleurs un dispositif d'entraînement motorisé pour faire tourner ledit rouleau de transport dans des directions opposées de façon à déplacer ledit bord avant de ladite feuille le long d'une branche de sortie sélectionnée, ledit embrayage à porte active et à traction (70) étant en prise avec ledit rouleau de transport (50) afin de déplacer ledit canal d'avance de feuille (82) de façon à ce qu'il s'étende depuis

ladite entrée vers l'une sélectionnée desdites première et deuxième branches de sortie.

7. Appareil de traitement de feuilles selon la revendication 6, dans lequel ledit embrayage à porte active et à traction comprend une paire de plaques d'extrémité (72, 74), ainsi que des premier et deuxième guides de feuille (80, 90) qui s'étendent entre lesdites plaques d'extrémité définissant ainsi ledit canal d'avance entre elles, lesdites plaques d'extrémité étant montées pour un mouvement de pivotement autour d'un axe commun parallèle à l'axe dudit rouleau de transport de feuille, ladite entrée de ladite porte étant proximale au dit axe.

8. Appareil de traitement de feuilles selon la revendication 7, dans lequel lesdits guides de feuille (80, 90) comprennent des portions sensiblement parallèles définissant ledit canal d'avance de feuille.

9. Appareil de traitement de feuilles selon la revendication 8, dans lequel un desdits guides de feuille comprend par ailleurs une portion pour guider des supports sous forme de feuilles vers ledit dispositif de traitement de supports sous forme de feuilles.

10. Appareil de traitement de feuilles selon la revendication 9, dans lequel ledit rouleau de transport (50) comprend une pluralité de rouleaux de transport de feuille alignés axialement, et comprenant par ailleurs des rouleaux pinceurs (62) en prise en surface avec au moins certains desdits rouleaux de transport (50) de façon à définir une ligne de contact pour recevoir un bord avant d'un support sous forme de feuille et pour déplacer ledit bord avant le long d'une première desdites branches de sortie.

11. Appareil de traitement de feuilles selon la revendication 10, comprenant par ailleurs des deuxièmes rouleaux pinceurs (64) en prise en surface avec au moins certains desdits rouleaux de transport (50) de façon à définir une deuxième ligne de contact pour recevoir un bord avant d'un support sous forme de feuille et pour déplacer ledit bord avant le long d'une deuxième desdites branches de sortie.

12. Appareil de traitement de feuilles selon la revendication 11, comprenant par ailleurs des guides fixes proximaux aux dits rouleaux pinceurs pour guider un support sous forme de feuille à l'intérieur desdites branches de sortie.

13. Appareil de traitement de feuilles selon la revendication 12, dans lequel lesdits rouleaux pinceurs sont sollicités en prise avec lesdits rouleaux d'entraînement.

14. Appareil de traitement de feuilles selon la revendication 12, dans lequel ledit dispositif de traitement comprend un numériseur.

15. Appareil de traitement de feuilles selon la revendication 12, dans lequel ledit dispositif de traitement comprend une imprimante.

16. Appareil de traitement de feuilles selon la revendication 6, dans lequel lesdits moyens de transport de feuille comprennent un dispositif de fourniture d'un support sous forme de feuille pour fournir des supports individuels sous forme de feuilles à partir d'une pile sur ledit support d'entrée à l'intérieur dudit chemin de transport de support sous forme de feuille.

FIG. 1A

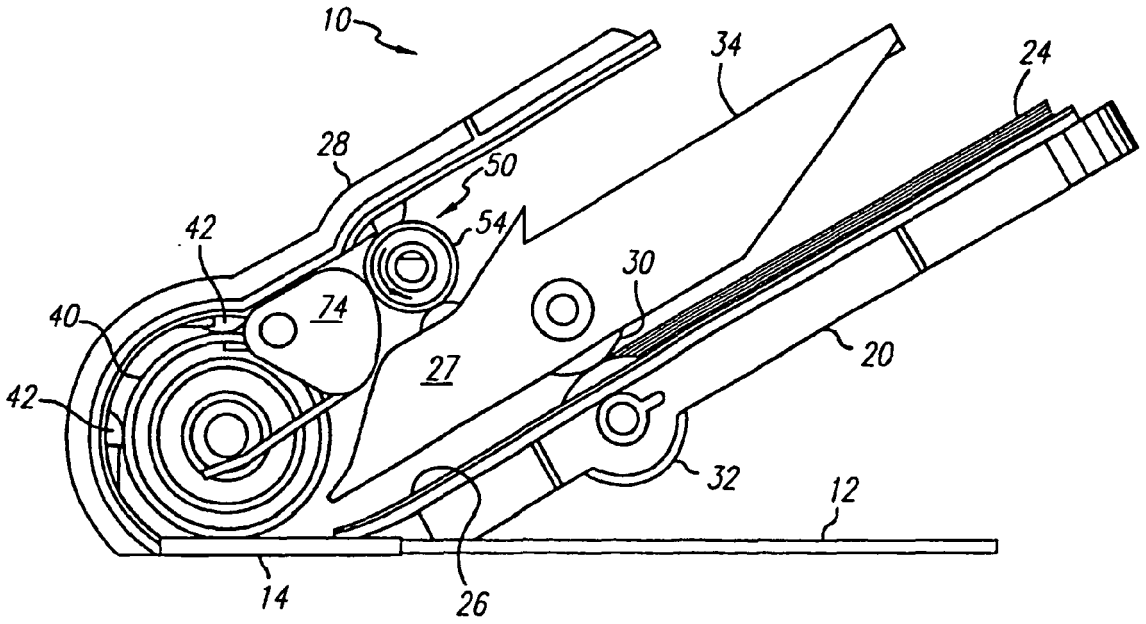


FIG. 1B

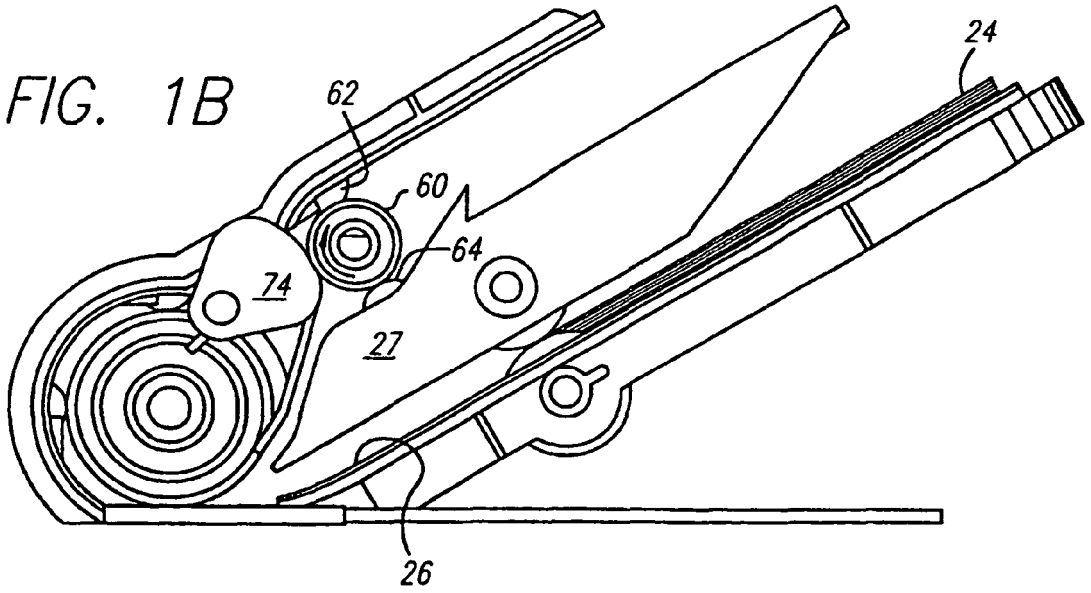
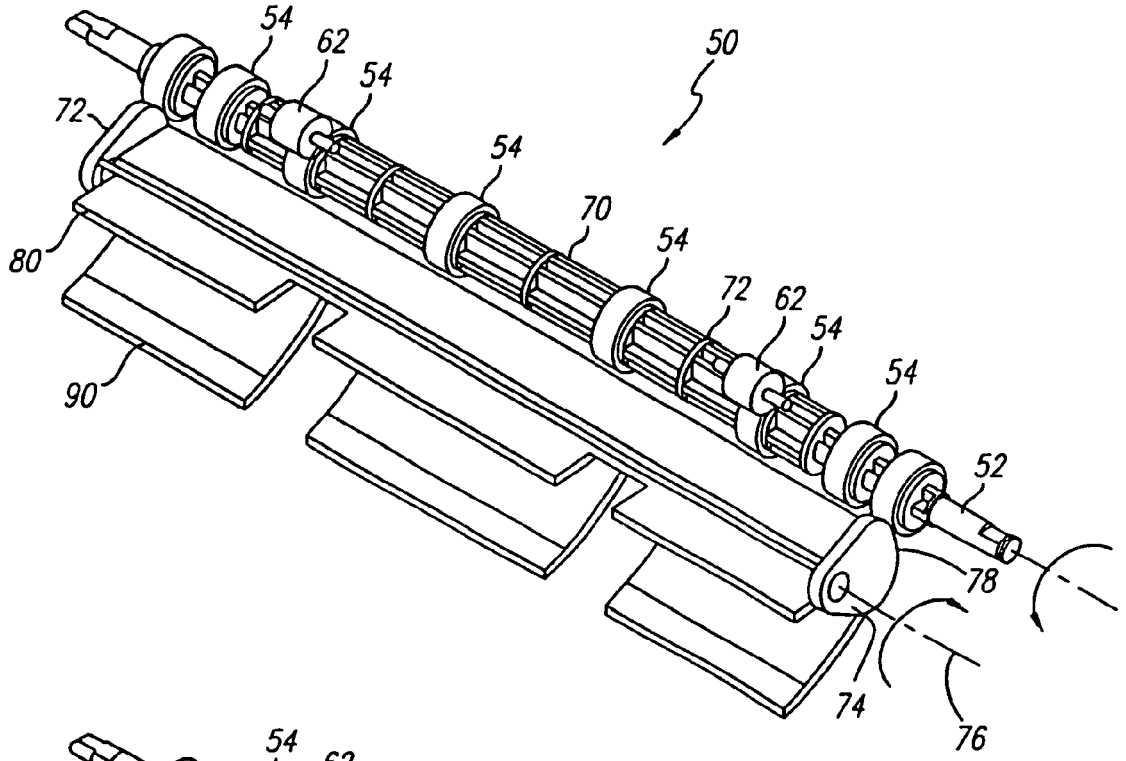


FIG. 2A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76

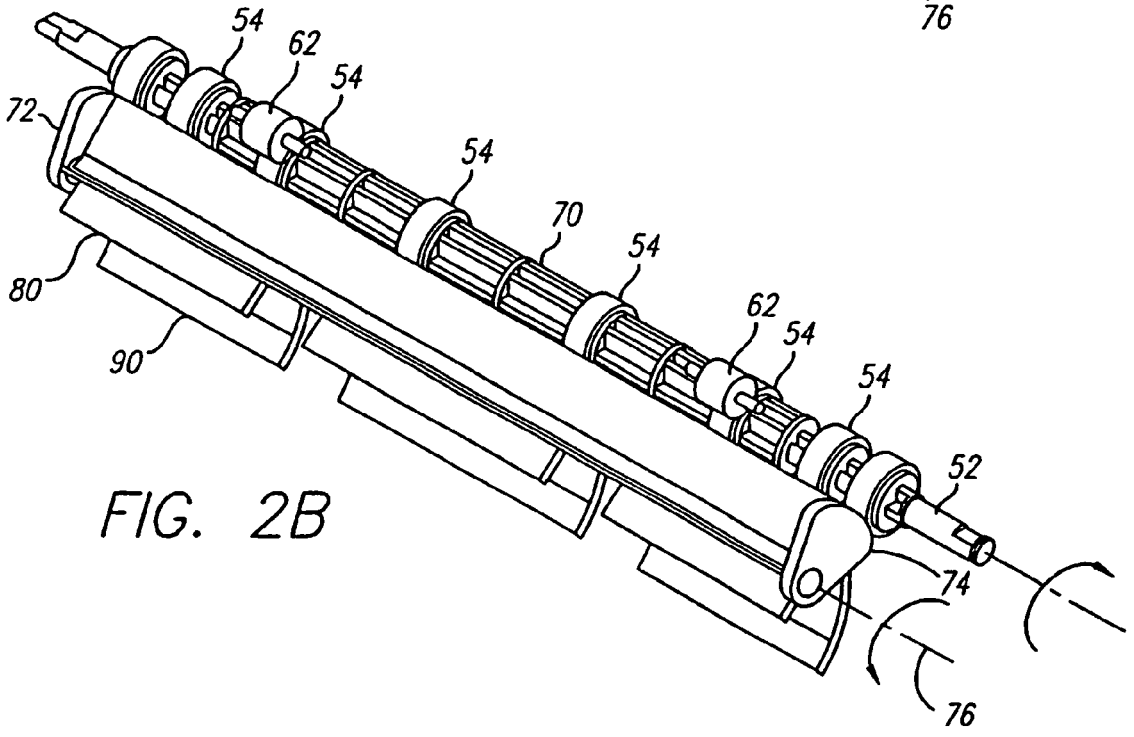
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FIG. 2B

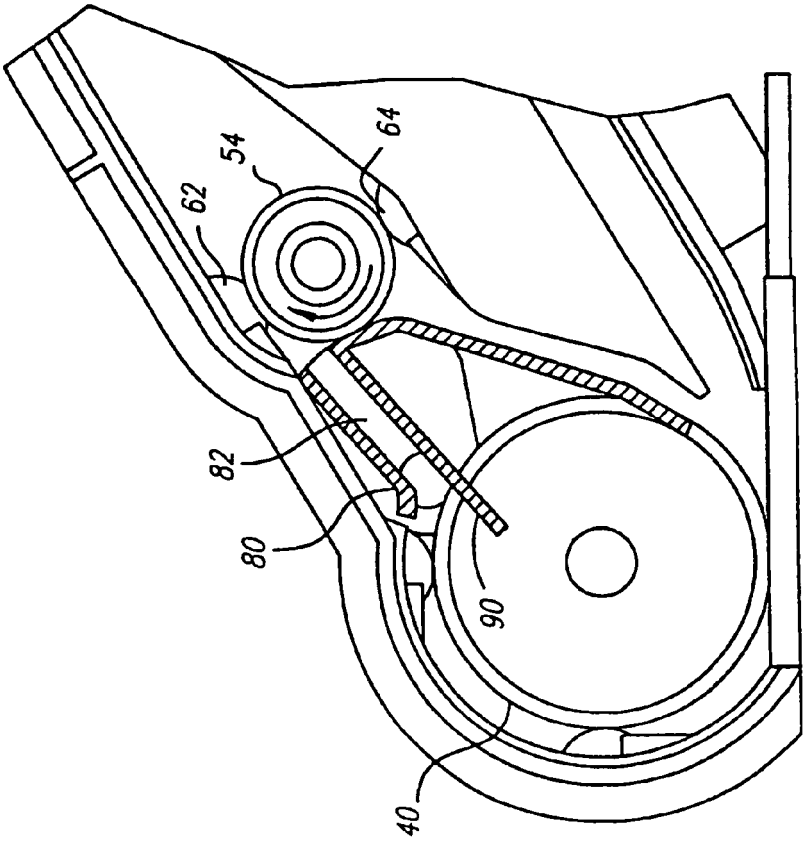

FIG. 3A

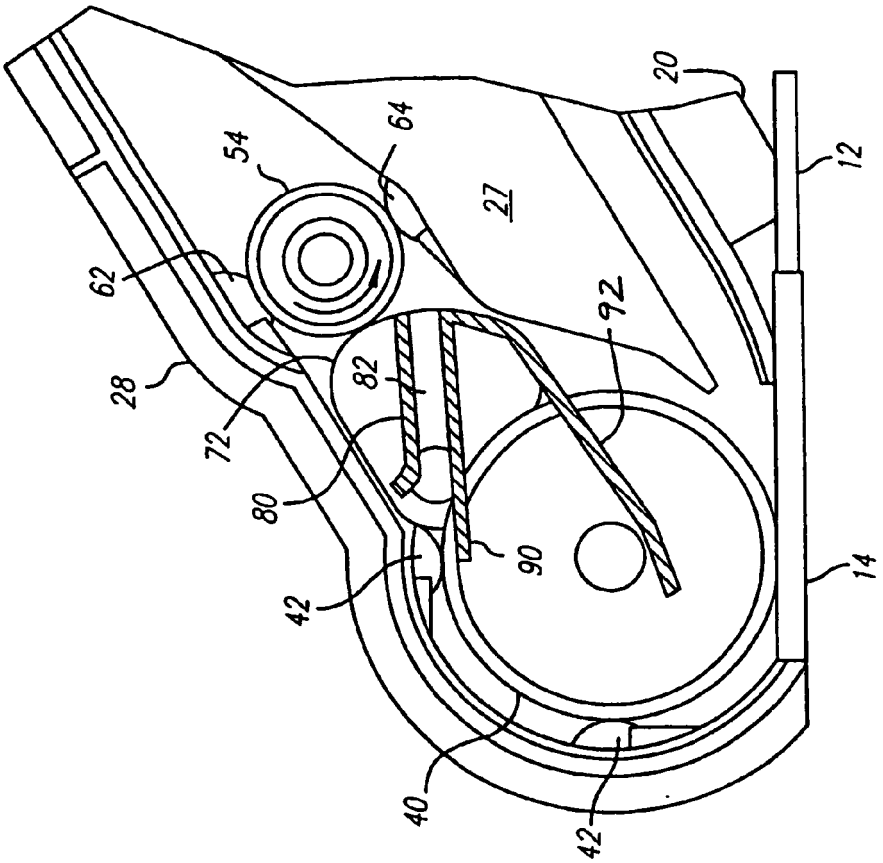

FIG. 3B

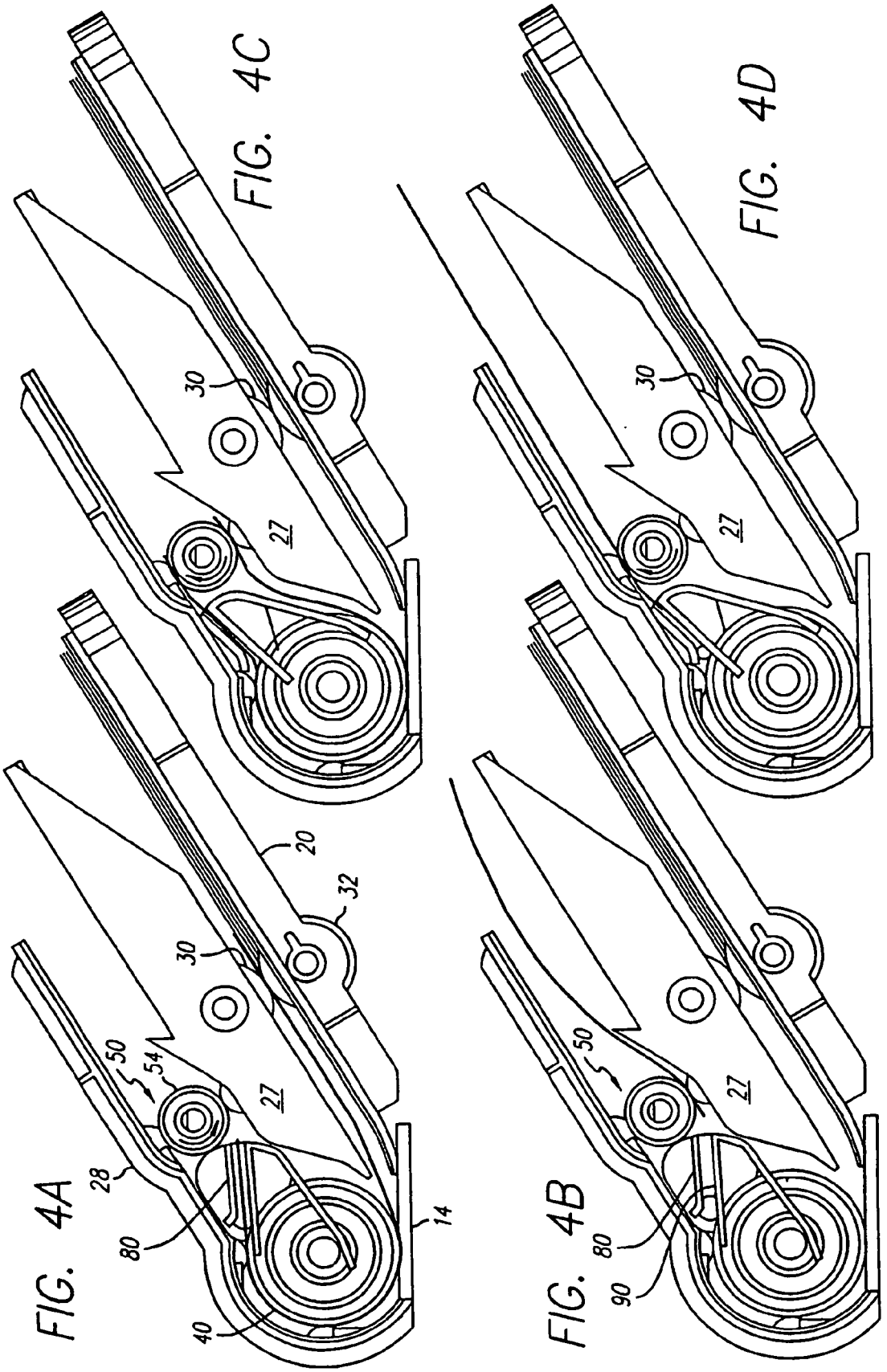
FIG. 4A
28
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FIG. 4B
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FIG. 4C
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FIG. 4D
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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- WO 09405991 A **[0008]**