United States Patent

[11] 3,626,846

[72] Inventors **Albert C. Wiegert; Casimir Nawrocki, both of 901 Elmgrove Road, Rochester, N.Y. 14650**

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[73] Assignee **Eastman Kodak Company Rochester, N.Y.**

[54] **APPARATUS FOR PRINTING INDICIA ON A SERIES OF DOCUMENTS**
6 Claims, 10 Drawing Figs.

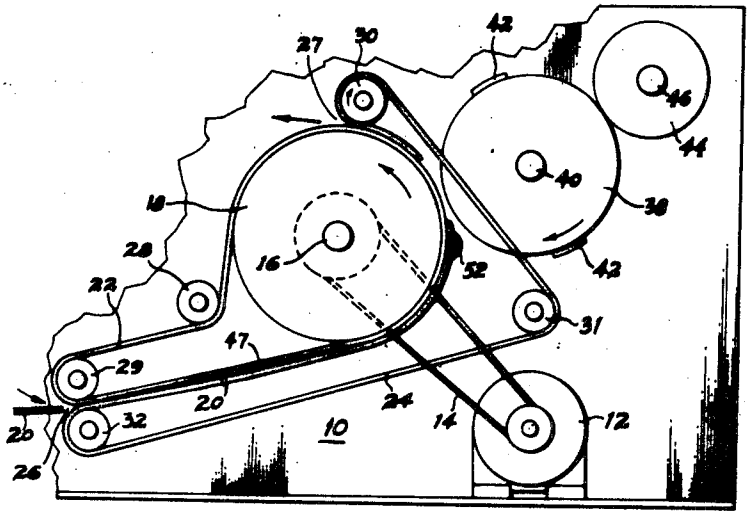
[52] **U.S. Cl.** **101/233,** 101/DIG. 3, 101/234
[51] **Int. Cl.** **B41f 13/20,** B41f 13/26
[50] **Field of Search** ..... 101/233–237, DIG. 3

[56] **References Cited**
UNITED STATES PATENTS

323,799	1885	Ethridge	101/237
688,214	12/1901	Waite	101/233
1,633,245	6/1927	Eskholme	101/235
1,726,449	8/1929	Oman	101/233 X
2,120,247	6/1938	Funk et al.	101/235 X
2,380,331	7/1945	Ryan et al.	101/233
2,443,791	6/1948	Ielfield	101/235
2,567,493	9/1951	Oden	101/235
2,950,675	8/1960	Copping et al.	101/236
3,037,447	6/1962	Gonzalez et al.	101/235 X
3,142,246	7/1964	Ross	101/233 X

Primary Examiner—Clyde I. Coughenour
Attorneys—Robert W. Hampton and R. Lewis Gable

ABSTRACT: Apparatus is disclosed for disposing indicia on a plurality of documents as they are moved through the apparatus. The apparatus includes a feed path along which the plurality of documents are moved one at a time, a printing member for placing indicia on the documents as they are fed along the feed path, and a backup member movable from a first, retracted position in response to the passage of a document to a second engaging position in which the backup member serves to support the document as suitable indicia are placed thereon by the printing member.



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5 Sheets-Sheet 1

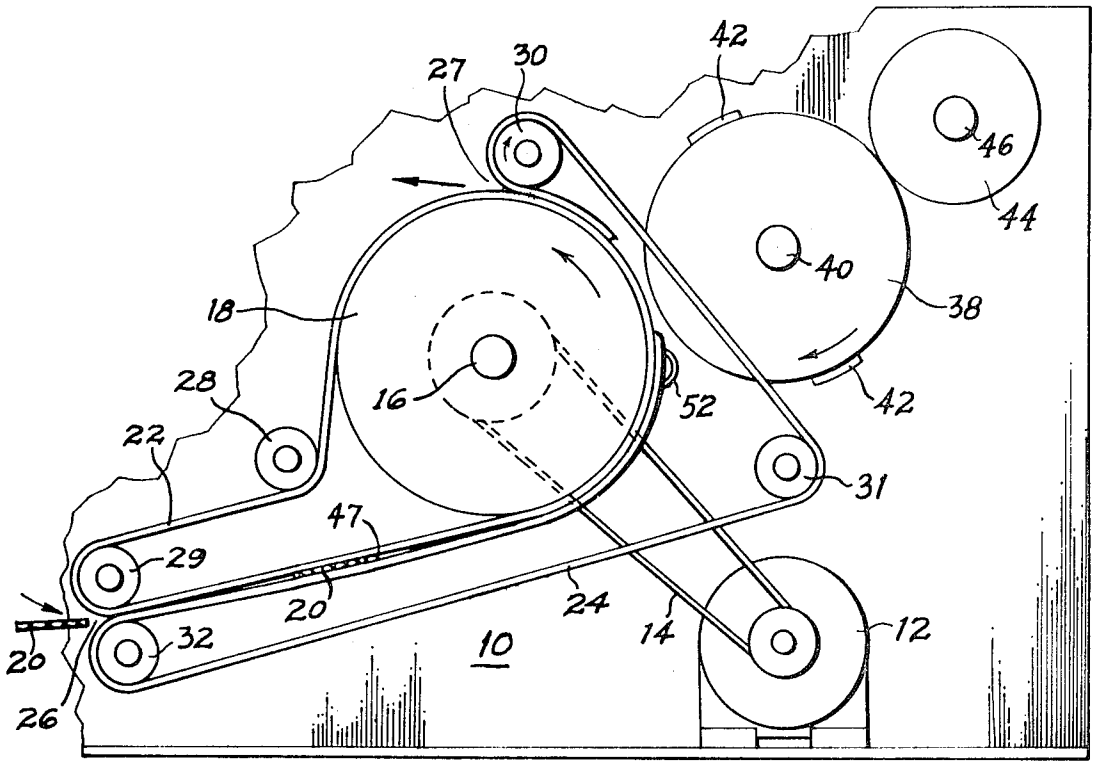


Fig. 1

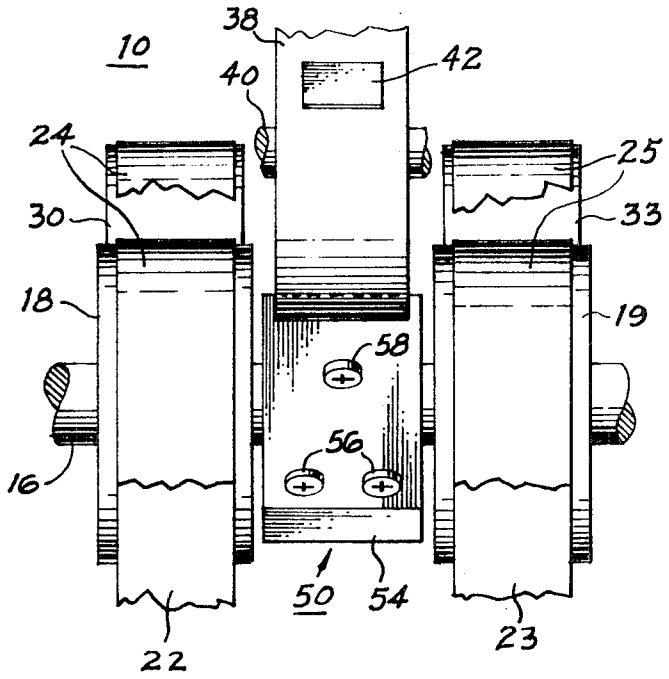


Fig. 2

ALBERT C. WIEGERT
CASIMIR NAWROCKI
INVENTORS

BY

R. Lewis Gable
Robert W Hampton

ATTORNEYS

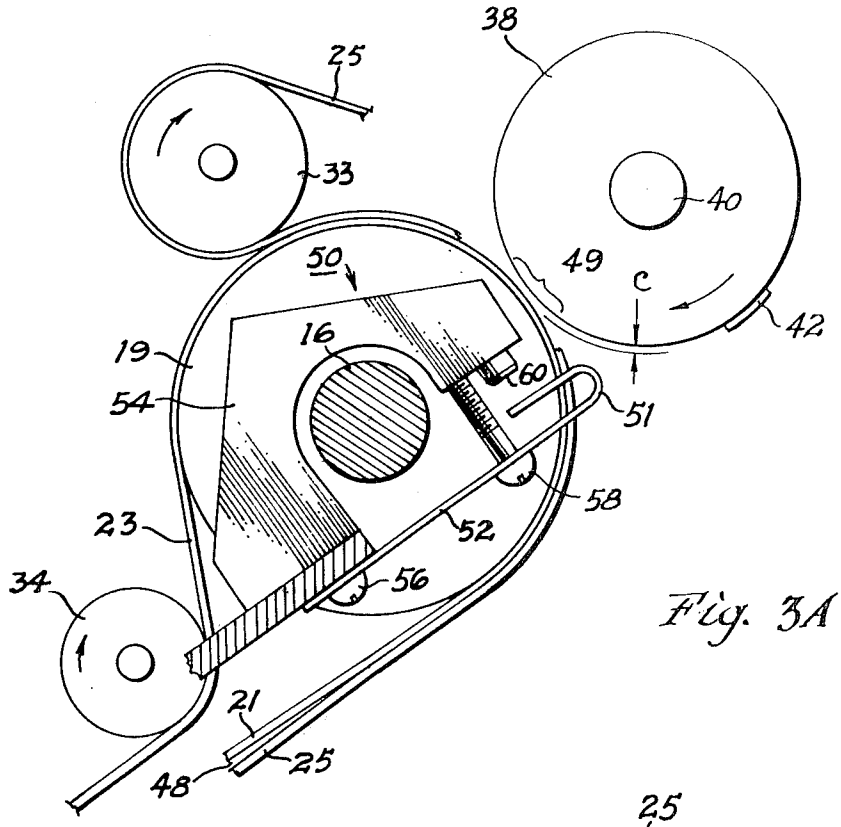


Fig. 3A

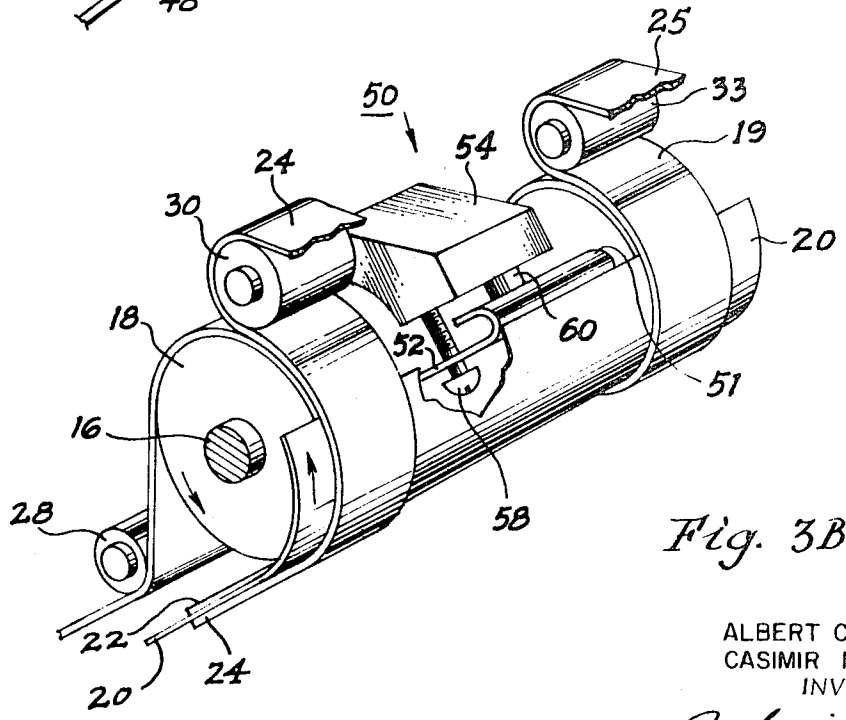


Fig. 3B

ALBERT C. WIEGERT
CASIMIR NAWROCKI
INVENTORS

BY R. Lewis Gable
Robert W Hampton
ATTORNEYS

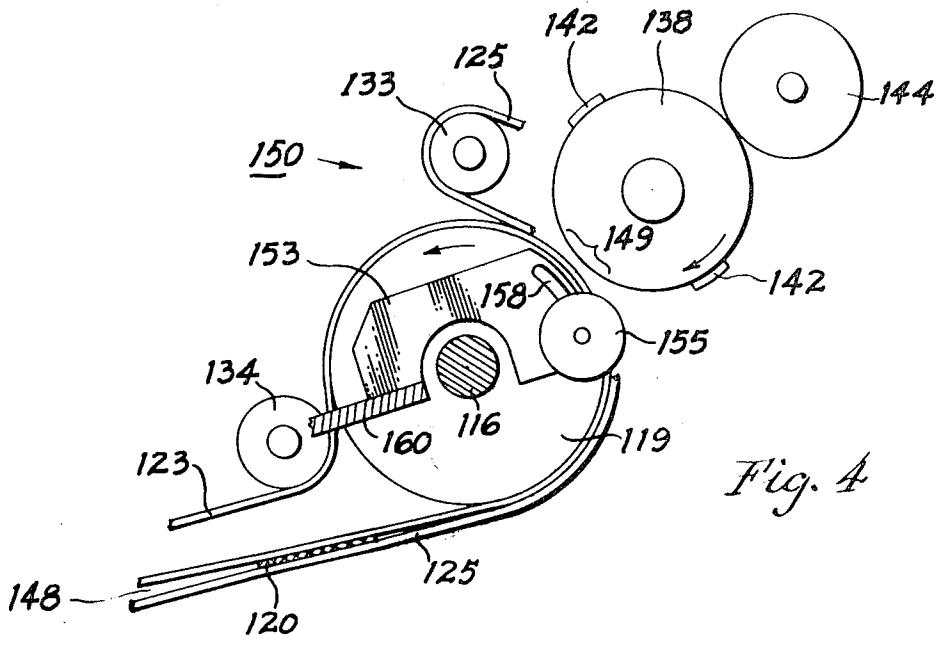


Fig. 4

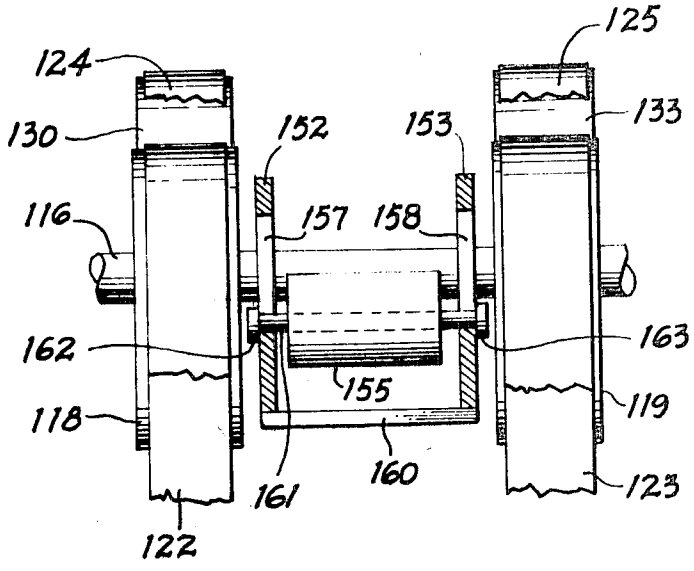


Fig. 5

ALBERT C. WIEGERT
CASIMIR NAWROCKI
INVENTORS

BY R. Lewis Gable
Robert W Hampton

ATTORNEYS

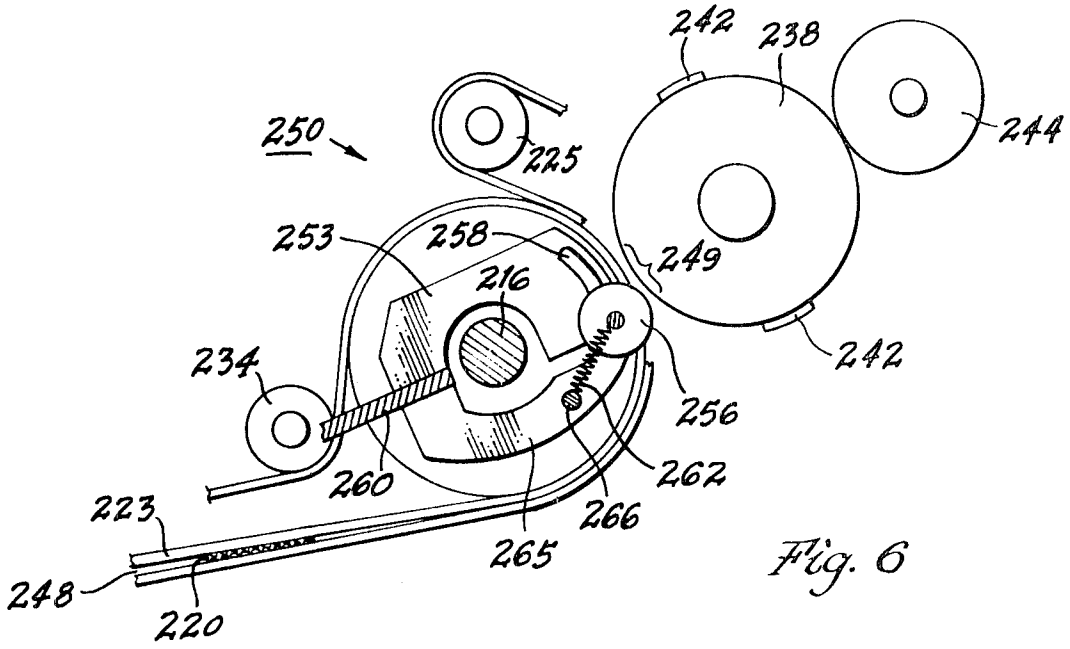


Fig. 6

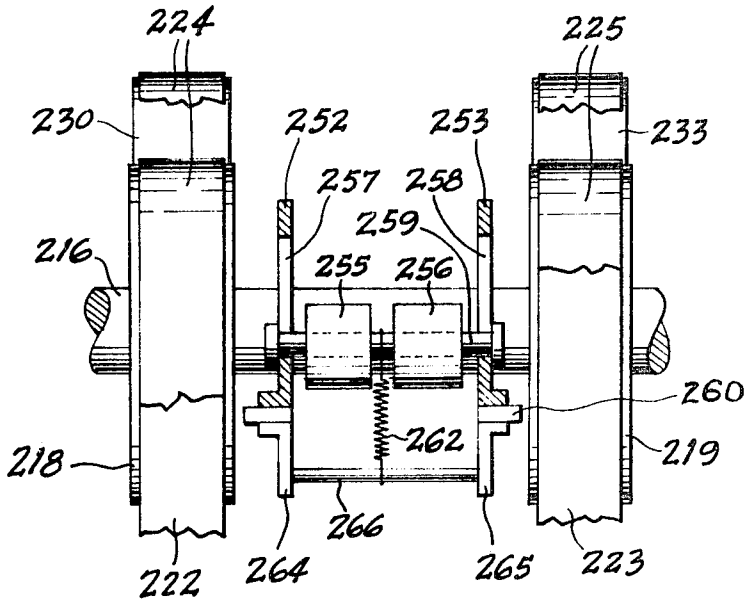


Fig. 7

ALBERT C. WIEGERT
CASIMIR NAWROCKI
INVENTORS

BY R. Lewis Gable
Robert W Hampton
ATTORNEYS

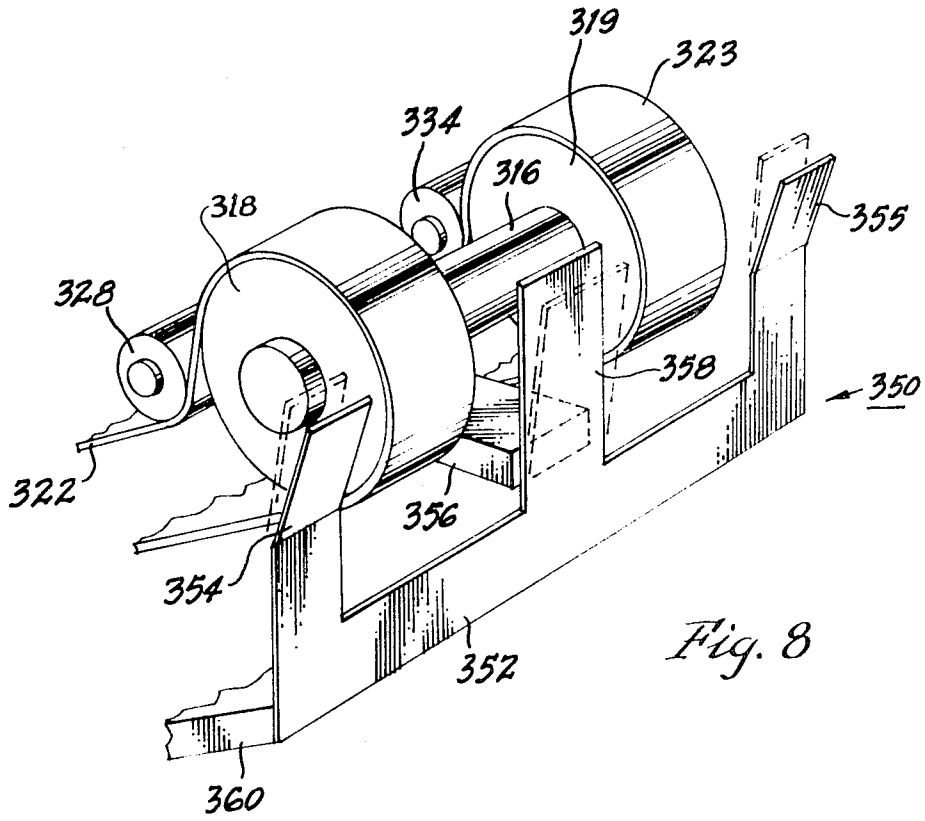


Fig. 8

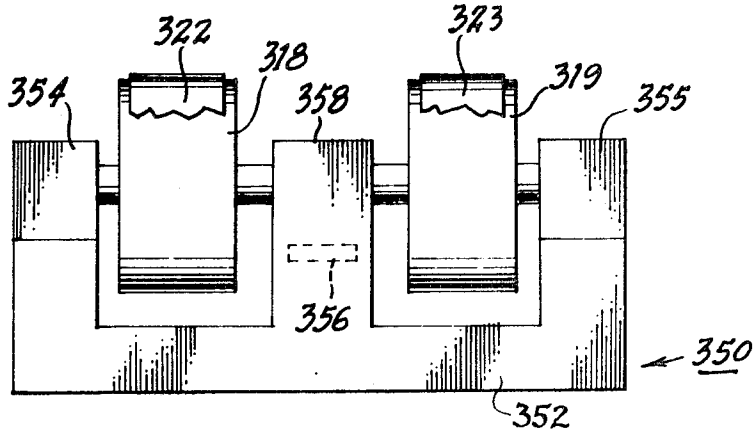


Fig. 9

ALBERT C. WIEGERT
CASIMIR NAWROCKI
INVENTORS

BY R. Lewis Gable
Robert W Hampton
ATTORNEYS

APPARATUS FOR PRINTING INDICIA ON A SERIES OF DOCUMENTS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to apparatus for handling a plurality of documents and, more particularly, to such apparatus for disposing indicia onto the plurality of documents.

2. Description of the Prior Art

In apparatus for reproducing documents such as checks, it is often desirable to print indicia on the back of the document before it is photographed. More specifically, reproducing apparatus such as microfilmers are adapted to receive a stack of documents and to photographically record the documents one at a time onto a strip of photosensitive material. Typically, such apparatus includes a document handling mechanism for receiving a stack of documents and for feeding them along a path one at a time, and a camera mechanism for photographing the documents one at a time as they pass an exposure station.

Typically, suitable indicia may be applied to the document by an array of characters or type upon which an inking medium has been coated. Such printing members may typically take the form of a roller with characters or type disposed thereon. Illustratively, the roller is rotated to bring the type into contact with the document and to thereby dispose the desired indicia on the document. One problem arising with the use of type to apply ink, is that the ink or printing medium transferred to the character type may be accidentally transferred to the mechanism for handling the documents or to the documents themselves. As a result, the handling mechanism may be clogged or dirtied with ink and additionally, the document may be blemished with ink smudges or spots. One possible solution would be to mount the printing roller so as to move from a first position remote from the documents to be imprinted to a second position where at a printing member may come into contact with the documents. Typically, the imprint roller could be moved from the supporting to the retracted positions by a solenoid. However, it would be necessary for the operator to actuate the solenoid each time it was desired to place indicia on the document or to provide a suitable mechanism for detecting the presence of the document as it is fed to the printing station and for actuating the printing member.

Therefore, it is an object of this invention to substantially eliminate the undesired transfer of the inking medium onto the handling mechanism and/or the document to be printed.

It is a further object of this invention to selectively provide a backing to the documents to be printed as the document is being disposed in a position to be printed.

SUMMARY OF THE INVENTION

These and other objects are accomplished in accordance with the teachings of this invention by a document printing assembly including a document-carrying mechanism for moving a plurality of documents past a printing station, a printing assembly for placing indicia on the documents as they pass the printing station, and a backup member movable from a first, remote position in response to the movement of a document to the printing station, to a second position to provide support to the document as the indicia is being placed or printed thereon by the printing assembly.

In one illustrative embodiment, the backup member may take the form of a flexible member disposed in the path along which the documents are directed and which is moved from its first position under the influence of the document as it is directed through the printing station. In other illustrative embodiments, the backup assembly may take the form of a roller which is biased by spring means or by gravity to its inoperative position and which is moved under the influence of the document to its second operative position.

The invention and its objects and advantages, will become more apparent in the detailed description of the preferred embodiments presented below.

BRIEF DESCRIPTION OF THE DRAWING

In the detailed description of the preferred embodiments of the invention presented below, reference is made to the accompanying drawing, in which:

FIG. 1 is a side view of a document printing assembly in accordance with the teachings of this invention;

FIG. 2 is a partial, front view showing how the flexible member is mounted on the assembly shown in FIG. 1;

FIGS. 3A and B are respectively an enlarged, sectioned side view, and a perspective view of the printing assembly shown in FIG. 1;

FIGS. 4 and 5 are respectively a sectioned, side view, and a front view of an alternative embodiment of this invention utilizing a gravity biased, backup roller;

FIGS. 6 and 7 are respectively a sectioned, side view and a front view of an alternative embodiment of this invention in which a backup roller is spring biased to its inoperative position; and

FIGS. 8 and 9 are respectively an orthogonal and front view of an alternative embodiment of this invention in which a backup finger is flexed to an operative position in response to the passage of a document to be printed.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings and in particular to FIGS. 1 and 2, there is shown a document printing assembly **10** including a drive means **12** which may take the form of a motor, which is connected to a drive shaft **16** by a drive belt **14**. A pair of drive pulleys **18** and **19** are connected to the drive shaft **16** to rotate therewith under the influence of the drive means **12**. A pair of conveyor belts **22** and **23** are respectively disposed about and driven by the drive pulleys **18** and **19**. As shown particularly in FIG. **1**, the conveyor belt **22** is disposed about the drive pulley **18** and the idler pulleys **29** and **28** in a configuration as shown in FIG. **1**. It may be understood that that conveyor belt **23** is disposed about the drive pulley **19**, a first idler pulley **34** and a second idler pulley (not shown) in a similar manner. Further, a second pair of conveyor belts **24** and **25** are disposed, as shown in FIGS. **1** and **2**, to form respectively feed paths **47** and **48** with conveyor belt **22** and **23**. More specifically, the conveyor belts **24** and **25** are superimposed respectively over conveyor belts **22** and **23** so as to be driven respectively by the conveyor belts **22** and **23**, which are driven by the pulleys **18** and **19**. The conveyor belts **24** and **25** are disposed about the curvature of the drive pulleys **18** and **19**. The conveyor belt **24** is suspended about idler pulleys **30, 31** and **32** as shown in FIG. **1**, and the conveyor belt **25** is suspended about three idler pulleys (only idler pulley **33** is shown) in a similar fashion. As shown in FIG. **1**, a plurality of documents **20** may be fed along the feed paths **47** and **48** from an input station **26** between the conveyor belts **22** and **25**, and **23** and **24** to an output station **27**. It may be understood as indicated in FIG. **3B** that each of the documents **20** is held between both of the pairs of belts **22** and **24** and **23** and **25** as they are passed from the input station **26** to the output station **27**.

As the plurality of documents **20** are moved along the feed paths **47** and **48**, the center portions of documents **20** will be directed to a printing station **49** and into contact with a printing roller or member **38** which is rotated to bring one of a plurality of print characters **42** into contact with the document **20** thereby printing the desired indicia or message thereon. As shown in FIGS. **1** and **2**, the imprinting roller **38** is rotatably mounted upon a shaft **40** and is disposed between the drive pulleys **18** and **19**. In order to provide a continuous supply of inking fluid to the print characters **42**, an inking roller **44** is rotatably mounted upon a shaft **46** so that the periphery thereof abuts the periphery of the imprinting roller **38** to thereby effect a transfer of the inking medium to the print characters **42**. It may be understood that as the imprinting roller **38** is rotated under the influence of the document **20**, that the inking roller **44** will also be rotated to thereby spread the inking medium onto the characters **42**.

In accordance with the teachings of the invention, there is provided a selectively actuatable backup assembly **50** including, as shown particularly in FIGS. **3A** and **3B**, a flexible backup member **52** extending into a surface as defined by the feed paths **47** and **48** so that a rounded portion **51** thereof may intercept the documents **20** as they are directed thereby. As shown in FIGS. **3A** and **2**, the flexible backup member **52** is mounted upon the support member **54** by a plurality of screws **56**. The flexible backup member **52** is disposable from a first, remote position as determined by an adjustment screw **58** to a second position as determined by a stop screw **60**. More specifically the adjustment screw **58** may be selectively positioned to control the extent to which the rounded portion **51** extends into the surface defined by the feed paths **47** and **48**. The stop screw **60** is threadably received within a support member **54** so as to provide an abutment surface against which the flexible backup member **52** is pressed as the documents **20** are moved thereby.

In operation, a plurality of documents **20** are fed one at a time into the input station **26** and between the conveyor belts **22** and **23**, and **24** and **25**. As the documents **20** are moved along by the conveyor belts, the leading edge of a document **20** will engage the rounded portion **51** of the flexible backup member **52** to thereby dispose the member **52** from its first remote position to its second, supporting position against the stop screw **60**. As shown in FIGS. **3A** and **3B**, the flexible backup member **52** functions to support and to press the document **20** radially outward from the drive pulleys **18** and **19** and toward the roller **38**. More specifically, the rounded portion **51** serves to press a portion of the document **20** into engagement with the printing roller **38** thereby rotating the roller **38** and causing the characters **42** to print the desired indicia onto the document **20**. There is a selected clearance between the printing roller **38** and the path along which the documents **20** are directed, which clearance is indicated in FIG. **3A** by the letter C. By proper selection of clearance C and also the placement of the roller **38** between the pulleys **18** and **19**, the inking medium is not misapplied to the mechanism for moving the documents past the printing station **49** and/or to the documents **20** themselves. Rather, the inking medium is printed on the documents **20** as they pass the printing station **49** to thereby activate the backup member **52** to its operative position. Once the document **20** has passed the printing station **49**, the flexible backup member **52** is again free to return to its first inoperative position and the printing roller **38** remains out of contact with the member **52** and the mechanism for moving the documents **20** past the printing station **49**.

Referring now to FIGS. **4** and **5**, there is shown another embodiment of this invention in which a backup assembly **150** includes a backup roller **155** which moves from a first remote position under the influence of a document **120** as it is moved past a printing station **149** to a second supporting position in which a backup roller **155** serves to press the document **120** out from a surface as defined by a feed path **148**. The roller **155** is supported upon a shaft **161** which is in turn disposed through a pair of openings **157** and **158** within support plates **152** and **153** respectively. A pair of retaining lugs **162** and **163** retain the roller **155** with respect to the support plates **152** and **153**. The support plates **152** and **153** are mounted upon a support member **160** by suitable means known in the art. In operation, the documents **120** are fed by conveyor belts **122** and **125**, and **123** and **125** along the path **148** so that the leading edge of the document **120** engages the roller **155** moving the roller **155** to its second or supporting position. In addition, the document **120** is pressed by the roller **155** into engagement with a printing roller **138** to thereby rotate the printing characters **142** and to print indicia on the documents **120**. After the document **120** has passed the printing station **149**, the roller **155** moves back to its first remote position under the influence of gravity.

Referring now to FIGS. **6** and **7**, there is shown another embodiment of this invention similar to that shown in FIGS. **4** and **5**. In particular, a backup assembly **250** is shown including a pair of backup rollers **255** and **256** which are disposed or biased to their first or remote position by a spring or flexible biasing means **262**. The pair of backup rollers **255** and **256** are mounted upon a shaft **259**, which in turn is disposed through openings **257** and **258** within support plates **252** and **253** respectively. The backup rollers **255** and **256** are movable along the path as determined by the openings **257** and **258** as the documents **220** are moved through a printing station **249**. The spring biasing means **262** is connected at one end to the shaft **259** and at another end to a rod **266** supported between a pair of support plates **264** and **265**. The support plates **264** and **265** and **252** and **253** are mounted and secured by suitable means to a support member **260**. In operation, the document **220** engages the backup rollers **255** and **256** as the document is moved past the printing station **249** to thereby move the document **220** into contact with a rotatable printing roller **238** and to bring print characters **242** disposed on the periphery of the roller **238** into contact with the document **220**. As the characters **242** contact the document **220**, indicia is printed onto the document. Under the influence of the conveyor belts, the document **220** is moved past the printing station **249** thereby allowing the backup roller **255** and **256** to return to their first or retracted position under the influence of the spring-biasing means **262**.

Referring now to FIGS. **8** and **9**, there is shown a further illustrative embodiment of this invention including a backup assembly **350** having a backup member **352** for selectively supporting documents against a printing roller (similar to that discussed above). The backup member **352** includes a plurality of actuating fingers **354** and **355** which extend into a surface along which the document is moved to thereby deflect the actuating finger **354** and **355** to a second position shown in dotted lines in FIG. **8**. The backup member **352** also includes a support finger **358** which is moved back under the influence of the actuating fingers **354** and **355** to engage a limiting member **356**. The limiting member **356** serves to direct the support finger **358** to a second position shown in dotted line in FIG. **8** to thereby press the document into engagement with the printing roller and to thereby affect, as described above, the printing of suitable indicia onto the document. As the document is moved by conveyor belts **322** and **323**, and drive pulleys **318** and **319** past the printing station, the actuating fingers **354** and **355** will return to their initial or first position with the result that the backup finger **358** will return to its initial position remote from the printing roller and from the path along which the documents are directed. As shown in FIG. **8**, the backup member **352** is mounted upon a support member **360**.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

We claim:

1. Apparatus for printing indicia on a flexible document of the kind provided with first and second portions, said apparatus comprising:

means for engaging the first portion of such a document and for advancing a document so engaged along a predetermined path;

means for printing indicia on the second portion of an engaged document;

means for supporting said printing means at a location spaced from said predetermined path;

means for contacting and urging the second portion of an engaged document into abutment against said printing means; and

means for mounting said contacting and urging means for movement from a first position, wherein said contacting and urging means is disposed in said predetermined path and spaced from said printing means, to a second position, wherein said contacting and urging means is disposed adjacent said printing means, and in a manner such that said contacting and urging means will be moved

from said first position to said second position by an engaged document advancing along said predetermined path.

2. Apparatus as recited in claim 1, wherein said engaging and advancing means includes:

a pair of belts; and

means for supporting said pair of belts for movement of respective, successive portions thereof into contiguous relation.

3. Apparatus as recited in claim 1, wherein said contacting and urging means includes:

means for guiding the second portion of an engaged document into abutment against said printing means, and wherein said mounting means includes:

means for supporting said guiding means for movement along said predetermined path from said first position to said second position.

4. Apparatus for printing indicia on a flexible document of the kind provided with first and second portions disposed in spaced relation and with a third portion disposed between the first and second portions, said apparatus comprising:

first and second means, disposed in spaced relation, for respectively engaging the first and second portions of such a document and for advancing a document so engaged along a predetermined path;

means for printing indicia on the third portion of an engaged document;

means for supporting said printing means at a location spaced from said predetermined path;

means for contacting and urging the third portion of an engaged document out of said predetermined path and into abutment against said printing means; and

means for mounting said contacting and urging means for movement from a first position, wherein said contacting and urging means is disposed in said predetermined path and spaced from said printing means, to a second position, wherein said contacting and urging means is disposed in said predetermined path and adjacent said printing means, and in a manner such that said contacting and urging means will be moved from said first position to said second position by an engaged document advancing along said predetermined path.

5. Apparatus as recited in claim 4, wherein said contacting and urging means includes:

means defining a curving surface for guiding the third portion of an engaged document out of said predetermined path and into abutment against said printing means.

6. Apparatus as recited in claim 5, wherein said mounting means includes:

means for supporting said curving surface defining means for movement along said predetermined path from said first position to said second position.

* * * * *