July 14, 1970 R. M. PINE 3,520,404

METHOD AND APPARATUS FOR INDICATING A CHANGE WITHIN A GROUPING

Filed July 13, 1967 4 Sheets-Sheet 1

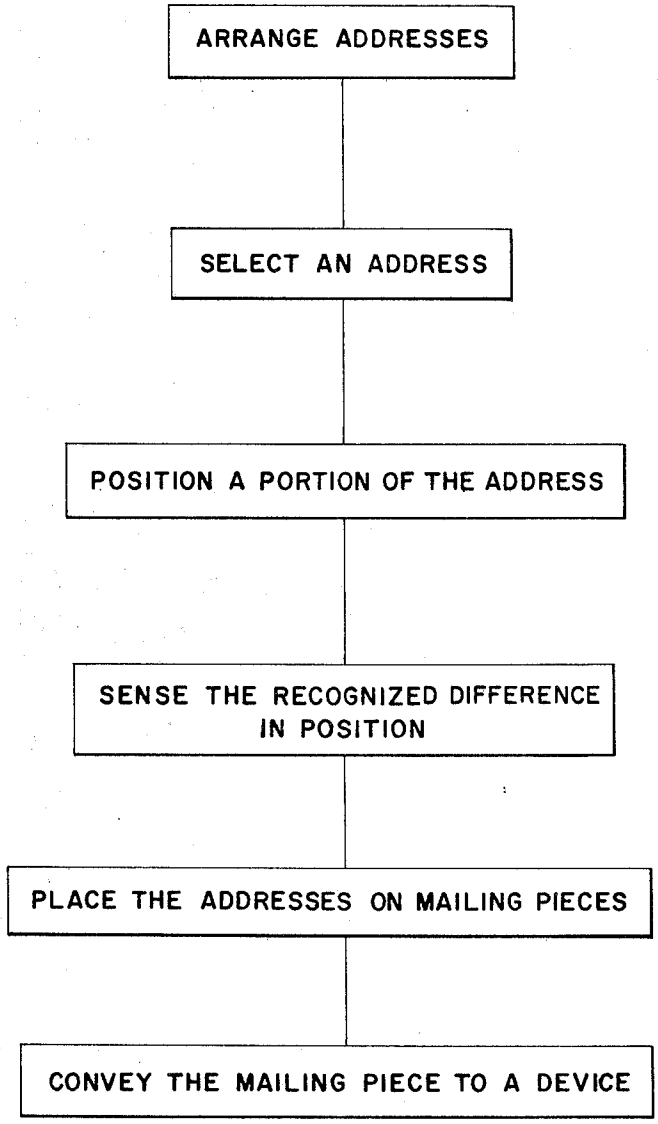

FIG. 1

INVENTOR.
ROBERT M. PINE
BY Leonard J. Uhlter
Francis P. Schneider
ATTORNEYS

July 14, 1970 R. M. PINE 3,520,404

METHOD AND APPARATUS FOR INDICATING A CHANGE WITHIN A GROUPING

Filed July 13, 1967 4 Sheets-Sheet 2

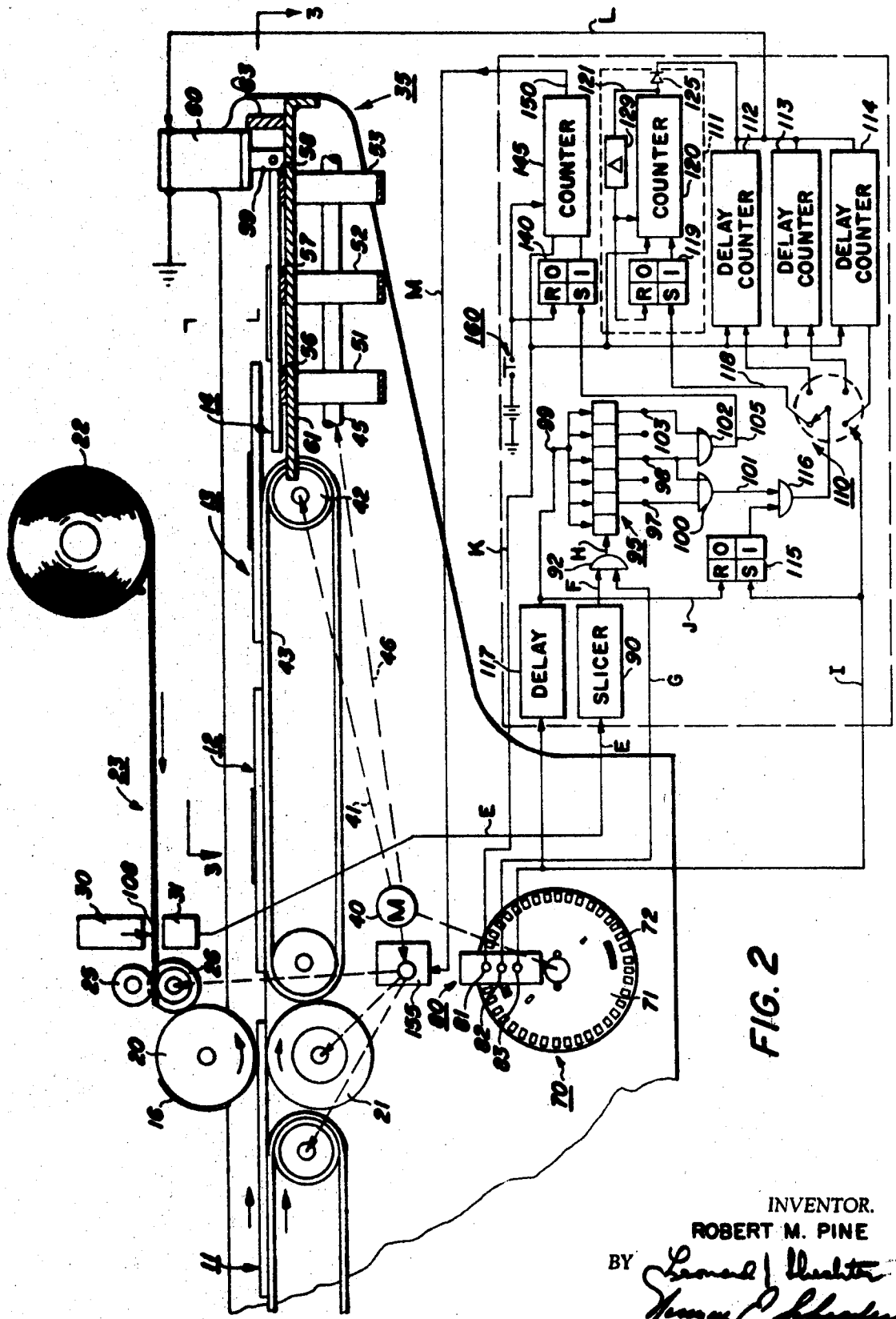

FIG. 2

INVENTOR.
ROBERT M. PINE
BY Leonard J. Hualter
Thomas P. Schneider
ATTORNEYS

July 14, 1970 R. M. PINE 3,520,404

METHOD AND APPARATUS FOR INDICATING A CHANGE WITHIN A GROUPING

Filed July 13, 1967 4 Sheets-Sheet 3

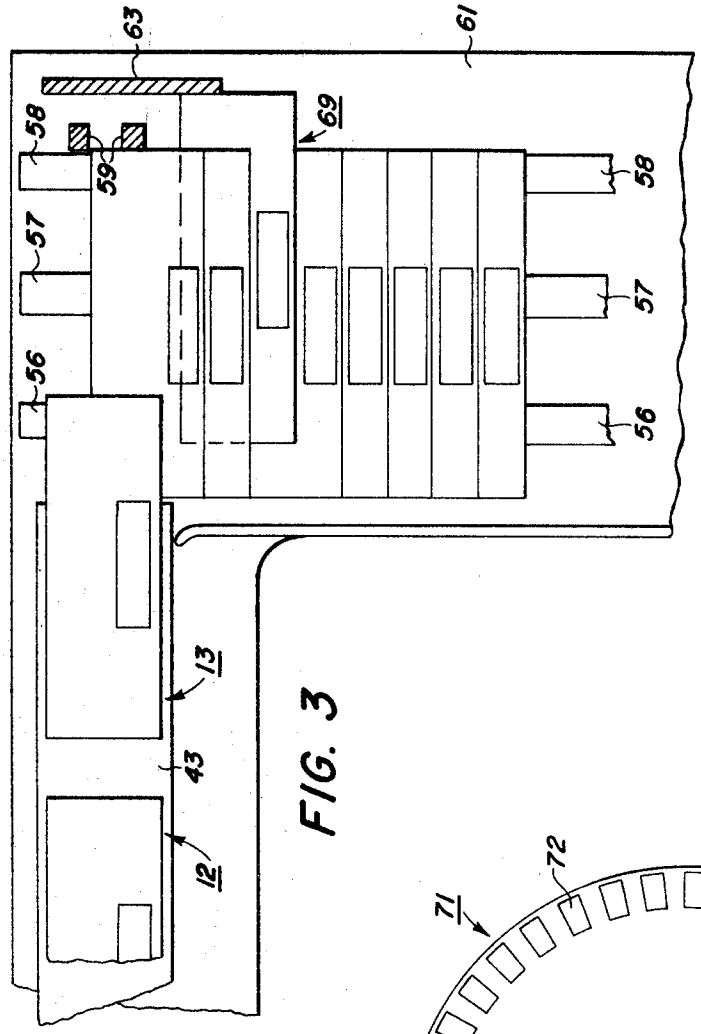

FIG. 3

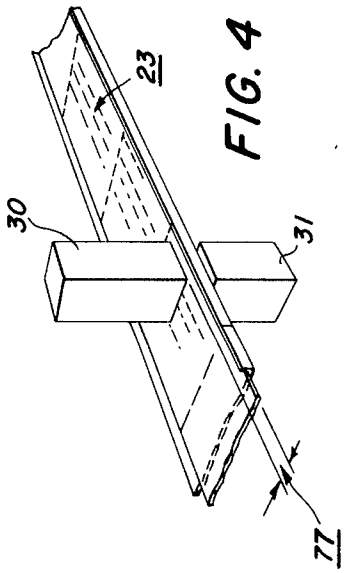

FIG. 4

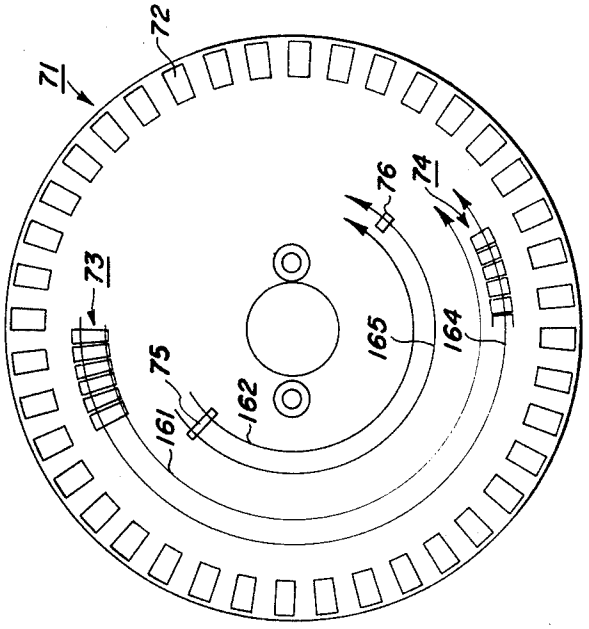

FIG. 5

INVENTOR.
ROBERT M. PINE
BY Leonard J. Shachter
Yaura P. Schwartz
ATTORNEYS

July 14, 1970 R. M. PINE 3,520,404

METHOD AND APPARATUS FOR INDICATING A CHANGE WITHIN A GROUPING

Filed July 13, 1967 4 Sheets-Sheet 4

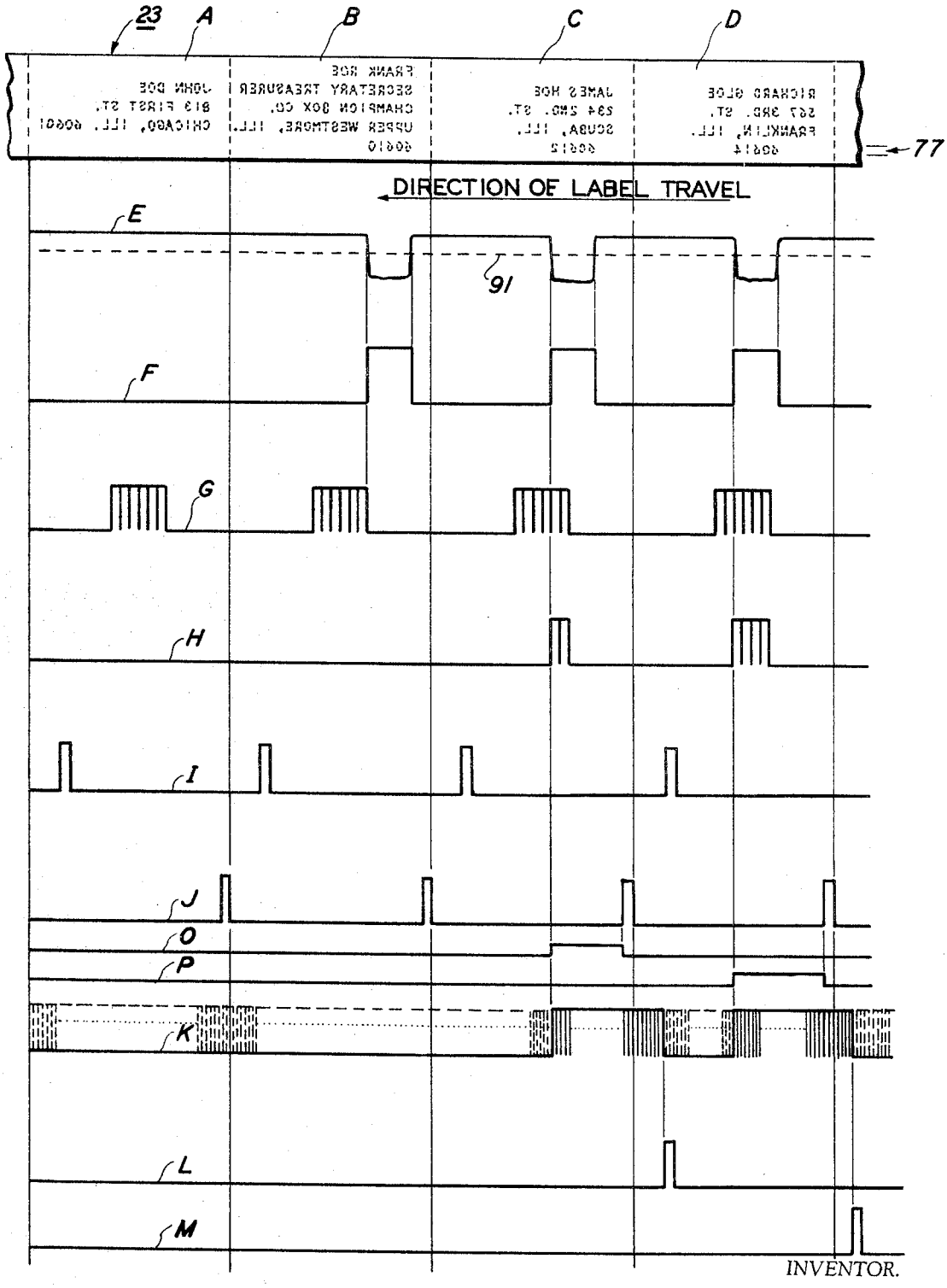

FIG. 6

INVENTOR.
ROBERT M. PINE
BY Leonard J. Shelter
James F. Schaker
ATTORNEYS

United States Patent Office 3,520,404
Patented July 14, 1970

3,520,404

METHOD AND APPARATUS FOR INDICATING A CHANGE WITHIN A GROUPING

Robert M. Pine, 9401 Home Ave.,
Des Plaines, Ill. 60016

Filed July 13, 1967, Ser. No. 653,143
Int. Cl. B07c 1/02
U.S. Cl. 209—72 14 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus for controlling the operation of an automatic addressing machine and for indicating a change within a grouping to actuate a device which, for example, can sort mailing pieces addressed thereby. The address information applied to the mailing pieces are printed by computer techniques or typed, the position of the ZIP CODE or other portion of the address being altered with respect to the remainer of the address in order to selectively control the operation of the addressing machine and the device. Photoelectric means are employed for generating electrical signals which, when compared with timing signals, indicate the relative position of the ZIP CODE. A logic circuit responsive to these signals operates in combination with timed delay units to monitor the movement of the mailing pieces and to produce signals which control the operation of the addressing and device at appropriate times.

Method for indicating a change of ZIP CODE within a grouping on mail pieces by arranging the addresses by groups, selecting either the first or last address in each group, positioning a portion of the so-selected address so that such position can be recognized and sensing the recognized difference in position.

BACKGROUND OF THE INVENTION

This invention relates to a method and machine for addressing flat mailing pieces and, more particularly, to a method and apparatus for separating a sequence of mailing pieces according to their destinations.

In order to rapidly and efficiently address large numbers of mailing pieces (such as magazines, direct mail advertising leaflets, newspapers, and the like), automatic addressing machines have been developed. An example of such an addressing machine may be found in the disclosure of U.S. Pat. 3,204,553 which issued Sept. 7, 1965 to Harry V. Kirk.

In one particularly effective addressing machine arrangement, the addresses are first imprinted by computer techniques on label sheets, however, the address could be typed on the label sheets. The machine then cuts these label sheets into individual labels and automatically places each of these labels or the image thereof on a mailing piece.

For the convenience of distribution and to comply with postal regulations, it is often necessary for the mailer to separate mailing pieces thus addressed by states or post office locations, placing each separate group in a separate mailing sack. As disclosed in U.S. Pat. No. 3,458,383 by Robert DuFour and Harry V. Kirk, this sorting operation may also be automated. At the output of many labeling machines, the mailing pieces may be "shingled"

on a conveyor in a normally aligned formation. During the addressing operation, marks may be placed on the labels of selected mailing pieces. By sensing these marks, the selected pieces may be offset with respect to the normal shingled alignment on the conveyor. If the first or last mailing piece of a sequence going to a given town or state is offset, the operator may easily separate the shingled pieces into individual bundles or groups without having to actually read the addresses.

While the mailing piece separator disclosed in the aforementioned application by Kirk and DuFour has proven to be highly efficient and dependable, it is not without disadvantages. The addition of indicating marks to the selected labels detracts from the appearance of the label and, in some instances, may conflict with bulk mailing postal regulations. Moreover, the mechanical apparatus disclosed in the Kirk and DuFour applications is both complicated and expensive.

SUMMARY OF THE INVENTION

It is accordingly an object of the present invention to automatically separate mailing pieces into groups without applying any marks specifically for separating purposes to the address label or to the mailing piece.

Another object of this invention is to improve present methods for indicating changes within groupings of mailing pieces.

A further object of this invention is to simplify and reduce the expense of automatic mailing piece separating arrangements.

In a principal aspect, the present invention takes the form of an arrangement which may be used in conjunction with automatic addressing machines for automatically separating a sequence of mailing pieces into groups according to their destinations or the like. In accordance with a principal feature of the invention, the address information is arranged in groups, the address information is placed on each of the mailing pieces in accordance with a selected one of a plurality of possible formats. Photoelectric means may then be employed for scanning at least a portion of the address information on each piece either before or after the address is placed thereon to develop an electrical signal indicative of the format selected for that piece. Means responsive to the electrical signal thus developed may then be employed for indicating the change in group to a device, for example, for separating the sequence of mailing pieces as desired.

Advantageously, format changes may take the form of a variation in placement of the addressing information on the label or piece. Preferably, the position of the ZIP CODE with respect to the remainder of the address information is varied (within limits) to identify particular mailing pieces. However, the position of any other portion of the address could be varied or the position of the entire address could be varied. A photoelectric device arranged to scan, for example, the line upon which the ZIP CODE is placed may be employed to identify the format (ZIP CODE location) used. Means responsive to the signal from the photoelectric device may then be used to discriminate between the various possible ZIP CODE placements and to signal selected operations for the sorting apparatus.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects, features and advantages of the present invention may be better understood by considering the following detailed description. In the course of this description, reference will frequently be made to the attached drawings in which:

FIG. 1 is a block diagram showing schematically the method in accordance with the invention;

FIG. 2 is a schematic representation of an arrangement for separating mailing pieces which embodies the principles of the invention;

FIG. 3 is a top plan view of a portion of the arrangement shown in FIG. 1 taken along the line 3—3 of FIG. 2;

FIG. 4 is a partial perspective view of the photoelectric sensor used in the apparatus shown in FIG. 2;

FIG. 5 is an enlarged view of a pulse generating wheel employed in the apparatus of FIG. 2; and

FIG. 6 depicts a series of waveforms which illustrate the operation of the arrangement shown in FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The method of the present invention is shown in block form in FIG. 1. The addresses within a grouping are arranged in groups according to ZIP CODE or other desired groups. This may be done manually, i.e., arrange the labels by hand or by computer, i.e., a computer can be programmed to process this information in a conventional data processing system.

An address which indicates a change in group is then selected. This could be the first or last address within a group. This step also may be done by hand or by computer as indicated above.

At least a portion of the so selected address or the entire so selected address is then positioned so that the portion so positioned can be recognized as different from that of the addresses that have not been so positioned. This may be done manually by a typewriter or may again be done by computer.

The addreses are then placed on the mailing pieces by apparatus as disclosed below.

The difference in position of the selected address is then sensed by suitable apparatus and circuiting to a device such as a mailing piece separator as disclosed below. The sensing of the difference in position can be done either before or after the addresses are placed on the mailing pieces.

The mailing pieces are then conveyed to the mailing piece separator where the mailing piece with the so selected address can be separated.

In FIG. 2, a series of mailing pieces being addressed and sorted by the apparatus are designated by reference numerals **11** through **14**. The mailing piece **11** as shown is about to receive an addressing label indicated at **16** which is carried upon a labeling drum **20**. As the drum **20** rotates, it presses label **16** against envelope **11** which is backed up by a pressure roller **21**.

The mailing pieces **12**, **13** and **14** have previously received such labels. The labels themselves are supplied from a label strip supply roll **22**. The labels on this roll have already been arranged in groups, an address selected from each group indicating a change therein and a portion of the so selected address positioned appropriately as discussed below. The labels could be arranged on computer printout or in a column. In the embodiment shown the label strip **23** which is drawn from the roll **22** by means of a cutting knife roll **25** and its associated drive capstan **26** comprises a series of successive labels separated by imaginary parting lines.

Prior to passing through the knife roll **25** and drive capstan **26**, the labeling strip **23** passes between an optical light beam source **30** and a photoelectric detector **31**. As will be discussed in detail below, the signals developed by the photoelectric sensor **31** controls the apparatus for

separating the mailing pieces which are "shingled" upon the output belt conveyer system indicated generally at **35**.

Operating power for the labeling and conveyer apparatus may be obtained from any suitable drive source, such as the electric motor indicated schematically at **40**. As indicated by the dashed line **41**, the motor **40** drives a conveyer belt drum **42** in a clockwise direction, carrying the upper half of belt **43** from left to right in order to convey the labeled mailing pieces from the labeling drum **20** to the output conveyer indicated generally **35**. The belt **43** can have timing cogs thereon to properly position the mailing pieces.

The output conveyer **35** includes a drive axle **45** which is driven directly by the motor **40** as indicated by the dashed line **46**. Three conveyer belt drums **51**, **52** and **53** are keyed to axle **45** for rotation therewith and carry output conveyer belts **56**, **57**, and **58**. The belts **56** through **58** overlay and are vertically supported by a platform **61**. In FIG. 2, the mailing piece **14** is shown positioned upon the belts **56** through **58**.

The conveyer belt **43** moves at a sufficient speed to throw the mailing pieces across the belts **56** through **58** to a positive stop normally provided by the downwardly extending gate **59** which is manipulated by a solenoid **60**. When the solenoid **60** is energized (in a manner to be discussed below), gate **59** is lifted and the mailing pieces continue further across the output conveyer **35** to the fixed stop provided by the upwardly depending flange **63**. This is commonly referred to as "a right angle" configuration, however "a left angle" could be used. With modification the entire system could operate "in line" also.

Thus, as more clearly illustrated in FIG. 3, of the drawings, selected mailing pieces may be offset with respect to the remainder of the pieces shingled upon the belts **56** through **58**. As shown in FIG. 3, the mailing piece indicated at **69** is offset with respect to the remainder of the mailing pieces. This offset condition was accomplished by temporarily lifting the solenoid operated gate **59** as the mailing piece **69** was thrown from the belt **43** across the output conveyer belts **56** through **58**.

The energization of solenoid **60** is controlled in response to electrical signals received from the photoelectric sensor **31**. The signals from sensor **31** are compared with timing signals generated by a rotating code wheel pulse generator indicated generally at **70**. Signals from the sensor **31** as well as signals from the code wheel pulse generator arrangement **70** are supplied to a logic circuit (indicated generally within the dashed-line rectangle) which provide appropriately timed pulses for energizing solenoid **60** through the logic circuit output conductor **74**.

As most clearly seen in FIG. 4 of the drawings, the optical light beam source **30** in combination with the photoelectric sensor **31** scans a single line of address information on each label in the labeling strip **23**. In the embodiment of the invention which will be described in detail hereinbelow, the bottom or "ZIP CODE" line is selected for scanning and particular labels are identified by the horizontal position of the ZIP CODE with respect to the remaining portion of the address information.

As contemplated by this embodiment of the invention, the addresses on the label strip **23** may be printed by known computer techniques. The computer imprinting arrangement may be programmed to position the ZIP CODE relative to the remainder of the address information in accordance with a set of programming rules, a typical set of which is outlined below for purposes of illustration. These rules may be better understood by referring to the addresses printed on label strip **23** as illustrated at the top of FIG. 6. (Because the strip **23** is shown "upside down," the address information appears backward and in phantom.)

(1) All addresses are to end on line 4. Therefore, all four line addresses begin on line 1, all three line addresses

begin on line 2, etc. The fifth line is normally empty—but may contain a ZIP CODE under certain conditions.

(2) Except when those conditions indicated below exist, the five digit ZIP CODE appears on line 4 and is positioned not less than two spaces nor more than six spaces after the "city-state" line ends (address A is an example of this "normal" condition):

Condition No. 1: When the "city-state" line is too long to permit placement of the ZIP CODE at the end thereof, the ZIP CODE will be placed on line 5 and begin even with the address lines above. (Address B is an example of this "overflow" condition.)

Condition No. 2: All abels having the same ZIP CODE occur in sequence and the ZIP CODE on the first label in such a sequence is placed on line 5 but shifted two spaces to the left. (Address C is an example of this "ZIP CODE change" condition.)

Condition No. 3: When it is desired to program a machine stop or other machine function a selected label may include a ZIP CODE on line 5 shifted four (but could be any figure) spaces to the left. (Address D illustrates such a "machine stop" condition.)

There may be any number of coded positions . . . each one indicated by a different amount of shifting, each one triggering a different output function.

In order for the labels to be properly applied to each mailing piece in the embodiment shown, the lettering on each label is on the underside of the label strip **23** as it is pulled from the roll **22**. One other addressing machines the lettering may be on the topside of the roll. This does not affect the principle of operation of the system but only affects where the scanner is physically positioned to scan the addresses. The labels are slightly translucent so that light from the optical beam source **30** shines through the label to the photoelectric sensor **31**. The light beam source **30** is positioned such that the beam scans the fifth address line along a path indicated generally at **77** in FIGS. 4 and 6.

Whenever ZIP CODE numerals are present in the beam path between source **30** and detector **31**, the light is somewhat obscured, reducing the magnitude of the electrical signal delivered by the sensor **31**. This effect is illustrated by the waveform shown at E on FIG. 6. (This waveform appears on the conductor indicated by the letter E in FIG. 2.) It should be noted at the onset that the photoelectric arrangement **31** employed need not be capable of distinguishing between different numerals in the ZIP CODE—so long as it can detect the presence or absence of a numeral. Thus, it should be understood that the signal generated at the output of detector **31** is indicative of the presence or absence of the ZIP CODE numeral at a particular location but does not identify the particular numerals.

The position of the ZIP CODE on each label is determined by comparing the time at which the sensor **31** develops a signal (indicative of the presence of an alphanumeric character) with an electrical timing signal developed by the rotating wheel pulse generator **70**. The generator **70** includes a windowed code wheel **71** which is driven at a constant speed in a clockwise direction by the motor **40**. Code wheel **71**, an enlarged view of which appears in FIG. 5, normally completes one revolution for each mailing piece handled by the apparatus. (As will be discussed later, when smaller mailing pieces are processed, means are employed for handling these at twice the normal rate.) As shown most clearly in FIG. 5, forty equally spaced windows are distributed about the outer periphery of the wheel **71**, one of these windows being indicated at **72**. Radially inward from the outer row of windows **72**, two arcuate rows of six windows each are positioned at **73** and **74**, the windows **73** having nearly twice the radial length of the windows **74**. Still closer to the center of the wheel **71**, two windows **75** and **76** are positioned adjacent the arcuate rows **72** and **73** respectively.

As seen in FIG. 2, a photoelectric device indicated generally at **80** is positioned adjacent rotating wheel **70** and includes three photoelectric detectors **81**, **82** and **83**. The detector **81** is positioned to receive light pulses passing through the outer row of windows **72**. Similarly, detector **82** receives light passing through the two arcuate rows of windows **73** and **74** while the third detector **83** receives light shining through the two individual windows **75** and **76**.

The photodetector **81** accordingly provides a continuous series of equally spaced optical pulses (40 pulses for each rotation of the wheel **71**). The photodetector **82** delivers two bursts of pulses for each rotation of the wheel **71**, there being six pulses in each burst. The photodetector **83** delivers a pair of pulses each of which appears shortly after the conclusion of the pulse burst delivered by photodetector **82**.

The waveform from the scanning photodetector **31** is applied to the input of a "slicer" **90** in the logic circuit **72**. The input waveform E applied to slicer **90** is illustrated in FIG. 6 at E. The slicer **90** compares the input waveform E with a predetermined threshold voltage (indicated by the horizontal dashed line **91** in FIG. 6) and generates an output waveform F in the form of a negative going output pulse which exists whenever the input voltage waveform E falls below the slicer threshold value. The waveform F of FIG. 6 appears at the output of slicer **90** on conductor F in FIG. 2.

The output of slicer **90** is connected to one input of an AND gate **92**, the other input of which receives the pulse burst waveform G from the sensor **82**. The wheel **71** is arranged on its axis so that the sensor **82** begins to deliver a series of six discrete pulses as shown in FIG. 6 at G starting at a point corresponding to 13 $\frac{1}{10}$ inch character spaces before the trailing edge of the label. Sensor **31** indicates the passage of a ZIP CODE on the fifth line of the address which is positioned in line with the remainder of the address information. Should the detected ZIP CODE have been shifted with respect to the remainder of the address information to indicate a "ZIP CODE change" or "machine stop" condition, pulses in waveform G exist simultaneously with the pulses from the output of the slicer **90** (waveform F) such that a selected number of pulses are gated through the AND gate **92**. The resulting waveform at the output of AND gate **92** is illustrated by the waveform H shown in FIG. 6. Any pulses which do appear at the output of AND gate **92** are applied to the input of a six-stage shift register **95**.

Shift register **95** takes the form well known in the art wherein the first input pulse is temporarily stored in the left-hand stage but advances to the right by one stage whenever the second pulse is received, and so on. Thus, if four pulses are applied to the input of the register **95**, these pulses are stored in the first four stages from the left such that the first four output conductors (including the second and fourth output conductors **97** and **98** respectively) are energized. Any pulse count received by the register **95** is retained until the register is reset by the energization of the reset input indicated at **99**, in the manner to be discussed below.

Output conductor **97** from the second stage of the shift register **95** is connected to the input of an INHIBIT gate **100**. The control input of gate **100** is connected to conductor **98**, the output from the fourth stage of shift register **95**. Output conductor **101** from gate **100** is accordingly energized whenever conductor **97** is energized except when conductor **98** is also energized. Thus, conductor **101** is energized whenever either two or three pulses have been shifted into the shift register **95** from AND gate **92**.

Conductor **98** is also connected to the input of a second INHIBIT gate **102**, the control input of which is connected via conductor **103** to the output from the last stage of the shift register **95**. Conductor **105**, the output from

gate **102**, is accordingly energized whenever four or five pulses have been shifted into the register **95**.

The energization of conductor **101** indicates a "ZIP CODE change" condition while the energization of conductor **105** indicates a "machine stop" or other "machine function" condition. These conductors are energized immediately after the label indicating the particular condition has passed between the scanning light source **30** and the photodetector **31**. Actual changes in machine operation must, however, be delayed until the particular mailing piece involved has reached the desired point in the machine. Accordingly, means are employed for delaying the change in machine operation due to a "ZIP CODE change" condition until the mailing piece sensed has been almost completely processed by the labeling apparatus and is about to be placed on output conveyor **35**.

As may be seen in FIG. 2, four different labels, each of which may contain different instructions to the machine, are being processed in sequence, one after the other. The label indicated at **108** in FIG. 2 is just passing between the light source **30** and detector **31**, label **16** is on the labeling drum **20**, and labels have already been applied to the mailing pieces **12** and **13**. It is accordingly necessary to provide four different time delay devices to "remember" the instructions on each label being processed. To serve this need, distribution switch **110** controlled by the pulses developed by photodetector **83** sequentially connects the output **101** to four separate delay counters **111**, **112**, **113** and **114** of similar design.

Pulses for actuating one of the delay counters **111** to **114** are gated from the output of AND gate **100** at the appropriate time by means of the combination of a flip-flop **115** and an AND gate **116**. The "set" input of flip-flop **115** receives pulses from the photodetector **83** while the "reset" input of flip-flop **115** is connected through delay unit **117** to the photodetector **83**. Thus, flip-flop **115** and shift register **95** are reset at the same time.

By way of example, assume that the address on label **108** (shown in FIG. 2 passing between light source **30** and detector **31**) has imprinted thereon an address of the type indicated by address C in FIG. 6. The ZIP CODE in this address is offset two spaces to indicate a "ZIP CODE change" condition and causes two pulses to be gated into the shift register **95** as indicated by the two pulses in waveform H of FIG. 6 below address C. This energizes output conductor **101**. The pulse generated by photodetector **83** (waveform I) has "set" flip-flop **115** to connect the conductor **101** to the input to switch **110**. This pulse also advances distribution switch **110** such that the output of AND gate **116** (as shown in waveform O in FIG. 6) is connected via conductor **118** to the delay counter **111**.

Conductor **118** is connected to the flip-flop **119** in delay counter **111**. Conductor **118** and hence the set input of flip-flop **119** remain energized until the flip-flop **15** and the shift register **95** are reset. This occurs when the pulse from photodetector **83** in generator **70** (the same pulse which advanced distribution switch **110** and set flip-flop **115**) passes through delay unit **117**. The delayed waveform at the output of delay unit **117** is illustrated as waveform J in FIG. 6.

As soon as flip-flop **119** has been "set," one input of a counter **120** is energized. A second input to counter **120** is connected to the photodetector **81** of generator **70** and accordingly receives forty pulses for each rotation of the wheel **71** as shown in FIG. 5 at K. Since these pulses are produced by the rotation of wheel **71**, their repetition rate is directly proportional to the operating speed of the machine. Counter **120** is adapted to count these pulses until a predetermined count is reached at which time its output **121** is energized as shown in FIG. 5 at L. Output **121** is connected through an isolation diode **125** and the conductor **74** to the solenoid **60**.

Thus, as the label **108** in FIG. 2 passes through the photoelectric sensing arrangement comprising light source **30** and detector **31**, the counter **120** begins counting and will complete its count just as the mailing piece to which label **108** is applied is about to be thrown onto the output conveyor unit **35**. At this time, the counter **120** completes its count and causes the gate **59** to be lifted such that the mailing piece to which label **108** has been applied will be offset with respect to the other shingled mailing pieces on the output conveyor **35**.

Gate **59** remains in its lifted position until counter **120** is reset. For this purpose, the energization of output **121** is delayed by a delay unit **129** and the delayed signal is applied to reset both counter **120** and flip-flop **119**. When counter **120** is reset, output **121** is de-energized and the gate **59** is permitted to return to its original position.

The other delay counters **112**, **113** and **114** are also connected to the distribution switch **110** and are similar in construction and operation to the counter **111** described in detail above.

The operation of the apparatus when a "machine stop" condition is detected may be explained as follows: a machine address format of the type illustrated by address D in FIG. 6 introduces four (but could be any number) pulses into the shift register **95**. This causes conductor **105** to be energized with a pulse as shown in waveform P in FIG. 6 and "sets" the flip-flop **140**. The counter **145** then begins counting pulses from photodetector **81** until a predetermined count is reached as shown in FIG. 6 at *m* at which time conductor **150** is energized. Conductor **150** is connected to the input of a solenoid operated clutch **155** which couples the drive motor **40** and all moving parts of the labeling apparatus except the conveyer drive hub **42** and the output conveyor **35**. Energization of conductor **150** thus stops the machine labeling operations until counter **145** and flip-flop **140** are reset by pressing reset button **160**. This "machine stop" condition sensing arrangement is particularly useful when it is desired to temporarily stop the machine to change the type of mailing pieces being addressed.

The pulse generator **70** may be readily adapted to operate in conjunction with smaller mailing pieces which may be processed at twice the normal rate. In this instance, the distance between mailing piece centers is set at one-half the usual length. As can be seen in FIG. 5 of the drawings, the windowed code wheel **71** is provided with two diametrically opposed sets of windows **73** and **74**. The photodetector **82** is normally set relative to the wheels **71** such that it scans the disc along a path indicated at **161** in FIG. 5. In this case, only the radially longer windows **73** appear at the detector **82** as the wheel **71** rotates. Similarly, the detector **83** scans along path **162** which intersects only the longer window **75**. In order for the detectors **82** and **83** to generate pulses on two occasions during each revolution of the code wheel **71**, it is merely necessary to move the detector **82** and **83** upward such that they instead scan the paths **164** and **165** respectively. This permits two sets of timing pulses to be generated during each revolution and allows smaller mailing pieces to be handled at twice the normal rate.

As it will be apparent to those skilled in the art, many other machine functions besides the "ZIP CODE change" and "machine stop" functions may be controlled in a similar manner to that discussed in detail above.

While the invention has been described with reference to the structure disclosed herein, it is not confined to the details set forth, and this application is intended to cover such modifications or changes as may come within the purposes of the improvements or the scope of the following claims.

What is claimed is:

1. A method for indicating changes in grouping of mailing pieces whereby to actuate a device to perform an act on certain ones of the mailing pieces to distinguish the mailing piece groupings from one another including the steps of:

arranging addresses to be placed on the mailing pieces according to groups,

selecting addresses which indicate a change in group,
offsetting at least a portion of the selected addresses appropriately with respect to a given reference position so that such, selected addresses can be recognized,
conveying the mailing pieces to the point of actuation of the device, and
actuating the device in response to said selected addresses whereby mailing pieces bearing said selected addresses are acted upon to distinguish the mailing piece groupings with which each of said selected addresses are associated from other mailing piece groupings.

2. A method for indicating a change within a grouping of mailing pieces including the steps of:
arranging addresses to be placed on the mailing pieces in groups,
selecting an address which indicates a change in group,
offsetting at least a portion of one line of the selected address from the other lines of said selected address to permit said selected addresses to be recognized as different from the addresses that have not been so selected,
sensing the recognized difference in position of the address and
visibly indicating the change in mailing piece grouping following sensing of said recognized difference in address position.

3. A method for indicating changes in grouping of mailing pieces whereby to actuate a device to perform an act on certain ones of the mailing pieces to distinguish the mailing piece groupings from one another including the steps of:
arranging addresses to be placed on the mailing pieces in groups serially,
selecting addresses at the beginning or end of each group,
positioning at least a portion of one line of the selected address appropriately with respect to a given reference position associated with each address so that such selected address can be recognized,
placing the addresses on the mailing pieces,
conveying the mailing pieces to the point of actuation of the device, and
actuating said device in response to said selected addresses whereby the mailing pieces bearing said selected addresses are acted upon to distinguish the mailing piece grouping with which each of said selected addresses are associated from other mailing piece groupings.

4. A method for indicating changes in ZIP CODE of addressed mailing pieces with a device adapted when actuated to perform an act on selected ones of said addressed mailing pieces to thereby distinguish groups of mailing pieces having a common ZIP CODE number from mailing pieces with different ZIP CODE numbers, including the steps of:
arranging addresses to be placed on the mailing pieces in groups according to ZIP CODE,
selecting addresses which indicate changes in ZIP CODE,
positioning at least a portion of the selected addresses appropriately so that such addresses can be recognized as different from addresses that have not been so selected,
placing the addresses on the mailing pieces,
conveying the mailing pieces to the point of actuation of the device, and
actuating said device in response to said selected addresses whereby to distinguish groups of mailing pieces having a common ZIP CODE number from mailing pieces with different ZIP CODE numbers.

5. A method for indicating a change in grouping of mailing pieces whereby to actuate a device to separate selected mailing pieces from the remaining ones of said mailing pieces, the steps including
arranging addresses to be placed on the mailing pieces in groups,
selecting addresses which indicate changes in mailing piece groups,
positioning at least a portion of the selected addresses appropriately so that such position can be recognized as different from the position of remaining addresses that have not been so selected,
placing the addresses on the mailing pieces,
conveying the mailing pieces to the mailing piece separating device, and
actuating said mailing piece separating device in response to the different position of said selected address portion whereby to separate the selected mailing piece from the remaining mailing pieces.

6. In an apparatus for processing a sequence of mailing pieces the combination of:
a source of individual address informations for said mailing pieces, said address informations being adapted to include control information comprising a change in address format distinguishable from the address formats of other address informations,
photoelectric means for scanning at least a portion of each address information for said mailing pieces in said sequence to develop a corresponding sequence of electrical signals respectively indicative of the address information formats for said pieces,
a signal discriminator for detecting the presence of a signal indicative of said change in address format, and
means responsive to said signal discriminator for controlling the operation of said apparatus in response to changes in said address formats.

7. The apparatus as set forth in claim **6** wherein said change in address format comprises displacement of a selected portion of said address information from the normal location for said address information.

8. The apparatus as set forth in claim **7** wherein said photoelectric means is adapted to scan said selected portion of said address informations.

9. The apparatus as set forth in claim **8** wherein said signal discriminator includes a source of clocking pulses and means for comparing the time position of each of said signals with one of said pulses to provide an indication of the location of said selected portion of said address information.

10. The apparatus as set forth in claim **6** wherein said apparatus includes means for separating said mailing pieces into groups, said signal discriminator responsive means being adapted to actuate said mailing piece separating means in response to a predetermined change in said address information formats.

11. The apparatus as set forth in claim **6** including means adapted when actuated to stop at least a portion of said apparatus, said signal discriminator responsive means being adapted to actuate said stop means in response to a predetermined change in said address information formats.

12. In combination with apparatus for automatically addressing a sequence of mailing pieces, an arrangement for automatically separating said pieces according to groups, comprising, in combination,
means for placing address information on each of said mailing pieces, said address informations being adapted to incorporate different address formats distinguishable from one another,
photoelectric means for scanning at least a portion of said address information to produce an electrical output signal in response to different address information formats,
electrical timing means for producing a delayed control signal at a predetermined time after the occurence of said output signal, and
means associated with said addressing apparatus and operable in response to said delayed signal to separate selected mailing pieces from the remainder of said mailing pieces whereby to distinguish between different groups of said mailing pieces.

13. An arrangement as set forth in claim 12 wherein said address information formats are formed by off-setting a selected portion of said address information at predetermined locations with respect to the remainder of said address information and wherein said photoelectric means is positioned to scan said selected portion.

14. An arrangement as set forth in claim 12 wherein said timing means comprises means for generating pulses at a rate directly related to the operating speed of said addressing apparatus, means responsive to said first signal for initiating a count of said pulses, and means for generating said delayed signal when said count reaches a predetermined value.

References Cited

UNITED STATES PATENTS

2,609,928	9/1952	Doust	209—72
3,283,163	11/1966	Folmar	271—57 X

RICHARD A. SCHACHER, Primary Examiner

U.S. Cl. X.R.

209—111.7; 250—219