

Dec. 25, 1962

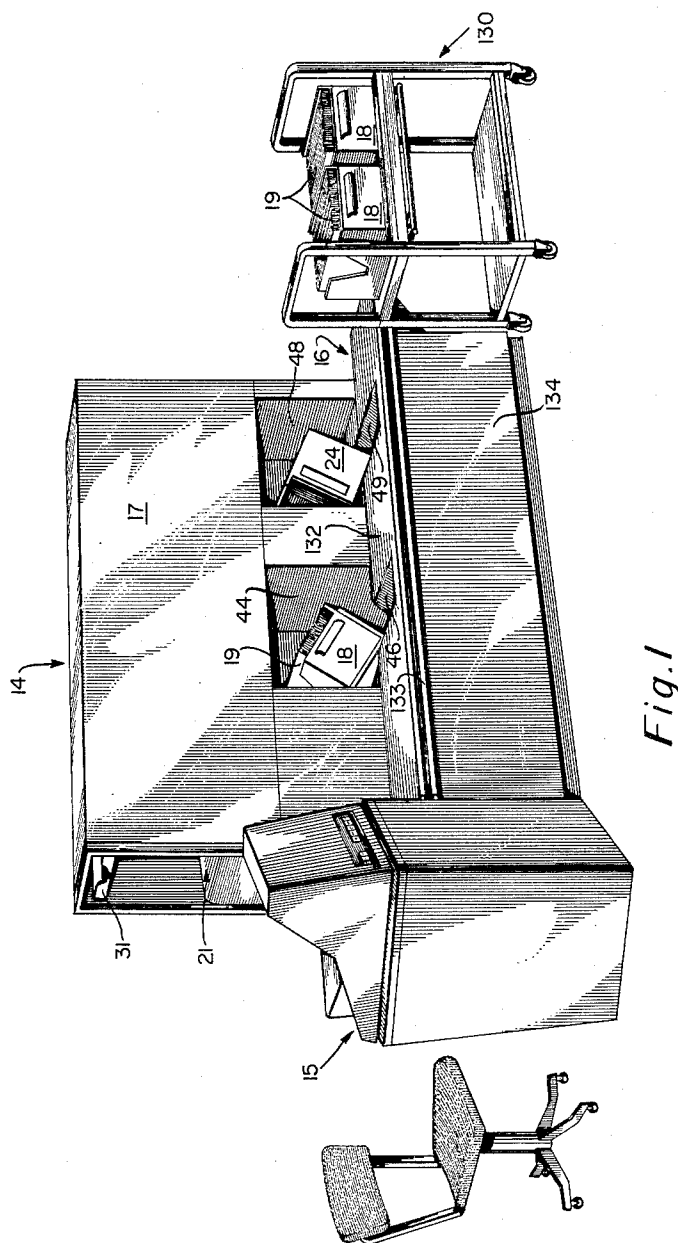
R. S. BRADSHAW

3,070,204

SHEET HANDLING APPARATUS

Filed July 29, 1959

6 Sheets-Sheet 1



INVENTOR.
ROBERT S. BRADSHAW

BY

Samuel Kane

ATTORNEY

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R. S. BRADSHAW

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6 Sheets-Sheet 3

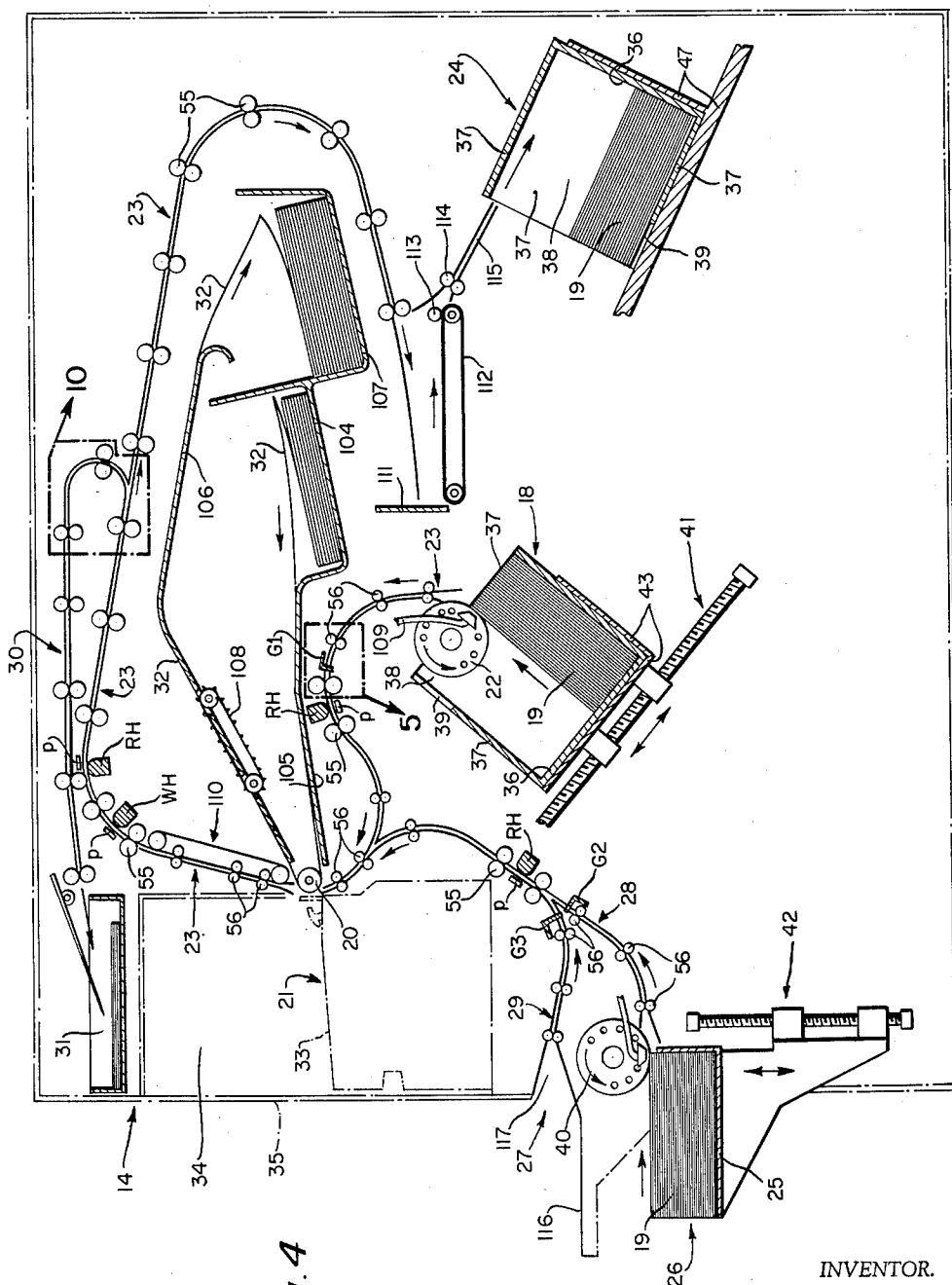


Fig. 4

INVENTOR.

ROBERT S. BRADSHAW

BY

Samuel Kave

ATTORNEY

Dec. 25, 1962

R. S. BRADSHAW

3,070,204

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6 Sheets-Sheet 4

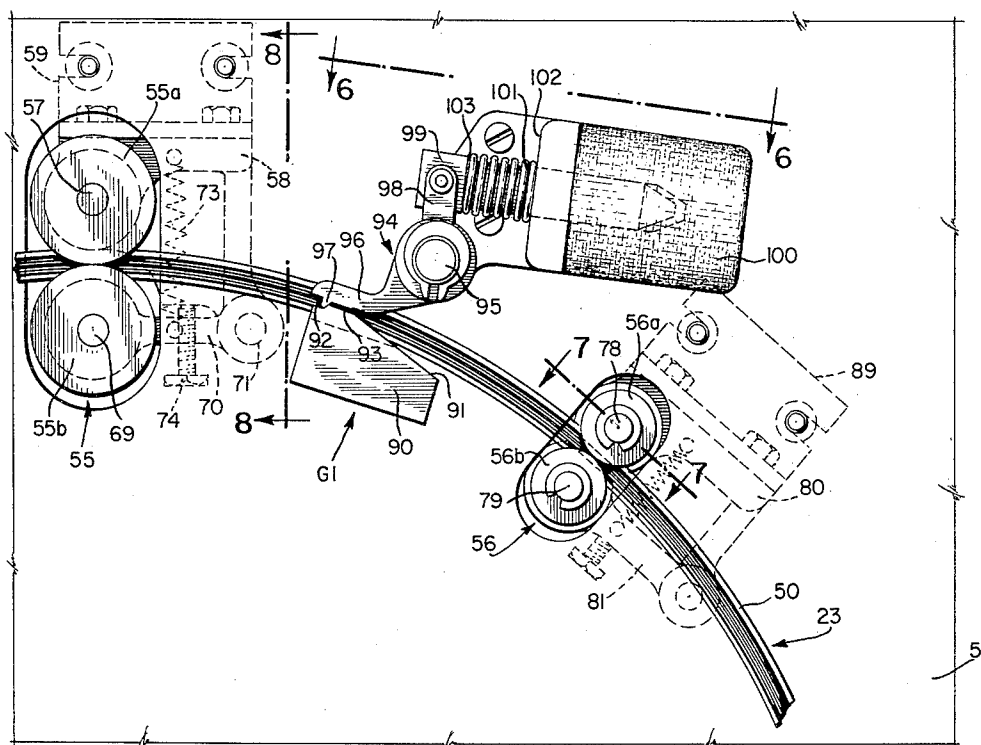


Fig. 5

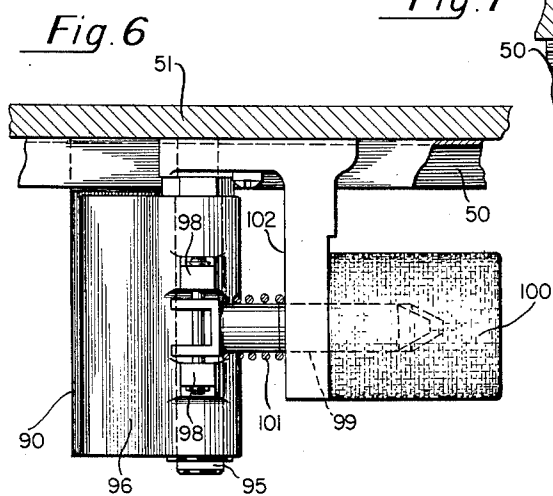


Fig. 6

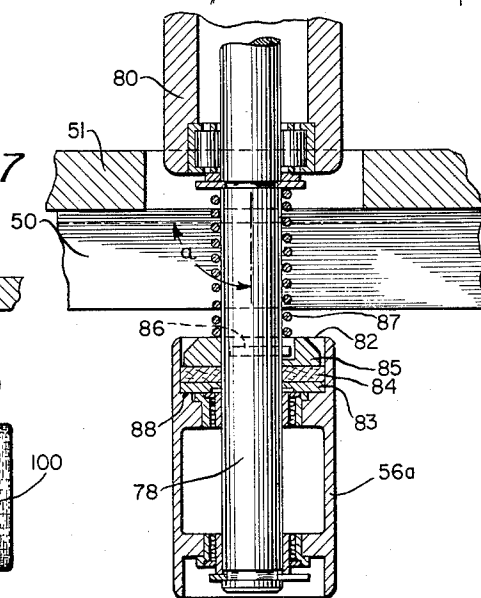


Fig. 7

INVENTOR.

ROBERT S. BRADSHAW

BY

Samuel Kane

ATTORNEY

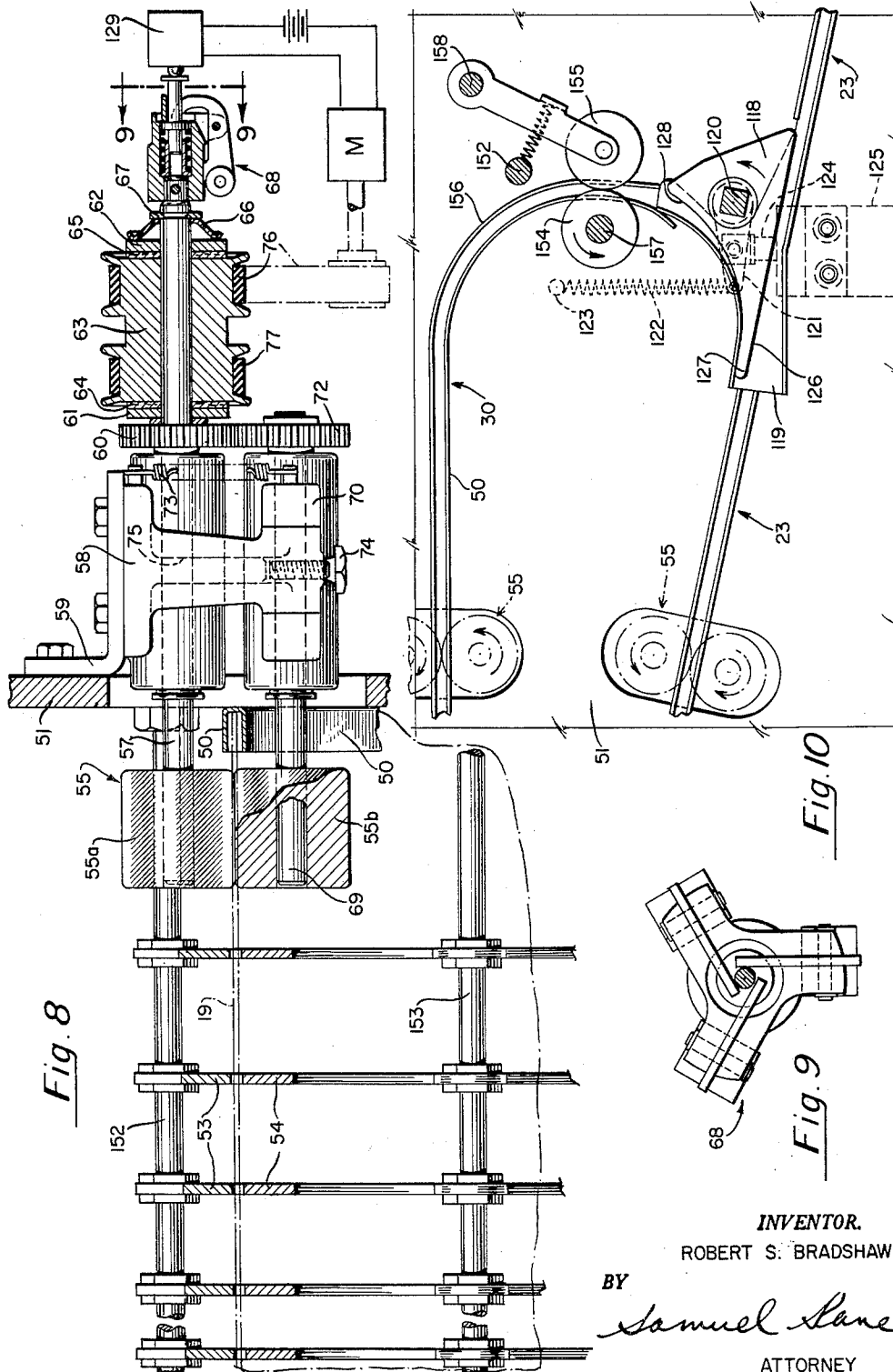
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R. S. BRADSHAW
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6 Sheets-Sheet 5



Dec. 25, 1962

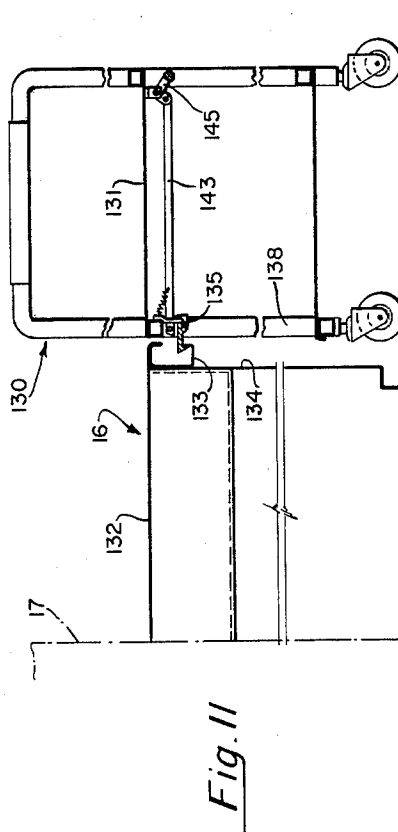
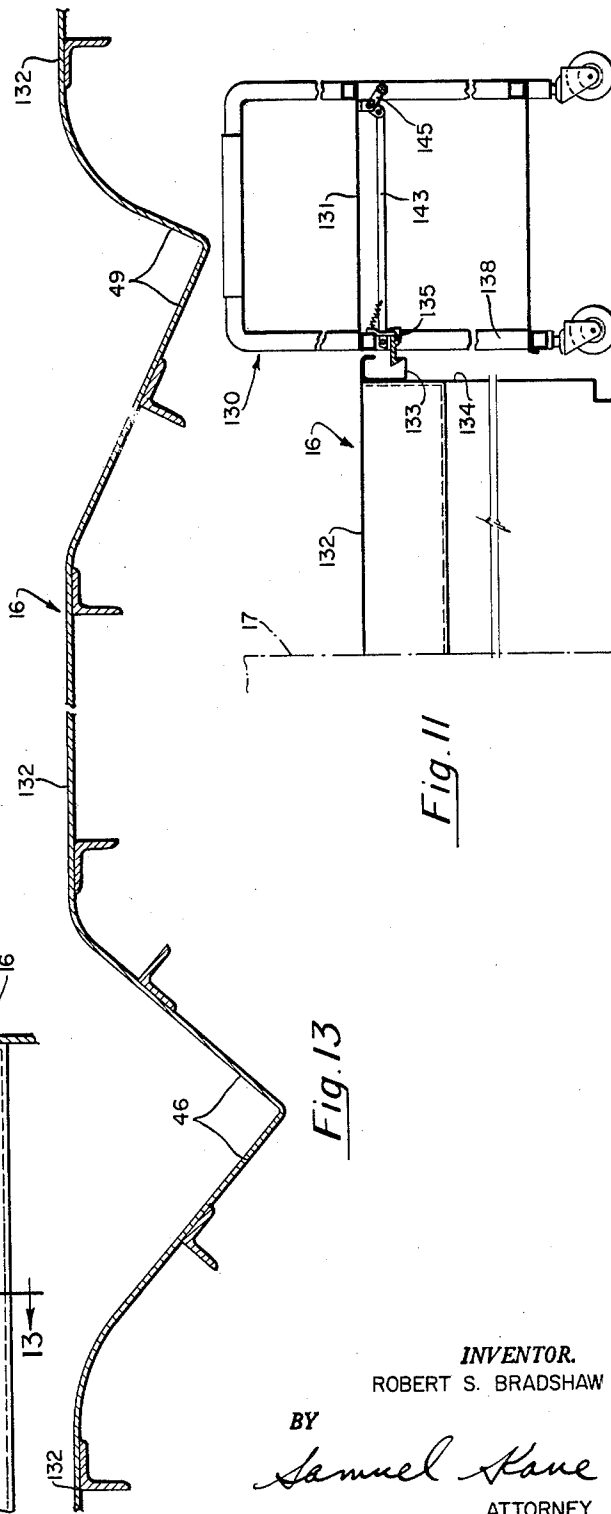
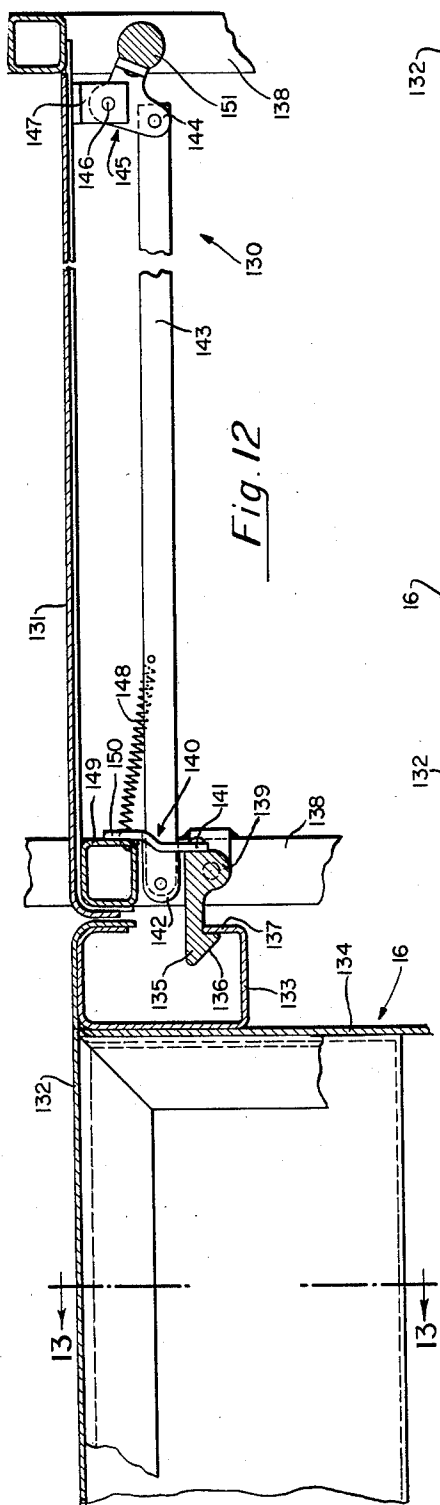
R. S. BRADSHAW

3,070,204

SHEET HANDLING APPARATUS

Filed July 29, 1959

6 Sheets-Sheet 6



INVENTOR.
ROBERT S. BRADSHAW

BY

Samuel Kane
ATTORNEY

1

3,070,204

SHEET HANDLING APPARATUS

Robert S. Bradshaw, Broomall, Pa., assignor to Bar-roughs Corporation, Detroit, Mich., a corporation of Michigan

Filed July 29, 1959, Ser. No. 830,391

23 Claims. (Cl. 197—130)

This invention relates generally to sheet and web feeding and handling devices and, more particularly, to apparatus for handling record forms and for feeding the forms to and away from various stations including a data imprinting station. While the invention is capable of a variety of uses in the sheet and web feeding art, it finds special application in bank bookkeeping machines for handling and feeding various forms and documents such as ledger account record cards and continuous form journals, and therefore it will be described hereinafter in connection with such use.

An important object of the invention is to provide an improved apparatus for handling and feeding sheet and web forms in business and other machines.

Another important object of the invention is to provide a novel arrangement and structure for data imprinting machines whereby record forms are delivered expeditiously along different feeding paths both to and from a single imprinting station where data may be printed or otherwise impressed on the forms of the respective paths.

A further important object of the invention is to provide improvements in recording machines whereby large quantities of record material may be inserted into and removed from the machines by the operator in a most convenient and rapid manner with a minimum of manual effort.

Another important object of the invention is to provide apparatus enabling repeated processing of a group or stack of sheet record forms through a business machine without any manual handling of either the sheet stack or the individual sheets.

Another important object of the invention is to provide in a business machine having an imprinting or data impression receiving position for a record form means for pre-positioning at an advance or ready position individual record forms fed from a supply station so that the pre-positioned or advanced form may be fed to the imprinting position in the shortest possible time.

A further object of the invention is to provide a plurality of record form supply stations with means for feeding a record form from a selected supply station into a feeding path leading to and away from a common imprinting position or data impression receiving position.

Still a further object of the invention is to provide means for withdrawing record forms from the machine as they are passing therethrough and delivering the forms for the attention of the operator.

These and other objects will be more fully revealed in the following detailed description of the preferred embodiment of the invention when read in conjunction with the accompanying drawings in which:

FIG. 1 is a right side view in perspective of a bank bookkeeping machine constructed in accordance with the invention;

FIG. 2 is a front perspective view of the machine of FIG. 1;

FIG. 3 is a right side elevation of the machine;

FIG. 4 is a right side diagrammatic view of the internal apparatus of the machine;

FIG. 5 is an enlarged view of the gate stop and certain of the feed rollers enclosed within the dotted block "5" in FIG. 4;

FIG. 6 is a view taken in the direction of line 6—6 of FIG. 5;

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FIG. 7 is a sectional view through one of the feed roller assemblies taken along the line 7—7 of FIG. 5;

FIG. 8 is a view taken along line 8—8 of FIG. 5 illustrating certain of the roller drives and form guide members;

FIG. 9 is an end view of a governor-type shut-off device taken along line 9—9 of FIG. 8;

FIG. 10 is an enlarged view of a track-type routing switch enclosed within the dotted block "10" in FIG. 4;

FIG. 11 is a vertical sectional view taken along line 11—11 of FIG. 3 and showing a transport cart detachably secured to a loading platform of the machine;

FIG. 12 is an enlarged detail view of the latching mechanism shown in FIG. 11 for detachably securing the transport cart to the loading platform; and,

FIG. 13 is a longitudinal sectional view through the loading platform of the machine taken along line 13—13 of FIG. 12.

Considered briefly in its broad aspects, the invention comprises apparatus for handling of forms at a supply station and delivery station respectively, means for feeding the forms from a magazine at the supply station to an operating mechanism, and means for further feeding of the forms from the operating mechanism into a magazine at the delivery station. More specifically, the invention contemplates further, the use of sheet and continuous form handling apparatus so constructed and arranged as to provide for feeding of forms of the same or of different physical configurations and from separate supply sources to and away from a common operating mechanism adapted for performing an operation on the forms such, for example, as printing or otherwise impressing data on the forms. The apparatus is contained in a cabinet structure providing for improved operator convenience and visibility of the forms at the operating mechanism and associated with improved loading devices greatly facilitating the handling of forms.

As shown in the drawings, the preferred form of the invention is illustrated in connection with its use in a bank bookkeeping machine for processing record forms such as ledger account record cards and continuous form journal records. Such apparatus comprises an enclosure or cabinet generally indicated at 14 (FIGS. 1 to 3) which is preferably rectangularly shaped as shown, a control unit generally indicated at 15, and a magazine loading platform 16 adjacent to the right side wall 17 of the cabinet 14. The cabinet may include an open frame supporting structure upon which external panels are mounted to form the walls of the cabinet. Devices inside of the cabinet include a principal or main supply magazine 18 (FIG. 4) from which record sheets such as ledger cards 19 are individually and successively fed to and around a printing platen 20 at a data imprinting station 21 for receiving printing impressions from a printing machine 33 in the forward end portion of the cabinet 14. Each card 19 is separated from the supply magazine 18 by a suitable feeding device 22 and fed into the main or primary document feeding path 23 and advanced therealong to the imprinting station 21. When a card is discharged from the imprinting station 21, it is normally conveyed along the balance of the primary feeding path 23 and finally stacked in a receiving magazine 24.

As is evident in FIGS. 3 and 4, the supply and receiving magazines 18 and 24 are located in the lower portion of cabinet 14 and relatively close together. Referring more particularly to FIG. 4, it is seen that the primary feeding path 23 extends leftwardly from the supply magazine 18 toward the front of the machine and to and around the platen 20, thence in a substantially vertical direction toward the top of the machine where it curves to the right, and thence toward the rear of the machine where it curves downwardly and leftwardly to terminate adjacent

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to the receiving magazine 24 and near its other terminal end and supply magazine 18, thus, in effect, exhibiting a substantially closed loop formation.

The supply and receiving magazines 18 and 24 are preferably similarly constructed and the machine designed for removably positioning the magazines in order that a given supply of record forms or cards 19 may be repeatedly processed through the machine without manual handling of the individual cards simply by interchanging the magazines.

Additional record sheets or ledger cards 19 may be introduced into the machine at the front end thereof, as seen in FIG. 4, from an auxiliary supply bin 25 at an auxiliary supply station 26 or from a manual feeding station 27 positioned just above the supply station 26. The latter two stations are respectively associated with an auxiliary feeding path 28 and an manual feeding path 29 both of which merge with each other and finally merge with the primary feeding path 23 at a position anterior to the imprinting station 21.

Whenever it is desired to withdraw a card 19 from the normal or primary feeding path 23 for the attention of the operator, an auxiliary delivery path 30—shown at the top of FIG. 4—is coupled with the primary feeding path 23 by suitable switching means 10 to deflect the selected card into the auxiliary delivery path 30 for feeding therealong into an auxiliary stacking bin 31 preferably located at the front end of the machine.

The primary feeding path 23, auxiliary feeding path 28 and manual feeding path 29 are each provided with similar gate stops G1, G2 and G3 respectively, each of which serves to arrest and detain a card 19 in a ready position in its respective path whenever a previously fed card is stopped in the imprinting station 21. As a card leaves the imprinting station, one of the gate stops is operated to release a detained card for advancing to the imprinting station.

As mentioned previously, the primary feeding path 23 is in the form of a substantially closed loop. Disposed within the loop is suitable structure and apparatus for containing an additional supply of record forms and for feeding the forms to and around the platen 20. As shown in FIG. 4, such structure and apparatus are preferably adapted for feeding and supporting a web-type record form composed of a series of connected documents forming a continuous manifold journal 32 and exhibiting a substantially closed loop formation with a portion thereof passed around the printing platen 20. As so disposed, the journal 32 may receive printing impressions from the printing machine 33 either at the same or at different times as impressions are made on cards 19 fed through the primary feeding path 23, the printing impressions of both the journal 32 and cards 19 being viewable through an opening 34 in the front wall 35 of the cabinet 14. It will be understood that the journal 32 may be a single web for receiving original impressions, or may comprise a plurality of webs for receiving duplicate or carbon copy impressions of the impressions made thereon or on the cards 19. It will further be understood that the journal 32 may be positioned along the platen 20, relative to a card 19, to extend either wholly or partially beyond one side of the card, or beyond both sides of the card if wider than the card, for receiving printing impressions on its side portions separate from those made on the cards 19.

The supply magazine 18 and the receiving magazine 24 are preferably similarly constructed as shown, for interchangeability, with each having a bottom wall 36, four side walls 37 and an open top 38. The cards 19 are deposited or received within the magazines with one of their edges bearing against the bottom wall 36. One side wall 37 of each of the magazines 18 and 24 is formed with a cut-out at 39 for admitting the feeding device 22 into the magazine for feeding cards from a stack therein. The tops of the stacks of cards 19 in the supply magazine 18 and in the auxiliary supply bin

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25 are maintained at a predetermined feeding height relative to their respective feeding devices 22 and 40 by suitable elevating mechanism 41 and 42, each shown herein as including a rotatable screw shaft threaded through a nonrotatable but axially movable ledger support and producing linear movement of the support when the shaft is rotated. The support for the supply magazine 18 is in the form of a cradle 43 exhibiting a trough or V-shaped formation for holding the magazine and its ledger content at a canted angle. When the magazine cradle 43 is in its lowermost or loading position, it is adjacent to an opening 44 (FIG. 3) in the right side wall 17 of cabinet 14 and in line with a V-shaped track 46 (FIGS. 1 and 13) in the loading platform 16. The receiving magazine 24 is supported on stationary structure 47, which is also trough or V-shaped, adjacent to a second opening 48 in the side wall 17 and in line with a V-shaped track 49 in the loading platform 16 (FIG. 13).

The transport system comprising the primary feeding path 23, the auxiliary feeding path 28, the manual feeding path 29 and the auxiliary delivery path 30 is formed of similar structure defining the respective paths and includes transport guides or edge aligning members 50 exhibiting a channel-shaped formation (FIGS. 8 and 10) and a plurality of fixed guide ribs 53 and 54 (FIG. 8). The opposing guide ribs 53 and 54 constitute a chute structure which also may be regarded as including the edge guiding members 50. The edge guiding members 50 are secured to an internal vertical wall 51 adjacent to the left wall 52 of the cabinet. The guide ribs 53 are secured to cross rods 152, each rod having one of its ends fixed to the internal wall 51 and the other end fixed to an internal frame member of the machine, not shown, adjacent to the right side wall 17 of cabinet 14. The guide ribs 54 are similarly secured to cross rods 153 also fixed at their ends to the internal wall 51 and the internal frame member. The guide ribs 53 are slightly spaced from the guide ribs 54 throughout the transport system for freely guiding each ledger card 19 therebetween along the respective feeding paths 23, 28, 29 and 30, as will be explained more fully hereinafter.

Disposed along the feeding paths and adjacent to the internal wall 51 are two sets or series of pairs of feed rollers 55 and 56 respectively (FIG. 4) adapted for feeding the cards 19 by one of their margins while maintaining the adjacent marginal edge of the cards against the bases (FIG. 8) of channels 50. By engaging the cards near one edge only, cards of various widths can be handled to the transport mechanism without adjustment by the operator. The side of the card feeding path opposite to the rollers and aligning guides is open and unobstructed for ready access by the operator by removal of adjacent wall panels. The rollers 56 are disposed in the respective feeding paths prior to the gate stop positions G1, G2 and G3, and prior to and along the imprinting station 21 while the rollers 55 are positioned after the gate stop positions and after the imprinting station.

Each roller 55a (FIG. 8) of each pair of rollers 55 is fixed on a shaft 57 rotatably mounted in a body 58 secured to an angle bracket 59 fixed to the internal wall 51. Secured on shaft 57 is a gear 60 and slidably keyed on the shaft are friction clutch discs 61 and 62. Between the discs 61 and 62 and journaled on shaft 57 is a drive pulley 63 having friction clutch discs or facings 64 and 65 secured to its ends and which are maintained in frictional contact with the discs 61 and 62, respectively, by means of a pressure cup 66 mounted on the shaft and retained under pressure against the disc 62 by means of a retaining ring 67. Secured on the outer end of shaft 57 is a governor-type shut-off device 68 of similar construction and operation as one disclosed in a copending U.S. patent application in the name of F. V. Palasciano, Serial No. 816,005, filed May 26, 1959 and assigned to the assignee of the present invention.

Each roller 55b of each pair of rollers 55 is secured on

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one end of a shaft 69 rotatably mounted in one end of a bracket 70 the other end of which is yoked and pivotally secured to the body 53 on a pin 71 (FIG. 5). A gear 72 secured on the other end of shaft 69 is in mesh with the gear 60 on shaft 57. A tension spring 73 secured to body 53 and bracket 70 urges the bracket in a clockwise direction, as seen in FIG. 5, to urge the roller 55b towards the roller 55a. A screw 74 threaded through bracket 70 has its end set to stop against a rib 75 of body 53 for adjustably setting the spacing of the rollers to suit the thickness of the particular record form or ledger card 19. The drive to the pulleys 63 is furnished by means of belts 76 from a source of power, such as an electric motor or motors M, and transmitted therefrom to one or more other pulleys by means of belts 77 in a manner not shown, but well understood.

The rollers 56a and 56b (FIGS. 5 and 7) of each pair of rollers 56 are similarly rotatably mounted on anti-friction bearings on one end of shafts 78 and 79 respectively, and supported adjacent the internal wall 51 by a body 80 and bracket 81 respectively, similar to those described for rollers 55. The drive for rollers 56 is similar to the drive for rollers 55 but differs in certain respects in that drive pulleys, not shown, but similar to pulleys 63 are secured on the opposite ends of shafts 78 and friction disc clutches, to be described, are disposed within each roller 56a and 56b rather than adjacent to pulleys 63 as described for rollers 55. As seen in FIG. 7, the friction disc clutches are disposed in a counterbore 82 of rollers 56 and comprise friction discs 83 and 84 slidable on shafts 78 and 79 and friction discs 85 slidably keyed on the shafts by means of keys 86. Compression springs 87 bias the discs 85, 84 and 83 toward the bottom shoulder 88 of counterbores 82 to frictionally couple the rollers with their shafts 78 and 79.

As mentioned earlier, the rollers 55 and 56 are adapted to maintain a marginal edge of the cards in alignment against the base of the channels 50. For such purpose, the roller assemblies (FIGS. 5, 7 and 8) are secured to the brackets 59 and 89 on an angle in the direction of feed slightly less than 90° to the base of the channels 50 so that the axes of the rollers form an acute angle "a" (FIG. 7) therewith.

The gate stops G1, G2 and G3 (FIG. 4) are similarly constructed so a description of one of them will suffice. Gate stop G1 comprises a fixed block 90 (FIG. 5) having a cam surface 91, a stepped portion 92 and a land 93 disposed along the center line of the primary feeding path 23. A stop member 94 pivotally mounted on a fixed pin 95 comprises an arm 96 from which depends a toe 97 and a second bifurcated arm 98 (see also FIG. 6) pivotally connected to one end of an armature 99 of an electromagnet 100 secured to a fixed bracket 102. A compression spring 101 between bracket 102 and a shoulder 103 of the armature 99 biases the armature outwardly of the electromagnet when the latter is de-energized to thereby rock the stop member 94 into the feeding path as seen in FIG. 5, in which position toe 97 is on the stepped portion 92 and the arm 96 spaced from land 93 a distance somewhat greater than the thickness of a card 19.

Returning to FIG. 4, in order to support the continuous record or journal 32 within the primary feeding path loop 23 with a portion of the journal around the platen 20 there is provided fixed structure comprising a pocket 104 for holding the journal supply, a lower track 105 for supporting the lower run of the journal, an upper track 106 for supporting the upper run of the journal, and a receiving pocket 107 for stacking the journal in manifold fashion, as is well known. The journal 32 is line-spaced or driven about the printing platen 20 by means of a tractor-type pin feed drive 108 of well known construction engaged in marginal apertures in the journal. The pin feed drive 108 is operated by a mechanism, not shown, and may be responsive to signals from an associated apparatus forming no part of the present invention.

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The feeding devices 22 and 40 for separating cards from the supply magazine 18 or the auxiliary supply bin 25 respectively, may be of any well known construction, however, as illustrated, they are preferably of the vacuum wheel type of the class shown in U.S. Patent No. 939,260.

As cards are fed through the respective feeding paths, as will shortly be explained, they pass between certain ones of reading heads RH and a writing head WH (FIG. 4) and associated pressure plates "p" for sensing and writing of coded data on the cards for purposes not forming a part of the present invention, however, due to the friction imposed on the cards by the pressure plates and reading and writing heads the friction clutches for the rollers 55 represented by discs 61, 62, 64 and 65 are made sufficiently strong to provide a suitable driving torque for overcoming the friction and feeding the cards past the heads at a predetermined and precise linear velocity. The friction clutches for the rollers 56, however, represented by discs 83, 84 and 85 are made relatively light to enable the rollers 56 to stop instantly when the cards are stopped, as will shortly be explained. It should also be mentioned that while the rollers 55 and 56 are shown in FIG. 4 to be of different diameters, this is only a matter of choice since both sets of rollers are rotated at the same tangential velocity. The rollers 56 are preferably small and lightweight in construction and therefore of low inertia to further enable them to stop instantly, as mentioned above.

In the operation of the apparatus, the rollers 55, 56 and vacuum wheels 22 and 40 are rotating continuously. For feeding a record member or ledger card 19 from the supply magazine 18, vacuum is supplied to the wheel 22 through a hose 109 leading to a valve mechanism and source of vacuum, not shown, and the top card of the stack is fed by the wheel 22 into the primary feeding path loop 23 and between the guide ribs 53 and 54 and with its left side edge riding in the channel 50. The rollers 56 engage the card by its left margin and advance it along the primary feeding path 23 while maintaining its left edge against the base of channel 50. If there is no previously fed card in the imprinting station 21, electromagnet 100 at G1 is energized to rock stop member 94 in a clockwise direction, as viewed in FIG. 5, to allow the advancing card to be fed by the rollers into the imprinting station. If the card is to receive printing, it will be stopped in the imprinting station 21 at an appropriate line position by a line selection mechanism generally indicated at 110 and forming no part of the present invention but fully disclosed and claimed in a copending application of Robert S. Bradshaw and Andreas G. Markgraf, Serial No. 838,468, filed September 8, 1959, now matured into U.S. Patent No. 2,996,166 entitled "Record Sheet Feeding and Line Selection Mechanism" and assigned to the assignee of the present invention.

If a previously fed card is in the imprinting station 21, electromagnet 100 is allowed to remain de-energized in which case the stop member 94 will be in the position shown in FIG. 5, so that the leading edge of the advancing card will come against the toe 97 as it passes between the arm 96 and land 93. As the card is thus stopped by toe 97, the rollers 56 will stop instantaneously on the card due to their low inertia and slipping of their disc clutches, while their shafts 78 and 79 continue rotating. As soon as the previously fed card is released and discharged from the imprinting station 21 for delivery to the receiving magazine 24, the electromagnet 100 is energized to release the detailed card to the driving torque of the rollers 56 for advancing into the imprinting station.

The cards are released from the imprinting station 21 by the line selection mechanism 110 in a manner described in the above mentioned Bradshaw and Markgraf application and they are normally fed along the primary feeding path 23 for stacking in the receiving magazine 24. As seen in FIG. 4, the primary feeding path 23 extends over the inside path for the journal 32 and then curves downwardly and leftwardly around the pocket 107 to terminate

adjacent to the receiving magazine 24. When a card is discharged from the primary feeding path 23 at this terminal end, its leading edge will come against a fixed stop 111 and the card will drop down onto an endless reversing belt mechanism 112 which may comprise a series of parallel continuously moving endless belts. The card will then be conveyed by the reversing belts 112 until it is engaged between the belts and cooperating pressure rollers 113 and advanced into the nip of a pair of opposed rollers 114 which will feed the card through a chute 115 into the receiving magazine 24. It will be observed that the cards are deposited into the receiving magazine in the same order and face position, relative to the cut-out 39, that they occupied in the supply magazine so that the same supply or stack of cards may be reprocessed in the same order through the machine without manual handling of the cards by interchanging the magazines.

Additional cards may be introduced into the machine from the auxiliary supply bin 25 in a manner similar to that described for feeding cards from the supply magazine 18, that is, by supplying vacuum to the wheel 40 and similarly stopping and releasing a card at the gate stop G2. Cards may be introduced into the machine individually by the operator by placing each card on a table top 116 (FIGS. 2 and 4) and sliding the card through an opening 117 in the front wall 35 of cabinet 14 and into the manual feeding path 29 until it is engaged by the rollers 56 associated with that path. Stopping and releasing of the cards at the gate stop G3 is also accomplished in a manner similar to that described for the primary feeding path 23 and the auxiliary feeding path 28.

Whenever a card is withdrawn from the normal or primary feeding path 23 for the attention of the operator, the auxiliary delivery path 30 is coupled with the primary feeding path 23. Such coupling is accomplished by a track-type routing switch device comprising a plurality of aligned but spaced-apart rock arms 118 one of which (FIG. 10) is disposed adjacent to wall 51 in a widened or flared portion 119 of channel 50 and the others, not shown, each disposed adjacent to a guide rib 53 and its associated guide rib 54. The rock arms 118 are secured on a common shaft 120 rockably journaled at one end in the internal wall 51 and at the other end in a frame member, not shown, adjacent to the right side wall 17 of cabinet 14. Secured at one of its ends on shaft 120 is a lever arm 121 whose other end is connected to a tension spring 122 anchored to a pin 123 fixed to wall 51. Pivotally connected to the medial portion of the lever arm 121 is one end of an armature 124 of an electromagnet 125. In the normal or non-operated position of the rock arms 118, as seen in FIG. 10, their lower surfaces 126 are parallel to the primary feeding path 23 at this position so that cards 19 are normally fed below the rock arms 118 through the channel 50 and guide ribs 53 and 54 of the primary feeding path 23 for delivery to the receiving magazine 24.

To switch cards to the auxiliary delivery path 30, electromagnet 125 is energized to rock the arms 118 counterclockwise, as viewed in FIG. 10, until their end portions 127 are disposed below the primary feeding path 23. The cards will then be deflected by curved portions 128 of the rock arms 118 from the primary feeding path 23 into the channel 50 and guide ribs 53 and 54 of the auxiliary delivery path 30 and advanced by pairs of opposed forwarding rollers 154 and cooperating pressure rollers 155 and then by the rollers 55 into the auxiliary stacking bin 31 (FIG. 4).

In the present embodiment of the invention, channel 50 of the auxiliary delivery path 30 has been chosen to take a relatively sharp bend as at 156 (FIG. 10) and therefore the forwarding rollers 154 and 155 are preferably employed at this region and spaced across the machine to assist the rollers 55 in maintaining the cards 19 in edge alignment around the bend 156. One roller 154 is adjacent to the internal wall 51 and the other rollers 154

are each disposed between adjacent pairs of guide ribs 53 and 54. The rollers 154 are secured on a power-driven cross shaft 157 journaled at one end in the internal wall 51 and operated from motor M by a belt 76 and pulley, not shown, and with its other end journaled in a frame member, not shown, adjacent to the right side wall 17 of cabinet 14. The rollers 155 are spring pressed against the rollers 154 and are supported on a cross shaft 158 fixed at one end to the wall 51 and at the other end to the above mentioned frame member.

The apparatus described thus far for feeding and edge guiding the cards 19 through the various feeding paths has proved most reliable in operation and also in preserving the condition of the cards. However, should a card become buckled or otherwise damaged while in the grip of a pair of rollers 55 such as to cause a sufficient drag or stopping of these rollers, slipping will occur between the clutch discs 61 and 62 and clutch facings 64 and 65, whereby the reduced angular velocity of the particular shaft 57 will cause its governor-type shut-off device 68 to operate a microswitch 129 (FIG. 8) in a manner described in the above mentioned Palasciano application for patent, and thus shut off power to motor M driving the roller driving belts 76.

For handling the stacks of cards, and particularly when the stacks are made up of large quantities of cards of appreciable size and weight, the magazines 18 and 24 are conveyed to and from the loading platform 16 by means of a transport cart generally indicated at 130 (FIGS. 1, 3 and 11) having a magazine supporting shelf 131 of an equal height with the normal surface 132 of the loading platform. An elongated outwardly opening C-shaped channel or rail 133 (FIG. 12) is secured to the upper edge portion of the right side wall 134 of the loading platform 16 for slidably latching the cart 130 to the platform by means of a latching mechanism constructed as a part of the cart 130. The latching mechanism comprises a latch bar 135 having a cam surface 136 adapted to ride over the lower flange 137 of rail 133. The latch bar 135 is elongated to extend the distance between two of the cart legs 138 and formed with lugs 139 pivotally connected to the legs. At each end of the latch bar 135 is a stop member 140 having a lower extension 141 secured to the bar 135 and a lateral ear 142 pivotally connected to one end of a link 143 whose other end extends to the far side of the cart and is pivotally connected to an arm 144 of a bell crank lever 145 pivotally connected at 146 to an angle bracket 147 fixed below the magazine supporting shelf 131. A tension spring 148 having one end secured to link 143 and the other end secured to a frame portion 149 of the cart serves to urge the latch mechanism to the latching position shown in FIG. 12, in which position an upper extension 150 of the member 140 is stopped against the frame portion 149 thus to limit counterclockwise rocking of the latch bar 135. An elongated rod-shaped handle 151 is secured to the levers 145 at the opposite sides of the cart for manual operation of the latching mechanism. In the latched position, the latch bar 135 is loosely engaged over the flange 137 so that the cart may be moved conveniently along the platform from one end to the other.

Raising of handle 151 will rock the latch bar 135 clockwise for detaching the cart from the loading platform for movement away therefrom. Although only one linkage system including link 143, stop member 140 and spring 148 is shown and described it is understood that a similar mechanism is employed at the other side of the cart. The linkage system provides a remote control enabling the operator to stand on the far side of the cart and attach it to the rail 133 of the platform.

A supply magazine 18 containing cards is slid from the cart shelf 131 onto an adjacent platform surface 132, tilted into the track 46 and slid therealong into the side wall opening 44 of the cabinet 14 until it is nested in the support or cradle 43, the cradle having been moved to

its lowermost or loading position for this purpose. The receiving magazine 24 is handled in a similar manner by sliding it along track 49 through the side wall opening 48 until it is nested in the stationary structure or cradle 47.

In connection with the handling of record forms or ledger cards by means of magazines, as described above, it is to be noted that in the use of prior art devices the record forms are first removed from a receptacle before they are fed through a machine. In the present invention, however, the supply magazine containing the record forms or ledger cards is placed in the machine and remains therein throughout the feeding operations. Thus there is eliminated the additional operation of prior devices of removing the stack of record forms from a receptacle prior to feeding.

From the foregoing description it will now be seen that the invention provides improvements in form handling and feeding apparatus and having particular, but not limited, application in bank bookkeeping machines. While there has been disclosed a specific embodiment of the invention, it is to be understood that this is the preferred form and that various modifications and changes in size, shape and arrangement of parts may be resorted to without departing from the true spirit of the invention. Accordingly, it is to be understood that the invention is not to be limited by the specific structure disclosed but only by the subjoined claims.

What is claimed is:

1. In data recording apparatus, a chute structure having an opening at least at one side and defining a primary document feeding path exhibiting a loop formation and having the terminal ends thereof adjacent to one another, an aligning surface opposite said opening and coextensive with said chute, means for positioning a feed magazine adjacent to one terminal end of the loop for supplying documents for transit through the chute, means for feeding documents successively from a supply of such documents in said magazine and through the chute with one edge of each document urged into continuous contact with said aligning surface to the other terminal end thereof, means for positioning a receiving magazine adjacent to the last mentioned terminal end of the loop for stacking documents fed through the chute, means defining a secondary document feeding path exhibiting substantially a loop formation of smaller size than the primary loop and positioned wholly within the primary loop, said secondary path defining means being operable to convey documents successively from one end to the other end thereof, means predisposing a portion of the secondary loop coincident to a portion of the primary loop such that documents of both loops may be brought into juxtaposition as they are being fed through their respective loops, printing means located adjacent to the coincidental portions of the two loops and operable to print information on documents of both loops, and means at the primary document feeding path between the feed magazine and the printing means operable to restrain a document from being advanced while an earlier document is being printed at said co-incidental portions of the two loops.

2. In data recording apparatus, means forming a chute defining a primary document feeding path and exhibiting a loop formation with the terminal ends thereof adjacent to one another, means for positioning a feed magazine adjacent to one terminal end of the chute for supplying documents for transit through the chute, means for feeding such documents separately and successively through the chute to the other terminal end thereof, means for positioning a receiving magazine adjacent to the last mentioned terminal end of the chute for stacking documents fed through the chute, means defining a secondary document feeding path and positioning the same wholly within the loop of the primary feeding path, means operable for moving a document from one end to the other end of the secondary feeding path, a portion of the secondary path defining means being disposed coincident to a portion of

the primary path such that documents of both paths may be brought into juxtaposition as they are being fed through their respective paths, means adjacent to the coincidental portions of the two paths and operable to impress information on documents of either path when such documents are in the coincident portion of their respective paths, and means in the primary feeding path between the feed magazine and the information impressing means operable to hold a document from being advanced while an earlier document is being impressed with information at said coincident portions of the two paths.

3. In document handling and recording apparatus, a substantially rectangularly shaped cabinet, means forming a chute defining a primary document feeding path in the cabinet exhibiting an approximately closed loop and having its terminal ends disposed adjacent to one another in the lower level of the cabinet, the loop of the chute extending laterally toward the opposite end walls of the cabinet beyond each terminal end of the loop, one side wall of the cabinet having a pair of openings in the lower level thereof each opposite to one of the terminal ends of the chute, means in the cabinet in line with said openings for removably receiving and supporting magazines for containing documents capable of being fed through the feeding path, means associated with the chute for removing documents successively from a supply magazine at one end thereof and for feeding such documents separately through the loop with an edge of each document leading to a substantially duplicate stacking magazine at the other end thereof and there feeding each document with the opposite edge leading in such manner that each document will be stacked therein in the same relative order and face position that it occupied in said supply magazine, one of said end walls of the cabinet having a sight opening therethrough exposing a portion of the chute to view, and a printing mechanism positioned in the cabinet adjacent to said end wall opening and operable to print impressions upon documents fed through the chute, such printing being exposed to view through the end wall opening.

4. The invention described in claim 3 characterized by means defining a secondary document feeding path loop in the cabinet and exhibiting an approximately closed loop of lesser size than the primary document feeding path loop, said secondary path defining means being mounted wholly inside of the primary feeding path loop and being operable to convey a document past the printing mechanism for receiving printing impressions made on the documents fed through the primary feeding path loop.

5. In document handling and recording apparatus, a cabinet for housing the apparatus and including a side wall, means defining a primary document feeding path in the cabinet having a looped portion thereof in the upper level of the cabinet and having its terminal ends disposed in the lower level of the cabinet, said side wall having a pair of openings opposite to said terminal ends, means in the cabinet in line with said openings for removably slidably receiving magazines for containing documents capable of being fed through the primary feeding path, means associated with the primary feeding path for removing documents from a first magazine at one terminal end thereof and for feeding such documents through the path to a second similar magazine at the other terminal end thereof, and means adjacent to the second magazine for arresting movement of a document being fed thereto from the first magazine and thereafter for feeding it in a reverse direction generally opposite to the direction in which it was moving at the time of reversal into the second magazine in the same relative order and face position it occupied in the first magazine.

6. In document handling and recording apparatus, a cabinet having side and end walls, a chute defining a document feeding path in the cabinet exhibiting an approximately closed loop having adjacent terminal ends in

the lower level of the cabinet, said loop of the chute extending toward the opposite end walls of the cabinet beyond each of said terminal ends, one side wall of the cabinet having a pair of openings in the lower level thereof opposite to said terminal ends, means in the cabinet in line with said openings for removably receiving interchangeable magazines for containing documents capable of being fed through the document feeding path, and a magazine loading platform along the outside of said one side wall having magazine guiding surfaces in line with said last mentioned means and an additional surface connecting said guiding surfaces for slidably shifting a magazine in straight-line motion from a guiding surface at one said opening to a guiding surface at the other said opening.

7. In document handling and recording apparatus, a cabinet having side and end walls, chute defining a document feeding path in the cabinet exhibiting a loop formation and having the terminal ends thereof adjacent to one another in the lower level of the cabinet, a printing mechanism inside the cabinet adjacent to one end wall thereof for making printing impressions on documents fed through said chute, one side wall of the cabinet having a pair of openings in the lower level thereof opposite to said terminal ends, a pair of substantially duplicate magazines removably positioned in the cabinet adjacent to the terminal ends and adapted to contain documents capable of being fed through the feeding chute path, said magazines having corresponding bottoms and corresponding sides, and a loading platform adjacent to the outside of said one side wall and having two guide portions each mating with the bottom and a different side of the respective magazines for slidably supporting and guiding the magazines for movement through the openings into and out of the cabinet.

8. In a record handling apparatus, a cabinet having side and end walls, a chute structure having open sides and defining a primary record form feeding path in the cabinet exhibiting an approximately closed loop and having the ends thereof terminating within the cabinet adjacent to one another, a channel-shaped member at one of said open sides of the chute having an inside surface for edge-guiding record forms in the chute, said loop extending longitudinally toward the opposite end walls of said cabinet from said terminal ends, one side wall of the cabinet having a pair of openings in line with the terminal ends of said loop, means in the cabinet for removably slidably guiding record form holding magazines into and out of the openings for positioning the same at the terminal ends of the feeding path loop, means associated with said chute for advancing record forms from a magazine at one end thereof and for feeding such forms successively through the chute in contact with said inside surface to a magazine at the other end thereof, an end wall of said cabinet having an opening therethrough exposing a portion of the feeding path loop to view, and a printing mechanism positioned adjacent to said end wall opening and operable to make printing impressions upon record forms fed through the feeding path loop, the results of said printing impressions being capable of being viewed through said end wall opening.

9. In record handling apparatus, a cabinet having front and rear end walls and opposite side walls, a chute defining a primary document feeding path in the cabinet exhibiting an approximately closed loop and having the ends thereof terminating adjacent to one another, said chute including a channel-shaped member at one side thereof having an inside surface for edge-guiding documents in the chute, a portion of said loop extending from a position adjacent to the front wall of the cabinet toward the rear wall thereof, one side wall of the cabinet having a pair of openings in line with said terminal ends, means in the cabinet for slidably guiding magazines for containing documents into and out of the openings for positioning the same at the terminal ends of the primary feeding

path, means associated with said primary path chute for advancing documents from a magazine at one end thereof and for feeding such documents progressively through the chute in contact with said inside surface to a magazine at the other end thereof, a secondary chute defining a secondary document feeding path having one of its ends leading to said portion of the primary feeding path loop and the other end terminating adjacent to the front wall of the cabinet, means associated with the secondary chute for switching documents from said primary feeding path loop portion to the secondary chute and for feeding such documents therethrough to a stacking bin adjacent to the front wall of the cabinet, said front wall having an opening therethrough exposing a portion of the primary feeding path to view, and a printing mechanism in the cabinet adjacent to said front wall opening and operable to make printing impressions upon documents fed through the primary feeding path, said printing impressions being viewable through said front wall opening.

10. The combination comprising, mechanism for operating on sheet material, a cabinet for housing the mechanism and having a pair of openings in the lower level of one wall thereof adjacent to one another, a pair of box-like interchangeable supply and stacking magazines for containing sheets capable of being operated on by said mechanism, each magazine having a bottom wall and side walls, and open at its top for receiving sheets, means in the cabinet adjacent said pair of openings for supporting the magazines therein by a bottom and at least one side wall of each magazine, and a loading facility adjacent to the outside of said cabinet wall and having guiding means in line with said supporting means for slidably moving the magazines into and out of the cabinet.

11. In combination with mechanism for operating on sheet material, means defining a sheet feeding path having terminal ends, a supply magazine at one of said terminal ends for containing sheets to be delivered along said path to the mechanism, a stacker magazine at the other terminal end for receiving the sheets fed from the mechanism along said path, each magazine having a bottom wall and side walls and an opening in one of said walls, a sheet feeding device adjacent to the supply magazine, means for causing relative movement between the supply magazine and the sheet feeding device for entering the latter into said opening of the supply magazine for feeding sheets from a supply of sheets therein for delivery to the feeding path, means at a ready position along the feeding path between the supply magazine and the mechanism operable to be projected across the feeding path for stopping sheets moving in the feeding path, and constantly driven rotating rollers along the feeding path for feeding the sheets along the path, certain of said rollers being operative to stop rotating while in contact with a sheet when a sheet is stopped at the ready position.

12. The invention defined in claim 11 characterized further by means associated with one of said rollers and responsive to a predetermined change in angular velocity of said roller for initiating stoppage of all of said rollers.

13. In sheet handling apparatus, stationary means forming the top and bottom guides of a document delivery chute, said chute being open sided and defining a document feeding path having terminal ends, a side guide for the chute extending along one open side thereof for substantially its length and being channel-shaped in cross section and having its channel opening inwardly of the chute, a magazine adjacent to one of the terminal ends of the chute for containing documents for transit through the chute, a magazine adjacent to the other terminal end of the chute for stacking the documents thus fed through the chute, means for extracting the documents from the first magazine and for successively advancing the same into the chute, roller means disposed at spaced intervals along the chute and being operable to engage the documents and advance the same along the chute to the other terminal end thereof, said rollers having their axes of

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rotation so angled with respect to the path of the documents along the chute that they urge the documents into the channel-shaped guide and maintain an edge of each document against the base of the channel while so advanced.

14. The combination comprising, a mechanism for operating on sheet material, a portable magazine in a first station for containing a supply of sheets to be delivered to the operating mechanism, a portable magazine in a second station for stacking sheets fed from the operating mechanism, said magazines being similarly constructed and each magazine having a bottom wall and side walls and an opening in one of said walls, a sheet extracting device adapted to extend through said opening of the supply magazine for advancing the end sheet of a supply of sheets out of the supply magazine with one of its edges leading, means for bodily advancing a supply of sheets in said supply magazine to said sheet extracting device to maintain the latter in feeding relation with the end sheet thereof, and means for feeding sheets from the operating mechanism and for delivering such sheets into the stacking magazine with an edge of each sheet leading which is opposite to said one edge and with the sheets in the same order and face position relative to said opening in the stacking magazine that the sheets occupy in the supply magazine relative to said opening therein, and wherein said magazines are interchangeably positionable in said respective stations for reprocessing a stack of sheets delivered into said stacking magazine.

15. The combination comprising, a mechanism for operating on sheet material, a portable magazine in a first station for supplying sheets to be delivered to the operating mechanism, a portable magazine in a second station for stacking sheets fed from the operating mechanism, said magazines being similarly constructed and each magazine having a bottom wall and side walls and an opening in one of said side walls, a sheet feeding device adjacent to the supply magazine, means for causing relative movement between the supply magazine and the sheet feeding device for entering the latter into said opening of the supply magazine for feeding sheets from a supply of sheets therein for delivery to the operating mechanism with one edge of each sheet leading, and means for feeding sheets from the operating mechanism and delivering such sheets into the stacking magazine with an edge of each sheet leading which is opposite to said one edge and with the sheets in the same order and face position relative to said opening in the stacking magazine that the sheets occupy in the supply magazine relative to said opening therein, and wherein said magazines are interchangeably positionable in said respective stations for reprocessing a stack of sheets delivered into said stacking magazine.

16. The combination comprising, a mechanism for operating on sheet material, a portable magazine in a first station for containing a supply of sheets to be delivered to the operating mechanism, a portable magazine in a second station for stacking sheets fed from the operating mechanism, said magazines being substantially duplicates and each magazine having a bottom wall, side walls, and an open top and being adapted to support sheets therein with an edge of each sheet bearing against the bottom wall thereof, a sheet extracting device adjacent to the supply magazine, means for advancing a supply of sheets in the supply magazine to the sheet extracting device for feeding sheets from the supply magazine through said open top thereof for delivery to the operating mechanism with one edge of each sheet leading, and means for feeding sheets from the operating mechanism and delivering such sheets into said stacking magazine with an edge of each sheet leading which is opposite to said one edge and with the sheets in the same order and face position relative to the stacking magazine that the sheets occupy in the supply magazine relative thereto, and wherein said magazines are interchangeably positionable in said respec-

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tive stations for reprocessing a stack of sheets delivered into said stacking magazine.

17. In data recording apparatus, a chute defining a primary document feeding path exhibiting a loop formation and having the terminal ends thereof adjacent to one another, an aligning surface co-extensive with said chute, means for positioning a feed magazine adjacent to one terminal end of the loop for supplying documents for transit through the chute, means for feeding documents successively from a supply of such documents in said magazine and through the chute in contact with said aligning surface to the other terminal end thereof, means for positioning a receiving magazine adjacent to the last mentioned terminal end of the loop for stacking documents fed through the chute, means defining a secondary document feeding path exhibiting substantially a loop formation of smaller size than the primary loop and positioned wholly within the primary loop, said secondary path defining means being operable to convey documents successively from one end to the other end thereof, means predisposing a portion of the secondary loop coincident to a portion of the primary loop such that documents of both loops may be brought into juxtaposition as they are being fed through their respective loops, printing means located adjacent to the coincidental portions of the two loops and operable to print information on documents of both loops, a second chute defining an auxiliary document feeding path connected at one end into the primary document feeding chute in advance of the printing means, means at the other end of the auxiliary feeding path for means from the auxiliary feeding chute path into the auxiliary feeding chute path, and means for gating documents from the auxiliary feeding chute path into the primary document feeding chute.

18. In data recording apparatus, a chute defining a primary document feeding path exhibiting a loop formation and having the terminal ends thereof adjacent to one another, an aligning surface co-extensive with said chute, means for positioning a feed magazine adjacent to one terminal end of the loop for supplying documents for transit through the chute, means for feeding documents successively from a supply of such documents in said magazine and through the chute in contact with said aligning surface to the other terminal end thereof, means for positioning a receiving magazine adjacent to the last mentioned terminal end of the loop for stacking documents fed through the chute, means defining a secondary document feeding path exhibiting substantially a loop formation of smaller size than the primary loop and positioned wholly within the primary loop, said secondary path defining means being operable to convey documents successively from one end to the other end thereof, means predisposing a portion of the secondary loop coincident to a portion of the primary loop such that documents of both loops may be brought into juxtaposition as they are being fed through their respective loops, printing means located adjacent to the coincidental portion of the two loops and operable to print information on documents of both loops, a second chute defining a manual document feeding path connected at one end into the primary document feeding chute in advance of the printing means and the other end adapted for receiving documents therein, and means for gating documents from the manual feeding chute path into the primary document feeding chute.

19. In data recording apparatus, a chute defining a primary document feeding path exhibiting a loop formation and having the terminal ends thereof adjacent to one another, an aligning surface co-extensive with said chute, means for positioning a feed magazine adjacent to one terminal end of the loop for supplying documents for transit through the chute, means for feeding documents successively from a supply of such documents in said magazine and through the chute in contact with said aligning surface to the other terminal end thereof,

means for positioning a receiving magazine adjacent to the last mentioned terminal end of the loop for stacking documents fed through the chute, means defining a secondary document feeding path exhibiting substantially a loop formation of smaller size than the primary loop end positioned wholly within the primary loop, said secondary path defining means being operable to convey documents successively from one end to the other end thereof, means predisposing a portion of the secondary loop coincident to a portion of the primary loop such that documents of both loops may be brought into juxtaposition as they are being fed through their respective loops, printing means located adjacent to the coincidental portions of the two loops and operable to print information on documents of both loops, a second and a third chute defining respectively separate manual and auxiliary feeding paths merging at one end with each other and with the primary document feeding chute and having their other ends adapted for receiving documents therein, means for positioning a supply of documents at said other end of the auxiliary feeding chute path to be fed therein, and means for gating documents from the manual and auxiliary feeding chute paths into the primary feeding chute.

20. In document handling and recording apparatus, a substantially rectangular shaped cabinet, means forming a chute defining a primary document feeding path in the cabinet exhibiting an approximately closed loop and having its terminal ends disposed adjacent to one another in the lower level of the cabinet, the loop of the chute extending laterally toward the opposite end walls of the cabinet beyond each terminal end of the loop, one side wall of the cabinet having a pair of openings in the lower level thereof each opposite to one of the terminal ends of the chute, means in the cabinet in line with said openings for removably receiving and supporting magazines for containing documents capable of being fed through the feeding path, means associated with the chute for removing documents successively from a magazine at one end thereof and for feeding such documents separately through the loop to a magazine at the other end thereof, one of said end walls of the cabinet having a sight opening therethrough exposing a portion of the chute to view, a printing mechanism positioned in the cabinet adjacent to said end wall opening and operable to print impressions upon documents fed through the chute, such printing being exposed to view through the end wall opening, means forming an auxiliary feeding chute merging at one end with the chute of the primary feeding path and having the other end thereof terminating in a position adjacent to said one end wall of the cabinet, a receptacle for containing documents capable of being handled by the printing mechanism and positioned at said last mentioned end of the auxiliary feeding chute, and means associated with the auxiliary feeding chute for conveying documents from the receptacle to the primary feeding path chute through its other merging end thereof.

21. In sheet handling apparatus, stationary means forming a chute defining a first record sheet feeding path exhibiting a loop formation and having the terminal ends adjacent to one another, means associated with the chute for conveying successive record sheets from one end to the other end of the loop, means for positioning a supply magazine adjacent to one terminal end of said loop for furnishing record sheets for transit through the chute, means for positioning a receiving magazine adjacent to the other terminal end of said loop for stacking record sheets fed through the chute, means defining a second record sheet feeding path substantially in the form of a loop and wholly disposed within the loop of the first feeding chute path, means associated with the second feeding path loop for conveying successive record sheets from one end to the other end thereof, means predisposing a portion of the second loop in substantially confluent relation to a portion of the first loop such that record sheets

fed through both loops may be brought into juxtaposition to one another, data impressing means located adjacent to the confluent portions of the two loops and operable to impress information on the record sheets of both loops, means defining an auxiliary feeding path for one of the feeding path loops connected at one end thereto anteriorly of the data impressing means, means for positioning an auxiliary supply of record sheets at the other end of the auxiliary feeding path, means associated with the auxiliary feeding path for conveying auxiliary record sheets from said record sheet supply to the feeding path loop to which the auxiliary feeding path is connected, and means for gating record sheets from the auxiliary feeding path into said last mentioned loop.

22. In record handling apparatus, a cabinet having side and end walls, a chute structure having open sides and defining a primary record form feeding path in the cabinet exhibiting an approximately closed loop and having the ends thereof terminating within the cabinet adjacent to one another, a channel-shaped member at one of said open sides of the chute having an inside surface for edge-guiding record forms in the chute, said loop extending longitudinally toward the opposite end walls of said cabinet from said terminal ends, one side wall of the cabinet having a pair of openings in line with the terminal ends of said loop, means in the cabinet for removably slidably guiding record form holding magazines into and out of the openings for positioning the same at the terminal ends of the feeding path loop, means associated with said chute for advancing record forms from a magazine at one end thereof and for feeding such forms successively through the chute in contact with said inside surface to a magazine at the other end thereof, an end wall of said cabinet having an opening therethrough exposing a portion of the feeding path loop to view, a printing mechanism positioned adjacent to said end wall opening and operable to make printing impressions upon record forms fed through the feeding path loop, the results of said printing impressions being capable of being viewed through said end wall opening, means defining an auxiliary feeding path merging at one end with the primary feeding path loop and having the other end thereof terminating in a position adjacent to said open end wall of the cabinet, a supply bin at said other end of the auxiliary feeding path for containing record forms, and means for feeding record forms from the supply bin and advancing such forms along the auxiliary feeding path into the primary feeding path loop.

23. In document handling apparatus, means defining a document feeding path having terminal ends, means at one of said terminal ends for removably receiving a first magazine for containing documents capable of being fed through the feeding path, means associated with the feeding path for removing documents from a said first magazine and for feeding such documents in succession through the feeding path to a second similar magazine at the other terminal end thereof, and means adjacent to the second magazine for arresting movement of a document being fed thereto from the first magazine and thereafter for feeding it in a reverse direction generally opposite to the direction in which it was moving at the time of reversal into the second magazine in the same relative order and face position it occupied in the first magazine.

References Cited in the file of this patent

UNITED STATES PATENTS

1,208,322	Johnson	Dec. 12, 1916
1,669,015	Oliver	May 8, 1928
2,028,813	Stuart	Jan. 28, 1936
2,070,684	Ritzerfeld	Feb. 16, 1937
2,220,283	Ritzerfeld	Nov. 5, 1940
2,220,526	Kluitmann	Nov. 5, 1940
2,240,568	Mills et al.	May 6, 1941

(Other references on following page)

UNITED STATES PATENTS

2,334,223	Smith -----	Nov. 16, 1943	2,674,456
2,348,059	Daly -----	May 2, 1944	2,726,860
2,384,768	Rau -----	Sept. 11, 1945	2,806,695
2,497,149	Berdis et al. -----	Feb. 14, 1950	2,814,248
2,522,226	Hood -----	Sept. 12, 1950	2,901,247
2,528,420	Carroll et al. -----	Oct. 31, 1950	2,905,465
2,598,939	Rainey -----	June 3, 1952	2,905,466
2,632,643	Egan -----	Mar. 24, 1953	2,908,220

Gibson -----	Apr. 6, 1954
Luhn -----	Dec. 13, 1955
Carlisle -----	Sept. 17, 1957
Federwitz -----	Nov. 26, 1957
Orner -----	Aug. 25, 1959
Armstrong et al. -----	Sept. 22, 1959
Azari et al. -----	Sept. 22, 1959
Eichenbaum et al. -----	Oct. 13, 1959

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,070,204

December 25, 1962

Robert S. Bradshaw

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 17, for "an", second occurrence, read -- a --; column 4, line 49, for "to" read -- in --; column 6, line 66, for "detailed" read -- detained --; column 7, line 32, after "is" insert -- to be --; column 14, line 31, for "ments from the auxiliary feeding chute path" read -- positioning a supply of documents to be fed --.

Signed and sealed this 11th day of February 1964.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWIN L. REYNOLDS
Acting Commissioner of Patents