United States Patent

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[54] FRONT FEEDING DEVICE FOR AN ACCOUNTING OR LIKE MACHINE

[72] Inventors: **Alessandro Cortona,** Banchette; **Piero Musso,** Ivrea, both of Italy

[73] Assignee: **Ing. C. Olivetti & C., S.p.A.,** Ivrea (Turin), Italy

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[52] **U.S. Cl.** ..... **197/128,** 197/138 R

[51] **Int. Cl.** **B41j 11/48**

[58] **Field of Search** 197/127, 128, 138

[56] **References Cited**

UNITED STATES PATENTS

1,487,284	3/1924	Stickney	197/128
1,744,512	1/1930	Smith	197/127
2,107,397	2/1938	Smith	197/128 X
2,217,160	10/1940	Dodge	197/138
2,348,059	5/1944	Daly	197/128 X
2,818,960	1/1958	Ascoli et al.	197/128
2,836,279	5/1958	Fischer	197/128
3,148,758	9/1964	Larsen	197/127
3,211,270	10/1965	Templeton	197/127

FOREIGN PATENTS OR APPLICATIONS

679,613	8/1939	Germany	197/128
719,060	4/1942	Germany	197/128

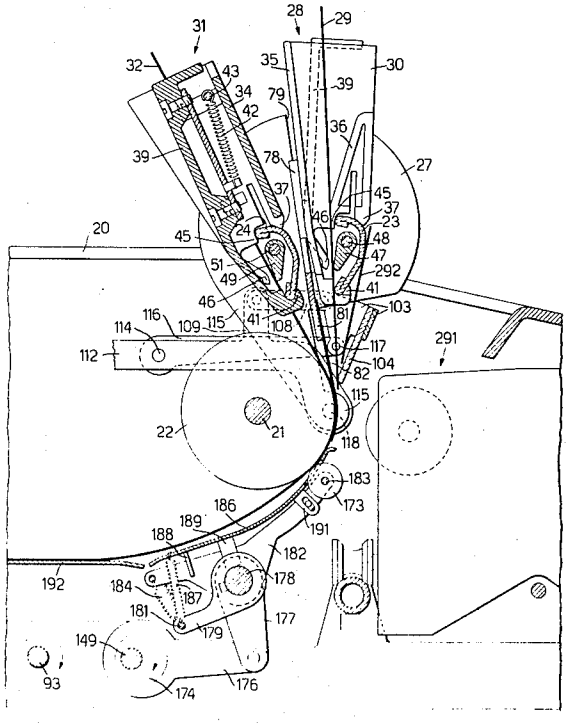
Primary Examiner—Ernest T. Wright, Jr.

Attorney—Birch, Swindler, McKie & Beckett

[57] **ABSTRACT**

A front feeding device for an accounting or like machine having a platen, the device including a plurality of paper-pressing rollers for clamping paper to the underside of the platen, clamping means for clamping paper above the platen, and operating means for selectively opening and closing the rollers and clamping means.

9 Claims, 7 Drawing Figures



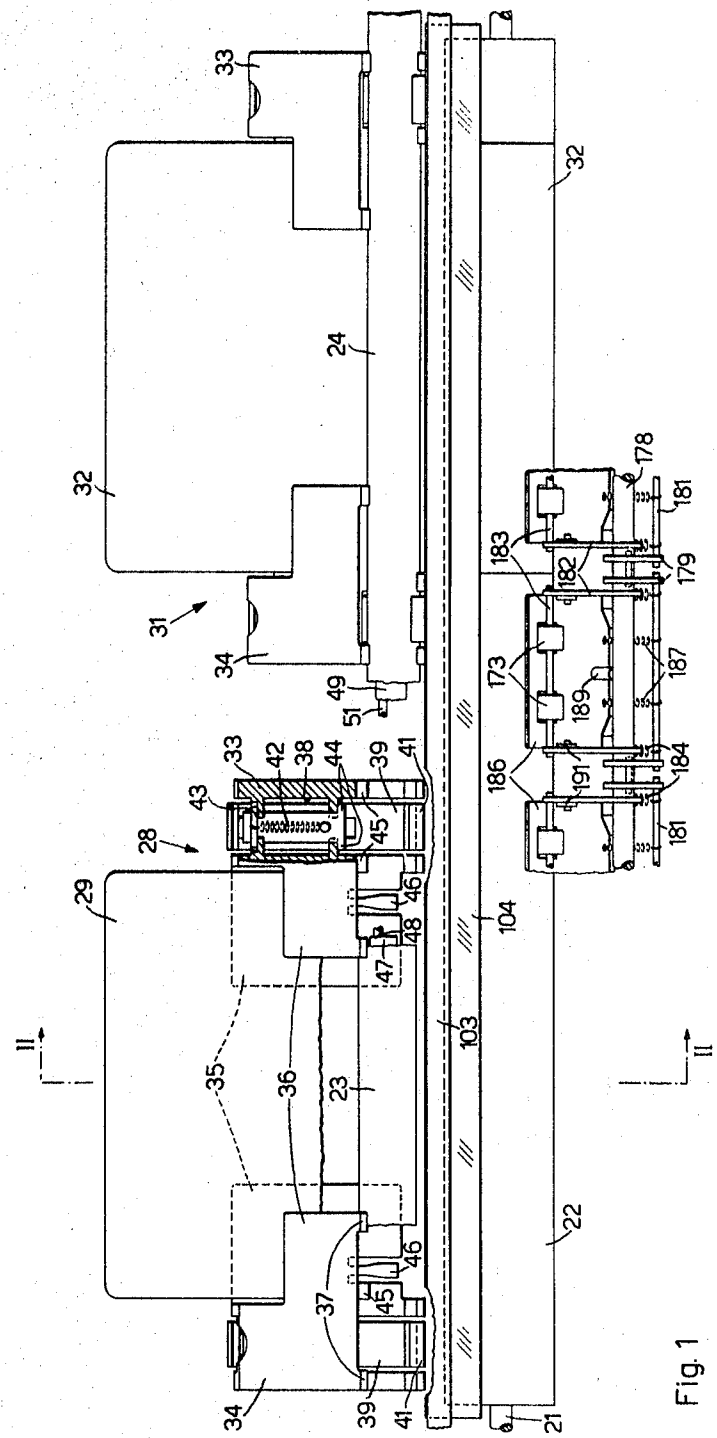
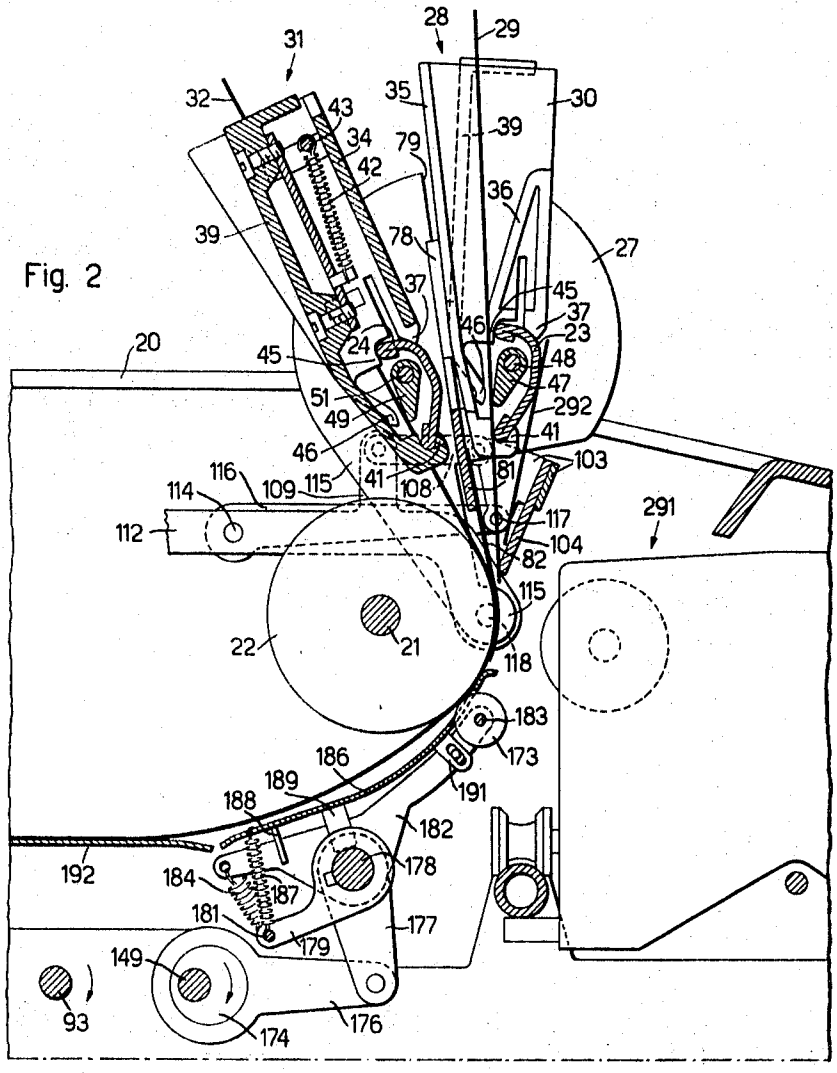


Fig. 1

INVENTORS
ALESSANDRO CORTONA
PIERO MUSSO

Fig. 2



INVENTORS
ALESSANDRO CORTONA
PIERO MUSSO

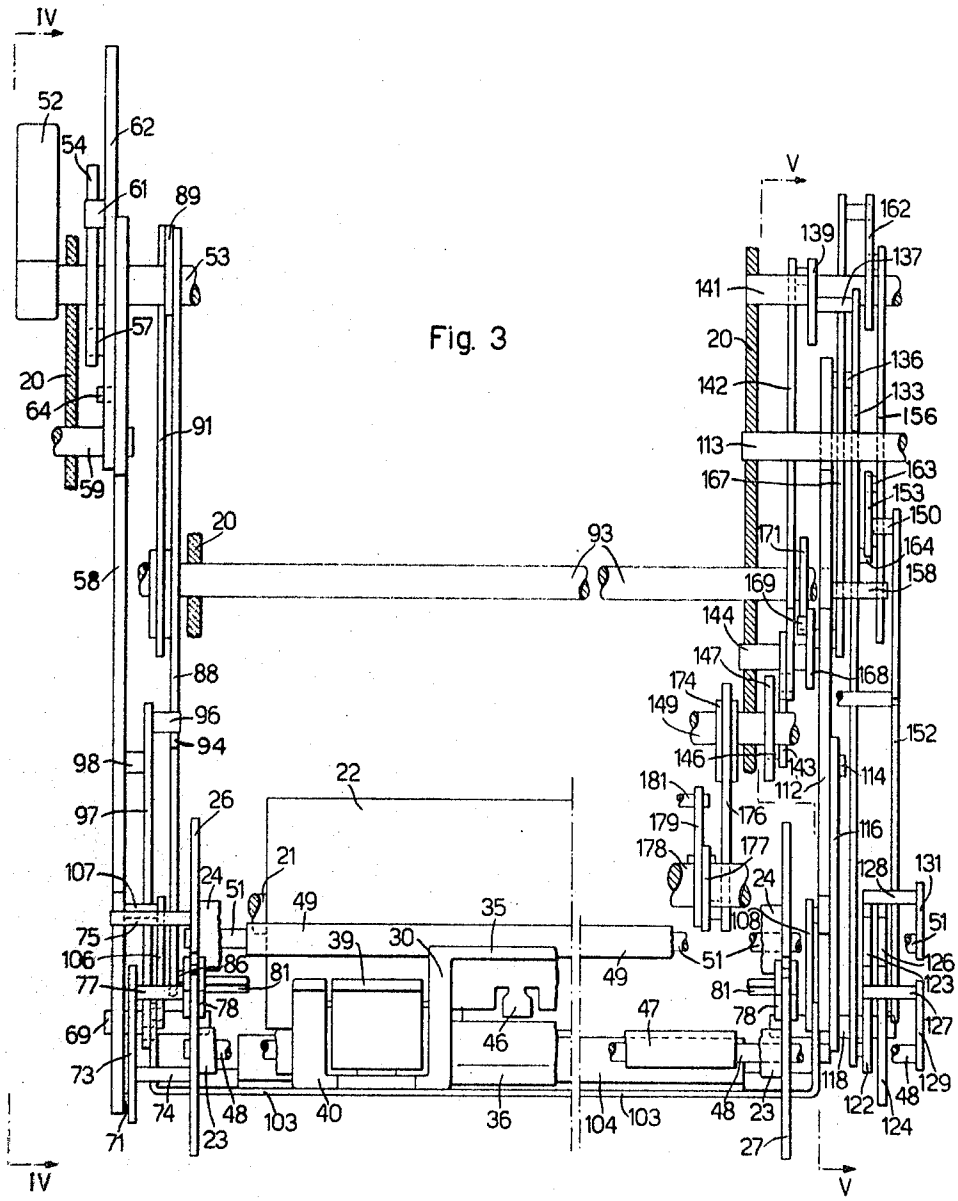


Fig. 3

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ALESSANDRO CORTONA
PIERO MUSSO

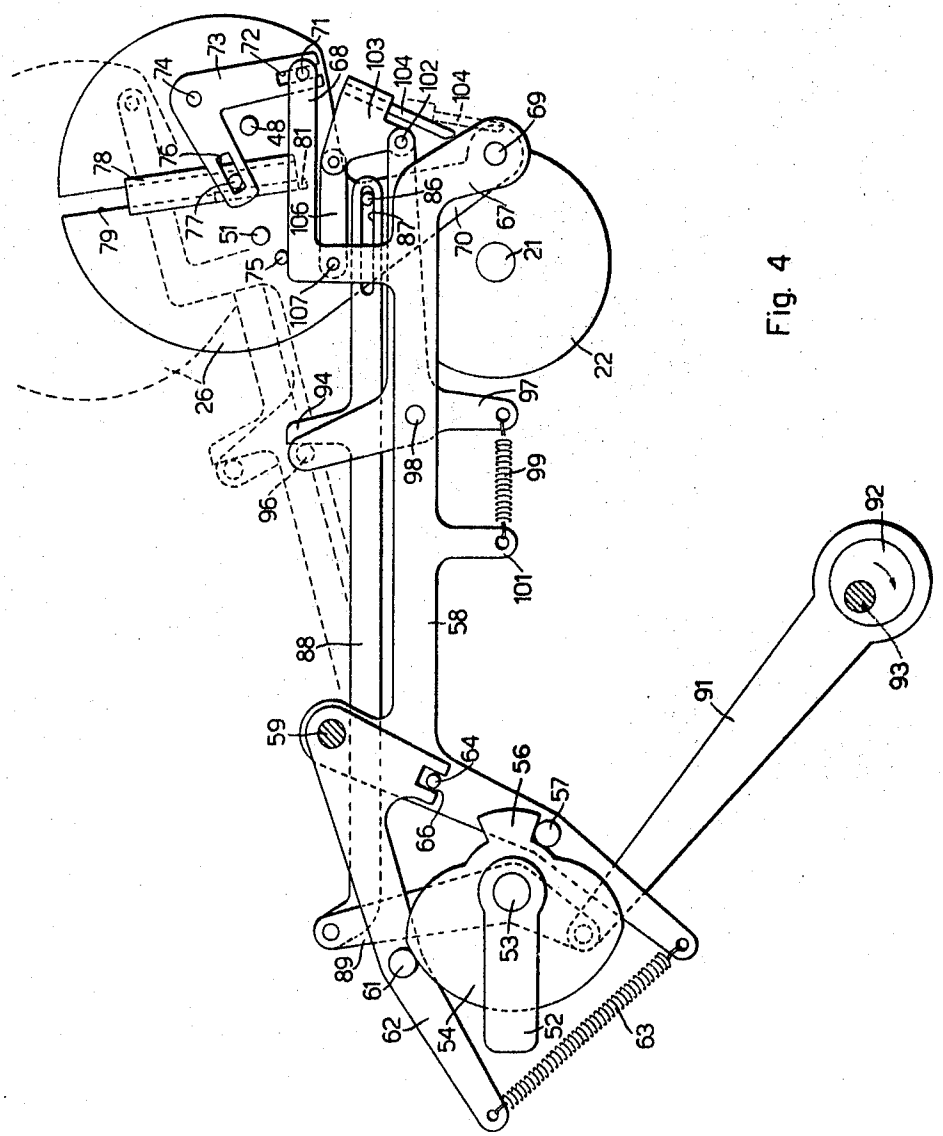

Fig. 4

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ALESSANDRO CORTONA
PIERO MUSSO

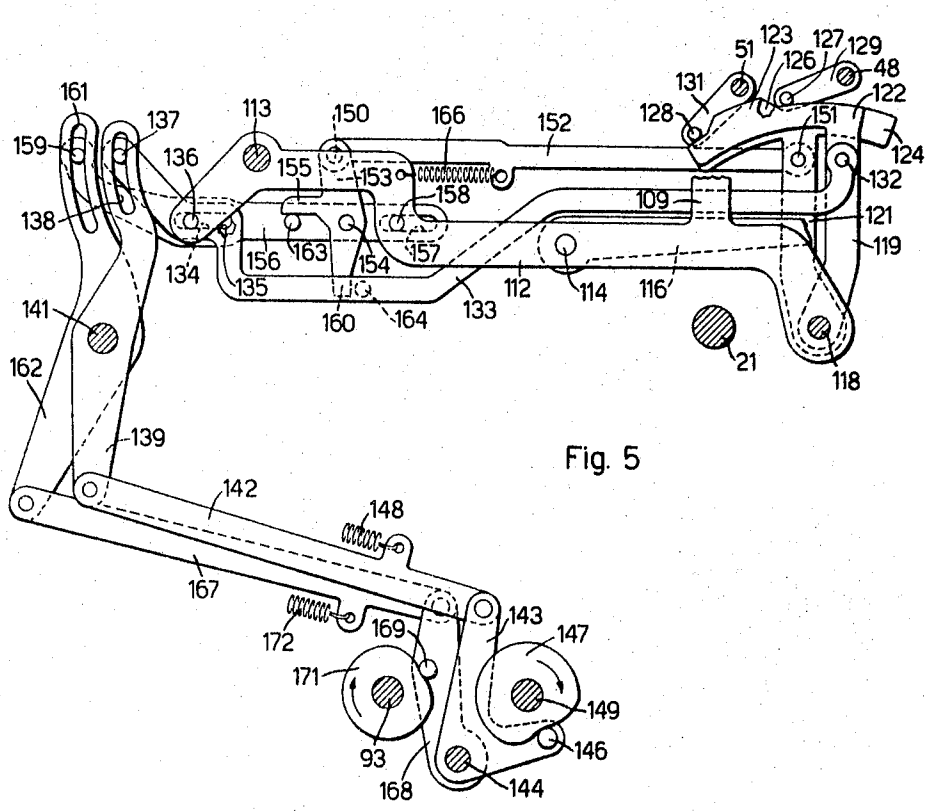

Fig. 5

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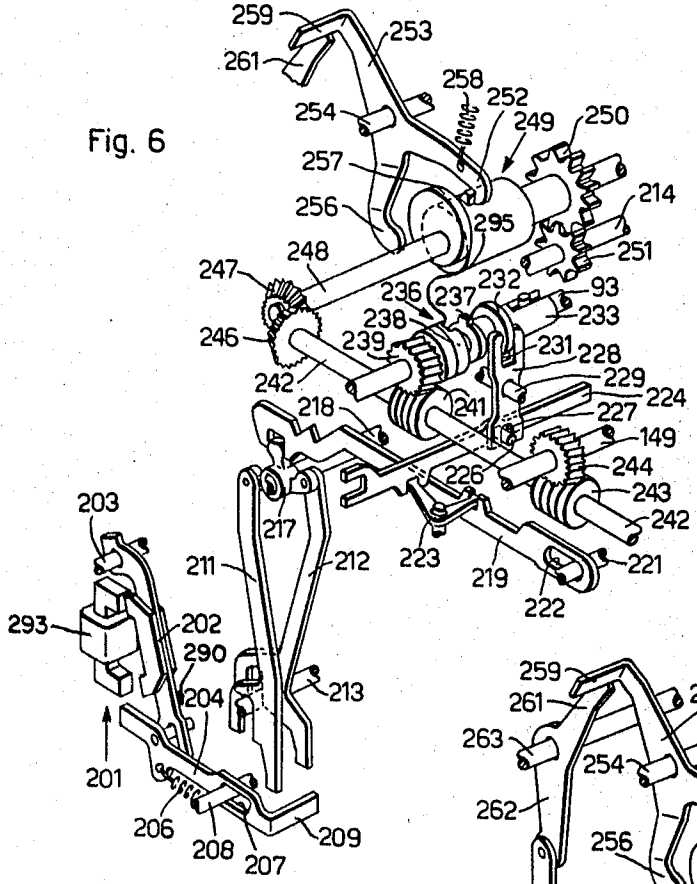
ALESSANDRO CORTONA
PIERO MUSSO

Fig. 6



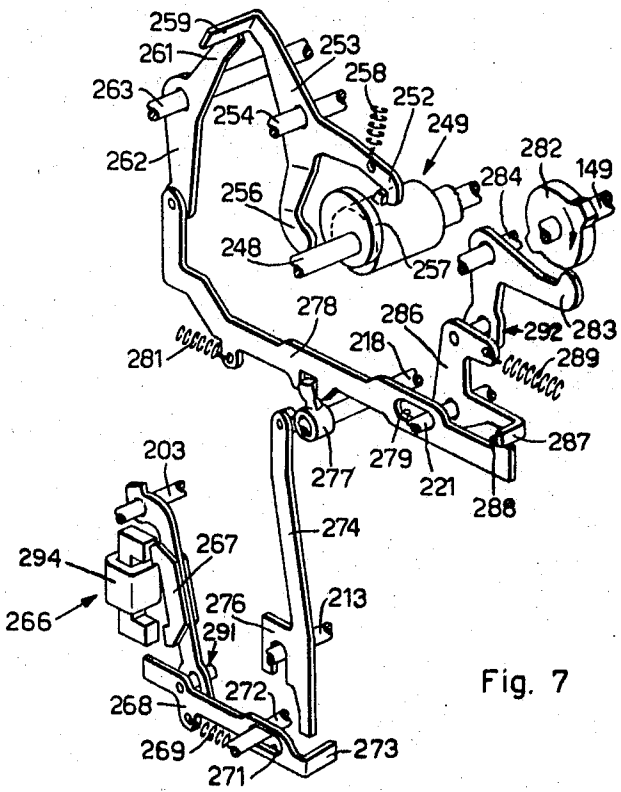


Fig. 7

INVENTORS
ALESSANDRO CORTONA
PIERO MUSSO

FRONT FEEDING DEVICE FOR AN ACCOUNTING OR LIKE MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a front feeding device for an accounting machine or other machine having a platen, the device comprising a series of paper-pressing rollers adapted to cooperate with the platen to clamp the paper immediately below the writing line, and at least one pair of hopper elements for receiving paper forms, these elements being mounted above the platen so as to be slidable transversely of the machine for the purpose of adapting them to the width of the form and to the transverse position required therefor.

2. Description of the Prior Art

Various front feeding devices of the above-mentioned type are known. In these devices, the forms introduced into the hopper elements are generally directly engaged by the paper-pressing rollers, so that the alignment of two forms which may be superposed and the replacement of only one of the forms becomes difficult. In other known devices, each inserter is equipped with independent draw rollers actuated by small electric motors which make these devices complicated and costly.

SUMMARY OF THE INVENTION

These disadvantages are obviated by the present invention, which provides a front feeding device for an accounting or other machine having a platen, comprising a series of paper-pressing rollers arranged to cooperate with the platen to clamp the paper immediately below the writing line, at least one pair of hopper elements mounted above the platen so as to be slidable therealong and adapted to guide a sheet of paper to and around the platen as the paper is inserted through said elements, clamping means in the hopper elements for clamping the paper above the writing line, and means for selectively opening and closing the paper-pressing rollers and the clamping means.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be described in more detail, by way of example, with reference to the accompanying drawing, in which:

FIG. 1 is a partial front view of an accounting machine incorporating a device according to the invention for the front feeding of paper forms;

FIG. 2 is a partial section on a larger scale taken along line II—II of FIG. 1;

FIG. 3 is a plan view on a larger scale of a number of details of the front feeding device;

FIG. 4 is a section on the line IV—IV of FIG. 3;

FIG. 5 is a section on the line V—V of FIG. 3;

FIG. 6 is a front perspective view from the left of a detail of the device; and

FIG. 7 is a front perspective view from the left of another detail of the device.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The front feeding device of the invention is incorporated in an accounting machine having a fixed frame **20** (FIG. 2). A shaft **21** carrying a platen **22** is rotatably mounted in frame **20**, and a type carriage **291** movable transversely of the machine in a known manner is supported by the frame **20**. The type carriage **291** is adapted to write on paper placed around the platen **22**. Above the platen **22** there are disposed two transverse bars **23** and **24** formed by bent sheet metal. The bars **23** and **24** are fixed to two side plates **26** and **27** (FIG. 3) of substantially circular form and connected to the frame **20**, as described hereinafter. The bar **23** (FIG. 2) is disposed in front of the bar **24**, which is turned through a certain angle with respect to the bar **23**.

A first form-guiding inserter, indicated generally by the reference **28**, is mounted slidably on the bar **23** in a substantially vertical position and can receive front accounting or bookkeeping form **29** normally used for individual entries, that is for one accounting entry at a time, so that it must be replaced at each entry. A second inserter **31**, similar to the inserter **28**, is mounted slidably on the bar **24** in a position inclined with respect to the vertical and can receive another accounting form, that is a rear accounting form **32**, normally used for entries of a summarizing nature, that is for a plurality of successive entries which summarize the entries on a plurality of forms **29**, so that is is replaced less frequently. The positions of the bars **23** and **24** and the inclination of the inserter **31** with respect to the inserter **28** allow the sliding of the inserters **28** and **31** without any interference along the respective bars **23** and **24**, as a result of which the two forms **29** and **32** can be disposed one alongside the other to enable two different entries to be made thereon during the same accounting operation.

The inserter **28** comprises two symmetrical hopper elements **33** and **34** (FIG. 1) for guiding the edges of the form **29**. The elements **33** and **34** are independent of one another and are made of a plastic material. Each element **33**, **34** comprises a rear plate **35** (FIG. 2), a vertical side plate **30** and a projecting front rib **36**. Each rib **36** is provided at the bottom with two extensions or projections **37** (FIG. 1) adapted to bear on the bars **23** and **24**; respectively, against which there moreover bear two shoulders **45** of each element **33**, **34**. An L-shaped extension **40** (FIG. 3) is integral with each plate **30** and defines with the associated plate **30** a vertical guide **38** (FIG. 1). A plate **39** slides in each guide **38** and is provided with an upwardly curved bottom edge **41** adapted to hook onto the bar **23**, **24**, respectively, by the action of a tension spring **42** attached to the plate **39** and to a pin **43** housed in a recess in the top edge of the guide **38**. The plate **39** is moreover provided with two projections **44** normally bearing against the bottom edge of the guide **38** to prevent disengagement of the plate **39**.

In order to shift the elements **33** or **34** along the bar **23** or **24**, the plate **39** is pushed downwardly manually to overcome the action of the spring **42**, so as to disengage the edge **41** from the bar **23** or **24**. The element **33** or **34** can then be made to slide without any difficulty by maintaining pressure on the plate **39**, which is then released after the element **33** or **34** has been brought into the desired new transverse position, in order to secure it on the bar **23** or **24**.

The element **33** can be shifted together with the element **34** of the same inserter **28**, keeping the distance between the elements **33** and **34** constant, if, for example, the inserter **28** is to be shifted with respect to the inserter **31**. The inserters **28** and **31** may moreover be arranged side by side in order to effect two different entries, one on the form **29** and the other on the form **32**. Of course, it is possible to shift both the inserters **28** and **31**, or only one of the two by acting on the respective elements **33** and **34**. Each inserter **28**, **31** can moreover be adapted to receive forms of different widths. To this end, the respective elements **33** and **34** can be shifted along the bars **23**, **24** independently of one another and be moved nearer to, or further from, each other.

Each element **33** and **34** is provided with a resilient projection **46** (FIG. 1) formed in the lower portion of the rear plate **35** inwardly from the side plate **30**. The projections **46** of the elements **33** and **34** of the inserter **28** cooperate with a flap **47** (FIG. 2) fixed on a shaft **48** turning in the plates **26** and **27** (FIG. 3) in order to clamp the form **29**. The projections **46** (FIG. 2) of the elements **33** and **34** of the inserter **31** cooperate with another flap **49** fixed on another shaft **51** turning in the same plates **26** and **27** in order to clamp the form **32**.

The front feeding device is adapted to be shifted in a direction substantially vertical with respect to the platen **22** (FIGS. 3 and 4). To this end, a manually operated lever **52** is fixed to a pin **53** turning in the frame **20** of the machine. Fixed to the pin **53** is a cam **54** (FIG. 4) having a projecting part **56**. The cam **54** and the projecting part **56** are adapted to cooperate with a stud **57** on a first lever **58** pivoted on a spin-

dle 59 fixed to the frame 20. The cam 54 and the projecting part 56 moreover cooperate with a stud 61 on a second lever 62 pivoted on the spindle 59, the levers 58 and 62 being connected by a spring 63. Moreover, the lever 58 is provided with a stud 64 engaged in a notch 66 in the lever 62.

The front end of the lever 58 forks into two arms 67 and 68. The arm 67 is provided with a pin 69 on which there is pivotally mounted an arm 70 extending downwardly from the plate 26. The plate 26 is provided with a pin 75 normally bearing against the upper edge of the arm 68 due to the weight of the inserters 28 and 31. The arm 68 is provided with a stud 71 engaged in a notch 72 of an L-shaped lever 73. The latter is pivoted on a pin 74 fixed to the plate 26 and is provided with a slot 76 in engagement with a pin 77 of a slider 78 slidable in a substantially vertical guide slot 79 in the plate 26. Another slider 78 (FIG. 2) is mounted slidably in a slot 79 in the plate 27. The two sliders 78 are rigidly interconnected by a transverse plate 81 to the lower edge of which there is fixed a transfer ribbon 82 which is inserted between the form 29 and the form 32 to permit the entry of the same data on the two superposed forms 29 and 32.

To the arm 70 (FIG. 4) of the plate 26 there is fixed a pin 86 engaged in a slot 87 in a slider 88. The slider 88 is connected to a lever 89 which is pivoted on the pin 53 and is also connected to a connecting rod 91 cooperating with an eccentric 92 fixed on an auxiliary shaft 93. The latter is adapted to be rotated cyclically through 180°, as will be described hereinafter.

The slider 88 is provided with a projection 94 adapted to cooperate with a stud 96 fixed to a three-armed lever 97 pivoted on a pin 98 on the lever 58. The lever 97 is connected by means of a spring 99 to a projection 101 of the lever 58 and is connected via a pin 102 to a frame 103 carrying a transparent rule 104 (FIGS. 1 and 3) extending over substantially the entire length of the platen 22. The rule 104 has the dual purpose of guiding the form 29 towards the platen 22 and of enabling the alignment of both the forms 29 and 32 to be checked by means of suitable references marked on the rule 104. The frame 103 (FIG. 4) is moreover connected by means of a link 106 to a pin 107 fixed on the arm 68 of the lever 58; the link 106 being shorter than the lever 97.

On the right side of the machine, the frame 103 is connected (FIG. 2) by means of another link 108 similar to the link 106 to a projection 109 of the lever 112 (FIG. 5). The lever 112 is pivoted on a spindle 113 fixed to the frame 20 of the machine in axial alignment with the spindle 59 (FIG. 3) so that the front feeding arrangement is supported by the two coaxial levers 58 and 112. The lever 112 is provided with a pin 114 (FIG. 5) coaxial with the pin 98 (FIG. 4). Pivoted on the pin 114 is a lever 116 connected by means of a pin 117 (FIG. 2) to the frame 103; the link 108 being shorter than the lever 116. The frame 103 is thus supported by the two levers 97 and 116 (FIG. 3) and, via the links 106 and 108, by the two levers 58 and 112.

The lever 112 is moreover provided with a pin 118 on which there is pivotally mounted an arm 115 (FIG. 2) integral with the plate 27. On the pin 118 there are also pivoted two levers 119 and 121 (FIG. 5), integral with respective circular sectors 122 and 124 provided with respective projections 123 and 126. Two pins 127 and 128 (FIG. 3) normally bear on the sectors 122 and 124. The pin 127 is fixed to a lever 129 (FIG. 5) fast with the shaft 48. The pin 128 is fixed to a lever 131 fast with the shaft 51.

The lever 119 is connected by means of a pin 132 to a slider 133 which is provided with a slot 134 engaging a pin 136 fixed to the lever 112. The slider 133 is moreover provided with a pin 137 engaged in a slot 138 of a rocking lever 139 pivoted on a spindle 141 fixed to the frame 20. The rocking lever 139 is connected through the medium of a connecting rod 142 to a crank 143 pivoted on a fixed spindle 144. The crank 143 is provided with a stud 146 held so that it bears against a cam 147 by a spring 148 attached to the connecting rod 142. The cam 147 is keyed on a main shaft 149 rotatable cyclically through 180°, as will be described hereinafter.

The lever 121 is connected by means of a pin 151 to one end of a connecting rod 152, the other end of which is connected by means of a pin 150 to a lever 153 pivoted on a pin 154 of a slider 156. The lever 153 is provided with a projection 155 normally bearing against a stud 163 fixed to the slider 156 due to the action of a spring 166 connected between the connecting rod 152 and the lever 112. Another projection 160 of the lever 153 is adapted to cooperate with a stud 164 fixed to the slider 133. The slider 156 is slidable on the pin 136 by means of a slot 135 similar to the slot 134 of the slider 133. The slider 156 is moreover slidable by means of another slot 157 on a pin 158 fixed to the lever 112. The slider 156 is provided with a pin 159 engaged in a slot 161 in a rocking lever 162 pivoted on the fixed spindle 141. The rocking lever 162 is moreover connected through the medium of a connecting rod 167 to a crank 168 pivoted on the spindle 144. The crank 168 is provided with a stud 169 held so that it bears against a cam 171 keyed on the auxiliary shaft 93 by a spring 172 attached to the connecting rod 167. Keyed on the main shaft 149 (FIG. 2) is an eccentric 174 with which there cooperates a connecting rod 176 connected to a crank 177 keyed on a shaft 178 rotatable in the frame 20 of the machine. On the shaft 178 there is keyed a series of levers 179 connected in pairs by rods 181 (FIG. 1). There is moreover pivoted on the shaft 178 a series of levers 182 (FIG. 2) connected at the front in pairs by rods 183 on each of which there are rotatable two paper-pressing rollers 173. Each lever 182 is connected at the rear to the corresponding rod 181 by means of a spring 184.

Each pair of levers 182 embraces a form-guiding plate 186 connected by means of a pair of springs 187 to the corresponding rod 181 and provided with two lateral guide tongues 188 cooperating with the respective levers 182. Each plate 186 is moreover provided with a pin 189 by means of which it bears on the shaft 178 and with two lugs 191 connected by a pin and slot to the respective levers 182. Another plate 192 for supporting and guiding the forms 29 and 32 and extending from one side of the machine to the other is fixed to the frame 20 in a position which is substantially horizontal and rearwardly of the plates 186.

The main shaft 149 and auxiliary shaft 93 are controlled by an operating system similar to that described in the specification of our copending application, Ser. No. 791,666, filed Jan. 16, 1969 and entitled Paper Feed System For Accounting Machines, with reference to the control of the line spacing. The operating system for the respective auxiliary and main shafts 93 and 149 is controlled by the same electronic programming unit indicated in said copending application Ser. No. 791,666 by the reference numeral 340 and disclosed in copending application Ser. No. 783,894, filed Dec. 16, 1968, by Fabrizio Saltini, entitled Stored Program Electronic Computer and owned by the assignee of the present application. The operating system for the main shaft 149 and auxiliary shaft 93 comprises a continuously rotating driving shaft 214 (FIG. 6), which corresponds to the shaft 239 of said copending application Ser. No. 791,666 and two shafts 208 and 272 which correspond to the shafts 144 and 214 of said copending application Ser. No. 791,666. Each of the shafts 208 and 272 are movable cyclically along a closed path with a predetermined displacement by the mechanism disclosed in copending application Ser. No. 773,872, filed Nov. 6, 1968, by Alessandro Cortona and Giuseppe Calano, entitled Electromechanical Transducer and owned by the assignee of the present application.

The operating system also comprises an electromagnet 201 (FIG. 6) for initiating the rotation of the auxiliary shaft 93. The electromagnet 201 is normally deenergized, and the armature 202 thereof is pivoted on a fixed spindle 203 and is connected by a pin and slot connection 290 to a slider 204. The armature 202 is normally held detached from the core 293 of the electromagnet 201 by a spring 206. The slider 204 is provided with a slot 207 sliding on the shaft 208.

The slider 204 is also provided with a lug 209 adapted to cooperate alternately with the lower end of two push rods 211 and 212. The lower ends of the push rods 211 and 212 are off-

set from one another in the direction of movement of the slider **204**, with the lower end of the push rod **211** being disposed to the left of the lower end of the push rod **212** as seen in FIG. **6**. The push rods **211** and **212** are guided vertically by a fixed spindle **213** and are pivoted on two opposite arms of a rocking lever **217** pivoted on a fixed spindle **218**. The rocking lever **217** is in engagement with a slider **219** provided with a slot **222** sliding horizontally on a fixed spindle **221**. The slider **219** is connected through the medium of a lever **223** to a slider **224** which is slidable horizontally and is disposed substantially at right angles to the slider **219**. The slider **224** is provided with a stud **226** engaged in a notch **227** of a rocking lever **228** pivoted on a fixed spindle **229**.

The rocking lever **228** is provided with a second notch **231** engaging a flange **232** of a sleeve **233** slidable on the auxiliary shaft **93**. The sleeve **233** is rotatably fast with the auxiliary shaft **93** and forms the driven part of a prearranging clutch **236**. The sleeve **233** is provided with a dog **237** adapted to engage in a corresponding notch **295** in a cup **238** forming the driving part of the clutch **236**. The cup **238** is loose on the auxiliary shaft **93** and is fast with a helical gear **239** meshing with a worm **241** fixed on a shaft **242**. Another worm **243** fixed on the shaft **242** meshes with a helical gear **244** keyed on the main shaft **149**.

The shaft **242** is connected by means of a pair of bevel pinion **246** and **247** to a shaft **248** adapted to be rotated cyclically by a one-cycle actuating clutch **249** the driving part of which is fast with a gear **250** in engagement with a gear **251** fixed on the driving shaft **214**. The clutch **249** is normally held open or disengaged by a tooth **252** of a lever **253** pivoted on a fixed spindle **254**. The lever **253** is provided with a lug **259** normally bearing by the action of a spring **258** against an arm **261** of a lever **262** pivoted on a fixed spindle **263** (FIG. **7**). The lever **253** has a projection **256** (FIG. **6**) adapted to cooperate with a cam **257** keyed on the shaft **248**.

The operating system for the main shaft **149** and auxiliary shaft **93** also comprises a normally deenergized actuating electromagnet **266** (FIG. **7**), the armature **267** of which is pivoted on the spindle **203** and is connected by a pin and slot connection **291** to a slider **268**. The armature **267** is normally held detached from the core **294** of the electromagnet **266** by a spring **269**. The slider **268** has a slot **271** engaging the shaft **272**. The slider **268** is also provided with a lug **273** adapted to cooperate with the end of a push rod **274** guided vertically by the spindle **213**. The push rod **274** is pivoted to an arm of a rocking lever **277** pivoted on the spindle **218** and in engagement with a slider **278**. The slider **278** is connected to the lever **262** and is slidable horizontally on the spindle **221** by means of a slot **279**. A spring **281** normally holds the slider **278** shifted to the left in FIG. **7**.

Since the transmission ratios between the gears **239**, **244** (FIG. **6**) and the corresponding worms **241**, **243** are such that a 180° revolution of the main shaft **149** and auxiliary shaft **93** corresponds to three revolutions of the shaft **248**, in order to enable the clutch **249** to cause three revolutions of the shaft **248** to be performed there is provided a cam **282** (FIG. **7**) keyed on the main shaft **149** and against which a lever **283** pivoted on a fixed spindle **284** bears through the action of a spring **289**. The lever **283** is also connected by a pin and slot connection **292** to a second lever **286** pivoted on the spindle **221** and provided with a lug **287** adapted to cooperate with a step **288** of the slider **278**.

The front feeding device operates in the following manner.

In order to adjust the transverse position of a journal sheet or continuous form with respect to platen **22**, the lever **52** (FIG. **4**) is pushed downwardly manually, causing the pin **53** and the cam **54** to rotate anticlockwise until the projecting part **56** bears against the stud **61**. Through the medium of the stud **57**, the cam **54** then causes the lever **58** to turn anticlockwise about the spindle **59**. The lever **58** raises the plate **26** through the medium of the arm **68** and the pin **69** and brings it into the position indicated by dashes in FIG. **4**, together with the plate **27** (FIG. **2**) which, by the action of the lever **112** (FIG. **5**), turns anticlockwise about the pin **113**. After the transverse position of the journal sheet or continuous form has been adjusted with respect to the platen **22**, the frontal insertion arrangement is brought back into the lower position by raising the lever **52**, so that the projecting part **56** moves back to bear against the stud **57**.

In order to insert or replace the form **29** (FIG. **2**) in the frontal inserter **28**, the electronic programming unit energizes the electromagnet **201** (FIG. **6**) in known manner and causes the shafts **208** and **272** to execute their own closed path movements. By means of the slider **204**, the shaft **208** first brings the armature **202** into contact with the core **293** of the electromagnet **201**, by which the armature **202** remains attracted. The lug **209** is thus brought below the end of the push rod **211** and, when the shaft **208** is shifted upward, causes the push rod **211** to move upward and rotate the rocking lever **217** clockwise. The latter shifts the **219** forward (to the right in FIG. **6**) and, by means of the lever **223**, the slider **219** shifts the slider **224** to the right. Consequently, the rocking lever **228** turns anticlockwise and causes the sleeve **233** to slide on the auxiliary shaft **93**, thereby engaging the prearranging clutch **236** while the auxiliary shaft **93** is still stationary. The operation of the prearranging clutch **236** is analogous to the operation of the clutch **181** disclosed in the aforementioned copending application Ser. No. 791,666.

Thereafter, the electronic programming unit, in coincidence with a signal indicating that the clutch **236** has been engaged, commands in known manner the energization of the electromagnet **266** (FIG. **7**). The shaft **272**, travelling along its own path, now moves nearer to the electromagnet **266** and, through the slider **268**, brings the armature **267** into contact with the core **294** of the electromagnet **266**, which thus keeps the armature **267** attracted. The lug **273** is therefore positioned below the end of the push rod **274** and raises it as soon as the shaft **272** moves upward. The rocking lever **277** is thus turned clockwise and shifts the slider **278** forward and thus causes the lever **262** to turn anticlockwise. The lever **262** releases the lug **259** from the projection **261**, as a result of which the lever **253**, urged by the spring **258**, turns anticlockwise. The tooth **252** consequently permits the closing or engagement of the actuating clutch **249**, while the projection **256** bears against the cam **257**.

The clutch **249** now causes the shaft **248** to rotate clockwise, so that the shaft **242** is set in rotation by means of the pair of bevel pinions **247** and **246**. Through the worm **241** and the helical gear **239**, the shaft **242** causes the auxiliary shaft **93** to rotate clockwise and, through the worm **243** and the helical gear **244**, also causes the main shaft **149** to rotate clockwise.

The clockwise rotation of the auxiliary shaft **93** produces a movement of the connecting rod **91** through the eccentric **92** (FIG. **4**), so as to cause the lever **89** to turn clockwise. The slider **88** is therefore shifted to the right, sliding on the pin **86** by means of the slot **87** and disengaging the projection **94** from the stud **96**. Under the action of the spring **99**, the lever **97** then turns clockwise and, by means of the pin **102** and the link **106**, causes the support **103** of the rule **104** to turn with respect to the pin **107** so as to move the rule **104** away from the platen **22**, as indicated in dashed lines in FIG. **4**.

Through the medium of the eccentric **174** (FIG. **2**), the clockwise rotation of the main shaft **149** produces movement of the connecting rod **176** so as to cause the crank **177** to turn clockwise together with the shaft **178** and the levers **179**. The springs **184** and **187** are therefore relieved and permit the clockwise rotation of the levers **182** and, therefore, of the rollers **173**, which move away from the platen **22** together with the plate **186**.

Also, through the medium of the stud **146** (FIG. **5**), the cam **147** on the main shaft **149** causes the lever **143** to turn clockwise. Through the connecting rod **142**, the lever **143** causes the rocking lever **139** to turn anticlockwise and produce a movement of the slider **133** to the left. Consequently, the lever **119** is turned anticlockwise and engages

the pin 128 by means of the projection 123 of the sector 122, pushing the pin 128 upward and causing the lever 131 to turn clockwise together with the shaft 51. The flap 49 (FIG. 2) therefore rotates clockwise in turn and is brought into contact with the projections 46 of the inserter 31, so that any form 32 present in the inserter 31, since it is not to be replaced, is clamped in the inserter 31 even if the form 32 has been released by the rollers 173.

At the same time, the cam 171 (FIG. 5) on the auxiliary shaft 93 causes the lever 168 to turn clockwise through the medium of the stud 169. Consequently, the rocking lever 162 is turned anticlockwise via the connecting rod 167 and shifts the slider 156 to the left together with the lever 153 for a stroke equal to that of the slider 133. During this stroke, the spring 166 holds the projection 155 in contact with the stud 163 through the medium of the connecting rod 152, as a result of which the relative position of the projection 160 and the stud 164 remains unchanged. The connecting rod 152 is therefore shifted to the left by the same stroke as the slider 133, so that the pin 127 remains in contact with the circular portion of the sector 124 and therefore the flap 47 (FIG. 1) remains spaced from the projections 46 of the inserter 28.

When the slider 278 (FIG. 7) was shifted forward, the lever 286 turned clockwise owing to the action of the spring 289 and the lug 287 positioned itself in front of the step 288, preventing the slider 278 from returning to the position shown in the drawing, so that disengagement of the clutch 249 is prevented. Only after the main shaft 149 has performed a rotation of about 180°, corresponding to three revolutions of the shaft 248 of the clutch 249, does the cam 282 cause the lever 283 to turn clockwise and, consequently, the lever 286 to turn anticlockwise. The lug 287 then releases the step 288 and allows the spring 281 to bring the slider 278 back into the position shown in the drawing. The slider 278 thus causes the lever 262 to turn clockwise and bring the projection 261 back against the lug 259 of the lever 253.

During each cycle of the shaft 248, the cam 257 causes the lever 253 to turn temporarily clockwise. For the first two revolutions of the shaft 248, however, the lever 262 is held turned anticlockwise, as a result of which the spring 258 immediately returns the lever 253 anticlockwise, and at the end of the cycle the tooth 252 does not succeed in disengaging the clutch 249. During the third cycle of the shaft 248, when the lever 253 turns clockwise due to the action of the cam 257, the projection 261 jumps below the lug 259, locking the lever 253 in the position shown in the drawing. At the end of the cycle, the tooth 252 therefore redisengages the clutch 249. Consequently, the shaft 248 (FIG. 6) stops and the shaft 242 also stops with it, while the main shaft 149 and auxiliary shaft 93 stop at 180° from the position shown in the drawing, keeping the flap 47 (FIG. 2) spaced from the projections 46 of the inserter 28, the flap 49 in contact with the corresponding projections 46 of the inserter 31 and the rollers 173 spaced from the platen 22. Also at the end of the cycle the electronic programming unit deenergizes the electromagnet 201 releasing the armature 202 from the core 293. The slider 204 is then shifted forward by the action of the spring 206. The lug 209 is thus brought below the end of the push rod 212 and, when the shaft 208 is shifted upward, causes the push rod 212 to move upward and rotate the rocking lever 217 anticlockwise. The latter shifts the slider 129 rearward (to the left in FIG. 6) and, by means of the lever 223, the slider 219 shifts the slider 224 to the left. Consequently, the rocking lever 228 turns clockwise and disengages the prearranging clutch 236. Also at the end of the cycle the electronic programming unit deenergizes the electromagnet 266 releasing the armature 267 from the core 294. The slider 268 is then shifted forward by the action of the spring 269. The lug 273 is thus brought out from below the end of the push rod 274.

The form 29 can now be inserted or replaced in the inserter 28 by passing it between the rib 36 and the plate 35. It therefore passes between the platen 22, on the one hand, and the rule 104 and the rollers 173, on the other hand, and is thereafter guided by the plates 186 and by the plate 192. After the form 29 has been aligned on the basis of the reference marked on the rule 104, a key is depressed in known manner, for example the usual drive bar of the machine, which is not shown in the drawing, and in known manner enables the electronic programming unit to produce a rotation of the main shaft 149 and auxiliary shaft 93 through another 180° in the manner seen hereinbefore. The main shaft 149 and auxiliary shaft 93 thus brought back into the position shown in FIGS. 2, 4 and 5, as a result of which the kinematic chains connected to the main shaft 149 and auxiliary shaft 93 move in the opposite direction to that previously described and also bring the flap 49 back into the open position, that is the position in which it is spaced from the projections 46, while the rule 104 and the rollers 173 are closed. The required entry can now be made on the from 29 by means of the type carriage 291.

For insertion or replacement of both the forms 29 and 32, the electronic programming unit again causes the main shaft 149 and auxiliary shaft 93 to perform a first cycle of 180° as hereinbefore described, closing the flap 49 and leaving the flap 47 open and opening the rule 104 and the rollers 173. The plates 26 and 27 (FIGS. 2 and 4) are now tilted forwardly manually, causing them to rotate clockwise on the pins 69 and 118 until the pin 86 (FIG. 4) reaches the end of the slot 87 in the slider 88, which had previously moved forward (to the right in the drawing).

The pin 74 rotates with the plate 26 and produces the rotation of the lever 73 about the point of contact of the stud 71 with the notch 72. The lever 73 therefore turns clockwise with respect to the pin 74, as a result of which the slider 78 is pushed upwards, sliding in the slot 79 in the plate 26. By means of the plate 81 (FIG. 2), this movement is transmitted to the slider 78 slidable in the slot 79 in the plate 27, so that the transfer ribbon 82 is raised parallel to itself. The plates 26 and 27 (FIG. 2) turn together with the inserters 28 and 31 and, therefore, the shafts 48 and 51, the levers 129 and 131 (FIG. 5) and the pins 127 and 128 also turn with the inserters 28 and 31. Since the projection 123 has already been brought below the pin 128, this is now brought on to the circular portion of the sector 122 to the right of the projection 123, as a result of which the flap 49 also re-opens and moves away from the projections 46 of the inserter 31. The rear form 32 can now be inserted or replaced in the inserter 31.

The plates 26 and 27 are now brought back manually into the position of FIGS. 2 and 4 by causing them to turn anticlockwise on the pins 69 and 118. Consequently, the pin 128 (FIG. 5) is brought back above the projection 123 and the flap 49 (FIG. 2) closes, clamping the form 32 against the projections 46 of the inserter 31. The pin 127 (FIG. 5) does not reach the projection 126, however, so that the flap 47 (FIG. 2) remains open. With the return of the plates 26 and 27 to the initial position, the transfer ribbon 82 is moved in the opposite direction to that previously described and is inserted between the forms 29 and 32. The form 29 can now be inserted or replaced in the inserter 28, after which a further 180° cycle of the main shaft 149 and auxiliary shaft 93 and is commanded in the manner that has been seen before.

The front feeding arrangement also permits the insertion of another document 292 (FIG. 2) in front of the form 29 and between this and the rule 104. For this insertion, under the control of the electronic programming unit of the machine, the electromagnet 266 (FIG. 7) is energized, but the electromagnet 201 (FIG. 6) is not energized, so that the clutch 236 is not closed or engaged. On the other hand, the clutch 249 is duly engaged and sets the shaft 242 in rotation. The main shaft 242 now causes only the shaft 149 (FIG. 4) to rotate, while the auxiliary shaft 93 remains stationary.

The rollers 173 (FIG. 2) are therefore opened as in the preceding case, but the rule 104 remains closed. Through the cam 147, the lever 143, the connecting rod 142 and the lever 139, the main shaft 149 (FIG. 5) now causes the slider 133 to move to the rear and, through the medium of the sector 122 and the lever 131, the slider 133 produces the closing of the

flap 49 (FIG. 2). In turn, the stud 164 of the slider 133 (FIG. 5) engages the projection 160 of the lever 153, producing the rotation of said lever 153 clockwise about the pin 154. Consequently, the connecting rod 152 is shifted to the right and causes the sector 124 to turn clockwise, thereby bringing the projection 126 of the sector 124 below the pin 127. The lever 129 is therefore turned clockwise and also causes the flap 47 (FIG. 2) to close. The document 292 can now be introduced by inserting it between the form 29 clamped in the inserter 28 and the rule 104 and causing it to pass between the open rollers 173 and the platen 22. If necessary, a transfer sheet is also interposed between the form 29 and the document 292. Thereafter, the main shaft 149 is made to perform the second 180° cycle and is thus returned to the inoperative position and produces the re-opening of the flaps 47 and 49 and the closing of the rollers 173.

We claim:

1. In an accounting machine including a frame, a platen rotatably mounted in said frame, and a front feeding device comprising two end plates operably mounted on said frame, said end plates being respectively positioned adjacent the respective ends of said platen, a forwardly disposed first transverse guide member, a rearwardly disposed second transverse guide member, said first and second guide members being secured in parallel relationship to said end plates, a forwardly disposed first inserter slidably mounted on said first guide member for guiding a first sheet of paper in front of said platen, a rearwardly disposed second inserter slidably mounted on said second guide member for guiding a second sheet of paper in front of said platen, said first and second inserters being movable transversely of the machine in noninterferring relationship with each other, a plurality of paper pressing rollers normally effective for clampling said sheets to said platen immediately below a writing line of the machine, and a pair of clamping means respectively associated with said respective first and second inserters and normally ineffective for clamping the corresponding sheets above said writing line, the improvement wherein each of said clamping means includes yieldable projection means secured to the associated inserter, and a flap movably mounted on said end plates and operable for clamping the corresponding sheet against the associated projection means, each of said flaps extending transversely of the machine a distance at least as great as the distance between the positions of the associated projection means at the extreme transverse positions of the associated inserter, and said front feeding device further comprises a rotatably mounted main shaft, and operating means operably connecting said main shaft to said flaps and to said paper pressing rollers, said operating means including a pair of movably mounted cam members respectively operably interposed between said main shaft and said respective flaps, said operating means being actuated by said main shaft upon rotation thereof through one-half revolution for simultaneously opening said paper pressing rollers and closing at least a first one of said flaps and being restored by said main shaft upon rotation thereof through another one-half revolution for simultaneously closing said paper pressing rollers and opening said first flap.

2. An accounting machine as recited in claim 1 wherein each of said first and second guide members comprises a bar extending transversely of the machine; and wherein said front feeding device further comprises a transparent rule mounted adjacent said platen for guiding an additional sheet of paper in front of said platen in cooperation with the bar of said first guide member, a rotatably mounted auxiliary shaft, moving means operably connecting said auxiliary shaft to said transparent rule for moving said rule toward and away from said platen; and wherein said machine further includes selectively operable control means connected to said auxiliary shaft for causing said auxiliary shaft to rotate synchronously with said main shaft for selectively actuating said moving means to open said rule relative to said platen upon rotation of said auxiliary shaft through one-half revolution and to close said rule relative to said platen upon rotation of said auxiliary shaft through another one-half revolution.

3. An accounting machine as recited in claim 2 wherein said cam members are similar and comprise a pair of coaxial annular sectors each having a projection extending outwardly therefrom; and wherein said operating means further includes a pair of contact elements respectively connected to said respective flaps, each of said contact elements being engageable with the associated sector on opposite sides of the associated sector projection, said sectors being rotatable by said operating means in opposite directions upon rotation of said main shaft; and wherein said operating means includes intermediate means interposed between said auxiliary shaft and a first one of said sectors for selectively rotating said first sector in the same direction that the other of said sectors is rotated upon rotation of said main shaft.

4. An accounting machine as recited in claim 3 wherein said operating means further includes a lever having two projections, a first one of said projections being actuatable upon rotation of said main shaft and a connecting rod connecting said first sector to said lever; and wherein said intermediate means comprises a slider pivotally mounting said lever and movable upon rotation of said auxiliary shaft to prevent the actuation of said first projection upon rotation of said main shaft.

5. An accounting machine as recited in claim 4 wherein said moving means further includes a pair of support levers and a pair of links connected to said rule, each of said links being shorter than each of said support levers and said links being respectively connected to said rule above said respective support levers.

6. An accounting machine as recited in claim 5 wherein said front feeding device further comprises a pair of simultaneously rotatable supports pivotally connected to said frame, said end plates being respectively pivotally connected to said respective supports with the pivot axes of said end plates being coaxial so that the plates may be tilted forwardly to give access to said second inserter and may be raised from said platen by rotating said supports to permit a sheet of paper to be transversely adjusted with respect to the platen, said links and support levers being respectively pivotally connected to said respective supports.

7. An accounting machine as recited in claim 6 wherein said front feeding device further comprises an additional plate disposed transversely of the machine, and a transfer ribbon supported by said additional plate and disposed between said first and second inserters, said additional plate being slidably mounted in guide slots formed in said end plates and being connected to a first one of said supports by an L-shaped lever pivotally connected to the end plate which is connected to said first support.

8. An accounting machine as recited in claim 3, wherein said control means further includes a one-cycle actuating clutch, speed reducing means drivingly connecting said clutch to said main and auxiliary shafts so that said shafts will be driven upon engagement of said clutch, and means for controlling the operation of said clutch so that the clutch may remain engaged for a predetermined number of cycles.

9. An accounting machine as recited in claim 8 wherein said control means further includes a normally disengaged prearranging clutch operably interposed between said actuating clutch and said auxiliary shaft and means for engaging said prearranging clutch before said actuating clutch is engaged.

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