April 4, 1961 F. C. WENDT 2,978,087

APPARATUS FOR PROCESSING FORM CARDS

Filed Dec. 10, 1957

3 Sheets-Sheet 1

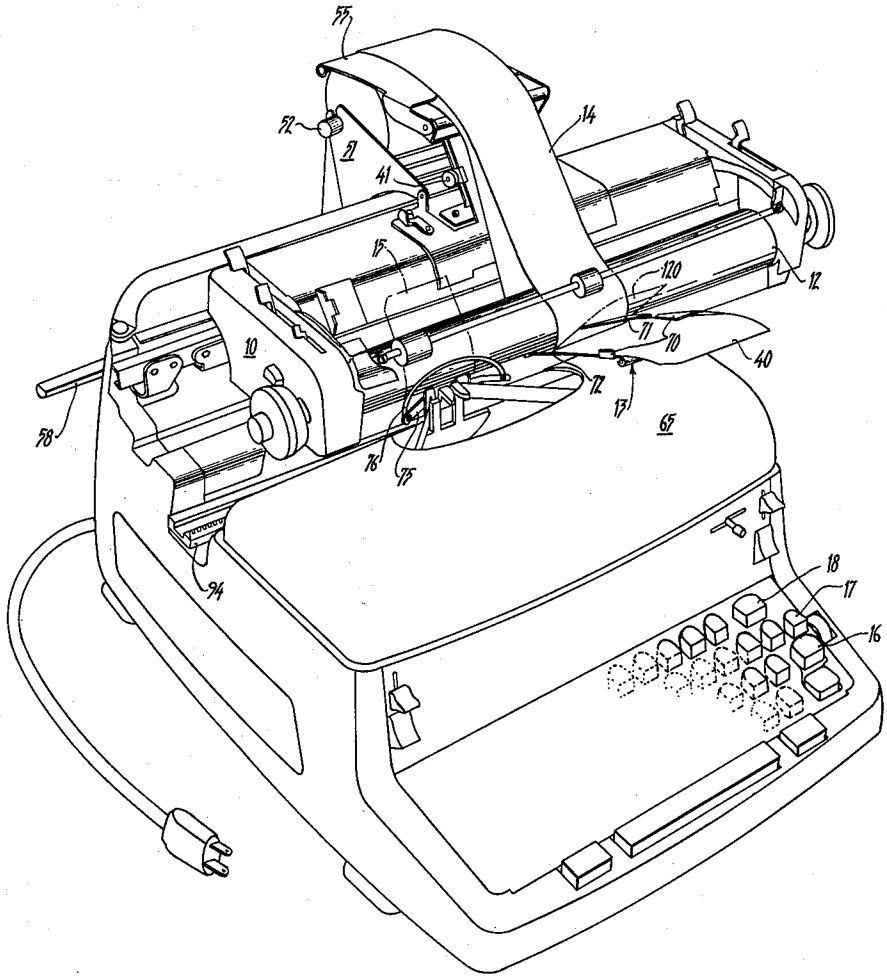


Fig. 1

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Filed Dec. 10, 1957 3 Sheets-Sheet 2

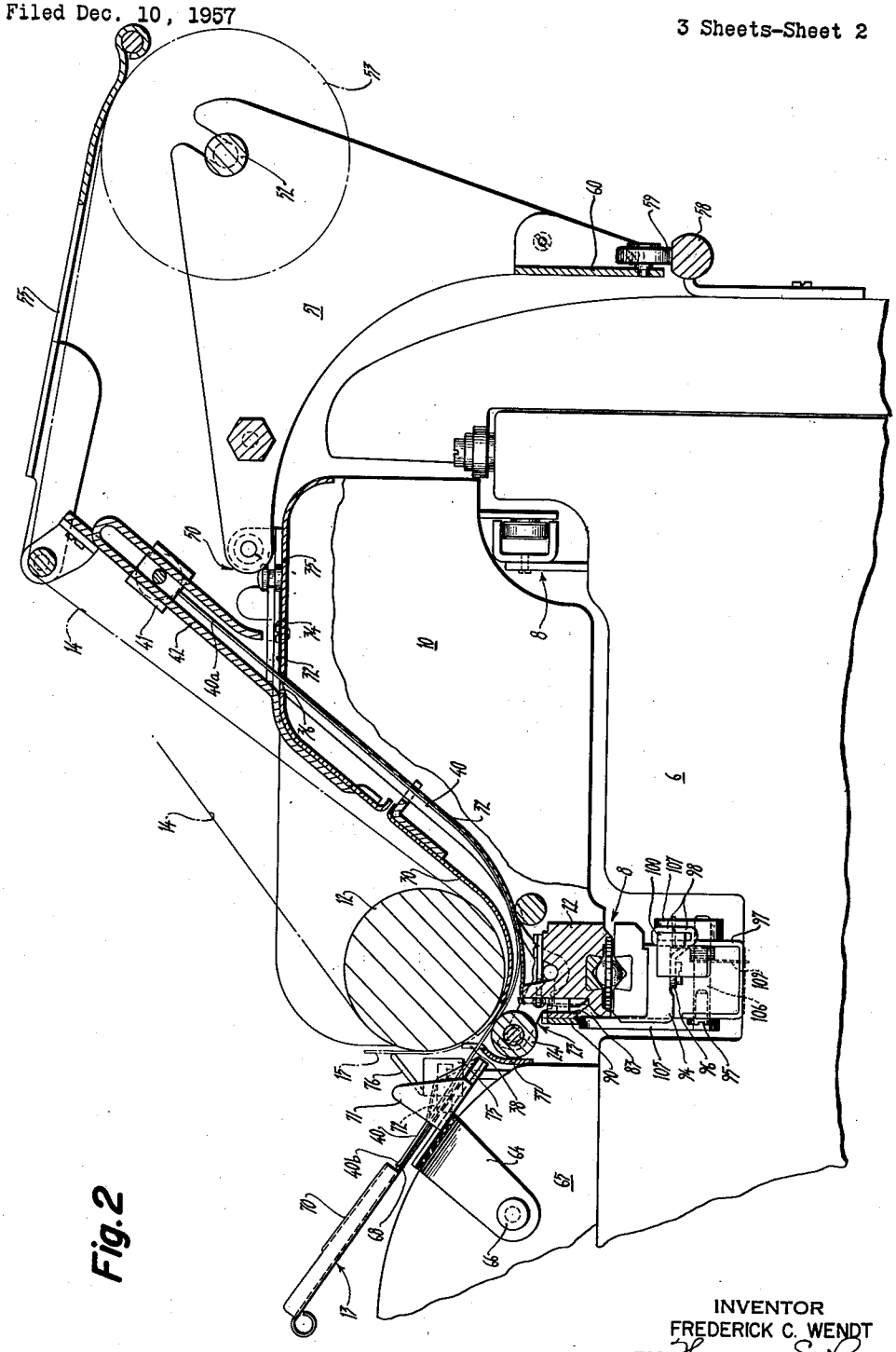


Fig. 2

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3 Sheets-Sheet 3

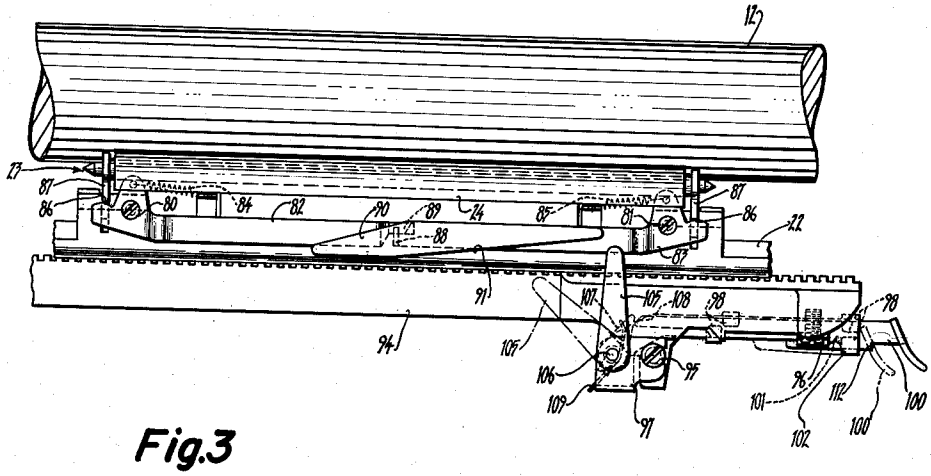


Fig.3

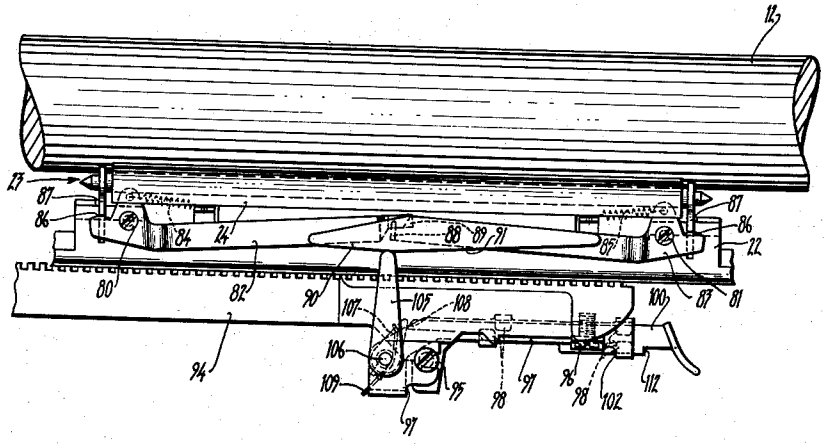


Fig.4

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APPARATUS FOR PROCESSING FORM CARDS

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Filed Dec. 10, 1957, Ser. No. 701,749

15 Claims. (Cl. 197—128)

This invention relates to an improved means for processing form cards, and more particularly relates to a novel construction and arrangement for the carriage and related parts of business machines.

A large amount of business correspondence and recording now involves the use of check sized form cards. When filling out a large number of such cards by typing on predetermined print receiving card areas, it will be apparent that a great deal of manual manipulation of the carriage controls of a business machine will be required in order to successively feed and remove each of said cards to and from a print receiving position in the carriage of said machine. Furthermore, if each individual form card has several duplicate forms attached thereto, together with one or more sheets of carbon paper for record keeping purposes, considerable time will be required to separate and handle each of said duplicate forms after each of the form cards has had the necessary entries made thereon. This repetitious manual manipulation of the said carriage controls and of the work sheets may become excessively tiresome and time consuming where a large number of said cards are to be serially processed.

Several special types of card receiving devices have been proposed by the prior art, however, these devices have not proved entirely satisfactory either because they are too expensive or because they lack the required simplicity, flexibility and/or efficiency to be operationally and structurally combined with a business machine carriage.

One object of the instant invention is to provide an improved apparatus for facilitating the making of printed entries on a large number of individual form cards.

Another object of the invention is to provide an improved means for facilitating the feeding and withdrawal of a form card to and from the carriage of a business machine such as a typewriter or accounting machine.

Another object of the invention is to provide a novel business machine apparatus which will not only speed up the processing of large numbers of individual form cards but will also provide a means for making a continuous record of the entries made on each of said cards; it being possible to successively feed said cards into operative position in the machine carriage without interfering with the line space feeding of the normally positioned record sheet.

Still another object of the invention is to provide a novel construction for a business machine carriage whereby the work card may be brought to its operative position in the carriage by being slidably moved around and beneath the paper pan of the machine carriage.

A further object of the invention is to provide an apparatus for automatically operating the carriage feed roll of a business machine carriage; which, in combination with work card and record roll feeding apparatus, provides an efficient means for serially processing a large number of separate form cards and for maintaining a continuous record of the material typed on said cards.

Other objects of the invention will become apparent as the disclosure progresses.

In the drawings:

Fig. 1 is a perspective view showing the overall nature of the instant apparatus;

Fig. 2 is a side elevation view in partial section and shows the general nature of the principal parts of the instant apparatus and their respective normal positions.

Figs. 3 and 4 are front elevation views respectively showing two operative positions for the paper feed roll and related structure of the instant typewriter carriage.

It will be understood that the various portions of the apparatus described below may be built into the typewriter or may be constructed as an attachment which is operatively secured to a conventional typewriter or like machine.

For illustrative purposes the instant apparatus will be shown and described in connection with an electric typewriter which is similar to that presently being produced and sold by the Royal McBee Corporation. It will be understood however, that the present invention may be utilized with equal efficacy with any one of the various other types of business machines having movable record supporting carriages.

A general description of the operation of the instant apparatus will be made with reference to Fig. 1. Here the typewriter carriage **10** is adapted to be moved to an extreme right hand position wherein the front paper feed roll thereof is automatically released from contact with the cylindrical platen **12**. The construction of the carriage is such that in this right hand position, individual check sized form cards may be inserted through the fixed card chute **13** and into a position beneath the paper pan of the carriage. A record strip **14** supported by the carriage **10** is adapted to be progressively fed between the upper side of said paper pan and the platen **12** to a position on the forward side of said platen, said record strip comprising any suitable type record duplicating material, or a hectograph paper. In that the said carriage paper pan is disposed between said strip and said card there will be no mutual interference between the opposed feeding movements of said card and strip.

When the work sheets have been operatively positioned as shown the carriage **10** is tabulated to the left so as to bring the superimposed card and strip to an initial print receiving position **15** in the machine. After the desired entries have been typed on said card and duplicated on said strip **14** the carriage return key **16** and the margin release key **17** are simultaneously depressed whereupon the carriage will be returned to said extreme right hand position wherein it will be possible to withdraw the work card, without touching or manipulating any of the carriage control levers or knobs. Thereafter a new card may be operatively inserted into the carriage **10**, and by merely depressing the tabulation key **18** the work card may be automatically secured in the carriage and again brought to said print receiving position **15**. During the card withdrawal and inserting operations the record strip **14** is not disturbed so that when the strip **14** together with the second superimposed form card is tabulated to the said print receving position the first line of entries on the new card will be recorded in a position on the strip **14** which is one line space below the last recorded line of the entry made on the prior card. In this manner separate form cards may be successively filled out and a continuous record thereof will appear on the consecutive line spaces of the strip **14**.

It will be apparent that successive form sheets or cards may be rapidly and efficiently inserted into the typewriter and brought to print receiving position, and thereafter returned to the initial position and withdrawn from the typewriter all without touching any portion of the carriage and without manipulating any of the conventional control levers, buttons or knobs on the carriage. The use of the instant apparatus will enable the machine operator to process a much larger number of form cards in a given

amount of time with far less physical effort than when using conventional equipment.

Fig. 2 shows the relative positions of the principal parts of the instant apparatus when the typewriter carriage is in its said extreme right hand or card receiving position. The main typewriter frame or housing 6 is provided with the usual rail means 8 for slidably mounting the carriage 10. On the upper carriage rail 22 is pivotally mounted a feed roll bail 23 which may be operated in a manner to be described and which rotatably supports the front paper feed roll 24 for movement towards and away from the surface of said platen 12. Beneath the platen 12 there is mounted the usual paper pan 30 which is secured by any suitable means to the carriage frame. Mounted in spaced relation to and beneath the paper pan 30 is a card guide plate 32. The forward end of plate 32 rests on the upper carriage rail 22 and its rearward end secured as at 34 to the upper surface of the rearward portion of the carriage housing 35. The upper portion of said housing 35 is provided with an elongated slot 36 which is disposed in a direction which is parallel to the axis of platen 12. The scale 37 mounted adjacent the lower front or forward side of the platen 12 is notched as shown at 38. Said slot and notch are each aligned with said card guide plate 32. Here a work card 40 may be inserted through the scale notch 38 and moved between the platen 12 and feed roll 24 until the leading edge 40*a* of said card engages the upper surfaces of said guide plate 32. Continued movement of said card will cause the said leading end to move around and beneath paper pan 30 and upwardly towards and through the said carriage housing slot 36. The longitudinal limit of movement of the card 40 is determined by the position of a pair of stops 41, Figs. 1 and 2, which are respectively adjustably mounted by any suitable means on the sides of the frame member 42. Said member 42 is secured to the carriage housing 35 by any suitable means. Said stops 41 are positioned so that when the leading edge of the form card 40 is in contact therewith the desired print receiving line of the work card will be brought to an operating position upon the subsequent tabulation of the carriage 12. It will be apparent that work cards may be inserted into the carriage 10 by initially introducing said cards through either the notch 38 or the slot 36.

Secured as at 50 to the rear of the carriage housing 35 is a pair of spaced vertical frame members 51 which rotatably support the shaft 52 and the roll 53 of hectograph paper or similar record material. The lever 55 pivotally mounted at its left end to the said frame member 42 has its right hand end overlying and frictionally engaging the upper side of roll 53 so as to prevent any random rotary motion of said roll 53. A rail 58 secured to the rear of the typewriter frame 6, is engaged by the roller 59 rotatably mounted on the bracket 60 which is fixed between the lower ends of said frame members 51. This arrangement provides a steady vertical support for the frame members 51 regardless of the columnar position of the typewriter carriage.

The card chute 13 has a depending arm 64 which is fixedly secured to the right hand front portion of the typewriter cover 65 by any suitable means such as the removable detent pin shown at 66. Chute 13, which is operatively aligned with the scale notch 38 when said carriage is in the card receiving position of Figs. 1 and 2, is provided with a plate body portion 68 which has a bent over guide ear 70, Figs. 1 and 2, along each of its two sides. The right and left sides of body portion 68 also have a bent over elongated angular arm 71, and an upwardly sloping camming projection 72 respectively, the purposes of which will be subsequently explained. The card guide scale 75 of the instant typewriter has fixedly mounted thereon an arcuate wire bow 76, Figs. 1 and 2.

The apparatus for automatically operating the front feed roll 24 is shown in Figs. 3 and 4. Pivotally mounted on the studs 80, 81 secured to the front side of the upper carriage rail 22 is a pair of elongated control arms 82, 83. Said arms 82, 83 are pivotally biased in clockwise and counterclockwise directions by means of springs 84 and 85 respectively. The outer end of each of said control arms is provided with a shoulder 86 which underlies one of the arms 87 of the feed roll bail 23. The inner end of control arm 83 has a bent off ear 88 which underlies the projection 89 on the inner end of said control arm 82. A contact bar 90 is secured to the forward side of control arm 83.

It will be apparent that the springs 84 and 85 normally resiliently retain the front feed roll 24 in contact with the platen 12 and that a vertically upward displacement of the contact bar 90 will move said shoulders 86 away from the bail arms 87 and will thereby permit said feed roll to drop away from operative contact with said platen.

Fixedly secured to the lower rail 94 by screws 95 and 96 is a U-shaped bracket member 97 having two aligned sets of bent over channel forming ears 98 which cooperatively form a means for slidably supporting the detent slide 100. A camming lever 105 is rotatably secured to the shaft 106 which is rotatably mounted in the left end of the bracket member 97. Rotatably secured to the rearward end of shaft 106 is a short lever arm 107 which is rotatably biased in a clockwise direction into engagement with inner end 108 of said detent slide 100 by means of the torsional spring 109. When the detent slide 100 is in its normal full line position of Fig. 3, the spring 109 will maintain the camming lever 105 in the full line upright position shown wherein the upper end thereof is adapted to engage the lower camming surface 91 of said bar 90 when the carriage is moved to the right. The limit of movement of slide 100 to the right, as seen in Figs. 3 and 4, is determined by the engagement of the stud 101, which is fixed on slide 100, with the left side edge 102 of one of said ears 98. When however, the detent slide 100 is moved to and held in the dotted line position of Fig. 3 the inner end 108 thereof will rotatably displace said lever 107 whereby said camming lever 105 is moved to and held in the inactive dotted line position shown in Fig. 3. The detent slide 100 has a shoulder 112 on the lower right hand edge thereof, Fig. 4, which may be moved down over said left side edge 102 of one of the ears 98 and thereby retain the slide 100 and the lever 105 in said dotted line position against the action of spring 109.

The typewriter is provided with two adjustable left hand margin stops, one of said stops determining the carriage return position to be used during a typing operation, the other of said stops determining the card inserting position of the carriage.

A detailed explanation of one cycle of operation of the instant apparatus will be made with reference to Figs. 1–4. When the typewriter carriage 10 has been returned to its extreme right hand or card receiving position shown in Fig. 1, the card chute 13 will be longitudinally aligned with the card guide plate 32, Fig. 2, and the feed roll 24 will be automatically released from contact with the platen 12 because of the elevation of said contact bar 90 by the camming lever 105. Under these conditions a work card 40 may be inserted into the said card chute and passed along said card guide plate 32 until the leading edge 40*a* of the card engages the fixed stops 41, Fig. 2, thereby properly longitudinally orienting the form card in the typewriter carriage. The record strip 14 is then passed between the paper pan 30 and the platen 12 so as to be vertically aligned with said form card 40. It will be noted that when the work card 40 is in its operative position in the carriage 10 the trailing edge 40*b* will have passed beyond the bent off ear 70, Fig. 1, at the left side of said card chute 13.

The tabulator key 18 is then depressed to bring the carriage 12 and the card 40 to the desired print receiving position 15 shown in Fig. 1. As the carriage 10 commences this tabulation movement the contact bar 90, Figs.

3, 4, will move to the left out of engagement with the camming lever **105** whereupon said springs **84** and **85** will immediately become operable to move the said feed roll **24** toward the platen **12** thereby securing the work card **40** in the typewriter carriage. After the carriage has moved a slight distance to the left the form card **40**, which is not secured in the carriage, will commence to ride over the angularly disposed camming projection **72** at the left side of said card chute **13**. This action will move the upper part of the card in a generally clockwise direction as seen in Fig. 2. Before the right side edge of card **40** rides over said projection **72** the left side thereof will engage the wire bow **76** and the continued leftward movement of the carriage will cause said upper part of the card **40** to be progressively moved nearer to the platen **12**. When the carriage has finally reached the printing position the upper part of the card will have been brought to a vertical print receiving position. Thereafter, the desired entries may be made on said card, the right and left margin stops for the carriage **10** having been set so that the typed lines on the work card are of proper length. These entries on the card **40** will be recorded on the record strip **14**. The strip **14** and the card **40** will be line spaced together during said typing operation.

When the necessary items have been typed on the work card and it is desired to process the next form card, the carriage return key **16** and the margin release key **17** are simultaneously depressed so as to cause said carriage to return to said extreme right hand or card receiving position of Fig. 1. During the return movement of the carriage the card **40** will move out from behind the wire bow **76**; however, before the left side of said card disengages said bow the right side of the card will engage the upper side of the elongated bent over arm **71**. Thus during the carriage return movement the card **40** will not reassume its initial position in said chute **13** but rather will ride over said elongated arm **71** to the position shown at **120**, Fig. 1, wherein the end portion of the card is elevated from the position it assumed when initially inserted in the card chute. This will facilitate the grasping and withdrawal of the filled out work card by the machine operator. After completion of the full return of carriage **10**, the feed roll **24** will be released as above described so that the typed card may be withdrawn from the carriage during the time that the next form card is being inserted in the machine. Thereafter, a second operational cycle may be initiated.

Each time that the carriage **10** is returned to the card inserting position the platen **12** will be line spaced through a given number of steps so that when the next work card is brought to print receiving position the impression receiving area of the record strip **14** will be located said given number of line spaces below last recorded line of the preceding work card. Thus a continuous record will be maintained of all the entries made on the work cards; said lines being uniformly spaced.

It will be seen that the above described operations do not involve the manual manipulation of any of the carriage control levers, knobs etc. Here the machine operator is required only to manually insert and withdraw the successive work cards, all the other necessary operations being automatically performed by the selective depression of the typewriter keys. Thus a large number of form cards or sheets may be filled out rapidly and with relative ease.

The apparatus described may be readily disconnected from the machine or rendered temporarily inoperative so that the typewriter may be used at any time for conventional typing operations.

While there is in this application specifically described one form which the invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration only and that the invention may be modified and embodied in various other forms

without departing from its spirit or the scope of the appended claims.

The invention claimed is:

1. In a typewriter having a frame, a movable carriage mounted on said frame and adapted to be selectively returned to card receiving and card typing positions, a cylindrical platen rotatably mounted on said carriage, a paper pan mounted on said carriage for cooperation with said platen, a work card guide means operatively mounted beneath said paper pan and adapted to slidably receive and adjustably position a work card, a feed roll movably mounted on said carriage for cooperation with said platen, means responsive to the arrival of said carriage at said card receiving position for releasing said feed roll for movement away from said platen, and a card chute supported on said frame, said chute being oriented so as to be aligned with said work card guide means when said carriage is in said card receiving position.

2. Apparatus as defined by claim 1 wherein said releasing means automatically moves said feed roll towards said platen in response to the movement of said carriage away from said card receiving position.

3. In a business machine having a frame, a movable carriage mounted on said frame, said carriage being movable to a card receiving position, a cylindrical platen rotatably mounted on said carriage, a paper pan operatively mounted beneath said platen, and a paper feed roll movably mounted for cooperation with said platen; the improvement comprising, a card chute mounted on the upper forward right side of said machine frame, a card guide means mounted beneath said paper pan and on said carriage, said chute being operatively aligned with said guide means when said carriage is in said card receiving position, and platen when said carriage reaches said card receiving position.

4. Apparatus as defined by claim 3 wherein the last mentioned means automatically move said feed roll toward said platen in response to the movement of said carriage away from said card receiving position.

5. Apparatus as defined by claim 3; additionally comprising, a record roll supporting means mounted on said carriage, said supporting means being disposed in substantially the same vertical plane as the said card guide means and being adapted to support a record roll so as to allow the record strip to be fed between said platen and said pan.

6. In a typewriter having a frame, a carriage movably mounted on said frame, said carriage being selectively movable to predetermined card typing and card receiving positions, a cylindrical platen rotatably mounted on said carriage, a paper pan mounted on said carriage and disposed immediately beneath said platen, and a feed roll movably mounted on said carriage for cooperation with said platen; the improvement comprising, means for permitting said feed roll to be moved away from said platen when said carriage arrives at said card receiving position, said means also automatically moving said roll toward said platen in response to the movement of said carriage away from said card receiving position, a card chute supported by said frame, card guide means mounted on said carriage and disposed beneath said paper pan, said card chute and guide means being operatively aligned when said carriage is in said card receiving position, and a record roll supporting means operatively mounted on said carriage and aligned with said card guide means so as to be capable of feeding a record strip between said platen and said paper pan.

7. In a business machine; a frame, a carriage movably mounted on said frame for movement between card receiving and card typing positions, a cylindrical platen rotatably mounted on said carriage, a feed roll mounted on said carriage for movement towards and away from said platen, means for permitting said feed roll to be moved away from said platen upon arrival of said car-

riage at said card receiving position, said means also automatically moving said roll towards said platen in response to the departure of said carriage from said card receiving position, a paper pan mounted on said carriage and extending beneath said platen, card guide means secured to said carriage and extending beneath said paper pan and platen, and a card chute secured to said frame, said card chute being operatively aligned with said card guide means when said carriage is in said card receiving position.

8. In a typewriter having a frame, a carriage movably mounted on said frame, a record supporting cylindrical platen rotatably mounted on said carriage, a feed roll cooperating with said platen, and means for controlling the tabulation of said carriage; the improvement comprising, means mounting said feed roll for movement toward and away from said platen, means for automatically permitting said feed roll to be moved away from said platen at the completion of a return movement of said carriage, means responsive to a subsequent tabulational movement of said carriage for automatically moving said feed roll toward said platen, a card chute secured to said frame, and card camming means supported on said frame for bending the print receiving portion of a work card towards said platen in response to said tabulational movement of said carriage.

9. Apparatus as defined by claim 8 additionally comprising; additional card camming means on said card chute for holding the end portion of the work card in an elevated position in response to said return movement of said carriage.

10. Apparatus as defined by claim 1 wherein said paper pan extends beneath said platen and wherein a roll of record strip is rotatably supported on said carriage in alignment with said card guide means.

11. In a typewriter having a frame, a carriage movably mounted on said frame and adapted to be movable towards and away from a card receiving position, a cylindrical platen rotatably mounted on said carriage, a paper pan secured to said carriage, and a feed roll mounted on said carriage for movement towards and away from said platen; the improvement comprising a card guide means mounted on said carriage and disposed beneath said paper pan, said guide means being open at its forward end so that a work card may be inserted therethrough, a card chute supported on said frame and disposed so as to be aligned with said card guide means when said carriage is in said card receiving position, and

card camming means supported by said frame for bending the print receiving portion of a work card towards the platen in response to the movement of said carriage away from said card receiving position.

12. Apparatus as defined by claim 11 wherein said paper pan extends around beneath the said platen.

13. Apparatus as defined by claim 11; additionally comprising means responsive to the movement of said carriage towards and away from said card receiving position for respectively controlling the movement of said feed roll away from and towards said platen, and a roll of record strip rotatably supported on said carriage in alignment with said card guide means and adapted to progressively feed said record strip between said platen and said paper pan.

14. Apparatus as defined by claim 11; additionally comprising additional card camming means for retaining the end portion of a work card in an elevated position when said carriage approaches said card receiving position.

15. In a business machine, a frame, a carriage movably mounted on said frame, a cylindrical platen rotatably mounted on said carriage, a paper pan mounted on said carriage, said paper pan extending beneath and cooperating with said platen, a card guide means operatively mounted on said carriage beneath said paper pan and adapted to receive a work card and guide the latter to a desired print receiving position in said carriage, the forward terminal portion of said card guide means being spaced a predetermined distance below the adjacent portion of the said paper pan to form an opening therebetween whereby a work card may be fed from the forward side of the carriage so as to be thereafter secured in said carriage preparatory for a subsequent typing operation, and camming means supported on said frame for displacing the print receiving portion of a work card towards said platen in response to a tabulating movement of said carriage.

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