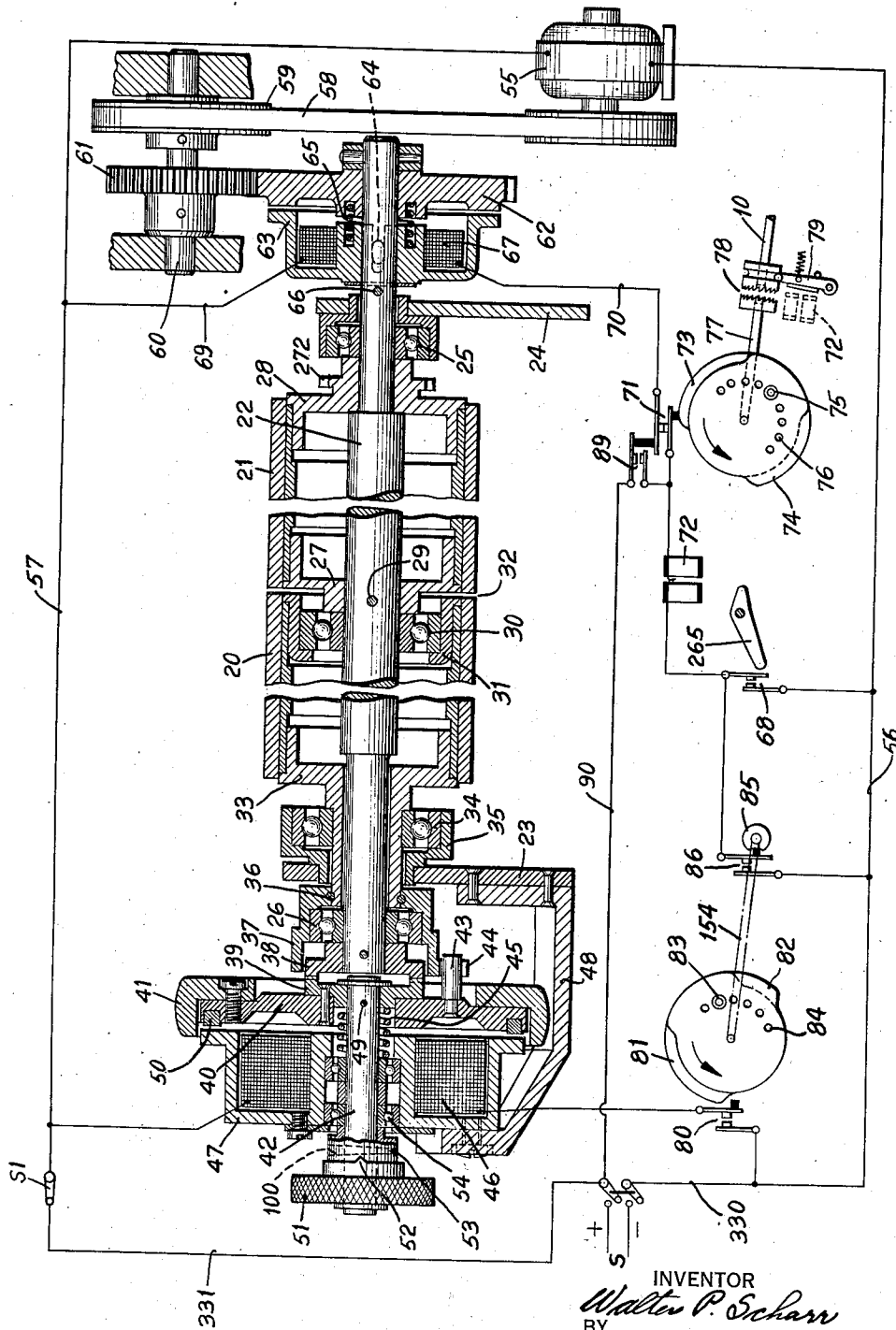


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PAPER FEEDING DEVICE

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PAPER FEEDING DEVICE

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This invention relates generally to paper feeding devices and, more specifically, to split platens for accounting machines wherein separate records are to be printed and fed differentially.

5 An object of the invention is to provide an improved form of split platen, one section of which is to carry a continuous sheet of bill forms for receiving lines of item and total impressions, and be line spaced between items and fed with
10 a long feed after total recordings so that the first line of a succeeding form is brought into print receiving position. The other section of the platen carries a continuous strip or collection list whereon the items and totals are recorded
15 without long open spaces between the successive recordings related to different bills.

Heretofore separate uncoordinated feeding devices have been applied to divide platen sections, but in the present case, the platen parts are coordinated because a single driving means is used
20 to operate both portions of the split platen.

When printing items on forms such as bills, there are times when it is desired to print an additional record of the list of items and totals appearing on a plurality of bills. Such a list is
25 usually called a "collection list." Of course, the size of the bill forms is constant, but the number of items recorded thereon varies, so that there is often a large space under the last item or total on a bill. If the collection list or strip were to
30 be fed the same as the bill sheet there would be long unused sections thereon corresponding to the unused parts of the bills. Therefore, the devices of the present invention are provided to
35 disconnect the feeding connections of the strip during the time that a long feeding operation is imparted to the bill sheet, and, in this way, the printed data on the strip is spaced with the lines of recording following directly under each
40 other. There is a slight increase in the distance between the lines of recording after each total line of recording. This is done to distinguish separate groups of items and associate the items and totals relating to a particular bill.

45 An object of the invention is to provide a divided platen which is adapted for use in the ordinary way as a long unitary platen with a surface that is substantially contiguous. Therefore, the divided platen may support a single
50 sheet to receive impressions across the full width, but it is also suited for holding separate sheets which are to be moved differentially.

Another object of the invention is to provide
55 a split platen with driving controls that are coordinated with a record controlled machine so

that the platen sections are automatically controlled to be fed in line spacing after item printing operations and shifted with a long feed after total printing operations.

A further object of the invention is the provision of separate but coordinated paper feeding
5 rollers with adjustable controls cooperating with one roller so that different sized forms or bills of different lengths may be fed thereon, and other adjustable controls cooperating with the
10 other roller so that a variable predetermined extent of feed may be imparted to the strip on said second roller following a reception of a total impression.

A still further object of the invention is the provision of a divided platen wherein one section
15 or part is fed through connections to the other part, with means for de-clutching the driven part from the driver. A magnetic clutch serves to connect the driving part to a main operating means, and another magnetic clutch may be operated to disconnect the second part from the
20 part connected to the main operating means.

It is also an object of the invention to provide adjustable cams for operating contacts in series
25 with the magnetic clutches controlling the feeding connections to the sections to the platen. Certain of these cams are coordinated and synchronized with the line spacing and long feeding movement of one section of the platen to determine the length of bill forms. The other contact
30 operating cams are driven on total taking operations to control de-clutching of the listing section of the platen while the other section is operative to eject a bill. The cams associated with
35 the listing section of the platen may be adjusted to select a predetermined spacing of the list after a total has been recorded thereon.

Other objects of the invention will be pointed out in the following description and claims and
40 illustrated in the accompanying drawing, which discloses, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawing:

45 The illustration shows a cross section view of the divided platen sections and the electrical operating controls therefor coordinated with a record controlled machine.

50 The invention is illustrated as embodied in and controlled by a record controlled machine such as that disclosed in the Lake Patent No. 1,976,617, issued October 9, 1934.

The two platen portions or sections 20 and 21 are supported on the platen shaft 22 that extends
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through carriage side frames 23 and 24. On the right end, the shaft is supported on a ball bearing 25 attached to the right side frame 24. The left end of shaft 22 is supported by another ball bearing 26, the outer race of which is secured to the left end of platen portion 20.

The right section 21 of the split platen is supported on shaft 22 by means of a pair of circular end members 27 and 28 the latter of which is centered on the shaft but confined between bearing 25 and a shoulder on shaft 22. Section 21 is secured to shaft 22 by means of a pin 29 extending through the hub of end member 27. Therefore it is apparent that the right section 21, which is the section that carries the bill form material, is permanently connected with the platen shaft and partakes of all movements imparted to the shaft.

The other section 20 is the portion of the platen adapted to carry the collection list strip and for this reason is arranged to be readily disengaged from the platen shaft 22, but normally connected therewith to move in synchronism with the line spacing movement of section 21. The right end of section 20 is rotatably mounted on shaft 22 by means of a ball bearing 30 which is confined between the end of member 27 and a shoulder on an annular ring 31 attached to the end of section 20.

As shown, the portions 20 and 21 are illustrated as being separated by a space 32 appearing at the center of the platen. This space 32 is exaggerated for purposes of illustration, for the surfaces of the two parts of the platen may be made substantially contiguous so that a type impression may be effected at the intersection of the parts of the platen when a single wide sheet is used.

The left end of section 20 is provided with a cylinder 33 surrounding the left end of shaft 22 but separated therefrom. This cylinder is attached to the end of section 20 and extends through a ball bearing 34 which is fastened inside a housing 35 attached to the left side frame 23 of the carriage. Fastened to the left end of cylinder 33 by means of feather pins 36, is a circular member 37 carrying the outer race of ball bearing 26, mentioned hereinbefore as being the left bearing of shaft 22. From the foregoing description it is apparent that platen section 20 is free to rotate with respect to shaft 22 because bearings 26, 30, and 34 are allowed to turn freely and at the same time serve as supports for the left end of the shaft.

Connections are provided to gear the left section 20 to the left end of the platen so that it is normally clutched and connected therewith. At the left end of shaft 22, a crown gear 38 is pinned on the shaft. The teeth on this gear cooperate with the teeth of a similar gear 39 fastened to the armature ring 40 on a hand wheel 41 loosely mounted on a stub shaft 42. Extending inwardly from the armature plate 40 is a pin 43 engaged in a slotted flange 44 extending from the member 37 attached to the cylinder 33. Therefore it is apparent that a driving connection exists between the platen shaft and the section 20 through gear 38, gear 39, armature plate 40, pin 43, flange 44, member 37, and cylinder 33 attached to section 20. This connection remains in effect as long as the teeth of the gears 38 and 39 remain in mesh, as they are urged to do by a compression spring 45 tending to move gear 39 towards the right. A magnet 46 is provided to counteract the pressure of spring 45 and

draw the armature and connected gear 39 towards the left to disengage the driving connection. This magnet is mounted in a cup-shaped holder 47 which is fastened to a bracket 48 attached to the left side frame 23 and thus made stationary with respect to the platen. When magnet 46 is energized it attracts armature 40 and slides the connected gear 39 towards the left, carrying the shaft 42 along therewith because it is attached to gear 39 by means of pin 49. The outer surface of armature 40 is provided with an annular ring of friction material 50 that is designed to engage the outer lip of cup 47 so that motion of gear 39 and hand wheel 41 may be stopped abruptly when the magnet draws them out of driving engagement.

In addition to the automatic means for disconnecting the platen drive by means of magnet 46, there is also provided a manual device for disconnecting gear 39 from gear 38. This control takes the form of a knurled knob 51 loosely mounted on the end of stub shaft 42. The knob is formed with a flange having a V-shaped extension 52 which normally fits into a groove in a collar 53 keyed on stub shaft 42. A pin 100 holds the collar with respect to rotation, but a slot in the shaft around the pin, permits the shaft to move axially through the collar. The right end of this collar 53 abuts against the inner race of a ball bearing 54 mounted between the magnet holder 47 and the shaft 42. Therefore, when the knob 51 is gripped and pulled outwardly to shift extension 52 away from the notch in collar 53 and then supported on the outer surface of collar 53, shaft 42 is drawn towards the left and the teeth of the connected clutch gear 39 are disengaged from the crown gear 38.

Hand wheel 41 provides means whereby the platen sections may be rotated by hand. When the clutch connection is established between gears 38 and 39, as shown, the operation of hand wheel 41 serves to turn both sections 20 and 21 of the platen. However, should the gear connections be disconnected either through operation of the manipulative knob 51, or through energization of magnet 46, then the hand wheel 41 is not connected to platen portion 21, but remains connected to the other section 20 through pin 43 which remains in cooperation with flange 44, regardless of the position of the armature 40. By this means the collection strip on section 20 may be adjusted or reinserted without disturbing the bill sheet around portion 21.

Both platen sections are driven from a common operator by means of connections established with a main operating means. When the main switch S is closed a motor 55 is driven by a circuit through line 330, wire 56, motor 55, wire 57, feed switch S1 and line 331. The motor drives a belt 58 on a pulley 59 connected to a shaft 60 on which there is fastened a gear 61. Gear 61 meshes with a constantly turning clutch gear 62 freely mounted on the end of platen shaft 22. Adjacent to clutch gear 62 is a cup magnet clutch housing 63 keyed to shaft 22 by means of a pin and slot connection 64. The housing 63 is normally pushed away from the clutch drive gear 62 by means of a compression spring 65 mounted in oppositely facing annular grooves in the parts 62 and 63. This spring serves to hold the housing 63 towards the left abutting against the stop pin 66 in shaft 22. However, the housing carries a magnet 67 which, when energized, attracts the clutch gear 62 and serves to move the housing

63 relative thereto so that the friction surfaces on both inner sides engage and form a driving connection.

It is obvious that the extent of movement imparted to the platen shaft 22 depends upon the time of energization of magnet 67, so that for short, line spacing movements a momentary energization of the magnet is sufficient to cause it to shift ahead one tooth space on the usual 10 ratchet and pawl locating means; while for long feeding operations, a sustaining energization of magnet 67 is required.

The automatic split section controls of the dis- 15 closure may be suspended by opening switch S1, and then the usual full width platen feed devices may be employed. It is noted that extending from the right end 28 of the platen section 21 attached to shaft 22 is the usual ratchet wheel 272 with which cooperates the ordinary paper feeding devices disclosed in Patent No. 1,976,617.

Electrical controls are provided to govern the energization of magnets 46 and 67 so that mechanical clutch connections are established with the pair of platen sections in such a manner that the bill sheet is fed from form to form while the accompanying strip is line spaced. In series with the clutch magnet 67 is a pair of contacts 68 which are closed momentarily during each printing operation by a lever 265 that is vibrated in the tabulator before each printing operation is effected. The line spacing circuit through magnet 67 includes line 331, switch S1, wire 57, wire 69, magnet 67, wire 70, normally closed contacts 71, magnet 72, contacts 68, wire 56, and line 330. This is a circuit that is closed momentarily so that magnet 67 attracts gear 62 and effects a connection between the main operating means and the platen shaft 22 which at this time is connected to both platen sections 20 and 21. The clutch connection is maintained just long enough to carry the driven sections so that the ratchet wheel 272 thereon makes one step of movement before the usual detent comes into play to hold it from further movement.

The described line spacing circuit is maintained 45 through contact 71 for a predetermined number of line spacing operations according to the desired length of bill form. The length of the bill form is predetermined by the arrangement of a pair of adjustable cams 73 and 74 which cooperate with the contacts 71 to regulate the time at which they are to open to stop line spacing and long feeding operation. These cams 73 and 74 are adjustable with relation to each other so that 50 the elevated periphery thereon may be extended or contracted by setting the cams relative to each other and then locking them together by means of a pin 75 passing through an aligned pair of the many perforations 76 appearing in the cams. The insulation block on the lower blade of contacts 71 is wide enough to cooperate with the elevated part of the periphery of both cams so that it rides along the outer edge of one cam and passes over both cams and along the outer edge of the other cam before dropping into the depression between both cams.

The contact operating cams 73 and 74 are moved in synchronism with the movement of the platen by means of clutch connections that are established by magnet 72 which is energized whenever magnet 67 is energized to cause platen movement. The cams are attached to a shaft 77 bearing one part of a normally open clutch 78 the other part of which is slidably mounted on a constantly rotating shaft 10 similar to the shaft

60. Whenever magnet 72 is energized it rocks a lever 79 articulated with the movable part of clutch 78 which then connects cams 73 and 74 to the driving means so that they are synchronized with the movement of the platen.

The combined effect of cams 73 and 74 is to sustain the electrical connections through contact 71 so that magnet 67 is energized for such a length of time that the platen section 21 is connected to the driving means to move to such a degree that the remainder of each bill form is 10 fed after each total printing operation regardless of the number of previously recorded items thereon.

Attention may be drawn to the fact that the platen section 20 carrying the continuous strip remains connected to the driven section of the platen through gears 38 and 39 during all line spacing operations. However, after a total printing impression is effected on the records, other automatic controls come into play to energize magnet 46 to disconnect platen section 20 from the bill carrying section 21 during most of the long feeding operation which is used to eject the bill form. These controls include a pair of contacts 80 in series with magnet 46 and a pair of adjustable cams 81 and 82 which cooperate with the contacts 80 to close them during long feeding operation. These cams 81 and 82 are similar to the other cams 73, 74 in that they are connected together by a pin 83 after being set with relation to each other by a pair of perforations 84 therein aligned by the pin. The cams 81 and 82 are attached to the tabulator shaft 154 which is turned after each total printing operation. Also attached to the shaft 154 is another contact operating cam 85 cooperating with contacts 86 arranged in series with the clutch magnets 67 and 72. The effect of cam 85 is to close contacts 86 during the latter part of a total operation and thus provide a sustaining circuit for clutch magnet 67 which holds the drive connection to platen section 21 long enough to eject the bill upon which the total has been printed. The length of time that this circuit through magnet 67, contact 71, magnet 72 and contacts 86, is held is governed by the adjusted raised periphery of cams 73 and 74 cooperating with contacts 71. At the same time that the contacts 86 are closed to initiate the long feeding operation, contacts 80 are closed to energize magnet 46 so that platen section 20 is disconnected from the platen shaft and thus is withheld from partaking of the long feed movement imparted to the other platen section 21. However, contacts 80 are not held closed through the entire length of the long feeding operation because it is desired that a certain amount of space be provided on the continuous strip after each total impression. This amount of space on a strip may be predetermined and selected by shortening the effective range of cams 81 and 82 so that contacts 80 are opened before contacts 71 open, therefore relay 46 will be deenergized near the end of the long feed operation and gears 38 and 39 are again engaged while magnet 67 is still effectively connecting the platen shaft to the main driving means.

When the contacts 71 open during the long feeding operation, magnet 67 is deenergized to prevent further movement of the platen, but 70 movement of cams 73 and 74 is maintained by other electrical connections through contacts 89 which maintain the energization of magnet 72 and therefore keep clutch 78 closed to drive the cams through the remainder of their cycle. The

circuit through magnet 72 at this time includes wire 90, contacts 89, magnet 72, contacts 86 and wire 56 to line 330. Thus magnet 72 is maintained effective until the cams 73 and 74 are brought around to the normal position, in which they are shown, at which time the contacts 89 open simultaneously with the opening of contacts 86 which deenergizes relay 72 so that the clutch 78 returns to the normal disengaged condition. Then the parts are ready for a new cycle of operation with the bill form on platen section 21 in position to receive the first item impression and the strip on platen section 20 spaced a predetermined amount below the last total impression and also in readiness to receive the first item imprint.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In a record feeding device, a platen shaft, a split platen thereon comprising a first section secured to the shaft and a second section rotatably mounted thereon, a main operating means, a device for connecting said shaft to said main operating means, clutch gearing between said shaft and the second section, an armature fixedly connected to one of the members of said clutch gearing and slidably connected to the second section, a cup magnet cooperating with said armature for disengaging said gearing and friction means cooperating with said cup, magnet and armature for stopping said second section from movement due to inertia, and means for energizing said magnet at predetermined intervals to prevent record feeding movement of said second section by said shaft.

2. In a record feeding device, a platen shaft, a split platen thereon comprising a first section secured to the shaft and a second section rotatably mounted thereon, a main operating means, a device for connecting said shaft to said main operating means, clutch gearing between said shaft and the second section, an armature connected to said gearing, a connection between said armature and said second section which is maintained in all positions of the armature, manual means for shifting the armature to disengage said clutch gearing, magnetic means for shifting said armature to disengage said clutch gearing, means for energizing said magnetic means to shift the armature and disengage said second section from the platen shaft, and means attached to said armature for rotating said second section through said connection.

3. In a device for feeding a pair of records, a main operating means, a platen comprising two sections, means for connecting a first section with the operating means, a first magnet for controlling said connecting means, means normally clutching a second section to the first section, a second magnet for controlling said clutching means, means for momentarily energizing said first magnet to line space said sections, other means for producing a sustained energization of said first magnet to long feed the first section, and devices for energizing said second magnet to

declutch said second section during long feed operation of said first section.

4. In a device for feeding a pair of records, a pair of feeding rollers, each roller carrying one of said records, a main operating means, means for connecting one of said rollers with said operating means, means for connecting the second roller with the first mentioned roller, means for controlling the operation of the first mentioned connecting means for line spacing the rollers, other means for controlling the operation of the first mentioned connecting means for long feeding the first roller, and means for disconnecting said second connecting means to stop said second mentioned roller during movement of the first roller for long feeding.

5. In a record feeding device, a platen shaft, a divided platen thereon comprising a first section secured to the shaft and a second section rotatably mounted thereon, a main operating means for turning said shaft, a crown gear secured to said shaft, and a second crown gear normally meshing with said first mentioned crown gear, a spring for urging said second gear into mesh with the first gear, a circular armature secured to said second gear, a driving pin extending from said armature and maintaining a driving connection with said second section, a manually operable means for shifting said second gear out of mesh to disengage said second section from the platen shaft, a magnet for attracting said armature to move the connected second gear out of mesh, means for energizing said magnet for a predetermined part of a cycle to disengage said second section from the platen shaft, and a hand wheel attached to said armature for turning said second section when said gears are out of mesh and turning both sections when the gears are meshed.

6. In a machine for feeding a sheet of bill forms and an associated collection strip and printing items and totals thereon, a split platen with a first section carrying said form sheet and a second section carrying said strip, a main operating means, means for connecting said first section with the operating means, means for connecting said second section with the first section, means for controlling the operation of said first mentioned connecting means for line spacing said records, other means for controlling the operation of said first mentioned connecting means for long feeding said first section, means for determining the extent of the long feed, and means for controlling the operation of said second mentioned connecting means to disconnect the second section from the first section and stop the strip feed during long feeding.

7. In a machine for feeding a sheet of bill forms and an associated collection strip and printing items and totals thereon, a split platen with a first section carrying said form sheet and a second section carrying said strip, a main operating means, means for connecting said first section with the operating means, means for connecting said second section with the first section, means for controlling the operation of said first mentioned connecting means for line spacing said records, other means for controlling the operation of said first mentioned connecting means for long feeding said first section to feed said sheet from form to form, adjustable means for determining the length of the bill forms and the extent of the long feeding operation, and other adjustable means for controlling the operation of said second mentioned connecting means to disconnect the second section from the first section

for a predetermined part of the long feed so that the strip is fed a shorter distance than the space the bill sheet is fed between forms.

8. In a machine for feeding a sheet of bill forms and an associated collection strip and printing items and totals thereon, a split platen with a first section carrying said form sheet and a second section carrying said strip, a main operating means, a clutch for connecting said first section with said operating means, normally engaged gears for connecting said second section to said first section, a magnet for operating said clutch, contacts in series with said magnet, means for closing said contacts to effect line spacing of both records on each printing operation, a second set of contacts in parallel with said first mentioned contacts, a cam for closing said second contacts after total printing to sustain energization of said clutch magnet for a long feeding and bill ejecting operation, a third set of contacts in series with said magnet, a pair of adjustable cams cooperating with said third contacts to hold them closed for a predetermined part of a cycle to determine the length of each bill form, means for moving said cams in synchronism with the movement of said first platen section, a second magnet for disengaging said gears, a fourth set of contacts in series with said second magnet, a second pair of adjustable cams connected to said cam and closing said fourth contacts to disengage the second section when long feeding is started, said second pair of cams being adjusted to open the fourth contacts before the third contacts are opened and thereby deenergize the second magnet to engage the second section while the first magnet is still energized to move the second strip

a short predetermined amount as the bill is ejected.

9. A machine as in claim 8 in which the synchronized cam moving means comprises a third magnet in series with the clutch magnet, and a clutch for connecting the first adjustable cams with a constantly rotating shaft, said third magnet engaging said clutch whenever the first magnet connects the first section to the main operating means and a holding circuit for maintaining said third magnet energized and the first cams clutched after the said third contacts open to stop record feeding, and until said fourth contacts open and said third contacts are again closed in normal condition.

10. In a record feeding device with a line spacing control effective to feed full width sheets, a platen shaft, a split platen thereon for feeding pairs of record sheets comprising a first section secured to the shaft and a second section rotatably mounted thereon, a main operating means, a first clutch between said shaft and the main operating means, a second clutch between said shaft and the second section, a feeding means on said first section adapting it for direct operation independent of said main operating means, auxiliary feed control means comprising a magnet for operating said first clutch to connect the shaft and the main operating means and another magnet for operating said second clutch to disconnect the second section from the shaft and make it free from the first section, and a switch for suspending operation of both magnets and both clutches so that the platen sections remain joined for feeding full width sheets through said feeding means.

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