May 22, 1951 F. BECKER 2,554,003

PAPER FEEDING AND SEVERING MEANS FOR TYPEWRITING AND LIKE MACHINES

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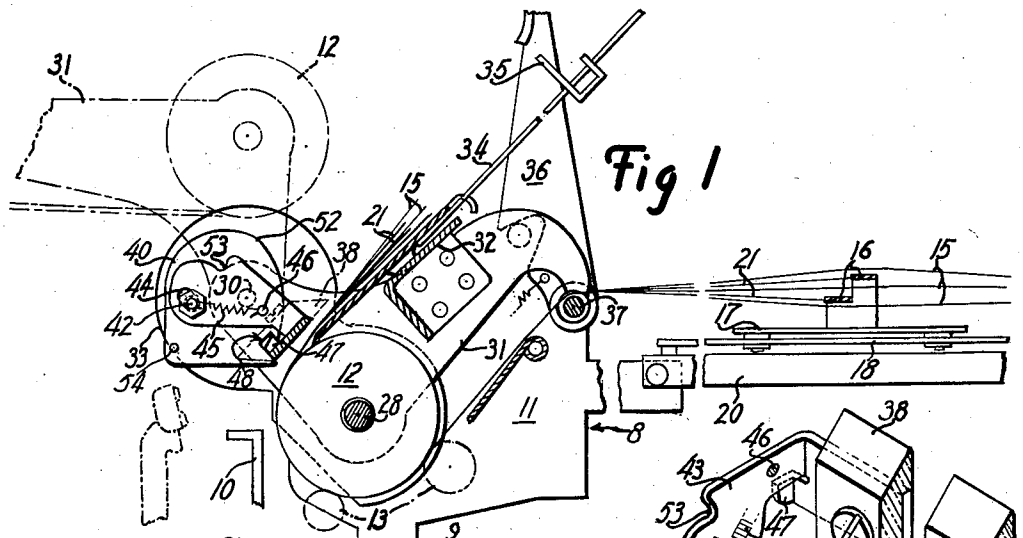


Fig 1

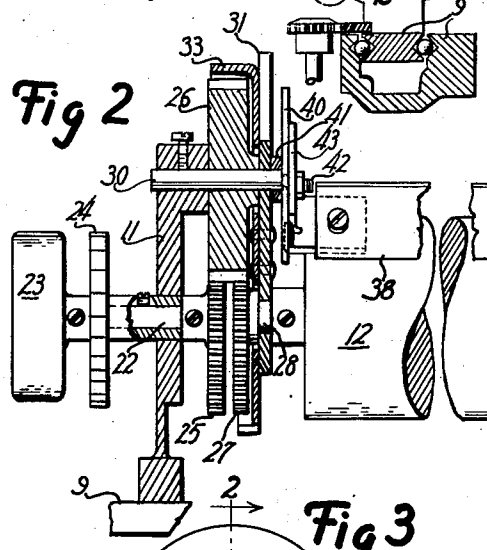


Fig 2

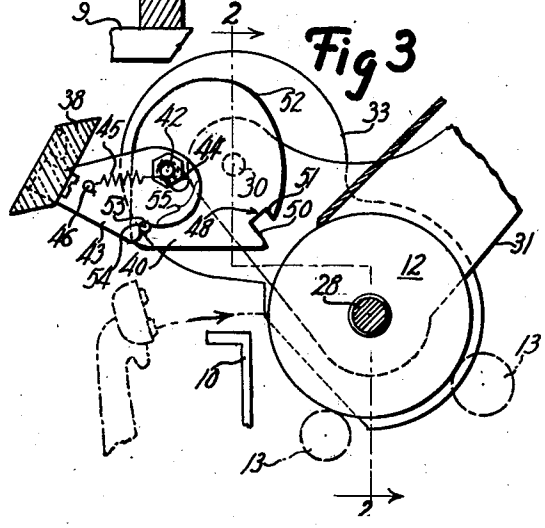


Fig 3

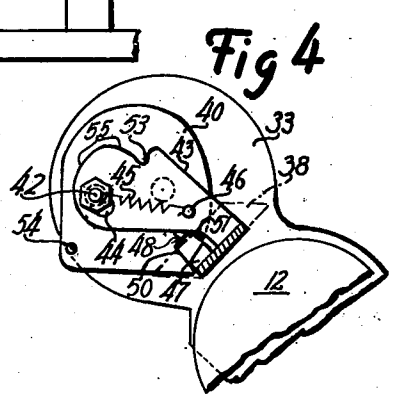


Fig 4

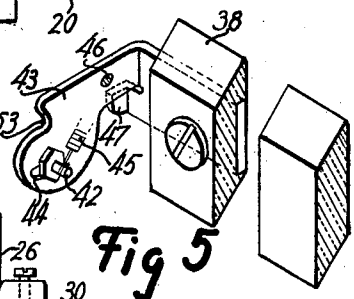


Fig 5

INVENTOR
FRED BECKER
BY Jesse A. Holton
ATTORNEY

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PAPER FEEDING AND SEVERING MEANS FOR TYPEWRITING AND LIKE MACHINES

Fred Becker, Queens Village, N. Y., assignor to Underwood Corporation, New York, N. Y., a corporation of Delaware

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8 Claims. (Cl. 197—133)

1

This invention relates to typewriting machines known as continuous billing or manifolding machines, and more particularly to the strip-feeding and sheet-severing means in such machines.

One of the objects of the invention is to provide an improved severing device by which the blade thereof may be securely held in its sheet-severing position and may be quickly released and swung to an out-of-use position to afford unobstructed view of the work in process.

Another object is to provide a device of this character by which the severing blade may be restored to the sheet-severing position merely by casual pressure of the typist's finger, and will be automatically latched in that position to serve reliably in tearing off a completed form.

Another object resides in providing a pivotal mounting for a spring-urged bail, having detent means rendered effective by the spring means to releasably retain the bail in the out-of-use position.

A further object is to provide a pivotal mounting for a severing bail which will arrest the bail at its out-of-use position with a cushioning action, and which will yield to prevent damage to the bail structure in the event of over-stressing same by undue force or accidental impact.

In typewriters of this kind, the original and the duplicate bill forms, with carbons interleaved therewith, are fed into the typewriter in a continuous strip extending around the platen cylinder. To facilitate withdrawing the completed bill and retracting the carbon sheets for re-use in typing the next form, mechanism, such as shown in the patent to Wernery et al., No. 1,132,055, is provided to enable the platen to be raised, to thus provide a straight path for stripping the carbon sheets and for advancing the finished bill forms to a severing position. This forward withdrawal of the bill-form strip is gaged so that it will bring the bottom edge of the bill in line with the tearing element or knife. The platen may then be restored to position to enable the usual feed rolls to hold the manifold strip, and the complete bill and duplicates may thus be torn off along a line dividing each form.

The severing blade is necessarily disposed close to the platen and at the leading edge of the bill form to be typed and is therefore adjacent the typing line where it partly obscures the view of the work in process. To afford an unobstructed view of the work and facilitate inserting the manifold strip around the platen, it is known to pivotally mount the severing blade so that it may assume a forward position away from the typing

2

work in process, as shown for example in the patents to Smith, No. 1,566,287 and Waldheim, No. 1,619,045. However, in continuous billing machines wherein the platen is adapted to be raised to facilitate withdrawing a completed bill, as in the Wernery et al. patent, the gearing and other mechanism associated with the platen present difficulties in swingably mounting the severing blade and securing it in its form-tearing position.

Accordingly, another object of the invention in its more specific aspect is to provide an improved mounting means for the swingable severing element, particularly adapted for manifolding typewriters having the raisable platen features substantially as disclosed in the Wernery et al. Patent No. 1,132,055.

With the above and other objects in view, the invention will now be described with reference to the accompanying drawings wherein one embodiment which the invention may assume in practice is shown for the purposes of illustration.

In the drawings:

Figure 1 is a sectional view, taken on a fore-and-aft plane through a continuous billing typewriter embodying the invention,

Figure 2 is a front elevational view partly in section, of the mechanisms shown in Figure 1, the section being taken on line 2—2 of Figure 3,

Figure 3 is a fragmentary view similar to Figure 1 but showing the severing device in its out-of-use position,

Figure 4 is a view similar to Figure 3 but showing the severing device during the restoration of same to the form-tearing position, just prior to latching the device in that position, and,

Figure 5 is a fragmentary perspective view of the severing blade unit apart from the machine.

Referring to Figures 1 and 2, the typewriter embodying the invention as illustrated comprises a platen carriage 8, mounted on guideways 9 to travel relatively to the typing point defined by a type-guide 10. The carriage 8 includes end members 11 on which a platen 12 is rotatably supported by means hereinafter described. Feed-rolls 13 cooperate with the platen in the usual manner to line-feed the work sheets as the platen is rotated.

The continuous manifold strip of form bills or the like is indicated at 15 and issues from a suitable supply at the rear of the machine. As shown in detail in the Wernery et al. patent, the several plies of the manifold strip extend forwardly through carbon holders 16 carried on a truck or carrier 17 supported on rails 18 to travel forth and back relatively to the platen carriage.

The rails 18 are carried on a frame 20 secured at its forward end to the platen carriage and guided at its rear portion by means, not shown, so that the carbon truck 17 and the manifold strip travel laterally with the platen carriage 8. Carbon sheets 21 are secured to the holders 16 where the carbons become interleaved with the plies of the manifold strip 15 and from which they extend forwardly to near the end of the manifold strip as it passes down around the platen 12 and up past the typing line.

As also disclosed in said Wernery patent, the platen is mounted so that it may be raised to the position shown in dot-and-dash outline in Figure 1, by means now to be described. In each of the end members 11 a stub shaft 22 is journaled, on each of which a platen knob 23 is secured, the left shaft also mounting the usual line-space ratchet wheel 24. On each shaft 22 a gear 25 is secured, which meshes with a second gear 26 which in turn is meshed with a third gear 27 secured to a shaft 28 by which the platen 12 is rotatably mounted. Each train of gears 25, 26, 27 enables rotating the platen by the knobs 23 in any elevational position of the platen, as well as by the usual line-space mechanism of which the artchet wheel 24 is shown. Each intermediate gear 26 is rotatably journaled on a stud or trunnion 30 secured to the respective carriage end-members 11. Journaled on each stud 30 adjacent gear 26 is a plate-like hanger 31 of L-shaped outline as shown in Figure 1. The hangers 31 are connected by an angle member 32 extending between the hangers and forming therewith a cradle frame for rockably supporting the platen, the shaft 28 of which is journaled in the hangers. A flanged plate 33 fastened on the hanger 31 provides a cover for each gear train. A front paper shelf supported on the cross member 32 carries a gage bar 34 along which a gage stop 35 is adjustable. The cradle 31, 32 is retained, with the platen 12 in typing position coacting with the feed rolls 13, by a spring-urged latching device 36, each hanger of the cradle resting on a cross rod 37 connecting the two carriage end-members 11.

When the typing of the bill form at the platen is completed, the latch device 36 is released and the cradle 31, 32 is rocked forwardly to substantially the dot-and-dash position of Figure 1. The typist now grasps the manifold strip at its forward end and pulls the entire strip forward until its leading edge comes against the gaging stop 35. The forward ends of the carbons are displaced slightly from the end of the strip to provide a margin at which the manifold strip may be gripped without engaging the carbons. While thus holding the strip against stop 35, the carbons 21 are withdrawn from the typed bill form by moving the carbon truck 17 rearwardly by means well known in the art. The platen is then lowered to its normal position at which the latching device 36 becomes reengaged, and the completed bill form from which the carbons 21 have been withdrawn is now severed from the manifold strip by tearing same against a severing device or blade 38 in the usual manner.

The organization and operation of the several mechanisms described up to this point are well known in the art of continuous billing or manifolding typewriters. No claim is made herein to these mechanisms, per se, except in the association of certain features thereof with the

novel severing device and its mounting means now to be described.

As previously mentioned, the severing blade 38 is retained in the Figure 1 position to serve in tearing off the completed bill form and when not in use many be swung forwardly to the Figure 3 position to afford a clearer view of the typing work in process. The structure for pivotally mounting the blade 38 comprises a cam-edged plate 40, embodying a stationary element of the mounting means, rigidly secured by suitable means to the stud or trunnion 30 at the end thereof adjacent the hanger 31, a collar or spacing member 41 being provided between the two members 31 and 40. On each plate 40 is fastened a threaded stud 42 to provide a pivot for a bail comprising the blade 38.

As shown best in Figure 5 the severing blade 38 has secured thereto at each end an angle piece, one leg of which is secured to the blade 38 and the other leg provides an arm 43 of the bail by which the latter is mounted on the plate 40. The arm 43 has an elongate arcuate slot 44 engaged on the pivot screw 42, a nut on the screw being turned up lightly against the arm. A tension spring 45 anchored at one end, on pivot screw 42, has its other end fastened to the arm 43 by a pin 46. The spring 45 is arranged as hereinafter described and tends to pull the blade 38 generally toward the pivot 42 to an extent limited by the bottoming of the slot 44 against the pivot.

Each bail arm 43 has a latch dog 47 offset laterally from the arm so as to be coplanar with the plate 40 and adapted to engage in a notch 48 in the plate under the tension of spring 45. The notch 48 is of a width just ample to receive the dog 47, with the two opposed edges of the notch engaging opposite faces of the dog. The lower edge of notch 48 forms a stop 50 extending substantially radially with reference to pivot 42 to an extent ample to stop the blade bail as it is swung clockwise from the Figure 3 position, even with the bail urged outwardly against the spring tension to the limit permitted by slot 44, as demonstrated in Figure 4. The notch edge 51 terminates at a distance from pivot 42 such that it will be clear of dog 47 when the bail is pressed radially away from its pivotal axis. The rightward edge of plate 40 defines a cam eccentric with reference to pivot 42 and ascending gradually from a low point 52 until it reaches the high point at edge 51 where it meets the notch 48. Leftward of the point 52 the periphery of plate 40 may be of any desired shape such as will clear the latch dog 47 and thus allow free counterclockwise swing of the bail to the Figure 3 position.

When the bail is swung to its out-of-use position, Figure 3, it is stopped there by the engagement of a notched shoulder 53 on the bail arm 43 with a pin 54 projecting from the cam plate 40. The relative locations of shoulder 53 and pin 54 may be determined so as to arrest the bail in whichever position affords the greatest vision of the work for the typist, without obstructing the path of the type bars to the typing point.

It may be here noted by reference to Figure 3, that the stopping of the bail as it engages the stop pins 54 is cushioned somewhat by the coaction of spring 45 at the instant of stopping. To accomplish this action the line of pull of spring 45, as determined by the location of pin 46 on arm 43, is preferably at an acute angle from a

line radiating from pivot 42 and passing through the stop pin 54. This angle may be modified somewhat from about a right angle to a relatively narrow acute angle but should be determined with the view to causing spring 45 to also draw latch dog 47 radially against cam edge 51, 52 and into notch 48. To demonstrate this cushioning action of spring 45, it may be assumed that a blade 38 is being brought to the Figure 3 position with an appreciable degree of force. As the bail is stopped by the pin 54, it will tend to pivot about the pin and thus react on spring 45 so as to momentarily further tension same. This yield of spring 45 allows the bail blade 38 to whip past its normal stop position. This action is accommodated by the slot 44 being elongate and arcuate with its curvature centered in notch 53. When, through the combined action of the parts as described, the spring 45 and pin 54 overcome the force of the dropping bail, the latter will be brought to its normal, Figure 3, position as the spring 45 relaxes its added tension and the left end of slot 44 again bottoms on pivot 42. This yielding action is also effective to prevent damage to the bail structure in the event that it is subjected to undue force or is struck, as by a falling object, while in the Figure 3 position.

To effect a detenting action of the bail at the out-of-use position, the periphery of each bail arm 43 provides a cam slightly eccentric relatively to the normal pivotal axis of the bail, that is, the pivot 42 positioned at the leftward end of slot 44 as viewed in Figure 3. This eccentric peripheral portion is that embraced by a bracket 55, having a radius of curvature somewhat less than the distance of notch 53 from the axis 42 and having its center of curvature displaced from axis 42 in the direction in which the slot 44 extends from said pivot and so positioned that at each limit of the eccentric portion the cam will be concentric with the pivot axis. As the bail is swung toward and approaches the out-of-use position, cam portion 55 reacts against pin 54 so as to cause the bail to move radially leftward against the tension of spring 45 as accommodated by slot 44. After the high portion of cam 55 passes pin 54 the radial movement of the bail, under tension of spring 45, is now rightward and continues until the notch 53 straddles pin 54. Thus, the effect of cam 55 and spring 45 in coaction with pin 54 is to detent the bail in the Figure 3 position, resisting unintended displacement of the bail.

When it is desired to restore the severing blade 38 to its in-use position, the typist need only pull the bail bodily leftward a slight extent to release it from the detenting effect and meanwhile swing the blade upwardly and then rearwardly. As the blade bail begins to swing downwardly and the latch dog 47 coacts with cam-edge 51, 52 of plate 40, the gradual rise of the cam overcomes the tension of spring 45, and the bail thus quickly arrives at the in-use position against stop 50, see Figure 4. At this instant spring 45 is fully tensioned in readiness to cause the bail dog 47 to snap into the notch 48. The dog 47 fits closely in the notch, thus holding the blade 38 with a positive action obviating any chance of displacement during the use of the blade in tearing off the typed bill forms.

Moving the blade to its out-of-use position may be effected with equal facility, it being necessary for the typist only to urge the blade bail radially from the pivot axis, against the tension of spring 45, to the limit defined by the slot 44, see Figure 4. The latch dogs 47 are thus brought clear of the notches 48 and the bail may be raised and swung rearwardly in an easy manipulation, allowing the bail dogs 47 to ride along the cam-edges of plates 40. After being swung past dead center the bail, if of ample weight, may be allowed to drop until arrested and detented in the Figure 3 position, as previously described.

Although the invention is illustrated and described in its present embodiment in an Underwood Fanfold typewriting machine as exemplified in the Wernery et al. patent, it will be understood that the same is shown for purposes of illustration, and that the invention may be modified in various other forms and may be embodied in other machines without departing from its spirit or the scope of the appended claims.

What is claimed is:

1. In a machine of the character described, the combination with a bail including a severing blade, of means for mounting said bail for movement between a severing position and an out-of-use position and for retaining the bail at either of said positions, said mounting and retaining means comprising a stationary element adjacent each end of the bail, means associated with each of said stationary elements for pivoting the bail and for allowing limited movement of the bail radially relatively to the pivotal axis, a spring at each end of the bail urging the bail to one limit of its radial movement, and means including parts of said stationary elements for effecting radial displacement of the bail against the force of said springs and for releasably retaining the bail at either the severing or the out-of-use position.

2. In a machine of the character described, the combination with a bail including a severing blade, of means for mounting said bail for movement between a severing position and an out-of-use position and for retaining the bail at either of said positions, said mounting and retaining means comprising a stationary element adjacent each end of the bail, means associated with each of said stationary elements for pivoting the bail and for allowing limited movement of the bail radially relatively to the pivotal axis, spring means urging said bail to one limit of its radial movement, means rendered effective by said spring means to automatically lock the bail in its severing position to said stationary elements, means including a part of said stationary elements to stop the bail in its out-of-use position, and means on the bail coacting with said part and rendered effective by said spring means to detent the bail in its out-of-use position.

3. In a machine of the character described, the combination with a bail including a severing blade, of means for mounting said bail for movement to and from a severing position and for retaining the bail at said position, said mounting and retaining means comprising a stationary element adjacent each end of the bail, means associated with each of said stationary elements for pivoting the bail and for allowing limited movement of the bail radially relatively to the pivotal axis, a spring at each end of the bail urging the bail to one limit of its radial movement, and means including parts of said stationary elements for effecting radial displacement of the bail against the force of said springs and for automatically looking the bail in its severing position to said stationary elements upon moving the bail to said position.

4. In a machine of the character described, the combination with a bail including a severing blade, of means for mounting said bail for move-

ment between a severing position and an out-of-use position, said mounting means comprising a stationary element adjacent each end of the bail, means associated with each of said stationary elements for pivoting the bail and for allowing limited movement of the bail radially relatively to the pivotal axis, spring means urging said bail to one limit of its radial movement, means rendered effective by said spring means to automatically lock the bail in its severing position to said stationary elements, and means including a part of said stationary elements to stop the bail in its out-of-use position, the arrangement of the bail-pivoting means and the spring means in relation to said stop means being such that the bail may rock bodily beyond the out-of-use position against the tension of said spring means.

5. In a machine of the character described, the combination with a bail including a severing blade, of means for mounting said bail for movement to and from a form-severing position and releasably retaining the blade in said position, said mounting and retaining means comprising a stationary element adjacent each end of the bail, means associated with each said element for pivoting the bail and allowing limited movement of the bail radially relatively to the pivotal axis, spring means urging said bail to one limit of its radial movement, a notch in at least one of said stationary elements, and a dog at the corresponding end of said bail adapted to enter said notch under influence of said spring means to retain the bail in its severing position.

6. In a machine of the character described, the combination with a bail including a severing blade, of means for mounting said bail for movement between a severing position and an out-of-use position and for yieldably stopping the bail in the out-of-use position, said mounting and stopping means comprising a stationary element adjacent each end of the bail, means associated with each of said stationary elements for pivoting the bail and for allowing limited movement of the bail radially relatively to the pivotal axis, spring means urging said bail to one limit of its radial movement, and means including a part of said stationary elements to stop the bail in its out-of-use position, the arrangement of the bail-pivoting means and the spring means in relation to said stop means being such that the bail may rock bodily beyond the out-of-use position against the tension of said spring means.

7. In a machine of the character described, the

combination with a bail including a severing blade, of means for mounting said bail for movement to and from severing position and releasably retaining the bail in said position, said mounting and retaining means comprising a stationary plate adjacent each end of the bail, a pin and slot forming a pivotal connection between the bail and each of said plates, spring means acting on said bail to normally urge the slot to bottom at one end on said pin, and a latch dog at each end of said bail, said plates each having a cam adapted to cooperate with the corresponding said dog when the bail is swung to severing position and effective to move the bail radially of the pivotal connection against the tension of said spring, each plate also having a notch at the high point of said cam to receive the latch dog for locking the bail in the severing position.

8. In a machine of the character described having a rotatable platen and cooperating feed rolls, and means including stationary trunnions mounting the platen for movement substantially away from the feed rolls, the combination with a bail including a severing blade, of means mounting the bail for movement to and from a form-severing position and for releasably retaining the bail in said position, said mounting and retaining means comprising a plate secured to each of said trunnions, a pin and slot forming a pivotal and sliding connection between the bail and each of said plates, spring means acting on said bail to normally urge the slot to bottom at one end on said pin, and a latch dog at each end of said bail, said plates each having a cam adapted to cooperate with the corresponding said dog when the bail is swung to severing position and effective to move the bail radially of the pivotal connection against the tension of said spring means, each plate also having a notch at the high point of said cam to receive the latch dog for locking the bail in the severing position.

FRED BECKER.

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