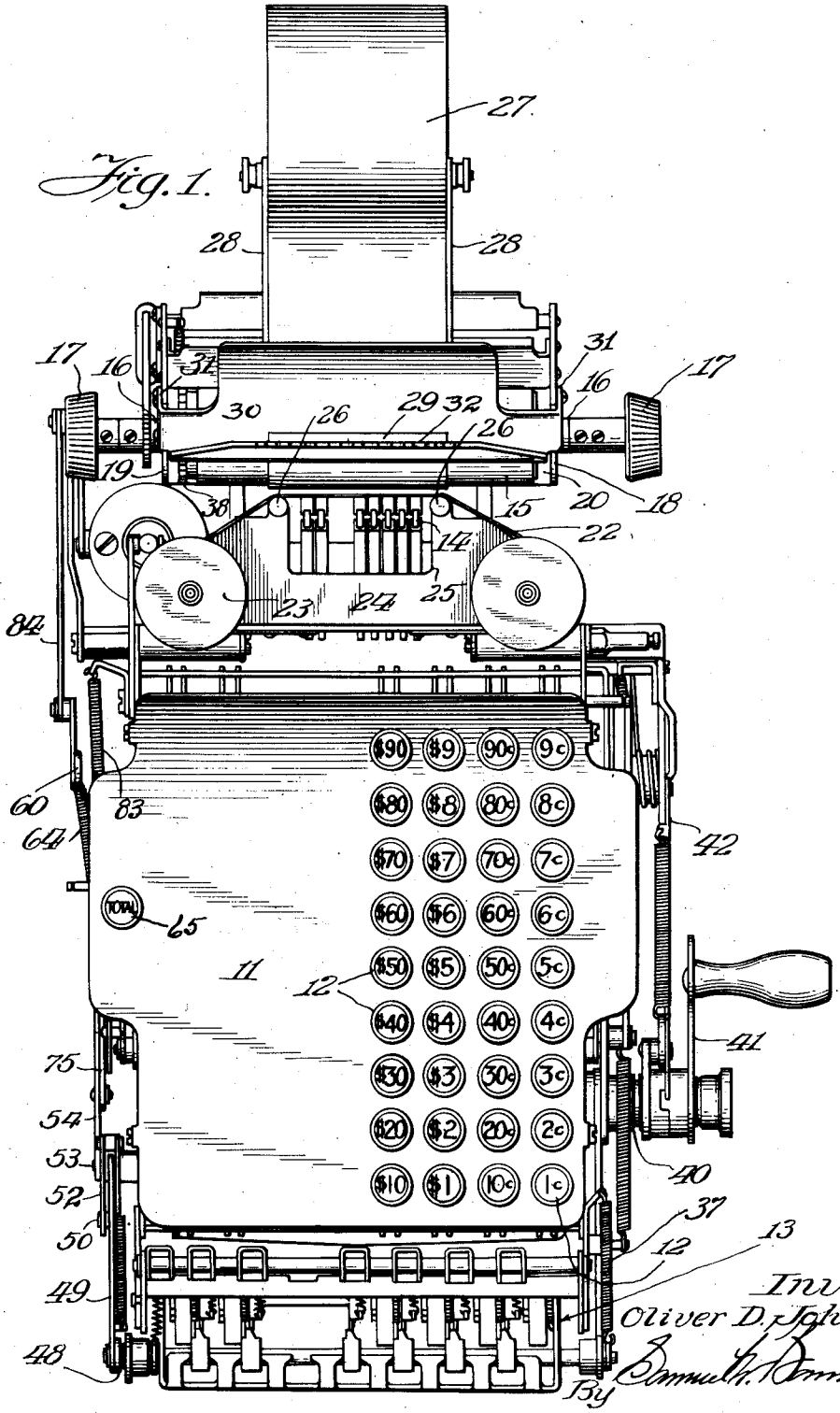
Sept. 6, 1932. O. D. JOHANTGEN 1,876,056

PAPER FEEDING MECHANISM FOR LISTING MACHINES

Filed Sept. 23, 1929 5 Sheets-Sheet 1

Fig. 1.



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Filed Sept. 23, 1929 5 Sheets-Sheet 2

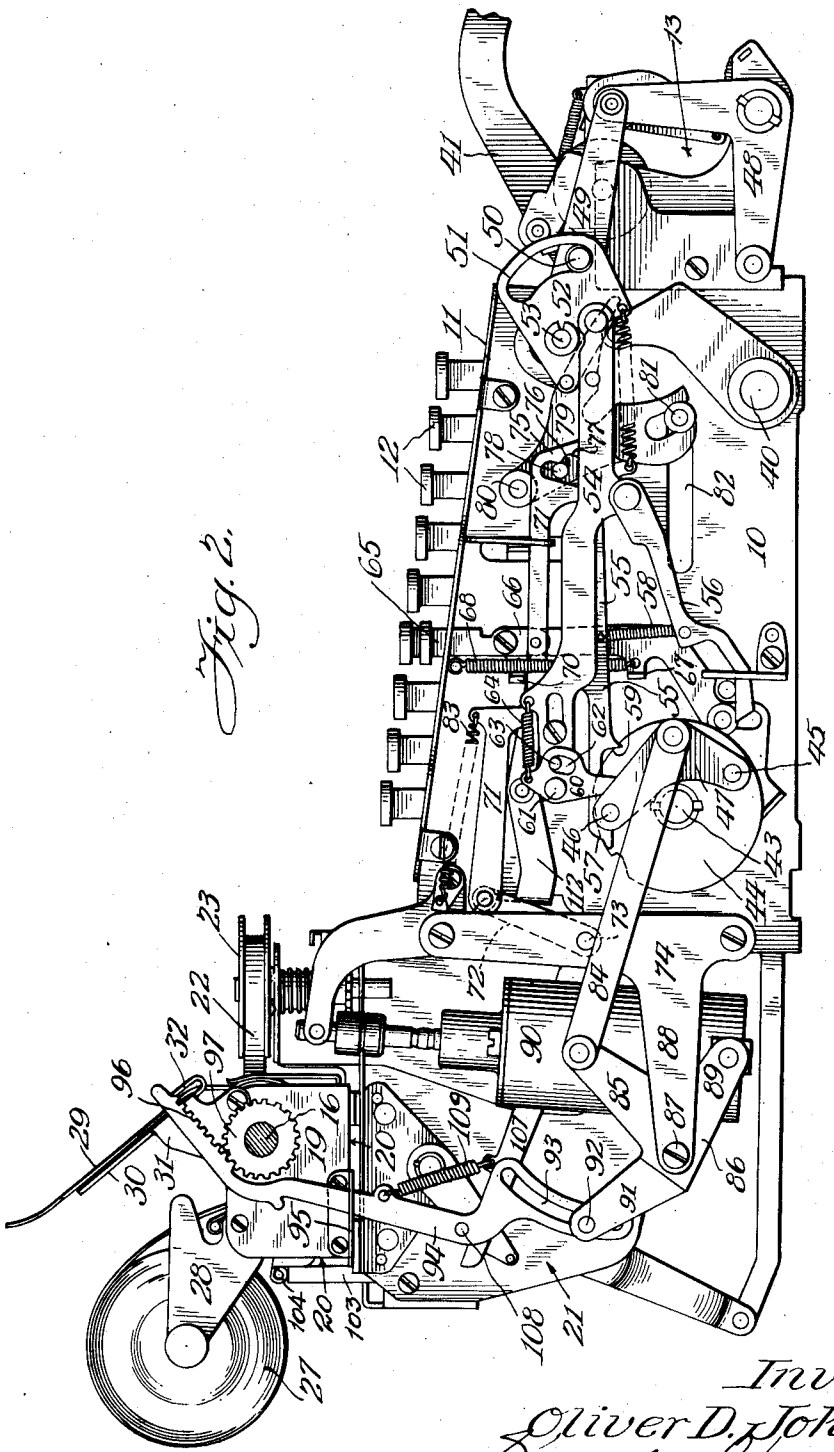


Fig. 2.

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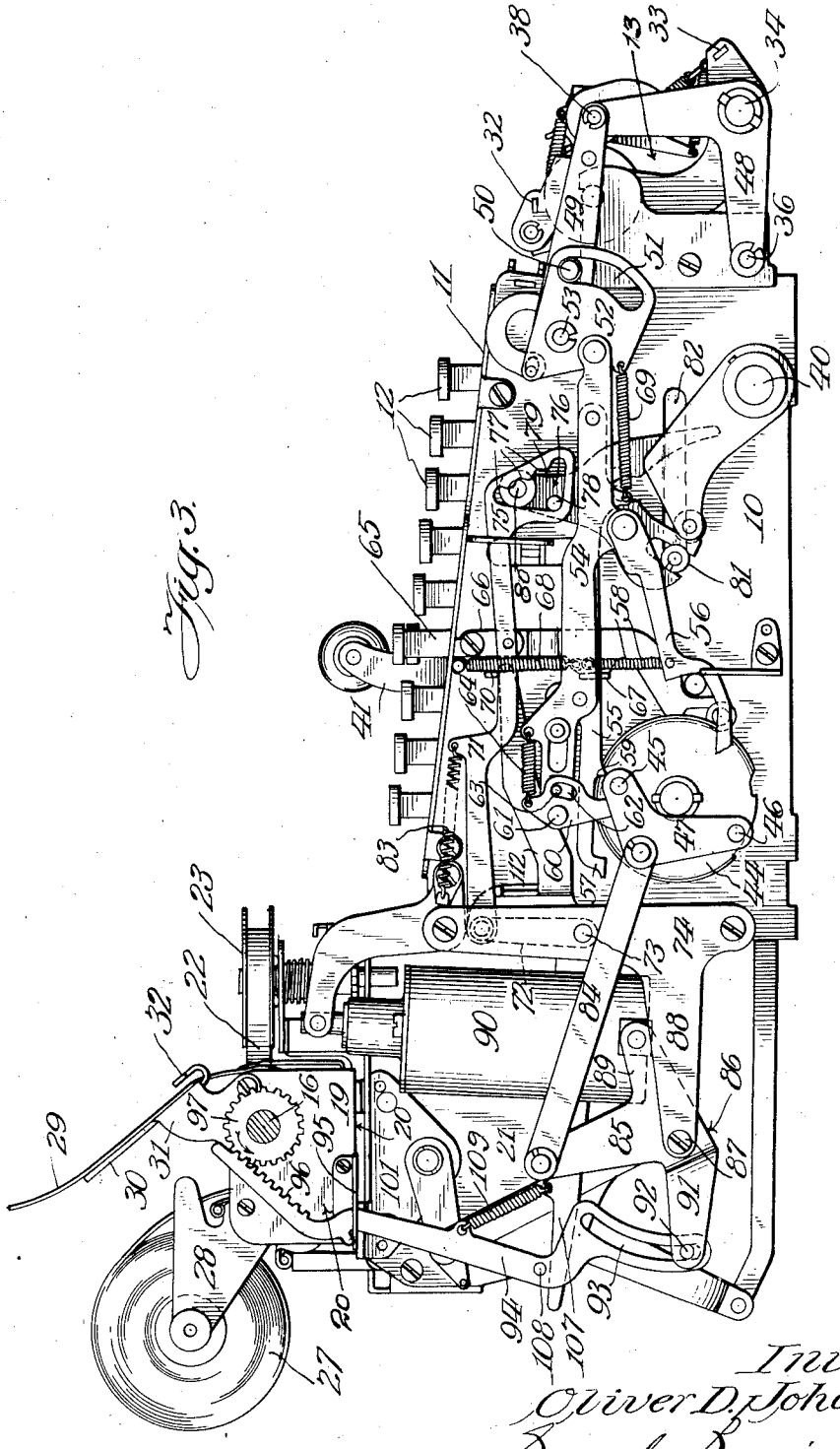


Fig. 3.

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PAPER FEEDING MECHANISM FOR LISTING MACHINES

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Fig. 5.

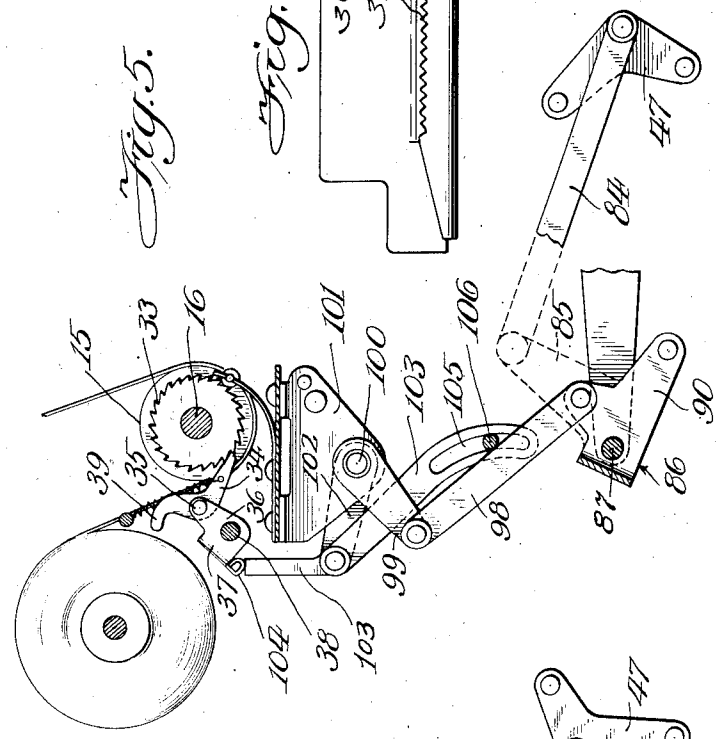
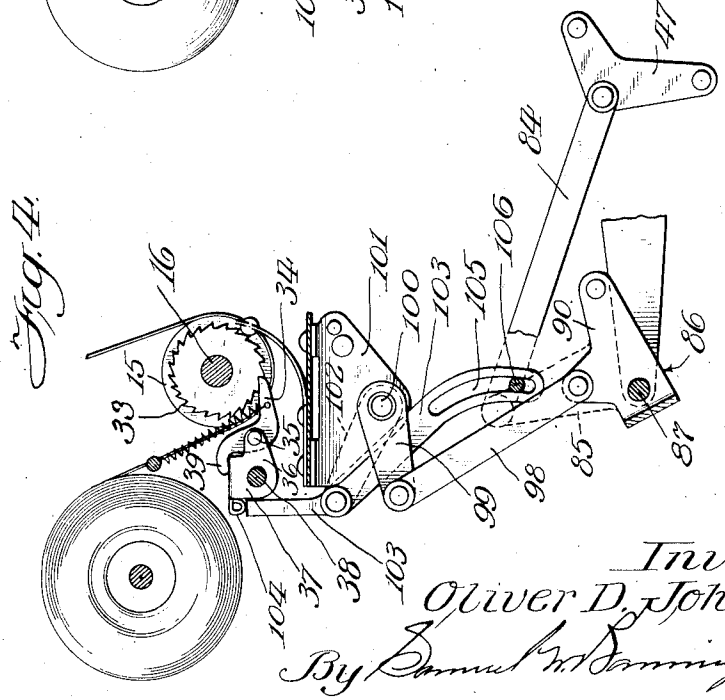


Fig. 7.

Fig. 4.



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PAPER FEEDING MECHANISM FOR LISTING MACHINES

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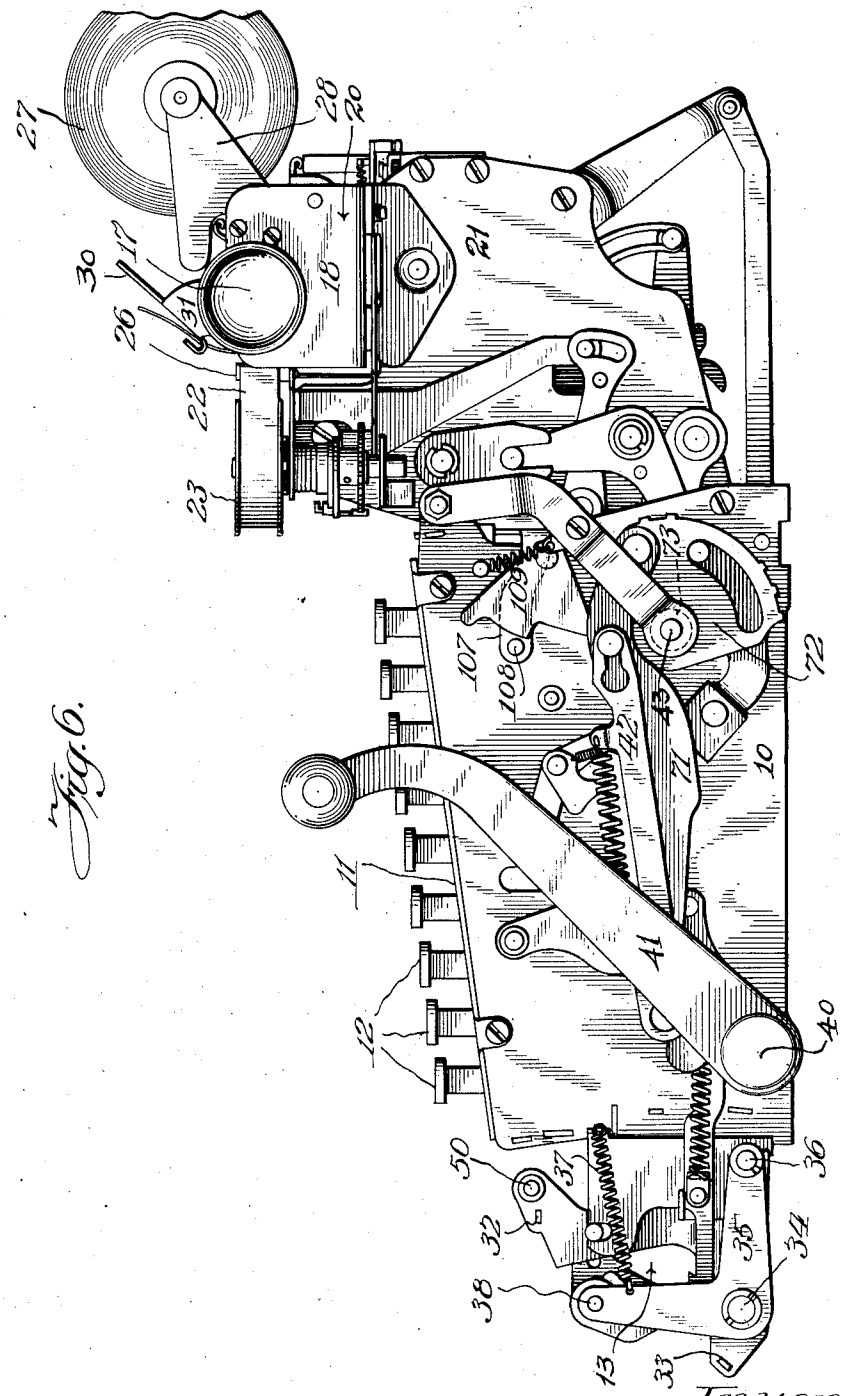


Fig. 6.

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UNITED STATES PATENT OFFICE

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PAPER FEEDING MECHANISM FOR LISTING MACHINES

Application filed September 23, 1929. Serial No. 394,491.

This invention relates to improvements in paper feeding mechanism for listing machines.

The features of the present invention constitute certain additions to a listing machine of the general type shown and described in the Johantgen Patent, No. 1,336,840, issued April 13, 1920.

The drawings illustrating the mechanism with which the present invention is associated illustrate the general structure of a listing machine of the type above referred to, although it is not the intention to limit the present invention solely to adding machines of such character, since the present features may be used in other associations.

The features of the present invention, in the present association, constitute parts of an adding machine which is designed to imprint items in column form upon a continuous strip of paper, which in the listing of such items is fed in a step by step movement to the printing line in the usual manner. After the imprinting and accumulating of a group of items thus listed, which will ordinarily constitute the items of a purchase made by a single customer, it is desirable to take a total of this group and clear the machine, and to tear off the record slip to hand to the customer as a completed record of a single transaction.

If in total taking the paper strip were fed forward to a degree equal only to the step by step spacing observed in the listing of the items, it would be difficult or inconvenient to tear off the strip within the limited spacing thus afforded. If on the other hand the operator were to manually draw out the paper strip to afford additional spacing before tearing off the strip, this operation would result in varying withdrawals of paper, usually excessive in amount, with a consequent waste of paper and irregularity in the appearance of item strips submitted to customers.

The object of the present invention is to provide special paper feeding devices operable in conjunction with the total setting mechanism, so that when a total is taken the paper strip will be automatically fed forward in enhanced degree, but in definitely measured amount, so that adequate marginal space will be afforded to provide for the tearing off of the item slip without manually withdrawing additional paper, in varying degree, from the roll, in order to accommodate the tearing off of the item slips.

This total feeding mechanism is associated with the machine as a whole in such a way as not to interfere with the normal operation of the machine, and is conditioned and actuated by the mechanisms ordinarily employed in the operation of the machine, so that it is not necessary in any way to remodel or reorganize the machine to accommodate features of the present invention.

Further objects and details will be apparent from a description of the invention, in conjunction with the accompanying drawings, wherein,—

Figure 1 is a top or plan view of a listing machine of the general type shown in the Johantgen Patent No. 1,336,840, with the special features of the present invention added thereto;

Fig. 2 is a side elevation of the left side of the machine as viewed by the operator, in the normal operation of the machine, with the special feeding features in the position for augmented paper feeding and with the total key depressed and the handle advanced;

Fig. 3 is a similar side elevation in the normal position and with the total key elevated and the handle retracted;

Figs. 4 and 5 are details showing the dog and ratchet mechanism for operating the platen, with the special paper feeding features of the present invention associated therewith;

Fig. 6 is a side elevation of the right hand side of the machine with the handle in normal position; and

Fig. 7 is a detail showing the tearing edge of the guide plate.

The machine as a whole comprises a body frame which includes side plates 10 of generally similar formation, only one of which (the left hand plate) is shown in the drawings.

The body frame supports a top plate or

keyboard 11, through which extend rows of keys 12 suitably inscribed to indicate the significant items in a plurality of orders, such as units, tens, hundreds and thousands. As shown, four orders are provided, although of course additional orders may be included up to the desired number.

The accumulating section of the machine is shown at the front or bottom of Fig. 1, and is generally designated by the numeral 13, but this section in the present embodiment of the invention is similar in all respects to that shown in the Johantgen Patent, No. 1,306,112, of June 10, 1919, so that a description thereof is deemed unnecessary. It suffices to state with reference to the general structure of the machine that the key stems, when depressed, serve to variably limit the movements of rack bars which control the degree of movement imparted to the accumulating wheels and the type carrying bars, in accordance with the plan or principle set forth in detail in the Johantgen Patent, No. 1,336,840.

The printing section of the machine includes type bars 14 upon which the type characters are inscribed, and which are elevated to the printing line by appropriate mechanism and in position to coact with a platen 15 which is carried by a platen shaft 16 which has mounted at each end thereof a knurled hand wheel or button 17 for manual adjustment of the platen.

The platen shaft is journaled through the turned end plates 18 and 19 of a platen frame 20 which rests upon a rear frame 21 which carries the type bars and other mechanisms constituting the printing section of the machine.

The type coact with an inked ribbon 22 carried upon spaced spools 23 journaled above a ribbon mounting plate 24 provided with an aperture 25 through which the type bars and associated parts project, and the ribbon is guided around posts 26—26 which bring a section of the ribbon into contiguous relation with the printing line. Mechanism is provided for feeding the ribbon, but this forms no portion of the present invention and need not be described.

The paper strip is fed from a roll 27 which is suitably supported within side brackets 28 connected with the platen frame, and the paper strip is carried down under and around the platen, the end 29 being threaded through an aperture in an obliquely disposed guide plate 30 extending upwardly beyond the platen and supported upon ears or tongues 31 which are secured by screws or otherwise to the ends 18—19 of the platen frame. The lower edge of the guide plate is bent back upon itself to afford an upwardly presented serrated tearing edge 32 (see Fig. 2) so disposed as to permit the paper strip to be drawn forward by the operator and torn along the tearing edge when it is desired to sever the strip.

The platen 15 is given a step by step rotation by the provision of a ratchet wheel 33 which is mounted upon the shaft 16 near the left hand end thereof and immediately inside of the end wall of the platen frame. The ratchet wheel is actuated by means of a dog 34 of angle formation, which is pivoted upon a pin 35 extending through an ear 36 formed on a rocking frame 37, which is journaled at each end upon a pivot 38 extending inwardly from the proximate end plate of the platen frame, so that the frame 37 is capable of being rocked from its initial position shown in Fig. 5, to its final position shown in Fig. 4.

The dog is acted upon by a spring, which normally holds the tooth of the dog into engaging relation with the ratchet wheel, and as the parts are moved from the position shown in Fig. 5 to that shown in Fig. 4, the ratchet wheel will be moved a single notch in the normal operation of item spacing.

The dog is provided with a tail 39 which in the position shown in Fig. 5 will be elevated above the rocking frame 37, but as the latter is rocked to the position shown in Fig. 4, the tail of the dog will ultimately be brought into engaging relation with the rocking frame and the ultimate thrust imparted to the ratchet wheel with the parts locked in this position.

The feeding movements required to perform the normal item spacing operations are all derived from a main power shaft 40 extending transversely of the body frame of the machine near the forward portion thereof.

The main power shaft, at its right hand end, carries an operating handle 41 which in Fig. 3 is shown standing in its normal or retracted relation, and in Fig. 2 is shown in the position occupied at the end of the forward handle pull. The power shaft 40 supplies power for the operation of all of the mechanisms present in the machine as a whole, but it is necessary to refer only to such movements and power connections as are involved in the paper feeding operations to which the present invention is directed.

The main power shaft 40 through suitable and adequate connections 42 at the right hand side of the machine imparts rocking movements to a rock shaft 43 journaled through the body frame of the machine near the rear end thereof. The rock shaft at its left end carries a disk 44 which is provided with two outstanding studs 45 and 46 carrying an angularly formed bridge plate 47 which stands in spaced relation to the outer face of the disk.

It is not deemed necessary to describe in detail all of the operations performed by the rocking movements of the disk 44, which in part control the action of the accumulating section of the machine. It suffices to state

that, in the accumulation of items, suitable and adequate movements are imparted to a pivoted bar 48 through the medium of a link 49 which mounts a roller 50 operating within an arcuate slot 51 in a plate 52 pivoted upon a pin 53 and actuated by a reciprocating bar 54 which has pivoted thereto an upper arm 55 and a lower arm 56. The upper arm 55 is provided at its rear end with a hook 57 and forwardly thereof with a shoulder 59.

In the normal operation of listing items, the lower arm 56 will be lifted by the action of a spring 58, so that its rear end occupies the position shown in Fig. 3, and in this position it will lie in the path of arcuate movement of the stud 45, so that, as the disk 44 is rotated, the stud 45 will upon its downward movement slip past the end of the lower arm 56 and assume a position as shown in Fig. 2, such that it will, upon its return movement impart a thrust forward through the lower arm 56 to the reciprocating bar 54, and in so doing will, upon the return movement of the handle, impart to the accumulating mechanisms, the movements necessary to introduce the items concurrently set up into the accumulating wheels. Likewise, with the parts in the relation shown in Fig. 3, the upper arm 55 will occupy such a position that its hooked end, together with the shoulder 59 formed forwardly of the hooked end, will be lifted above the path of movement of the stud 45.

With the parts in this normal item accumulating position, the reciprocating bar 54 will be drawn rearwardly, and finally restored at the terminus of the handle stroke, by the action of a detent 60 which is pivoted to a pin 61 on the rear end of the reciprocating bar 54 and provided with a slot 62 coacting with a stop pin 63 which limits the movement of the detent under the action of a spring 64. The relation of these parts is such that, as the disk 44 is rotated by the forward pull of the handle, the stud 46, which is shown in the lowermost position in Fig. 3, will be swung around to the uppermost position, as in Fig. 2, with a corresponding reversal of the positions of the stud 45, and as the stud 45 moves to the lowermost position at the end of the forward handle pull, it will slip past the end of the arm 56 in preparation for engagement therewith on the return movement of the parts.

As the handle is released, the restoration of the stud 45 to the uppermost position will first impart a forward thrust to the arm 56 and ultimately as the stud 45 reaches its uppermost position will impart a rearward pull to the detent 60, which completes the accumulating cycle and restores the parts to normal position. It is not deemed necessary to describe the manner in which these movements are effective in actuating the accumulating and carrying mechanisms, since these features of the construction are fully set forth and described in the Johantgen Patent, No. 1,336,840.

When it is desired to take a total and clear the accumulating wheels, it is of course necessary to reverse the order of actuation of the accumulating mechanisms, and with this end in view provision is made, in total taking, for the actuation of the accumulating mechanisms on the forward pull of the handle rather than upon the rear or return movement thereof. These mechanisms will now be described.

Fig. 2 illustrates the position of the parts during the total taking operation and with the handle advanced to the foremost position. A total key 65 is provided, which is carried upon the upper end of a vertically extending adjusting bar 66 provided at an intermediate point with an outwardly projecting finger 67 which, when the adjusting bar is normally elevated through the tension of a spring 68, will lift the upper arm 55 sufficiently to hold the shoulder 59 out of the arcuate path of movement of the stud 45 in the accumulation of items, in the manner previously described. When, however, the total key is depressed to the position occupied in Fig. 2, the finger 67 will drop, thereby allowing the arm 55 to swing downwardly under the tension of the spring 58, so that the shoulder 59 will occupy a position immediately in advance of the stud 45 then occupying the upper position, with the result that upon the forward pull of the handle the stud 45 will impart a thrust through the arm 55 to the reciprocating bar 54, so that in the instance of total taking the actuation of the accumulating mechanisms will occur upon the forward movement of the handle rather than the return movement as in the case of the accumulation of items.

Since it is necessary that the excess paper feeding occur concurrently with the taking of a total, provision is made for utilizing the total key to set the mechanisms required in excess paper feeding for actuation by the handle during the total taking operation.

The adjusting bar 66, in addition to the finger 67, is provided with an upper finger 70 which in all positions of adjustment rests upon the upper edge of an adjustable draw bar 71, the rear end of which is pivoted to a rocking arm 72 upwardly extending from and keyed upon a rock shaft 73 which is journaled at its outer end through a bracket plate 74, which constitutes a fixed rear extension of the main frame of the machine.

The forward end of the draw bar 71 is enlarged to form a head portion 75 provided with an aperture 76 having a configuration, best shown in Fig. 3. The edge of the apertured portion of the head is provided with notches or serrations 77, the upper and lower of which are the only ones requiring particu-

lar notice in connection with the present invention. It will be noted that the aperture 76 is in general of triangular formation enlarging toward the base.

The apertured head 75 coacts with a stud 78 outwardly extending from a swinging plate 79 pivoted at its upper end to a pin 80 on the side plate 10 of the main frame. During each forward movement of the handle, whether in listing items or taking totals, the swinging plate 79 will be swung forwardly into the position shown in Fig. 2, by the action of a roller 81 traveling within a slot 82, which roller is mounted upon the end of the universal release bar which at each handle stroke moves forward to permit movement of all of the rack bars which have been unlocked by the operation of the corresponding item keys, as shown in detail in the Johantgen Patent, No. 1,336,840.

Since the roller 81 is mounted upon a portion of the machine which moves uniformly with each operation of the handle, it affords an appropriate source of power for actuating the draw bar 71 during the total taking operation.

With the draw bar elevated through the tension of a spring 83 during the process of item accumulation, as in Fig. 3, the stud 78 on the swinging arm 76 will move idly within the enlarged clearance afforded at the lower portion of the head 75, but when the total key is depressed it will swing down the draw bar 71 into the lowermost position shown in Fig. 2, and this will eliminate the clearance afforded for idle movement of the stud 78, so that under this adjustment, concurrent with total taking, the draw bar 71 will be drawn forward by the forward movement of the handle and thrust rearwardly by the return movement of the handle, thereby imparting a rocking movement through the arm 72 to the rock shaft 73, which special movement is utilized in the excess paper feeding operation to which the present invention is directed.

In order to understand how this movement is utilized, it is now necessary to enter into a more detailed description of the mechanisms for actuating the dog and ratchet mechanism, which is active during the item feeding operations, in conjunction with the special mechanisms for total feeding. The operation of the item feeding mechanisms is uniform at all times, irrespective of the setting of the total key, but when the total key is set, these item feeding movements are submerged within the more extended movements afforded by the special mechanisms associated with the total taking operation.

The bridge plate 47, which rotates throughout an arc of slightly less than 180 degrees during the rotative movements of the disk 44, has pivoted thereto a link 84, the rear end of which is pivoted to an upstanding arm 85 forming part of a cradle 86 which is pivoted on a rod 87 extending between the arm 88 of the bracket 74 and the adjacent side plate of the rear frame 21.

The cradle 86 is provided with forwardly extending outer and inner arms 89 and 90 respectively (see Fig. 4) which embrace the lower end of a dash pot 90 which by the handle pull is moved from the lower position shown in Fig. 2 to the upper position shown in Fig. 3 with each operation of the handle, for the purpose of cushioning the action of the parts in a manner well understood in the adding machine art.

The cradle is provided with a rearwardly extending arm 91 provided with a pin 92 which in item taking rides idly within an arcuate slot 93 formed in the lower end of a yieldingly mounted rack bar 94 which extends through a guide plate 95 and is provided at its upper end, on its forward edge, with a series of rack teeth 96 meshing with a spur gear 97 keyed upon the platen shaft 16. The rack bar and the spur gear are out of coacting relation to one another during the item taking operations.

The cradle has pivoted to the inner arm 90 a link 98 which is pivoted to the rear end of an arm 99 keyed at its forward end upon a rock shaft 100 journaled through a bracket plate 101 which is rigidly secured to the side wall of the rear frame 21. The rock shaft 100 carries an arm 102 which is pivoted to a lifting bar 103, the upper end of which bears against a flange 104 formed on the rear edge of the rocking frame 37 which carries the ratchet dog 34, so that with each complete movement of the handle, the rocking frame 37 will be first swung downwardly, as in Fig. 5, to retract the dog 34 to engage a single tooth of the ratchet wheel and then restored to the position shown in Fig. 4, which moves the ratchet wheel and with it the platen one step of movement.

The lower end of the lifting bar 103 is provided with an arcuate guide slot 105 which receives a pin 106 for guiding the up and down movements of the lifting bar in conformity with the movements imparted by the swinging arm 102.

The rock shaft 73, which is rocked slightly only during total taking, is provided with a rearwardly extending swinging arm 107, the end of which rests beneath a stud 108 inwardly extending from the rack bar 94. During item taking, the arm 107 remains inactive and in its lowermost position, as indicated in Fig. 3. In this position, the outermost teeth 96 of the rack bar will lightly contact with the teeth of the spur gear 97 under the tension of a spring 109, so that as the spur gear is rotated in a counterclockwise direction, step by step during the operations of item taking, the spur teeth will ride freely under the rack teeth, which

will remain inactive so as in no way to interfere with the normal ratchet feeding of the platen.

When, however, the total key is depressed, the forward pull of the handle will impart a rocking movement to the rock shaft 73 with a corresponding lifting movement of the arm 107, which in turn lifts the rack bar 94 to its uppermost position, as indicated in Fig. 2, and this lifting movement of the rack bar will be concurrent with the normal upward movement of the stud 92 carried by the cradle arm 91, so that both movements will take place without interference.

It will be noted that the upper end of the rack bar 94 is bent forwardly at a rather considerable angle, while the general line of movement of the bar is substantially in a vertical line. As the rack bar is lifted, the spring 109 will permit the rack teeth to ride freely over the teeth of the spur gear 97, but at the terminus of the upward movement the rack teeth and spur teeth will stand in such angular interlocking relation, with respect to the subsequent downward line of movement of the rack bar, that they will remain intermeshed, so that an extended rotative movement will be imparted to the platen sufficient to feed forward an excess amount of the paper strip required in tearing after total taking.

The rack bar 94 is dragged downwardly upon the return movement of the operating handle by the engagement of the stud 92 with the lower end of the arcuate slot 93, and concurrently with this downward movement the arm 107 will recede to the lowermost position, so that at the terminal portion of the handle stroke the excess feeding will occur and the parts be thereafter restored to the normal position.

The rack bar 94 is a floating element, being unconnected, save by the spring 109, with the remaining operating parts, but its up and down movements will be guided and restrained by the action of the stud 92 within the slot 93, in conjunction with the guiding action of the plate 95 through which the bar extends, and the action of the spring 108 in drawing the upper end of the bar forwardly and downwardly. These parts are thus coordinated in such a way that it is not necessary to provide a specially formed ratchet wheel 97, since the spur gear shown conjointly subserves the function of a ratchet wheel and that of a spur gear for engagement with the rack teeth.

Operation

In operation, with the total key elevated and the parts set for the accumulation of items, the operator will proceed to introduce the items one at a time into the accumulating wheels. This will be accomplished in the usual manner by depressing the appropriate keys in the various orders and afterwards operating the handle. The forward stroke of the handle will serve to bring the type bars to the printing line, and upon the return stroke the items will be introduced into and stored up in the accumulating wheels.

When it is desired to take a total, the total key will be depressed, which will condition the machine for a reversal of the accumulator actuating operations; that is to say, the accumulator wheels will on the forward stroke of the handle be actuated and restored to zero, clearing the machine, and concurrently the platen actuating rack bar will be lifted and brought into meshing relation with the spur gear, so that upon the return stroke of the handle an extended rotative movement will be imparted to the platen, thereby feeding forward a sufficient length of the paper strip to afford a convenient margin for tearing off the slip containing the total items, which can thereafter be presented to the customer.

The operations required in affording an increased platen feeding movement are superposed without interference upon the normal step by step ratchet feeding operations, which is possible, since both feeding movements proceed in the same direction, and when the total feeding movement is in progress, it simply overrides or continues the ratchet feeding movement without interference.

The special features of the present invention are thus harmonized and correlated with the mechanisms normally present in a machine of this class, so that no substantial change or alteration is required, and the present invention is simply added to and properly timed and correlated with the parts requisite to the normal operation of the listing machine.

Although the invention has been described with particularity and in its detailed correlation with the machine of the particular style shown in the Johantgen patents referred to, it is obvious that the special paper feeding devices of the present invention may be combined and correlated with other types of adding, listing, or calculating machines, or in fact with any type of a machine which employs platen feeding mechanism the action of which it is desired periodically or under predetermined conditions to amplify in order to temporarily effect an increased paper feeding. Therefore, it will be understood that unless otherwise indicated, the claims are intended to cover feeding mechanism of the general kind here involved, irrespective of the specific nature of the machine with which said mechanisms are associated, or the manner in which the parts are combined and actuated.

In the claims and elsewhere I have referred to a handle and parts operated thereby, but it will, of course, be understood that the term

handle may properly apply to power appliances operable by a motor as a prime mover rather than by the human hand, so that in the use of such terms it is in no sense the intention to limit the invention to a hand operated machine, but the terms employed are intended to cover any combination of mechanisms which derive power from a handle or the equivalent thereof, and distribute it to the various mechanisms included within the structure of the machine as a whole, and in a sequence corresponding to that imparted by the forward and return movements of a handle of the specific character shown and described.

I claim:

1. In a machine of the class described, in combination with item accumulating devices, total taking devices, and a platen with dog and ratchet mechanisms having connections for rotating the platen by predetermined steps in line spacing, a handle and power connections for operating the various devices embodied in the machine, a total key adapted to set the machine in proper relation for total taking during the operation of the handle, and means for imparting an increased feeding movement to the platen, normally inactive during item taking operations and adapted, by a setting of the total key, to be brought into operative relation with movable mechanisms actuated by the handle in total taking to impart an increased feeding movement in the normal direction of feeding during the operation of taking a total and to cause the ratchet to rotate freely under the dog during said feeding movement.

2. In a machine of the class described, in combination with item accumulating and total taking devices and a platen normally adapted to be actuated by predetermined steps in line spacing, a handle and power connections for imparting movements to the various mechanisms comprised within the machine, a total key adapted when actuated to condition the machine for the taking of totals, and means for imparting increased feeding movements in the same direction to the platen, said means comprising a movable rack bar and a pinion on the platen the pinion being adapted to rotate freely under the rack during item accumulating, means operable by actuation of the total key in total taking, for bringing said rack into operative connecting relation with parts movable during the total taking operation, the rack being freely movable over the pinion during the forward stroke of the handle and in effective meshing relation during the return stroke of the handle.

3. In a machine of the class described, including item accumulating devices, total taking devices, a platen, and dog and ratchet connections for normally operating the platen step by step in line spacing, a total key adapted when actuated to condition the machine to reverse the operation of the accumulating devices in the taking of totals, a handle and power connections for actuating the various portions of the machine in item accumulation and in total taking, a rack, and a member associated with the platen and adapted to be engaged by the rack to increase the feeding movement of the platen in the same direction after taking a total, and a connection for said rack adapted, by the movement of the total key, to be thrown into active relation with a portion of the machine responsive to the operation of the handle, the rack being so related to the means on the platen that it will move freely with respect thereto in one direction and in engaging relation therewith in the opposite direction during total taking and permit the pinion to rotate freely under the rack during normal line spacing.

4. In a machine of the class described, which includes item accumulating devices, total taking devices, a platen and means normally operative during the taking of items to rotate the platen by predetermined steps in line spacing, a handle and power connections for actuating the various mechanisms contained within the machine, a total key adapted when depressed to condition the machine for a reversal of the operation of the accumulating mechanisms under the forward and return movements of the handle, a rack and pinion device for imparting increased rotative movements to the platen in the same direction during the restoration of the machine after total taking and so related as to permit the pinion to rotate freely under the rack during normal line spacing, and a connection for actuating said rack device normally standing in inactive relation to portions of the machine responsive to the handle movements, and adapted upon the depression of the total key to be brought into active relation with such moving parts to condition the mechanisms for increased platen feeding movements during the restoration of the machine after the total taking operation.

5. In a machine of the class described, which includes item accumulating devices, total taking devices, a platen and means normally operative during the taking of items to rotate the platen by predetermined steps in line spacing, a handle and power connections for actuating the various mechanisms contained within the machine, a total key adapted when depressed to condition the machine for a reversal of the operation of the accumulating mechanisms under the forward and return movements of the handle, a rack and pinion device for imparting increased rotative movements to the platen during the restoration of the machine after total taking, and a connection for actuating said rack device normally standing in inactive relation to portions of the machine responsive to the

handle movements and adapted upon the depression of the total key to be brought into active relation with such moving parts to condition the mechanisms for increased platen feeding movements during the restoration of the machine after the total taking operation, the rack and pinion devices being so correlated that the rack will slip freely over the pinion during one movement of the handle and maintain engaging relation during the other movement of the handle.

6. In a machine of the class described, including accumulating devices, total taking devices, and a platen with dog and ratchet mechanisms and connections for rotating the platen by predetermined steps in line spacing, the combination of a handle and power connections for actuating the several mechanisms, special feeding means adapted to rotate the platen to a greater than normal degree and in the same direction as the line spacing means, and connections for actuating said special platen feeding means, said connections being normally out of train with the handle operated portions of the mechanism, and means adapted to throw said special feeding means into entrained relation with the handle operated movable portions of the mechanism, said special feeding means being so related as to move idly with respect to the platen during the forward movement of the handle and to maintain effective actuating relation with the platen during the restoring movement of the handle and to cause the ratchet to rotate freely under the dog during said feeding movement.

7. In a machine of the class described, the combination of a paper platen and mechanism for normally feeding the same step by step in line spacing, a pinion connected with the platen, a freely mounted rack bar associated with said pinion and having a substantially vertical movement, the rack teeth being arranged in a row at an oblique angle to said line of movement to permit the rack teeth on the up-stroke of the rack bar to slip past the teeth of said pinion and to maintain the rack teeth in engaging relation with the teeth of said pinion on the down-stroke to impart an augmented movement to said platen, and a total key adapted when actuated to set the machine for total taking and to condition the machine for imparting a movement of reciprocation to the rack bar the teeth of the pinion being so related to the rack as to permit the pinion to rotate freely during normal line spacing.

8. In a machine of the class described, the combination of a paper platen and mechanism for normally feeding the same step by step in line spacing, a pinion connected with the platen, a freely mounted rack bar associated with said pinion and so related as to permit the pinion to rotate freely in normal line spacing, the rack having a substantially vertical movement, the rack teeth being arranged in a row at an oblique angle to said line of movement to permit the rack teeth on the up-stroke of the rack bar to slip past the teeth of said pinion and to maintain the rack teeth in engaging relation with the teeth of said pinion on the down-stroke to impart an augmented movement to said platen, and a total key adapted when actuated to set the machine for total taking and to condition the machine for imparting a movement of reciprocation to the rack bar, the augmented movement being concurrent with and in excess of the normal step movement of the platen in the same direction.

In witness that I claim the foregoing I have hereunto subscribed my name this 18th day of September, 1929.

OLIVER D. JOHANTGEN.