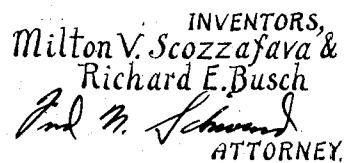


2,843,245

2 Sheets-Sheet 1



July 15, 1958

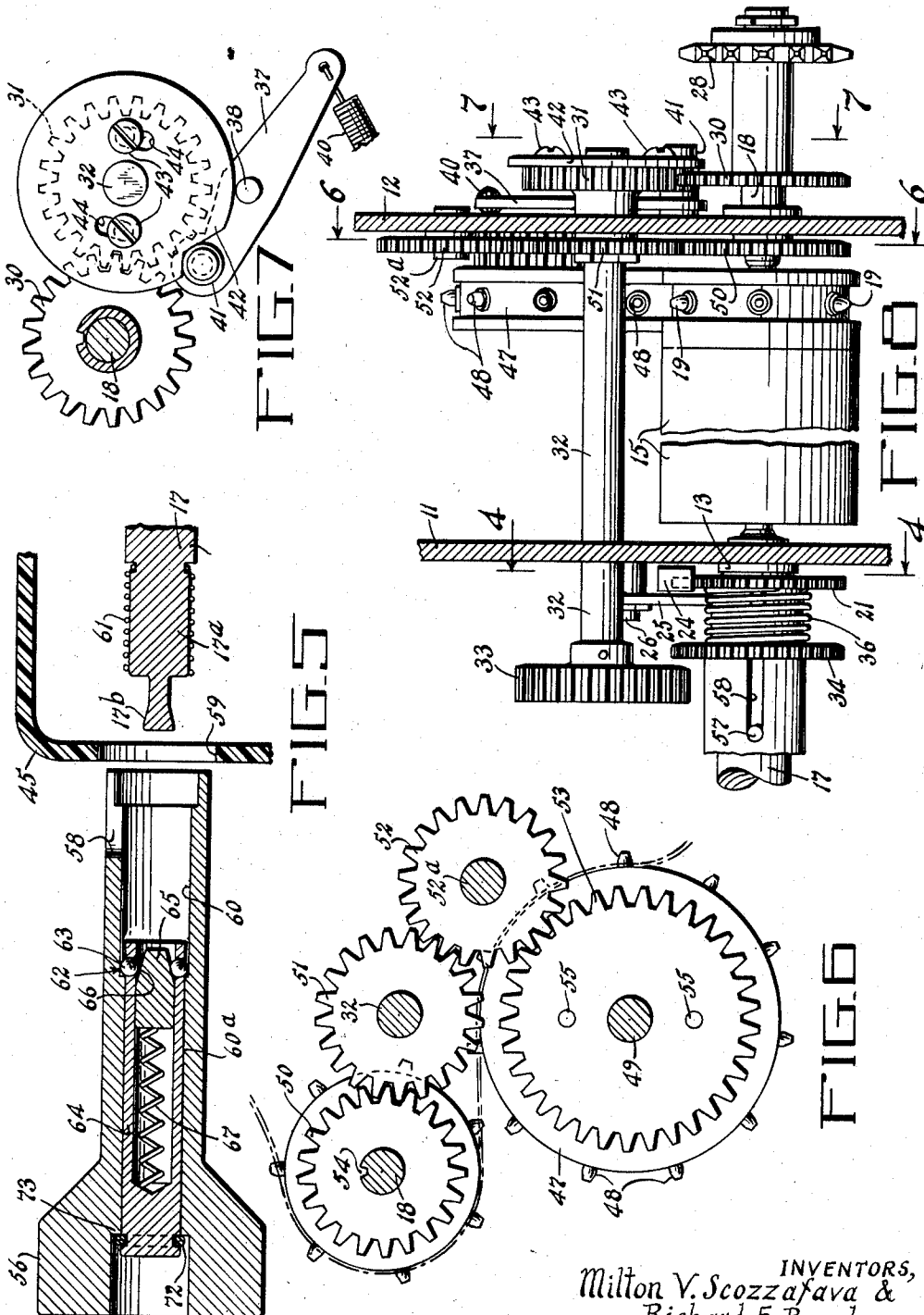
M. V. SCOZZAFAVA ET AL

2,843,245

PLATEN LINE SPACING MECHANISM

Filed March 25, 1957

2 Sheets-Sheet 2



INVENTORS,
Milton V. Scozzafava &
Richard E. Busch
Paul H. Schumacher
ATTORNEY.

1

2,843,245

PLATEN LINE SPACING MECHANISM

Milton V. Scozzafava, Arcadia, and Richard E. Busch, La Puente, Calif., assignors to Clary Corporation, San Gabriel, Calif., a corporation of California

Application March 25, 1957, Serial No. 648,354

9 Claims. (Cl. 197—123)

This invention relates to line spacing control mechanism for paper feeding platens of typewriters, adding machines, cash registers, etc. In machines of this nature, the platen is normally advanced by a suitable line spacing mechanism in order to space the paper one or more lines at a time relative to the printing mechanism. However, in threading the paper, it is desirable to disable the line spacing mechanism so that the platen can be manually and variably advanced by a suitable hand operated knob or the like connected to the platen to properly locate the paper in position for printing.

Heretofore, such line spacing control mechanisms generally have comprised an axially movable platen rotating knob or a plunger associated with such knob, which is effective in one position to enable the line spacing mechanism and effective in another position to disable the line spacing mechanism.

Although such slideable knobs, plungers, etc., work satisfactorily, a problem arises in providing a removable housing for the machine in which the housing extends over at least a part of the platen and wherein the knob must necessarily extend through an opening in the housing to permit manual operation of the platen. In such case, the knob must be removed before the housing can be removed.

It, therefore, becomes a principal object of the present invention to provide a readily removable knob for a platen line spacing mechanism.

Another object is to provide a readily removable knob for a platen line spacing mechanism which cannot be accidentally removed.

Another object is to provide a compact, simple and easily assembled platen release mechanism embodying a readily removable line feeding knob.

The manner in which the above and other objects of the invention are accomplished will be readily understood on reference to the following specification when read in conjunction with the accompanying drawings, wherein:

Fig. 1 is a sectional view through a portion of a sales registering and printing machine embodying a preferred form of the present invention, this view illustrating the platen control knob in paper threading position.

Fig. 2 is a sectional view similar to Fig. 1 but illustrating the knob in a line spacing position.

Fig. 3 is a sectional view similar to Figs. 1 and 2 but illustrating the initial stages of removing the platen control knob.

Fig. 4 is a transverse sectional view taken along the line 4—4 of Fig. 8 and illustrating the line spacing mechanism for advancing the platen one line at a time.

Fig. 5 is a sectional view illustrating the platen control knob completely removed from the platen shaft.

Fig. 6 is a transverse sectional view taken along the line 6—6 of Fig. 8, illustrating the gear train for driving the threading sprocket.

2

Fig. 7 is a sectional view taken along the line 7—7 of Fig. 8, illustrating one of the platen centralizers.

Fig. 8 is a general plan view taken substantially along the line 8—8 of Fig. 1.

Referring to the drawings, the printer frame of the machine comprises a pair of spaced frame plates 11 and 12 in which are mounted aligned bearing bushings 13 and 14, respectively.

A platen 15 having a rubber band 16 therearound is located between the frame plates and is integrally secured at opposite ends to two shafts 17 and 18 which are journaled in the bearing bushings 13 and 14, respectively.

The platen is provided with sprocket pins 19 along one end thereof whereby to positively drive the paper tape indicated at 20. The tape has a series of regularly spaced sprocket holes along one side thereof which fit over the pins 19.

The platen is normally automatically advanced either one line at a time or a number of lines at a time depending upon the operation of the machine.

Describing first the means for advancing the platen a line at a time, a ratchet wheel 21 (Figs. 1 and 4 in particular) secured by a pin 22 to the shaft 17 is engageable by a spacing link 23 having an ear 24 thereon located directly above the teeth of the ratchet wheel. During a machine operation, and after a printing impression has been made on the tape 20, the pawl is lowered to engage a tooth on the ratchet wheel to advance the platen from one line position to the next.

The platen is centralized in each of its line positions by a centralizer 25 fulcrummed at 26 and urged clockwise by a tension spring 27 to engage a roller thereon between two adjacent teeth of the ratchet wheel.

Describing now the means for automatically feeding the platen a number of lines at a time, a chain sprocket 28 is rotatably mounted on the shaft 18 and is connected by a chain (not shown) to a suitable drive mechanism. The latter is actuated as an incident to a certain machine operation. A gear 30 integral with the sprocket 28 meshes with a gear 31 (Figs. 7 and 8) fixed on a cross shaft 32 which is journaled in bearings provided in the printer side plates 11 and 12. A similar gear 33 is fixed on the left hand end of the shaft 32 and normally meshes with a gear 34 slideably keyed at 35 on the shaft 17 adjacent the ratchet wheel 21.

A compression spring 36 extends between the ratchet wheel 21 and gear 34 to normally maintain the latter in its position shown by the dotted lines 34a of Fig. 2 whereby to constitute an operative connection between the chain sprocket 28 and the platen.

A second centralizer 37 (Fig. 7) is provided to centralize the drive mechanism including gear 33. The centralizer is fulcrummed at 38 and urged clockwise by a tension spring 40 to hold a roller 41 thereon in engagement with a notched disc 42 adjustably secured to the gear 31 by screws 43, the latter extending through elongated slots 44 in the disc.

A removable machine housing or cover, partly indicated at 45, is fitted over the machine and extends over a portion of the platen to exclude dust and dirt and to hide the parts from view.

Means are provided to facilitate threading of a paper tape onto the platen and in particular to insure registration of the sprocket holes in the tape with the sprocket pins 20 on the platen. For this purpose, a threading sprocket 47 (Figs. 6 and 8) having sprocket pins 48 thereon is located in a position readily accessible through a suitable opening (not shown) in the housing 45. The sprocket is rotatably mounted on a frame pin 49 and is driven in time with the platen 15 by a gear train comprising intermeshing gears 50, 51, 52 and 53, the first gear 50 being keyed at 54 to the platen shaft 18 and

3

gear 53 being attached to sprocket 47 by rivets 55. The gears 51 and 52 are freely rotatable upon the shaft 32 and a frame pin 52a, respectively.

It will be seen on reference to Fig. 6 that the pins on the sprocket 47 are so spaced, and the relative sizes of the gear train is such, that when the sprocket holes in the tape are initially fitted over the pins 48, they will properly feed onto the pins 20 of the platen, suitable guide means (not shown) being provided to guide the tape between the sprocket 47 and the platen.

Describing now the means for disabling the automatic line feeding of the platen and enabling manual feeding thereof for threading purposes or the like, a knob 56 is provided, having a bore 60 therein slideable over the left hand portion of the shaft 17. A driving connection is formed between the knob and the shaft 17 comprising a pin 57 fixed in the shaft and engaged by an open ended slot 58 formed on the hub of the knob whereby the latter may be used to turn the platen when the train of gears, operatively connecting the platen to the sprocket 23, is disabled.

The outer portion 17a of the shaft 17 is reduced slightly in diameter and is embraced by a correspondingly reduced portion 60a of the bore in the knob. A compression spring 61 is fitted over the shaft portion 17a and extends between shoulders on the shaft and in the bore 60 of the knob to urge the knob to the left. However, a clutching device, generally indicated at 62, is provided to locate the knob in position along the shaft against the action of spring 61.

The clutching device comprises a series of balls 63 fitted in radially extending caging holes formed in a hollow plunger 64 which is slideable axially in the bore 60a of the knob. The balls are radially positioned about a reduced end portion of the shaft 17 which terminates in a conical formation 17b.

The plunger 64 has slideable therein a plug 65 having a conical end portion 66 which is normally pressed against the left hand end of the shaft section 17b by a compression spring 67, the latter normally urging the plunger 64 to the left to cause the balls 63 to ride up the conical portion 17b of the platen shaft whereby to wedge or jam the same against the inner bore 60a of the knob 56, thereby preventing the knob from further movement leftwardly.

When it is desired to manually rotate the platen, as in threading the paper tape or adjusting it to a particular printing line, the knob 56 is pressed inwardly along the shaft 17 into its position shown in Fig. 1 whereupon the end thereof which abuts the gear 34, moves the latter out of mesh with gear 33 against the action of spring 36. The clutching device 62 will now grip the knob to locate the same in this position against the combined actions of springs 36 and 61.

After manual adjustment of the tape has been effected, the operator presses the plunger 64 inwardly with his finger, forcing the balls 63 along the declining conical surface of the shaft portion 17b so as to release their grip on the interior of the bore 60a, thus permitting springs 36 and 61 to return the gear 34 and knob 56 outwardly into their positions shown in the full lines in Fig. 2. Accordingly, the gear 34 will remesh with the gear 33. In the meantime, the outward movement of the knob 56 will be arrested (at the position shown in the full lines in Fig. 2) by the operator's finger *f* and as the finger pressure is released, the springs 61 and 67 will move the knob 56 and plunger 64 slightly further into their dot and dash line positions, also shown in Fig. 2, wherein the clutch 62 again assumes the same jamming relationship as shown in Fig. 1. In such position, the gear 34 will be limited in its leftward movement against the pin 57, thus remaining in mesh with the gear 33, but in the 34a position.

In its normal position indicated by the dot-dash lines

4

of Fig. 2, the left hand end of the plunger lies flush with the left hand end of the knob 56. Therefore, the knob cannot be normally removed or moved further leftward relative to the shaft by the operator, unless a special tool or the like is used, as will appear presently.

It will be noted that the shaft 17 terminates within the housing 45 and that the knob protrudes through an opening 59 in the side wall of the housing to permit manual rotation of the platen without having to remove the housing.

If it is desired to remove the housing 45 from the machine for servicing or other purposes, the knob 56 necessarily must first be moved from the shaft 17. This is accomplished by forcing the plunger 64 inwardly (until it abuts the shaft portion 17a) with a pencil or other rod like tool 70 having a smaller diameter than the diameter of the plunger. In this case, the spring 67 is compressed until the balls 63 are forced out of gripping engagement with the bore 60a (Fig. 3) and into alignment with the larger bore 60. At this time, while still holding the plunger 64 inwardly by the tool 70, the latter, in unison with the knob 56, may be manually withdrawn toward the left whereupon the balls ride over the conical end portion 17b without jamming (because of the clearance provided by the bore 60) until the balls drop onto the conical portion 66. The tool 70 may now be removed while the knob is entirely removed from the shaft 17, and the plug 65 will jam the balls against the bore 60, as in Fig. 5, due to the expansion of the spring 67.

As the knob 56 is removed, inward movement of the plunger is limited by a lock ring 72 fitted in a groove located at the left hand end of the plunger 64. The ring engages a counter-bored shoulder 73 formed in the knob to prevent the plunger from being moved completely through the knob.

In order to replace the knob on the shaft, the knob is merely fitted over the same and moved inwardly toward the right, causing the plug 65 to engage the end portion 17b of the shaft, thereby moving the plug slightly to the left within the plunger 64 to release its jamming action so that the balls 63 will ride over the tip of the portion 17b and into proper jamming relationship with the bore 60 (as shown in Fig. 1) when the hand is removed from the knob 56.

Although we have described our invention in detail and have, therefore, used certain terms and languages herein, it is to be understood that the present disclosure is illustrative rather than restrictive and that changes and modifications may be made without departing from the spirit or scope of the invention as set forth in the claims appended hereto. For example, it will be noted that the invention may be applied to paper feed platens of machines other than that in which the mechanism of the present disclosure is embodied.

Having thus described the invention, what we desire to secure by United States Letters Patent is:

1. In a line spacing mechanism, the combination comprising a rotatable shaft, a paper feed platen operably connected to said shaft, a line spacing wheel slideably keyed on said shaft, actuating mechanism for rotating said wheel, means comprising a knob slideably keyed on said shaft for moving said wheel axially out of cooperative relation with said actuating mechanism, a manually operable release member supported by said knob, a clutching device for clutching said knob to said shaft in different positions, and means responsive to said release member upon movement thereof relative to said knob for releasing said clutching device.

2. In a line spacing mechanism, the combination comprising a rotatable shaft, a paper feed platen operably connected to said shaft, a line spacing wheel slideably keyed on said shaft, actuating mechanism for rotating said wheel, a spring for normally maintaining said wheel

5

in cooperative relation with said actuating mechanism, means comprising a knob slideably keyed on said shaft for moving said wheel axially out of cooperative relation with said actuating mechanism, a manually operable release member supported by said knob, a clutching device for clutching said knob to said shaft against the action of said spring, and means responsive to movement of said release member for releasing said clutching device.

3. In a line spacing mechanism, the combination comprising a rotatable shaft, a platen operably connected to said shaft, a line spacing wheel slideably keyed on said shaft, actuating mechanism for rotating said wheel, a spring normally maintaining said wheel in cooperative relation with said actuating mechanism, a knob having an axial bore therein, a portion of said bore being slideable on said shaft, said knob being engageable with said wheel whereby to move said wheel axially out of cooperative relation with said actuating mechanism, a manually actuatable plunger slideably mounted in another portion of said bore, a clutching device for clutching said knob to said shaft, and means responsive to axial movement of said plunger for releasing said clutching device.

4. In a line spacing mechanism, the combination comprising a rotatable shaft, a platen operatively connected to said shaft, a line spacing wheel slideably keyed on said shaft, actuating mechanism for rotating said wheel, a spring normally maintaining said wheel in cooperative relation with said actuating mechanism, a knob having an axial bore therein, a portion of said bore being slideable on said shaft, means forming a keyed connection between said knob and said shaft, said knob being engageable with said wheel whereby to move said wheel axially out of cooperative relation with said actuating mechanism, a manually actuatable plunger slideable in another portion of said bore and normally extending outwardly therefrom, a clutching device for clutching said knob to said shaft in different positions therealong, and means responsive to inward axial movement of said plunger for releasing said clutching device.

5. In a line spacing mechanism, the combination comprising a rotatable shaft, a platen operatively connected to said shaft, a line spacing wheel slideably keyed on said shaft, actuating mechanism for rotating said wheel, a spring normally maintaining said wheel in cooperative relation with said actuating mechanism, a knob having an axial bore therein, a portion of said bore being slideable on said shaft, means forming a keyed connection between said knob and said shaft, said knob being engageable with said wheel whereby to move said wheel axially out of cooperative relation with said actuating mechanism, a manually actuatable plunger slideable in another portion of said bore and normally extending outwardly therefrom, a clutching device for clutching said knob to said shaft in different positions therealong, spring means normally maintaining said clutching device engaged, and means responsive to inward axial movement of said plunger for releasing said clutching device.

6. In a line spacing mechanism, the combination comprising a rotatable shaft, a paper feed platen operably connected to said shaft, a line spacing wheel slideably keyed on said shaft, actuating mechanism for rotating said wheel, a spring for normally maintaining said wheel in cooperative relation with said actuating mechanism, a knob slideably keyed on said shaft for moving said wheel axially out of cooperative relation with said actuating mechanism, a manually operable release member

6

slideably supported by said knob, a clutching device for clutching said knob to said shaft against the action of said spring, spring means normally maintaining said clutching device engaged, and means responsive to movement of said release member relative to said knob for releasing said clutching device, said clutching device when released permitting said knob to be withdrawn axially from said shaft.

7. In a line spacing mechanism, the combination comprising a rotatable platen shaft, a knob having an axial bore therein, a portion of said bore being slideable on said shaft, means forming a slideable keyed connection between said knob and said shaft, a plunger slideable in another portion of said bore and having a portion normally extending outwardly therefrom, said plunger having openings therein for receiving balls, a conical formation on said shaft extending axially thereof, a plurality of balls in said plunger openings, said balls normally extending intermediate said conical formation and said bore, and spring means for normally urging said plunger in a direction to wedge said balls between said conical formation and said bore whereby to clutch said knob to said shaft, said plunger being movable in the opposite direction to declutch said balls from said bore.

8. In a line spacing mechanism, the combination comprising a rotatable platen shaft, a knob having an axial bore therein, a portion of said bore being slideable on said shaft adjacent one end thereof, means forming a slideable keyed connection between said knob and said shaft, a plunger slideable in another portion of said bore and having a portion normally extending outwardly therefrom, said plunger having caging openings therein for caging a plurality of balls, a conical formation on said end of said shaft extending axially thereof, a plurality of balls in said caging openings, said balls normally extending intermediate said conical formation and said bore, and means comprising a spring extending between said end of said shaft and said plunger for urging said plunger outwardly to wedge said balls between said conical formation and said bore whereby to clutch said knob to said shaft; said plunger being movable inwardly to declutch said balls from said bore.

9. In a line spacing mechanism, the combination comprising a rotatable platen shaft, a knob having an axial bore therein, a portion of said bore being slideable on said shaft adjacent one end thereof, means forming a slideable keyed connection between said knob and said shaft, a hollow plunger slideable in another portion of said bore and having a portion normally extending outwardly therefrom, said plunger having openings therein for caging a plurality of balls, a conical formation on said end of said shaft extending axially thereof, a plurality of balls in said plunger openings, said balls normally extending intermediate said conical formation and said bore, a plug slideable in said plunger, said plug having a conical formation engageable with said end of said shaft, and a spring in said plunger urging said plunger outwardly relative to said shaft whereby to wedge said balls between said conical formation and said bore to clutch said knob to said shaft, said plunger being movable inwardly to declutch said balls from said bore, said conical formation of said plug being effective to retain said balls in said openings upon removal of said knob from said shaft.

No references cited.