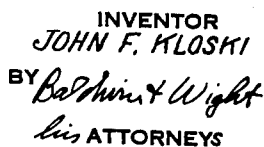


Filed March 11, 1953

2,729,322

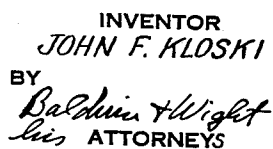
3 Sheets-Sheet 1



Filed March 11, 1953

2,729,322

3 Sheets-Sheet 2



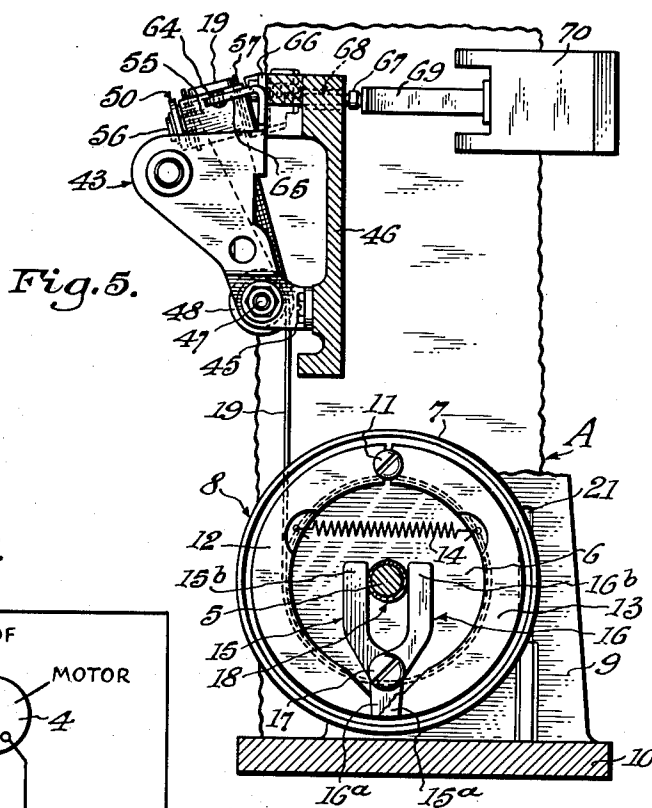
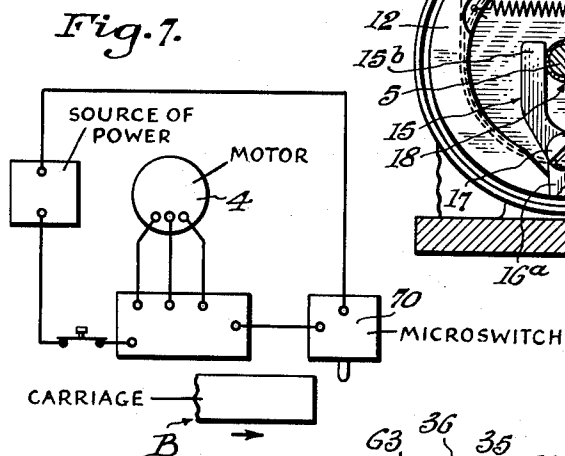
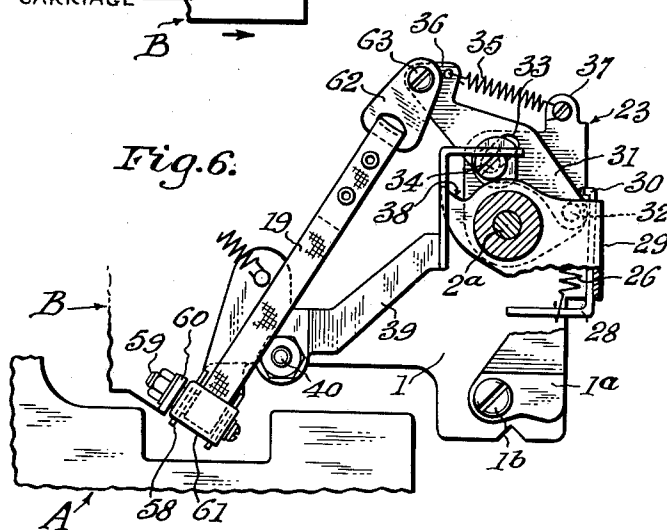
Jan. 3, 1956

J. F. KLOSKI
CARRIAGE RETURNING MECHANISM FOR
TYPEWRITERS OR LIKE MACHINES

2,729,322

Filed March 11, 1953

3 Sheets-Sheet 3



INVENTOR
JOHN F. KLOSKI
BY
Bardwin & Wright
ATTORNEYS

1

2,729,322

CARRIAGE RETURNING MECHANISM FOR TYPE- WRITERS OR LIKE MACHINES

John F. Kloski, Windsor, Conn., assignor to Royal McBee Corporation, a corporation of New York

Application March 11, 1953, Serial No. 341,703

12 Claims. (Cl. 197—66)

This invention relates to carriage returning mechanism for typewriters or like machines, and more particularly to power operated mechanism for effecting rapid carriage returning under the control of mechanism which prevents or reduces shocks incident to rapid operation. Generally stated, power operated carriage returning mechanism has the advantage of producing rapid carriage returning movement, but usually with the disadvantage of causing shocks at the beginning of the carriage returning movement when the static inertia of the carriage must be overcome, and at the end of the carriage returning movement when the carriage mounted margin stop engages the frame mounted stop.

An object of the invention is to provide carriage returning mechanism having the usual advantage of the speed characteristic of power operated returning mechanisms, but which includes a novel and improved control mechanism for minimizing shocks by interrupting momentarily the carriage returning drive at the beginning of the carriage returning movement, and then re-establishing the drive.

Another object of the invention is to provide mechanism of the character stated which is responsive to the increased driving effort needed to overcome the static inertia of the carriage for temporarily interrupting the carriage drive.

A further object of the invention is to provide mechanism of the kind referred to which is of simple construction, and which may easily be applied to or combined with the parts of typewriting or like machines of various constructions.

Other objects of the invention will become apparent from a reading of the following description, the appended claims, and the accompanying drawings, in which:

Figure 1 is a fragmentary top plan view of mechanism embodying the invention;

Figure 2 is a fragmentary vertical section on the line 2—2 of Figure 1, drawn on an enlarged scale, and showing a control device for operating a switch to stop the motor which provides power for returning the carriage;

Figure 3 is a fragmentary front elevational view of the parts shown in Figure 1;

Figure 4 is an exploded perspective view, drawn on an enlarged scale, and showing parts of a control device in separated relation;

Figure 5 is a vertical sectional view on the irregular line 5—5 of Figure 3, some parts being shown in elevation;

Figure 6 is a fragmentary vertical sectional view on the line 6—6 of Figure 1, some parts being shown in elevation and others being omitted for clarity;

Figure 7 is a wiring diagram; and

Figure 8 is a schematic perspective view of motor drive transmitting mechanism.

A preferred embodiment of the invention is shown as being applied to or combined with a typewriting machine which may be of known construction, including a main

2

stationary frame element A and a carriage element generally designated B mounted on the frame for character spacing and return movements. As viewed in Figures 1 and 3, the carriage B moves toward the left when performing letter or character spacing movements, and moves toward the right when performing return movements. The carriage includes two end plates, one of which is shown at 1, a platen or cylinder 2 rotatable about a shaft 2^a, and a knob 3 for rotating the platen or cylinder 2. The carriage may be advanced or moved in the character spacing direction by any suitable means such as a spring motor operating under the control of escapement mechanism (not shown).

The carriage returning mechanism includes an electric motor 4 (Figures 7 and 8) mounted on the frame A and arranged to drive the shaft 5 through a belt drive mechanism including a pulley 4^a on the motor, a belt 4^b, pulleys 4^c and 4^d fast with each other, a belt 4^e, and a pulley 4^f fixed to the shaft 5. Secured to the shaft 5 is a clutch ring carrier disk 6 (Figure 5) surrounded by the circular flange 7 of a windup drum member 8 mounted to rotate on a bracket 9 on the base 10 of the frame A. The carrier disk 6 carries a pivot 11 for two clutch ring parts 12 and 13 urged toward each other by a spring 14, the ring parts 12 and 13 thus normally being out of contact with the flange 7. Two clutch engaging fingers 15, 16 are pivoted at 17 on the carrier disk 6, and have their outer ends 15^a, 16^a disposed between the free ends of the fingers 15, 16, opposite the pivot 11. The inner ends 15^b, 16^b of the fingers 15, 16 are disposed on opposite sides of a clutch operating cone 18 which is slidable axially of the shaft 5. Any suitable means may be employed for sliding the clutch cone 18 inwardly toward the carrier disk 6 so as to spread the finger ends 15^b, 16^b, and consequently spread the opposite finger ends 15^a and 16^a, thereby to swing the clutch ring parts 12, 13 outwardly about their pivot 11 so as to bring them into engagement with the flange 7 and clutch the disk 6 to the windup drum 8. An elongated flexible motion transmitting member, e. g. a draw band 19, wound around the drum 8 and secured thereto, extends from the drum for connection to the carriage in a manner to be described later. The arrangement is such that when the cone 18 is moved inwardly toward the disk 6 so as to effect clutching of the disk to the windup drum 8, the latter will turn and will wind up the draw band 19, thereby pulling the carriage toward the right as viewed in Figures 1 and 3, in other words causing the carriage to perform a return movement. The carriage may, at times, be moved in the return direction manually. This would tend to cause the draw band 19 to become slack. In order to prevent slackness in the draw band, a spring housed in a stationary barrel 20 is connected to the barrel and to the windup drum 8, and is so arranged as constantly to tend to rotate the drum 8 in a direction to wind up the draw band 19. Spring devices of this kind and used for this purpose are well known and need not be illustrated in detail. A guide finger 21 secured to the bracket 10 may be provided for holding the draw band 19 in the winding groove in the drum 8.

Preferably, the draw band 19 is connected to line spacing mechanism for rotating the platen 2, and also for returning the carriage to its line starting position. The line spacing mechanism shown includes a ratchet wheel 22 secured to the platen 2, a lever 23 pivotally mounted to rock about the axis of the platen shaft 2^a, and a pawl 24 pivoted at 25 on the lever 23. Two springs 26, 26, interposed between a spring anchor pin 27 fixed to the lever 23 and a stationary spring anchor 28 in the form of an ear projecting from the bottom of the front wall 29 of the end plate 1, tend to hold the line spacing lever 23 in the position shown in Fig-

ure 6 in which the bottom of the front part of the lever 23 is in engagement with a limit stop 30 on the wall 29 of the end plate 1.

A cushioning lever 31 is pivoted at 32 on the line spacing lever 23, and is formed with a slot 33 which receives a screw 34 carried by the line spacing lever 23. In the form shown, the pivot 32 is provided by an extension of the spring anchor pin 27. A spring 35 is interposed between an ear 36 on the cushioning lever 31 and an ear 37 on the line spacing lever 23, the spring 35 normally holding the cushioning lever 31 and the line spacing lever 23 in the relative positions shown in Figure 6. The spring 35 is yieldable to permit the cushioning lever 31 to partake of limited movement counterclockwise with respect to the line spacing lever 23, this movement being limited by engagement of the right hand end of the slot 33 (as viewed in Figure 6) with the screw 34. Normally, however, the spring 35 causes the line spacing lever 23 to rock substantially in unison with the cushioning lever 31. When the line spacing lever 23 has been rocked through a sufficient angular distance to cause the line spacing pawl 24 to engage the ratchet wheel 22 and effect the desired line spacing movement of the platen 2, the screw 34 on the line spacing lever 23 will engage a stop surface 38 on the end plate 1 so as to prevent further rocking of the line spacing lever. The cushioning lever 31 may, however, rock a little further as is permitted by extension of the spring 35 while the screw 34 and line spacing lever 23 remain stationary. The outboard end of the platen shaft 2^a is braced against lateral deflection by a bracket 1^a secured to the end plate 1 by a screw 1^b.

An escapement releasing lever 39 is shown as being pivoted at 40 on the end plate 1, and a line space ratchet releasing lever 41 is shown as being pivoted at 42 on the end plate 1. These parts are conventional and are not included in the carriage returning mechanism.

In accordance with the invention, an electric switch in circuit with the motor is adapted to be opened by control mechanism which is responsive to the transmission of sufficient effort from the motor to the carriage to overcome the starting inertia of the carriage to start the carriage on its return movement from a state of rest, the control mechanism being operable for effecting re-closing of the switch in response to diminishing of the effort transmitted from the motor to the carriage after the starting inertia of the carriage has been overcome. For accomplishing this control, a bracket 43 is secured by screws 44 and 45 to a cross bar 46 on the frame A. The lower end of the bracket 43 carries an axle 47 which journals a pulley 48, a guard 49 also being carried by the bracket 43 so as to prevent the draw band 19 from becoming dislodged from the pulley 48. The upper part of the bracket 43 has a guide part 50 including legs 51, 52 formed with slots 53 and 54. A U-shaped control device or member 55 is provided with a pintle or axle 56 the ends of which project into the slots 53, 54 for mounting the device 55 to slide in the guide part 50. Journalled on the pintle or axle 56 is a guide pulley 57 around which the draw band 19 passes to extend horizontally to another guide pulley 58 journalled on an axle 59 secured to an ear 60 formed on the end plate 1. A guard 61 carried by the axle 59 is disposed close to the pulley 58 for preventing the draw band 19 from accidentally becoming displaced from the pulley 58. The end of the draw band 19 is equipped with a connecting member 62 attached to the cushioning lever 31 by a screw 63. Thus, the draw band 19 is connected to the carriage through the cushioning lever 31 for both operating the line spacing mechanism and for moving the carriage toward the right. Resilient means, as shown a contractile coiled spring 64, is interposed between the control device 55 and an ear 65 on the bracket 43 for urging the con-

trol device 55 toward the right as viewed in Figures 1 and 3.

In operation, when the motor 4 is running and the clutch parts 12 and 13 are spread into engagement with the flange 7 on the winding drum 8, the draw band 19 will be wound up on the drum 8 so as to pull on the cushioning lever 31 and rock the latter and the line spacing lever 23 until the stop screw 34 engages the stop surface 38, continued winding up of the draw band 19 then moving the carriage toward the right. The carriage has considerable starting inertia so that when force is first exerted on the carriage rather abruptly for starting it on its return movement, a temporarily increased force will be transmitted through the draw band 19 which will cause the guide pulley 57 and the associated slidable control device 55 to be moved to the left as viewed in Figures 1 and 3 to a predetermined actuated position, against the urge of the spring 64. This movement of the control member 55 is utilized to open the motor circuit and temporarily discontinue the transmission of driving effort to the carriage. For this purpose, the control device 55 is provided with a cam 66 which engages a pin 67 mounted to slide in a transverse opening 68 in the frame bar 46. The rear end of the pin 67 is in contact with the operating arm 69 of a normally closed microswitch 70, the arrangement being such that when the cam 66 operates the pin 67, the switch arm 69 is moved to open the switch 70 and thereby stop the motor 4. This will relieve the tension in the draw band 19, permitting the spring 64 to move the control device 55 back to its normal position which displaces the spring loaded cam 66 from its actuated position and enables the switch arm 69 to return to its switch closing position, thereby re-starting the motor and causing the return driving of the carriage to be resumed. The temporary interruption of the drive to the carriage at the beginning of its return movement relieves the parts of undue strains which otherwise would occur due to the overcoming of the starting inertia.

More specifically considered the characteristics of the spring 64 are so related to the inertia of the carriage B and the speed of motion transmission to the carriage that when the rotatable winding drum 8 is started to rotate to start return movement of the carriage from a state of rest, the spring is weak enough to yield to enable the control device 55 to be moved from its normal position to an actuated position while the return movement of the carriage is being started, thereby to open the switch 70 and interrupt the carriage return driving effort during the first part of the carriage return movement. The spring 64 is strong enough to move the control device 55 from its actuated position back towards its normal position after the starting inertia of the carriage has been overcome, thus to effect re-closing of the switch 70 and continued transmission of effort for completing the return movement of the carriage.

The temporary interruption of the drive to the carriage at the beginning of its return movement not only alleviates shock at the beginning of the return movement, but has been found also to reduce the force with which the carriage margin stop engages the center stop at the end of the carriage return movement. Any suitable mechanism may be provided for discontinuing the carriage return drive when the carriage approaches the end of its return movement. A suitable form of mechanism is disclosed in the patent to Hart No. 2,567,937, issued September 18, 1951.

The construction disclosed embodies the invention in a preferred form, but it is intended that the disclosure be illustrative rather than definitive. The invention is defined in the appended claims.

I claim:

1. Carriage returning mechanism for a typewriter or like machine having a stationary frame element, and a carriage element mounted on said frame element for

5

character spacing and return movements, said mechanism comprising an electric motor mounted on one of said elements; means connected to the other of said elements and to said motor for transmitting returning driving effort from said motor to said carriage element; a normally closed electric switch in circuit with said motor; and a spring loaded cam device for opening said switch in response to the transmission of sufficient effort from said motor to said carriage element to overcome the starting inertia thereof and start said carriage element on its return movement from a state of rest, said cam device being operable by its spring loading for effecting re-closing of said switch in response to diminishing of the effort transmitted from said motor to said carriage element after the starting inertia thereof has been overcome.

2. Carriage returning mechanism for a typewriter or like machine having a stationary frame element, and a carriage element mounted on said frame element for character spacing and return movements, said mechanism comprising an electric motor mounted on one of said elements; means connected to the other of said elements and to said motor for transmitting returning driving effort from said motor to said carriage element; a normally closed electric switch in circuit with said motor; and control mechanism including a spring loaded cam device, and means mounting said cam device for sliding movement in one direction for opening said switch in response to the transmission of sufficient effort from said motor to said carriage element to overcome the starting inertia thereof and start said carriage element on its return movement from a state of rest, said cam device being slidable in the opposite direction by its spring loading for effecting re-closing of said switch in response to diminishing of the effort transmitted from said motor to said carriage element after the starting inertia thereof has been overcome.

3. Carriage returning mechanism for a typewriter or like machine having a stationary frame element, and a carriage element mounted on said frame element for character spacing and return movements, said mechanism comprising an electric motor mounted on one of said elements; means including a flexible draw band connected to the other of said elements and to said motor for transmitting returning driving effort from said motor to said carriage element; a pulley around which said draw band passes; means mounting said pulley to slide in one direction in response to transmission of a predetermined effort through said draw band; resilient means opposing such sliding of said pulley; a normally closed electric switch in circuit with said motor; and a cam mounted to move with said pulley during sliding of the latter for opening said switch in response to the transmission of sufficient effort from said motor to said carriage element to overcome the starting inertia thereof and start said carriage element on its return movement from a state of rest, said resilient means being operable for causing said pulley to slide in the opposite direction for effecting re-closing of said switch in response to diminishing of the effort transmitted from said motor to said carriage element after the starting inertia thereof has been overcome.

4. Mechanism as set forth in claim 3 in which said motor is mounted on said frame element.

5. Mechanism as set forth in claim 3 in which said means mounting said pulley is mounted on said frame element.

6. Mechanism as set forth in claim 3 in which said motor and said means mounting said pulley are both mounted on said frame element.

7. Carriage returning mechanism for a typewriter or like machine having a stationary frame element, and a carriage element mounted on said frame element for character spacing and return movements, said mechanism comprising an electric motor mounted on one of said elements;

6

a guide fixed to one of said elements and having spaced portions formed with slots; a control member having means projecting into said slots for mounting said control member to slide on said guide; a pulley mounted on said control member; a flexible draw band passing around said pulley; means connecting said draw band to said motor and to said carriage element; resilient means urging said control member to a normal position on said guide but being yieldable in response to transmission through said draw band of sufficient driving effort to overcome the starting inertia of said carriage element for enabling said control member to be moved to an actuated position by the tension in said draw band; a normally closed switch in circuit with said motor; and a cam on said control member responsive to movement of the latter to its actuated position for opening said switch, said resilient means being sufficiently strong in relation to the effort required to maintain said carriage element in motion after its starting inertia has been overcome to move said control member back towards its normal position after the starting inertia of said carriage element has been overcome, whereby to effect re-closing of said switch and further exertion of effort for completing the return movement of said carriage element.

8. Mechanism as set forth in claim 7 in which said guide and said motor are mounted on said frame element.

9. Mechanism as set forth in claim 7 in which said resilient means comprises a spring.

10. Carriage returning mechanism for a typewriter or like machine having a stationary frame and a carriage mounted on said frame for character spacing and return movements, said mechanism comprising an electric motor mounted on said frame; means including a flexible draw band for transmitting return driving effort from said motor to said carriage; a guide bracket secured to said frame; a control member slidably mounted on said guide bracket; a pulley mounted on and to rotate relatively to said control member and to move with said control member when the latter slides on said guide bracket, said draw band passing around said pulley and tending to cause said control member to slide according to the force being transmitted through said draw band; a spring urging said control member toward a normal position on said guide bracket; a normally closed switch in circuit with said motor; and a cam on said control member for opening said switch in response to transmission of a predetermined effort through said draw band with consequent sliding of said control member against the urge of said spring.

11. Mechanism as set forth in claim 10 in which said frame includes a fixed bar, said switch being mounted at one side of said bar, and said guide bracket being mounted on the opposite side of said bar, there being a transverse opening through said bar, and an operating pin slidable in said opening and being engageable by said cam for operating said switch.

12. Carriage returning mechanism for a typewriter or like machine having a stationary frame element, and a carriage element mounted on said frame element for character spacing and return movements, said mechanism comprising an electric motor mounted on one of said elements; a rotatable member drivingly connected to said motor; means for effecting rotation of said rotatable member by said motor; a motion transmitting member operatively connected to said rotatable member and to the other of said elements; a control device mounted for movement on one of said members and being engaged by said motion transmitting member and being acted upon thereby so as to tend to move from a normal position toward an actuated position when said motion transmitting member is transmitting motion to said carriage element; resilient means connected to said control device and tending to maintain said control device in its normal position but being yieldable to permit said control device to be moved to a predetermined actuated position; a normally closed switch in circuit with said motor; and means operable by

7

said control device when it is in its said predetermined actuated position for opening said switch, the characteristics of said resilient means being so related to the inertia of said carriage element and the speed of motion transmission to said carriage element that when said rotatable member is started to rotate by said motor to start return movement of said carriage element from a state of rest said resilient means will yield to enable said control device to be moved from its said normal position to its said predetermined actuated position while the return movement of said carriage element is being started, thereby to interrupt the carriage element return driving effort during the first part of the carriage element return movement, said

8

resilient means then moving said control device from its said actuated position back towards its said normal position after the starting inertia of said carriage element has been overcome, whereby to effect re-closing of said switch and continued exertion of effort for completing the return movement of said carriage element.

References Cited in the file of this patent

UNITED STATES PATENTS

1,386,387	Waldheim	Aug. 2, 1921
2,104,007	Bower	Jan. 4, 1938