May 22, 1951 E. K. GRIP 2,554,103

CLEARING DEVICE IN CALCULATING MACHINES

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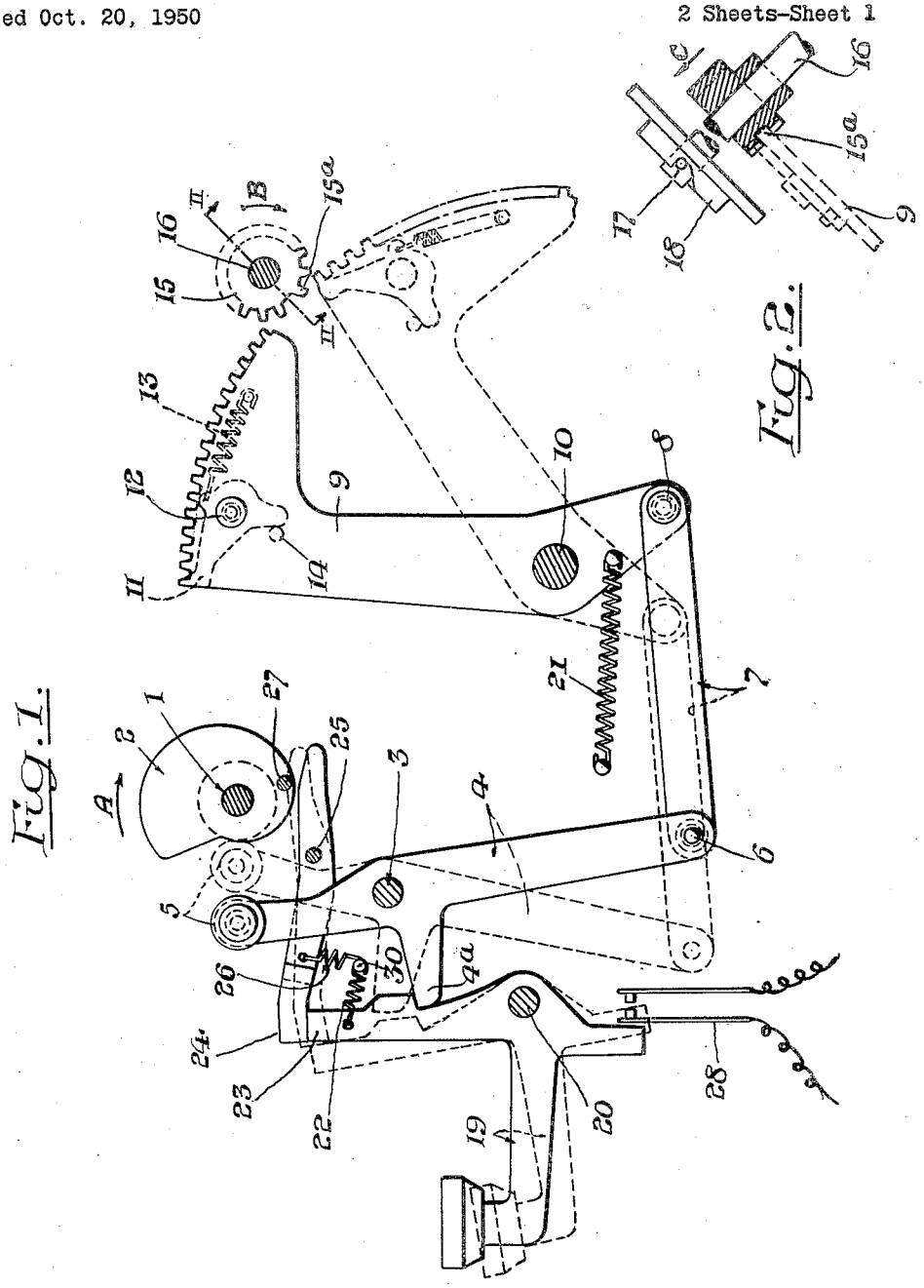


Fig. 1.

Fig. 2.

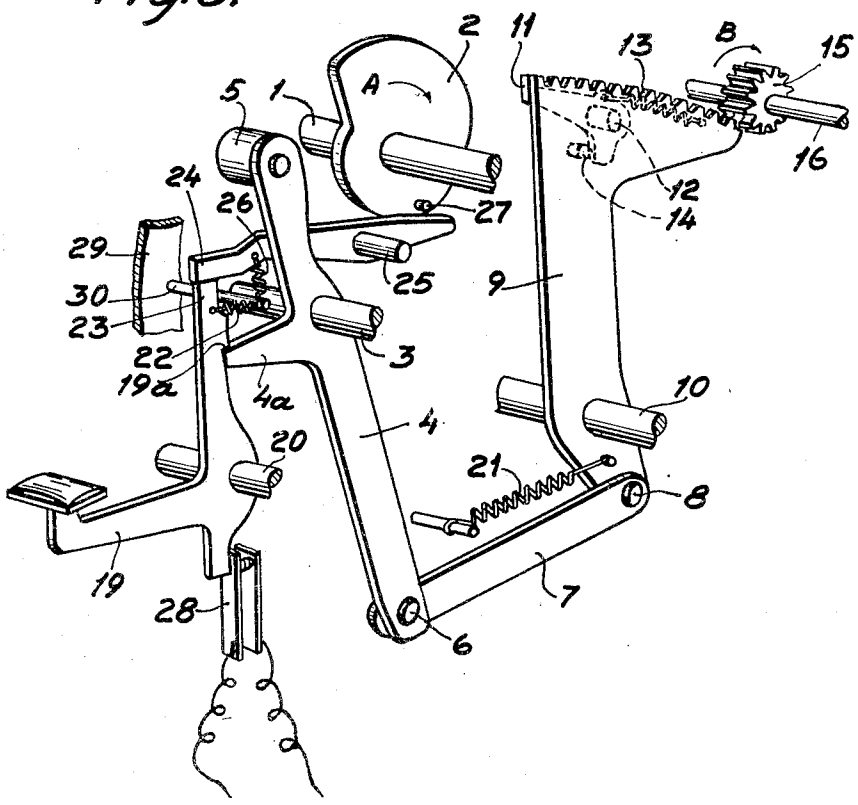
Inventor:
Erik K. Grip
by his Attorneys,
Darby & Darby

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Fig. 3.



INVENTOR
Erik K. Grip
By Darby & Darby
ATTORNEYS

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CLEARING DEVICE IN CALCULATING MACHINES

Erik K. Grip, Atvidaberg, Sweden, assignor to Aktiebolaget Atvidaberg-Facit, Atvidaberg, Sweden, a joint-stock company of Sweden

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6 Claims. (Cl. 235—144)

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The present invention relates to electrically driven calculating machines of the pin-wheel or Odhner type, and more particularly to a clearing or zeroizing device for the product and quotient registers (the accumulator and the revolutions counter) in which the numeral wheels are mounted on a common shaft and the clearing is effected by rotating the numeral wheel shaft one revolution. For example, the machine may be of the type disclosed in the U. S. Patent No. 2,108,596.

The clearing mechanism according to the invention is an elegant, reliable and very small and compact device for effecting a key-operated clearing by means of the electric motor in machines of this type. The device according to the invention is substantially characterized in that a clearing key, when depressed, releases a lever which thereby is swung by a spring so as to rest, directly or through the intermediary of a roller, against a cam driven by the electric motor of the machine, whereafter the lever is forced back to its initial position by the motor-driven cam and thus actuates a zeroizing segment so that said segment performs, in a manner known per se, the clearing operation.

An embodiment of the invention is shown in detail in the accompanying drawings.

Fig. 1 is a side view of the elements included in the clearing device.

Fig. 2 is a section on line II—II in Fig. 1.

Fig. 3 is a perspective view of the elements of the clearing device in the position shown in full lines in Fig. 1.

By means of a gear transmission, not shown, a shaft 1 is connected to the electric motor of the calculating machine and carries a cam 2 which is rigid with the shaft. When the electric motor is running, the shaft 1 and the cam 2 rotate in the direction indicated by the arrow A in Fig. 1 (clockwise in Fig. 1).

A lever 4 is fulcrumed on a pivot 3 fixed in the frame of the machine. Said lever 4 carries at one end a rotatably mounted roller 5, and may be swung on the pivot 3 to a position in which the roller 5 rests against the cam 2 and, at the rotation of said cam, rolls on the periphery of the cam, as shown in dotted lines in Fig. 1.

The other end of the lever 4 carries a pivot 6 on which one end of a link 7 is swingably mounted, and the other end of said link 7 is in like manner mounted on a pivot 8 which in its turn is rigidly connected with one end of a toothed segment 9. This segment is swingably mounted on a pivot 10 which is fixed in the frame of the machine.

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The toothed segment 9 is in a well-known manner provided with a starting tooth 11 which is swingable around a pivot 12 fixed on the toothed segment. The starting tooth is held pressed against a stop 14 by means of a spring 13, said stop being rigidly connected, e. g. riveted, to the segment. The toothed segment 9 cooperates in the usual manner with a toothed wheel 15 fixed on the shaft 16 carrying all the numeral wheels in the register to be cleared by the device according to the invention.

The toothed wheel 15 is in a well-known manner provided with a recess 15a permitting the segment 9 to move freely (thus without rotating the toothed wheel 15) from the position shown in full lines to the position shown in dash-and-dot lines in Fig. 1. However, when the segment is returning to the position shown in full lines in Fig. 1, the starting tooth will in well-known manner engage the teeth of the wheel 15, whereafter this wheel engages the other teeth of the segment 9 and is rotated in the direction of the arrow B (clockwise in Fig. 1).

The numeral wheel shaft 16 is rigidly connected with a pin 17 (Fig. 2) which in well-known manner cooperates with a stationary cam 18 so that upon rotation the shaft 16 is somewhat displaced axially in the direction of the arrow C (see Fig. 2), whereby the zeroizing or clearing teeth (not shown) on this shaft in well-known manner engage the corresponding teeth on the numeral wheels so that the latter are rotated to their zero position (cleared).

The clearing device is operated by means of a key 19 which is rotatably mounted on a stationary shaft 20 in the machine frame. The key arm carries a shoulder 19a cooperating with a projection 4a on the lever 4 in such a manner that when the shoulder 19a has engaged the projection 4a, the lever 4 and the segment 9 connected therewith are prevented from turning (clockwise in Fig. 1) against the action of a tension spring 21 acting on the segment 9.

After depression, the key 19 is returned to its initial position by a tension spring 22. Furthermore, a projection 23 on the key arm cooperates with a locking hook 24 which is fulcrumed on a stationary shaft 25 and is actuated by a tension spring 26. This locking hook 24 locks, in certain cases, the key 19 in the depressed position as indicated by the position shown in dot-and-dash lines in Fig. 1. The locking hook is returned to its initial position against the action of the tension spring 26 by means of a pin 27 fixed on the cam 2. Furthermore, a downwardly directed projection of the key 19 cooperates with a contact

device 28 for starting the electric motor of the machine. One end of the two springs 22 and 26 are fixed to a pin 30 riveted to the end wall 29 of the machine frame.

The device operates substantially in the following manner:

When the key 19 is depressed, the projection 19a slides off from the projection 4a of the lever 4 carrying the roller 5, and the spring 21 now swings the segment 9 and the lever 4 in the clockwise direction until said swinging movement is stopped by the roller 5 contacting the cam 2. The parts are now in the position indicated in the dash-and-dot lines in Fig. 1. The teeth of the segment 9 now pass freely through the depression 15a in the toothed wheel 15 without rotating the same.

Upon the depression of the key 19 also the contact device 28 is actuated so that the electric current is closed and the motor of the machine is started and begins to rotate the shaft 1 with the cam 2. The depressed key will at the same time be locked in the depressed position by the locking hook 24 (see the position shown in dot-and-dash lines in Fig. 1).

The periphery of the cam 2 is designed in such a manner that, at the rotation in the clockwise direction, it presses the roller 5 back to its initial position so that the lever 4 and thus also the segment 9 are brought back to their initial positions (shown in full lines in Fig. 1). When the segment 9 returns (anticlockwise in Fig. 1), the starting tooth 11 engages the toothed wheel 15 (see Fig. 2) and during the return movement the shaft 16 will consequently be rotated a whole revolution so that the register is cleared in well-known manner.

When the cam 2 has completed a whole revolution, the pin 27 on the cam will return the locking hook 24 to its initial position, whereafter the key 19, against the action of the spring 22, returns to its initial position in which the projection 4a is hooked up and retained by the projection 19a on the key so that the final position becomes identical with the initial position.

The pin 27 is located in such a manner on the cam 2 that the locking hook 24 is returned to its initial position only in such a position of the cam 2 that the lever 4 is in the position shown in full lines in Fig. 1, or is moving towards said position. By this it is achieved that a complete clearing operation is always obtained after a single depression of the key 19.

The invention is, of course, not limited to the embodiment shown. The various elements may be designed in different ways and be fitted to different types of machines within the scope of the appended claims.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A clearing device for a register in an electrically operated calculating machine of the Odhner type, comprising, in combination, a common shaft for the numeral wheels of the register, a clearing segment operatively connected with said common shaft to rotate it for clearing said numeral wheels, a lever for actuating said segment, a clearing key, said lever being normally locked but releasable at the depression of said key, a power-operated cam, and a spring for pressing said lever against said cam, when said lever has been released by said key.

2. A clearing device for the numeral wheels of a register in an electrically operated calculating machine of the Odhner type, comprising, in combination, a clearing key, a lever normally locked by said key but releasable at the manual depression thereof, a power-operated cam, a spring acting on said lever for pressing it in the direction towards said cam, a clearing segment, a link interconnecting said lever and said segment, a common shaft for the numeral wheels of said register, and a toothed wheel on said common shaft for cooperation with said toothed segment to be rotated thereby.

3. A clearing device for a register in an electrically operated calculating machine of the Odhner type, comprising, in combination, a common shaft for the numeral wheels of the register, a clearing segment operatively connected with said common shaft to rotate it for clearing said numeral wheels, a lever for actuating said segment, a clearing key, said lever being normally locked but releasable at the depression of said key, a spring-actuated hook for locking said key in its depressed position, a power-operated cam, and a spring for pressing said lever against said cam, when said lever has been released by said key.

4. A clearing device for a register in an electrically operated calculating machine of the Odhner type, comprising, in combination, a common shaft for the numeral wheels of the register, a clearing segment operatively connected with said common shaft to rotate it for clearing said numeral wheels, a lever for actuating said segment, a clearing key, said lever being normally locked but releasable at the depression of said key, a spring-actuated hook for locking said key in its depressed position, a power operated cam, a pin on said cam for restoring said locking hook to release said key, and a spring for pressing said lever against said cam, when said lever has been released by said key.

5. A clearing device for the numeral wheels of a register in an electrically operated calculating machine of the Odhner type, comprising, in combination, a clearing key, electrical contacts for the electric current to the calculating machine, said contacts being controlled by said key, a lever normally locked by said key but releasable at the manual depression thereof, a power-operated cam, a spring acting on said lever for pressing it in the direction towards said cam, a clearing segment, a link interconnecting said lever and said segment, a common shaft for the numeral wheels of said register, and a toothed wheel on said common shaft for cooperation with said toothed segment to be rotated thereby.

6. A clearing device for the numeral wheels of a register in an electrically operated calculating machine of the Odhner type, comprising, in combination, a clearing key, a hook on said key, a lever, a projection on said lever normally engaged by said hook to lock said lever, a power-operated cam, a spring acting on said lever for pressing it in the direction towards said cam, and also for pressing the projection on said lever against the hook on said key, a clearing segment, a link interconnecting said lever and said segment, a common shaft for the numeral wheels of said register, and a toothed wheel on said common shaft for cooperation with said toothed segment to be rotated thereby.

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No references cited.