

United States Patent

Gruenig et al.

[15] 3,674,200

[45] July 4, 1972

- [54] **SELECTOR AND SETTING DEVICE FOR THE SYNCHRONOUS OPERATION OF AT LEAST TWO MULTI-DENOMINATIONAL COUNTERS IN A MACHINE SUCH AS A CASH REGISTER CAPABLE OF EFFECTING PRINTING OPERATIONS**

[72] Inventors: **Rudolf Gruenig**, Koeniz; **Erwin Berger**, Thoerishaus; **Charles Sieber**, Fribourg, all of Switzerland

[73] Assignee: **Hasler A.G.**, Berne, Switzerland

[22] Filed: **Jan. 27, 1971**

[21] Appl. No.: **110,208**

[30] **Foreign Application Priority Data**

Jan. 29, 1970 Switzerland1235/70

[52] U.S. Cl.235/60 R, 235/58 P

[51] Int. Cl.G06c 11/04, G06c 23/00

[58] Field of Search235/60 R, 58 P, 60 MT, 235/2, 3

[56]

References Cited

UNITED STATES PATENTS

3,009,633	11/1961	Dilks et al.	235/60 R
3,168,981	2/1965	Goy et al.	235/58 P
3,259,058	7/1966	Gassino et al.	235/58 P

Primary Examiner—Stephen J. Tomskey

Attorney—Michael S. Striker

[57]

ABSTRACT

In a machine capable of effecting printing operations and including at least two multi-denominational counters the counters are formed by side-by-side coaxial rotatable wheels each having a pinion rotatable therewith. The pinions of the wheels of like denomination of the counters are connected by lengthwise movable racks having teeth meshing with the pinions and longitudinal setting movements of the racks effect synchronous setting of the counters. The setting movements of the racks are made by a stepped setting pawl which is selectively engaged with setting teeth formed on the racks.

8 Claims, 4 Drawing Figures

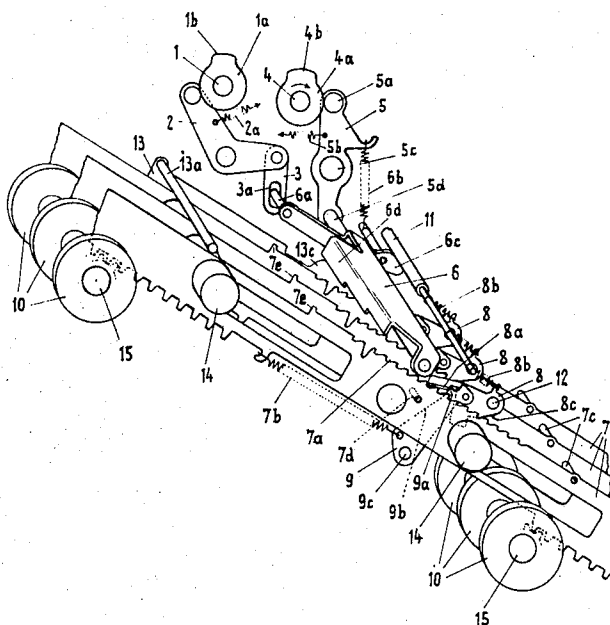
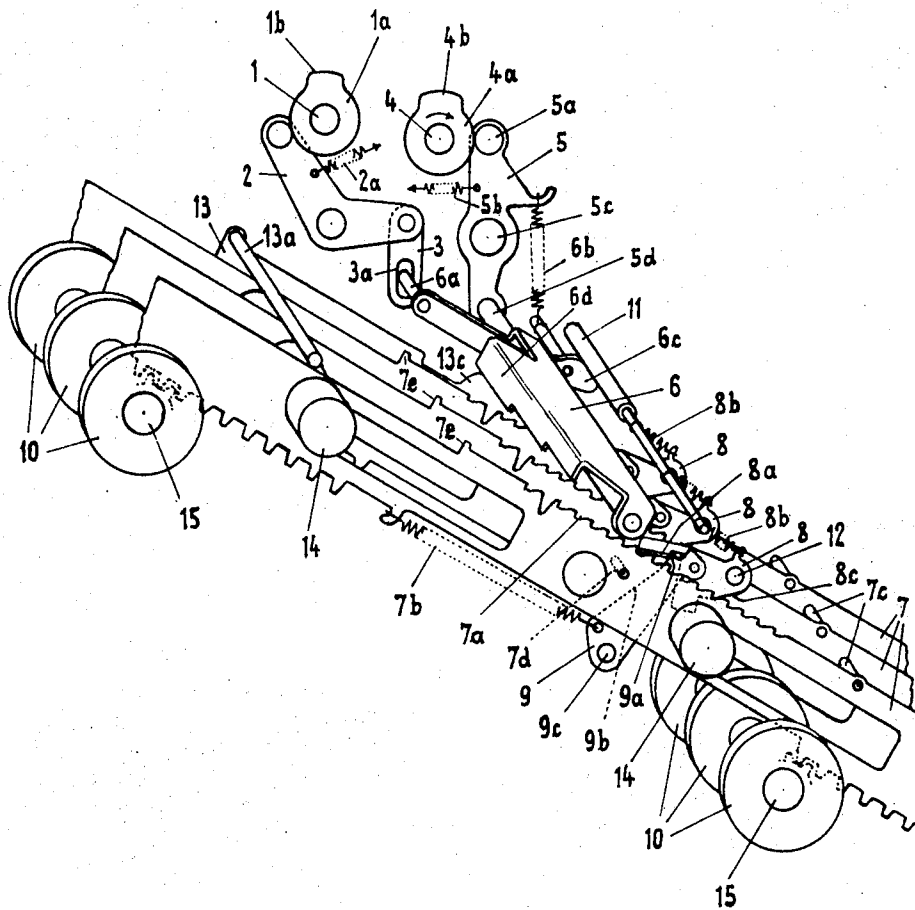


FIG. 1



INVENTORS:
 RUDOLF GRUENIG
 ERVIN BERGER
 CHARLES SIEMER
 By: Wm. S. Stokke
 Attorney

FIG. 2

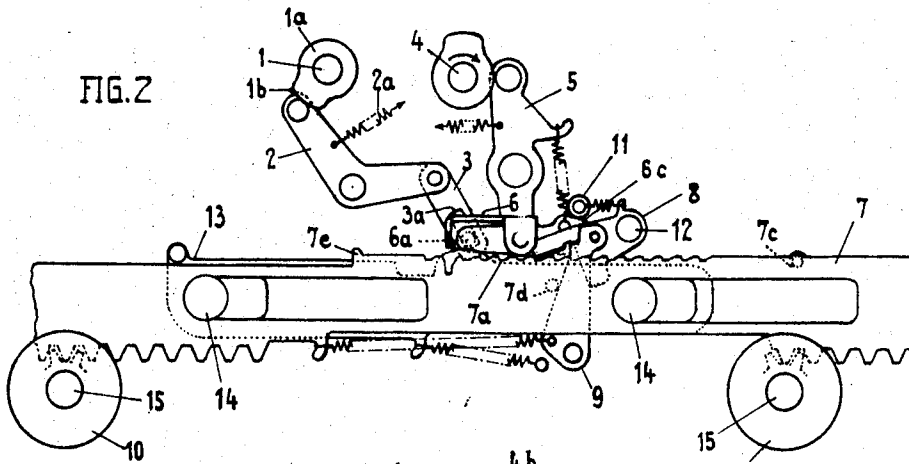


FIG. 3

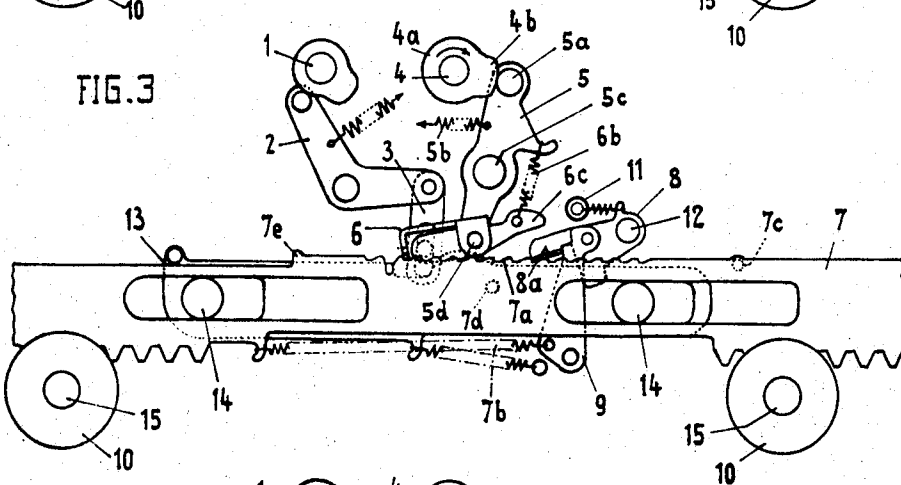
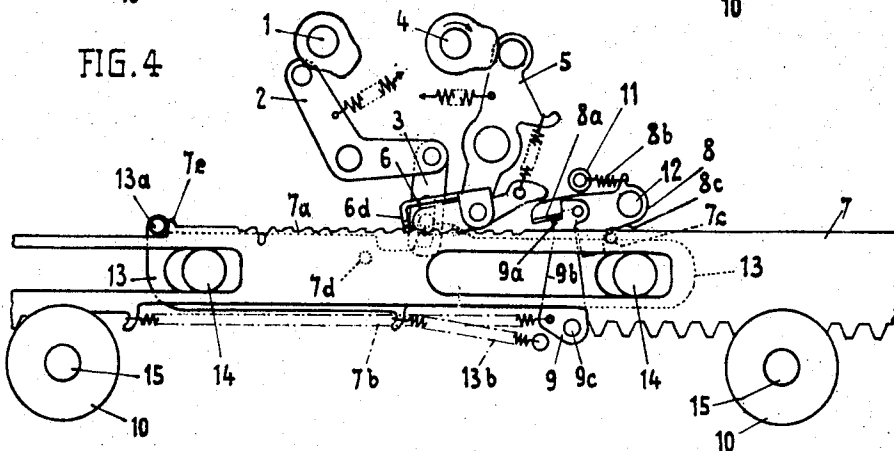


FIG. 4



INVENTORS:
 RUDOLF GRUENIG
 ERWIN BERGER
 CHARLES SIEBER
 BY: 46-10-1 (1/1/72)
 HORN

SELECTOR AND SETTING DEVICE FOR THE SYNCHRONOUS OPERATION OF AT LEAST TWO MULTI-DENOMINATIONAL COUNTERS IN A MACHINE SUCH AS A CASH REGISTER CAPABLE OF EFFECTING PRINTING OPERATIONS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a selector and stepping device for the synchronous operation of at least two multi-denominational counters in a machine such as a cash register capable of effecting printing operations.

2. Description of the Prior Art

Selector and setting devices for a plurality of counters in a cash register are known in which the counters are driven exclusively by way of rotating elements, such as shafts and gears which are stepped forward by means of stepped pawls. When such selector and drive devices are used, the position in which the counters are installed in the cash register is determined by the size of the individual elements and the distances between the individual shafts.

It is the main object of the present invention to provide a space-saving and inexpensive selector and setting device for a plurality of counters in a cash register.

SUMMARY

According to the invention there is provided a selector and setting device for the synchronous operation of at least two multi-denominational counters in a machine such as a cash register capable of effecting printing operations, comprising for each counter rotatable, denominational counter wheels each having a pinion rotatable therewith, a rack for each denomination, each rack being supported for longitudinal movement and having teeth engaged with the teeth of pinions of like denomination in each of the counters, a stepped setting pawl engageable with setting teeth on the racks to effect longitudinal movements of the racks and incremental rotation of the counter wheels connected therewith, and selector means operable to control engagement of the setting pawl with the setting teeth of the racks.

Through this elongated form of the setting elements, which are moved forward by means of a central drive, a greater choice is available for the position in which the counters are disposed in the cash register and consequently in respect of the position of the ticket to be printed, thus leading to more convenient arrangements of the counters.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the starting position of a selector and setting device according to the invention, the device being associated with two three-denominational counters,

FIG. 2 is a side view of the selector and setting device with the setting device in the starting position thereof,

FIG. 3 is a view similar to that of FIG. 2, after a setting movement has been made, and

FIG. 4 is a view similar to FIG. 2, shortly before a selector rack returns to the starting position thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, the selector device comprises a rotatable selector shaft 1, a control lever 2, and a connecting lever 3 by means of which a stepped pawl 6 is controlled.

The setting device comprises a rotatable drive shaft 4, a stepping lever 5, the stepped pawl 6, and toothed racks 7 which are disposed in parallel side-by-side relation and are mounted to be slidable lengthwise on two fixed rack supports 14. A locking pawl 8 cooperates with each rack 7, and each of the pawls 6 cooperates with a support or latching lever 9. The teeth at the opposite ends of the toothed racks 7 engage in pinions rotatable with counter wheels 10 which are provided in the counters and which are rotatable on stationary shafts

15, so that synchronous setting movements of the two counters installed in a cash register, is ensured.

The setting of the counters takes place in each case shortly before the issue of a ticket by the cash register, that is to say when the latter performs a total-taking function. In the case of an addition or of a sub-total-taking function of the cash register, the setting of the wheels 10 is prevented by the selector device in a manner described below.

Construction and Mode of Operation of the Selector Device

The selector shaft 1 is controlled from the keyboard of the cash register so that every operation thereof is transmitted to the selector shaft 1. A cam 1a is rotatable with the selector shaft 1. The control lever 2 is urged by a tension spring 2a against the outer periphery of the cam 1a and is held in contact therewith. The movements of the control lever 2 are transmitted to the connecting lever 3 which is provided with a slot 3a. The stepped pawl 6 is provided with a pin 6a which projects into the slot 3a. By means of the pin 6a the selector device controls the engagement of the stepped pawl 6 in the teeth 7a of the rack 7.

In the position of the selector shaft 1 illustrated in FIG. 1, the control lever 2 is urged by the tension spring 2a against the smaller diameter of the cam 1a and the connecting lever 3 assumes its lowest possible position, in which position the slot 3a frees the stepped pawl 6 to such an extent that during a setting movement the pawl 6 can engage in the teeth 7a of the racks 7 and advance the racks to effect setting of the counters 10.

If however the cash register does not perform a total-taking function, the selector shaft 1 turns to such an extent that the control lever 2 is engaged by the hump 1b of the cam 1a, as illustrated in FIG. 2. The connecting lever 3 then assumes its highest position and the pin 6a is so engaged by the slot 3a as to lift the stepped pawl 6 to an extent such that during the setting movement the pawl 6 cannot engage in the teeth 7a of the racks 7. In this position of the selector shaft 1 no setting of the counters is possible.

Construction and Mode of Operation of the Setting Device

Every rotational movement of the main shaft, not shown, of the cash register is transmitted to the drive shaft 4 and the cam 4a which is rotatable therewith. The cam 4a is turned in the clockwise direction by the main shaft of the cash register. On every rotation of the drive shaft 4 the cam 4b rocks the setting lever 5 about a pin 5c against the action of a tension spring 5b. To the lower end of the setting lever 5 there is secured a pivot pin 5d about which the stepped pawl 6 is rotatable. On each rocking movement of the setting lever 5 the stepped pawl 6 performs a forward and rearward movement. In the starting position of the setting device a curved extension 6c on the stepped pawl 6 is drawn towards a cross-bar 11 by the action of a tension spring 6b which acts at one end on the setting lever 5 and at the other end on the stepped pawl 6 so that it is held out of engagement with the teeth 7a of the racks 7 (FIGS. 1 and 2).

When on the rotation of the main shaft of the cash register the setting lever 5 performs a rocking movement about the pin 5c, the curved extension 6c of the stepped pawl 6 first slides along the cross-bar 11. After the extension 6c has left the cross-bar, the tension spring 6b comes into action so that the stepped pawl 6 is engaged with one or more of the teeth 7a of the racks 7, provided that this is permitted by the selector device. In this case the racks engaged by the stepped pawl 6 are displaced by one tooth division forwards (to the left as viewed in FIG. 3).

A locking lever or pawl 8 has a bent end 8a which, when engaged in the teeth 7a, prevents the racks 7 from performing a rearward movement after each forward step due to the action of a return spring 7b.

Since the teeth at the opposite ends of the racks 7 are engaged in the pinions of the counterwheels 10, on each rocking movement of the setting lever 5 the counterwheels are advanced synchronously in a counter-clockwise direction by one figure provided on their periphery and not shown in the drawing.

The setting lever 5 and the stepped pawl 6 are returned to the starting positions thereof by the tension spring 5b. When this return movement is performed the curved extension 6c again underlies the cross-bar 11 so that in its starting position the stepped pawl 6 is again held out of engagement with the teeth 7a.

On the tenth forward setting movement of a rack 7 through the action of the stepped pawl 6, a pin 7c provided on the rack comes under a beveled portion 8c of the locking lever 8 and lifts the lever 8 against the action of a tension spring 8b to such an extent that the lever 8 is disengaged from the teeth 7a (FIG. 4).

In this position of the locking lever 8 the return spring 7b, one end of which engages in the rack 7 and the other in a latching lever 9, has the effect of turning the latching lever 9 in the counter-clockwise direction about its axis 9c and of causing it to lie with its nose 9a under the bent-over end 8a of the locking lever 8, so that the latter is latched in the swung-out position and is secured against engagement in the teeth 7a. The racks 7 can now return to their starting positions. Simultaneously with the racks 7 the counterwheels 10 of the two counters are also restored to their starting positions. Shortly before the racks 7 are fully restored to their starting positions a pin 7d provided on each rack strikes against the flank 9b, see FIG. 2, of the latching lever 9 and turns the latter in the clockwise direction about its pivot 9c, thus bringing it out of reach of the locking lever 8. Consequently the locking lever 8 is free again to engage with the teeth 7a and during the forward, or setting, movements of the racks 7 which then take place can prevent undesired return movement of the racks (FIG. 2).

Checking Slide for Preventing the Advance of the Racks Beyond the Tenth Step Position

If for any reason the return to the starting position should not take place after the tenth forward setting movement of a rack 7, for example if the return spring 7b is broken, a checking slide 13 is arranged to prevent any further forward setting movement of the racks by making it impossible for the stepped pawl 6 to engage in the teeth 7a.

The checking slide 13, which is disposed at the side of and parallel to the first rack 7, is provided with a cam 13c, FIG. 1, and a stop 13a which extends over all the racks 7. The checking slide 13 is pulled by a tension spring 13b into the starting position thereof shown in FIGS. 1, 2, and 3 in which position it engages a stop 14.

On the tenth forward setting movement of a rack 7 a nose 7e provided on the rack engages the stop 13a and displaces the checking slide 13, against the action of the tension spring 13b out of its starting position by one tooth space in the forward direction (to the left in FIG. 4).

When the checking slide 13 is in this position its cam 13c prevents the stepped setting pawl 6 from engaging in the teeth 7a when a setting movement takes place, since the step 6d provided on the stepped pawl 6 runs on to the cam 13c and holds the pawl in the raised position, thus preventing any engagement of the racks 7 with the teeth 7a.

After the rack 7 has performed a return movement, the tension spring 13b restores the checking slide to its starting position, so that the forward setting movements can be performed once again without hindrance from the checking slide 13.

We claim:

1. A selector and setting device for the synchronous operation of at least two multi-denominational counters in a machine such as a cash register capable of effecting printing operations, comprising for each counter rotatable denominational counter wheels each having a pinion rotatable therewith, a rack for each denomination, each rack being supported for longitudinal movement and having teeth engaged with the teeth of pinions of like denomination in each of the counters, a stepped setting pawl engageable with setting teeth on the racks to effect longitudinal movements of the racks and incremental rotation of the counter wheels connected therewith, and selector means operable to control engagement of the setting pawl with the setting teeth of the racks.

2. A device according to claim 1, wherein controlled connection between the selector means and the setting pawl is effected by a pin carried by the selector means.

3. A device according to claim 1, including a curved extension on the setting pawl and which in the starting position of the setting pawl is operable to hold the pawl out of engagement with the setting teeth of the racks.

4. A device according to claim 1, including locking pawls one for each rack engageable with the setting teeth of the racks and operable to prevent return movement of the racks following a setting movement thereof, and a pin movable with each rack and operable during the tenth forward movement of a rack to lift the locking pawl associated therewith out of engagement with the setting teeth of the rack.

5. A device according to claim 4, including for each locking pawl a pivoted latching lever operable to retain the locking pawl in the position thereof in which it is disengaged from its rack, and a pin carried by each rack and operable to engage the locking pawl associated therewith just before the rack reaches the starting position thereof thereby to rock the latching lever out of engagement with its locking pawl to permit re-engagement of the locking pawl with its rack.

6. A device according to claim 5, in which a spring is operable to restore the racks to the starting positions thereof, said spring being connected at one end thereof to the latching lever and at its other end to the racks.

7. A device according to claim 1, including a checking slide arranged in parallel side-by-side relation with the racks and provided with a cam arranged to prevent the stepped setting pawl from engagement with the setting teeth of the racks after the tenth forward setting movement of the racks and before the racks have been restored to the starting positions thereof.

8. A device according to claim 7, wherein a nose carried by each of the racks is operable on the tenth forward setting movement of a rack to engage an abutment carried by the checking slide and to move the checking slide forwards by one tooth space thereby to cause the cam on the checking slide to disengage the setting pawl from the setting teeth of the racks.

* * * * *

60

65

70

75