

[54] SET NUMERAL CHANGING DEVICE IN AN AUTOMATION COUNTER

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[51] Int. Cl. G06c

[58] Field of Search..... 235/114, 115, 117 A, 235/77, 91 B, 1 B, 109; 116/133, 129

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[57] ABSTRACT

In an automation counter of the type having a plurality of setting wheels and the same number of elongate push-buttons as the number of said setting wheels for operating said setting wheels respective to change the set numerals indicated thereby, each of said elongate push-buttons consists of two separate sections, i.e., a front section and a rear section, and said front section is pivotally connected to said rear section, so that it may be normally held in a folded position substantially parallel to the front face of a counter casing when not in use but be turned to an operative position in alignment with said rear section only when it is to be used, whereby the pushing concurrently of two adjacent push-buttons is avoided in the set numeral changing operation.

2 Claims, 5 Drawing Figures

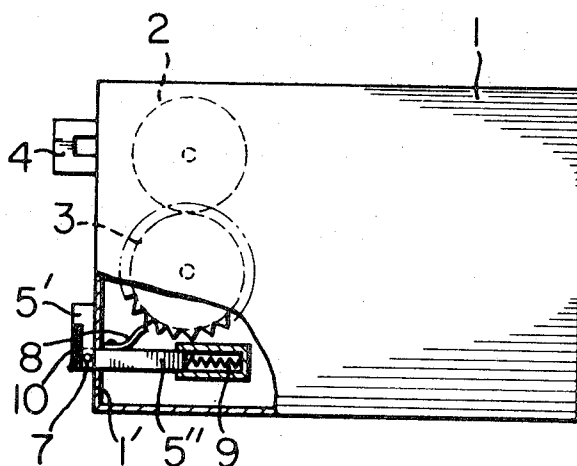


FIG. 1

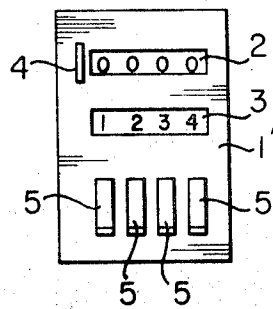


FIG. 2

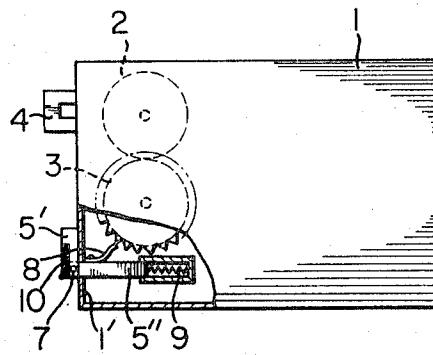


FIG. 3

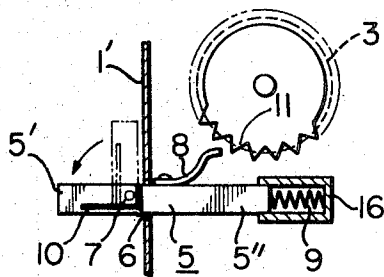


FIG. 4

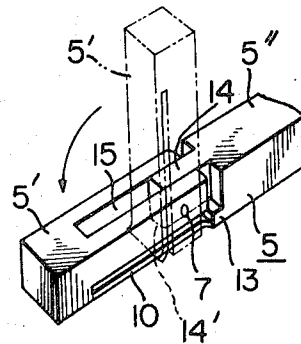
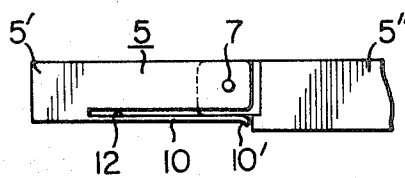


FIG. 5



SET NUMERAL CHANGING DEVICE IN AN AUTOMATION COUNTER

This invention relates to a device for changing the set numerals of a push-button preset type automation counter.

In a conventional automation counter of the type described, a plurality of set numeral changing push-buttons projecting on the front side of the counter are arranged closely in side-by-side relation on a narrow front panel of said counter and, therefore, much difficulty is encountered in pushing the push-buttons individually one at a time. Namely, when a selected push-button is pushed, the adjacent push-button tends to be pushed concurrently, resulting in faulty operation. Such a tendency is particularly apparent when the counter is small in size and hence the interval of the push-buttons is extremely small.

It is, therefore, the object of the present invention to provide a set numeral changing device which overcomes such defect of the conventional counter and ensures a correct numeral changing operation by avoiding the possibility that the operator in changing a set numeral by pushing a selected push-button will erroneously push the push-button adjacent said selected one.

According to the present invention, a plurality of elongate push-buttons projecting side by side from the front panel of a counter are each composed of two sections, i.e., a rear section and a front section having a length equal to the stroke of said push-button and pivotally connected to said rear section by a pivot pin so that it may be pivotable upwardly or downwardly about said pivot pin through an angle of about 90° with respect to said rear section, said pivotable front section normally being held in its pivoted position parallel to the front panel of the counter but turned to its projecting position only when the associated set numeral is to be changed, whereby the possibility of two push-buttons being pushed concurrently in the numeral changing operation can be completely eliminated and the operational efficiency of the counter is substantially enhanced.

Namely, according to the invention there is provided a device for changing set numerals in an automation counter comprising a casing, a plurality of setting wheels disposed in said casing and the same number of elongate axially movable push-buttons as the number of said setting wheels supported by and extending outwardly through a front panel of said casing, each of said setting wheels being provided along the outer periphery thereof with teeth engageable with a setting pawl provided on each push-button, whereby when a selected one of said push-buttons is pushed, the associated setting wheel is rotated and thereby the numeral indicated by said setting wheel is changed, characterized in that each of said elongate push-buttons is composed of a front section and a rear root section, said front section being pivotally connected to said rear root section so that it may be pivotable relative to said rear root section on the front side of said casing from an operative position in alignment with said root section to a non-operative position substantially parallel to said front panel, or vice versa.

The invention will now be described in greater detail with reference to the accompanying drawings, in which:

FIG. 1 is a front elevational view of an automation counter embodying the present invention;

FIG. 2 is a side elevational view of the automation counter, with a portion thereof cut away;

FIG. 3 is a side view showing in an enlarged scale the push-button and associated parts;

FIG. 4 is an enlarged perspective view of a portion of the push-button; and

FIG. 5 is an enlarged side view of a portion of the push-button.

In the drawings, reference numeral 1 designates a casing, 2 indicator wheels, 3 setting wheels meshing with said indicator wheels respectively, 4 a clear push-button and 5 setting push-buttons. The automation counter shown is of a type having four digital positions, and accordingly comprises four each of the indicator wheels, setting wheels and push-buttons. The four push-buttons 5 arranged in side-by-side parallel relation on the front face of the casing 1 are extended loosely through square openings 6 formed in a front panel 1' of the casing 1, with their front portions projecting forward from said front panel 1' and their rear portions located backside of said front panel. Each push-button 5 is composed of two sections, i.e., a front section 5' and a rear root section 5''. The front portion 5' is pivotally connected to the rear section 5'', with a projection 14 formed at one end of said rear section received in a slot 15 formed at the confronting end of said front section and secured therein by means of a pivot pin 7 extending through the overlapping end portions of said front and rear sections, so that said front section 5' may freely be pivotable about said pivot pin 7 relative to said rear section 5''. The front section 5' normally is in its erected position substantially parallel to the front panel 1' of the counter as indicated by the chain lines in FIGS. 3 and 4, but is pivotally turned to its projecting position in alignment with the rear section 5'' as indicated by the solid lines in FIGS. 3 and 4, only when it is to be used. When the push-button 5 is pushed, with the front section 5' being in its projecting position, it moves into the casing 1 against the biasing force of a spring 9 which is interposed between the inner end of said push-button 5 and a spring support 16, and a setting pawl 8 fixed on the rear section 5'' of the push-button engages one of teeth 11 formed around the outer periphery of the associated setting wheel 3, turning said setting wheel 3 one pitch, which in turn turns the associated indicator wheel 2 to change the numeral indicated by said indicator wheel. The push-button 5 is pushed repeatedly until a desired numeral is indicated by the indicator wheel 2. When the pressure is removed from the push-button 5, said push-button 5 returns to its original position under the biasing force of the spring 9. The set numeral indicated by the indicator wheel 2 can be changed in the manner described above. After the push-button 5 has returned to its original position, the front section 5' of said push-button 5 is pivotally turned, relative to the rear section 5'', to its erected position as shown in FIG. 2. Then, another push-button is operated in exactly the same manner as described above. By operating all of the push-buttons one after another, all of the numerals indicated by the respective indicator wheels 2 can be changed to a desired number. The push-button may be constructed such that its front section 5' is pivotable downwardly relative to the rear section 5''.

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Furthermore, in the device described above and shown in the accompanying drawings, there are provided both the setting wheels and the indicator wheels each meshing with the associated setting wheel. However, such an arrangement may be changed to another arrangement in which the indicator wheels are omitted and the set numerals are directly indicated by the respective setting wheels.

The front section 5' of push-button 5 is formed in the lower portion thereof with a slit 12 extending longitudinally from the pivoted end thereof, in a manner to form an elastic strip 10, and the free end 10' of said strip is bent outwardly, as best shown in FIG. 5. In the projecting position of the front section 5', the bent end 10' of the elastic strip 10 abuts against the front face of a projection 13 formed at the forward end of the rear section 5'', to hold said front section 5' in its projecting position. When the front section 5' is pivotally moves from the projecting position to erected or folded position, or vice versa, the bent end 10' of the elastic strip 10 is once engaged by and then disengaged from the edge 14' of the projection 14 of the rear section 5'', and the elastic strip 10 is once urged away from the major portion of said front section 5' and then returns to its original position. The energy accumulated in the elastic strip 10 during its engagement with the edge 14' provides a snapping effect which facilitates the pivotal movement of the front section 5' from the projecting to folded positions or vice versa, described above.

I claim:

1. A device for changing set numerals in an automation counter comprising a casing, a plurality of setting wheels disposed in said casing and the same number of elongate axially movable push-buttons as the number

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of said setting wheels supported by and extending outwardly through a front panel of said casing, each of said setting wheels being provided along the outer periphery thereof with teeth engageable with a setting pawl provided on each push-button, whereby when a selected one of said push-buttons is pushed, the associated setting wheel is rotated and thereby the numeral indicated by said setting wheel is changed, characterized in that each of said elongate push-buttons is composed of a front section and a rear root section, said front section being pivotally connected to said rear root section so that it may be pivotable relative to said rear root section on the front side of said casing from an operative position in alignment with said rear root section to a non-operative position substantially parallel to said front panel, or vice versa.

2. A device according to claim 1, wherein said front and rear root sections of each push-button are pivotally connected with each other, with a projection formed at one end of said rear root section received in a slot formed in the confronting end of said front section and secured therein by means of a pivot pin extending through the overlapping end portions of said front and rear root sections, and further an elastic strip is provided at the lower portion of said front section by a longitudinal slit which is formed at said portion and extends from the connected end of said front section, so that said elastic strip may be deflected by the edge of the projection of said rear root section in the course of pivotal movement of said front section and the energy thus accumulated in said elastic strip may provide a snapping effect to facilitate the pivotal movement of said front section.

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