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[56]

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[54] **SLIDING SWITCH PROGRAMMER FOR**
CONTROLLING MULTIPLE SWITCHES
 5 Claims, 4 Drawing Figs.

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200/5 R, 200/16 R, 200/168 R
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16, 1 R, 5 A, 5 R, 16 R, 168 R

ABSTRACT: A programming unit designed as a variable input unit for a data transmission system incorporates a number of sliders which are able to be moved to various positions to set up a program. A switch matrix situated behind the sliders is operated by the sliders to set up a signal pattern which can be transmitted serially by a separate switch.

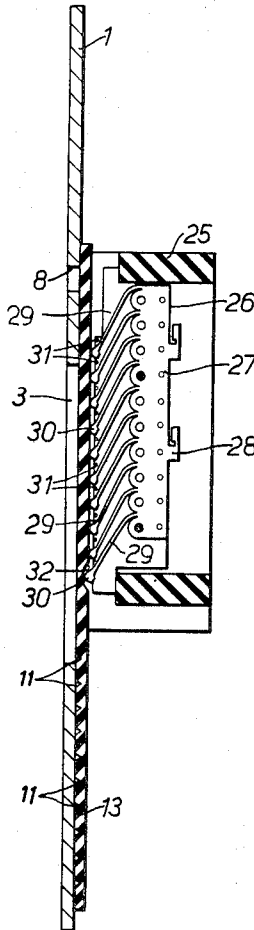
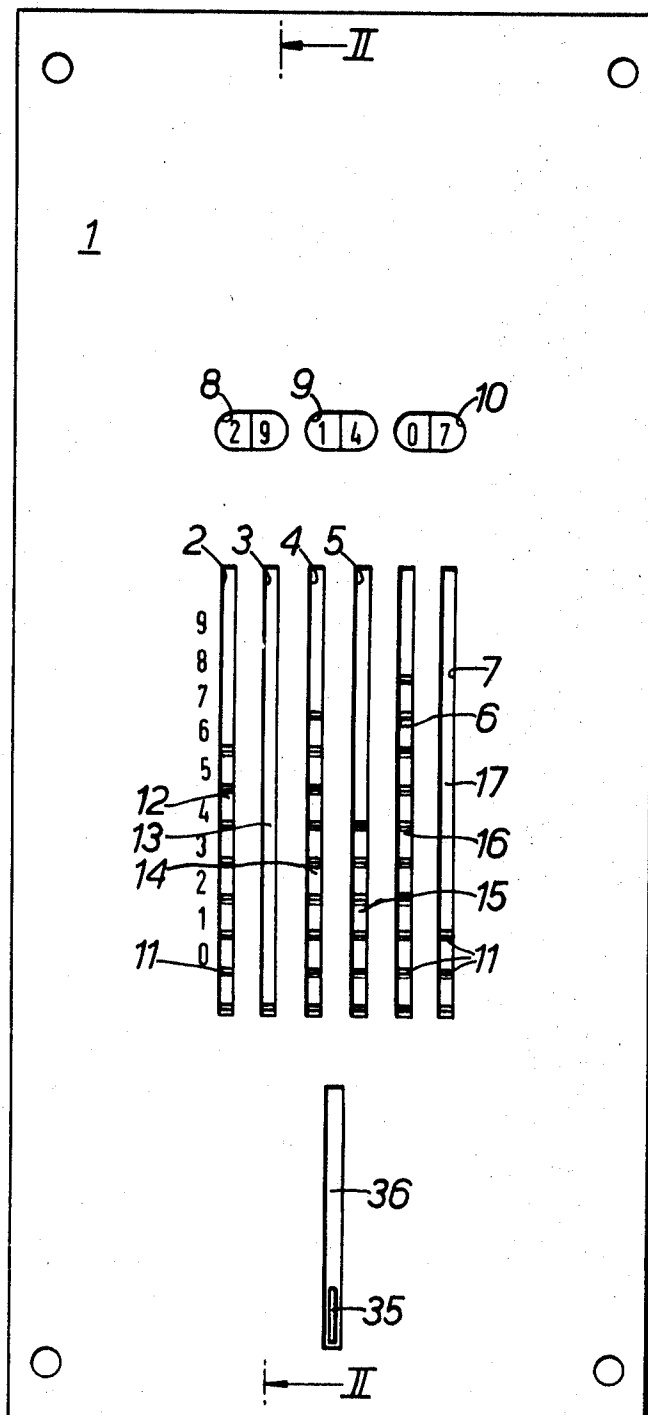
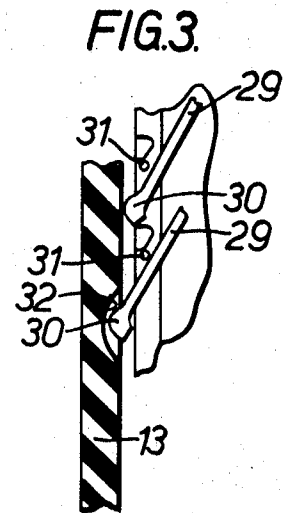
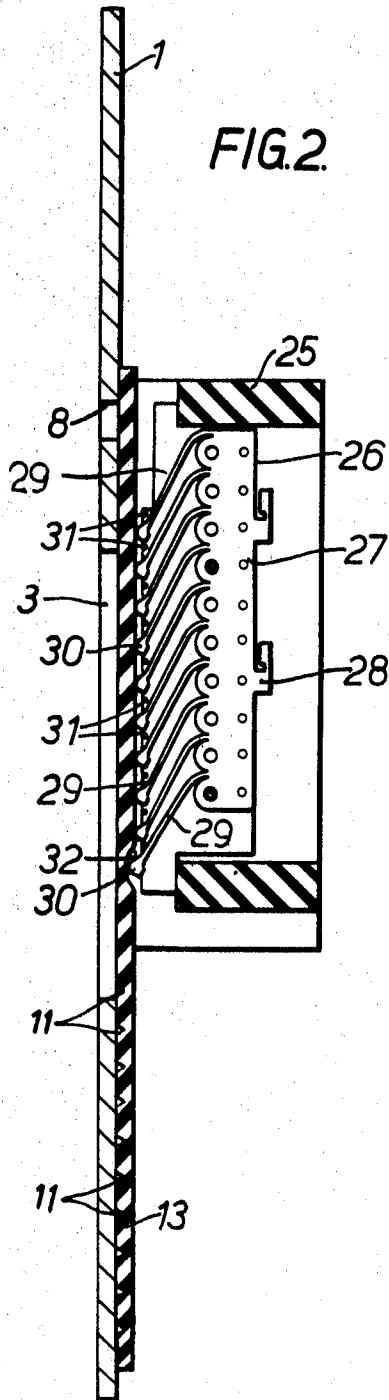


FIG. 1

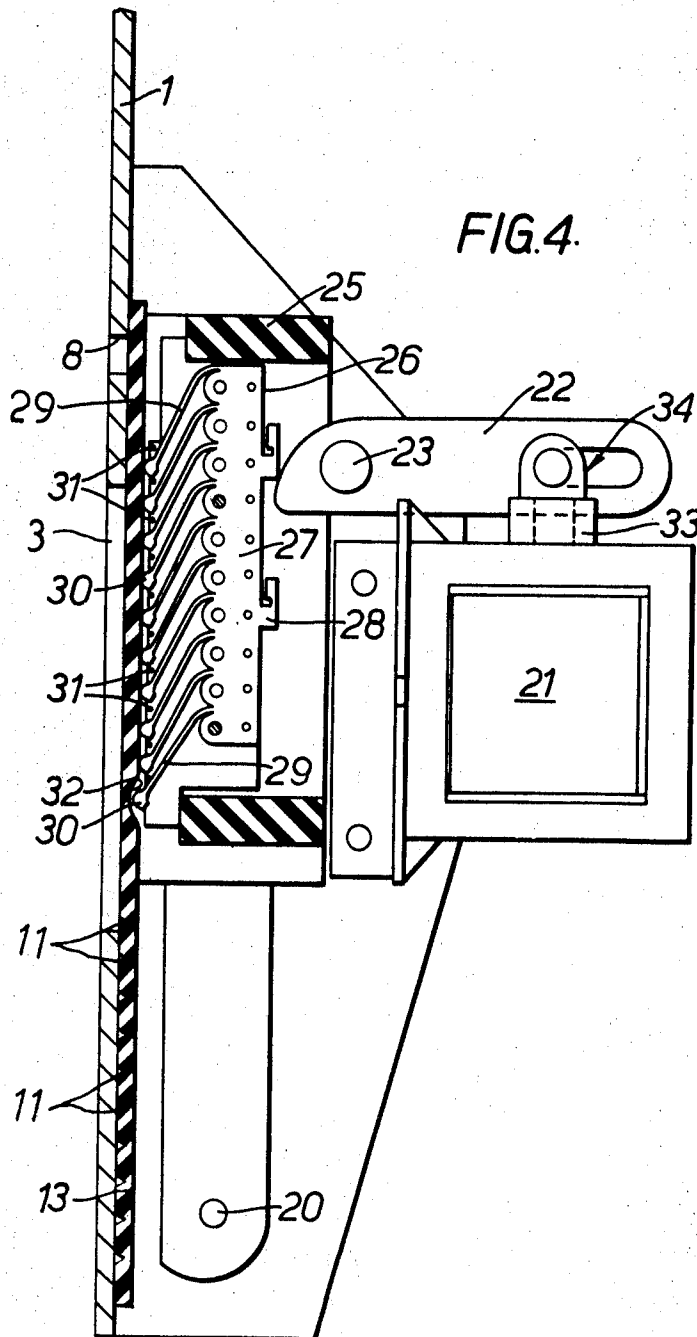


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SLIDING SWITCH PROGRAMMER FOR CONTROLLING MULTIPLE SWITCHES

This invention relates to an electrical switch arrangement of the kind including a plurality of pairs of cooperating contacts arranged in sets, each set having an individually associated operating member.

Such an electrical switch arrangement can be used as a variable data input device in a credit card system used in a shop. Such an arrangement is provided in combination with a credit card reader in a data collection unit at each sales point in the shop, the data collection units being linked by wires to a central processing station. When a customer makes a purchase which is to be debited against his account, he produces a credit card which carries his personal details relative to his account. This credit card is placed in the credit card reader of the data collection unit at the sales point, which reader transmits the data concerning the purchaser from the credit card to the central processing station.

It is necessary to send to the central processing station details of the purchase made, and the variable data input device is used for this.

In a simple case these details may be only the cost of an article purchased, although other details such as a stock code and the shop assistant's number may also be required. The variable data input device thus has to include means for setting up the required details and means for translating the details into an electric signal for transmission to the central processing station.

According to the present invention, in an electrical switch arrangement including a plurality of pairs of cooperating contacts arranged in sets, each set having an individually associated operating member, each operating member is a slider arranged for movement between a plurality of positions, in each of which positions the slider operates an individual one of the pairs of contacts of the associated set.

An object of the invention is to provide a sliding programming switch to set forth selected data to be transmitted to peripheral equipment for use thereby.

Another object is the provision of spring contacts of the sliding programming switch being in constant engagement with sliding members of the switch.

A further object is to provide means to maintain spring contacts of the sliding programming switch out of engagement with sliding members of the switch.

An additional object is the provision of a contact member for the sliding programming switch which has lamina, spring legs and enlarged ends disposed in a plane having long-wearing capability and they are easy and economical.

A still further object is to provide means to move all of the sliders simultaneously to their rest or zero positions.

Other objects and attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there are shown and described illustrative embodiments of the invention; it is to be understood, however, that these embodiments are not intended to be exhaustive nor limiting of the invention but are given for purposes of illustration in order that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of a particular use.

Two embodiments of arrangements in accordance with the present invention will now be described by way of example with reference to the drawings in which:

FIG. 1 is a front view of a first embodiment;

FIG. 2 is a section on the line 2-2 in FIG. 1;

FIG. 3 is a detail of two pairs of cooperating contacts; and

FIG. 4 is a section similar to that of FIG. 2 but of the second embodiment.

As shown in FIG. 1, the arrangement includes a front panel 1 having six parallel slots 2, 3, 4, 5, 6, 7, in it. At one end of the slots 2 to 7 are three transverse slots 8, 9, 10 each spanning the width of a pair of the slots 2 to 7. A slider 12, 13, 14, 15, 16, or

17 is located beneath each of the slots 2 to 7. Each of the sliders 12 to 17 also projects below one of the transverse slots 8, 9 and 10. Each of the sliders 12 to 17 has 10, spaced, transverse grooves 11 on it, which show through the associated one of the slots 2 to 7, and which can be engaged by a suitable implement, for example a ballpoint pen, to move the slider. The panel 1 is marked with the digit characters 0 to 9 adjacent the slot 2, the characters being spaced apart by equal distances corresponding to the distance between the grooves 11 in each slider 12 to 17.

Each of the sliders 12 to 17 carries on its upper surface a row of the digits 0 to 9 which are successively presented in the associated one of slots 8, 9 and 10 as the slider is moved.

A particular digit is presented in one of the slots 8 to 10 when the sliders 12 to 17 are in their uppermost (as seen in FIG. 1) position, with a groove 11 on each of sliders 12 to 17 in line with each of the digit characters 0 to 9 on the front panel 1, by placing the suitable implement in the groove 11 in the appropriate one of sliders 12 to 17, in line with the particular digit character on the front panel 1, and then moving the slider downwards (as seen in FIG. 1) until the implement reaches the bottom of the one of slots 2 to 7 in which it is positioned.

As shown in FIGS. 2 and 3, below the front panel 1 there is located a housing 25 which contains six sets of pairs of cooperating contacts, one set 26 in respect of each of sliders 12 to 17. The sets 26 are identical, and each comprises a flat lamina 27 of spring copper having connection tabs 28 on one edge, for connection to supply leads, and a plurality of flexible spring arms 29 on the opposite edge. Each spring arm 29 has an enlarged end 30 which bears against the underside of the associated one of sliders 12 to 17 to thereby frictionally hold the sliders between the spring arms 29 and the front panel 1. Each spring arm 29 forms a movable pair of cooperating contacts, and contact rods 31 extending transversely through the housing 25 from relatively fixed contacts of the pairs of contacts for engagement by the arms 29. The rods 31 are bussed across the housing 25. Each spring arm 29 has a section extending outwardly from lamina 27 with a radiused configuration so that another section extends at about a 30° angle relative to an inner edge of lamina 27 to provide legs 29 with good spring characteristics. Lamina 27, legs 29 and enlarged ends 30 are all in the same plane and contacts 26 are readily stamped from thin flat stock without any forming operation being formed thereon. The edges of enlarged ends 30 engage sliders 12-17 and these contacts have been proven to have exceedingly long-wearing capability.

Each of the sliders 12 to 17 has a recess 32 formed in its underside, into which recess 32 the end 30 of any associated spring arm 29 can extend.

For example, when the slider 13, as shown in FIGS. 2 and 3, is in the position with the digit 9 is showing in the slot 8, the lowermost contact rod 31 is contacted by its associated spring arm 29 with the enlarged end 30 of this arm 29 extending into the recess 32 in the slider 13. The other contact rods 31 are not engaged by their associated spring arms 29 since the ends 30 of the other spring arms 29 engage the back of the slider 13 and thus the arms 29 are held off from the rods 31. The contact rod 31 which is engaged has an electrical circuit completed to it via the inputs 28, 31 to the arrangement and an electrical signal indicative of the digit 9 is initiated by the arrangement.

The contact rods 31 are in use connected to the inputs of a scanning switch, for example a rotary stepping switch, which scans each of the rods 31 for each of the sets 26 in turn, and thus the digits set up on the sliders 12 to 17 are read out in succession.

The arrangement can be used as an encoder for setting up a complex digital program if a large number of sliders are provided. By providing more than one recess 32 on the reverse of one or more of the sliders 12 to 17, a commoning between contact rods 31 can be achieved. The lamina 27 of a contact set 26 can be subdivided into a plurality of parts each with an

individual tab 28. In this way many different programs can be set up on the arrangement.

In the embodiment shown in FIG. 4, the housing 25 carrying the contact sets 26 is mounted independently of the front panel 1 on a shaft 20, so that it can move between a position in which the ends 30 of the spring arms 29 engage the sliders 12 to 17, and a position in which there is no such engagement. This arrangement prevents the spring arms 29 being constantly flexed as the sliders 12 to 17 are moved, and means that the spring arms 29 are in contact with the contact rods 31 in the rest position, thus ensuring that the area of contact between the arms 29 and the rods 31 is kept clean. The sliders 12 to 17 are held to the back of the panel 1 by straps (not shown) which allow the required movement of the sliders 12 to 17.

The movement of the housing 25 is effected by an electromagnetic solenoid 21 which is mounted on the housing of the arrangement, and which is arranged to be energized when data set up on the sliders 12 to 17 is to be read, this moving the housing 25 so that the ends 30 of the spring arms 29 engage the sliders 12 to 17. The solenoid 21 is deenergized when the data has been read, the housing 25 then returning to its initial position so that the ends 30 of the spring arms 29 move out of engagement with the sliders 12 to 17. The housing 25 is moved by means of a cam lever 22 which is rotatably mounted on a shaft 23 and which is connected to the plunger 33 of the solenoid 21 by way of a pin and slot connection 34.

As shown in FIG. 1, the arrangement is provided with a lever 35 for simultaneously moving all of the sliders 12 to 17 to their rest position when the data has been read. The lever 35 projects through a slot 36 in the front panel 1, and engages a bar (not shown) arranged beneath the lower ends of the sliders 12 to 17 (as seen in FIG. 1). When the lever 35 is pushed upwards the bar engages the ends of the sliders 12 to 17 to push them upwards (as seen in FIG. 1) when they are to be returned to their rest position.

The moving of the ends 30 of the spring arms 29 out of contact with the sliders 12 to 17, when the data has been read and before the sliders 12 to 17 are returned to their rest position, gives the advantage that very little force is required to move the sliders 12 to 17, and, as mentioned above, prevents all of the spring arms 29 being flexed each time the sliders 12 to 17 are moved.

It will, therefore, be appreciated that the aforementioned and other desirable objects have been achieved; however, it should be emphasized that the particular embodiments of the invention, which are shown and described herein, are intended as merely illustrative and not as restrictive of the in-

vention.

The invention is claimed in accordance with the following:

1. A programming switch comprising a series of contact members defining a matrix, each of the contact members including a lamina and a plurality of spring contact members extending outwardly from an inner edge of said lamina at an acute angle with respect to this inner edge defining movable contact members and stationary contact members disposed proximate outer ends of said spring contact members with said spring contact members in engagement therewith, and slider means movably disposed in engagement with said movable contact members and having means thereon to allow selected ones of said movable contact members to move into engagement with said stationary contact members.

2. An electrical switch arrangement, including a plurality of pairs of cooperating contacts arranged in sets in a housing, each pair of cooperating contacts comprising a first contact fixed relative to the housing and a second contact in the form of a resilient arm movable relative to the first contact, a plurality of operating sliders respectively associated with the sets and arranged for movement between a plurality of positions, the sliders and the housing being mounted relative to each other such that the free ends of the resilient arms can engage the sliders, this engagement holding the resilient arms out of contact with the associated first contacts, each slider having a recess into which the free end of any one of the associated resilient arms can project when the slider is in an appropriate one of the plurality of positions, the one resilient arm then contacting the associated first contact.

3. An electrical switch arrangement, including a plurality of pairs of cooperating contacts arranged in sets, each set having an individually associated operating member, in which each operating member is a slider arranged for movement between a plurality of positions, in each of which positions the slider operates an individual one of the pairs of contacts of the associated set, and in which the pairs of cooperating contacts are mounted in a housing in a matrix formation, and in which the housing is mounted for movement relative to the sliders between a first position in which none of the pairs of cooperating contacts can be operated by one associated slider, and a second position in which one of the pairs of cooperating contacts of each set can be operated by the associated slider.

4. An arrangement as claimed in claim 3, in which the movement of the housing is effected by an electromagnetic solenoid.

5. An arrangement as claimed in claim 4, in which are solenoid acts on the housing by way of a cam lever.

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