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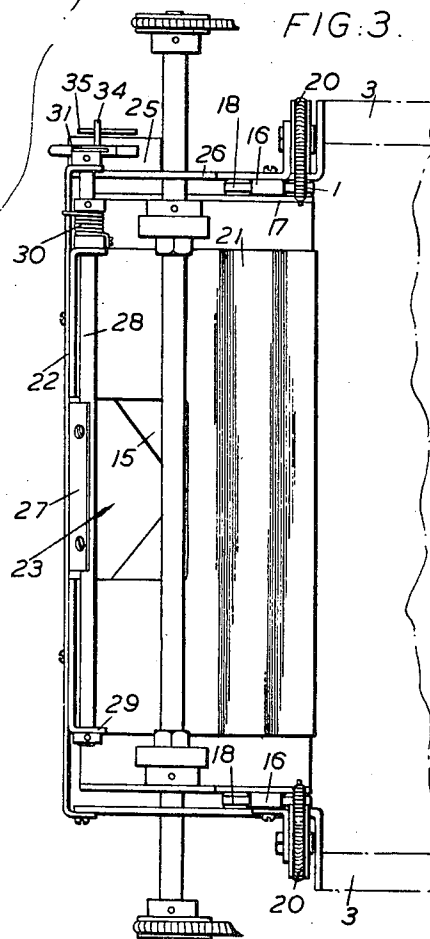
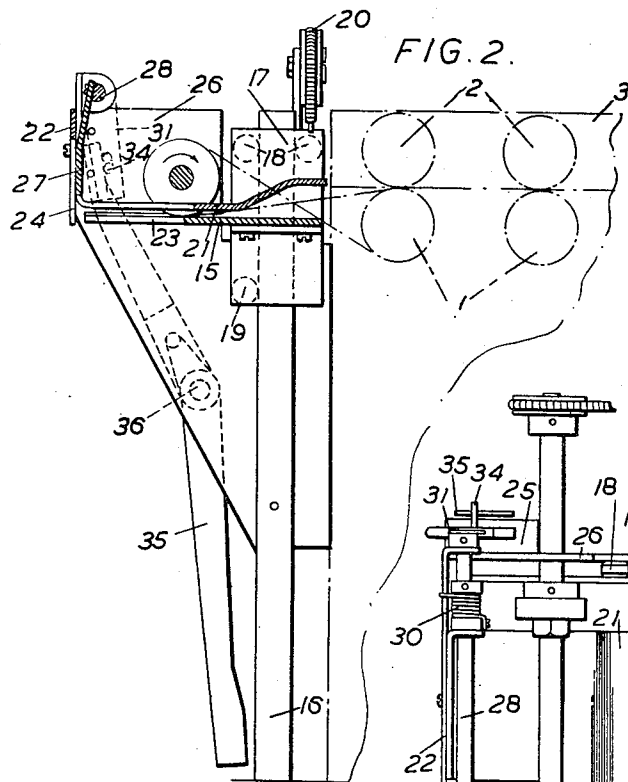
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RECORD CARD CONTROLLED STATISTICAL MACHINES

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RECORD CARD CONTROLLED STATISTICAL MACHINES

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This invention relates to record card controlled statistical machines and in particular to a machine which includes a support on which statistical record cards are superposed as they issue in succession from the machine, the support being movable away from the position of card delivery thereto and spring-urged towards said position, and driving means for the machine.

As is well understood in the art the controls for statistical machines of the kind referred to are normally situated at that end of the machine which is remote from the end thereof at which the cards issue from the machine. Consequently, when, during operation of the machine, it is desired to remove cards from the support before it reaches a predetermined maximum distance from the position of card delivery it is necessary for the operator to proceed first to the control end of the machine in order to operate the controls to effect stopping of the machine and then to proceed to the delivery end of the machine to remove the cards. Thereafter the operator must again go to the control end of the machine to effect re-starting thereof.

It is, of course, necessary that the machine be stopped before removal of cards because during operation of the machine the cards issue therefrom continuously at a high rate and if the machine is not stopped the action of removing cards from the support would seriously interfere with the proper delivery of cards during the removal operation. However, the time taken by the operator in proceeding from end to end of the machine is operational time wasted and it is one object of the present invention to avoid such time wastage.

It is a main object of the present invention to provide in a machine of the kind above referred to apparatus which is so constructed and arranged that the operation of the machine will be automatically interrupted by the hand of an operator being moved to engage cards on the support and will be automatically re-started on removal of the hand.

According to the present invention there is provided in a machine of the kind above referred to apparatus comprising an interrupter device, to interrupt operation of the driving means, a control device to control operation of the interrupter device, and a manually operable actuator spring-urged to a normally inactive position in which it is so disposed as to be engaged by a hand entering the path of the support to engage cards thereon and thereby moved from its inactive position to operate the control device to effect interruption of the operation of the driving means and being spring restored to permit continued operation of the driving means on removal of the hand from said path.

In one preferred embodiment of the apparatus the driving means includes a clutch and the interrupter device comprises a clutch trip member and a solenoid to control operation thereof, and the control device comprises an electric switch operated by the actuator to control the operation of the solenoid. The actuator means may

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comprise an arm secured to and depending from a rocking spindle and normally co-operating with said switch to close the solenoid circuit, a flap also secured to the rocking spindle and depending therefrom for manual engagement as aforesaid, and a spring urging said flap to the normally inactive position thereof.

In order that the invention may be clearly understood one embodiment thereof will now be described, by way of example, with reference to the accompanying diagrammatic drawings in which:

Fig. 1 is an end elevation of the card delivery end of a statistical machine,

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

Fig. 3 is a top plan of Fig. 2 but with the card feeding rollers omitted, and

Fig. 4 is a pictorial view, partly exploded, of a clutch device included in the driving means for the machine and by which operation of the machine can be interrupted and restarted.

Referring to the drawings, record cards are fed through the machine by a plurality of pairs of rollers 1, 2, Fig. 2, supported by the machine frames 3. As is customary the rollers are positively rotated by gearing, not shown, driven from a main shaft 4, Fig. 4, through a clutch device connecting the shaft 4 with a continuously rotating shaft 5, the shaft 5 being rotated by any suitable means, for example an electric motor, not shown.

The clutch device forms an interrupter device whereby operation of the machine can be interrupted and comprises a clutch dog 6 secured to a worm wheel 7 freely rotatable on shaft 4 and driven by a worm 8 secured to shaft 5. A clutch pawl 9 is carried by and pivoted on a disc 10 secured to the shaft 4 for rotation therewith, and is urged by a spring, not shown, to the active position thereof shown in Fig. 4. A trip member 11 pivoted at 12 to a machine frame 3 is normally held out of engagement with the pawl 9 but is operable by the armature 13 of solenoid 14, as described below, to trip the pawl 9 out of engagement with the clutch dog 6 thereby to interrupt the operation of the machine.

The last set of rollers 1, 2, at the left as viewed in Fig. 2, delivers the cards in succession on to a support 15 supported by guide rails 16 for movement in a vertical plane. The support 15 is carried by a carriage 17 which is provided with two upper rollers 18 and a lower roller 19 running on the rails 16 to steady the support and it is urged upwards towards the position of delivery of the cards thereto by springs 20 anchored to the carriage 17 and to the machine frames 3.

From Fig. 2 it will be seen that cards leaving the last set of rollers 1, 2 are deflected downwards towards the support 15 by a deflector plate 21 and the leading edges of the cards being superposed on the support engage a fixed stop plate 22 which aligns the cards as they are superposed one on the other on the support 15. As each card is delivered on to the pile on the support 15 the latter is forced downwards against the action of springs 20 by a distance equal to the thickness of the card.

To facilitate removal of a pile of cards from the support 14 the latter is provided with a cut-away portion 23 but it will be understood that the uppermost cards of the pile on the support are always engaged by the stop plate 22. In order to remove cards neatly and in the order in which they are stacked on the support it is necessary that the top and bottom cards of the pile be gripped by the hand removing the pile from the support. The bottom card can be engaged by the hand due to the provision of the cut away portion 23 of the support and to facilitate engagement of the top card of the pile, the stop plate 22 has a cut-away portion 24, Fig. 2.

In accordance with the present invention the machine

is automatically stopped by the movement of the hand of the machine operator into the path through which the support 15 moves and this is effected by a control device which controls the operation of the solenoid 14 and trip member 11 for the clutch pawl 9. The control device, as shown in the drawings, consists of an electric micro-switch 25, Figs. 1, 3 and 4 secured to a bracket 26 fixed to one of the machine frames 3, the switch 25 being in circuit with the solenoid 14 and controlling the energization thereof by opening or closing the circuit therefor.

The control device 25 is operated by an actuator consisting of a flap 27 depending from and secured to a spindle 28 mounted for rocking movement in brackets 29 secured to the machine frames 3. The flap 27 is urged by a spring 30 to a normally inactive position in which it is so disposed that it must be rocked inwards, to the right as viewed in Fig. 2, by the hand of an operator moving into the path of the support 15 to engage the top card of a pile on the support.

Also secured to the spindle 28 for rocking movement therewith is an arm 31 which co-operates with the switch 25 to effect actuation thereof on rocking movement of the spindle 28 thus causing the switch to open the circuit of the solenoid 14 whereupon a spring 32, Fig. 4, acts to insert the trip member 11 into the path of a tail 33 on pawl 9 to trip the pawl out of the clutch dog 6 thus interrupting the operation of the machine.

It is not always desired to remove a pile of cards from the support before the support has been moved to a predetermined position at a distance from the position of card delivery and so, to ensure that operation of the machine is automatically interrupted when the support does reach such predetermined position means are provided to effect operation of switch 25 when the support reaches the predetermined position.

These means comprise a lateral abutment 34 carried by the arm 31 and against which rests a rocking element formed by one arm of a bell-crank lever 35 freely pivoted at 36 to the bracket 26. The other arm of the bell-crank lever is normally positioned in the path of the lower roller 19 on carriage 17, the roller 19 thus forming a rocking member which, when the support reaches said predetermined distance from the position of card delivery, rocks the rocking element 35 clockwise as viewed in Fig. 2, about its pivot 36 thereby imparting to the arm 31 a rocking movement such as it receives on movement of the flap 27 from the inactive position thereof and accordingly effecting operation of the switch 25 which in turn operates the solenoid 14 to effect interruption of operation of the machine.

From the foregoing it will be understood that as viewed in Fig. 2, on counterclockwise movement of flap 27 or clockwise movement of rocking element 35 the operation of the machine will automatically be interrupted while on restoration of the flap 27 or element 35, by spring 30, to its normal inactive position operation of the machine will automatically be recommended as then the solenoid 14 will be again energized and its armature 13 will, against action of spring 32, draw the trip member 11 out of the path of the tail 33 thus permitting pawl 9 again to cooperate with dog 6 to effect operation of the machine.

In the foregoing description of apparatus according to the present invention there has been described a switch 25 and solenoid 14 for effecting interruption of the operation of the machine, it will, however, be understood that if desired these parts may be replaced by a Bowden wire operated by the arm 31 and acting to operate the trip member 11.

I claim:

1. A record card controlled statistical machine comprising driving means including a normally active clutch, card feeding rollers driven by said driving means, a card receiver to receive cards delivered from the machine by the feeding rollers and including a support movable away from the position of card delivery thereto under the

weight of cards delivered thereto and spring-urged towards the position of card delivery, a normally inactive clutch trip member spring-urged to the active position thereof thereby to render said clutch inactive, a solenoid cooperating with the trip member to retain the member in the inactive position thereof, a normally closed electric switch electrically connected with said solenoid, a rocking spindle, an arm secured to and depending from said spindle and spring-urged normally to close the switch, a bell crank to effect rocking of the spindle, and a rocker member carried by said support and operable on movement of the support to a predetermined distance from the position of card delivery thereto to co-operate with said bell crank and effect rocking of said spindle to a position at which said arm is moved thereby to open said switch thereby to render the solenoid inactive and permit the trip member to move to the active position thereof to render the clutch inactive.

2. A machine according to claim 1, including a carriage on which the support is mounted to lie in a horizontal plane, guide rails to guide the carriage for movement in a vertical plane, rollers freely mounted on the carriage to run on opposite sides of the guide rails, and springs connected with the carriage and tending to urge the support towards the position of card delivery thereto.

3. A record card controlled statistical machine comprising driving means including a normally active clutch, card feeding rollers driven by said driving means, a card receiver to receive cards delivered from the machine by the feeding rollers and including a fixed stop plate to align the leading edges of cards delivered to the receiver by the feeding rollers, and a support movable relative to the stop plate as cards are delivered thereon and spring-urged towards the position of card delivery thereto, said stop plate and support each having a cut-away portion to permit manual engagement of the top and bottom cards of a pile on the support to facilitate removal of the pile from the receiver, a normally inactive clutch trip member spring-urged to the active position thereof thereby to render said clutch inactive, a solenoid co-operating with the clutch trip member to retain the trip member in the inactive position thereof, a normally closed electric switch electrically connected with said solenoid, a rocking spindle, an arm secured to and depending from said spindle normally to close said switch, and a flap secured to said spindle and depending therefrom for engagement by a hand entering the cut-away portion of said stop plate, said flap being spring-urged to a position thereof at which said arm effects closing of said switch and operable on movement thereof against the action of its spring to effect opening of the switch thereby to permit movement of the clutch trip member to the active position thereof.

4. A machine according to claim 3, including an abutment carried by said arm, a rocking element engaging said abutment, and a rocker member movable with said support to effect rocking of the rocking element when the support is moved to a predetermined distance from the position of card delivery thereby to operate said arm and open said switch to effect interruption of the driving means.

5. A machine according to claim 4, including a carriage on which the support is mounted to lie in a horizontal plane, guide rails to guide the carriage for movement in a vertical plane, rollers freely mounted on the carriage to run on opposite sides of the guide rails, and springs connected with the carriage and tending to urge the support towards the position of card delivery thereto.

6. A record card controlled statistical machine comprising driving means including a normally active clutch, card feeding rollers driven by said driving means, a card receiver to receive cards delivered from the machine by the feeding rollers, a fixed stop plate to align the leading edges of cards delivered to the receiver by the feeding rollers, a support movable relative to the stop plate as cards are delivered thereon, a carriage on which the sup-

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port is mounted to lie in a horizontal plane, guide rails to guide the carriage for movement in a vertical plane, rollers freely mounted on the carriage to run on opposite sides of the guide rails, springs connected with the carriage and tending to urge the support towards the position of card delivery thereto, said stop plate and support each having a cut-away portion to permit manual engagement of the top and bottom cards of a pile on the support to facilitate removal of the pile from the receiver, a normally inactive clutch trip member spring-urged to the active position thereof thereby to render said clutch inactive, a solenoid co-operating with the clutch trip member to retain the trip member in the inactive position thereof, a normally closed electric switch electrically connected with said solenoid, a rocking spindle, an arm secured to and depending from said spindle normally to close said switch, and a flap secured to said spindle and

depending therefrom for engagement by a hand entering the cut-away portion of said stop plate, said flap being spring-urged to a position thereof at which said arm effects closing of said switch and operable on movement thereof against the action of its spring to effect opening of the switch thereby to permit movement of the clutch trip member to the active position thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

2,251,221	Cleven	July 29, 1941
2,320,393	Randolph	June 1, 1943
2,379,828	Rubidge	July 3, 1945
2,390,573	Dohl et al.	Dec. 11, 1945
2,549,965	Fitzgerald	Apr. 24, 1951