May 4, 1943. N. S. WELK 2,318,132

AUTOMATIC STOP FOR COUNTING MACHINES

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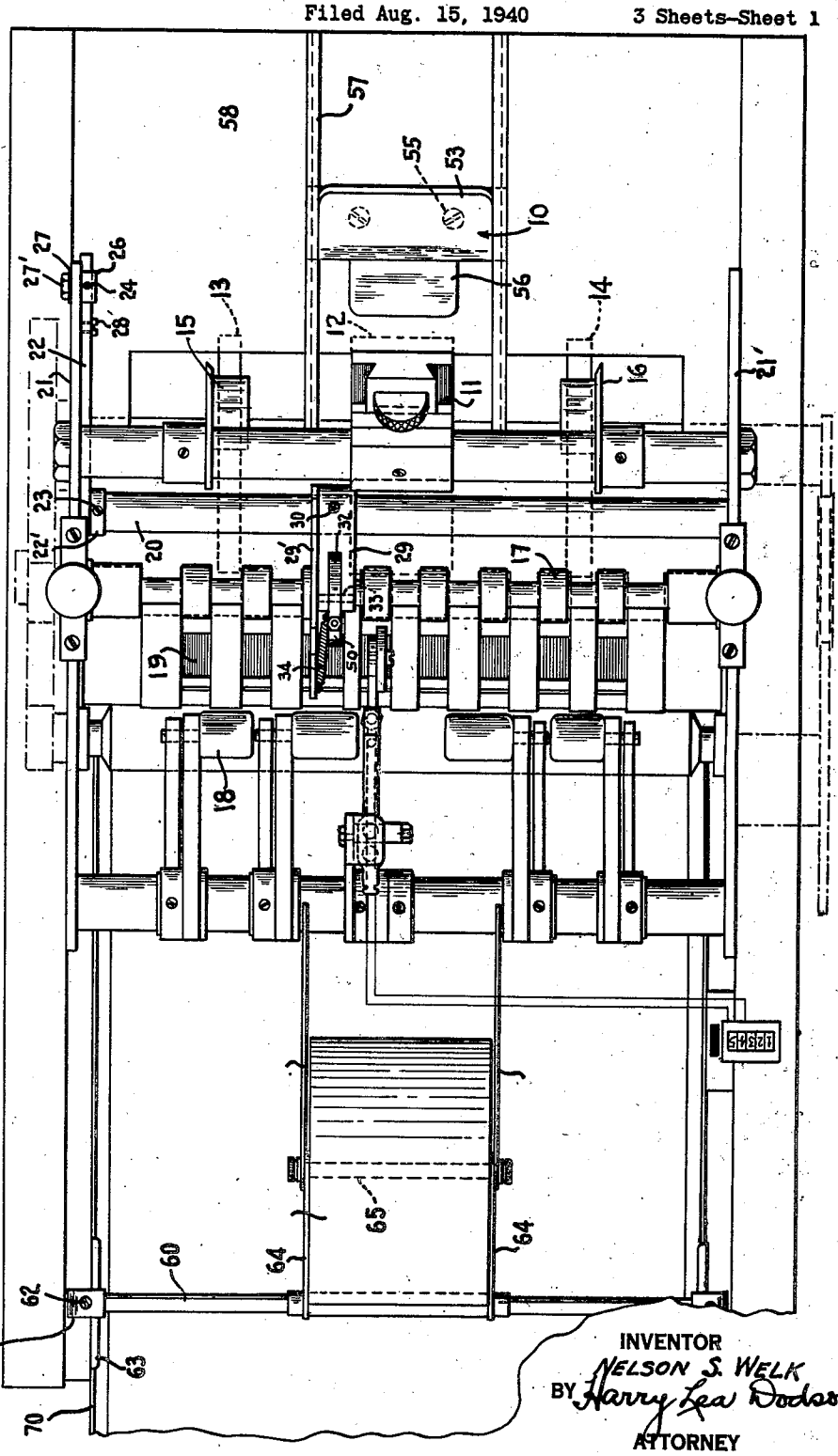


FIG. 1

INVENTOR
NELSON S. WELK
BY Harry Lea Dodson
ATTORNEY

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FIG. 5

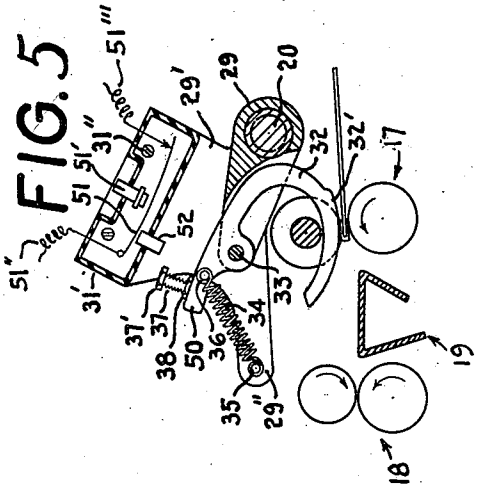


FIG. 3

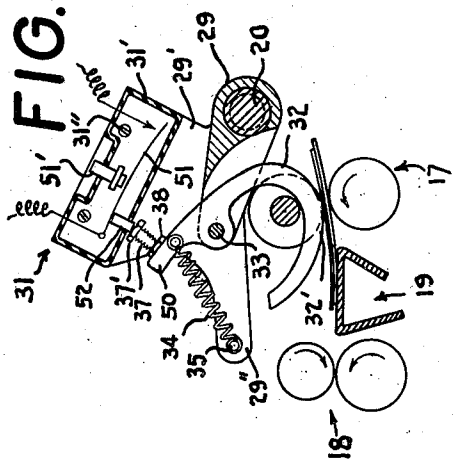


FIG. 4

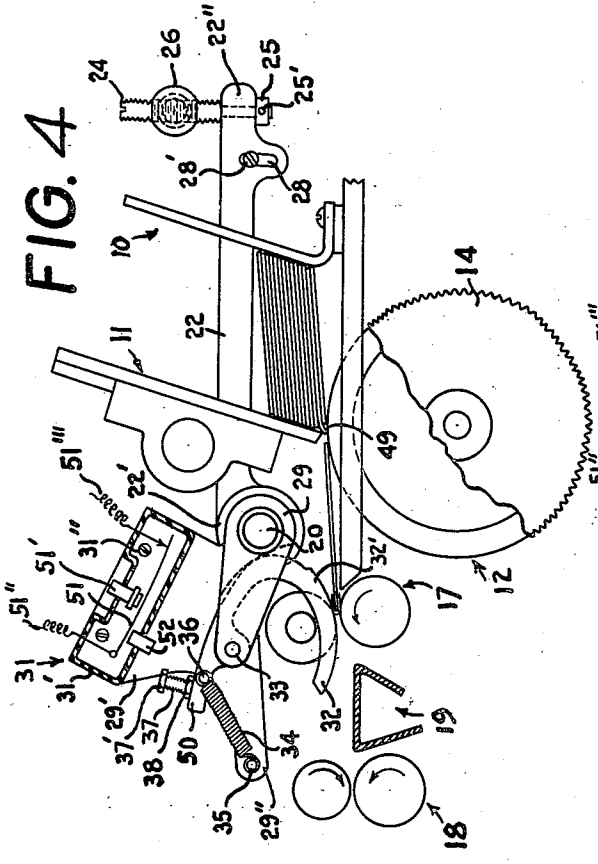
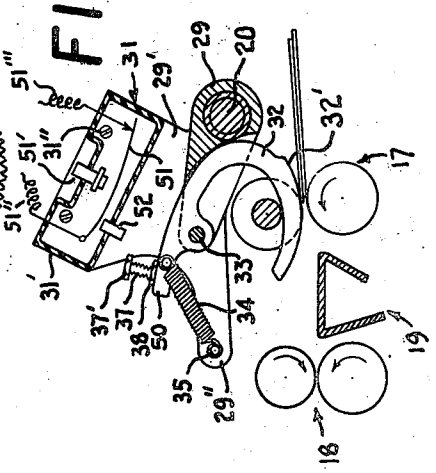


FIG. 2



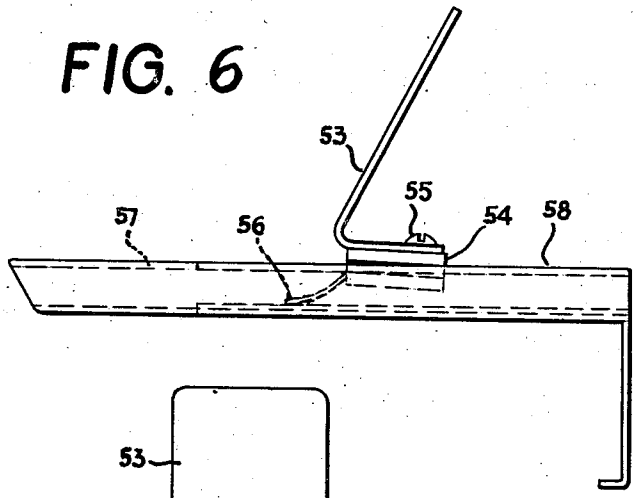
INVENTOR
NELSON S. WELK
BY Harry Lee Dodson
ATTORNEY

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FIG. 6



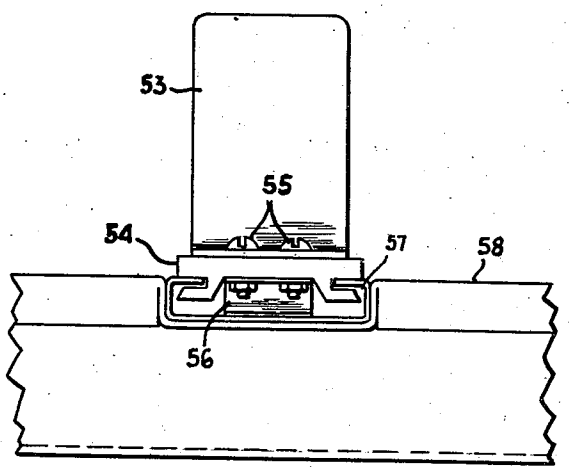


FIG. 7

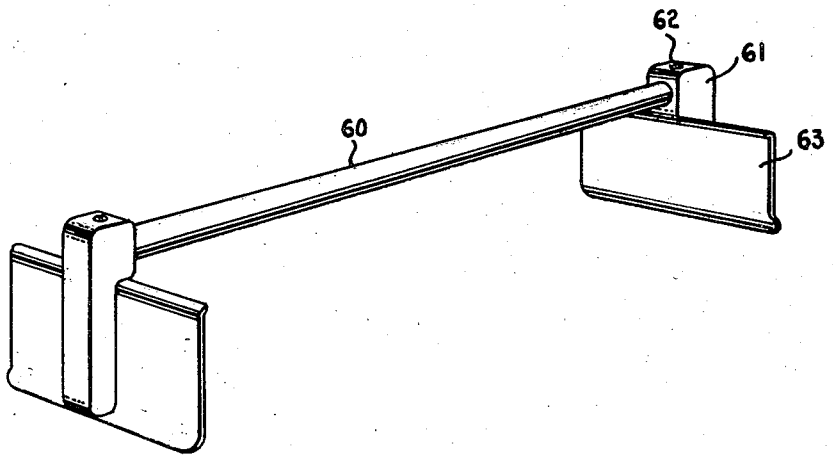


FIG. 8

INVENTOR
NELSON S. WELK
BY Harry Leal Dodson
ATTORNEY

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AUTOMATIC STOP FOR COUNTING MACHINES

Nelson S. Welk, Athens, Ohio, assignor to The McBee Company, Athens, Ohio, a corporation of Ohio

Application August 15, 1940, Serial No. 352,703

4 Claims. (Cl. 192—127)

My invention relates to that class of machine which is described in my copending application, Serial No. 286,570, now Patent No. 2,233,149, issued February 25, 1941. As described in that application, the machine is designed to count cards, checks, loose leaves, etc., at a very high rate of speed, counting as high as 50,000 cards per hour.

It has been found in practice that the sheet material counted by these machines does not always run true to size. This is frequently the case if the size of the sheet is a multiple of the standard size of paper sheets carried in stock, for it is well known, these sheets vary in size, with the result that unless there is considerable waste the variations will also appear in the cards and some will be longer than others.

When counting such cards, in the machine, it sometimes happens that a long card will be on top of a short one. When and if this occurs the short card will be compressed into the rubber feed wheel and the edge of the long card will be forced down over the edge of the shorter card and thus two cards will be fed under the caliper. Obviously, if this occurs there will be an inaccurate count which however can not be observed owing to the high rate of speed of the cards passing through the machine.

Inasmuch as the utility of the machine depends upon its accuracy, such an occurrence militates against its use and consequently its sale.

Moreover, if the machine is used to count cards which have been perforated and notched according to the teachings of Perkins Patent No. 1,544,172 a further difficulty is experienced. This is due to the fact that as taught in that patent the card is provided with a plurality of perforations adjacent one or more of its edges. The material intermediate certain of the perforations is then cut or notched out forming a pattern which refers to a single desired classification. This usually leaves a number of points or fingers which are more or less sharp and consequently easily bent out of shape.

It sometimes happens that the operator in notching a card makes an error. In other instances it may be desired to change the classification so as to avoid the expense due to having to throw away such card. Such an error may be rectified, or the change in classification effected by attaching to the edge of the card a fold-over sticker made of gummed paper. It will be clear that when such sticker is cemented in place, any erroneous notches will be closed or the entire pattern of notches may be filled up in this manner. When this is done however, the edge of the card is thickened by the addition of the paper forming the sticker, so that it will not pass through the caliper.

In certain cases it is the custom to attach tabs of various colors to the edge of the card to facilitate the selection of cards referring to a single classification. Here too the card is thickened by the thickness of the material of which the tab is formed.

Now if the machine is equipped with a stop which will operate when two cards pass into it, obviously the thickness of the cards provided with stickers or tabs would also stop it, whereas only a single card is passing through the machine. The result is that it becomes necessary not only to provide automatic mechanism to stop the machine when two cards are fed through, but which will permit a card having thickened edges to pass through without its actuating the stop mechanism.

The principal object of my invention is to provide a mechanism which will automatically stop the machine if two cards are fed through the machine regardless of the speed of the machine.

A further object is to so construct the said mechanism that if a card having thickened edges is fed to the machine it will not stop the machine, provided that the increased thickness is confined to the edge of the card.

A further object of my invention is to improve the support for the stack of cards to be fed to the machine as shown in the said application in which the card support slides upon two parallel rods. In practice, it has been found that these rods interfere with the operator when placing a stack of cards in position to be fed. With my improved construction as herein set forth, these rods are entirely done away with, yet I preserve the adjustable feature which is so desirable.

A further object of my invention is to provide an improved means for supporting the stacker roll carrying means.

My means of accomplishing the foregoing objects may be more readily understood by having reference to the accompanying drawings which are hereunto annexed and made a part of this specification in which:

Fig. 1 is a plan of a counting device equipped with my improved stopping mechanism.

Fig. 2 is a diagrammatic view of my attachment for stopping the machine when two cards are fed under it, showing the cards about to operate my improved device for stopping the machine.

Fig. 3 is a similar view showing two cards passing through the machine where the stop mechanism has been actuated.

Fig. 4 is a view showing a card with a "sticker" or tab attached to its edge about to enter the first set of wringer rolls.

Fig. 5 is a similar view showing the position of a similar card passing through the wringer rolls and under the switch control arm without actuating the stop mechanism.

Fig. 6 is a side elevation of an improved sup-

port for cards to be fed into the counting machine.

Fig. 7 is a front elevation of the support shown in Fig. 6 and

Fig. 8 is a detailed view of an improved method of supporting the stacking roller which functions to stack the cards upon the conveyor belt.

Similar reference numerals refer to similar parts throughout the entire specification.

As shown in the drawings the machine is the one illustrated in the said application Serial No. 286,570 which has attained wide commercial success. It has a card supporting plate 10, against which the cards rest, a caliper 11, to regulate the space for the admission of cards, a main feeding roll 12, two card supporting rolls 13 and 14, adjustable spacing plates 15 and 16, and two sets of carrying or wringer rolls 17 and 18, with a platform 19, mounted between them.

My improvement is more clearly seen by reference to Figs. 1 and 4, in which a shaft 20, is provided which extends across the machine. The ends of this shaft are preferably turned down forming a reduced portion and a shoulder. The reduced portion is fitted to holes in the side walls 21 and 21', and the shoulders abut the same holding the shaft from longitudinal movement while permitting it to rotate.

Upon the shaft adjacent one end thereof I mount the hub 22' of an arm 22. The hub 22' is secured fixedly to the shaft 20, by any convenient means, as shown a dowel pin 23, is employed for that purpose.

Mounted on the shaft 20, adjacent the center of the machine is a bracket 29, which is fixedly secured thereto by means of a set screw 30. This bracket 29, has an outwardly and upwardly extending wall 29'.

On the wall 29' I mount a standard commercial switch 31, which is known to the trade as a "micro electric switch." The operating parts of the switch 31, are housed in a casing 31' usually formed of hard rubber or a synthetic composition. Screws 31'' are used to fasten the switch 31 to the wall 29' of the bracket 29. The switch comprises a spring contact 41, which is normally closed carrying current through wires 51'' and 51''' to the motor (not shown) which drives the machine. A push button 52 is provided in the lower wall of the container 31', longitudinal movement of which will operate to flex the spring 51 and break the electrical contact.

In the top wall is mounted a manually operable push button 51' by means of which the operator may restore the circuit after it has been broken by the push button 52.

My improved switch control 32 is mounted upon a pin 33, upon which it swings freely. The pin 33, is carried by a fork formed on the bracket 29. The switch control 32, is falciform when viewed in side elevation and is provided with an elevated peripheral surface 32'. It has an arm 50, which carries a pin 36, to which is attached one end of a spring 34, the other end of the spring is secured to a pin 35, which is mounted in a member 29'' which projects from the wall 29' of the bracket 29, as clearly seen in the detail views.

The function of the spring 34, is to hold the switch control 32, normally in the position shown in Figs. 2 and 5. An adjustable screw 37, provided with a head 37' is mounted in the arm 50 near its end. A lock nut 38, is provided to lock the screw 37, in its adjusted position.

Means for adjusting the position of the pivot 33, on which the switch control swings comprises a screw 24, which is rotatably mounted in the end 22' of the arm 22, a collar 25 and cotter pin 25' serving to hold it in place. The screw 24 is threaded into a stud 26 which is rotatably secured to the side wall 21 by a nut 27' and washer 27. The arm 22, is held in alinement by means of a screw 28' which passes through a slot 28, formed in said arm 22, and into the side wall 21.

In Figs. 6 and 7 I have shown my improved card support which comprises an angle plate 53, carried by a block 54, to which it may be secured by bolts 55, which also serve to hold a friction spring 56. The block 54, is fitted to and slidable in a slide or channel 57, which may be mounted in a depression or groove formed in table 58 and secured therein in any desired manner.

As shown in my copending application, the stacker roller shaft is carried by a pair of arms fastened to a shaft in front of the stacker roller. In my improved construction shown in Fig. 8, I mount a detachable shaft 60, which is carried by blocks 61, to which they are secured by set screws 62. These blocks 61, are attached by welding or in some other suitable manner to slidable plates 63. This shaft carries two arms 64, which support the shaft 65, on which the stacker roller J rotates. Inasmuch as the inner surfaces of the plates fit tightly over metal frame 70, it is held securely, but detachably, in place.

Operation of the automatic stopping mechanism

It will be clear to persons skilled in the art that as long as the cards are normal, the counting will be accurate and no difficulty will be experienced in obtaining an accurate count. But, if one or more of the unusual conditions, hereinbefore referred to, happens, it may be possible for two cards to be fed through at one time, and if this occurs, they will be counted as a single card.

Practice has shown that it is almost impossible for cards to be cut so closely to size that they will not vary. As I have stated, this is nearly always true if the condition before referred to exists, that is, where the size of the card is a multiple of a standard size of card sheet such as is usually carried in stock by manufacturers of cards. This is due to the fact that these sheets vary in size, so that the cards cut from the two margins will vary considerably. Now when this occurs, it may happen that a short card may be followed by a longer one, as clearly shown in Fig. 4, the result will be that the edge of the long card will be forced downwardly, as indicated at 49, in said Fig. 4. This will have the effect of compressing the short card into the rubber surface of the feeding roll 12, and will permit two of the cards to pass under the caliper 11. In Fig. 2 I have shown the two cards passing under the switch control 32, which acts in a measure as a secondary caliper. The first set of wringer rolls 17 will carry these two cards along with the result that since the switch control 32 is adjusted to approximate one and one-half the thickness of a card (which may be done through the medium of the adjusting lever 22 and adjusting screw 24), the two cards as they enter the wringer rolls 17 will swing the switch control 32, and this swinging motion will elevate the arm 50, of the switch control, carrying the screw 37 with it, thus causing its head 37' to contact the push button 52, which in turn will open the contact switch spring 51, as clearly seen in Fig. 3.

As previously explained, this spring is mounted in the container 31, which houses the "micro switch." The design of the contact spring 51, is such that when its contact is broken, by the pressure of the push button 52, it will be flexed and remain so with the contact points open until the operator presses manually upon push button 51' mounted in the upper wall of the casing of the "micro switch." This will flex the spring 51, in the opposite direction and again close the contacts and complete the circuit to the motor which will start the machine again.

It is understood that this "micro switch" is suitably connected by electric conductors to the main line, so that when the contact spring 51, breaks the contact, the machine will stop, since the supply of electric current is cut off.

When the two cards are fed as described and the machine is stopped by the automatic action of the switch control 32, before manually depressing the button 51', the operator should add one to the counter dials of the electric counting mechanism manually, and then start the machine by pressing down button 51'.

Obviously the count may also be corrected by lifting one of the two cards and placing it back in the hopper on top of the other cards in the stack, however, if the cards which are being counted are arranged in sequence which must be maintained during the counting operation, it is preferable to add an additional unit on the counter for each time the machine is stopped.

As previously explained, it is frequently the case that these cards are provided with stickers or tabs and when this is done the cards so equipped should be permitted to pass through the counting machine without stopping it. I accomplish this result in the following manner.

In Fig. 4 I have shown a card carrying a sticker passing under the switch control 32. This operation swings the switch control on its pivot 33, in the same manner as when two cards pass through, with this difference, that as the area of the sticker is comparatively slight, it will only swing the caliper a short distance and as soon as the thickened portion passes under the switch control 32, the coil spring 34, will swing the switch control to its normal position and this movement, as clearly seen in the drawings, will occur before the head of the screw 37, contacts the push button 52, with the result that the machine will not be stopped.

It has been found, in practice, that regardless of the fact that the machine is a high speed machine, it will not be stopped by cards equipped with stickers as hereinbefore described, but it will be invariably stopped if two cards pass from the hopper simultaneously.

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

1. In a card counting machine driven by electric current flowing through a normally closed switch; means to open said switch; a pivoted switch control swung on its pivot by the passage of a card through said machine, said control including an arm having a peripheral surface adapted to contact the surface of more than one card fed simultaneously therethrough and being actuated thereby, the length of the said peripheral surface being so related to the throw of said switch control that in the case of single cards with relatively short arm contacting protuberances said protuberances will be too short to actuate said contact control to its switch opening position but that if more than one card be fed simultaneously through the machine the relatively long surface provided by said plurality of cards will be in contact with said peripheral surface sufficiently long to actuate said control to its switch opening position.

2. In a card counting machine having a normally closed switch, means to open said switch, a container for said switch, means to feed a card through said machine, oscillating means having a peripheral surface adapted to contact the surface of more than one card fed simultaneously therethrough and being actuated thereby, the length of said peripheral surface being so related to the throw of said means to open said switch that in the case of single cards with tabs or the like said tabs will be too short to actuate said oscillating means to cause the said oscillating means to contact said first named means and open said switch, but that if more than one card is fed simultaneously through said machine, the relatively long surface provided thereby will be in contact sufficiently long to actuate said oscillating means to cause said oscillating means to contact said first named means and open said switch.

3. In a card counting machine having a normally closed switch, means to open said switch, a container for said switch, means to feed a card through said machine, oscillating means having a peripheral surface adapted to contact the surface of more than one card fed simultaneously therethrough and being actuated thereby, the length of said peripheral surface being so related to the throw of said means to open said switch that in the case of single cards with tabs or the like, said tabs will be too short to actuate said oscillating means to cause the said oscillating means to contact said first named means and open said switch but that if more than one card is fed simultaneously through said machine, the relatively long surface provided thereby will be in contact sufficiently long to actuate said oscillating means to cause said oscillating means to contact said first named means and open said switch, and manually operable means to close said switch.

4. In a card counting machine driven by electric current flowing through a normally closed switch; means to open said switch; a pivoted switch control swung on its pivot by the passage of a card through said machine, said control including an arm having a peripheral surface adapted to contact the surface of more than one card fed simultaneously therethrough and being actuated thereby, the length of the said peripheral surface being so related to the throw of said switch control that in the case of single cards with relatively short arm contacting protuberances said protuberances will be too short to actuate said contact control to its switch opening position but that if more than one card be fed simultaneously through the machine the relatively long surface provided by said plurality of cards will be in contact with said peripheral surface sufficiently long to actuate said control to its switch opening position, and manually operable means to close said switch.

NELSON S. WELK.