Dec. 10, 1935. P. F. GROUT 2,023,921

COUNTER ACTUATING DEVICE

Filed June 14, 1932 4 Sheets-Sheet 1

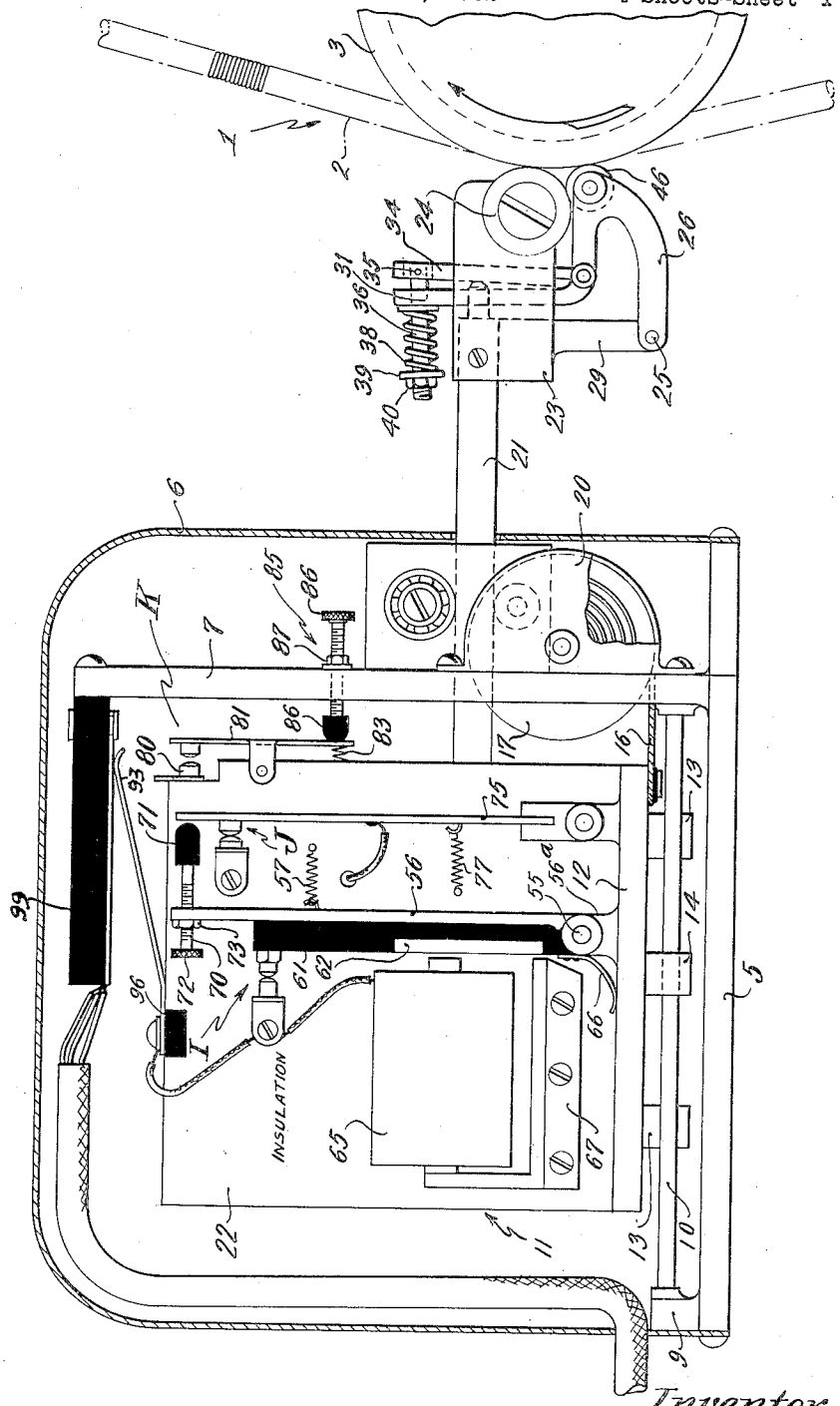


Fig. 1

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COUNTER ACTUATING DEVICE

Filed June 14, 1932 4 Sheets-Sheet 2

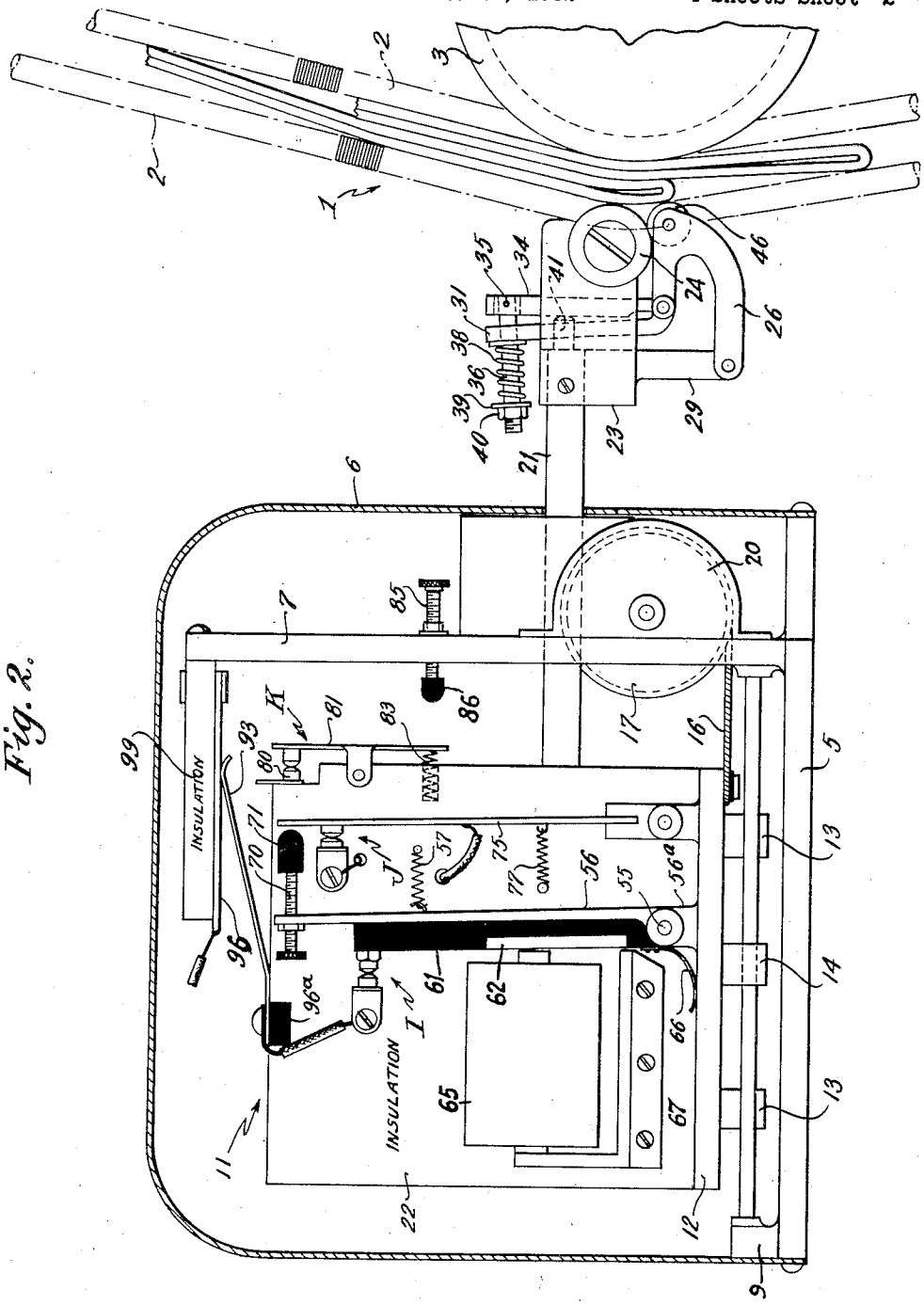


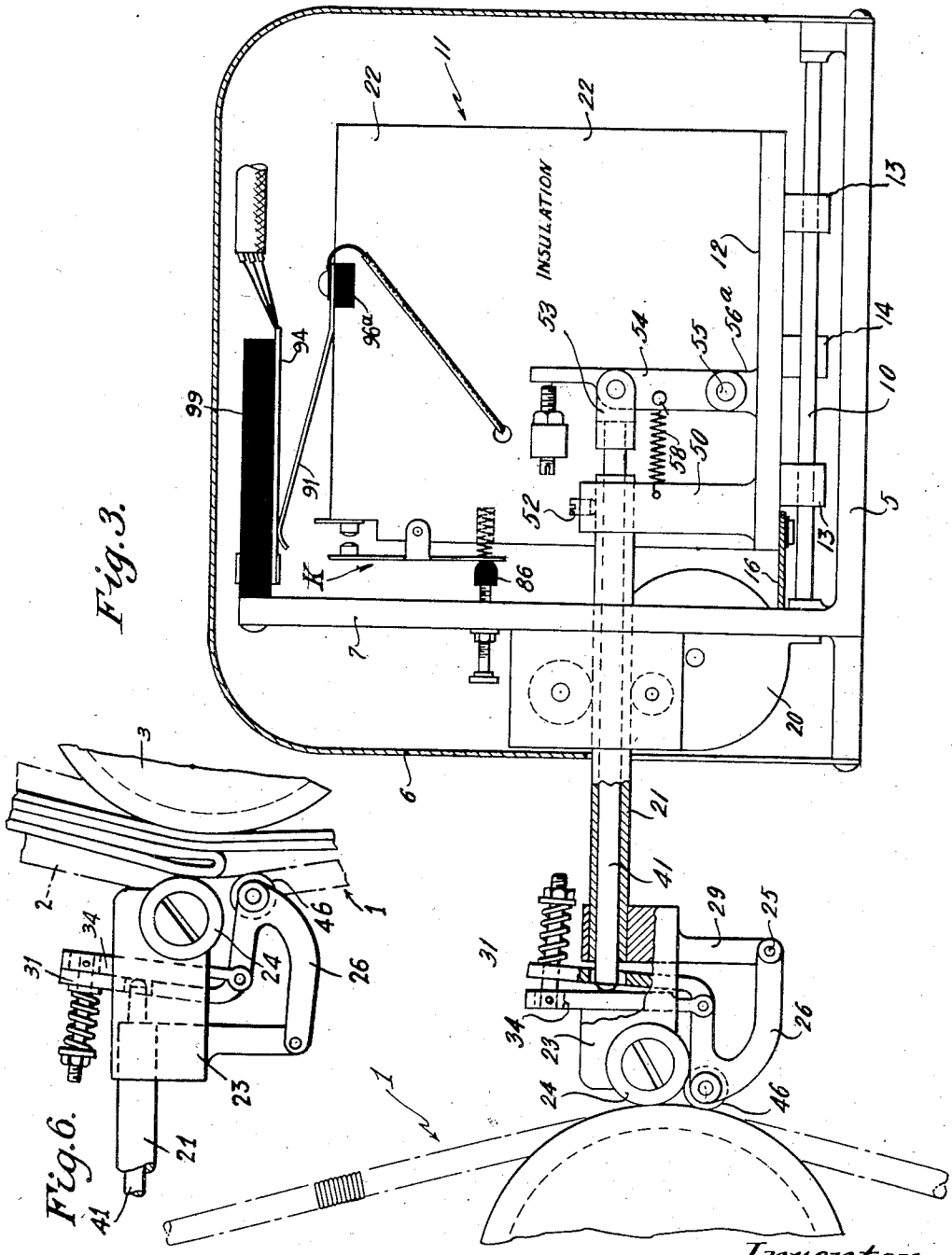
Fig. 2.

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COUNTER ACTUATING DEVICE

Filed June 14, 1932 4 Sheets-Sheet 3



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Dec. 10, 1935. P. F. GROUT 2,023,921

COUNTER ACTUATING DEVICE

Filed June 14, 1932 4 Sheets-Sheet 4

Fig. 5.

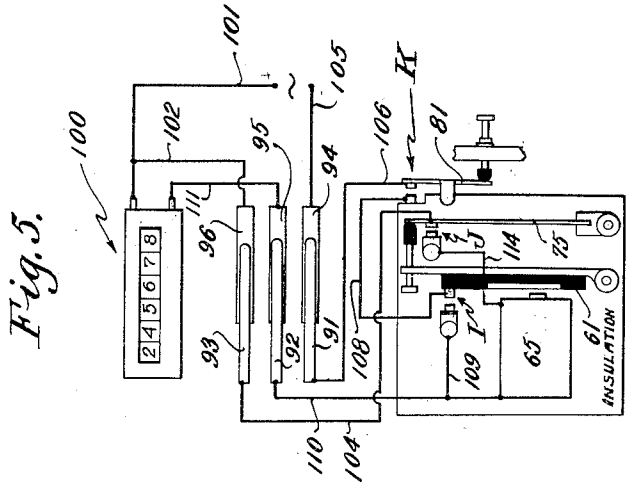
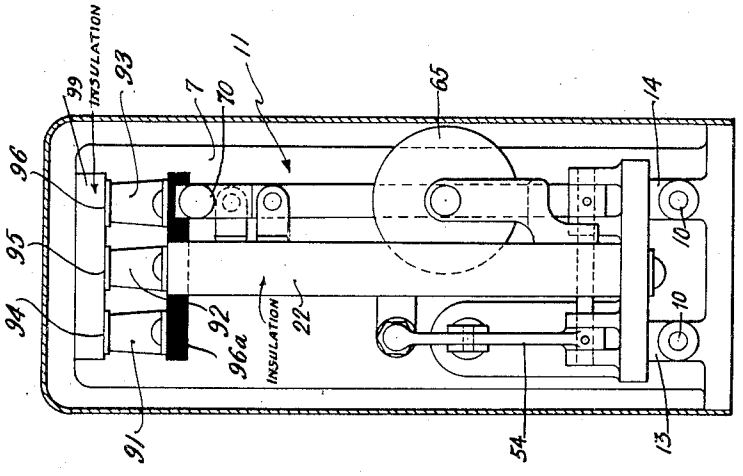


Fig. 4.



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UNITED STATES PATENT OFFICE

2,023,921

COUNTER ACTUATING DEVICE

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Application June 14, 1932, Serial No. 617,133

11 Claims. (Cl. 235—98)

This invention relates to a device for actuating a counter, for example, of the electrically operable type, in response to a series of articles moving past the device upon a conveyor. This device is particularly suitable for the accurate counting of newspapers as they leave the printing press.

In the conventional operation of newspaper printing establishments, the freshly printed papers are delivered from the press room to the mailing or distributing room by means of a conveyor and the papers received from the conveyor are counted in the mailing room. However, papers often are removed when they leave the presses so that the number of impressions recorded in the press room may vary rather widely from the number of papers actually received in the mailing room. This invention affords an automatically operable arrangement to assure the accurate counting of the newspapers or the like as they are being conveyed from the press room to the mailing room, thus affording a definite, impartial record of the actual number of papers supplied to the mailing room by the press room and permitting the checking of the record of the number of impressions by the presses with the number of papers actually received, so that it may be ascertained whether or not an undue number of spoiled papers have been removed in the press room or whether copies of the papers have been removed by people having access to the press room rather than passing out through legitimate channels.

In accordance with this invention, I provide a device which is adapted to be actuated by the folded portion of a newspaper even when a plurality of papers pass along the conveying means in overlapped relationship to each other. This device affords suitable electrical means for actuating an electrical counter which may be of customary design and responsive to an electrical impulse. To this end, I afford two elements juxtaposed to the path of the successive papers, the first of these elements being actuable to close a controlling circuit which conditions a circuit through which the counter may be actuated, and the second of these elements actuating a switch control which causes subsequent deenergization of the counter circuit, thus affording means operable to close and open the counter circuit in rapid succession if necessary so that papers even in close overlapped relationship may actuate the counter to afford an accurate record of the actual number of papers passing along the conveyor means.

In the accompanying drawings:

Fig. 1 is a front elevational view of my improved actuating device, the casing of the same being broken away and a portion of the conventional conveyor means being shown in juxtaposition to the device;

Fig. 2 is a view similar to Fig. 1 showing papers on the conveyor means and the position of the parts of my device when the counter is being actuated;

Fig. 3 is a rear elevation of my device with the casing shown in section and a portion of the conveyor device also shown;

Fig. 4 is an end elevation of my device with the casing shown in section;

Fig. 5 is a diagrammatic view showing the arrangement of the wiring and electrical connections of my device and the counter with which it is associated;

Fig. 6 is an elevational detail of a portion of the device showing the parts in the position which they occupy as the counter is being actuated.

In the accompanying drawings, the numeral 1 designates conveyor means of the well known type which is employed in newspaper publishing establishments and which is provided with yieldable belt elements 2 passing over rollers, one of which is identified by numeral 3. The actuating device, which more particularly forms the subject matter of the present invention, is juxtaposed to such a roller 3 of conveyor 1 and comprises a fixed base 5 provided with a box-like sheet metal cover 6. Integral with the base 5 is an upstanding partition or plate 7, while at the opposite end of the plate 5 I provide an upstanding flange 9. A pair of horizontal bars 10 extend between the lower part of plate 7 and the flange 9 to provide a track upon which a moving switch assembly 11 is mounted. This assembly comprises a lower platform 12 with depending lugs 13 and 14 slidably engaging the respective horizontal bars 10.

A cable 16 is secured to one end of the platform 12 and is wound about a spring operated roller 17, the latter being mounted on a substantially semi-cylindrical casing 20 secured to the plate 7. The spring roller 17 is arranged to draw the cable 16 and the assembly 11 to the right as viewed in Fig. 1, i. e., in the direction of the conveyor 1. Mounted upon the platform 12 is an insulating block 22 from which a tube or sleeve 21 projects through casing 6; the outer end of this sleeve carries a bifurcated metal block 23. Upon the outer end of the block 23 is a rotary element or roller 24 adapted to contact a paper

passing along conveyor 1. Depending from the U-shaped member 23 is an integral bar 29 carrying a pintle element 25 upon which a U-shaped arm 26 is pivotally connected. This U-shaped arm 26 has its longer leg pivoted to the part 29 and its shorter leg provided with an upstanding extension 31 which projects between the legs of the bifurcated block 23.

Pivotally mounted upon the member 26 adjoining the juncture of its shorter leg with the projection 31 is an upstanding plate 34 which also extends upwardly between the legs of member 23. The member 34 is pivotally connected, as designated by numeral 35, to a bolt element 36 which extends through an opening in the upper end of member 31. A coiled compression spring 38 is disposed about the shank of member 36 and between a washer engaging the face of member 31 and a washer 39 which is adjustably held on the bolt element by a nut 40. Within the sleeve 21 is an actuating rod 41, the end portion of which extends through an opening in extension 31 and engages the face of member 34. A roller 46 is mounted substantially at the juncture of the legs of the U-shaped member 26, and is smaller than the roller 24, roller 46 also being engageable with papers passing along the conveyor 1.

As shown in Fig. 3, the sleeve 21 is adjustably connected to the movable assembly 11, a block 50 projecting upwardly from the platform 12 and providing an opening to receive the end of the sleeve, and a set screw 52 being provided to clamp the sleeve 21 in the desired position in relation to the block 50. The actuating rod 41 projects beyond the end of sleeve 21 and is received within a recess in a clevis element 53 which is pivotally connected to a crank arm 54 fixed to a shaft 55 extending through the insulating block 22. Suitable journals 56a are provided upon the platform 12 to support the shaft 55. Fixed to the shaft 55 is a metal arm 56 which is connected to a tension spring 57 that in turn is secured to the block 22 while a spring 58 connects arm 54 and block 50. These springs tend to swing arms 56 and 54 together with shaft 55 in the direction of conveyor 1.

Pivotally mounted upon the shaft 55 but freely movable in relation thereto is an insulating bar 61 which supports a metal armature element 62. A spring 66 tends to swing bar 61 against arm 56. An electromagnet 65 is mounted on the insulating block 22 adjoining the armature 62. For this purpose an L-shaped metal bracket 67 is provided so that its end is juxtaposed to the lower end of armature 62 to permit substantial completion of the magnetic circuit. The upper end of arm 56 receives a screw element 70 in threaded engagement therewith, this element carrying an insulating tip 71 and being provided with a knurled head 72. A lock nut 73 is afforded to permit loosening of the screw in relation to the arm 56 and its ready adjustment by means of the knurled head 72.

A swinging switch arm 75 is pivotally mounted upon but insulated from a lug integral with platform 12 and has its upper end engageable with the tip 71 of screw 70. The arm 75 carries one contact of a magnet control switch J, the other contact of which is secured to the insulating block 22, the spring 77 normally holding this switch closed. The upper end of the swinging insulating block 61 similarly carries one contact of a counter-actuating switch assembly I, the other contact of which is fixedly mounted on block 22.

Upon the upper corner of block 22 I provide one contact 80 of a primary switch assembly K, the opposite contact of which is mounted upon a rocker 81, the intermediate part of the latter being pivotally connected to the block 22. A compression spring 83 between the lower end of rocker 81 and the end of block 22 tends to hold the contacts of switch K in mutual engagement, while a screw 85, having an insulating tip 86, is engageable with the lower end of rocker 81 to compress spring 83 and thus move the contacts out of engagement, see Fig. 1. The screw 85 is threaded through an opening in plate 7 and is also provided with a knurled head 86 and a lock nut 87.

As shown in Fig. 4, a plurality, namely three, resilient metal fingers or contact elements 91, 92 and 93 are secured to an insulating plate 96a mounted upon the upper part of block 22; these elements engage corresponding contact bars 94, 95 and 96 which are secured upon the lower surface of a fixed insulating plate 99 that projects from the upper end of plate 7.

The arrangement of the electrical connections of my device and of the associated counter may be more readily understood by having reference to Fig. 5 wherein the counter, which may be of the customary type operable in response to electrical impulses, is designated by numeral 100. A lead 101 connects the counter to one side of the source of electrical supply as, for example, to an ordinary lighting circuit. A branch 102 of this lead is connected to the fixed bar 96 which contacts the metal element 93 upon assembly 11. The member 93 is connected by a lead 104 with the contact of switch assembly J which is carried by arm 75. The opposite side of the electrical line is connected by a lead 105 with the fixed conductor 94, and the contacting movable element 91. The latter is connected by a lead 106 with the contact of switch assembly K which is mounted upon rocker 81. The other contact of this switch is connected by a lead 108 with the contact of switch assembly I which is mounted upon the swinging insulating element 61. The other contact of this assembly is connected by a lead 109 to a lead 110 that is joined to the movable contact element 92 and thus electrically connected through fixed contact 95 and lead 111 to the opposite side of counter 100. The contact of switch assembly J which is fixed to block 22 is connected through a lead 114 with the electromagnet 65 which in turn is connected to the lead 110.

In the operation of a device of this character, the switch K must be closed before current can flow either to the counter 100 or to the magnet 65. The counter will receive current if both the switches K and I are closed, while the magnet 65 receives current when the switches K, J and I are closed. The inoperative condition of the device is illustrated in Fig. 1, the spring roller 17 being effective through the cable 16 in drawing the assembly 11 into a position wherein the lower end of rocker 81 engages the tip 86 of screw 85, thus holding the conditioning switch K in its open position. When there are no papers passing along the conveyor 1 and the parts are in the position illustrated in Fig. 1, the spring roller 17 causes the rollers 24 and 46 to press against the roller 3 of the conveyor. The major portion of the resulting pressure is received by the roller 24 but a portion of the same is effective in pressing

roller 46 inwardly so that a slight thrust is imparted to push rod 41, thus holding arms 54 and 56 in such a position the tab 71 is out of engagement with switch lever 75. Accordingly in this position of the parts the spring 77 is effective in holding switch J in its closed position and the arm 56 is effective in holding the switch I in its closed position against the action of springs 57, 58 and 66.

When the upper edge of a paper is received under the rolls 46 and 24 and particularly under the latter, the tube 21 is effective in pushing the entire assembly 11 away from the conveyor so that the switch K closes. Thereupon current may flow from the lead 105 through the relatively movable contacts 94 and 91, lead 106, switch K, lead 108, switch I, leads 109 and 110, relatively movable contacts 92 and 95, and counter 100 to the lead 101 upon the opposite side of the line. Simultaneously current may pass from switch I, lead 109 and the extension of lead 110 through magnet 65, energizing the latter, thence through lead 114, switch J, lead 104, relatively movable contacts 93 and 96, and lead 102 to lead 101 at the other side of the line. Thus the counter controlling switch I is closed and is being held in closed position due to energization of magnet 65.

As the fold in the paper passes out of engagement with the lower roll 46, Fig. 6, relative movement occurring between rolls 24 and 46, the rod 41 moves toward conveyor 1, permitting arms 54 and 56 to swing in this directioin under the action of springs 57 and 58, so that the tab 71 engages the upper end of switch arm 75 to open switch J. Thereupon the circuit of magnet 65 is opened so that the spring 66 is effective in moving the bar 61 and opening the switch I. Thus a break in the current passing to the counter 100 is afforded, due to the relatively greater pressure afforded by the fold of the paper engaging roll 24 after it has passed out of engagement with roll 46.

The arrangement of the magnet 65 and switches J and I with their associated parts affords a more accurate control of the counter. When arm 56 moves away from arm 61 a slight interval of time elapses before switch J is opened. Thereafter there may be a slight additional interval due to magnetic lag before member 61 swings into engagement with arm 56 and switch I is opened. Due to the slight intervals which may thus elapse, minute irregularities, such as wrinkles in papers, are not sufficient to cause counter actuation; furthermore, this arrangement avoids a tendency which the device otherwise might have to afford an inaccurate count due to chattering under certain conditions. In other words, when the magnet 65 is in its portative position, it firmly holds the switch I closed, while if mechanical means alone were depended upon for this purpose, the switch contacts might be held in very light engagement so that any slight vibration would cause chattering and repetitive actuation of the counter.

When the fold of the paper leaves the roll 24 the rolls assume a relative position similar to that occupied when there are no papers passing along the conveyor, although there may be two or more overlapped papers under these rolls so that the switches I and J are again closed, although in this position of the parts the assembly 11 may be moved further away from the conveyor 1 than would be the case were no papers passing along that conveyor, and switch K remains closed.

It is therefore evident that ordinarily the rolls or elements 46 and 24 occupy the relative position shown in Figs. 1 and 3, the entire movable assembly moving away from or toward the conveyor roll 3, depending upon the thickness of the layer of papers and the thickness of the individual papers on the conveyor 1, but that as a fold of a paper leaves the element 46, the latter moves slightly toward the roll 3, as shown in Fig. 6, thus permitting the movement of the rod 41 and the opening of the control switch J and the counter-actuating switch I. Accordingly the counter is actuated in response to each folded edge of a paper passing along the conveyor 1.

It is evident that the arrangement of the parts 31 and 34 in association with the spring 38 affords a spring take-up means permitting minor variations in the relative positioning of rollers 24 and 46 without affecting the operation of the switches.

I claim:

1. Apparatus of the class described comprising a support, a movable assembly, a pair of relatively movable elements supported by said assembly and adapted to contact a succession of articles, a primary switch having a movable contact upon the assembly, said switch being closable when the assembly moves away from the path of articles contacting said elements, a counter-actuating switch in series with said primary switch, means operable in response to relative movement of said elements to open and close said actuating switch, whereby the counter-actuating switch may be repetitively actuated by a succession of overlapping articles contacting said elements.

2. Apparatus of the class described comprising a support, a movable assembly, a pair of relatively movable elements supported by said assembly and adapted to contact a succession of articles, a primary switch having a movable contact upon the assembly, said switch being closable when the assembly moves away from the path of articles contacting said elements, a counter-actuating switch in series with said primary switch, means operable in response to relative movement of said elements to open and close said actuating switch, said means including an electromagnet, said magnet being arranged to hold the actuating switch closed, a control switch for said magnet, and a member movable in response to movement of one of said elements in relation to the other to close said control switch thereby causing actuation of said counter-actuating switch.

3. Apparatus of the class described comprising a support, a movable assembly, a pair of relatively movable elements supported by said assembly and adapted to contact a succession of articles, a primary switch having a movable contact upon the assembly, said switch being closable when the assembly moves away from the path of articles contacting said elements, a counter-actuating switch in series with said primary switch, means operable in response to relative movement of said elements to open and close said actuating switch, said means including an electromagnet, said magnet being arranged to hold said actuating switch closed, a control switch for the magnet in parallel with said actuating switch and mechanism operative in response to relative movement of said elements to close the control switch and to cause energization of the magnet and thus to hold the actuating switch closed.

4. Apparatus of the class described comprising a support, a relatively movable assembly, a movable element secured in fixed relation to said assembly and adapted to contact a succession of

overlapping articles thus to move the assembly, a primary switch upon the assembly including a contact movable to switch closing position when the assembly is thus moved, a counter operable in response to electrical impulses, a counter-actuating switch on the assembly, a circuit connecting said switches and the counter in series, a second element carried by the assembly and movable in relation to the first element in response to the overlapping edge of each of the articles moving past the elements, and means operatively connecting said second element and the actuating switch whereby the counted may be actuated due to relative movement of said elements.

5. Apparatus of the class described comprising a support, a relatively movable assembly, a movable element secured in fixed relation to said assembly and adapted to contact a succession of overlapping articles thus to move the assembly, a primary switch upon the assembly including a contact movable to switch closing position when the assembly is thus moved, a counter operable in response to electrical impulses, a counter-actuating switch on the assembly, a circuit connecting said switches and the counter in series, a second element carried by the assembly and movable in relation to the first element, means operatively connecting said second element and the actuating switch whereby the counter may be actuated due to relative movement of said elements, said means including an electromagnet upon the assembly, a control switch in series with the magnet and in parallel with the actuating switch, an armature associated with the magnet and arranged to hold the actuating switch closed when the magnet is energized, and linkage between the armature and second element effective mechanically to permit closing of the control switch in response to relative movement of said elements.

6. Apparatus of the class described comprising a support, a relatively movable assembly, a movable element secured in fixed relation to said assembly and adapted to contact a succession of overlapping articles thus to move the assembly, a primary switch upon the assembly including a contact movable to switch closing position when the assembly is thus moved, a counter operable in response to electrical impulses, a counter-actuating switch on the assembly, a circuit connecting said switches and the counter in series, a tube projecting from said assembly and supporting said element at its end, a push-rod within the tube, a second element to contact articles, said second element being movably supported by said tube and a part between said second element and rod to push the latter in response to relative movement between said elements, and means operatively connecting said rod and the actuating switch whereby the counter may be actuated due to relative movement of said elements.

7. Apparatus of the class described comprising a support, a relatively movable assembly, a movable element secured in fixed relation to said assembly and adapted to contact a succession of overlapping articles thus to move the assembly a primary switch upon the assembly including a contact movable to switch closing position when the assembly is thus moved, a counter operable in response to electrical impulses, a counter-actuating switch on the assembly, a circuit connecting said switches and the counter in series, a tube projecting from said assembly and supporting said element at its end, a push-rod within the tube, a swinging member pivotally connected to the end of said tube, a second element to contact articles supported by said member, a part pivoted to said member, a spring yieldably holding said part against the end of the rod so that movement of said second element relative to the tube and first element is effective in moving the rod, and means operatively connecting said second rod and the actuating switch whereby the counter may be actuated due to relative movement of said elements.

8. Apparatus of the class described comprising a support, a relatively movable assembly, a movable element secured in fixed relation to said assembly and adapted to contact a succession of overlapping articles thus to move the assembly, a primary switch upon the assembly including a contact movable to switch closing position when the assembly is thus moved, a counter operable in response to electrical impulses, a counter-actuating switch on the assembly, a circuit connecting said switches and the counter in series, a second element carried by the assembly and movable in relation to the first element in response to each overlapping edge of each of the articles moving past the elements, a rod actuable by said second element, a shaft on the assembly, a crank arm on the shaft movable by said rod, a magnet upon the assembly, an armature associated with the magnet, the counter actuating switch being closable in response to movement of the armature toward the magnet, a second arm on said shaft, said second arm tending mechanically to move the armature and close the actuating switch, a control switch in series with the magnet and in parallel with the actuating switch, and spring means tending to swing said arms and shaft to open the control switch when pressure from said rod is substantially released, and thus releases the actuating switch.

9. Apparatus of the class described comprising a fixed support, a conveyor, a counter operable in response to electrical impulses, a movable assembly upon the support, an element in normally fixed relation to the assembly positioned to contact articles upon the conveyor and thus move the assembly, a second element supported by the assembly but movable in relation thereto, a counter-actuating switch upon the support, and means operatively connecting said switch and second element so that relative movements of said elements open and close the switch to actuate the counter, an electrical circuit including said switch and counter and fixed members on the support as well as conductors on the assembly slidably contacting said members.

10. Apparatus of the class described comprising a fixed support, a conveyor, a counter operable in response to electrical impulses, a movable assembly upon the support, an element in normally fixed relation to the assembly positioned to contact articles upon the conveyor and thus move the assembly, a second element supported by the assembly but movable in relation thereto, a counter-actuating switch upon the support, and means operatively connecting said switch and second element so that relative movements of said elements open and close the switch to actuate the counter, an electrical circuit including said switch and counter and fixed members on the support as well as conductors on the assembly slidably contacting said members, said circuit also including a primary switch, said primary switch having a contact fixed to the assembly and a relatively mov-

able contact, and a part projecting from the support to hold said movable contact away from the contact fixed to the assembly when the assembly is positioned at the end of its path which is nearer the conveyor.

11. Apparatus of the class described comprising a fixed support, a conveyor, a counter operable in response to electrical impulses, a movable assembly upon the support, an element in normally fixed relation to the assembly positioned to contact articles upon the conveyor and thus move the assembly, a second element supported by the assembly but movable in relation thereto, an electrical circuit, a counter-actuating switch upon the support and included in said circuit, said circuit including an electromagnet and a magnet control switch in parallel with said actuating switch, an armature associated with said magnet being effective to hold said actuating switch closed, and means operatively connecting said control switch and second element so that the actuating switch is closed in response to relative movement of said elements, said electrical circuit including said switches and counter fixed members on the support as well as conductors on the assembly slidably contacting said members.

PERLEY F. GROUT.