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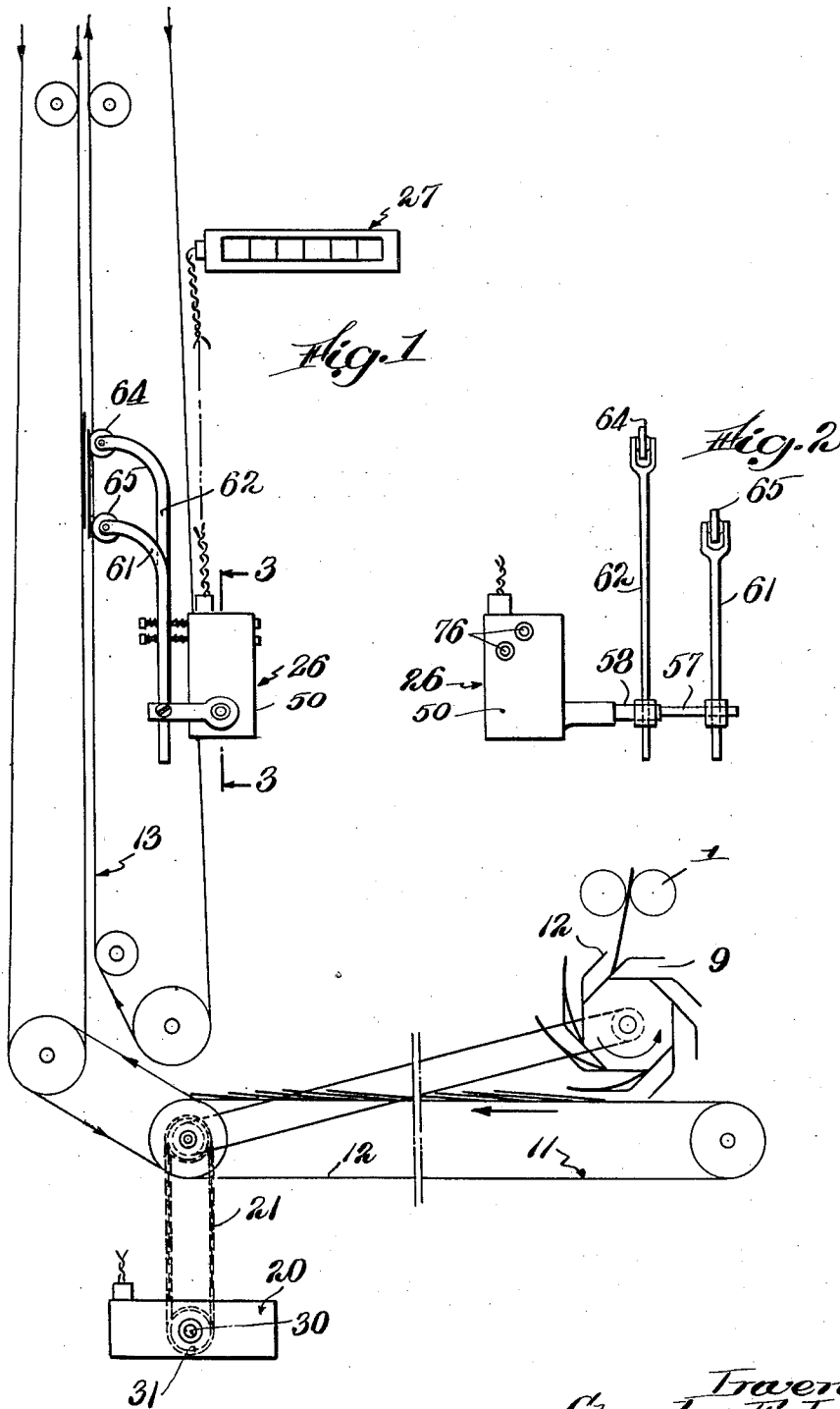
C. E. LYONS

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NEWSPAPER COUNTING APPARATUS

Filed Nov. 9, 1937

2 Sheets-Sheet 1



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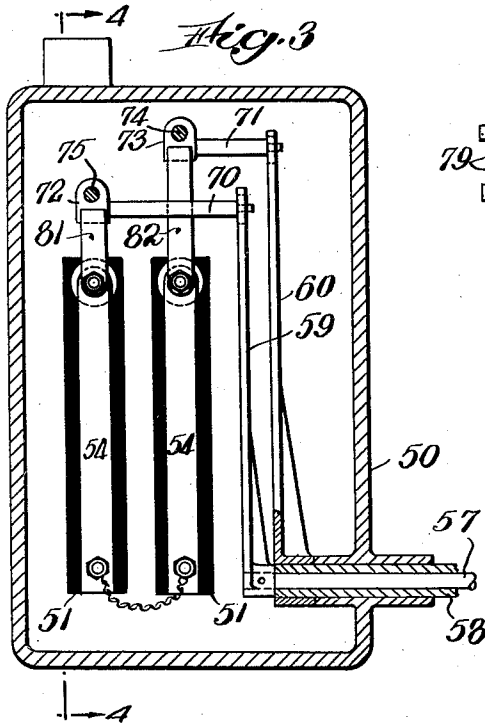
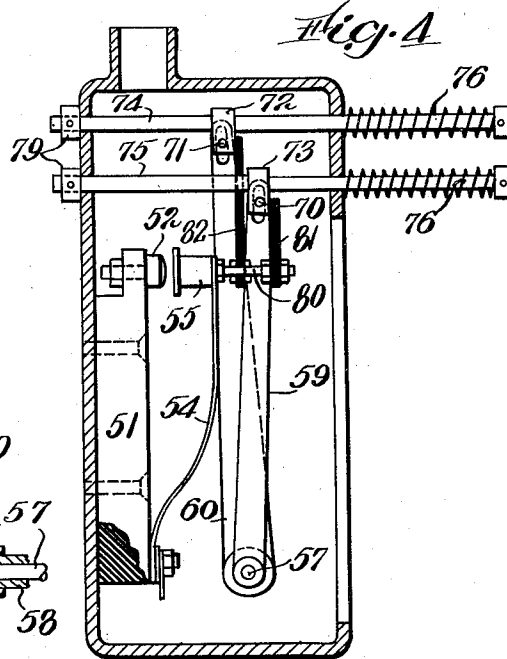
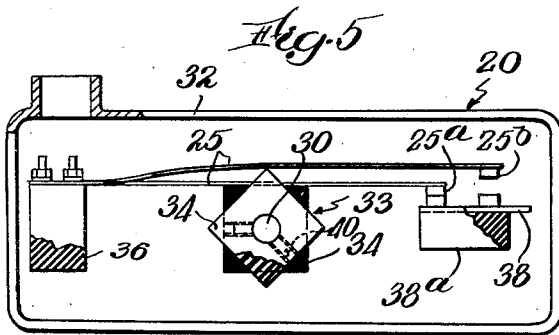
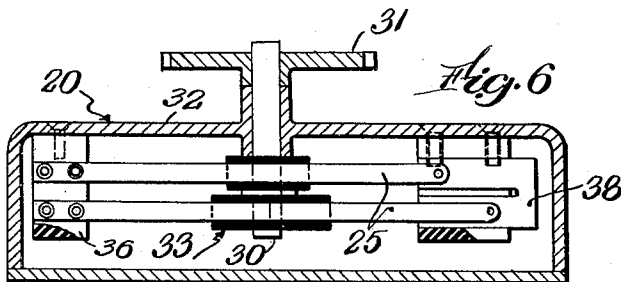
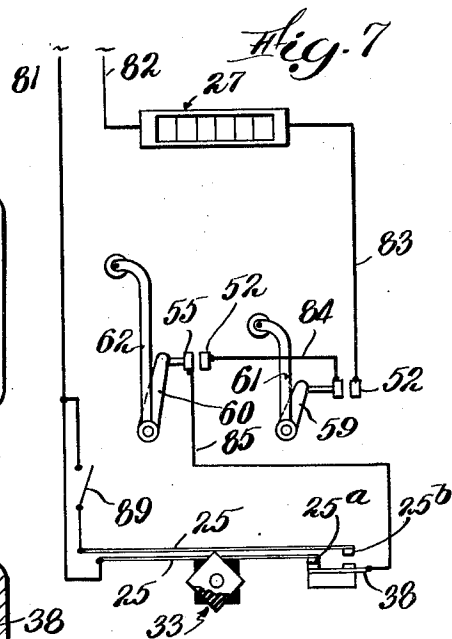
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UNITED STATES PATENT OFFICE

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NEWSPAPER COUNTING APPARATUS

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7 Claims. (Cl. 271-63)

This invention relates to improved apparatus for counting articles such as newspapers being delivered from a printing press. The present invention affords a simple, inexpensive mechanism for this purpose which is adapted to compensate for variable conditions which may occur during the operation of the press and the conveyor associated therewith so that an accurate count may be afforded under all operating conditions. While the apparatus is particularly adapted to operate a counter which may be observed to determine the number of papers which have been printed and which have passed along the conveyor, it may also be associated, if desired, with automatic mechanism for interrupting the press after a predetermined number of copies of the papers have passed along the conveyor.

The apparatus is furthermore arranged so that it may only count alternate papers or alternate paper sections and, furthermore, the device may be arranged so that only every third or fourth paper or the like will be counted. Such an arrangement is particularly advantageous when the paper is being printed in separate sections individually delivered to the fan which forms a portion of the conveying means.

In the accompanying drawings:

Fig. 1 is a diagrammatic elevational view of apparatus embodying the principle of the present invention;

Fig. 2 is a side elevation of the controller forming part of the apparatus;

Fig. 3 is a section of the controller indicated by line 3-3 of Fig. 1;

Fig. 4 is a section on line 4-4 of Fig. 3;

Figs. 5 and 6 are respectively vertical and horizontal sections of the timer or circuit-closing means which forms part of the apparatus; and

Fig. 7 is a wiring diagram, with parts schematically shown.

In Fig. 1 I have diagrammatically disclosed conveying means which is associated with a press and folder in the conventional manner. Papers are delivered from the folder, a portion of which is indicated by the numeral 1, to a delivery fan 9 having a plurality of blades 12 separating the peripheral zone of the fan into a plurality of pockets, each of which may receive a single folded paper or a single section of a paper, if the paper is being printed in a plurality of sections. For purposes of convenience of description, the paper received by a single section of the folder, whether in the form of a section of a newspaper or in the form of the entire newspaper, will hereinafter be referred to as a "paper".

The delivery fan 9 is rotated in synchronism with the remainder of the conveyor means 11 which includes a horizontal run 12 and a vertical run 13, the fan delivering the papers in overlapping relation onto the horizontal run 12 which in turn supplies the papers to the vertical run 13 from which the papers may pass to the mailing room or the like. The folder 1 and the conveyor 11 are driven while the press is operating and, in some cases, continue to operate when the press is no longer operating in order to clear the entire apparatus of printed papers.

Since the folder 1 and conveying means, including the conveyor 11 and delivery fan 9, are operable in synchronism, and since the delivery fan can only deliver a certain maximum number of papers corresponding to the number of pockets which pass below the folder 1 in a given period of time, it is evident that a counter driven directly in synchronism with the conveyor would afford an accurate count, if papers were continuously supplied to the fan and conveyor during this entire period of operation. As a practical matter, there are interruptions in the stream of papers supplied from the folder to the conveying means, so that such an arrangement by itself would be unsatisfactory. On the other hand, the operation of the counter by the conveying means avoids inaccuracies due to the movement of the papers out of normal overlapping relation. Accordingly, I provide means normally operating the counter in response to the conveying means but provided with a controller to interrupt such operation when there is a gap in the stream of papers passing along the conveyor. Thus an accurate count may be afforded by a relatively simple mechanism.

For this purpose I provide a circuit-closing means 20 operable in synchronism with the conveyor 11 and driven by suitable means such as a chain 21 from a portion of the conveyor. This circuit-closing device is arranged so that it may always be driven when the conveying means is operating. The device is electrically connected through a suitable controller 26 to an electrically actuable counter 27. The controller conditions the electric circuit so that impulses may pass from the circuit-closing means 20 to the counter as long as a stream of papers is passing the controller 26. Whenever this stream of papers is interrupted, there is a corresponding interruption in the electrical circuit and, although the circuit-closing means 20 continues to be driven by the conveyor, electrical impulses are no longer transmitted to the counter.

Figs. 5 and 6 illustrate in detail a preferred

form of circuit-closing means. The chain 21 drives a shaft 30 through a sprocket 31. This shaft extends into a casing 32, and suitable cam means 33 is disposed within the casing and secured to the shaft. In the illustrated form of the invention such cam means comprises two non-circular cams 34 of insulating material. For example, as shown, each of these cams may be substantially square. Two leaf springs 25 are mounted on an insulating block 36 at one end of the housing 1 and carry electrical contacts 25^a and 25^b at their opposite ends. The mid-portions of these springs are engageable by the corners or lobes of the cams 34; accordingly each time that a spring 25 is actuated by a lobe of the corresponding cam, the contact at the end of the spring is moved away from contact on a common metal plate 38 which is mounted on an insulating block 38^a.

It is evident that with the form of the invention illustrated, a single rotation of the shaft 30 may be effective in causing eight circuit opening and closing movements of the springs 25 and the corresponding contacts, 25^a and 25^b, these eight movements corresponding to the eight pockets in fan 9. Thus this assembly may be operable to send eight electrical impulses along the electrical circuit during each revolution of the fan.

Preferably the cams 33 are secured to the shaft 30 by suitable set screws 40 so that the cams may be removed or adjusted. If desired, either of the cams 33 may be removed and other cams having a different number of lobes may be substituted for either one or both of these cams so that, instead of counting every paper section or eight papers for each revolution of the shaft 30, the device may be adjusted so that it may either count every alternate paper, every third paper, every fourth paper, etc. Obviously the sizes of the sprockets associated with chain 21 may also be changed, if desired, to permit variation in the ratio between the number of impulses and the number of papers passing along the conveyor.

If a continuous stream of papers were always supplied to the conveyor, the timer shown in Figs. 5 and 6 could be employed directly without further apparatus to control the counter 27 to assure an accurate count. However, since there actually are gaps in the stream of papers passing along the conveyor, I have provided the controller 26. This controller includes a casing 50 supporting insulating blocks 51 (Figs. 3 and 4) on its inner wall. Each of these blocks carries a fixed contact 52 and a leaf spring 54 carrying a movable contact 55 engageable with the corresponding fixed contact 52.

On the lower part of the casing is mounted a shaft 57 and a sleeve 58 adapted to turn on the shaft. Arms 59 and 60 are disposed within the casing 50 and are connected respectively to the shaft 57 and the sleeve 58. On the outside of the casing the shaft 57 carries an arm 61 and sleeve 58 carries an arm 62. The extremities of these arms support contact rolls 64 and 65, respectively. These rolls are arranged to contact the papers passing along the escalator or vertical run 13 of the conveyor 11. Accordingly, when the first paper of a group comes along a conveyor, its advance edge first engages the contact roll 65, swinging the arm 61 toward the casing 50, and as the paper continues on its path, the roll 64 and the arm 62 are also moved toward the casing 50. The rolls 64 and 65 are spaced from each other at a distance along the conveyor

somewhat less than the width of the folded paper for a purpose that will be more fully described.

The arms 59 and 60 have slotted ends which receive the ends of pins 70 and 71 respectively on lugs 72 and 73 respectively, fixed to slidable rods 74 and 75. These rods are yieldably urged toward the position shown in Fig. 4 by springs 76, the movement of each rod in this direction being limited by a collar 79 engageable with the wall of the casing 50. When the arms 62 and 61 are swung toward the casing 50 by a paper passing along the conveyor, the shaft 57 and sleeve 58 are turned so as to swing the upper ends of arms 59 and 60 toward the block 51. The springs 54 carry rods 80 with plates 81 and 82 of insulating material engageable with the lugs 72 and 73 respectively, so that as the arms 59 and 60 are moved in this manner toward blocks 51, the springs 54 may be effective in moving the contacts 55 into engagement with the corresponding contacts 52. Obviously both sets of contacts only continue in engagement while both arms 61 and 62 are swung away from the conveyor and toward the casing 40. As soon as, for example, the arm 61 swings away from the controller, after a paper has passed the roll 65, the corresponding arm 59 moves away from the block 51, acting through the corresponding plate 81 and rod 80 to permit the corresponding contact 55 to separate from the contact 52.

Obviously the arms 59 and 60 may swing toward the plates 51 to a position substantially beyond that required to close the corresponding switches provided by contacts 52 and 55. Thus an arrangement is provided to permit suitable ranges of movement for the exterior arms 61 and 62, so that the latter may move inwardly only a slight distance when, for example, one paper comes along the conveyor but yet may be thus effective in closing the switches within the controller casing 50. On the other hand, the arms 60 and 61 may move inwardly a substantial distance when a plurality of relatively thick overlapping papers are passing along the conveyor. Under such conditions the springs 76 permit the arms 59 and 60 to swing through a substantial angle while the switches 52-55 are held closed by springs 54.

The operation of the apparatus may best be described with reference to the wiring diagram of Fig. 7. Current is supplied from a suitable source to leads 81 and 82, the latter being connected directly to the conventional actuating mechanism of the counter 27. From this mechanism a lead 83 may extend to one of the contacts 52, as that associated with the shorter arms 59 and 61 of the controller 26. From the corresponding contact 55 a lead 84 extends to the other fixed contact 52, while a lead 85 extends from the corresponding movable contact 55 to the contact plate 38. The latter has electrically conductive portions engageable by each of the contacts 25^a and 25^b carried by the leaf springs 25 of the circuit-closing means 20, which are alternately moved into circuit-closing position by the cam means 33. One spring 25 which is associated with one of the cams may be connected directly to the lead 81 extending from the source of current supply, while the other spring arm 25 may be connected to lead 81 through a switch 89.

When the conveyor 11 is operating, the circuit-closing means, including the shaft 30 and cam means 33, is being constantly driven. Accordingly the contacts 25^a and 25^b are moved to circuit-closing position to afford, for example, eight cir-

cuit-closing movements during each revolution of the shaft 30. These movements have no effect upon the counter 27 until a paper comes along the conveyor and engages the rolls 65 and 64. As the first paper engages the roll 65, one set of contacts 55 and 52 are engaged, but until the paper reaches the roll 64, the other set of contacts 52—55 remain in spaced relation so that the circuit is not yet conditioned for the transmittal of an impulse to the counter. When, however, the advance edge of the paper actuates the roll 64 and arm 62, the other set of contacts 52—55 are also engaged so that the circuit is completed and an impulse resulting from the closing of the circuit by the means 20 may then be transmitted to the counter 27 to cause a single actuation of the latter.

If but a single paper comes along the conveyor in this manner, the roll 65 will move away from the housing 50 as the edge of the paper passes out of engagement with the roll. Thus the switch 55—52 associated with arms 61 and 59 will be opened before a second impulse can be transmitted to the counter 27. It is thus evident that the rolls 64 and 65 are spaced along the conveyor at a distance nearly as great as the width of a paper, so that but a single impulse can be transmitted to the counter while both rolls are in engagement with the paper. In practice the exact spacing of the rolls 64 and 65 can be adjusted relative to the axis of the shaft 57 and sleeve 58; thus the effective lengths of the arms 61 and 62 may be varied after loosening the set screws associated with the inner ends of these arms.

When a plurality of papers move along in conventional overlapping engagement, the rolls 64 and 65 are maintained in their circuit-closing positions, thus permitting the transmittal of a plurality of impulses to the counter, the impulses corresponding in number to the number of papers which move along the conveyor.

Should a gap occur in the stream of papers moving along the conveyor, corresponding, for example, to a failure to fill several pockets of fan 9 with papers, one or the other of the rolls will momentarily move from its circuit-closing position, causing a corresponding interruption in the transmittal of impulses to the counter. The spacing of the rolls 64 and 65 is so determined that when a plurality of overlapping papers move along the conveyor one impulse is transmitted to the counter 27 for each paper. Thus an accurate count is afforded corresponding to the exact number of overlapping papers, while, when there is a gap between successive groups of overlapping papers, impulses no longer can be transmitted to the counter 27 from the circuit-closing means 20. The spacing of the rolls 64 and 65 permits an accurate count which would not be possible were but a single contact roll employed in a corresponding location.

The provision of the switch 89 affords convenient means permitting the transmittal of impulses to the counter in response only to alternate papers or paper sections, since, when this switch is opened, only the contact 25^a is effective in sending impulses to the counter, while when the switch is closed the contact 25^b is also similarly effective.

It is evident that the present invention affords a simple and dependable mechanism for counting newspapers or the like being received from a press and folder, the device being primarily operable in direct response to the operation of the conveyor but being provided with control means to prevent such operation from being effective to cause actuation of the counter when there is a

gap in the stream of papers passing along the conveyor.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. Apparatus of the class described comprising a conveyor for receiving papers from a press, a circuit-closing device operable in synchronism with the conveyor, an electrically actuable mechanism, a circuit connecting the mechanism and the circuit-closing device, and a control device associated with the said circuit including a switch means responsive to the passage of papers along the conveyor for conditioning the circuit so that electrical impulses can pass from the circuit-closing device to the mechanism to actuate the latter, said control device comprising two elements adapted to contact spaced portions of a paper moving along the conveyor and control two switches arranged in series in the circuit so that the circuit may be closed for actuation of the mechanism only when each of said elements is being contacted by a paper.

2. Newspaper counting apparatus comprising a conveyor for receiving papers from a press, a circuit-closing device operable in synchronism with the conveyor, an electrically actuable counter, a circuit connecting the counter and the circuit-closing device, and a control device associated with the said circuit for conditioning the circuit so that electrical impulses can pass from the circuit-closing device to the counter to actuate the latter, said control device comprising two elements adapted to contact spaced portions of a paper moving along the conveyor and control two switches arranged in series in the circuit so that the circuit may be closed for actuation of the counter only when each of said elements is being contacted by a paper, said elements being spaced from each other at a distance which comprises a major fraction of the extent of a paper in the direction of movement of the conveyor, whereby the elements may remain in circuit-closing position only long enough, if a single paper is passing along the conveyor, to permit one impulse to pass from the circuit-closing means to the counter.

3. Newspaper counting apparatus comprising a conveyor for receiving papers from a press, a circuit-closing device operable in synchronism with the conveyor, an electrically actuable counter, a circuit connecting the counter and the circuit-closing device, and a control device associated with the said circuit including means responsive to the passage of papers along the conveyor for conditioning the circuit so that electrical impulses can pass from the circuit-closing device to the counter to actuate the latter, said circuit-closing device comprising cam means adapted alternately to open and close switch means, said device being adjustable to permit the actuations of the counter by a single impulse in response to either the movement of each paper along the conveyor, or the movement of one paper out of each of a plurality of papers along the conveyor.

4. Newspaper counting apparatus comprising a conveyor for receiving papers from a press, a circuit-closing device operable in synchronism with the conveyor, an electrically actuable counter, a circuit connecting the counter and the circuit-closing device, and a control device associ-

ated with the said circuit for conditioning the circuit so that electrical impulses can pass from the circuit-closing device to the counter to actuate the latter, said circuit-closing device comprising two switches operable alternately to close the circuit to the counter, and a control switch arranged to prevent the flow of current through one of said two switches whereby the apparatus may be adjusted upon opening of said control switch to send half of the previous number of impulses to the counter in response to the movement of an equal number of papers along the conveyor.

5. Newspaper counting apparatus comprising a conveyor for receiving papers from a press, a circuit-closing device operable in synchronism with the conveyor, an electrically actuable counter, a circuit connecting the counter and the circuit-closing device, and a control device associated with said circuit for conditioning the circuit so that electrical impulses can pass from the circuit-closing device to the counter to actuate the latter, said control device comprising two switches arranged in series in the circuit, and means operative to close one of said switches in response to the movement of a paper along the conveyor, and means operable to close the other of said switches in response to the movement of a paper along the conveyor, said means being responsive respectively to spaced portions of a paper on the conveyor so that both switches remain closed for only a long enough period of time to permit a single impulse to pass to the counter when a single paper is moving along the conveyor.

6. Newspaper counting apparatus comprising a conveyor for receiving papers from a press, a circuit-closing device operable in synchronism with the conveyor, an electrically actuable counter, a circuit connecting the counter and the circuit-closing device, and a control device associated with said circuit for conditioning the circuit so that electrical impulses can pass from the circuit-closing device to the counter to actuate the latter, said circuit-closing device comprising two switches, movable members respectively to control opening and closing of the switches, parts actuable by spaced portions of the paper moving along the conveyor to permit movement of said members to circuit-closing positions, said parts and members being constructed and arranged so that the parts may have a wider range of movement than said parts, thus to accommodate the movement of a plurality of thick overlapped papers along the conveyor while the members may also cause the closing of the switches in response to even the movement of a single thin paper along the conveyor.

circuit-closing device, and a control device associated with said circuit for conditioning the circuit so that electrical impulses can pass from the circuit-closing device to the counter to actuate the latter, said control device comprising two switches arranged in series in the circuit and two switch actuating means spaced along the conveyor to engage opposite edges of a paper as it moves along the conveyor so that as a single paper moves along the conveyor one switch opens shortly after the other switch closes, whereby both switches remain closed for an interval only long enough to permit the sending of a single impulse from the circuit-closing device to the counter.

7. Newspaper counting apparatus comprising a conveyor for receiving papers from a press, a circuit-closing device operable in synchronism with the conveyor, an electrically actuable counter, a circuit connecting the counter and the circuit-closing device, and a control device associated with said circuit for conditioning the circuit so that electrical impulses can pass from the circuit-closing device to the counter to actuate the latter, said circuit-closing device comprising two switches, movable members respectively to control opening and closing of the switches, parts actuable by spaced portions of the paper moving along the conveyor to permit movement of said members to circuit-closing positions, said parts and members being constructed and arranged so that the parts may have a wider range of movement than said parts, thus to accommodate the movement of a plurality of thick overlapped papers along the conveyor while the members may also cause the closing of the switches in response to even the movement of a single thin paper along the conveyor.

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