July 16, 1940. P. F. GROUT 2,208,270

COUNTING MECHANISM

Filed Oct. 31, 1938 2 Sheets-Sheet 1

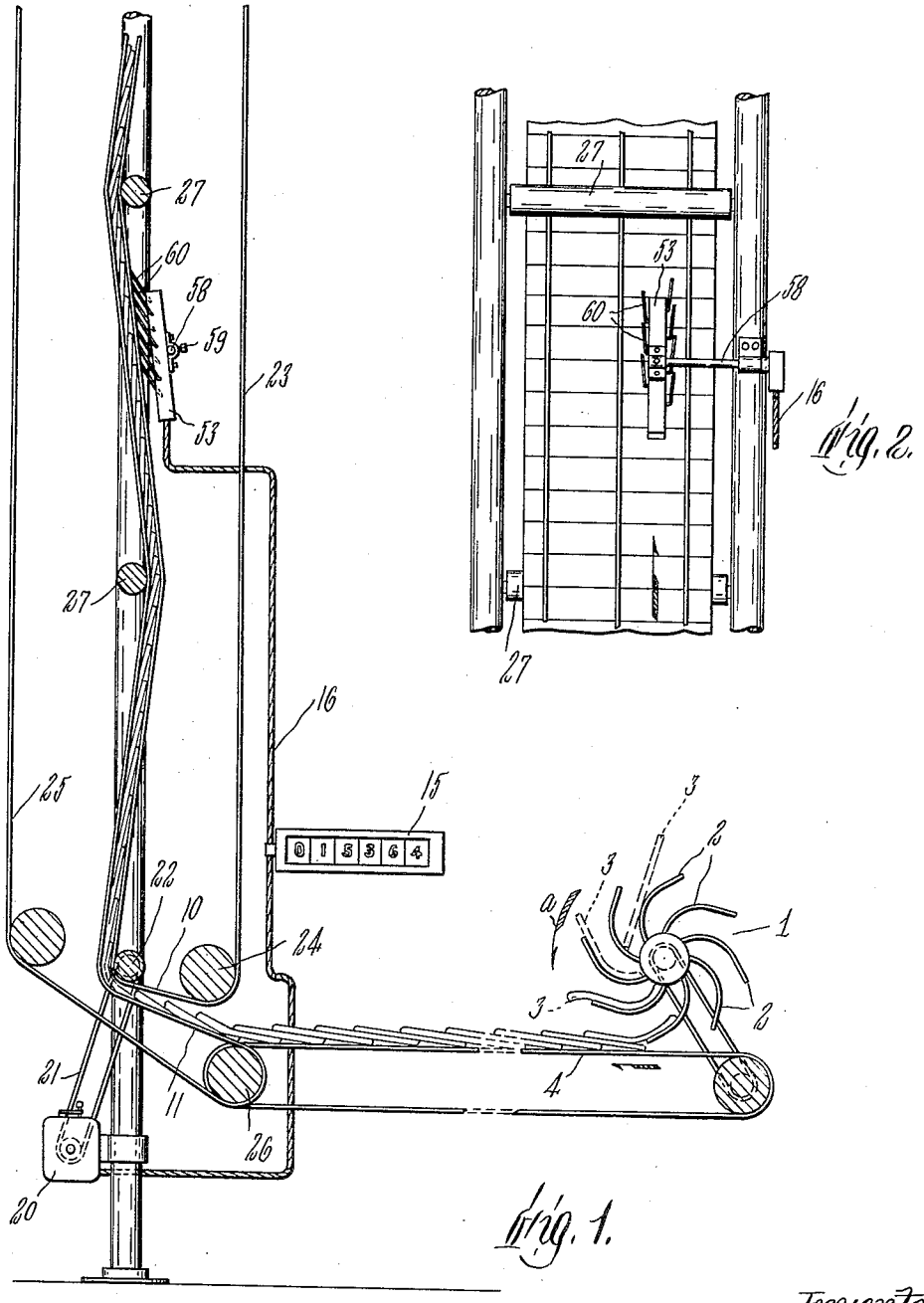

Fig. 1.

Fig. 2.

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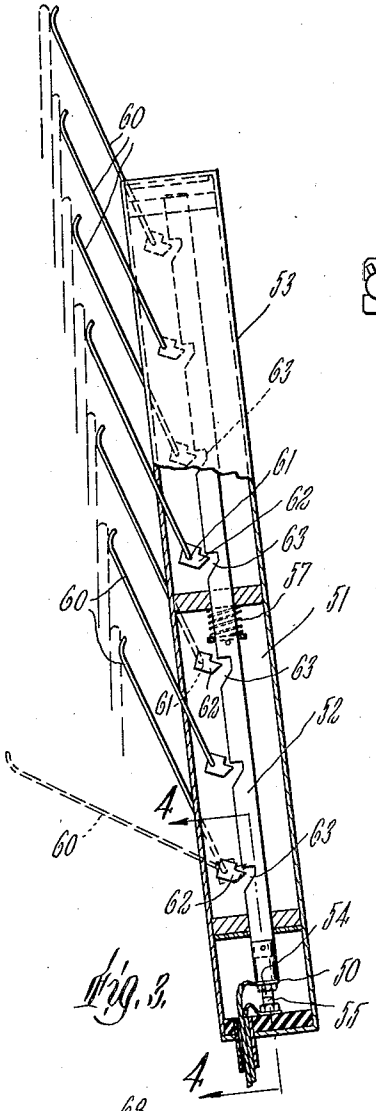

Fig. 3.

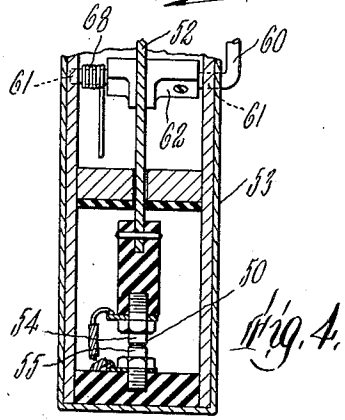

Fig. 4.

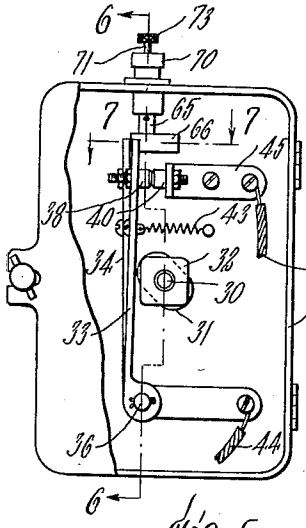

Fig. 5.

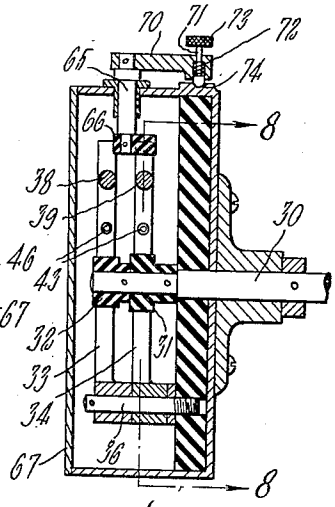

Fig. 6.

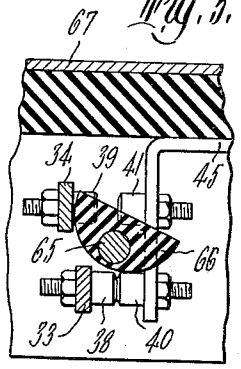

Fig. 7.

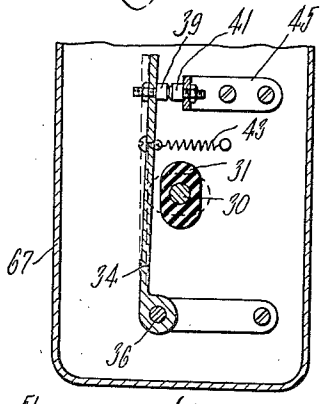

Fig. 8.

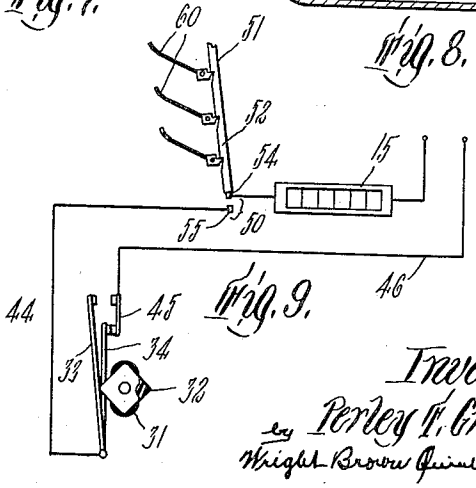

Fig. 9.

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2,208,270

COUNTING MECHANISM

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Application October 31, 1938, Serial No. 237,928

4 Claims. (Cl. 200—52)

It is usual practice in newspaper printing establishments to deliver the papers or sections of the papers from each press to a conveyor by which they are delivered in overlapping relation to the mailing or distributing room. Papers are often removed from the conveyor, however, so that the number which reach the mailing or distributing room may be substantially less than the number printed.

An object of the present invention, therefore, is to provide a mechanism applicable to this and similar situations for accurately counting the papers or sections actually delivered to the mailing or distributing room, so that this room may be charged with all the papers actually delivered there regardless of the number of those which have been delivered from the press. This is done, in accordance with this invention, by a counting mechanism actuated in time with the delivery of the papers to the conveyor but rendered inoperative whenever there is a gap in the sequence of papers passing a given length of the conveyor where later removal of the papers before reaching the mailing or distributing room is not to be feared, the extent of inoperative time being proportional to the size of the gap and thus proportional to the number of papers or sections missing at any particular time. The inoperative-rendering mechanism comprises a series of feelers into contact with which the papers pass in the selected length of the conveyor, absence of a paper in that selected length, permitting one or more of the feelers to drop below a predetermined position, being effective to render the counter inoperative.

Means may also be provided by which the frequency of the counting impulses may be varied, depending on the frequency of the supply of papers or sections to the conveyor.

For a more complete understanding of this invention, reference may be had to the accompanying drawings, in which

Figure 1 is a somewhat diagrammatic view showing the means for delivering the papers or sections to the conveyor and the conveyor by which these papers or sections are delivered to the mailing or distributing room, the counting mechanism being shown associated therewith.

Figure 2 is a fragmentary front elevation of a portion of the conveyor where the feeler mechanism is positioned.

Figure 3 is a view partly in elevation and partly broken away of the feeler mechanism drawn to a larger scale than in Figures 1 and 2.

Figure 4 is a detail section on line 4—4 of Figure 3.

Figure 5 is a front elevation partly broken away of the mechanism which determines the frequency of the counting impulses.

Figures 6 and 7 are sections on the correspondingly numbered section lines of Figure 5.

Figure 8 is a detail section on line 8—8 of Figure 6.

Figure 9 is a diagrammatic view illustrating the operation of the mechanism.

Referring first to Figure 1, at 1 is indicated somewhat diagrammatically the usual fan for receiving between the blades 2 thereof from the press the papers or sections of papers indicated at 3. This fan rotates in the direction of the arrow *a* and deposits these papers or sections of papers on a conveyor belt 4. From this conveyor belt the papers or paper sections lying in partly overlapped relation are delivered between the cables 10 and 11 of the cable conveyor by which they are held in overlapping relation and are transported, usually upwardly, to the mailing or distributing room where they are made ready for delivery. While the paper or paper sections are on the conveyor 4 they are free to be removed therefrom as may be desired, but by the time they have reached the bight of the cable conveyor, they are so firmly held that there is small chance for removal of one or more of them on the way to the mailing or distributing room. If the papers or paper sections were fed continuously to the cable conveyor, in order to provide an accurate count of the papers delivered, it would be necessary only to provide a counting mechanism periodically actuated in time with the conveyor mechanism, but as papers may be removed from the conveyor 4, such a mechanism by itself would not be suitable and would not result in accurate counting.

In accordance with this invention, therefore, means are provided by which should the stack of papers be interrupted, the counting mechanism operated in time with the cable conveyor will be interrupted during that time which corresponds to the spacing of the papers on the cable conveyor so that the actual count corresponds to the actual number of papers which will be delivered to the mailing or distributing room, the absence of a paper or section resulting in skipping a count.

At 15 in Figure 1 is diagrammatically illustrated a counting mechanism of a well known type which gives a count each time an electrical connection 16 leading thereto is energized.

These are standard counters and as per se they form no part of the present invention, they are not further described herein.

The means for energizing the counter periodically thus comprises two mechanisms or devices, one which would normally give a counting impulse periodically, dependent on the driving of the cable conveyor, and a correcting device which renders inoperative the first mentioned mechanism or device at such time as there is discontinuity in the stack of papers being delivered, and for a length of time corresponding precisely to the number of papers or paper sections omitted from the stack and which give rise to these discontinuities. As shown the first of these mechanisms is positioned at 20, and is driven as by a belt 21 from the pulley 22 which in turn is driven in time with the speed of motion of the cable conveyor 10. As shown one side of this cable conveyor comprising the cords or cables 23, passes around a guide 24, around the pulley 22, and up to the mailing or distributing room. The other portion of the conveyor comprises the cords 25 which pass about the pulley 26 where they receive the papers being delivered from the conveyor 4. The two sets of cables then pass upwardly and alternately at one side and then the other of the guide members 27, to the point of delivery of the papers.

In some cases certain only of the fan blades deliver the papers or sections, and in other cases more than one section makes up the final paper. Means are therefore provided in the device 20 for selecting the frequency of the counting impulses to correspond with the number of sections or papers being delivered to the conveyor system. Details of this mechanism are shown in Figures 5 to 8. As there shown, a cam shaft 30 is employed, this being driven directly from the belt 21. It carries thereon a plurality of cams such as 31 and 32, and where two selections of counting speed are employed, there will be two of such cams. As shown one of the cams 31 has two lobes thereon while the cam 32 has four lobes. If the cam 31 is made effective, there will be two counting impulses for each revolution of the shaft 30. If the cam 32 is effective, there will be four counting impulses for each single revolution of the shaft 31. Each of these cams 31 and 32 bears against a movable switch arm 33 or 34, as shown the cam 32 bearing against the switch arm 33, and the cam 31 bearing against the switch arm 34. These arms are fulcrumed as on the fulcrum post 36, and adjacent to their opposite ends each is provided with an electric contact element 38 and 39 which may make contact with and close an electric circuit with the mating contacts 40 and 41.

The pairs of contacts 38 and 40 and 39 and 41, respectively, form portions of a normally closed switch, the arms 33 and 34 being normally held in switch-closing position as by the springs 43, each of the arms having electrical connection through their common fulcrum with a line 44, and each of the contacts 40 and 41 being in electrical connection through the contact carrier arm 45 with the lead 46 (see Figure 9). One of these leads as 46 goes to a source of power (not shown) and the other goes to one side of a switch 50 in the correcting mechanism 51, the other terminal of the switch leading back to the counter and through the counter back to the other side of the power source. The switch 50 is controlled as between closed and open condition by the position of a bar 52 slidable axially within the device casing 53 (Figure 3). It is normally held in switch-closing position with its contact 54 engaging the fixed contact 55 of the switch. In its normally operative position this device 51 may be substantially vertical as shown in Figure 3, so that gravity biases the bar 52 into switch-closing position. It may also be further biased to this position as by a coil spring 57. It may, however, be held in lifted position wherein its switch is open, by any one or more of a plurality of feeler fingers 60. As shown, each finger is fulcrumed adjacent to one end as at 61 and carries rigid therewith a latch dog 62 having a portion which may ride into a notch 63 of the bar 52, the parts being arranged so that as the feeler finger is in its lowered angular position as in the dotted line position of Figure 3, the bar 52 is held lifted. This casing 53 is supported in any suitable way adjacent to the cable conveyor mechanism, so that if papers or paper sections are opposite thereto within the cable conveyor, the corresponding finger is pushed upwardly as in one of the full line positions of Figure 3, thus retracting its dog 62, this in so far as this particular finger is concerned, permitting the bar 52 to move to its biased position, closing the switch 50. As shown the casing 53 is rockably adjustable on a pivot 58 to which it may be clamped as by a screw 59. Each feeler finger is biased to downward position as by the torsion spring 68 and when it is allowed to descend to its inoperative position it lifts the bar 52 and opens the switch at 50. Thus all of the feeler fingers must be held upwardly by the papers or stacks of papers positioned opposite thereto in the cable conveyor for the switch 50 to remain closed, and as soon as any one or more of these fingers drops, as because of the absence of a paper in the cable conveyor with which it may be engaged, the bar is held lifted and the switch at 50 remains open.

The number and spacing of the feeler fingers is so chosen that the switch 50 is open for the whole time during which the stack of papers in the cable conveyor is discontinuous. As the papers lie in overlapping relation, however, and the spacing of the top edges of the papers is much less than the whole width of the paper or paper sections, it is important that there be a sufficient number of fingers and that their spacing be sufficiently close so as to prevent the actuation of a counter whenever there is no paper opposite to any one of the feeler fingers, or when the total thickness of the papers passing up the conveyor is so reduced from the normal that the normal counting impulses derived from the mechanism 20 would give a number greater than that of the papers actually being delivered.

Means are provided by which either of the selected switches in the mechanism 20 may be rendered inoperative, or where more than two switches are employed for rendering only one of these operative at a time. As shown this comprises a rock shaft 65 to which is attached a cam 66. This cam is so designed that when in one angular position it engages one of the switch fingers 33 or 34 and breaks the circuit between the corresponding switch contacts, while at the same time it permits the switch contacts of the other finger to come together so as to close that particular switch. In order that this rock shaft 65 may be adjusted as desired, it is shown as extending outside of the casing 67 which houses the mechanism 20, where it is provided with a handle 70 having a spring locking pin 71 therein

by which it may be latched in any of its selected angular positions, which in the case of two switches only, would require only two such angular positions of the arm 20. A spring projected latch bolt 72 is shown as employed for holding the arm 70 in either of its selected positions, this latch having a knurled head 73 by which it can be retracted from a suitable locking depression such as 74 in the switch casing and by which the arm 70 may be retained in either selected of its positions with a correspondingly frequent counting impulse as the shaft 30 is rotated in time with the drive mechanism for the conveyors. The cams 31 and 32 are so designed as to open the corresponding switch whenever they are actuated, the subsequent closing of the switch causing the counter 15 to move ahead one count.

From the foregoing description of an embodiment of this invention, it should be evident to those skilled in the art that various changes and modifications might be made without departing from the spirit or scope of this invention as defined by the appended claims.

I claim:

1. A feeler mechanism comprising a plurality of feeler fingers arranged for successive contact by articles moved therepast, each of such fingers being movable by such contact into one position and biased to another position in the path of motion of said articles and into which it moves when no articles are in position to prevent such motion, a movable control member associated with said fingers, and connections between said fingers and member for causing said member to take one position when all of said fingers are in said one position for each finger and to take another when any one or more of said fingers are in biased position.

2. A feeler mechanism comprising an axially movable bar, a plurality of feeler fingers positioned along said bar and movable between operative and inoperative positions, means biasing said bar to one axial position, interconnections between each of said fingers and said bar causing motion of any finger to operative position to retract and retain said bar out of said biased position, a device to be controlled, and means governed by the position of said bar for controlling said device.

3. A feeler mechanism comprising an axially movable bar biased to one position, a plurality of feeler fingers each pivoted adjacent to said bar and biased to one angular position from which they may be turned by pressure of elements felt by said fingers, said fingers and bar having mating latch parts coacting to move and hold said bar out of its biased position when any of said feeler fingers is in its biased angular position, and an electric switch controlled by the position of said bar.

4. A feeler mechanism comprising a bar, means supporting said bar for axial movement from and to a definite position to which said bar is biased, a plurality of feeler fingers pivoted to said supporting means along said bar each biased to a non-feeling position from which it may be removed by an article the presence of which is to be felt by said mechanism, interconnections between said fingers and bar holding said bar out of biased position whenever any of said fingers is in non-feeling position, a device to be controlled, and means controlled by the position of said bar for controlling said device.

PERLEY F. GROUT.