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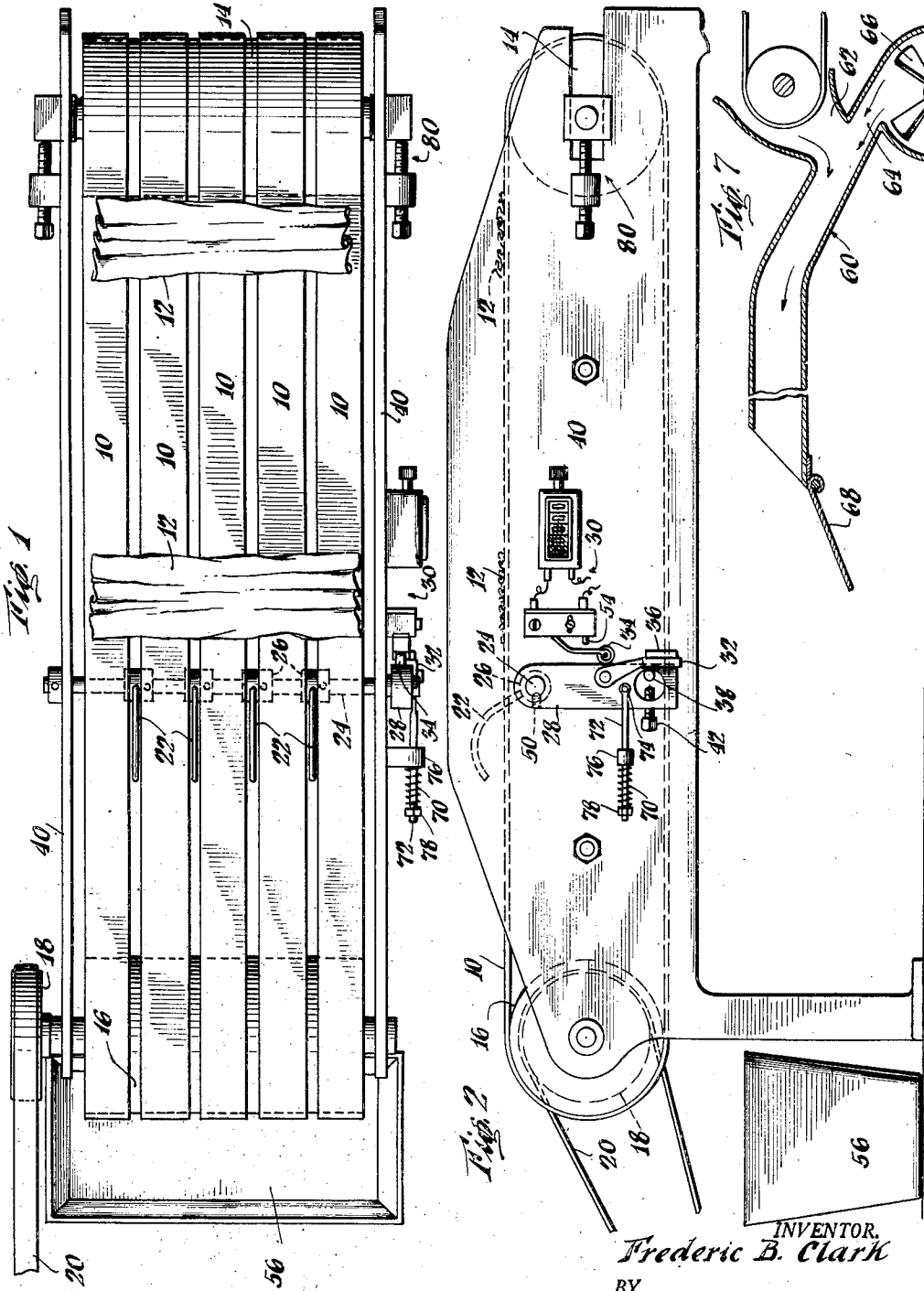
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2,486,118

COUNTING MACHINE FOR LAUNDRY ARTICLES

Filed Oct. 1, 1947

2 Sheets-Sheet 1



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Fig. 5

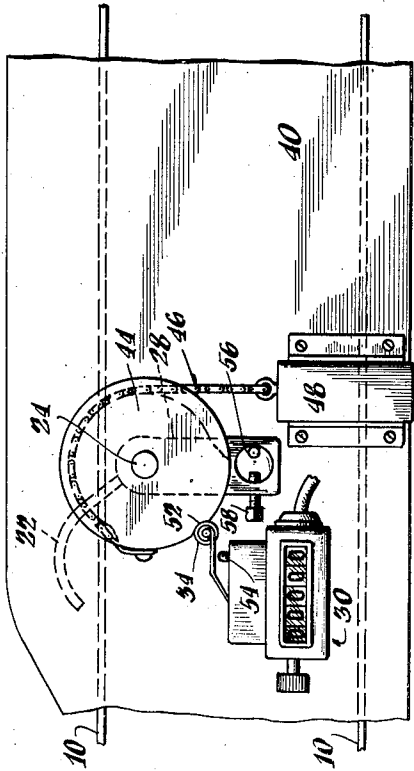


Fig. 6

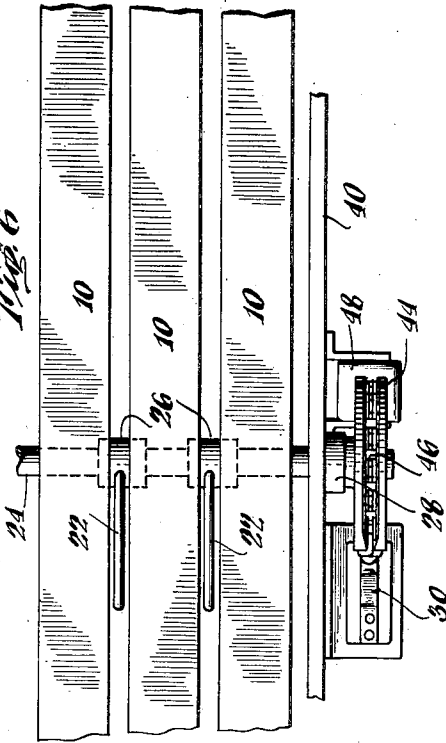
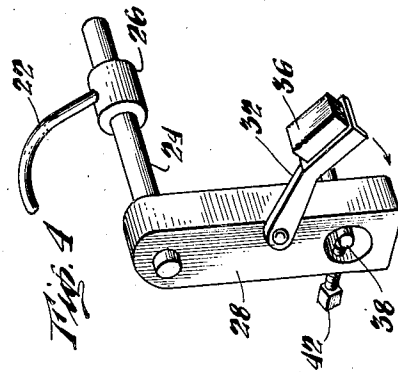
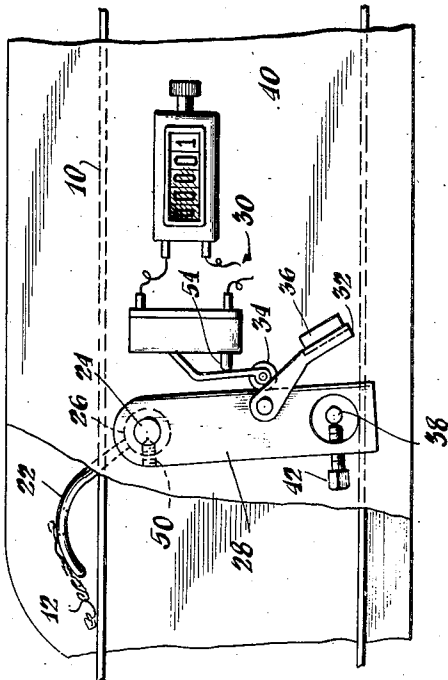


Fig. 3



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# UNITED STATES PATENT OFFICE

2,486,118

## COUNTING MACHINE FOR LAUNDRY ARTICLES

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Application October 1, 1947, Serial No. 777,196

3 Claims. (Cl. 235-98)

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This invention relates to a counting machine. The machine is an improvement over that described in my copending application Ser. No. 720,541, filed January 7, 1947, for Counting machine for laundry articles. Materials of construction of corresponding parts of the machine of the present and parts not illustrated or otherwise described may be and suitably are the same as in the machine of the said copending application.

My improved counting machine is particularly suitable for use in counting laundry articles. It will be illustrated, therefore, by description in connection with such use.

In counting laundry articles by passage over a projection or series of projections that may be called the trigger mechanism of a counting machine, there is difficulty due to the articles becoming lodged upon the trigger if single or between the several projections constituting a multiple trigger. There is also difficulty due to chattering or vibration of the mechanism as it continues to oscillate under the application and subsequent removal of an impulse from the trigger.

The present invention provides a counting machine that is satisfactory for use with articles ranging in size or mass from that of handkerchiefs to bed sheets, without an adjustment of the machine for the variation in size or mass of the articles. The articles being counted will not lodge on any part of the mechanism and, on the other hand, will pass over and away from the trigger member of the counting machine.

Briefly stated, the invention comprises the herein described counting machine including a counting unit, a conveyor for the articles to be counted, a trigger member actuating the counting mechanism and extending below and also above the level of the conveyor, and means connecting this member, at a position below the conveyor, to a contact element for closing the circuit in the counting unit, the conveyor extending both in advance of and beyond the position of the trigger member and, by contact with the part of the article passed over the trigger, serving to draw the article completely over and away from the trigger.

The invention comprises, also, the herein described means for damping the vibration of the circuit closing device attached to the said trigger member. In one embodiment, the invention includes also an air conveyor for withdrawing the counted articles from the end of the conveyor, first by induced air current and then by a direct stream of air.

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The invention will be further illustrated by description in connection with the attached drawings.

Fig. 1 is a plan view of my counting machine. Fig. 2 is a side view of the same machine.

Fig. 3 is an enlarged side view or vertical elevation showing on a somewhat larger scale the trigger and counting unit assembly with the trigger in depressed or deflected position due to the drawing thereover of an article to be counted.

Fig. 4 is a perspective view of the assembly of the trigger member with the contact element which closes the electrical circuit that activates the counting unit.

Fig. 5 is a view similar to that of Fig. 3 but with a modified form of mechanism for preventing vibration of the contact element for closing the circuit in the counting unit.

Fig. 6 is a plan view of the assembly shown in Fig. 5.

Fig. 7 is a sectional side view of the delivery end of the machine of Fig. 1 with an air conveyor of special type substituted for the receiving table of Fig. 1 and in position for removing the articles from the said end of the conveyor.

It is to be understood that the assemblies shown in Figs. 5 and 6 may be substituted in the machines of Figs. 1 and 2 for those parts shown in Figs. 3 and 4.

There are shown conveyors 10 for the articles 12 which are to be counted. These conveyors are suitably in the form of spaced belts or strip belts driven over pulleys 14 and 16 by power supplied through the pulley 18 by power belt 20.

Rising above the level of the conveyor and also extending there below is the trigger member 22. This is suitably in the form of a series of arms or curved rods extending upwardly through the spaces between adjacent ones of strip belt conveyors.

The machine includes means mounting pivotally the trigger member at its lower end and at a level below that of the conveyor 10, as upon the horizontal rod 24 passing through mounting ring 26.

Mounted upon the same rod is the compound pendulum which in effect is the contact element for closing the circuit and thus activating the counting unit indicated generally at 30, this counting unit being a conventional type of electromagnetic counter.

The compound pendulum includes the primary pendulum 28 and a secondary pendulum 32 of different effective length and, therefore, of different period of oscillation or vibration than the

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primary pendulum. As illustrated, this secondary pendulum is disposed on the side of the primary pendulum adjacent to the terminal 34 of the electromagnet counter.

The secondary pendulum suitably contains a mass adding member such as block 36 of material of high specific gravity, such as a heavy metal.

The amount of swing of the primary pendulum under a temporary impulse from the trigger member is controlled by stop means including the pin 38 mounted by conventional means (not shown) on the frame 40 of the machine. The amount of the swing is subject to variation by means of the set screw 42 extending in the direction of the pin 38.

Conventional wiring (not shown) is so arranged that when any part of the pendulum 28 strikes the terminal 34, the circuit is completed through the counting unit and the count registers on the dial thereof.

In the modification shown in Figs. 5 and 6, the pendulum mechanism is replaced by the wheel 44 mounted upon the shaft 24 and supporting through belt 46 weight 48 of adjustable mass.

The pendulum 28, of Figs. 3 and 4, and the wheel 44 of Figs. 5 and 6 are mounted in fixed angular relationship to the trigger member 22, as by the set screw 50 of Fig. 2.

When the wheel 44 is used, it has a slight depression in the periphery at position 52, this depression engaging the terminal 34 of the counting unit and causing it to close the contact with post 54 of the counting unit as the wheel is rotated slightly.

The amount of angular displacement on movement of the chain 46, as the trigger 22 is depressed, is controlled by the stop pin 56 mounted on the frame 40 of the machine by means not shown and the set screw 58.

The moment of the mass of the parts depending from the shaft 24 normally somewhat more than balances the moment of the mass of the trigger member 22 and its assembly in the machine. As a result, the trigger is normally maintained in the fully raised position ready for being depressed by drawing over it an article to be counted. In order to make this balance easily adjustable, there is included a slightly compressed spring 70 (Fig. 2) disposed around the rod 72 mounted upon the pendulum by pin 74. The spring is confined between the stop 76 mounted upon the frame 40 by conventional means not shown and the nut 78 which is threaded upon the rod 72.

The belt tightening means indicated at 80 are of usual type.

Tray or table 56 is disposed beyond and below the end of the conveyor (Fig. 1) for receiving the articles that have been counted.

In a modification of the invention, this receiver 56 is replaced by the air conveyor 60 (Fig. 7). This air conveyor is in the general form of a T with one branch 62 serving as the intake for the counted articles and opening just beyond and preferably somewhat below the delivery end of the conveyor 10. Another arm 64 of the T serves as the inlet from the blower or fan 66. At the delivery end of this air stream conveyor, there is a pivoted delivery outlet 68 which may be deflected sufficiently to deliver the articles from the air stream conveyor to a number of usual cars or other means that are conventional and not shown for moving the counted articles away from the area of operation.

The air stream conveyor described causes draw-

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ing of the counted articles through the intake 62 by induced air current and then conveying to the outlet 68 by the stream of air directly from the blower 66.

The operation of the machine will be largely evident from the description that has been given.

Articles to be counted, such as the flexible articles of the laundry class that have been referred to, are thrown by a workman singly upon the conveyor 10 moving at high speed. These articles move in series towards the delivery end of the conveyor and in so doing strike the trigger member 22. No matter how carelessly the articles are placed upon the conveyor 10, a part at least of the article will pass over the trigger member and contact the conveyor at a position beyond the trigger. The portion of the conveyor beyond the trigger draws the article over the trigger and away from it. As a result there is no lodging of the articles on the trigger. The article thus drawn over and then away from the trigger passes towards the receiving table 56 of Fig. 1 or into the air stream conveyor of Fig. 7.

As the article is being drawn over the trigger 22, this trigger is depressed at its upper portion and thus causes shifting of the depending part 28.

It will be observed that the upper reaches of the conveyor belts extend generally horizontally and in the same plane. The edges of adjacent ones of the belts define between them narrow spaces to receive the depressible trigger elements 22. It will be observed also, particularly from Fig. 2, that the trigger elements slope in the direction of travel of the conveyor belts so as to promote sliding, over the elements, of the articles 12 conveyed by the belts against the said elements. The elements at the top portions become approximately horizontal, that is, the tangents to the curve at the top of elements 22 (Fig. 2) are approximately parallel to the plane of the conveyor belts 10. This becoming horizontal or rounding off of the trigger elements promotes sliding from the elements of the articles that move over the elements in the step of being counted.

The spring 70 and its mounting maintain the circuit closing member 28 normally in such position that the member does not close the circuit to the counting unit. The circuit is closed only when force is applied to the trigger element 22 by an article 12 striking the element.

In greater detail, there is in effect a throw of part 28 until the adjustable set screw 42 strikes the stop 38. The secondary pendulum 32 does not stop at this moment but continues to swing out somewhat, as shown in Fig. 4 except that the amplitude of the swing from the primary pendulum is exaggerated in that figure. Then, when the pendulum 28 rebounds from the contact with the stop pin 38, the secondary pendulum 32 falls down against the side of the primary pendulum. Being out of phase with the vibration of the primary pendulum and having also substantial mass due in part to the mass of element 36, the secondary pendulum prevents repeated vibration or chattering of the primary pendulum.

After the articles have been drawn over and then away from the trigger member 22, they are either received in the collection tray 56 of Fig. 1 or removed by some means of which the pneumatic conveyor of Fig. 7 is a particularly satisfactory example.

The machine is simple and dependable in operation.

Not only is it free from lodging of articles

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upon the trigger 22, even of articles that are as susceptible to lodging as wet towels or sheets, but also it is very sensitive to pressure of an article against the trigger member and is free from repeated vibration of the part which closes the circuit to the counting element.

It will be understood also that it is intended to cover all changes and modifications of the example of the invention herein chosen for the purpose of illustration which do not constitute departures from the spirit and scope of the invention.

What I claim is:

1. A counting machine for laundry articles and like articles comprising a counting mechanism, spaced driven conveyor belts extending in their upper reaches generally horizontally, in the same plane, and defining a narrow space between adjacent edges of the belts, and a depressible trigger element for actuating the counting mechanism extending upwardly through the said space, being normally inclined in the direction of travel of the belts so as to promote sliding over the element by articles carried by the belts against the element, and at the top portion of the element becoming approximately horizontal, so as to promote sliding off of the said articles from the element, the conveyor belts extending beyond the said top portion of the element so as to receive and pull forward articles sliding off the trigger element.

2. A counting machine as described in claim 1, the said counting mechanism including an electrically operated counting unit with an electrical circuit and an exposed electrical terminal, a circuit closing member for completing the elec-

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trical circuit by contact with the terminal, a rigid member mounting the closing member and trigger element pivotally and in fixed angular relationship to each other, with the closing member in normal position adjacent to but out of contact with the electrical terminal and not completing the said circuit, and means maintaining the closing member in said normal position except at times when force is applied to the trigger element by delivery of an article to be counted against the trigger element.

3. A counting machine as described in claim 2, the said trigger element being in the form of a plurality of spaced rods extending between the spaced conveyor belts.

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