

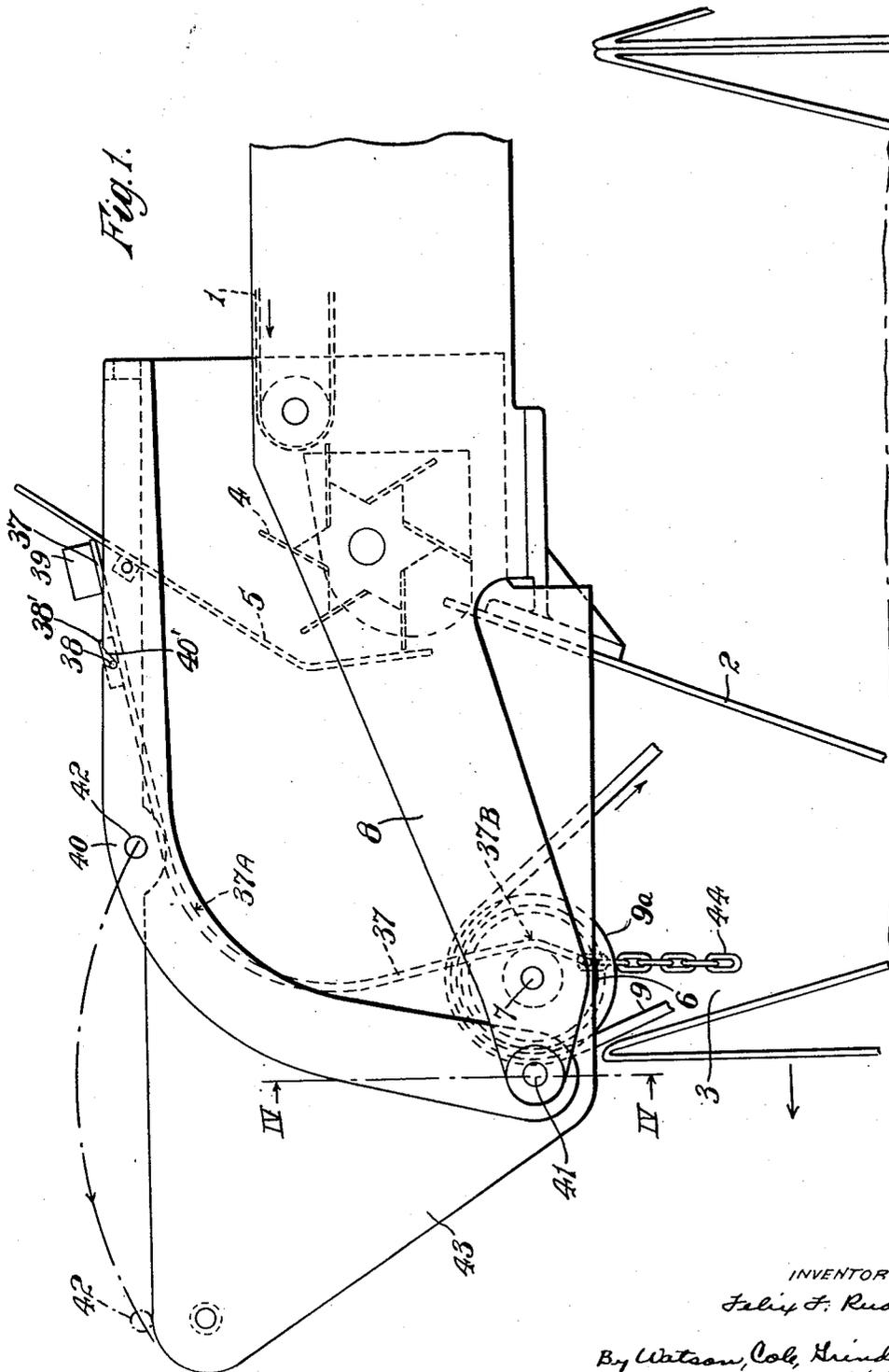
April 10, 1951

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COLLECTING MECHANISM COMPRISING A ROTATING LEVELING
ROLLER FOR MOVING TRAYS OF CIGARETTES

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4 Sheets-Sheet 1



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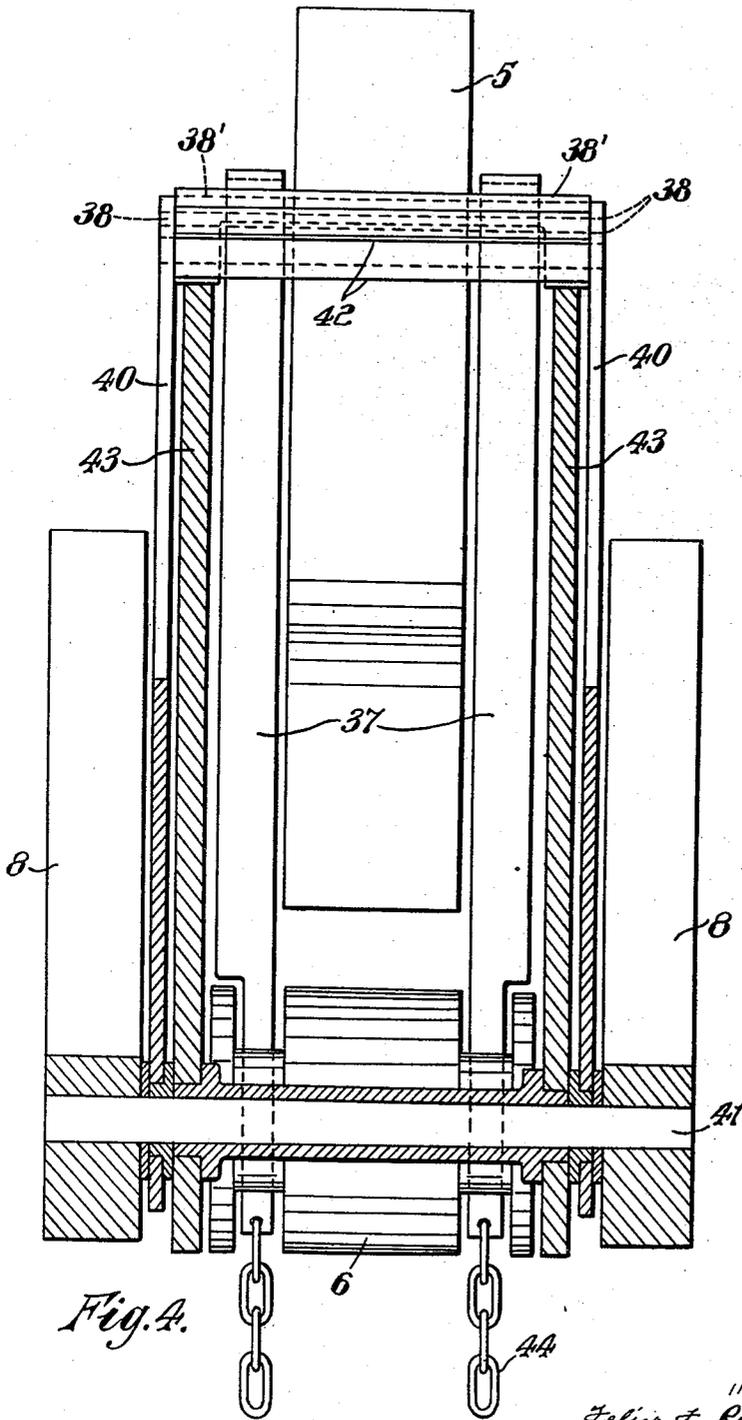


Fig. 4.

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COLLECTING MECHANISM COMPRISING A ROTATING LEVELING ROLLER FOR MOVING TRAYS OF CIGARETTES

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5 Claims. (Cl. 226-5)

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This invention concerns improvements in or relating to collecting mechanism of the kind in which rod shaped articles, e. g. cigarettes are, during movement in a direction transverse to their longitudinal axes, delivered into a receptacle, which latter is movable in a manner such that articles are delivered first into one end of a receptacle and thereafter to successive positions along the length of the receptacle as the leading end of the latter becomes filled approximately to the desired extent, the articles being directed into the receptacle by a downwardly inclined guide which projects into the receptacle. Such collecting mechanism will be referred to below as "collecting mechanism of the kind referred to."

Collecting mechanism of the kind referred to is described and illustrated in United States patent specification No. 2,354,040 for filling receptacles of a particular shape. The receptacles or trays used in the present case are externally of rectangular shape in plan and moved in abutting relationship, but interior sloping walls are provided at each end of a tray so that the outline of the neighbouring inner walls of two adjacent trays forms an inverted V. It will therefore be seen that filling conditions differ when two abutting trays are passing the filling zone as compared with the conditions when the middle part of a tray is passing said zone, and much the same conditions arise in the construction described and shown in United States patent specification No. 2,354,040.

It is of course desirable that the trays shall be uniformly filled and that the upper surface of the contents shall be substantially level.

According to the invention there is provided collecting mechanism of the kind referred to comprising a levelling roller rotatably mounted and so positioned that its lower surface engages cigarettes and is so rotated as to sweep surplus cigarettes backwards and direct them to the unfilled part of the tray whereby a tray is completely filled with cigarettes and the upper surface of the cigarettes is substantially level.

Further according to the invention there is provided collecting mechanism of the kind referred to comprising a levelling roller rotatably mounted and so positioned that its lower surface engages cigarettes delivered to the tray and is so rotated that said lower surface moves in the same direction as the trays during most of the time a tray is passing the filling zone, the direction of rotation being reversed just before the rear end of the tray reaches said zone and the reversed direction being maintained until the

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front end of a succeeding tray has passed the filling zone whereby cigarettes entering the trays are forwarded to fill the trays completely during the major part of the filling operation and moved backwards to feed cigarettes into the succeeding tray when the latter is moving into the filling zone while another is leaving said zone. The direction of rotation of the roller may be controlled by a clutch or the like operated by a part of a moving tray or an abutment on the tray conveyor. The roller may be fluted, knurled or constructed as a brush to provide a frictional cigarette engaging surface.

A guide may be provided to assist in filling the first tray moving through the filling zone after the mechanism has been put into operation, said guide being pivoted and of concave shape on its operative face below the pivot, whereafter the shape becomes convex. With such a guide, cigarettes from the delivery mechanism are guided around and directed backwards to lead them into the front part of the receptacle, and on continued movement of the tray the guide swings on its pivot as its lower end moves forward with the tray and reaches a position where it remains stationary for the rest of the time the collecting mechanism is in operation.

One way of carrying out the invention as applied to mechanism of the kind illustrated in the aforesaid specification is illustrated in the accompanying drawings but as the actual structure is large and the roller driving devices are some distance from the roller the tray filling and roller driving devices are shown in separate views.

In the drawings:

Figure 1 is a side elevation of mechanism for delivering cigarettes into a tray.

Figure 2 is a side elevation of driving mechanism for driving a part shown in Figure 1.

Figure 3 is a plan of Figure 2 partly in section and also shows diagrammatically a plan of a tray and a levelling roller.

Figure 4 is a section of Figure 1 on the line IV-IV.

Referring to Figure 1, cigarettes are brought along a belt 1 and delivered to a sloping guide 2 which directs them into trays 3. The delivery rate is regulated by a paddle wheel 4 and a pivoted plate 5 is associated therewith and adapted to operate as a detector to control the speed of the trays, for example in the manner described in specification No. 2,354,040, the paddle wheel functioning in the manner described in the aforesaid specification. A leveling roller 6 is provided which is rotatably mounted on a shaft 7 jour-

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nalled in extensions 8 of the side frames of the collecting mechanism and so arranged that its lower surface is substantially level with the desired level of cigarettes in the trays. In practice the lower surface of the roller is about 2 mm. above the top of a tray. The roller 6 is driven by a belt 9, which passes around pulley 9a carried by the shaft 7, and the roller is so rotated that its lower surface moves in the same direction as the trays during most of the time a tray is passing the filling position, but just before the rear end of a tray reaches said position the direction of rotation of the roller is reversed. This reversal is effected by a clutch which is operated by a part of the moving tray or one of the trays and will be described later with reference to Figures 2 and 3. The roller continues to rotate in the reverse direction until shortly after the leading end of the succeeding tray has passed the filling zone, when the roller is again reversed so that its under surface moves in the direction of movement of the trays during most of the time the second tray is passing the filling zone and so on. In this way cigarettes are forwarded to fill the trays completely and ensure a proper level during the major part of the filling operation, while the reversal of the roller fills up the rear corner of a tray and carries surplus cigarettes over into the front corner of the succeeding tray. It will be appreciated that at the transition period the space to be filled up per unit of tray movement is less than during the major part of the filling in view of the aforesaid sloping walls and inverted V and the sloping guide 2. The cigarette machine delivers a substantially constant quantity of cigarettes per minute and thus cigarettes will accumulate above the trays and cause the variable speed mechanism described in the above mentioned specification to accelerate the movement of the trays.

Referring now to Figures 2 and 3, the belt 9 which drives the pulley 9a passes around pulleys 10 and 11, one of which is a driving pulley while the other is idle, the function of these pulleys 10 and 11 at any particular time being determined by clutches. The spindles 12 and 13 on which the pulleys are freely rotatable are journaled in a bearing 14 and on the spindles are splined clutch hubs 15 and 16. The hubs have projections 17 and 18 respectively adapted to engage with pins 19 and 20 on the associated pulleys. A double-arm clutch lever 21 is pivoted on a rod 22 and the arms have pins 23 and 24 respectively which enter grooves 25 and 26 in the clutch hubs. The lower end of the rod 22 has a lever 27 fixed to it which has a roller 28 at one end. A spiral spring 29 tends to hold the clutch lever in one clutch engaging position but a cam 30 on each tray 3 eventually engages a roller 31 on a slidable rod 32 and the latter presses against the roller 28 and moves the clutch lever 21 to the other clutch engaging position. The spindles 12 and 13 are continuously rotated by a chain 33 passing around sprocket wheels 34, 35, and 35a and driven by a sprocket wheel 36 which may be geared to the rest of the mechanism or be driven by an independent motor as may be desired.

In this way the roller 6 is continuously rotated but its rotation is reversed at the proper times so that it rotates in a particular direction for a suitable period to secure the object in view.

A further device is employed to assist in the correct filling of the leading tray, as in the present case this is filled with cigarettes instead of merely acting as a support for the starting box

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described in the specification referred to. The device comprises a guide 37 comprising two spaced strips of arcuate shape connected by a rectangular bar 38 having pivots 38 at its ends adapted to be disposed in the notches 40' in the arms 40. The part 37A nearer the pivot 38 consists of a concave arc with the concavity facing the paddle wheel 4 of the device. The curvature of the guide beyond said arc is in the reverse direction so as to present a convex face 37B to the paddle wheel. The guide is weighted at 39 and the weight distribution is such that its free and lower end near 37B tends to move away from the paddle wheel 4.

In use the guide is lifted from its pivot supports so that the lower end can be put inside the leading tray, and it is then pivotally mounted again and held in this position by the tray and guides the cigarettes into said tray as they are delivered from the wheel. As the tray moves along, the guide swings on its pivot until finally it is clear of the tray and its lower end is located near the roller, as in Figure 1, where it stays as long as a continuous series of trays is being filled. If the continuity of the trays is broken the guide is once more adjusted so as to enter the leading tray. Short lengths of chain or other flexible members 44 are attached to the lower end of the guide and rest on the cigarettes in the tray to assist in levelling the cigarettes.

The pair of curved arms 40 in which the pivots 38 are mounted are pivoted on a rod 41 so that the arms may be swung anti-clockwise to swing the pivoted plates 5 and 37 clear to permit inspection or the like. A cross stay 42 between the arms 41 serves as a stop to check the arms when they are swung about the pivot. Transparent side plates 43 enclose the device to shield it from dust and the like.

In some collecting mechanisms the trays used are very shallow and in such cases the volume defined by the tray wall and cigarette guide is so small that cigarettes easily fill it and in such cases it is only necessary to rotate the roller so as to level the top surface of the cigarettes and brush back any surplus towards the unfilled part of the tray. The particular design of levelling apparatus depends on the shallowness or depth of the tray and the angle of the end walls thereof and if proper filling does not occur with a roller rotating continuously in one direction as explained above then it is necessary to operate the roller in two directions as previously explained.

What I claim as my invention and desire to secure by Letters Patent is:

1. Collecting mechanism of the kind referred to, in which cigarettes are delivered into successive trays of a series advancing along a substantially horizontal path, said mechanism comprising a levelling roller rotatably mounted and so positioned that its lower surface engages cigarettes being delivered and means for first rotating said roller so as to sweep cigarettes toward the leading end of the tray and then, when the rear end of the tray approaches the roller, rotating said roller in the opposite direction so as to sweep surplus cigarettes backwards.

2. Collecting mechanism of the kind referred to, in which cigarettes are delivered into successive trays of a series advancing along a substantially horizontal path, said mechanism comprising a levelling roller rotatably mounted and so positioned that its lower surface engages cigarettes being delivered to the tray and means for rotating said roller so that said lower surface

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moves in the same direction as the trays during most of the time a tray is passing the filling zone, the direction of rotation being reversed just before the rear end of the tray reaches said zone and the reversed direction being maintained until the front end of a succeeding tray has passed the filling zone whereby cigarettes entering the trays are forwarded to fill the trays completely during the major part of the filling operation and moved backwards to feed cigarettes into the succeeding tray when the latter is moving into the filling zone while another is leaving said zone.

3. Collecting mechanism as claimed in claim 2 wherein the direction of the roller is controlled by a clutch or the like operated by a part of a moving tray or an abutment on the tray conveyor.

4. Collecting mechanism as claimed in claim 2 wherein the roller is fluted, knurled, or con-

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structed as a brush to provide a frictional cigarette engaging surface.

5. Collecting mechanism as claimed in claim 2 comprising a guide to assist in filling the first tray moving through the filling zone after the mechanism has been put into operation, said guide being pivoted and of concave shape on its operative face below the pivot, whereafter the shape becomes convex.

FELIX FREDERIC RUAU.

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