Feb. 3, 1953 G. M. STONE 2,627,348

CAN WEIGHING MACHINE DIVIDER DEVICE

Filed March 30, 1950 2 SHEETS—SHEET 1

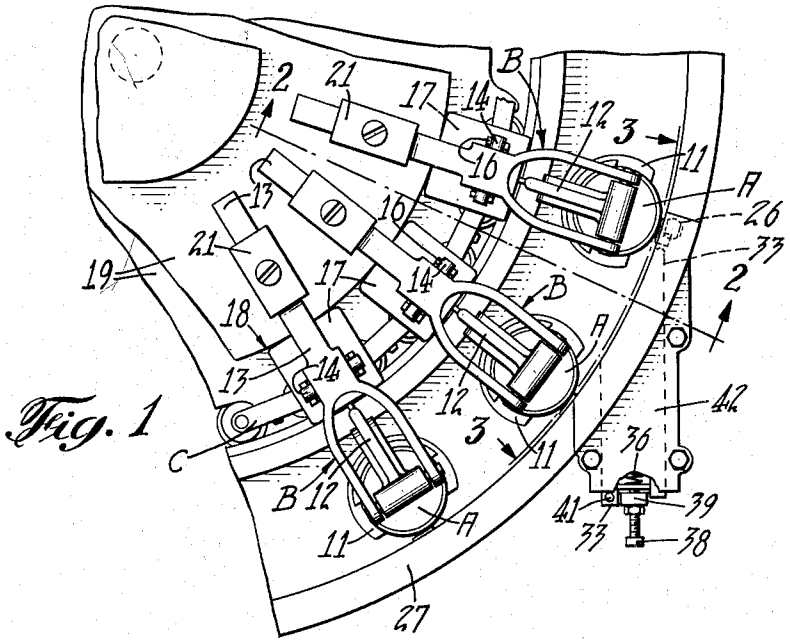
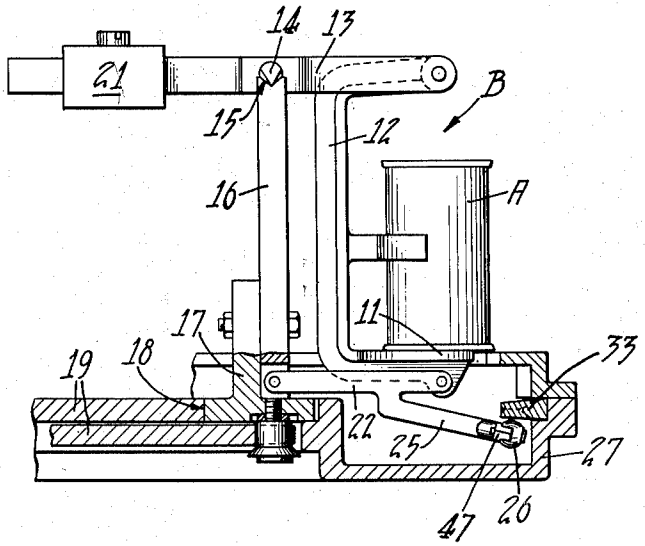


Fig. 1

Fig. 2



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Fig. 3

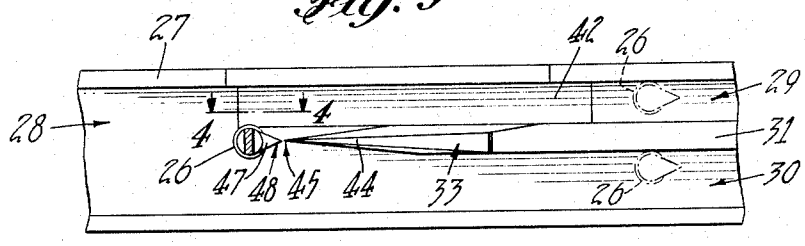


Fig. 4

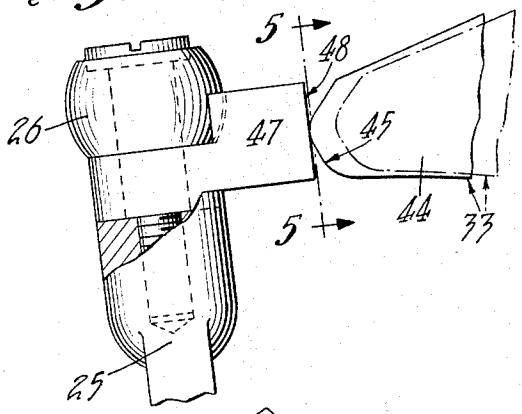


Fig. 6

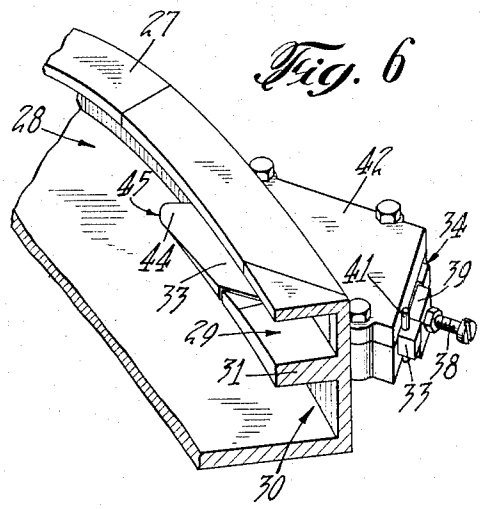


Fig. 7

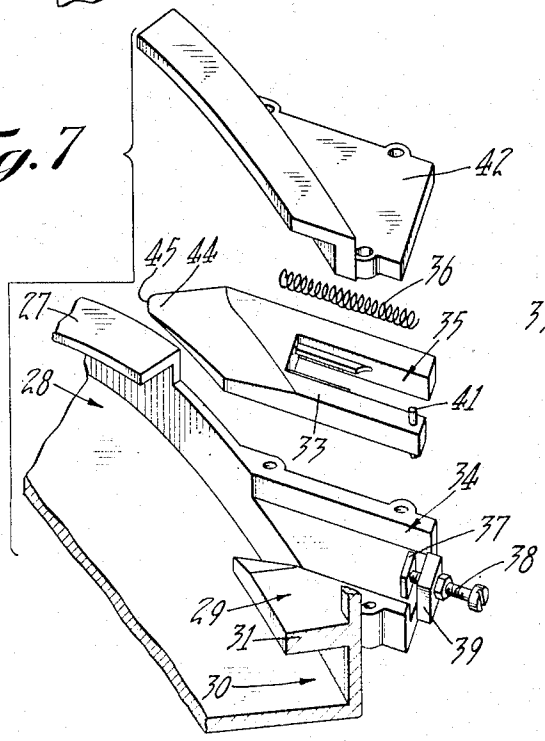
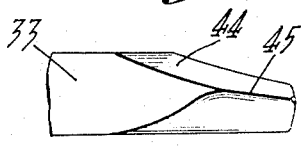


Fig. 5



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CAN WEIGHING MACHINE DIVIDER DEVICE

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5 Claims. (Cl. 209—121)

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The present invention relates to machines for weighing and sorting articles such as for example filled cans or containers and in which sorting of the articles after weighing is controlled in accordance with their weight by a divided cam track and has particular reference to yieldable devices in the track which insure proper division of the articles.

An object of the inventon is the provision in a can weighing and sorting machine of devices co-operable with a follower element operating in a divided cam track wherein the follower element is readily directed into one of the divisions of the cam track for holding a can after weighing in a predetermined position for discharge.

Another object is the provision of such devices wherein a yieldable divider member is provided to insure smooth and continued advancement of the follower element without damage under impact of the follower element with the divider member.

Another object is the provision of such a machine wherein the follower element is provided with a positioning instrumentality which guides the can or other article smoothly into proper sorting position.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a fragmentary top plan view of a machine embodying the instant invention;

Fig. 2 is an enlarged sectional view taken substantially along the line 2—2 in Fig. 1, with parts broken away;

Fig. 3 is an enlarged sectional view taken substantially along the curved line 3—3 in Fig. 1, with parts broken away;

Fig. 4 is an enlarged top plan view taken substantially along the line 4—4 in Fig. 3, with parts broken away and partly shown in section;

Fig. 5 is an elevational detail as viewed along the line 5—5 in Fig. 4, with a portion broken away;

Fig. 6 is a fragmentary perspective view of the parts shown in Fig. 3; and

Fig. 7 is a view similar to Fig. 6 and showing the various parts in exploded relation.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate principal parts of a can weighing and sorting machine of the character disclosed in United States Patents 2,098,260 issued November 9, 1937, to W. R. Smith and 2,266,807 issued December 23, 1941, to W. E. Rooney. In such machines filled cans A (Fig. 1) supported on vertically movable and horizontally advancing scale units B carried on an endless conveyor C, move through the machine in a continuous procession. As a scale unit B, after receiving a can A, advances through the machine, it floats vertically in accordance with the weight of the received can. If the can is of full-weight, the can and its scale unit settles to a predetermined level and remains there until discharged. If the can is underweight, the can and its scale unit rises to a level above the full-weight can level in accordance with the lightness of the can.

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Following this weighing operation the scale units B are locked in position against vertical movement at one of two different levels in accordance with the level the cans assume during the weighing operation, the lightweight cans being locked at the upper level and the full-weight cans at the lower level. At these levels the cans approach a discharge station at which the lightweight cans are segregated from the full-weight cans. The instant invention is directed particularly to devices associated with the locking of the cans at their different levels as will be more fully explained hereinafter.

Referring now to the drawings in more detail, it will be observed that the scale units B comprise a horizontally disposed scale pan 11 (Figs. 1 and 2) formed on an upright arm 12 which at its upper end curves outwardly and terminates above the center of the pan in spaced relation thereto to permit of the carrying of a can A on the pan. The upper terminal end of the vertical arm 12 is pivotally connected to the outer bifurcated ends of a substantially horizontal balance beam 13. Intermediate its ends the balance beam is provided with trunnions 14 having antifriction knife edges which rest in V-shaped seats 15 in the upper end of an upright support bracket 16. The lower end of the bracket is secured to a block 17 forming a part of the endless conveyor C. The blocks slide in a groove 18 formed in a frame 19 which constitutes the main frame of the machine.

The inner end of the balance beam 13 carries an adjustable counterbalance weight 21 to counterbalance the weight of the scale pan 11 and its supporting arms. Adjacent the lower end of the scale unit, the scale pan 11 is connected by a link 22 to the lower end of the upright bracket 16. This link 22 completes a parallelogram system which supports and controls the movement of the scale pan.

Sorting of the cans A in accordance with their weight as mentioned hereinbefore is controlled by an arm 25 (Fig. 2) which extends downwardly and outwardly from the link 22. The outer end of this arm carries a cam roller or follower element 26 which operates in a cam 27 which is disposed adjacent to the path of travel of the scale units B. The cam 27 is formed with a cam track having a wide portions 28 (Figs. 3, 6 and 7) and two narrow parallel portions 29, 30. The narrow portions are separated by a divider rail 31. The wide portion 28 of the track permits free vertical movement of the follower element 26 attached to the scale unit B according to the weight of the advancing can and thus allows the can to assume its own level in accordance with its weight as hereinbefore mentioned. This weighing action takes place along a major portion of the length of the cam 27 in order to let the can settle into its position slowly, as disclosed fully in the above mentioned Smith and Rooney patents.

When a can has assumed its position in accordance with its weight, its associated follower element 26 is directed into one or the other of the narrow track portions 29, 30 which ever is in line with the follower element to lock it in position for discharge of the can from the machine at its assumed level. In order to effect this direction of the follower element 26 into its proper narrow portion of the track as smoothly as possible and to overcome damage through possible impact between the follower element and the divider rail, the forward or leading end of the divider rail 31 is provided with a yieldable extension member 33 constituting a separate forward end of said rail (Figs. 3, 4, 5, 6 and 7).

The separate yieldable member 33 is illustrated as comprising a flat slide block disposed in a horizontal slideway 34 (Fig. 7) formed on the cam 27 and extending outwardly, preferably at an angle to the cam as shown in the drawings. The slide block is formed with a longitudinal slot 35 which is open at its outer end and which provides clearance space for a compression spring 36. The spring is located between the closed end of the slot 35 and a pad 37 mounted on an adjusting screw 38 carried in a lug 39 formed on the outer end of the slideway 34. Hence the spring urges the slide block inwardly. A pin 41 fixed in the block limits the inward travel of the block. This pin engages against a cover 42 for the slideway. The cover holds the slide block in place in the slideway.

The inner end of the yieldable member or slide block 33 extends into the cam track 28 adjacent the forward end of the dividing rail 31 and forms a yieldable forward extension of the rail. This inner end of the slide block is formed with a long slender tapered nose 44 which extends from a sharp leading edge 45 toward the divider rail 31 where it is substantially the same thickness as the rail, as best shown in Figs. 3 and 6. The sharp leading edge 45 of the slide block is disposed at a slight angle to the horizontal, i. e. transversely of the track 28, as shown in Fig. 5 and recedes at an angle, longitudinally of the track as shown in Fig. 4 for the purpose of deflecting the follower element 26 upon possible impact with the slide block nose 44 as will be more fully explained hereinafter.

In order to provide for smooth operation of the follower element 26 against the slide member 33, the outer end of the follower arm 25, adjacent the follower roll 26 is formed with a wedge

shaped positioning instrumentality or member 47 (Figs. 3 and 4) having a straight horizontally disposed sharp contacting edge 48.

Hence, during the weighing operation, when the follower roll 26 is free to move vertically in the cam track 28 under the weight of the can A on its scale unit B, if the follower roll 26 assumes a position in the region of the middle of the track 28, the wedge shaped positioning instrumentality 47 rides against the tapered nose 44 of the slide block 33 and thus smoothly guides the follower element 26 to one side or the other of the divider rail 31 and into the proper narrow track 29 or 30 in accordance with the weight of the can.

Very frequently, the follower element 26 assumes a position which causes the wedge shaped positioning instrumentality 47 to exactly coincide and collide with the sharp leading edge 45 of the slide block 33 as shown in Figs. 3 and 4. Under these conditions the advancing positioning instrumentality 47 pushes the slide block 33 back in its slideway 34 against the resistance of the spring 36 and thus the slide block yields to permit the follower element to pass. During this retraction of the slide block 33, the sharp edge 48 of the positioning instrumentality 47 rides along the angularly disposed sharp edge 45 of the slide block and due to the angularity of the edge 45, the edge 48 is deflected upwardly and the positioning instrumentality 47 is thus deflected into the upper narrow track 29. Because of this deflection, the slide block is pushed back only a slight distance, or to the position indicated in dotted lines as shown in Fig. 4.

In this manner, a positioning instrumentality 47 which collides with the slide block 33 is always deflected upwardly into the narrow track portion 29 to insure that a can which is on the border line of the acceptable limits of lightweight is classified as a lightweight can and is sorted and discharged from the machine as such. The yieldable slide block 33 insures under abnormal conditions of impact between the follower element 26 or its positioning instrumentality 47, the follower element will continue its advancement without damage to the scale unit B or other parts of the machine and thus properly sort the cans in accordance with their weight as hereinbefore explained.

Discharge of the sorted cans while locked in the narrow track portions 29, 30 as herein explained may be effected in any suitable manner, preferably as disclosed in the Smith and Rooney patents mentioned above and forms no part of the instant invention. A description of the discharge mechanism therefore is thought unnecessary and is omitted from this specification.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a can weighing machine, the combination of a vertically movable and horizontally advancing scale unit for receiving a can to be weighed, said unit including a movable follower element, a cam track in which said follower element operates during advancement of said unit, said track having a wide portion permitting free vertical

movement of said scale unit during one phase of its advancement to assume a relative vertical position according to the weight of the can on said unit, said track further including parallel narrow portions separated by a dividing rail having a separate longitudinally slidable tapered extension member constituting the forward end of said rail for directing said scale unit into one of two positions within the range of its assumed position during a succeeding phase of its advancement, yieldable means for holding said extension member in longitudinally outwardly spaced relation to said rail, and a positioning instrumentality on said scale unit adjacent said follower element and engageable with the directing forward end of said dividing rail to guide said follower element smoothly into one of said narrow track portions.

2. In a can weighing machine, the combination of a vertically movable and horizontally advancing scale unit for receiving a can to be weighed, said unit including a movable follower element, a cam track in which a follower element operates during advancement of said unit, said track having a wide portion permitting free vertical movement of said scale unit during one phase of its advancement to assume a relative vertical position according to the weight of the can on said unit, said track being provided with parallel narrow portions separated by a dividing rail to hold said scale unit in one of two positions within the range of its assumed position during a succeeding phase of its advancement, a positioning instrumentalinty on said scale unit adjacent said follower element to guide said follower element smoothly into one of said narrow track portions, and a separate longitudinally slidable member forming an extension of the forward end of said dividing rail, yieldable means for normally holding said slidable member in outwardly spaced relation to the forward end of said dividing rail, said slidable member being yieldably engageable by said positioning instrumentality for sliding movement thereof towards the forward end of said dividing rail to direct said follower element into one or the other of said narrow track portions, said yielding movement of said slidable member upon impact thereof with said positioning instrumentality permitting said instrumentality and said follower element to pass without damage.

3. In a can weighing machine, the combination of a vertically movable and horizontally advancing scale unit for receiving a can to be weighed, said unit including a movable follower element, a cam track in which said follower element operates during advancement of said unit, said track having a wide portion permitting free vertical movement of said scale unit during one phase of its advancement to assume a relative vertical position according to the weight of the can on said unit, said track being provided with parallel narrow portions separated by a dividing rail to hold said scale unit in one of two positions within the range of its assumed position during a succeeding phase of its advancement, and a slidable member forming an extension of the forward end of said dividing rail and having spring means for normally holding the same in outwardly spaced relation from the latter for directing said follower element into one or the other of said narrow track portions, said slidable member being longitudinally yieldable upon impact with said follower element to permit advancement of said element without damage.

4. In a can weighing machine, the combination of a vertically movable and horizontally advancing scale unit for receiving a can to be weighed, said unit including a movable follower element, a cam track in which said follower element operates during advancement of said unit, said track having a wide portion permitting free vertical movement of said scale unit during one phase of its advancement to assume a relative vertical position according to the weight of the can on said unit, said track being provided with parallel narrow portions separated by a dividing rail to hold said scale unit in one of two positions within the range of its assumed position during a succeeding phase of its advancement, a slideway projecting laterally from said track adjacent the forward end of said dividing rail, a slide member disposed in said slideway and extending into said track and forming an extension of the forward end of said dividing rail for directing said follower element into one or the other of said narrow track portions, pressure means interposed between said slide member and said slideway for rendering said slide member retractable under impact with said follower element, and stop means on said slide member for limiting the inward travel of said slide member.

5. In a can weighing machine, the combination of a vertically movable and horizontally advancing scale unit for receiving a can to be weighed, said unit including a movable follower element, a cam track in which said follower element operates during advancement of said unit, said track having a wide portion permitting free vertical movement of said scale unit during one phase of its advancement to assume a relative vertical position according to the weight of the can on said unit, said track being provided with parallel narrow portions separated by a dividing rail to hold said scale unit in one of two positions within the range of its assumed position during a succeeding phase of its advancement, a wedge shaped positioning instrumentality on said scale unit adjacent said follower element, a retractable member forming an extension of the forward end of said dividing rail, said retractable member having a tapered nose portion engageable by said wedge shaped positioning instrumentality for directing said follower element smoothly into one or the other of said narrow track portions, said tapered nose portion of said retractable member being disposed at an angle transversely and longitudinally of said track for retracting said member and for deflecting said follower element in one direction under impact with said retractable member to permit advancement of said follower element without damage.

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