May 24, 1949. McSHERRY LUPTON 2,471,225

GRADING MACHINE BIN

Original Filed Aug. 9, 1941

FIG. 1

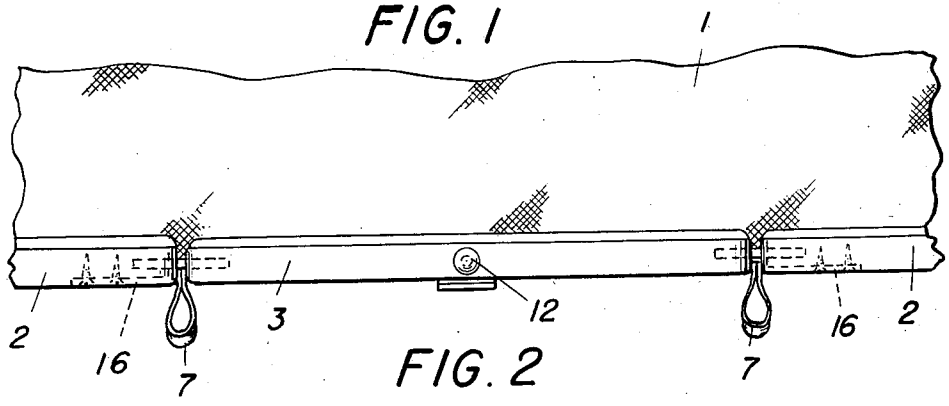
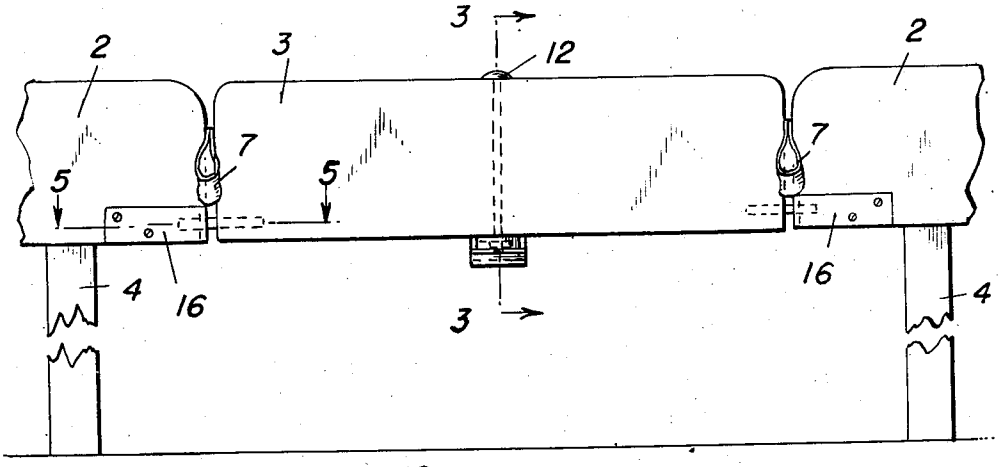


FIG. 2



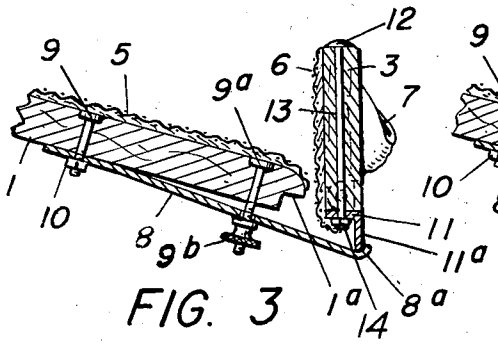


FIG. 3

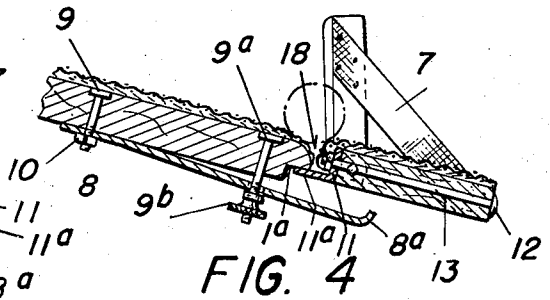
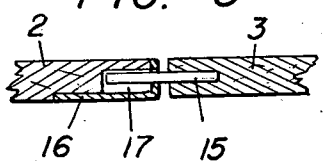


FIG. 4

FIG. 5



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GRADING MACHINE BIN

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Original application August 9, 1941, Serial No. 406,177. Divided and this application July 26, 1946, Serial No. 686,543

2 Claims. (Cl. 209—74)

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This invention relates to apparatus for grading of fruit and vegetables and pertains particularly to the structural details of a sorting or packing bin such as is commonly located at the side of a grading machine. From such bins persons packing the fruit are accustomed to select fruit and place it in shipping containers, such as baskets or boxes.

This invention relates particularly to the structural details of the bin and its associated lower marginal wall. Certain of the details pertain to the mounting of a door which is so pivoted that it may be swung downwardly and outwardly from the wall, whereby fruit may be moved expeditiously by the packer from the bin to the shipping containers. Other details of the improvement relate to means for protecting the fruit including a padded surface for both the upper face of the bin and the next adjacent face of the door, whereby fruit is protected in its passage outwardly and downwardly over the upper surface of the door. Another detail advantage relates to the detent means whereby an element projecting from the lower edge of the door is yieldably held so that the door becomes relatively fixed in either the extreme open or extreme closed position and the door is held with increasing resistance as it approaches or leaves the vertical position.

The foregoing and additional details and advantages of the invention will be understood from the following specification and claims and from the accompanying drawings, in which—

Fig. 1 represents a plan view of the side wall and door and the adjacent upper surface of a fruit packing bin, embodying the improvements of this invention;

Fig. 2 is a side elevation of the structure shown in Fig. 1, facing the exterior of the side wall of the bin;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2 looking in the direction of the arrows and showing the essential related parts of the detent means for holding the door;

Fig. 4 is a sectional view similar to that shown in Fig. 3 with the door in open position; and

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 2 showing the pivotal mounting of the door at one end thereof.

Referring in detail to the several figures of the drawings, like reference characters identify like parts in each of the several figures.

In the drawings, 1 is the floor of a packing bin having an inclined surface as indicated in Figs. 3 and 4. 2 indicates the vertical side wall at the lower edge of bin 1. 3 is a pivotally mounted

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door which is located in a recess in the wall 2. The bin 1 is shown as having supporting legs or framework 4, thus to hold the bin in its proper relation to the other parts of the grading machine, not illustrated. Protection for fruit against damage by bruising is provided by a padded surface having a textile outer covering indicated at 5 extending over the upper surface of the floor of the bin 1. A similar padded surface having a similar textile cover 6 is provided on the adjacent surface of the wall 2 and door 3.

The padding and covering 5 is continued downwardly at the outer edge of the bin 1, and the padding and covering 6 is continued beneath the door 3. As shown in Fig. 4, a padded groove 18 is provided between 5 and 6 when the door 3 is down, thus serving to catch fruit which might otherwise tend to roll from the bin.

The door 3 is pivotally mounted and adapted to be lowered from the position shown in Fig. 3 to the position shown in Fig. 4, as will be described. In the lowermost position of the door, guard straps 7 serve the function of preventing fruit from falling off of the ends of the door. These straps have one end secured to the wall 2 and their opposite ends secured to the opposite ends of the door 3. It will be observed that the lowermost of the side edge of each of the straps 7 which is the edge next adjacent the axis of rotation of the door, is low enough to prevent fruit or other articles being graded from escaping laterally. In other words, these straps are intended to prevent the fruit from falling off and the straps are not intended to serve as limit stops for the lower movement of the door. When the door 3 is in its uppermost and closed position, the straps 7 project outwardly as loops, as shown in Figs. 1 and 2, but when the door is in its lowermost position, the straps are straightened out and prevent the inadvertent loss of fruit from the ends of the door. The straps may be of any suitable flexible material, as for example canvas or leather.

Detent means for holding the door 3 in either the closed or open position includes a strap metal spring element 8 which is mounted on the underneath surface of the floor of the bin 1 and projects outwardly beyond the outer and lower edge of the bin 1 and is provided on its extreme outer end with an upwardly curved portion 8a (Figs. 3 and 4). One end of the spring element 8 is secured to the floor of the bin 1 by a bolt 9 having a nut 10. Between the bolt 9 and the end 8a, the spring element 8 is adjustably secured with respect to the bin floor 1 by means of a bolt 9a having an adjusting screw 9b, whereby thrust

downwardly on the projecting upper surface of the element 8, is adjustably controlled. The spring element 8 constitutes one main portion of the detent means. A second and cooperating portion of the detent means is provided by a flanged member 11 which is mounted on the lower portion of the door 3 and has the following characteristics. The flanged member 11 is shown in Figs. 3 and 4 as an angle member, one face of which is secured to the lower edge of the door 3, and the opposite side 11a of which angle member projects in the plan of the door 3, downwardly as shown in Fig. 3 and laterally as shown in Fig. 4. A bolt having a head 12 is provided with a shank 13 which passes through the heighth of the door 3 from top to bottom and extends through one wall of the angle member 11. A nut 14 mounted on the bolt 13 serves to clamp the angle member 11 to the adjacent lower edge of the door 3.

The function of the detent device, including the parts 8, 8a and 11a, is effected by cooperation which explained as follows. When the door 3 is in its vertical position, closing the opening in the wall 2, the inward movement of the upper edge of the door 3 is limited by the engagement of the lower edge of the flange 11a with the upwardly turned lip 8a of the spring member 8. In the opposite direction when the door 3 is lowered, the outer end of the flange 11a engages the under surface 1a of the next adjacent edge portion of the bin floor 1, and as shown in Figs. 3 and 4. The under surface of the floor of the bin has been undercut or recessed to provide a portion 1a against which the adjacent and upper surface of the flange 11a rests when the door is in the position shown in Fig. 4.

The pivotal mounting of the door 3 is effected simply but satisfactorily by means of pins 15 which may have a driven fit into the opposite ends of the door 3 adjacent its lower edge. These pins, as shown in Figs. 1, 2 and 5, have a portion projecting into the door and another portion projecting outwardly therefrom. The outwardly projecting portions of pins 15 are adapted to be thrust through angle member 16 mounted on the adjacent portions of the wall 2. One side of an angle member is adapted to be faced against the wall 2 at either side of the door opening, and each angle member has a right angle flange adapted to be fitted or otherwise extend into the space between the adjacent ends of the walls 2 and the door 3. The last mentioned flange has an opening through which the outer end of the pin 15 is adapted to project, and within which the pin is journaled. Preferably the walls 2 are notched at 17 opposite the outer ends of the pins 15 whereby the ends of the pins 15 may be fitted to the wall 2 after the flanged element 16 has been applied to the pin 15.

The structure described herein has proved to be convenient and to facilitate the movements of the packers whose duty it is to remove the graded fruit or vegetables from the surface of the bin and to pack such objects in shipping containers. During a packing operation, packers should be able to move alongside of the wall 2 of the apparatus and the wall 2 should be clear of any projections which might tend to catch the clothing of the persons performing the packing operation. When a packer is ready to go to work opposite a door 3, he is supplied with boxes or baskets or other shipping vessels. He lowers the door 3 so that he will be able to move his hands quickly from the upper surface of the floor of

the bin to remove fruit or vegetables therefrom one by one and place them in orderly manner in the shipping containers. Usually fruit or vegetables which have been graded are wrapped individually or packed with shredded paper, or both operations are used. An experienced packer moves his hands at a very high rate of speed. During the movement, the selected fruit or vegetable may be picked from the bin and wrapped and placed in the shipping container in practically one continuous motion of the hand. The present apparatus serves to make such speed possible, because when the door 3 is lowered, there is no necessity for the operator to raise either his hand or the article to be packed upwardly and over a marginal wall such as is represented by the wall 2.

A further factor of convenience to the packer is provided by the adjustable and frictional engagement of the edge of the flange 11a on the upper surface of the spring element 8. The door 3 may be pulled outwardly until the flange 11a is at right angles to the spring 8 and even slightly beyond the right angle position, thus making it possible to lower the door 3 somewhat while yet retaining it by frictional engagement between the part 11a and the upper surface of the spring 8. It is obvious that, after the door 3 has been pulled outwardly and lowered a substantial distance, the flange 11a will no longer engage the upper surface of the spring 8 and that the door 3 must then continue to its lowermost position.

This is the divisional of my application filed August 9, 1941, Serial No. 406,177, now Patent No. 2,335,594, Grading machine.

I claim:

1. In a machine of the class described, a padded packing bin having upright sides for receiving fruit to be packed, said bin having a door padded on its inner surface and pivoted to the bottom of the bin so as to be flush with the side of the bin when in the upright closed position, and a detent device engaging said door for maintaining said door in the upright closed position against the weight of the fruit in the bin and limits its closing movement upwardly and inwardly at the termination of the upward closing movement, said door having a plate extending from the door downwardly when the door is in the upright position and said detent device including a leaf spring mounted on and extending from beneath said bin floor and having at its outer end an upwardly extending end element, said plate being adapted to have its outer edge portion bear against the upper surface of said spring and engage the upwardly extending element whereby inward closing movement of the door is limited, said detent exercising its maximum resistance to the movement of the door as the door approaches and leaves the vertical position.

2. In a machine of the class described, a padded packing bin having upright sides for receiving fruit to be packed, said bin having a door padded on its inner surface and pivoted to the bottom of the bin so as to be flush with the side of the bin when in the upright closed position, and a detent device engaging said door for maintaining said door in the upright closed position against the weight of the fruit in the bin and limits its closing movement upwardly and inwardly at the termination of the upward closing movement, said door having a first plate extending from the door downwardly when the door is

in the upright position and said detent device including a second plate mounted on and extending laterally from beneath said bin floor and having at its outer end an upwardly extending end element, said first plate being adapted to have its outer edge portion bear against the upper surface of said second plate and engage the upwardly extending element whereby inward closing movement of the door is limited, said detent exercising its maximum resistance to the movement of the door as the door approaches and leaves the vertical position, the relation between said first and said second plates being such that said second plate is constantly pressed upwardly against said first plate.

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