May 7, 1968 L. D. CRAWFORD 3,381,819

SORTING MECHANISM FOR PEACH HALVES

Filed Aug. 1, 1966 3 Sheets-Sheet 1

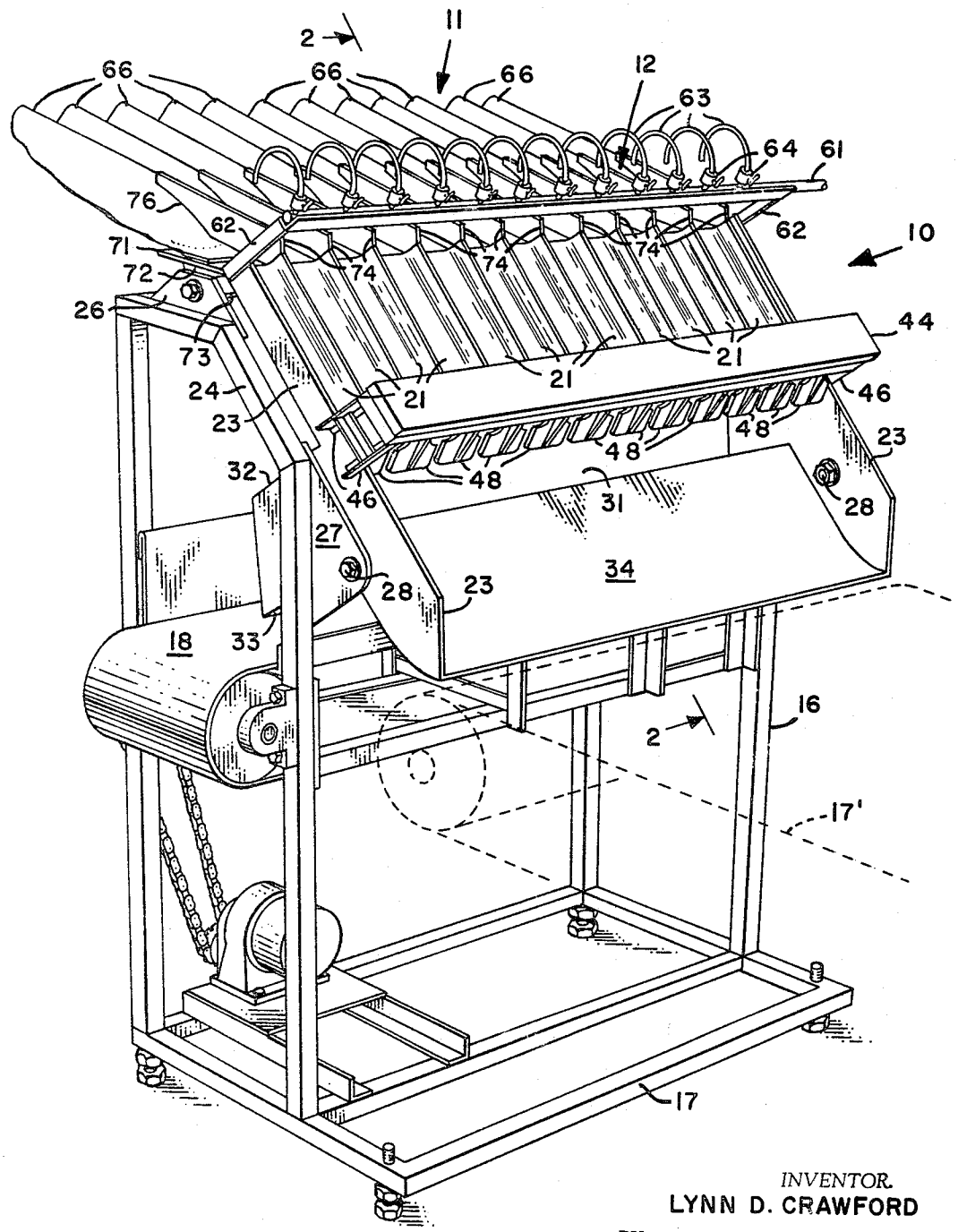


FIG. 1

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Filed Aug. 1, 1966 3 Sheets-Sheet 2

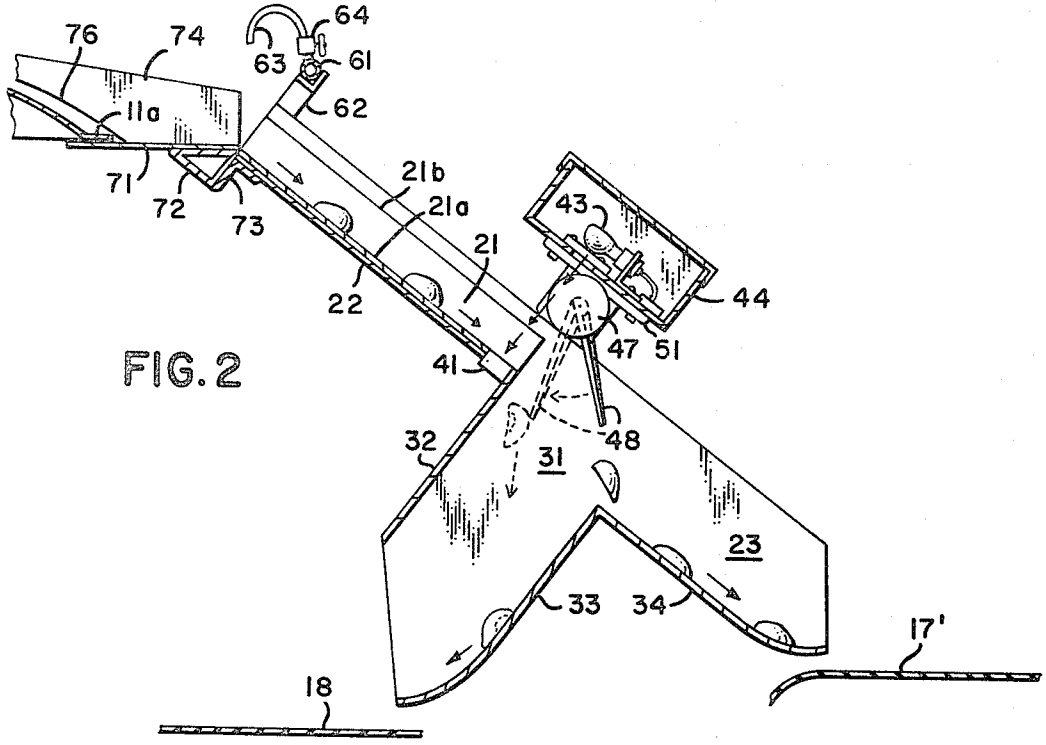


FIG. 2

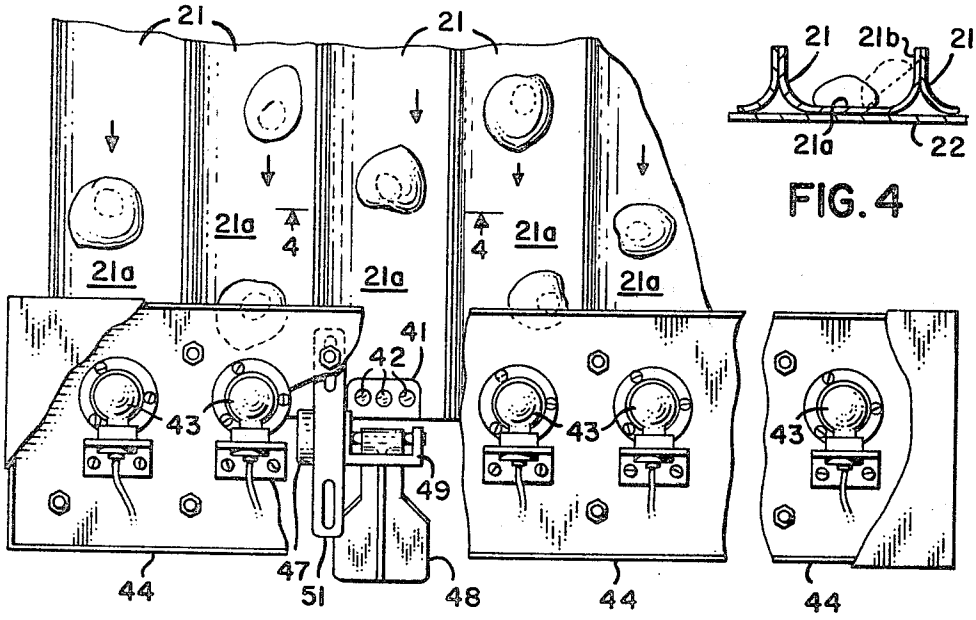


FIG. 3

FIG. 4

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SORTING MECHANISM FOR PEACH HALVES

Filed Aug. 1, 1966 3 Sheets-Sheet 3

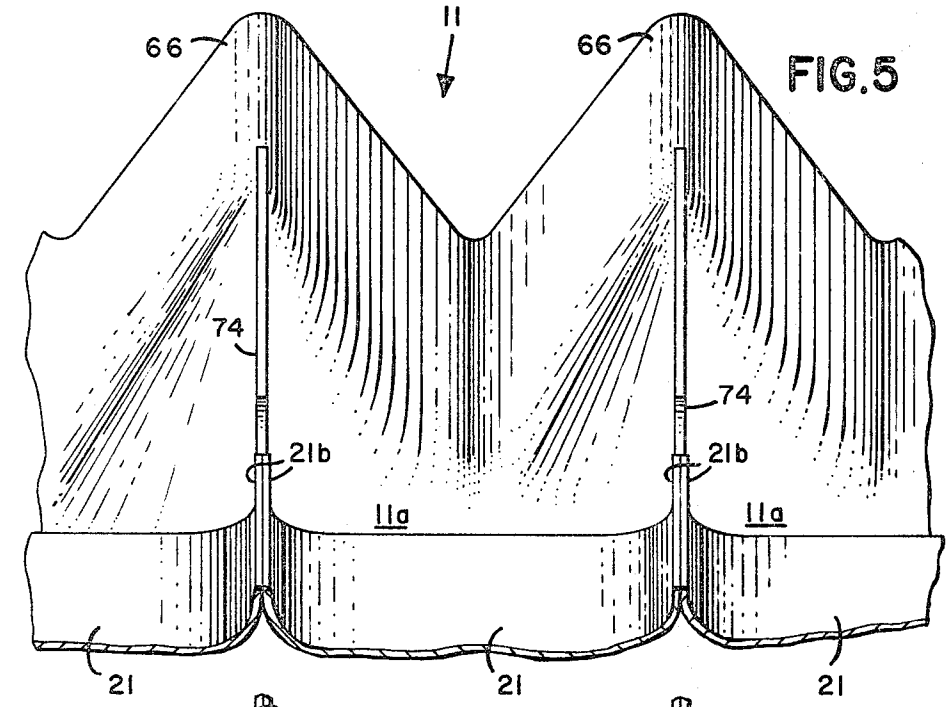


FIG.5

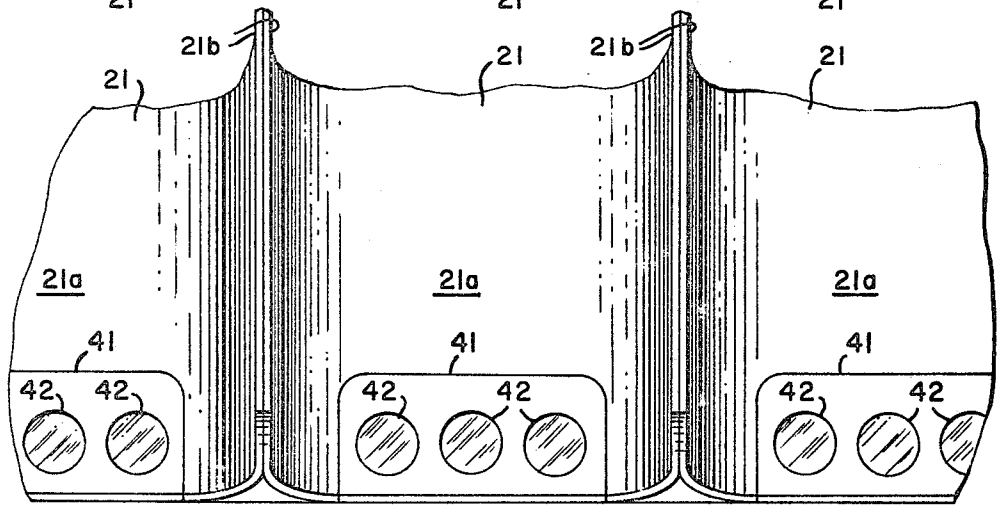


FIG.6

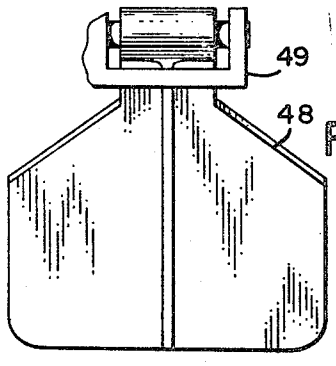


FIG.7

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3,381,819

SORTING MECHANISM FOR PEACH HALVES

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Filed Aug. 1, 1966, Ser. No. 569,509
8 Claims. (Cl. 209—73)

The present invention relates to a sorting mechanism for separating peach halves which are freed from pits or half pits from peach halves which still contain pits or half pits, and is concerned more particularly with a multiple file mechanism of the above character which is adapted to be placed in a production line for canning peach halves and to effectively sort out the peach halves containing pits from each row or file of peach halves being fed through the canning line and directing the peach halves which are free of pits or half pits to a common accepted product slide and conveying mechanism and for automatically rejecting the peach halves containing pits or half pits and directing them from the individual parallel paths into a common reject slide for reprocessing or disposal.

It is a general object of the invention to provide a mechanism for sorting peach halves to separate peach halves which are free of pits or half pits from those which still contain them.

Another general object of the invention is to provide sorting mechanism of the above kind which is of a multifile character to be adapted for positioning in a full capacity production canning line.

Still another object of the invention is to provide a peach sorting mechanism in combination with a cup-down positioner for peach halves together with transfer means for transferring multiple files of peach halves from the cup-down shaker to a sorting mechanism.

Still another object of the invention is to provide a peach trough in a peach sorting mechanism for peach halves which positions a peach half properly with respect to means for sensing the presence or absence of a pit or half pit therein.

Other objects and advantages of the invention will be apparent from the following description of a preferred embodiment thereof, as illustrated in the accompanying drawings, in which:

FIG. 1 is a perspective view of a sorting mechanism embodying the instant invention;

FIG. 2 is a longitudinal sectional view to a part of the mechanism and is taken in a plane indicated by the line 2—2 in FIG. 1;

FIG. 3 is an elevational view looking down on a portion of the peach troughs of the sorting mechanism and showing the relation of the parts of the sorting mechanism to each other;

FIG. 4 is a detail sectional view taken in a plane indicated by the line 4—4 in FIG. 3;

FIG. 5 is a detailed perspective view of a portion of the cup-down positioning mechanism and the transfer means associated therewith;

FIG. 6 is a fragmentary enlarged view of a portion of

FIG. 3 showing the relation of adjacent peach sorting troughs to each other;

FIG. 7 is an enlarged view of the peach rejecting means in the form of a peach rejecting paddle.

Referring first to FIG. 1 the mechanism of the instant invention includes a peach sorting mechanism indicated generally at **10**, a conventional cup-down positioning mechanism in the form of a cup-down shaker **11**, and transfer means **12** for transferring files of peach halves from the cup-down shaker to the parallel paths of the sorting mechanism.

The sorting mechanism includes a fabricated frame **16** having a base **17** and providing a partial support for an accepted product conveyor **17'** (shown in dotted lines) and reject product conveyor **18**.

In general the sorting mechanism **10** includes sheet metal parts which are fabricated to a desired shape in each instance and are secured together as a unit by spot welding or by bolting as required in each case. The sorting mechanism includes a plurality of feed troughs or chutes **21**, (FIGS. 1 through 4), which are generally U-shaped in contour having a flat bottom surface **21***a* (FIG. 4) and upright side walls **21***b* which merge gradually with the bottom wall **21***a* through a curved surface to guide the peach halves to be disposed centrally in the path. Each of the fabricated feed chutes **21** may be secured as by spot welding to a common support plate **22** which extends between respective side plates **23** which is mounted in inclined position on respective frame portions **24** by means of brackets **26**. Mounting plates **27** are also provided on the frame at either side of the side wall members **23** and are secured to said side wall members by respective bolts **28**.

Each of the feed chutes **21** terminates at a sorting gap **31** (FIG. 2) which is defined by an inclined top wall **32** and an inclined bottom wall **33** which is curved at the bottom to lead to the reject conveyor **18**. The wall **33** is connected at its top to an accepted product slide **34** which continues down between the side plates **23** and is curved at the bottom to direct the accepted peach halves to the accepted product conveyor **17'**. These parts may be suitably joined and connected together where necessary. At the bottom of each chute **21** there is provided a sensing station **41** in the form of a photocell box which contains three photocells **42** as seen in FIG. 3 which extend transversely across the bottom of each feed chute **21** and are in alignment with a light source **43** in a common mounting box **44** which extends across the machine and is suitably carried by brackets **46** on the frame.

The operation of the machine is such that the reduction in light from the presence of a half pit or pit interposed between one or more of the photocells **42** and the light source will cause the photocells to operate a conventional rotary solenoid **47** for each path. On the shaft of the rotary solenoid there is mounted a reject paddle **48**, the shaft being journaled in a mounting bracket **49** carried as a unit with the rotary solenoid **47** by a mounting plate **51** which is slotted and is secured by suitable bolts to the underside of the housing **44** for the light sources. There is one reject paddle **48** for each path and when a peach half containing a half pit or pit is detected by the photocell, the paddle **48** is operated as shown in dotted lines in

FIG. 2 to cause the rejected peach half to be directed to the reject slide **33**. Peach halves not containing a pit or a half pit will jump the sorting gap **31** and land on the accepted product slide **34**, this slide being disposed below the plane of the chute **21** to effect this result.

In order to lubricate the various chutes **21** there is provided a common source of lubricating fluid such as water including a pipe **61** (FIGS. 1 and 2) carried by a respective mounting bracket **62** and having a plurality of outlet pipes **63** which overlie the top of each chute **21**. Each pipe **63** has an individual control valve **64** to control the desired flow of water.

The inclination of the feed chutes **21** and the lubrication thereof combine to produce a desired substantially constant velocity of the peach halves as they pass the sorting station so that the timing of operation of the paddle **48** can be controlled as required to effect the ejection of each peach half to be rejected as it passes through the sorting gap **31**. This in combination with the adjustment of the position of the reject paddle **48** combines to obtain the desired results.

In order to feed the peach halves to the sorting mechanism, a conventional cup-down positioner or cup-down shaker **11** is provided having a plurality of parallel positioning ribs **66** between which are provided the positioning paths for the peach halves in a conventional manner. In order to transfer the peach halves from each positioning path, a transfer means is provided in the form of a transfer plate **71** which is mounted by a triangular-shaped sheet metal tube **72** on an angle **73** secured to the plate **22** and this transfer plate **71** extends below the discharge lip **11***a* of the cup-down shaker in order to have relative movement with respect thereto during the shaking operation. In order to keep the peaches divided into the respective files as they move across the transfer plate **71** separators **74** are mounted on the plate **71** in line with the apex of each of the ribs **66** and extending partially thereover as indicated at **76** to insure the separate files being transferred as files to the sorting mechanism.

In operation the cup-down positioner or shaker **11** is supplied with an indiscriminate mass of peach halves and operates to separate the halves into files and to position them for discharge cupped-down from the shaker. These respective files of peaches are carried across from the cup-down shaker **11** to the sorting mechanism **10** by the transfer plate **71** and are discharged onto the upper end of the inclined peach chutes **21**, the curved configuration of the chutes between the side walls thereof and the bottom wall serving to center the peach halves as they are received from the transfer plate in approximately centered position. It will be appreciated that the peach halves as they slide down the feed chute **21** are not oriented as to the stem blossom axis and so the peach pits do assume different attitudes. Therefore, the peach pit is positioned at different locations transversely of the feed chute **21**. One or more of he three photocells **42** will be activated by the peach pit during its travel before entering the sorting gap **41**. The peach halves slide down each feed chute **21** which is lubricated by the water from the associated pipe **63** and each peach half passes over a sensing station and will cause less light to reach one or more of the photocells **42** if a pit or half pit is present therein, and when this occurs this photocell operates in a manner disclosed in the copending application of Patrick M. L. Simmons, Ser. No. 567,602, filed July 25, 1966, for Pit Detection Circuit to operate the rotary solenoid **47** and to actuate the associated reject paddle **48** to cause a change in the path of this rejected peach half and to cause its ultimate rejection by the reject peach conveyor **18**. Peach halves which contain no half pit or pit pass through the sorting gap **31** without being deflected and are received by the accepted product slide **34** and transferred to the accepted product conveyor **17'**.

While I have shown and described a preferred embodiment of the invention, it is apparent that the invention is capable of variation and modification from the forms shown so that the scope thereof should be limited only by the scope of the claims appended hereto.

I claim:

1. In a sorting mechanism for removing from a flow of peach halves those halves containing pits or half pits, means providing a plurality of parallel feed paths for peach halves, said feed paths being inclined downwardly in the direction of travel of the peach halves whereby said peach halves attain a desired velocity, means providing a gap in the bottom of each path, a sensing station in each path including photoelectric means disposed in said path to view an article adjacent the entrance end of said gap, a first product receiving means common to all of said paths for a first type of peach half and positioned at the far side of said gap from said sensing station to receive peach halves having a normal trajectory across said gap, second product receiving means common to said paths for products of a second type, and peach half control means for each path controlled by an associated photoelectric means for diverting a product of the second type from its normal trajectory and into said gap for delivery to said second product receiving means.

2. In a sorting mechanism as recited in claim **1** in which said parallel paths providing means comprises a support plate having a parallel plurality of U-shaped trough members secured thereto, each of said U-shaped trough members including vertical side walls merging by means of arcuate surfaces with a planar bottom wall to which the flat surface of a peach half is guided into engagement by said arcuate merging portions.

3. In a sorting mechanism as recited in claim **2** in which said photoelectric means extends substantially across said planar bottom portion of each of said troughs in order to sense the pit in a peach half irrespective of the orientation of a peach half in said trough.

4. In a sorting mechanism as recited in claim **1** in which each said sensing stations comprise a light source, and a common light housing for said sources mounted above the photoelectric means in said troughs.

5. In a sorting mechanism as recited in claim **4** in which said control means includes a reject paddle and electrical operating means therefor adjustably mounted on the bottom of said light housing.

6. In a sorting mechanism as recited in claim **1** in which liquid feed means is provided to supply lubricant to each of said paths to lubricate said paths.

7. In a sorting mechanism for detecting and sorting out peach halves containing pits or portions thereof, a peach positioner having a plurality of adjacent parallel paths for effecting positioning of the peach halves in a common position, a sorting mechanism including a plurality of parallel peach paths included downwardly, a pit sensing station in each of said parallel paths, a common "accepted" product receiving means disposed to receive accepted peach halves after they have passed the sorting station, a common "rejected" product receiving means common to said paths, reject means controlled by a said sensing station for directing peach halves to said "rejected" product receiving means, and a transfer means between said sorting mechanism and said positioner including plate means extending across the discharge end of the positioner and adapted to receive peach halves therefrom and a series of vertical separators extending upwardly from said transfer plate means to direct peach halves from the paths of said positioner into respective aligned paths of said sorting mechanism.

8. In a sorting mechanism for removing from a flow of peach halves those halves containing pits or half pits, means providing a feed path for peach halves, said feed path comprising a trough inclined downwardly in the direction of travel of the peach halves whereby said peach halves attain a desired velocity, said trough comprising a planar bottom wall having curved guide portions

extending upwardly at either side thereof, means providing a gap in the bottom of the path, a sensing station in the path including a light source disposed above said path and photoelectric means disposed below said path to view an article adjacent the entrance end of said gap, means for feeding a lubricant to said trough, a first product receiving means for a first type of peach half and positioned at the far side of said gap from said sensing station to receive peach halves having a normal trajectory across said gap, second product receiving means for products of a second type, and peach half control means controlled

by an associated photoelectric means for diverting a product of the second type from its normal trajectory and into said gap for delivery to said second product receiving means.

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