

Sept. 19, 1967

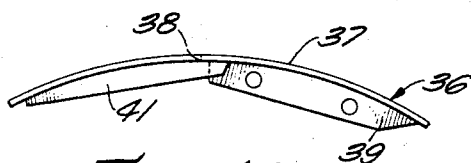
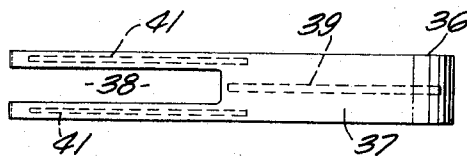
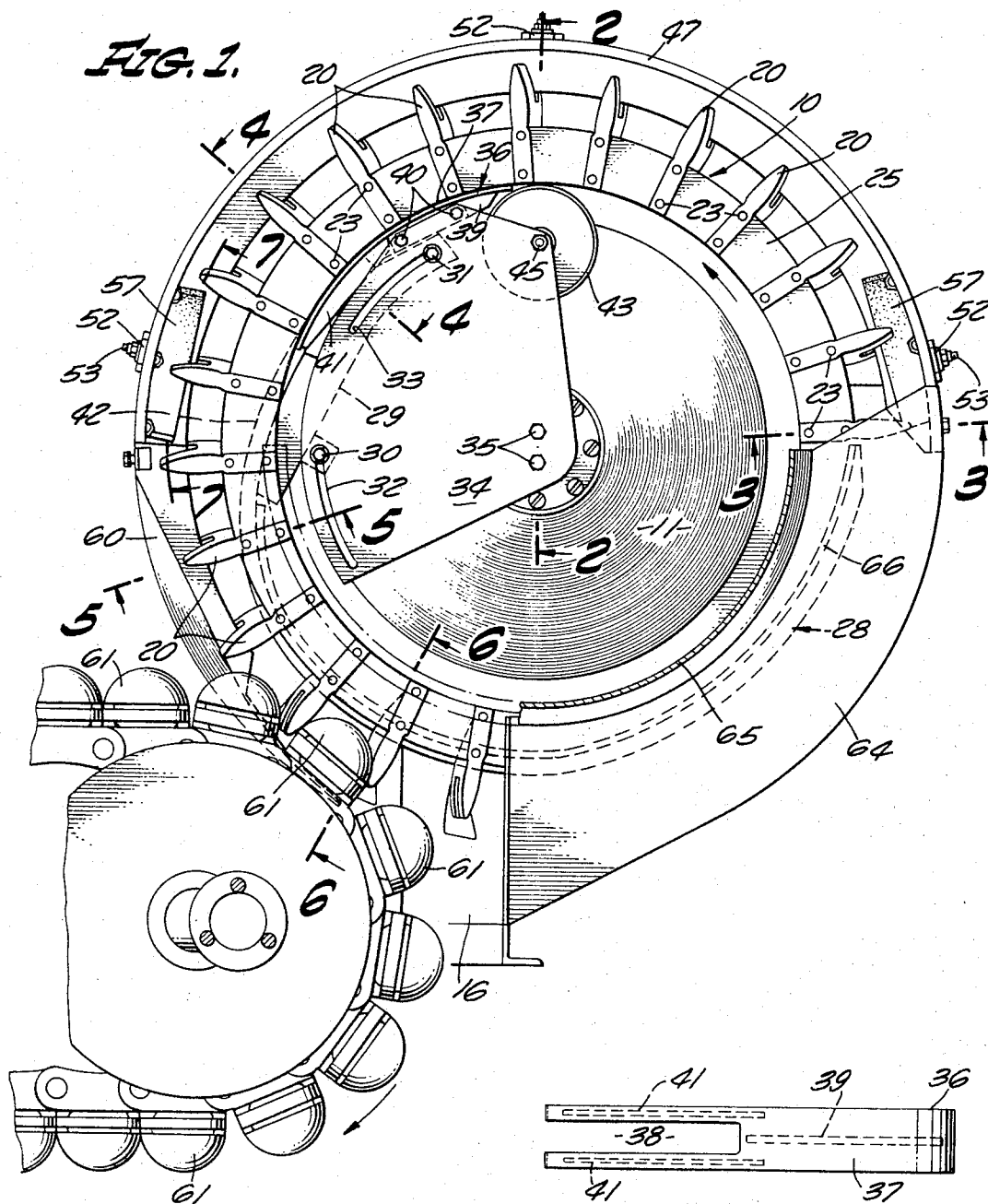
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3,342,314

ROTARY FEEDER FOR FRUIT

Filed Feb. 7, 1966

4 Sheets-Sheet 1



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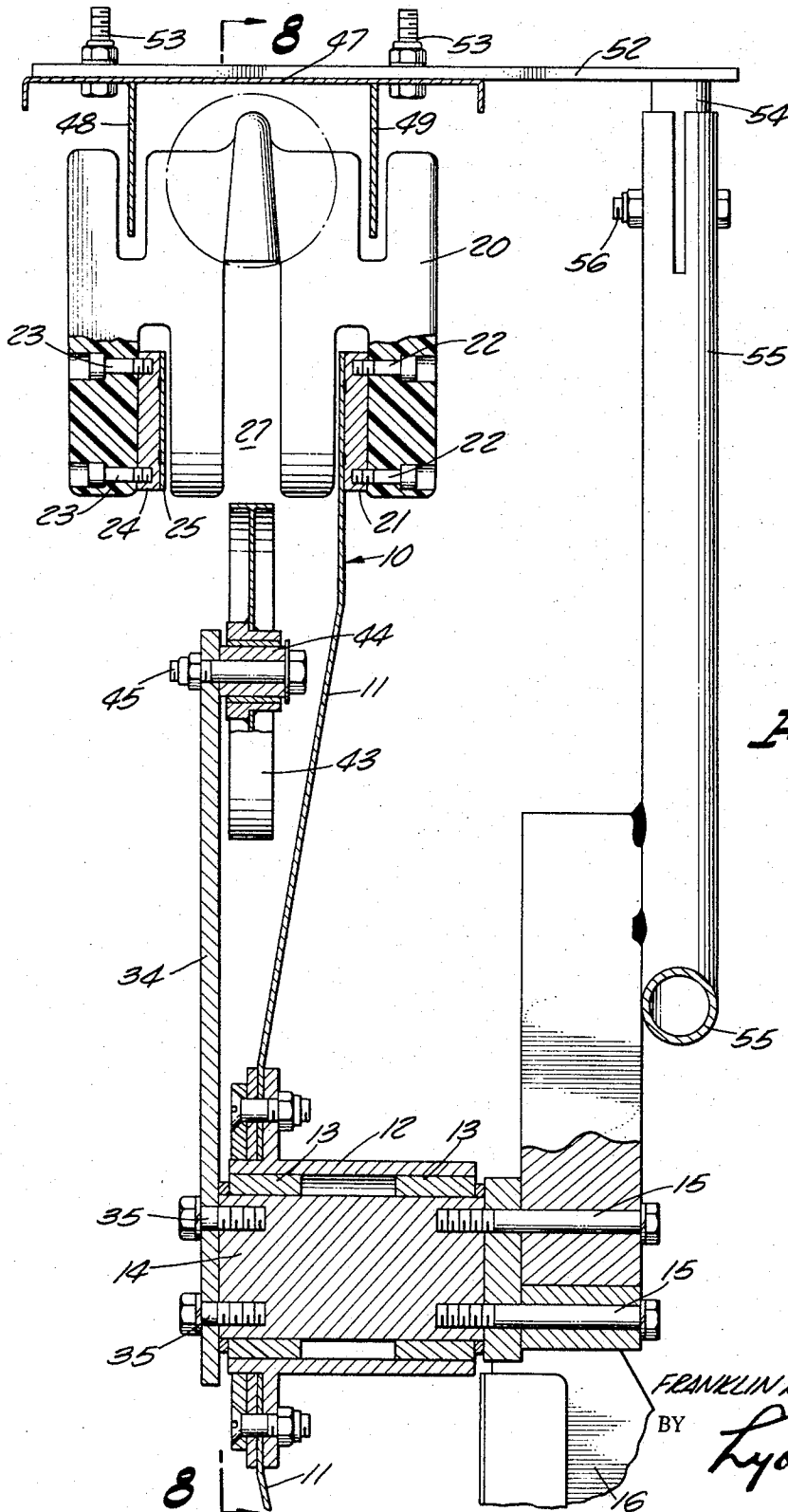


FIG. 2.

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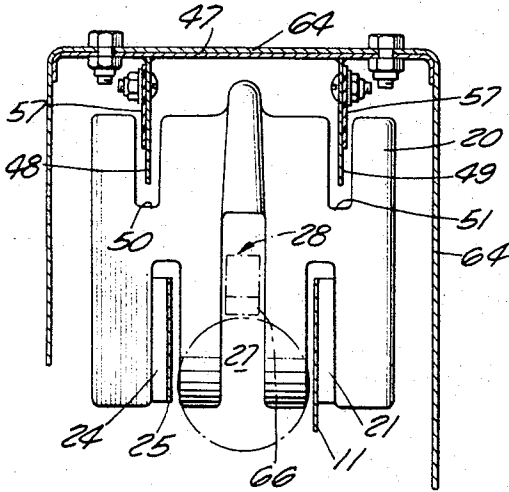


FIG. 3.

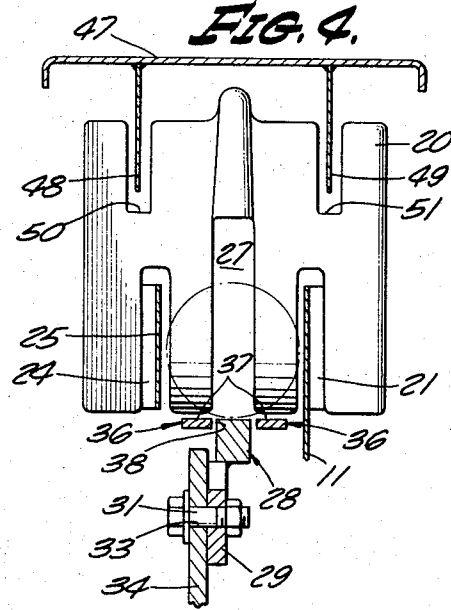


FIG. 4.

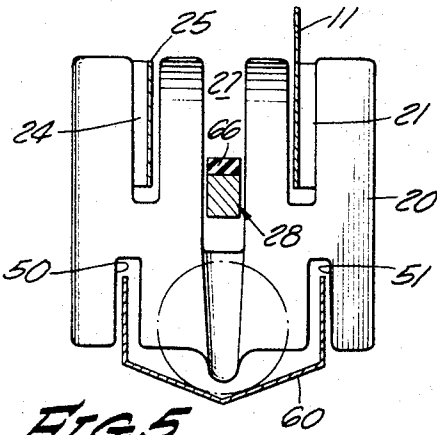


FIG. 5.

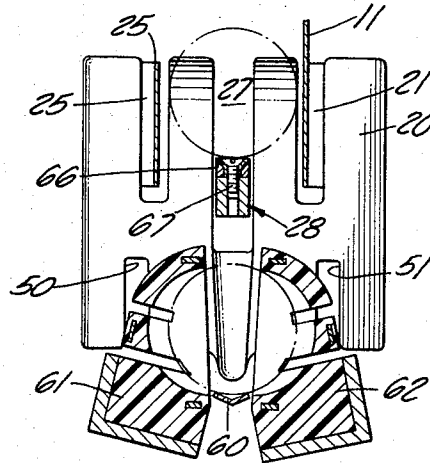


FIG. 6.

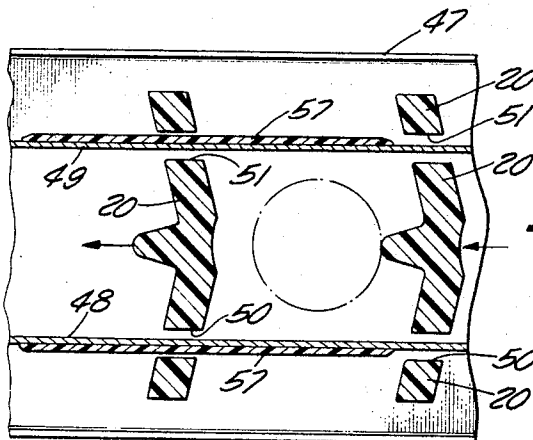


FIG. 7.

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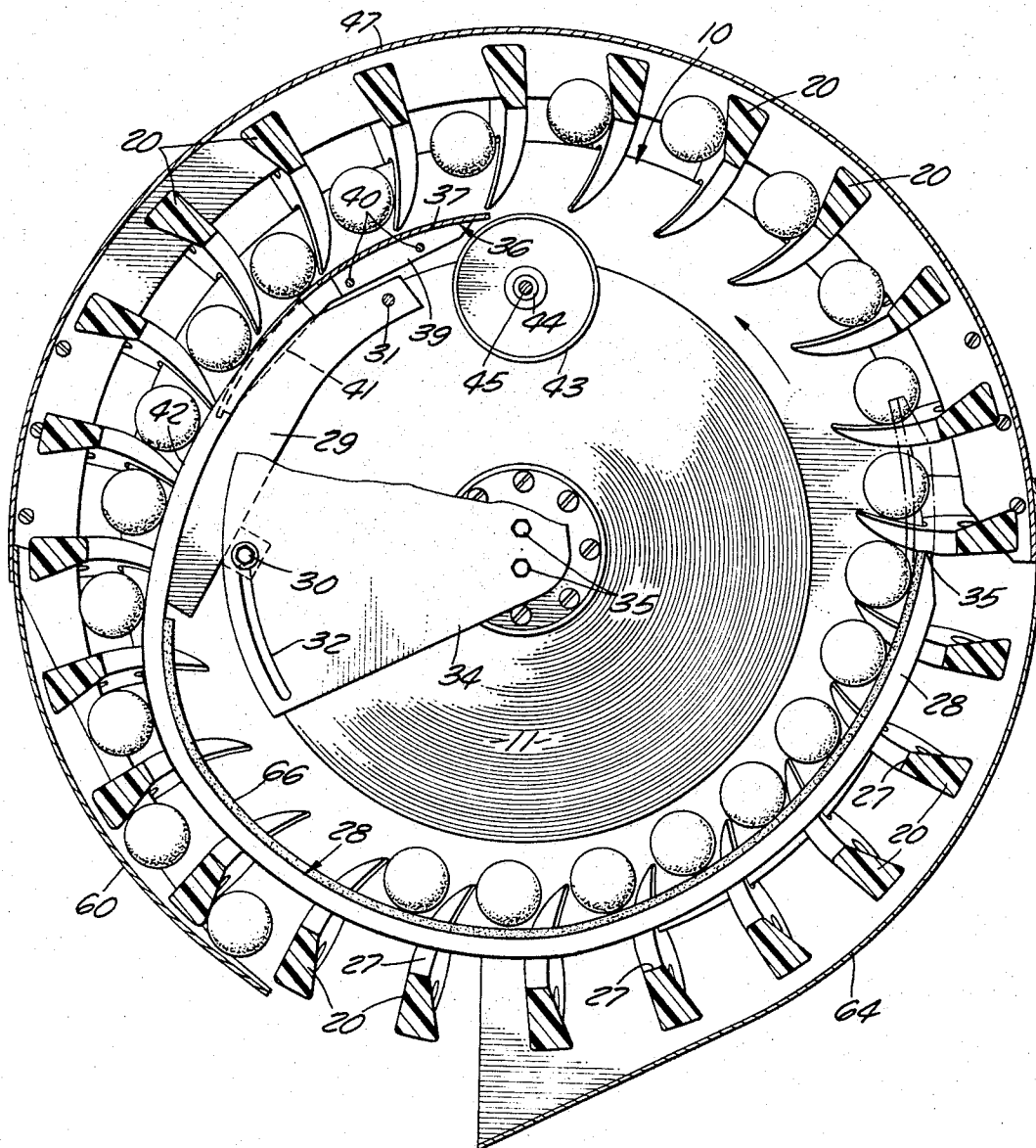


FIG. 8.

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ROTARY FEEDER FOR FRUIT

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4 Claims. (Cl. 198—212)

ABSTRACT OF THE DISCLOSURE

A rotary feed wheel has pockets defined between radial blades on its periphery. A stationary rail extends into radial slots formed in the blades and extends in an arc around the wheel, so that a portion of the rail near one end forms the inner boundary of the fruit-receiving pockets, while another portion of the rail near the other end forms the outer boundary thereof. The position of the rail is adjustable circumferentially with respect to a nose-piece provided with a roller which prevents impaling of the fruit on the forward end of the rail.

This invention relates to fruit processing apparatus and is particularly directed to improvements in a rotary fruit feeder of the general type shown in Wells Patent No. 2,644,568. The rotary feeder device shown in that patent employs a wheel having fruit-receiving pockets defined between radial blades on its periphery. The blades are slotted to receive a stationary rail which extends circumferentially around the wheel structure. The stationary rail cooperates with the rotating wheel and blades, so that a portion of the rail near one end forms the inner boundary of the fruit-receiving pockets, while another portion of the rail near the other end forms the outer boundary of the fruit-receiving pockets. The continuous rail extends for a full revolution and the ends are offset so that the fruit in the pockets passes between the offset ends of the rail.

The rotary feed wheel device of that patent has found particular usefulness in connection with juice extracting machines used for oranges and lemons. The fruit is graded as to size before delivery to the rotary feed wheel device, but some variation in size must be accommodated since it is commercially impractical to restrict size variation beyond certain limits. Accordingly, it is the principal object of this invention to provide a rotary feeder device of the general type shown in the Wells patent, but having important modifications which enable the device to accommodate a wider range in fruit size.

Another object is to provide a rotary feeder device of the type described particularly adapted for higher speed of operation.

Briefly stated, these and other objects of the invention are achieved by reducing the arcuate length of the stationary continuous rail from about one full revolution to about three-quarters of one revolution, and by providing a roller which turns about an axis parallel to the rotary axis of the feed wheel structure, which roller has an upper portion substantially tangent to one end of the stationary rail. The arcuate distance between the circumferentially spaced ends of the continuous rail facilitates movement of fruit radially outward into the pockets between the peripheral blades on the wheel, and the roller insures that the fruit moves radially outward in the pockets for a sufficient distance to clear the adjacent end of the stationary continuous rail.

Other and more detailed objects and advantages will appear hereinafter.

In the drawings,

FIGURE 1 is a side elevation partly broken away showing a preferred embodiment of this invention.

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FIGURES 2, 3, 4, 5, and 6 are radial sectional views taken substantially on the lines 2—2, 3—3, 4—4, 5—5, and 6—6, respectively, as viewed in FIGURE 1.

FIGURE 7 is a sectional detail taken substantially on the lines 7—7 as shown in FIGURE 1.

FIGURE 8 is a sectional elevation taken substantially on the lines 8—8 as shown in FIGURE 2.

FIGURE 9 is a plan view of the rail nose-piece.

FIGURE 10 is a side elevation of the nose-piece shown in FIGURE 9.

Referring to the drawings, the wheel structure generally designated 10 includes a wheel disc 11 fixed on a rotary hub 12 and supported by spaced bearings 13 on a stationary shaft 14. This shaft 14 is fixed by suitable fastenings 15 to a stationary support frame 16. A plurality of radially extending webs or blades 20 are fixed on the outer periphery of the disc 11. Metal blocks 21 are fixed by welding to the periphery of the disc 11 and each block 21 is fixed to its respective blade 20 by means of threaded fastenings 22. Each blade 20 is also provided with fastenings 23 which are secured to metal blocks 24 welded to the annular ring 25. From this description it will be understood that the blades 20, ring 25, disc 11 and hub 12 turn as a unit around the stationary horizontal shaft 14.

The blades 20 are each provided with a centrally positioned inwardly opening slot 27 for reception of the stationary rail generally designated 28. This rail has a supporting fin 29 fixed to its inner surface near one end thereof but is unsupported for the remaining portion of its arcuate length. Threaded fastenings 30 and 31 fixed to the supporting fin 29 extend through arcuate slots 32 and 33, respectively, provided in the stationary support plate 34. This support plate 34 is fixed to the stationary shaft 14 by means of fastenings 35. The slots 32 and 33 permit arcuate adjustment of the rail 28 with respect to the stationary support plate 34, and this adjustment permits movement of the free unsupported end 35 of the rail 28 between the full line and phantom line positions shown in FIGURE 8.

A separate nose-piece 36 for the supported end of the rail 28, best shown in FIGURES 9 and 10, has a curved outer surface 37 provided with a slot 38 at one end for slidable reception of the supported end of the rail 28. A fin 39 is fixed centrally under the forward end of the nose-piece 36 and is supported by threaded fastenings 40 which pass through the support plate 34. Stiffening ribs 41 may be provided on the underside of the nose-piece 36 on opposite sides of the slot 38. Although positioned for relative adjustable arcuate movement, the nose-piece 36 and rail 28 function as an integral unit. The outer surface 37 of the nose-piece and the outer surface 42 of the adjacent portion of the rail 28 cooperate to form a smooth continuous surface which forms the inner boundary of fruit-receiving pockets formed between adjacent blades 20.

A roller 43 is mounted on the stationary support plate 34 and positioned so that its upper portion is substantially tangent to the curved upper surface 37 of the nose-piece 36, and is positioned closely adjacent the forward end of the nose-piece. The roller 43 turns on a stationary horizontal stubshaft 44 fixed to the support plate 34 by means of the bolt assembly 45. The roller 43 insures that fruit in the pockets between the blades is lifted sufficiently to clear the forward end of the nose-piece 36, as the wheel structure 10 turns in the direction of the arrow shown in FIGURE 8.

A stationary arcuate cover 47 encloses the upper portion of the wheel structure 10 and is provided with a pair of parallel inwardly extending radial flanges 48 and 49. Each of the blades 20 has a pair of radially extending outward opening slots 50 and 51 for reception of these flanges. The flanges form the side boundaries of the fruit-

receiving pockets defined between the blades 20, and the cover 47 forms the outer boundary of these pockets. The cover 47 is conveniently supported on three axially extending bars 52, each bar being connected to the cover 47 by means of threaded fastenings 53. Each bar 52 is fixed to a radial post 54 slidably received within the slotted end of a stationary support tube 55. A threaded fastening 56 clamps the slotted end of the support tube about the post 54 in adjusted position. The support tubes 55 are fixed to the stationary part 17. Teflon pads 57 are secured to the cover flanges 48 and 49 to serve as guides for sliding contact with the sides of the slots 50 and 51 in the blades 20, as shown in FIGURES 1, 3, and 7.

A stationary transfer chute 60 forms a continuation of the cover 47, and this chute extends downward at an angle between converging pairs of conveyor cups 61 and 62 which are of the type described in said Wells patent. A stationary slicing knife (not shown) also extends between the converging conveyor cups to slice each fruit into two halves, each half thereafter remaining in its respective cup for subsequent juice-extracting operations. The conveyor cups are driven by means not shown and the outer projecting portions of the blades 20 mesh with these conveyor cups to drive the feed wheel device in timed relation to this movement of the conveyor cups.

A removable bottom cover 64 forms a continuation of the cover 47, but it does not contain guide flanges.

A side entry stationary hopper 65 delivers fruit laterally into the feed wheel device above the lower portion of the rail 28. The fruit has been previously graded as to size and the fruit falls into the spaces between the blades 20 and above the rail 28. A nonmetallic liner 66 is fixed within the lower portion of the stationary rail 28 on the inner surface thereof and secured by means of threaded fastenings 67 as shown in FIGURE 6. Liners of different thicknesses may be used for fruit of different graded sizes. As the feed wheel 10 turns in the direction of the arrow as shown in FIGURES 1 and 8, the fruit delivered by the stationary hopper 65 is lifted by the inner ends of the blades 20 and rolls along the liner 66 on the stationary rail 28. The blades 20 are curved in a direction to move the fruit radially outwardly as it is lifted, and centrifugal force assists in this action. The roller 43 prevents any individual fruit which for any reason fails to follow the proper path from becoming impaled on the forward end of the stationary nose-piece 36.

Having fully described my invention, it is to be understood that I am not to be limited to the details herein set forth but that my invention is of the full scope of the appended claims.

I claim:

1. A rotary device for feeding fruit to a juice extracting machine, comprising in combination: a frame, a wheel structure mounted to rotate on the frame about a horizontal axis and having a series of circumferentially spaced blades fixed on the periphery thereof, each pair of adjacent blades defining therebetween a fruit-receiving pocket, a stationary arcuate cover on the frame enclosing an upper portion of the wheel structure, each blade having a central slot, a continuous stationary rail received in said

slots and extending circumferentially for an arcuate distance substantially less than one full turn, said rail having a first portion adjacent one end defining the inner boundary of said pockets, a roller mounted on the frame adjacent said end of the rail for rotation about a horizontal axis and having an upper portion substantially tangent to said inner boundary, the rail having a second portion adjacent the other end defining the outer boundary of said pockets.

2. A rotary device for feeding fruit to a juice extracting machine, comprising in combination: a frame, a wheel structure mounted to rotate on the frame about a horizontal axis and having a series of circumferentially spaced blades fixed on the periphery thereof, each pair of adjacent blades defining therebetween a fruit-receiving pocket, a stationary arcuate cover on the frame enclosing an upper portion of the wheel structure, each blade having a central inward-opening slot and a pair of laterally spaced outward-opening slots, a continuous stationary rail received in said slots and extending circumferentially for an arcuate distance substantially less than one full turn, said rail having a first portion adjacent one end defining the inner boundary of said pockets, stationary arcuate flanges on the cover extending into said outward-opening slots, a roller mounted on the frame adjacent said end of the rail for rotation about a horizontal axis and having an upper portion substantially tangent to said inner boundary, the rail having a second portion adjacent the other end defining the outer boundary of said pockets.

3. A rotary device for feeding fruit to a juice extracting machine, comprising in combination: a frame, a wheel structure mounted to rotate on the frame about a horizontal axis and having a series of circumferentially spaced blades fixed on the periphery thereof, each pair of adjacent blades defining therebetween a fruit-receiving pocket, a stationary arcuate cover on the frame enclosing an upper portion of the wheel structure, each blade having a central slot, a continuous stationary rail received in said slots and extending circumferentially for an arcuate distance substantially less than one full turn, said rail having a first portion adjacent one end defining the inner boundary of said pockets, a roller mounted on the frame adjacent said end of the rail for rotation about a horizontal axis and having an upper portion substantially tangent to said inner boundary, the rail having a second portion adjacent the other end defining the outer boundary of said pockets, said rail being provided with a nose-piece adjacent said roller, and means for adjusting the arcuate position of the rail with respect to the nose-piece and roller.

4. The combination of claim 3 in which the nose-piece has a slot removed from said roller, and means for adjustably positioning said rail in said slot.

References Cited

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2,644,568	6/1953	Wells	198—30

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