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(54) A METHOD OF AND APPARATUS FOR PEELING PINEAPPLES

(71) We, ATLAS PACIFIC ENGINEERING COMPANY, a Corporation organized and existing under the laws of the State of Delaware, United States of America of 67th and Hollis Streets, Emeryville, California, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a method of and apparatus for peeling pineapples.

Pineapples are prepared for canning by first cutting off the opposite ends, the butt end and the leafy crown end. The pineapples are then fed to a machine which makes two cuts on the fruit. One comprises a first cut to remove most of the outside shell and reduce the pineapple to a generally cylindrical shape of predetermined diameter. The second cut removes the woodlike core and what remains is a hollow cylinder with the skin and eyes removed to a greater less extent. In the interest of economy, the first cut is made at as large a diameter as possible. As a result, in the great bulk of the fruit, the eyes on the fruit are not removed at each end. This is because pineapples are ovoidal in shape with eyes extending about 3/8" deep, and if the fruit were cut to remove all the eyes, the waste would be too great. The machine on which these cylindrical cutting operations are performed is well-known in the art and is commonly referred to as a "GINACA"; (see United States Patent Specification Nos. 1,039,926, 1,060,247, 1,060,248, 1,060,249, 1,060,250, 1,060,750, 1,065,309, 1,075,031, and 1,112,130).

The cutting of the pineapples on a Ginaca is subject to several objections. One is that any eyes remaining on the outer surface at both ends must be removed by hand trimming. This is a time consuming and an expensive operation. Another objection is the loss of good pineapple meat on the ovoidal shell cut from the fruit. Because so many eyes are present in any meat extracted from the shell, the only practical use to which this can be put is to press it to release the juice and recover this by filtration. The saleability of the juice is only at a low price and it moves slowly in the market place. Finally, the Ginaca machine is only useful for large fruit.

According to one aspect of the present invention there is provided a method of peeling a pineapple comprising rotating the fruit to be peeled through at least one substantially complete turn while performing a first cutting operation in the surface of the rotating fruit to remove substantially all the rough peel portions of the pineapple and subsequently rotating the fruit through at least one substantially complete turn while performing a second cutting operation in the surface of the rotating fruit to remove substantially all the uncut peel material remaining after the completion of the first cutting operation.

According to another aspect of the invention there is provided a method of peeling a pineapple comprising rotating the fruit to be peeled through at least one substantially complete turn at a first peeling zone while performing a first cutting operation in the surface of the rotating fruit to remove substantially all the rough peel portions of the pineapple, moving the fruit to a second peeling zone, rotating the fruit through at least one substantially complete turn at the second peeling zone while performing a second cutting operation in the surface of the fruit to remove substantially all the uncut peel material remaining after the completion of the first cutting operation.

According to a further aspect of the invention there is provided apparatus for peeling pineapples, such apparatus comprising a first peeling zone, a second peeling zone, means for moving a fruit step-wise from the first to the second peeling zones, means for rotating a fruit to be peeled through at least one substantially complete turn at each peeling zone, a cutter provided at the first peeling

zone for performing a first cutting operation on the surface of the pineapple to remove substantially all the rough peel portions of the pineapple and a cutter provided at the second peeling zone for performing a second cutting operation on the surface of the pineapple to remove substantially all the uncut peel material remaining after the completion of the first cutting operation.

Illustrative embodiments of the invention will now be described with reference to the accompanying drawings in which:—

Figure 1 illustrates schematically one form of the method;

Figure 2 is a plan view of one form of apparatus for carrying out the method;

Figure 3 is a side elevational view on the line 3—3 of Figure 2;

Figure 4 is an enlarged sectional view of one form of cutting head;

Figure 5 is an end view generally on the line 5—5 of Figure 4 but showing the head rotated 90° from the position shown in Figure 4;

Figure 6 is a view of the cutting head on the line 6—6 of Figure 5;

Figure 7 is a perspective view of a pineapple showing one form of a spindle which may be utilized during the peeling operation;

Figure 8 is a diagrammatic view showing the method of removing the pineapple from the peeling spindle and forcing it onto a coring tube;

Figure 9 is a side view of the method of cutting the pineapple to size preparatory to canning; and

Figure 10 is a diagrammatic view showing a method of helical peeling which forms another embodiment of the present invention.

Referring now to the drawings, particularly to the extreme upper left hand part of Figure 1, there is shown a pineapple, generally designated 11, on which a first peeling operation has been performed by a first machine. This peeling operation comprises cutting off the top 13 and bottom 15 of a pineapple which parts contain little pineapple meat and which are sent to a cattle feed or waste. The pineapple is then fed into a second machine in which centring elements 17 align the pineapple for a coring operation. Pusher element 16 then forces the aligned fruit upward onto a hollow finned spindle 19 which cuts part of the core from the pineapple to leave a hole extending the length of the pineapple. Thereafter the pineapple is passed through a first zone wherein it is given a first peeling as at 21 and the core portion cut by the spindle 19 is ejected. The first peeling 21 takes off a rough cut about 3/16" deep, the skin and substantially all the rough outside portion of the pineapple being removed with a minimum of the fruit. This rough material may have the juice extracted or be used as cattle feed or sent to waste.

At this stage, the pineapple still has part of the indentations of the eyes. The pineapple is then passed through a second zone where it is given a second peeling 23 also about 3/16" deep. This removes substantially all the eyes and imperfections, leaving the pineapple substantially ready for canning or other further processing. The pineapple is forced off the coring spindle 19 by presser foot 75 and is sent to an inspection station 25. The material removed by the second peel is sent to a juicer 20, the juice being recovered and the solid sent to waste or cattle feed. The pineapple is inspected at station 25, and if a small amount of hand trimming is necessary, it may be done at this station.

The pineapple is now passed to station 27 where it is cut into a generally cylindrical shape and the remainder of the core is removed. The resulting hollow cylinder 31 is subject to further operations such as slicing. The outer annular portion 32 which has been cut off is sent to further operations for producing crushed or chunk pineapple, while the hollow cylindrical core 33 which was removed during the coring operation at the station 27 is sent to cattle feed or to waste. This more advantageous economic use is possible because the outer annular portion 32 is free from imperfections, as contrasted with the annular portion left after the operation of the Ginaca machine, which portion is only suitable for juice or cattle feed. It is believed apparent from the above generalized description that the present method produces the greatest amount of usable pineapple and the minimum amount of cattle feed and juice and this with a minimum amount of hand labour.

In Figure 2 there is shown one form of apparatus for performing the method. The machine illustrated has six spindles for carrying pineapples which are moved stepwise from one work zone to the next. These work zones include a rough peeling zone 38 having two peeling locations 39 and 41, a finish peeling zone 40 having peeling locations 43 and 45, and an unloading zone 47. Pineapples to be peeled are loaded onto the apparatus at the loading zones 37. The six spindles 49 are advanced from one work zone to the next under control of an index mechanism which is not shown but which is well-known in the art. The spindles 49 make one revolution in each peeling location before moving to the next; the spindles are not rotated at the loading and unloading zones 37 and 47.

The spindles 49 depend from a rotating disc or table 51 above a chute structure 52. The chute structure is divided into three separate compartments 54A, B and C by partitions 53 so that each operation is conducted in a separate compartment to enable the several by-products to be kept separate from one another. The partitions 53 have swinging doors 55 to permit the pineapples to pass

from one work zone to the next. Suitably, the doors 55 may be merely spring loaded and are pushed open by the pineapples as they move from one work zone to the next or they may be positively power actuated.

At the loading zone 37, a plurality of spring loaded fingers 57 are provided to grasp and align a pineapple which has been fed by hand or by machine which its core axis vertical. The fingers 57 then move in time with the disc 51 from loading zone 37 to the zone designated 58. By the time the pineapple has reached the zone 58 it is directly under a spindle 49. In zone 58, the pineapple is pushed upwardly through fingers 57 and is impaled on the spindle 49 until its median plane is substantially in the plane of a middle peeling unit 67 as in Figure 3. Fingers 57 and spindle 49 correspond respectively to the elements 17 and the spindle 19 described in the operation set forth in connection with Figure 1.

A suitable form of spindle 49 is shown in enlarged form in Figure 7. The spindle comprises a hollow shaft 59 with a series of fins 61 or flutes thereon and having a sharpened end 63. As the pineapple is impaled on the spindle, the sharpened end cuts a primary core which is thereafter ejected in the first peeling compartment 54B. The outside diameter of the fins 61 is somewhat smaller than the ultimate core diameter of the pineapple to be removed in a later operation, so substantially no usable portion of the pineapple is harmed by impalement on the spindle.

After the pineapple has been impaled on a spindle, it is moved through the series of work zones (clockwise in the embodiment illustrated in Fig. 2) by a suitable indexing mechanism. The first of these is zone 38 having peeling locations 39 and 41 at each of which the pineapple makes substantially one revolution while undergoing peeling. Locations 39 and 41 are rough skin peeling locations at which the first rough peeling previously described is made in two stages. As is shown in Figure 3, cutter heads 65, 67 and 69 operate at location 39 while cutter heads 71 and 72 operate at location 41. The cutter structures will be hereinafter described in detail but at this point it will suffice to say that the three cutter heads 65, 67 and 69 make a top, central and bottom cut respectively leaving two bands of uncut skin while cutter heads 71 and 72 thereafter remove the two theretofore uncut bands. The initial cut penetrates about 3/16" and removes substantially all skin and a greater portion of the eyes. The cut material is collected by the chute 52 and ordinarily is used for cattle feed or sent to waste.

After cutting at the two locations 39 and 41, the pineapple passes to location 43 and then to location 45 where another cut is taken off at each stage to provide the second peeling previously described, again in two stages with the pineapple making substantially one revolution at each of locations 43 and 45. The cuts at this zone are again made in bands as at the previous zone and as is shown in Figure 3. This finish cut is also about 3/16" deep and, since a considerable amount of meat is taken on the second cutting, this material can be collected and used for juice. At this point, the pineapple still has the characteristic pineapple shape but is free of all skin and all but unusually deep eyes.

In the above, it has been assumed that two cuts, the first one with three cutters and the second with two cutters, would provide both the rough and second cuts, but it will be apparent that this is for illustration purposes only and that other numbers of cutting heads might be employed. Ordinarily five heads would be about a minimum and larger pineapples might require more cutting heads for operation at any zone.

After the two series of cutting operations, the pineapple then passes to work zone 47. The operation at this zone may include a further, secondary, coring and in any case the pineapple is discharged from the machine at this zone. The secondary coring operation is shown in diagrammatic form in Figure 8. Here the pineapple is shown impaled on a spindle 49 and a presser foot 75 is employed to press the pineapple off the spindle 49. The pineapple may be discharged from the machine or pressed onto a coring tube 77 and thus into the position shown in broken lines to the right of Figure 8. It will be seen that one end of the coring tube 77 has a sharpened edge and cuts out a core which is larger in diameter than the fins on the spindle 49 and fully encompasses the central core fibre of the fruit. The peeled and cored fruit is then moved off the core tube 77 and the core ejected by a separate mechanism not shown.

The peeled and fully or partially cored fruit is delivered to an inspection station whereat any hand trimming required is provided. The inspected and trimmed fruit is then passed to a sizing machine, generally designated 79, Figure 9. The pineapple is placed on, and is carried by, a rod 81 which fits in the core hole in the fruit. Pusher element 82 is sidable on rod 81 and serves to force the fruit into a sharpened cylinder 83 which may be rotating. This cuts the fruit into a generally cylindrical shape which fits the size of the can in which the fruit is to be packaged If the fruit was not fully cored as it was discharged from the peeling machine, an internal cylindrical cut can be made simultaneously with the external cylindrical cut. Methods for cutting both the external and internal cylindrical cuts are well-known in the art. In addition, radial blades 85 may be employed to sever the annular portion removed

by the cylinder 83 into two or more segments for easier handling. The pineapple then passes onto a conveyor 87 to be sliced or otherwise processed.

In Figure 10 an alternative embodiment is shown. Here a pineapple 89 is held on a rotating spindle 49 and a first cutting head 90 makes a first pass through an arc 92 to perform the initial cutting operation while the pineapple is rotated through substantially one complete turn. Thus, the pineapple shown at 89A has a helical cut thereon and has been peeled to remove the rough skin. The pineapple then passes to the position shown at 89B whereupon a second cutting head 94 makes a second pass through an arc 96 while the pineapple is rotated through substantially one complete turn completing the peeling operation, producing the pineapple shown at 89C and which has substantially all of its eyes removed and which is in substantially the same condition as the pineapple processed in accordance with the first described embodiment. The peeling heads 90 and 94 may be at separate stations or may be the same head making a forward and return cut each about 3/16" deep. By utilizing two peeling operations at different stations, the cuttings can be collected separately and used to their greatest economic advantage.

In Figures 4 to 6, one of the cutting heads is illustrated. The cutter head has generally been designated 91 and comprises a body 93 adjustably mounted on a bracket 102 so that the base of a rotary cutter 119 will be substantially tangential to the outer surface of a pineapple and its cutting edge substantially on a line through the axis of the pineapple. Within body 93, sleeve 113 is slidably mounted in bushings 107. A split collar 104, clamped on the end of sleeve 113, has one or more slots 105 in its outer face. Piston shaft 99 engages one of the slots 105 to prevent rotation of the collar and its attached sleeve 113. A piston and cylinder assembly 97 is supplied with a regulated and controlled air pressure to urge the sleeve 113 and a shaft assembly toward the fruit with a steady pressure when air pressure is applied. When the air is not applied, spring 101 retracts the cutter from the fruit. The on-off sequence is controlled by an automatic valve, not shown, which relates the application of air to the revolution of the fruit. By retracting the piston rod 99 from one of slots 105, the sleeve 113 may be rotated to cause a guard assembly, generally indicated at 115, to advance toward or recede from the end of the sleeve 113, thus controlling the depth of cut. Re-engagement of piston rod 99 with a slot 105 prevents further rotation of sleeve 113. Shaft 109 is mounted for rotation within sleeve 113 on bushings 110. The shaft 109 is prevented from moving axially within sleeve 113 by collar 106 and flange 108. Shaft 109 is rotated by a suitable drive such as a flexible shaft, not illustrated.

The guard assembly 115 is threaded onto sleeve 113 and is prevented from rotating therewith by pin 117 slidably engaged with body 93. Mounted on shaft 109 is cutter 119, which has a series of saw tooth-like teeth 121. Face 120 on the cutter 119 in contact with the fruit is smooth and planar so that it cannot cut into the fruit axially when it is rotated. Each tooth has a cutting surface in the form of a face sloping away from the face 120, each such face having a sharpened cutting edge. In addition to the teeth 121, projections 126 are provided on the opposite face of the cutter to the face 120, the projections being substantially normal to the face 120. The teeth sever the fibres of the pineapple and lift a ribbon of peel while the projections 126 which are sharpened on their leading edge cut the ribbon or peel into segments about 1/4" long depending on the speed of cutter and pineapple rotation. There are preferably two diametrically opposed projections 126.

The guard member 115 carries a depth gauge 123 which regulates the depth of the cut. The gauge includes a foot 131 pivoted at 124 and pressed by spring 132 to engage the fruit. The foot 131 projects beyond the path of the cutter. This action can best be seen in Figure 4. Further, as is shown in Figure 5, the gauge 123 may have wings 125 on either side and which ride on the uncut portion of the pineapple as is best seen in Figures 5 and 6. These wings are particularly valuable when making the first cut of a series such as at locations 39 and 43, in Figure 2. In making the second cut, as at locations 41 and 45, the guard rides over the uncut surface to regulate the depth of the cut, as is best seen in Figure 4.

Various modifications can be made to the apparatus, for instance, in Figure 2 it is shown that the cutter heads are stationary and that the spindles rotate in a fixed position in front of the stationary cutter heads. However, it could easily be arranged so that the cutter heads would move along from one work zone to the next with the spindles 49. This would be particularly valuable in carrying out the embodiment shown in Figure 10 wherein two helical cuts can be made with a single cutter rather than with two cutters as described above. Further, it has been shown in Figure 2 that two separate locations are used for the initial peeling cut and two more locations for the second cut. It is obvious that the entire cutting operation could be done at one location at each of the two zones or the two cutting operations could be performed sequentially at a single zone. Instead of performing each cutting operation in two stages at the two locations of each cutting zone, it is possible to rotate the fruit

through substantially one complete turn to perform the rough peeling operation and then to rotate the fruit through a further substantially complete turn to perform the second peeling operation.

Our copending Application No. 61630/70 (Serial No. 1277742) relates to the rotary cutter used for peeling the fruit.

WHAT WE CLAIM IS:—

1. A method of peeling a pineapple comprising rotating the fruit to be peeled through at least one substantially complete turn while performing a first cutting operation in the surface of the rotating fruit to remove substantially all the rough peel portions of the pineapple and subsequently rotating the fruit through at least one substantially complete turn while performing a second cutting operation in the surface of the rotating fruit to remove substantially all the uncut peel material remaining after the completion of the first cutting operation.

2. A method of peeling a pineapple comprising rotating the fruit to be peeled through at least one substantially complete turn at a first peeling zone while performing a first cutting operation in the surface of the rotating fruit to remove substantially all the rough peel portions of the pineapple, moving the fruit to a second peeling zone, rotating the fruit through at least one substantially complete turn at the second peeling zone while performing a second cutting operation in the surface of the fruit to remove substantially all the uncut peel material remaining after the completion of the first cutting operation.

3. A method as claimed in claim 1 or claim 2 in which the first and second cutting operations are each performed by cutting helical bands of peel from the surface of the pineapple.

4. A method as claimed in claim 1 or claim 2 in which the first and second cutting operations are each performed by making a series of annular cuts in the surface of the pineapple.

5. A method as claimed in claim 2 in which the first and second cutting operations are performed by first and second sets of spaced cutters respectively which make respectively a first and second series of spaced annular cuts in the surface of the pineapple.

6. A method as claimed in claim 5 in which the first peeling zone has first and second peeling locations, a fruit being rotated through substantially one complete turn at each location whereat respectively a first and second set of spaced annular cuts are made in the surface of the rotating fruit by spaced cutters, the first and second sets of cuts comprising the first series of cuts.

7. A method as claimed in claim 6 in which the second peeling zone has first and second peeling locations, a fruit being rotated through substantially one complete turn at each location whereat respectively a third and fourth set of spaced annular cuts are made in the surface of the rotating fruit by spaced cutters, the third and fourth sets of cuts comprising the second series of spaced cuts.

8. A method as claimed in any one of claims 5, 6 or 7 wherein each cutter makes a cut in the rotating fruit in a plane substantially parallel to the plane of the tangent to the outer surface of the fruit adjacent the cutter.

9. A method as claimed in any one of the preceding claims wherein material cut from the fruit during the first cutting operation is collected as a first waste and the material cut from the fruit during the second cutting operation is collected as a second waste separate from the first waste.

10. A method as claimed in any one of the preceding claims wherein each cut is of a depth of approximately 3/16".

11. A method as claimed in any one of the preceding claims wherein the fruit to be peeled is firstly aligned by engaging its outer surfaces at spaced points and subsequently a hollow spindle engages the aligned pineapple along substantially its major axis to impale the pineapple and cut a core therein.

12. Apparatus for peeling pineapples, such apparatus comprising a first peeling zone, a second peeling zone, means for moving a fruit step-wise from the first to the second peeling zones, means for rotating a fruit to be peeled through at least one substantially complete turn at each peeling zone, a cutter provided at the first peeling zone for performing a first cutting operation on the surface of the pineapple to remove substantially all the rough peel portions of the pineapple and a cutter provided at the second peeling zone for performing a second cutting operation on the surface of the pineapple to remove substantially all the uncut peel material remaining after the completion of the first cutting operation.

13. Apparatus as claimed in claim 12 in which each peeling zone includes a first and second location with a cutter provided at each location for cutting different portions of the surface of the fruit.

14. Apparatus as claimed in claim 13 in which the cutters of the first and second locations of each peeling zone are adapted to cut alternate bands of peel material from the surface of the fruit.

15. Apparatus as calimed in any one of claims 12 to 14 which include means for separately collecting the peel removed at each of the first and second peeling zones.

16. Apparatus as claimed in any one of claims 12 to 15 in which the means for moving a pineapple include a rotatable spindle on which the pineapple may be impaled.

through substantially one complete turn to perform the rough peeling operation and then to rotate the fruit through a further substantially complete turn to perform the second peeling operation.

Our copending Application No. 61630/70 (Serial No. 1277742) relates to the rotary cutter used for peeling the fruit.

WHAT WE CLAIM IS:—

1. A method of peeling a pineapple comprising rotating the fruit to be peeled through at least one substantially complete turn while performing a first cutting operation in the surface of the rotating fruit to remove substantially all the rough peel portions of the pineapple and subsequently rotating the fruit through at least one substantially complete turn while performing a second cutting operation in the surface of the rotating fruit to remove substantially all the uncut peel material remaining after the completion of the first cutting operation.

2. A method of peeling a pineapple comprising rotating the fruit to be peeled through at least one substantially complete turn at a first peeling zone while performing a first cutting operation in the surface of the rotating fruit to remove substantially all the rough peel portions of the pineapple, moving the fruit to a second peeling zone, rotating the fruit through at least one substantially complete turn at the second peeling zone while performing a second cutting operation in the surface of the fruit to remove substantially all the uncut peel material remaining after the completion of the first cutting operation.

3. A method as claimed in claim 1 or claim 2 in which the first and second cutting operations are each performed by cutting helical bands of peel from the surface of the pineapple.

4. A method as claimed in claim 1 or claim 2 in which the first and second cutting operations are each performed by making a series of annular cuts in the surface of the pineapple.

5. A method as claimed in claim 2 in which the first and second cutting operations are performed by first and second sets of spaced cutters respectively which make respectively a first and second series of spaced annular cuts in the surface of the pineapple.

6. A method as claimed in claim 5 in which the first peeling zone has first and second peeling locations, a fruit being rotated through substantially one complete turn at each location whereat respectively a first and second set of spaced annular cuts are made in the surface of the rotating fruit by spaced cutters, the first and second sets of cuts comprising the first series of cuts.

7. A method as claimed in claim 6 in which the second peeling zone has first and second peeling locations, a fruit being rotated through substantially one complete turn at each location whereat respectively a third and fourth set of spaced annular cuts are made in the surface of the rotating fruit by spaced cutters, the third and fourth sets of cuts comprising the second series of spaced cuts.

8. A method as claimed in any one of claims 5, 6 or 7 wherein each cutter makes a cut in the rotating fruit in a plane substantially parallel to the plane of the tangent to the outer surface of the fruit adjacent the cutter.

9. A method as claimed in any one of the preceding claims wherein material cut from the fruit during the first cutting operation is collected as a first waste and the material cut from the fruit during the second cutting operation is collected as a second waste separate from the first waste.

10. A method as claimed in any one of the preceding claims wherein each cut is of a depth of approximately 3/16".

11. A method as claimed in any one of the preceding claims wherein the fruit to be peeled is firstly aligned by engaging its outer surfaces at spaced points and subsequently a hollow spindle engages the aligned pineapple along substantially its major axis to impale the pineapple and cut a core therein.

12. Apparatus for peeling pineapples, such apparatus comprising a first peeling zone, a second peeling zone, means for moving a fruit step-wise from the first to the second peeling zones, means for rotating a fruit to be peeled through at least one substantially complete turn at each peeling zone, a cutter provided at the first peeling zone for performing a first cutting operation on the surface of the pineapple to remove substantially all the rough peel portions of the pineapple and a cutter provided at the second peeling zone for performing a second cutting operation on the surface of the pineapple to remove substantially all the uncut peel material remaining after the completion of the first cutting operation.

13. Apparatus as claimed in claim 12 in which each peeling zone includes a first and second location with a cutter provided at each location for cutting different portions of the surface of the fruit.

14. Apparatus as claimed in claim 13 in which the cutters of the first and second locations of each peeling zone are adapted to cut alternate bands of peel material from the surface of the fruit.

15. Apparatus as claimed in any one of claims 12 to 14 which include means for separately collecting the peel removed at each of the first and second peeling zones.

16. Apparatus as claimed in any one of claims 12 to 15 in which the means for moving a pineapple include a rotatable spindle on which the pineapple may be impaled.

17. Apparatus as claimed in any one of claims 12 to 16 in which each cutter is a rotary cutter and includes a disc having a planar surface, a plurality of saw tooth-like teeth formed on the periphery of the disc, each tooth having a sharpened cutting surface.

18. Apparatus as claimed in claim 17 in which each cutter includes a pair of projections provided on the opposite side of the disc to the planar surface, the projections extending away from and being substantially normal to the planar face of the disc, each projection having a sharp leading edge.

19. Apparatus as claimed in claim 17 or 18 in which each cutter includes a peel-cut depth gauge.

20. Apparatus as claimed in claim 19 in which each gauge has a surface projecting laterally beyond the path of the corresponding cutter on each side thereof.

21. Apparatus as claimed in claim 14 or 15 in which each gauge is spring biased.

22. Apparatus for peeling pineapple, substantially as described herein with reference to and as shown by Figures 1 to 9 or Figure 10 of the accompanying drawing.

23. A method of peeling pineapple, substantially as described herein with reference to Figures 1 to 9 or Figure 10 of the accompanying drawing.

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