

[54] **APPARATUS FOR PEELING VEGETABLES**

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[57] **ABSTRACT**

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99/630, 629, 484; 259/208, DIG. 25;  
241/101 R, 101.1, 101.2; 15/3.13

A removable vegetable peeling attachment for use at variable high speeds on a household liquidizer power unit, including a bowl that journals near its bottom a rotatable concave disk having holes therethrough with sharp edges, and, in coaction therewith providing a helically inclined ramp along a part of a circular wall bordering the edge of the disk to gently turn or tumble vegetables contacting the disk and slow their movement below a locked on cover that prevents vegetables leaving the bowl during peeling.

[56] **References Cited**

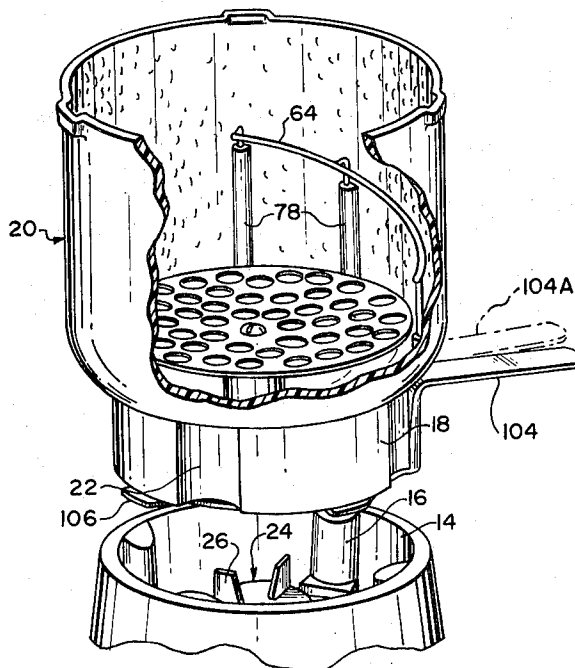
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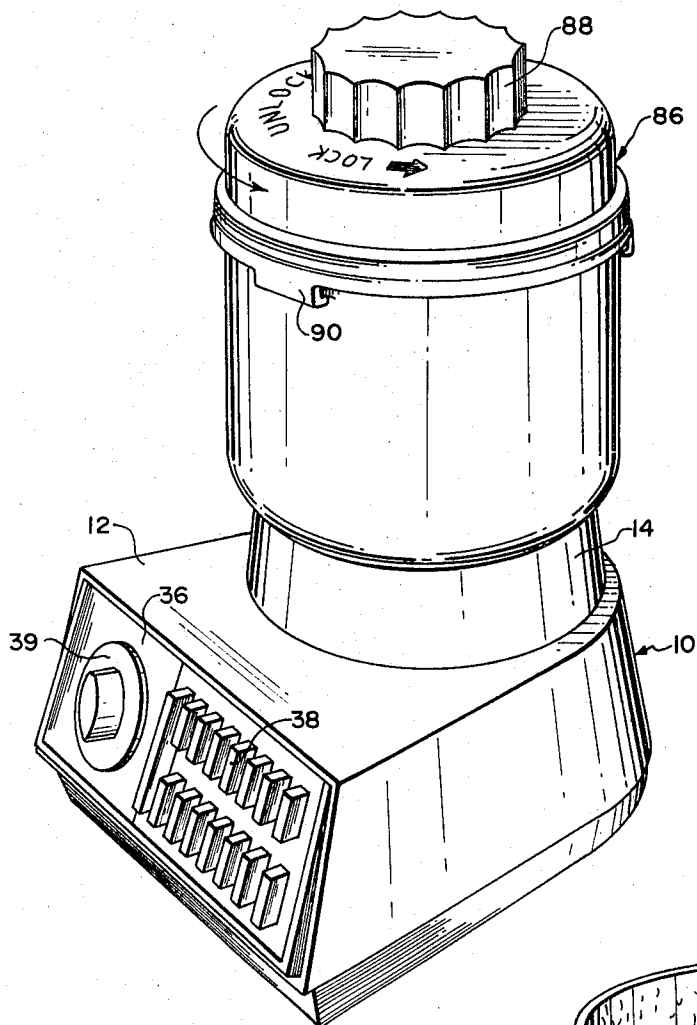
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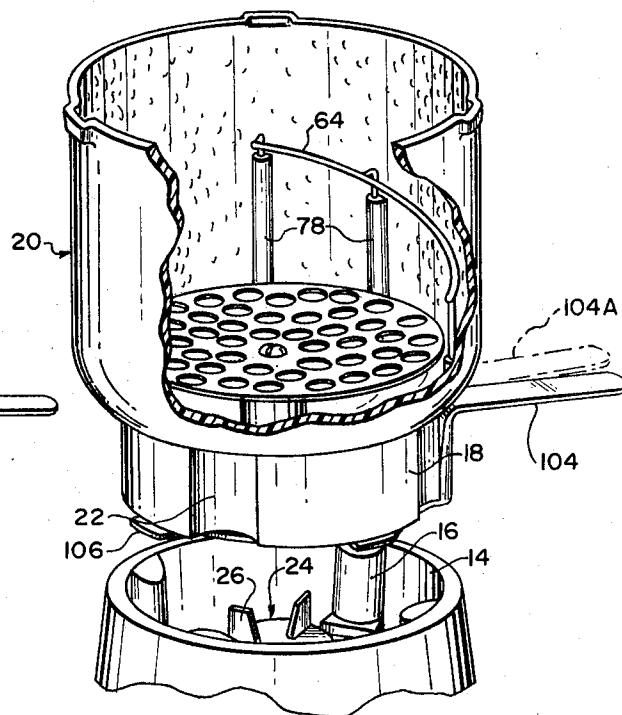
**7 Claims, 7 Drawing Figures**



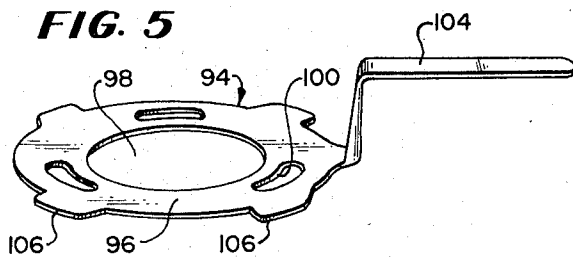


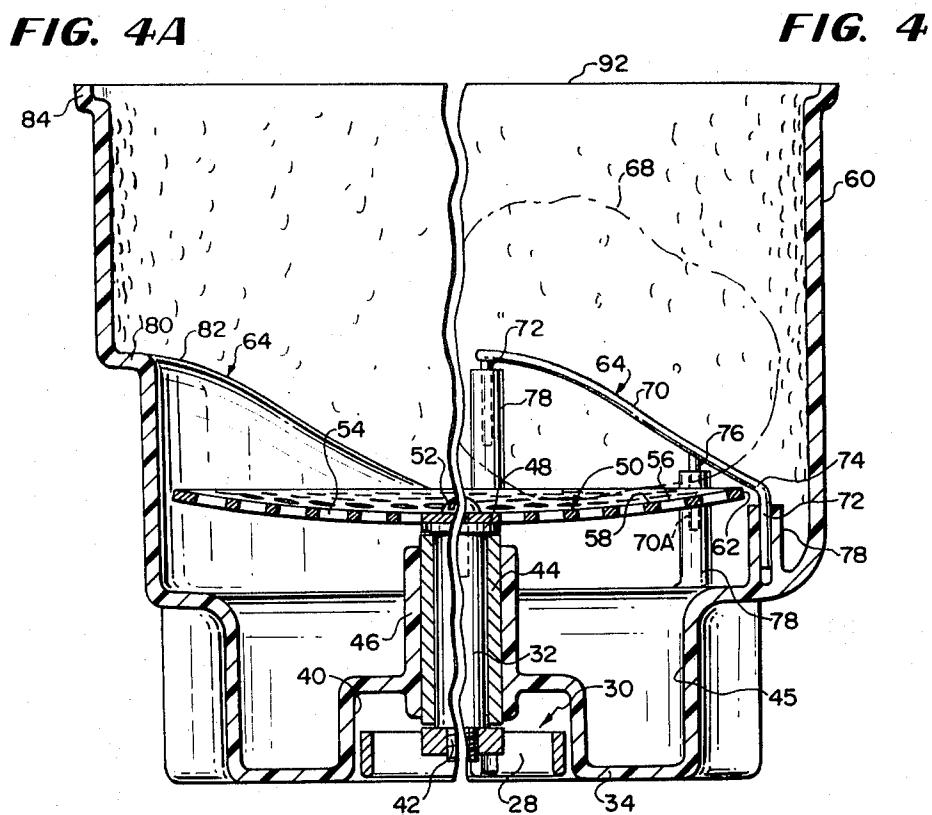
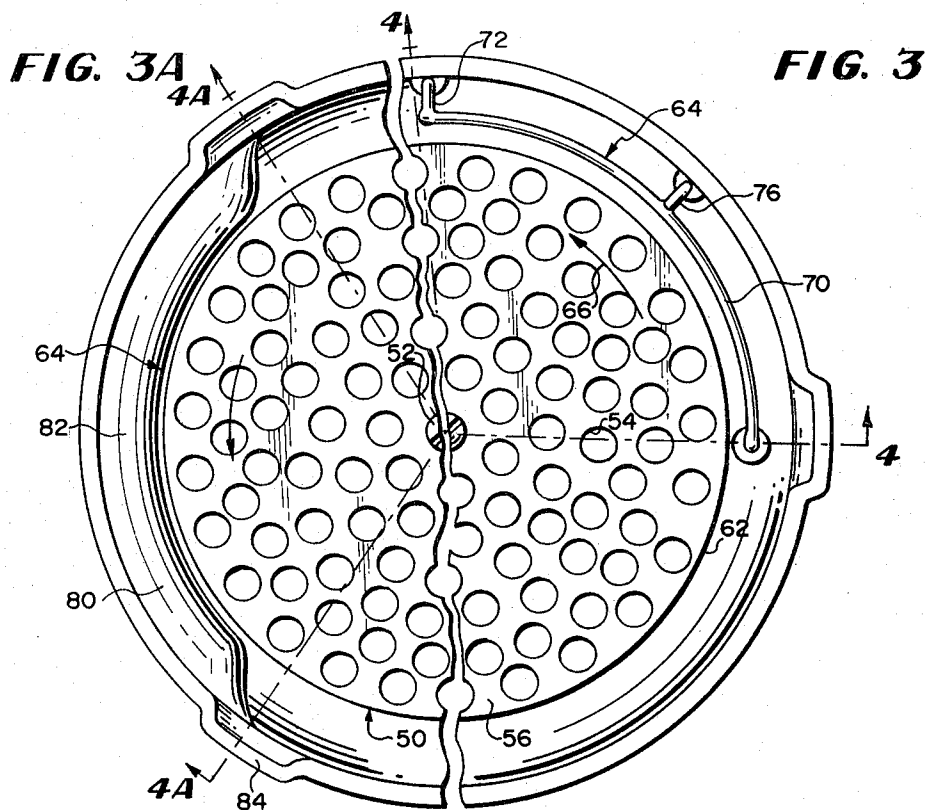
**FIG. 1**

**FIG. 2**



**FIG. 5**





## APPARATUS FOR PEELING VEGETABLES

## BACKGROUND OF THE INVENTION

Several important factors are desired with a powered vegetable peeler for household use including a high degree of safety for a user; low price for an enduring household appliance; the accommodation and non-interfering accumulating of peeling waste; minimization of waste of usable substrate portions of the vegetable; the accomplishment of desired results with minimized power and time; and, a unit that is readily assembled, disassembled and cleaned after either a single or a succession of repeated operations on one or more vegetables.

Earlier peelers employ sharp knives that cut deeply each contact; rotating members having dangerous irregular exposed peripheral edges; rough, concealed, or perforated interior elements that are hard to clean; irregular shapes that are expensive to form; multiple rotating cutter units requiring gearing; wobble plates that hammer the vegetables; and mechanical arrangements of elements that are complicated and consume power and time in their operation.

## SUMMARY OF INVENTION

The invention contemplates a high speed disk scraping a thin surface layer from a vegetable with an interface contact speed high enough and the frictional contact low enough that the vegetable is subjected to a minimum degree of propulsion and tends to move slowly around the center of a bowl-like container as it is positively retarded and tumbled with resulting rotational inertias that continually and progressively bring different areas gravitationally in contact with the scraping disk. The disk is upwardly concave to assist some radial movement of the vegetable and to follow more closely the roundness of the vegetable while forcefully centrifugating peeling waste against the wall of the container from below the disk and into a collecting space that is below any area of rolling contact that occurs between the vegetable and the wall of the container.

The scraper is a circular disk of uniform thickness and has holes within its periphery preferably punched by dies whose draw is towards the upper face whereby sharp square abrading edges are left on its concave face. The size of the holes are related to permit a limited curved area of a vegetable to be exposed downwardly in the holes enough under its weight to be scuffed or scraped by the abrasion of the trailing edges of the holes moving swiftly in contact with the vegetable, it being found that repeated scraping of the skin surface of a vegetable will break away the skin whereas a knife will cut deeper than the skin in order to remove the skin. Herein also resides a safety factor for users whose touch perception will not be destroyed by knives before reaction occurs, if the disk is inadvertently touched.

Vegetable sizes vary. The greater the size and weight of vegetables, the heavier the contact at the holes, the flatter the curvature of the vegetable entering each hole, and the less the depth of abrasion due to the relative curvatures with respect to the hole size.

Moreover, not only can the speed at which the vegetable is scraped be varied for various surface conditions of the vegetables but size can also be accommodated by varying the liquidizer motor speed, and a tumbling bar

or rail is provided at the edge of the disk over a part of the inner circumference of the container as spaced therefrom and helically inclined to accommodate and tumble various sizes of vegetables. The circularly inclined bar both lifts and retards the side of the vegetable that contacts the bar in directions different to the bodily movement induced by the scraper disk. The result is a vegetable action that continually presents a heterogeneously changing area contacting the scraper disk without undue waste of substrate material before the vegetable is adequately peeled.

Although it is preferable to employ a metal rod for the tumbler bar so that there is space below it into which peelings can be centrifugally discarded, the rail can be a molded element on the side of the bowl wall, either as a separate shelf member secured thereto or as an integral ledge formed by offsetting the wall of the bowl. In all instances, however, the waste can be readily washed away.

These being among the objects and advantages of the invention, other and further ones will become apparent from the drawings and description which follows.

In the drawings:

FIG. 1 is a perspective view of an embodiment of the invention in which a vegetable peeler attachment is mounted on a liquidizer power unit;

FIG. 2 is a perspective view of the embodiment shown in FIG. 1 with the elements detached to show the manner of attachment and the container wall broken away to show the interior construction of the attachment;

FIG. 3 is a plan view of portion of a container showing the embodiment of FIG. 2;

FIG. 3A is a plan view of portion of a container showing another embodiment of the invention; and

FIGS. 4 and 4A are vertical sections taken on lines 4—4 and 4A—4A of FIGS. 3 and 3A, respectively.

FIG. 5 is a perspective view of a clamping member shown in FIG. 2 to resiliently secure the container on the power unit.

## DESCRIPTION OF PREFERRED EMBODIMENTS

The power unit or base 10 of a universal motor-driven, variable speed liquidizer is shown in FIG. 1 which is more particularly described in ADAJIAN, No. 3,575,524. It comprises a molded plastic housing 12 with a universal motor mounted therein (not shown) and carries an integral top collar 14 to receive the reduced bottom 18 of a peeler attachment 20 and non-rotatively engage peripheral recesses 22 in the wall of the reduced bottom 18 by peripherally spaced lugs 16 of elastomer material. Journalled centrally in the collar 14, the upper end of the motor shaft (not shown) carries a lower drive coupler 24 having resilient axial teeth 26 that releasably interdigitate with the spokes 28 of the driven coupler 30 on the lower end of a driven shaft 32 journalled in the bottom wall 34 of the attachment 20 when located in operative position. The base 10 has a switch panel 36 with push buttons 38 for selective graduated speed control and a timer dial control 39 as described, for example, in Swanke et al., U.S. Pat. No. 3,678,288.

The bottom wall 34 is recessed upwardly at 40 to accommodate the driven member, and the driven member is threaded thereon at 42 in the direction of rotation to rotate the shaft 32 as journalled in a sintered bearing sleeve 44 secured in the axial boss 46. A

washer 48 engaging the upper end of the sleeve 44 supports an upwardly concave scraper disk 50 that is secured to the shaft in driven relation by a screw 52.

The disk 50 is provided with holes 54 having a dimension of  $\frac{1}{4}$  inch to  $\frac{3}{8}$  inch in the direction of rotation and the holes preferably are unevenly spaced from the center of rotation. The holes are die formed with the punch die moving through the disk towards its concavity and thereby providing a sharp corner edge 56 at the concave surface 58 around the holes.

A substantially circular wall 60 of the container 20 surrounds the scraper disk 50 a spaced distance from its periphery 62 and proximate to the periphery of the disk a tumbling bar 64 is provided extending approximately 90° around the disk, starting at the level of the disk edge 62 and inclined upwardly in the direction of disk rotation, arrow 66, along a substantially helical path to a position well above the disk a distance related to the radius of a large vegetable to be peeled, illustrated in broken lines 68, having a diameter less than approximating the radius of the container 60.

Preferably the tumbling bar 64 is a curved metal rod 70 (FIG. 4) approximately  $\frac{1}{8}$  inch in diameter turned downwardly at the ends to form legs 72 and offset radially at 74 inwardly therefrom a distance not to exceed the vertically projected periphery of the disk. The rod 70 is also secured intermediate its ends by at least one L-shaped rod member 76 attached thereto with its lower portion forming a leg 70A parallel to the end legs 70. The legs are received in vertical cored bosses 78 molded on the inner wall of the container 60 into which the legs are pressed for rigid support.

Referring to FIGS. 3A and 4A another embodiment is illustrated wherein the bar 64 is formed in the molding of the container. The wall of the container where the rod 70 would be located is inwardly offset at 80 to provide a helical ledge 82 defining a tumbling bar 64. Although less expensive, because of molding it with a straight withdrawal of molding cores as compared with the rod 70, it may take up some space where peeling waste would be initially collected from the disk. This, however, is not critical since the offset occupies approximately only one fourth of the inner circumference of the container wall.

An optimum speed for operating the scraper disk 50 is approximately 8,000 R.P.M. and in operation a potato can be rapidly peeled in 5 to 15 seconds with a gentle rolling action which does not bruise it.

For instance, whenever a potato engages the scraper at high speed, many scrapes occur rapidly and the resultant movement tends to be a rotation like a planet gear in an epicyclic gear train. The inertial rotational forces build up to provide a spin about an assumed axis with a somewhat gyratory result which tends to reduce the scraping speed and to scrape the potato in a predominantly circular path. This is opposed by the heterogeneous tumbling of the potato. The reaction forces induced in the body of the potato by the scraping action are continually being absorbed, counteracted, or redirected heterogeneously by the tumbling bar absorbing some of forces and redirecting of the forces to continually change both the orientation of effective inertial forces in the potato and its surface locales with respect to the scraper disk. Accordingly, the area of the vegetable or vegetables being scraped is continuously changed for uniform surface treatment all over while the relative movement between the scraper disk and

the vegetable is kept very low, and, thereby a high speed can be employed for the scraper.

Also, since one of the important compositions of forces to be opposed to a high degree is that resulting in rotating the vegetable bodily by the scraper, as already mentioned. This effect is directly related to the weight or size of the vegetable. Varying the speed of the scraper can assist in this as well as the fact that with small objects being peeled, there will be more than one in the container jostling one another, in which case the speed can be varied to the point where the vegetables bodily circulate to engage the scraper disk in their path of travel induced by the tumbler.

Whatever waste is scraped from a vegetable is initially located in the openings 54 but with the high speed and the upwardly sloping radial curvature of the concavity of the disk, the waste frees itself from the trailing edge portions of the openings 54 and move outwardly from the openings below the disk level to be centrifuged against the wall of the container from where the waste can gravitate to the reduced lower portion 45 of the container thereby keeping the upper surface of the disk clear for further scraping operations with clean hole edges.

Around the upper edge 92 of the container 60 outward offsets are provided to serve as bayonet fastener lugs 84 to rotationally hold a closure 86 thereon having a fluted boss 88 on top for handling the cover. The cover 86 and the bayonet members 90 on the edge of the cover loosely engage the mating edge 92 and lugs 84 on the container and in view of the versatility and safety of the disk from a user viewpoint, the relative heights of the cover and container walls can be designed for best manufacturing economies and user convenience. Moreover, the cover looseness permits any contact between vegetable and cover to urge the securing of the bayonet fastening, the bayonet joint being preferably one with rotational limits in the direction of disk rotation but without a cam tightening.

To support the assembled container and cover against possible gyration if a large potato is in motion therein, reference is made to FIG. 5 where a clamp member 94 for that purpose is shown formed from sheet metal. The central portion 96 is disposed at the bottom of the container 34 of the container 20 and has a central opening 98 which clears the driven member 28 and concentric arcuate slots 100 therearound by which the clamp is mounted by rivets 102 for limited rotation. The rotation is controlled by a handle 104 whose alternate clamping position is shown in broken lines 104A.

Peripherally the central portion 96 is provided with cams 106 which in the clamp release position clear the internal resilient lugs 16. When the handle 104 is advanced to the position 104A the cams engage the resilient lugs 16 under compression and holds both the container in operative position and the drive members in drive relationship without any gyration loosening the resilient drive and the drive flipping the container from its working position.

The cover 86 can be easily removed, the container lifted from the top of the power unit and the peeled vegetables lifted out. The container can then be immediately or shortly thereafter easily rinsed clean under a water faucet and returned to storage with the liquidizer power unit 10 available for other purposes.

The cover is easy to use and is mandatory for safety sake, even though there is little likelihood of injury to the user from the scraper disk if inadvertently left off. To assist the user in the use of the cover and its presence at all times during operation it is made of transparent material such as polystyrene, through which the progress of peeling of the vegetables can be observed even though the use of the timer is recommended according to prescribed recipe instructions.

Preferably the peeler container and cover are made of a high impact, thermoplastic material for durability. 20 gauge stainless steel sheet is used for the scraper disk.

Having thus described the invention and the structure and operation of the preferred embodiments, it will be understood how the objects and results are accomplished and how various modifications can be made therein without departing from the spirit of the invention within the scope of the inventive concept.

What is claimed is:

1. A vegetable peeler comprising,

a power unit including a drive shaft driven at high speed by a motor,

a container member removably mounted on said power unit journalling a driven shaft on its bottom wall and having an upstanding wall surrounding said shaft,

a disengageable clutch means to interengage said shafts in interdriving relationship,

a horizontally disposed concave scraper disk mounted on the upper end of said driven shaft with the concavity disposed upwardly and having holes through the disk defining scraping edges on the trailing walls of the holes, and

tumbler means above said disk and circularly inclined upwardly in the direction of disk rotation along and inwardly spaced from a portion of said upstanding wall to tumble vegetables of various sizes located on scraper disk and contacting said tumbler means,

said tumbler means comprising a curved member defining a helical ledge bordering the scraper disk and overhanging the space below it into which peelings may be discarded by the peeling disk.

2. A vegetable peeler comprising,

a liquidizer power unit including a drive shaft driven by a multi-speed controlled universal motor,

a container removably mounted non-rotatively on said power unit journalling a vertical driven shaft on its bottom wall and having an upstanding wall surrounding said shaft provided with vertically disposed bosses peripherally spaced in said portion of the upstanding wall and having vertically opening core holes therein,

an axially disengageable clutch means to interengage said shafts in interdriving relationship,

a horizontally disposed concave scraper disk on the upper end of said driven shaft with the concavity disposed upwardly with the edges curving upwardly towards the upstanding wall and having holes through the disk defining sharp scraping edges on

the trailing walls of the holes for peeling a vegetable contacting the upper surface of the disk and centrifugating the peelings from the bottom side of the disk against said upstanding wall,

tumbler means circularly inclined upwardly along and inwardly spaced from a portion of said upstanding wall in the direction of rotation of the disk with the lower end of said tumbler means located near the level of the scraper disk to tumble vegetables on the scraper disk contacting said tumbler means which comprises a curved rod bordering the scraper disk and overhanging the space below it into which peelings may be discarded by the scraper disk and having downwardly extending legs received in said core holes.

3. A vegetable peeler comprising,

a power unit including a drive shaft driven at variable speed by a motor,

a container member journalling a driven shaft on its bottom wall,

a disengageable clutch means to interengage said shafts in interdriving relationship,

a plurality of lugs on said power unit around said drive shaft non-rotatively receiving the container member in supported relation on said power unit with said shafts in coaxial relation,

readily releasable clamp means carried by said container member to engage said power unit in their operative position to hold said container member in place against radial forces exerted on said container during peeling operations and movable from a position clearing said lugs to a position engaging said lugs under clamping pressure,

scraper means mounted on the upper end of said driven shaft within said container for peeling a vegetable therein,

tumbler means above said scraper means intermittently engaged by said vegetable for tumbling said vegetable as it is moved by said scraper means around in said container.

4. The vegetable peeler defined in claim 1 including a removable cover member on said container member, one of said members having a transparent portion above the level of said scraper disk.

5. The vegetable peeler defined in claim 3 in which said tumbler means comprises a radially inwardly offset portion of said wall providing a shelf whose edge defines an inclined vegetable engaging element.

6. The vegetable peeler defined in claim 3 in which the scraper disk comprises a circular concave disk of sheet metal of uniform thickness having sharp square corners around the upper margins of holes there-through.

7. The vegetable peeler defined in claim 3 in which said tumbler means comprises a curved member bordering the scraper disk to simultaneously lift and retard the side of the vegetable proximate to the wall at least once every revolution of the vegetable around a circular path.

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