No. 809,582. PATENTED JAN. 9, 1906.

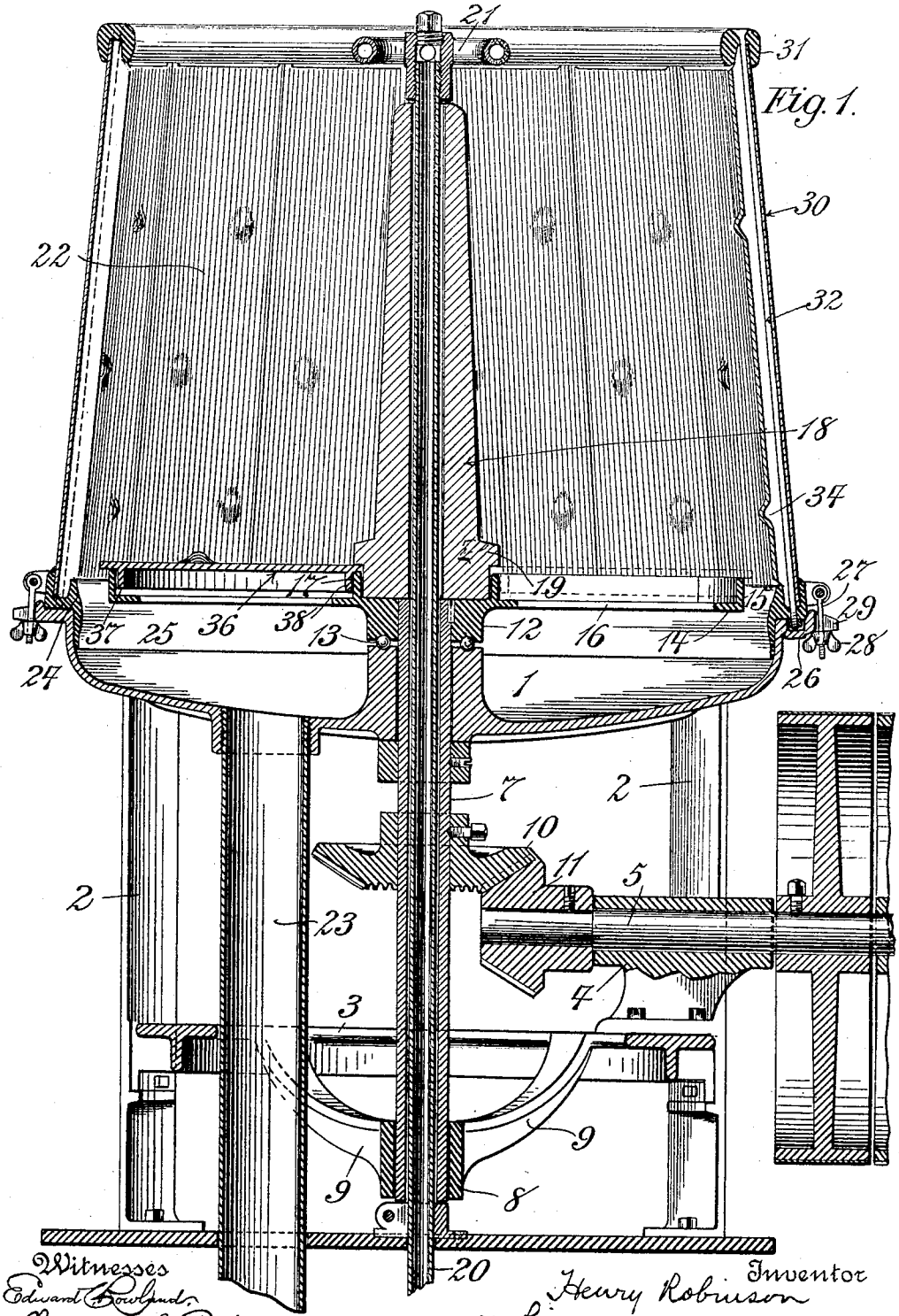
H. ROBINSON.

MACHINE FOR PEELING VEGETABLES.

APPLICATION FILED JAN. 7, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

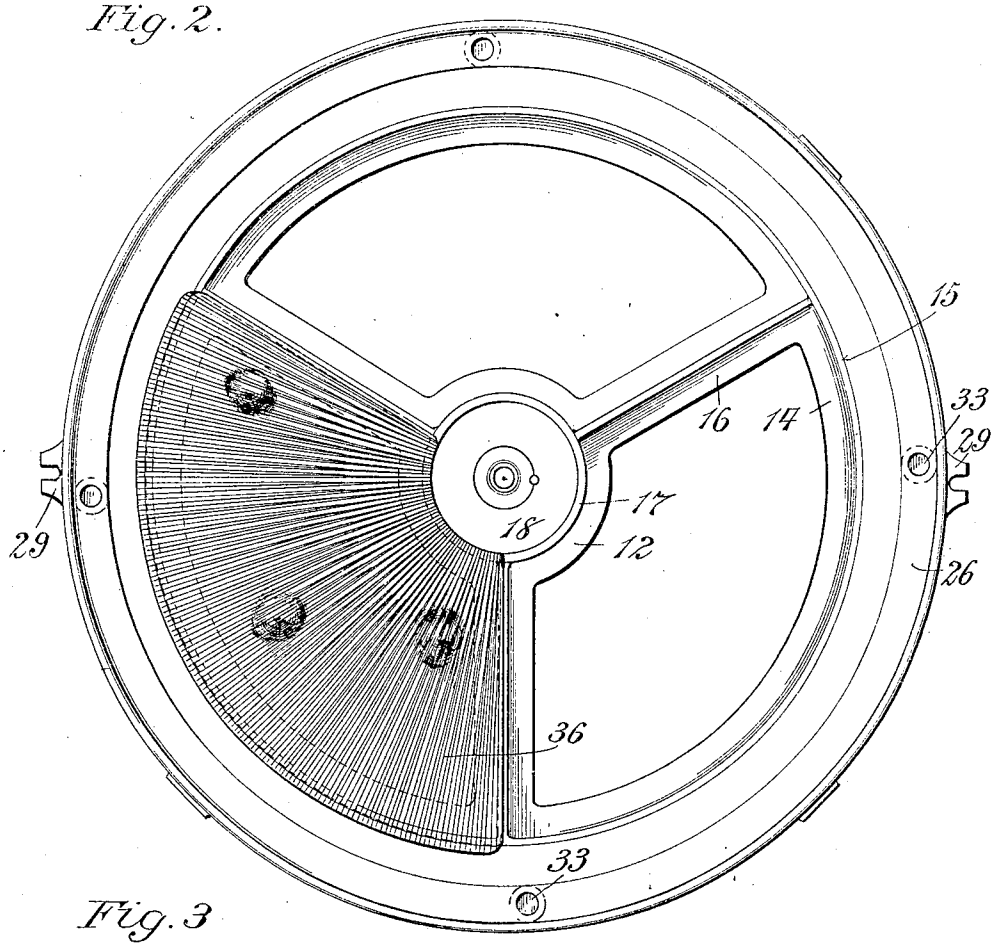


Fig. 3

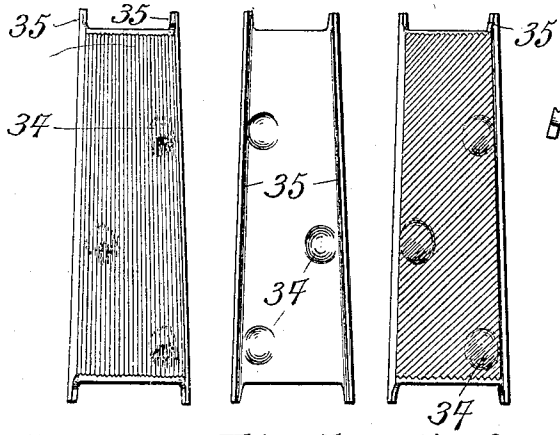
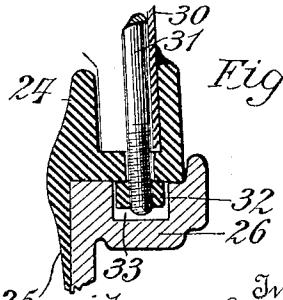


Fig. 4.

Fig. 9.

Fig. 5.

Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

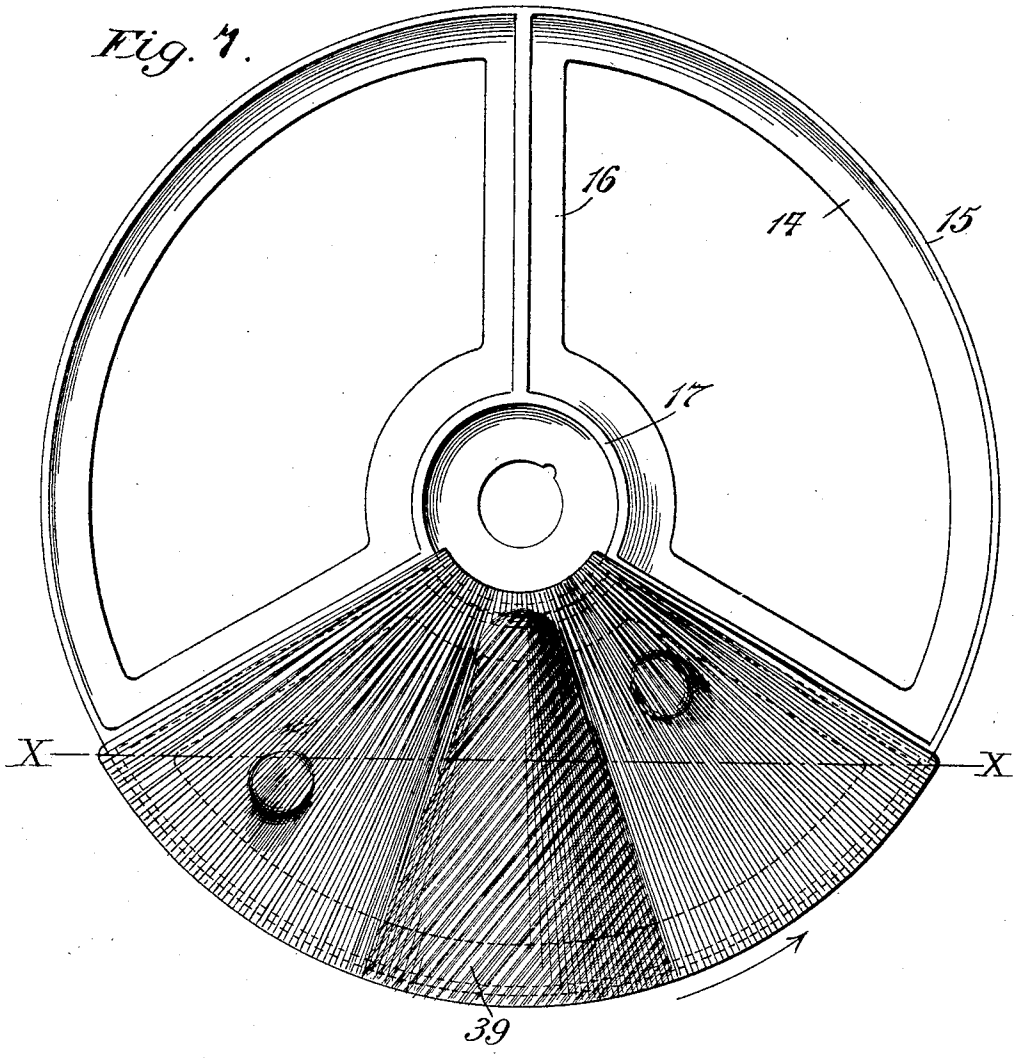
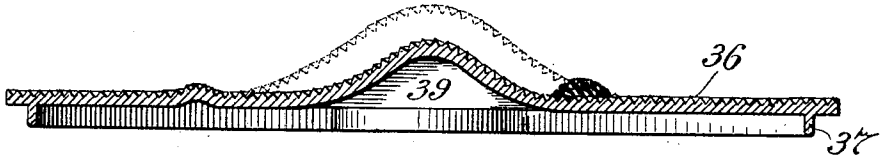


Fig. 8.



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UNITED STATES PATENT OFFICE.

HENRY ROBINSON, OF BROOKLYN, NEW YORK.

MACHINE FOR PEELING VEGETABLES.

No. 809,582. Specification of Letters Patent. Patented Jan. 9, 1906.

Application filed January 7, 1905. Serial No. 240,047.

To all whom it may concern:

Be it known that I, HENRY ROBINSON, a citizen of the United States, residing in the city of Brooklyn, county of Kings, and State of New York, have invented a certain new and useful Improvement in Machines for Peeling Vegetables, of which the following is a specification.

This machine has relation to improvements in that type of machines for peeling vegetables wherein an abrading-disk rotates at the bottom of a containing vessel provided with an abrading-lining. Machines of this type have been hitherto designed according to two principal plans. In following one plan of construction inelastic sharp cutting edges are provided for acting upon the material to be treated and the turning of individual vegetables is accomplished by special devices introduced in the path of movement of the mass. The second plan of construction involves the use of brushes as abrading agents, and the turning of the vegetables to bring all parts successively against the active surfaces is supposed to be acccomplished by the elasticity of the wires or bristles in such brushes. In this form a free path of movement is left for the mass to be treated.

While the present invention involves certain improvements capable of advantageous use with any class of active surfaces or abraders, the invention furthermore comprises improvements in the abraders themselves, whereby the advantages of both of the above classes of construction are united, while avoiding the disadvantages inseparable from each of the older plans.

Among the advantages incident to this invention aside from the nature of the specific abraders used may be mentioned the following: The entire device can be easily opened for inspection and cleaning. The abraders are divided into sectional elements which are so arranged as to be easily removed and replaced when worn out, and this whether brushes or other abraders are used. The two normally separable parts of the machines are so joined that no water can escape, and this without the use of gaskets or other perishable devices. The top of the containing vessel is left entirely open and unobstructed, so that the machine may be charged without any impediment whatever. The impelling rotary disk at the bottom of the containing vessel is removable in sections without the use of tools, so as to expose the parts wherein the waste may accumulate, thus facilitating sanitary and convenient operation at all times.

The improved forms of abraders specifically preferred and with which one branch of this invention is concerned have the following advantages: The vegetables are peeled with a smooth surface instead of being hackled, and at the same time by avoidance of all sharp cutting edges the minimum of surface material is removed. Means are provided for reaching the concave parts of the individual vegetables. These are very common, in many potatoes especially, and are not reached by ordinary means. This feature makes it unnecessary to sort out the properly-shaped potatoes or other vegetables before charging the machine. This feature may be applied to either the brush type or elastic abraders or to the inelastic abraders specifically illustrated herein. Where inelastic abraders are used to line the containing vessel, they are preferably constructed with especial reference to the double movement, tangential and vertical, imparted to the vegetables by the action of the machine. All danger of broken wires or bristles getting into the potatoes is avoided. The abrading, impelling, and turning functions are all united in the rotary disk without any danger of bruising or crushing the vegetables whether small or large, and in the preferred form illustrated herein the utmost efficiency is given to all of these functions.

A preferred embodiment of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical median section of one form of the device. Fig. 2 is a plan view of the rotary frame for the lower disk, showing one of the sectional horizontal abraders in place. Figs. 3 and 4 are respectively a front and a back view of one form of sectional abrader for the pot-lining. Fig. 5 is an edge view of the same. Fig. 6 is a sectional detail of the joint between the removable pot and the supporting-bowl. Fig. 7 is a view similar to Fig. 2, but on a larger scale and showing a modified form of disk abrader. Fig. 8 is a sectional view of the abrader shown in Fig. 7, taken on the line x x in that figure; and Fig. 9 is a face view of a modified form of upright abrader-section for the pot-lining.

As shown in Fig. 1, a deep bowl 1 is supported by legs 2, which are braced strongly

together by the horizontal flat ring 3, which also serves as a support for the bearing 4 of the driving-shaft 5. In the center of the bowl is a hub 6, which serves as the upper bearing for the upright shaft 7. This shaft is hollow and has its lower bearing 8 at the junction of four strong downwardly-curving braces 9, preferably cast in one piece with the ring 3. This shaft is driven by a bevel-wheel 10, which meshes with the pinion 11 on the driving-shaft 5. These details of construction are not herein claimed, as they are covered by my prior application for patent, Serial No. 213,522, filed June 21, 1904.

A horizontal frame 12 of circular form covers the bowl 1 and turns on ball-bearings 13, carried on the hub in said bowl. This frame consists of a circular rim 14, having an upwardly-extending flange 15 and joined to the hub 12 by a number of arms 16, preferably three in number and symmetrically placed. Just over the hub 12 is a circular upturned flange 17, within which stands the lower end of the central spindle 18. The hub 12 is firmly keyed to the upper end of the hollow shaft 7, as plainly shown in Fig. 1. The spindle 18 is preferably provided with a circular flange 19, as shown in Fig. 1. A water-supply pipe 20 brings water from a point beneath the device up through the shaft 7 and the spindle 18 to the sprinkling-ring 21 at the top of the machine. An open-topped pot 22, preferably conical, as shown, rests upon the upturned circular edge of the bowl 1, and its inner surface is provided with appropriate abrading means, which may be of any desired construction so far as the general plan of the machine is concerned. Appropriate abrading means are supported by the frame 12, and when the vegetables to be peeled are charged upon the disk so formed within the pot 22 said disk is turned by means of the shaft 7, while a stream of water playing through the pipe 20 and sprinkler 21 carries away the detritus into the bowl 1, where it escapes through the wide drain-pipe 23.

In the preferred form of this device the pot 22 is supplied with a lower base-ring 24, which has a wide depending flange or lip 25. (See Fig. 6.) This ring has a flat under surface adapted to fit upon the corresponding flat surface of the rim 26 of the bowl 1. The pot may be secured in place by any desired means—as, for instance, the locking-pins 27 and butterfly-nuts 28, coöperating with the pairs of lugs 29.

I prefer to give the inner surface of the lip 25 a material slope downward and outward from the center of the bowl in order to give a downward tendency to the stream of water thrown outward from the surface of the rotating disk, which stream impinges against the lip 25. By this expedient reflection of the water back upon the disk is avoided, and the water is aided in acting to sweep the detritus toward the center of the bowl. This prevents heaping up of the waste and dirt, which would otherwise tend to obstruct escape of the water to the drain-pipe and tend to force it out of the joint between the bowl and pot. The use of the lip or flange 25 inside of the pot at the joint is not broadly claimed herein, as it is covered by the claims of my previously-filed pending application, Serial No. 213,522, filed June 21, 1904.

The construction of the pot is preferably as shown in the drawings and as about to be described; but in certain of my claims which do not mention these details I am not to be limited to their use. In this preferred form a conical casing, which may be of sheet-iron, is used, as shown at 30 in Fig. 1. The top of this casing fits into a circular channel in the lower part of the upper ring 31, which is removable from said casing. The lower edge of the casing is introduced into the deep channel in the top of the lower ring 24 and is preferably soldered in place to better secure a water-tight joint. An abrading lining of any desired character is secured within the casing 30 and is held in place, as shown in Fig. 1, where the top and bottom of the lining are tapered to fit the channels in the upper and lower rings 31 and 24. At proper intervals long bolts 32 are passed through the rings between the casing and the lining, and nuts 33 are screwed to the lower ends of these bolts to draw the two rings firmly together, and thus tightly secure the casing and its lining. Cavities 33 are provided in the rim 26 of the bowl to accommodate the nuts 32 and allow the flat surfaces of the pot and the bowl to be brought flat together. The lining, whatever its specific construction, is preferably formed of separable sections, so that worn-out parts may be replaced without taking out the whole lining. By securing these sections side by side in the manner above described they need not be accurately proportioned to fit the casing 30, but may be built together firmly in spite of considerable spaces left between them. This is of course impossible where sections are merely hooped together like barrel-staves.

Those features of the construction thus far described, which are hereinafter claimed, are disclosed in a prior application for patent, Serial No. 194,108, filed February 17, 1904, of which this is to that extent a continuation and which will be abandoned in favor of this application without prejudice. In said application there were described abraders of the brush type having humps or knobs calculated to enter the concavities in the potatoes or other vegetables to be peeled. These are hereinafter claimed in connection with any type of abrader and are shown in the accompanying drawings at 34. The preferred abraders shown herein are strips such as shown in Figs. 3, 4, and 5, which may be made of a

variety of materials—such as cast-iron, glass, earthenware, &c. When made of cast-iron, they may be galvanized to prevent danger of rust and are molded in the form shown in Figs. 3, 4, and 5. Seen in edge view they are preferably concaved, so as to conform to the inner surface of the casing 30, while the sides are tapered to fit the conical shape of said casing, and ribs 35 lie along said sides, which ribs are tapered at their ends to enter the channels in the securing-rings, as hitherto described and as shown in Fig. 1. The inner face of each of these strips or abrader-sections is striated or finely ridged to such a depth as is sufficient to accomplish removal of the thin skin of the vegetables to be treated. The striæ are plainly shown in Fig. 5, and it is there seen that they offer no chisel or cutting edge, but are formed by sloping faces or sides coming together at substantially the same angle to the general surface of each abrader-section. The edges are dull and are intended for acute rubbing instead of cutting action. This action when exerted upon the skin of a potato, for instance, when it is wet is all that is sufficient to remove the outer cuticle, while leaving the inner skin, which contains the most nitrogenous part of the potato. In the form of section shown in Figs. 3, 4, and 5 these striæ are shown running vertically from end to end of the surfaces; but my invention is not limited to any specific arrangement thereof. Indeed, the preferred arrangement of the striæ is shown in Fig. 9, wherein the direction of movement of the rotary disk, and therefore of the mass to be treated, is supposed to be from right to left. It will be seen that in this figure the striæ are shown formed at a considerable angle to the length of the abrader-section and so placed that the higher end of each striation is inclined toward the oncoming mass of vegetables. In the operation of the machine a double motion is imparted to the vegetables. The disk imparts a circular motion, to which is added an upward movement against the lining, caused by the pressure of centrifugal force. These components are resolved into an upward-slanting motion substantially at right angles to the striæ as shown in Fig. 9, and thus the arrangement there shown places the ridges substantially directly across or at right angles to the movement of the mass. The upward movement of the potatoes against the abrasive walls is caused by the fact that the centrifugal pressure in the bottom of the mass, where the movement is most rapid, is greater than this pressure at the top of the mass. The consequence of this is that the layer of potatoes at the bottom being prevented from movement horizontally or downward tends to crowd upward, and this tendency is less than that opposed by the potatoes situated nearer the top of the mass. It is to a great extent to counteract this tendency, which often when great velocity is employed throws individual potatoes entirely out of the vessel, that the walls of the vessel are made to incline inward toward the top.

It is to be understood that I am not limited to the form of ridges shown in the drawings—namely, a V shape—but that my claims cover any fine ridges presenting rubbing edges of a dull or rounded character as opposed to a cutting edge. Furthermore, my invention covers striations of any desired character combined with humps or knobs of such proportions as to conform generally to the average concavities in that class of vegetables intended to be treated. The term "knobs" as used in my claims is to be thus understood.

One of the main advantages of the striations substantially as herein shown and described lies in the fact that they act to smoothly peel the vegetables, so that they may be presentable without further treatment for table use. Where brushes are used, each bristle or wire acts elastically and whips out a particle of the potato or other vegetable, producing a pitted or hackled appearance. This causes waste of the nourishing part of the potato and unfits the same for table use without subsequent smoothing.

While I have shown a containing vessel lined with abraders, it is to be understood that this is not essential to my broad invention, as the principal abrading agent is really the rotary disk, which also impels the mass forward. The walls of the containing vessel act to continually throw the mass back upon the disk, which acts by centrifugal force to send the mass outward; but the weight of the total mass lying on the impelling-disk, gives to this latter a paramount action on the vegetables.

The disk abraders whether made in the preferred form hereinafter described or otherwise are shaped so as to be accommodated within the spaces between the arms 16 of the disk-frame, and they lie loosely therein, the inner or central edges being held down preferably by means of a ring projecting over said edges. In the specific form shown the ring is supplied by the flange 19 on the spindle 18, which acts to prevent the inner edges of all the abraders from being thrown upward, and thus secures them from displacement during use.

The abraders illustrated are composed of flat plates 36, having ribs 37 and 38 extending downward just within the upward ribs of the arms 16 and the rim. The plates 36 fit over these upward ribs of the frame and have in general the shape of the sector of a circle. These plates are striated and provided with knobs, as above described, for the pot-linings, save that in the form shown the striæ are substantially radial. As shown in Fig. 2, I

prefer to supply main striæ or ridges extending from the inner to the outer edges of each sector and, in addition to these, secondary striæ beginning near the middle of the main striæ and extending outward. By this arrangement the main striæ are separated by others over the outer part of each sector, so that successive ridges are not brought too far apart by the radial divergence.

While the sector-shaped elements so far described will answer fairly well in many cases, I prefer the specific form shown in Figs. 7 and 8, wherein the elements are provided with flat surfaces separated by rising portions extending inward from the circumference toward the center, as shown at 39 in Figs. 7 and 8. This rising portion is preferably bounded by radial sides and is higher at the circumference, sloping toward the center. This is indicated in Fig. 8 by a dotted line which indicates the outer edge of the rising portion which is supposed to be removed by the section plane in the view shown in this figure. While this rising portion may have any desired surface without departing from the broad invention, I prefer to striate this surface, and in the preferred form shown these striæ extend across the rising part at a material angle to the line of movement of the disk. The large arrow at the edge of the disk shows the direction of movement of the disk, and it is preferred to arrange the ridges on the rising part, as shown, so that the advancing end of each ridge is nearest the center. This causes the striæ to coöperate with the centrifugal force in pushing the vegetables toward the circumference of the vessel.

I have found that where the flat disk is used alone there is a tendency to set up a rotary motion of the mass, wherein each individual soon settles down to a substantially fixed position in the moving mass. This causes undue wear on certain parts of each vegetable and retards the sufficient action on other parts. The rising parts of each sector-shaped abrader act not only to force the mass forward, but inasmuch as the disk as a whole always moves faster than the mass treated these rising parts act to turn over the vegetables next the bottom, so as to help bring different portions of each separate member of the mass into contact with the different abrading-surfaces. By using striæ in the preferred arrangement shown in Fig. 7 the ridges produce a further turning action around a different axis from that around which the vegetables are individually turned by the mere onward movement of each rising part. The rounded upper surface of each rising part further acts to enter certain of the concave surfaces, and thus promote rapid completion of the peeling process. It is to be understood that the particular form or arrangement of the rising part as shown is not essential to my invention and that a variety of shapes and a variety of methods of striations will be within the spirit of this invention. I am not limited in these respects in any claim except as expressly stated therein.

While I prefer to use the humps or knobs substantially as shown both in the upright lining and on the rotary disk, it is to be understood that these knobs are not essential to my invention as set forth in certain of my claims wherein the same are not mentioned. Indeed, a variety of changes may be made in various parts of this invention without departing from the spirit thereof, and in each instance the respective claims hereinafter set forth should not be understood to be limited except as expressly therein set forth.

What I claim is—

1. In a device of the class described, an impelling and abrading member comprising a rotary disk composed of a horizontal flat striated portion and a raised portion extending from near the circumference inward and having two sides sloping down to the flat striated portion of said disk, substantially as described.

2. In a device of the class described, an impelling and abrading member comprising a rotary disk composed of a number of horizontal flat striated portions separated by raised portions at intervals extending from near the circumference inward, substantially as described.

3. In a device of the class described, an impelling and abrading member comprising a rotary disk composed of a horizontal flat striated portion and a rounded raised portion rising gradually from near the center toward the circumference, substantially as described.

4. In a device of the class described, an impelling and abrading member comprising a rotary disk composed of a horizontal flat striated portion, and a rounded raised portion bounded by two approximately radial edges extending from near the circumference inward and having a striated surface, substantially as described.

5. In a device of the class described, an impelling and abrading member comprising a rotary disk composed of a horizontal flat striated portion and a rounded raised portion bounded by two approximately radial edges extending from near the circumference inward, and having its surface striated at a material angle to the radii of the disk, substantially as described.

6. In a device of the class described, a containing vessel and a removable lining therefor the surface of which is striated and provided with rounded knobs adapted to enter the concavities of potatoes and the like, substantially as described.

7. In a device of the class described, a containing vessel and a removable lining therefor composed of vertical sections the surface of each of which is striated and provided with

rounded knobs adapted to enter the concavities of potatoes and the like, substantially as described.

8. As an article of manufacture, an abrading element for peeling-machines comprising a striated strip having side ribs tapered at their ends, substantially as described.

9. As an article of manufacture, an abrading element for peeling-machines, comprising a striated strip having non-parallel sides and tapering ends, and provided with knobs on its striated surface, substantially as described.

10. As an article of manufacture an abrading element for peeling-machines comprising a striated strip with non-parallel sides and having ribs along said sides which ribs have tapering ends, substantially as described.

11. As an article of manufacture, an abrading element for peeling-machines, comprising a concave strip with non-parallel sides and tapering ends, and having striations on its concave surface making an acute angle with the median line of the strip, substantially as described.

12. As an article of manufacture, an abrading element for peeling-machines comprising a flat striated plate conforming roughly in outline to a sector of a circle and having isolated knobs on the working portion of its striated surface, substantially as described.

13. In a peeling-machine, a horizontal bowl having an upturned circular edge and a removable pot resting on said edge and having a deep circular lip fitting snugly within the edge of said bowl and having its inner surface sloping downward away from the center of the bowl, substantially as described.

14. In a peeling-machine, a horizontal bowl having an upturned circular edge and a removable pot provided with a bottom ring having an exterior flange extending upward and a deep interior lip fitting snugly within said bowl and having its inner surface sloping downward away from the center of the bowl, substantially as described.

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