July 3, 1923. 1,460,747

H. W. CROWELL

MACHINE FOR SHUCKING VEGETABLE IVORY NUTS

Filed Oct. 28, 1921 2 Sheets-Sheet 1

Fig. 1.

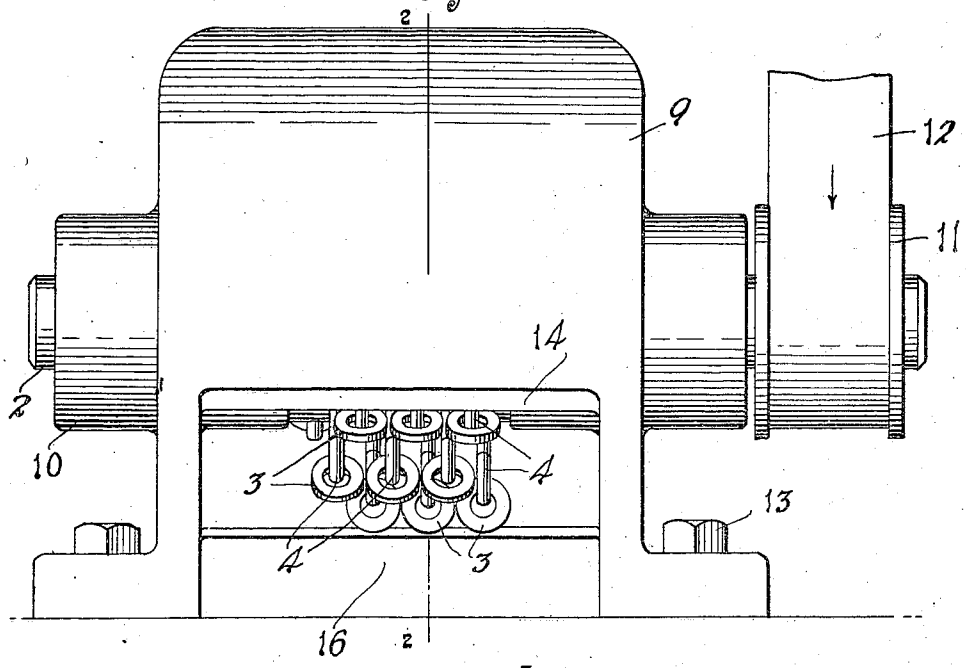
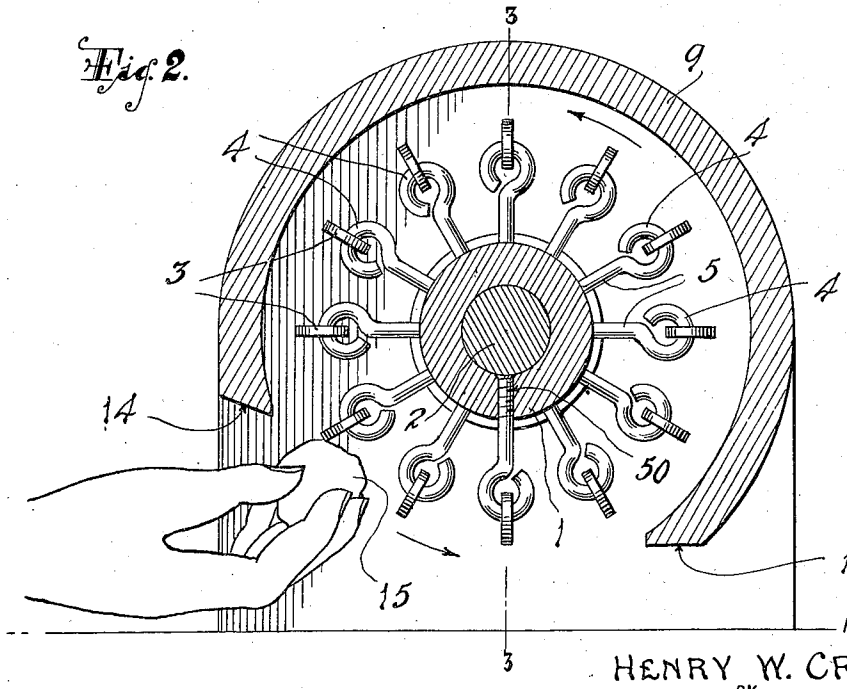


Fig. 2.



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Fig. 3

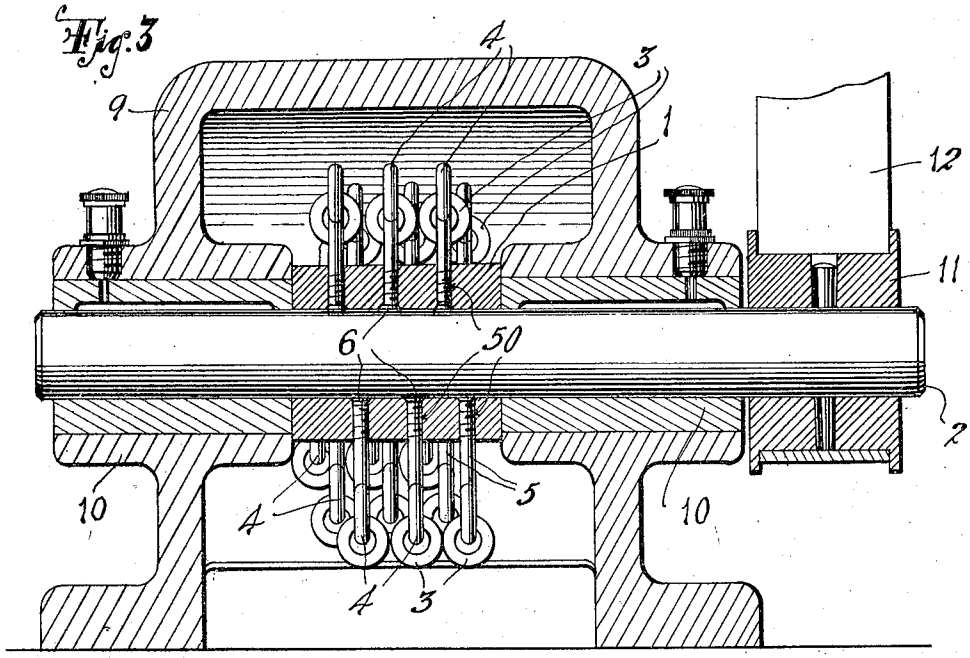


Fig. 5.

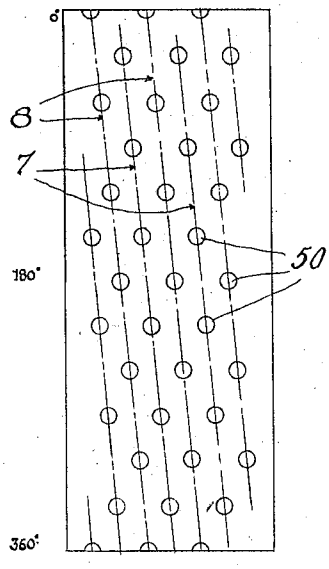
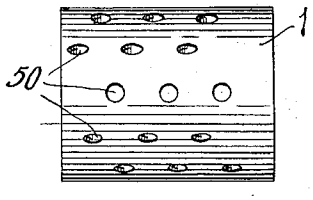


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY W. CROWELL, OF GLEN RIDGE, NEW JERSEY.

MACHINE FOR SHUCKING VEGETABLE IVORY NUTS.

Application filed October 28, 1921. Serial No. 511,124.

To all whom it may concern:

Be it known that I, HENRY W. CROWELL, a citizen of the United States, and a resident of Glen Ridge, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Machines for Shucking Vegetable Ivory Nuts, of which the following is a specification.

This invention relates in general to rotary cutters, and more particularly to a machine for shucking vegetable ivory nuts.

The objects of the invention are to provide a rotary cutter embodying novel features of construction and including a revoluble body portion having a plurality of cutting elements on its peripheral surface adapted to be thrown into cutting position by the centrifugal force developed by the revolving motion of said body portion; to provide such a cutter in which the cutting elements operate by impact to chip or break the surface of an article being operated upon; to provide a rotary cutter embodying novel features of construction having a plurality of cutting elements on its peripheral surface adapted to be thrown outwardly by centrifugal force developed by revolving said body portion with their cutting edges disposed in axial planes of said body portion; to provide such a rotary cutter in which the cutters have their cutting edges curved in axial planes of said body portion; to provide a rotary cutter including a revoluble body portion or rotor having a plurality of radially disposed eyes secured in its periphery and washer-like cutting elements mounted in the said eyes whereby the cutting elements are adapted to be thrown outwardly by centrifugal force developed by the revolving motion of said portion; to provide such a cutter in which the washers are disposed in axial planes of said body portion when in operation; to provide such a rotary cutter in which the cutting element is adapted to be automatically moved by engagement with an unyielding surface to present different portions of the cutting edge to said surface on successive engagements of the cutting element with said surface; to provide a machine for shucking vegetable ivory nuts comprising a rotary cutter of the character described revolubly mounted in a casing; and to obtain other results and advantages as may be brought out by the following description.

Referring to the accompanying drawings, in which like numerals of reference indicate the same parts throughout the several views,

Figure 1 is a front elevation of a machine for shucking vegetable ivory nuts constructed in accordance with my invention showing the cutting elements in working position;

Figure 2 is a transverse sectional view through the machine taken on the line 2—2 of Fig. 1;

Figure 3 is a vertical longitudinal sectional view through the machine taken on the line 3—3 of Fig. 2, showing the rotor and cutting elements in idle position;

Figure 4 is a detached side elevation of the rotor with the screw eyes removed therefrom, and

Figure 5 is a development of the rotor showing the helical and circumferentially spaced arrangement of the screw eyes.

In the embodiment of my invention shown in the drawings, the reference character 1 designates the revoluble body portion or rotor of the rotary cutter which in the present instance is shown in the form of a sleeve made fast upon a shaft 2 in any suitable manner so as to rotate with the shaft. The cutting elements 3 are shown in the form of hardened steel washers with sharp edges which are adapted to serve as cutting edges, the said washers being loosely mounted in the eyes 4 of screw eyes 5 threaded into radial openings 50 in the rotor 1. The eyes 4 are arranged in planes at right angles to the axis of the rotor as clearly shown in Figures 2 and 3, and the inner ends of the screw eyes are riveted or otherwise positively secured, as at 6, against rotation in the rotor 1. The screw eyes 5 are arranged in two helixes 7 and 8 as shown on the development of the rotor in Figure 5 of the drawings and a plurality of screw eyes, in the present instance three, are arranged in the same axial plane. The screw eyes are spaced circumferentially of the rotor at angles of substantially 30° apart as clearly shown in Figure 2, and with the above described arrangement of the screw eyes and washers, it will be seen that the cutting elements 3 are arranged in close proximity to each other both circumferentially and longitudinally of the rotor, the screw eyes being longitudinally spaced on the rotor at just sufficient distances to allow a slight

clearance between the edges of the adjacent cutting elements 3.

In operation of the rotary cutter above described, the shaft 2 is rapidly revolved, and the centrifugal force set up by the revolution of the rotor causes the cutting elements to be thrown outwardly so that their cutting edges are disposed in axial planes of the rotor as shown in Figure 2. An article or surface to be operated upon by the cutter is forced into engagement with the edges of the cutting elements, and the said cutting elements due to their circumferentially spaced relation on the rotor will successively engage the said surface by impact so that the cutting edges of the cutting elements will chip or break off portions of the surface being operated upon. The cutting elements being loosely mounted in the eyes 4 will yield slightly upon engagement with an unyielding surface so as to strike an effective glancing blow to chip or break the surface, and when the cutting elements engage the surface at a point at one side of the axis of the corresponding screw eye 5, the cutting element will be slightly rotated in its own plane in the corresponding eye 4 so as to present another portion of the cutting edge thereof to the surface on the next engagement of the cutting element with the surface. The cutting edges of the washer-like cutting elements 3 are curved in axial planes of the rotor so that they act upon an unyielding surface with a shearing effect which facilitates in the rapid chipping or breaking of the surface being operated upon.

The rotary cutter above described is particularly designed for use in a machine for shucking vegetable ivory nuts, that is, for removing the shells from the nuts. For this purpose the rotary cutter is mounted in a casing 9 which is substantially circular in cross-section and provided with axial bearings 10 at opposite ends thereof in which the shaft 2 is journaled. Portions of the bearings 10 project inwardly of the casing, as shown in Figure 3, and the rotor 1 is arranged between the ends of said bearings so as to be effectively held against longitudinal movement in the casing. The shaft 2 is adapted to be rapidly revolved in the bearings 10 in the direction indicated by the arrows in Figure 2 by any suitable means such as the pulley 11 and belt 12. The casing is fastened upon a table or other suitable support by means of bolts 13, and the front of the casing is provided with an opening 14 through which the nut 15 to be shucked is inserted by the hand of the operator. The nut 15 is held in the fingers of the operator as shown in Figure 2 so as to be engaged by the cutting elements 3. As the cutting elements rapidly revolve they chip or break off pieces of the shell of the nut and the nut is turned in the fingers of the operator until all of the shell has been thus removed. The casing also prevents the pieces of the shell of the nut from being scattered, and the back of the casing is preferably provided with an opening 16 to facilitate in the removing of the pieces of shell from the casing.

It will be noted that the cutting elements 3 have only a slight leverage and are comparatively light in weight so that the force of the impact thereof with the object or surface being operated upon is comparatively light. The effect of the cutter is thus that of a substantially continuous cutting surface formed with a plurality of spaced yielding cutting elements, and the freedom of movement of the cutting elements in all directions provides a very effective cutter for removing the shells from ivory nuts. Due to the light weight of the cutting elements and their short leverage, there is no danger to the operator's hands, it having been found that the worst effect of engagement of the fingers with the cutting elements is a stinging sensation. The curved or arcuate edges of the cutting elements 3 and the close arrangement of the cutting elements in the same axial plane longitudinally of the rotor enable two adjacent cutting elements to simultaneously engage different portions of a curved surface, such as the shell of a vegetable nut, when a portion thereof is held between said adjacent cutting elements.

While I have shown and described one possible embodiment of my invention, it will be understood that this is for the purpose of illustrating the principles thereof only, and that many modifications and changes can be made in the detail construction of the invention without departing from the spirit or scope thereof. Therefore, I do not wish to be understood as limiting myself except as required by the following claims when construed in the light of the prior art.

Having thus described the invention, what I claim is:

1. A rotary cutter including a revoluble body portion, and a plurality of substantially flat cutting elements mounted on said body portion the edges of which serve as cutting edges, said elements being adapted to be actuated by centrifugal force developed by revolution of said body portion to position the cutting edges substantially in axial planes of said body portion and having a limited movement in all directions.

2. A rotary cutter including a revoluble body portion, and a plurality of substantially flat cutting elements mounted on said body portion the edges of which serve as cutting edges, said cutting elements being adapted to be actuated by centrifugal force

developed by revolution of said body portion to position the cutting edges substantially in axial planes of said body portion.

3. A rotary cutter including a revoluble body portion, and a plurality of cutting elements having arcuate cutting edges mounted on said body portion with said edges arranged in substantially axial planes of the body portion, said elements being free for limited movement in all directions.

4. A rotary cutter including a revoluble body portion, and a plurality of cutting elements mounted on said body portion, said elements being actuated by centrifugal force developed by revolution of said body portion to position the cutting edges substantially in axial planes of said body portion and adapted to be moved laterally in their own planes by impact upon a substantially unyielding surface.

5. A rotary cutter including a revoluble body portion, and a plurality of substantially circular cutting elements mounted on said body portion to swing about axes substantially parallel with the axis of said body portion.

6. A rotary cutter incuding a revoluble body portion, a plurality of washer-like cutting elements, and means on said body portion loosely passing through the openings in said cutting elements for mounting said cutting elements on said body portion.

7. A rotary cutter including a revoluble body portion, a plurality of eyes secured in the periphery of said body portion, and washer-like cutting elements loosely mounted in said eyes.

8. A rotary cutter including a revoluble body portion, a plurality of eyes secured in the periphery of said body portion and arranged in planes at angles to the axis of said body portion, and washer-like cutting elements mounted in said eyes.

9. A rotary cutter including a revoluble body portion, and a plurality of substantially circular cutting elements mounted on said body portion and adapted to be actuated into cutting position by centrifugal force developed by revolution of said body portion.

10. A rotary cutter including a revoluble body portion, and a plurality of substantially circular cutting elements mounted on said body portion, the edges of which serve as cutting edges, said elements being mounted on said body portion and adapted to be actuated by centrifugal force developed by revolution of said body portion to position said edges substantially in axial planes of said body portion.

11. A rotary cutter including a revoluble body portion, a plurality of cutting elements mounted on said body portion having arcuate cutting edges in substantially axial planes of said body portion and adapted to be moved by impact with a substantially unyielding surface to present different portions of the cutting edges on successive engagements with said surface.

12. A rotary cutter including a revoluble body portion, and a plurality of cutting elements having arcuate cutting edges mounted on said body portion so that their cutting edges are positioned in substantially axial planes of the body portion by centrifugal force developed by revolution of said body portion, said elements being spaced longitudinally of said body portion so that adjacent cutters may simultaneously engage different portions of a curved surface.

13. A rotary cutter including a revoluble body portion, a plurality of washer-like cutting elements, and means for mounting said elements on the body portion to permit them to be swung into substantially axial planes of the body portion by centrifugal force developed by revolution of the body portion.

14. A rotary cutter including a revoluble body portion, a plurality of washer-like cutting elements, and means for mounting said elements on the body portion to permit them to be swung into substantially axial planes of the body portion by centrifugal force developed by revolution of the body portion and to rotate in their own planes upon impact with a relatively unyielding surface.

15. A rotary cutter including a revoluble body portion, a plurality of washer-like cutting elements, and means for mounting said elements on the body portion to permit them to be swung into substantially axial planes of the body portion by centrifugal force developed by revolution of the body portion and to yield a limited extent in all directions.

HENRY W. CROWELL.