July 31, 1923. 1,463,233

C. J. ULRICH

GRAPEFRUIT CORER

Filed Sept. 8, 1922

Fig. 2

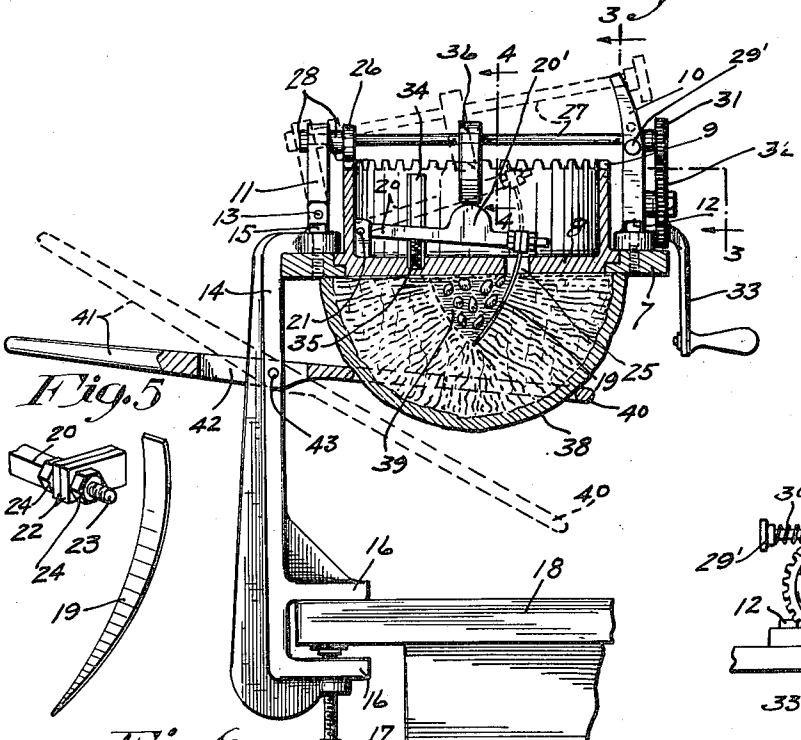


Fig. 3

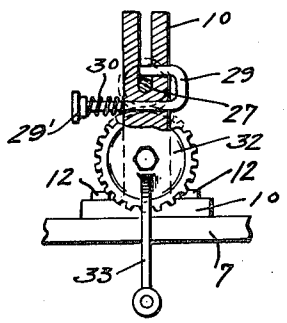


Fig. 5

Fig. 6

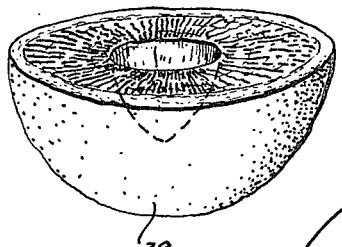


Fig. 4

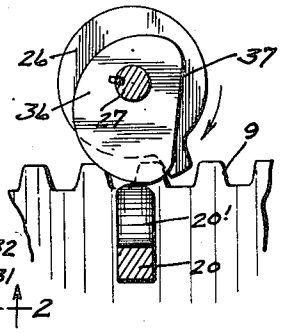
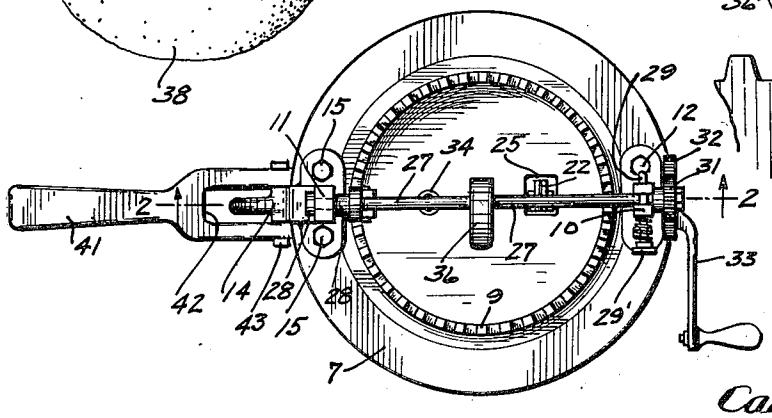


Fig. 1



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UNITED STATES PATENT OFFICE.

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GRAPEFRUIT CORER.

Application filed September 8, 1922. Serial No. 586,878.

To all whom it may concern:

Be it known that I, CARL J. ULRICH, a citizen of the United States, residing at Mankato, in the county of Blue Earth and State of Minnesota, have invented certain new and useful Improvements in Grapefruit Corers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention has for its object to provide a simple and highly efficient grapefruit corer, and to this end, it consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a plan view of the grapefruit corer;

Fig. 2 is a view partly in side elevation and partly in central vertical section, taken on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary view partly in front elevation and partly in vertical section, taken on the line 3—3 of Fig. 2;

Fig. 4 is a detail view with some parts sectioned on the line 4—4 of Fig. 2, on an enlarged scale;

Fig. 5 is a perspective view of the knife-blade clamp-equipped holder and knife-blade removed therefrom; and

Fig. 6 is a perspective view of one-half of a grapefruit, the core of which has been removed by the improved corer.

The numeral 7 indicates an annular table within which is mounted a rotatable disc-like head 8 with which is formed an upstanding horizontally disposed ring gear 9. As shown, the internal edge of the table 7 and periphery of the head 8 are reversely rabbeted to afford means for supporting the head 8 upon the table 7 with freedom for rotation, and at the same time hold said head against radial movement. Two diametrically opposite posts 10 and 11, the former of which is secured to the table 7 by machine screws 12, and the latter of which is hinged at 13 for swinging movement toward and from the post 10, to the inturned upper end of a standard 14. By reference to Fig. 2 it will be noted that the post 10 and upper internal end of the standard 14 extend slightly over the head 8 and thereby hold the same in the table 7.

The table 7 is horizontally supported from the standard 14, by attaching the same directly opposite the post 11, to the under surface of the inturned upper end of said standard by machine screws 15. On the lower end portion of the standard 14 are upper and lower horizontal jaws 16 which underlie the table 7, and the latter of said jaws is provided with a clamping screw 17 arranged to impinge against the under surface of the top of a kitchen table 18 over which the table 7 is supported by said standard.

A depending curved knife-blade 19 is carried, at its upper end, on the outer or free end of a knife-blade holder 20, in the form of a horizontally disposed lever, which extends radially over the head 8 and is pivoted at 21, to the internal wall of the ring gear 9, for vertical swinging movement. This knife-blade holder 20 is of such length as to extend toward the post a considerable distance beyond the axis of the head 8 over which it extends.

The knife-blade 19 is attached to the holder 20 and held offset from the axis of the head 8 by a clamp comprising a pair of jaws 22 mounted on a screw-threaded stem 23 formed by reducing the outer end of the knife-blade holder 20. These jaws 22 are held between a pair of opposing nuts 24 having screw-threaded engagement with the stem 23. Obviously, by adjusting the nuts 24 on the stem 23, the knife-blade 19 may be offset variable distances from the axis of the head 8. The depending curved knife-blade 19 works through an opening 25 in the head 8, and its free or lower end is substantially at the projected axis of the head 8 when the same is depressed, as shown in Fig. 2.

For imparting a step-by-step rotary movement to the head 8, I provide a single toothed pinion 26 which meshes with the ring gear 9 once for each rotation of a horizontal shaft 27. One end of the shaft 27 is journaled in the upper end of the post 11 and held against axial movement therein by a pair of opposing collars 28, and the other end of the shaft 27 is journaled in the bifurcated upper end of the post 10 which permits said shaft to be raised or lowered by a movement of the post 11 on its hinge 13, as shown by

full and broken lines in Fig. 2. To hold the shaft 27 in an operative position, I provide a U-shaped latch 29 having a short and long prong, both of which are slidably mounted in the post 10. The short prong of the latch 29 normally overlies the shaft 27 and holds the same against lifting movement of the post 10, and the long end of said latch is provided with a thumb piece 29′. A coiled spring 30, encircling the long prong of the latch 29, is compressed between the post 10 and the thumb piece 29′ and holds said latch in an operative position.

For imparting a continuous rotary movement to the shaft 27, which in turn imparts a step-by-step rotary movement to the head 8 through the one toothed pinion 26 and ring gear 9, there is keyed to the shaft 27, outward of the post 10, a pinion 31 which meshes with a gear 32 loosely journaled in the post 10 and provided with a hand crank 33 by which it may be operated. The knife-blade holder 20 works between the prongs of an upright bifurcated guide 34 secured to the head 8 by seating its lower end in a bore therein. A coiled spring 35, guided by the guide 34, is compressed between the table 7 and the knife-blade holder 20, and is under strain to raise said holder, as indicated by broken lines in Fig. 2. To intermittently depress the knife-blade holder 20 against the action of the spring 35, there is keyed to the shaft 27 a cam 36 having a flat side 37 and engageable with an upstanding semi-spherical projection 20′ on the knife-blade holder 20 and located directly over the axis of the head 8 so that the cam 36 is always in engagement therewith during the rotation of the head 8.

For holding one-half of a grapefruit 38 in position to have its core 39 cut therefrom by the knife-blade 19, there is provided a holder in the form of an annular ring 40 having formed therewith a radially extended handle 41 slotted at 42 to receive the standard 14 which projects therethrough, and intermediately pivoted thereto at 43. The holder 40 is adapted to receive and support one at a time, halves of grapefruit which may vary materially in size, and with the cut edge of the skin of a respective one-half of a grapefruit pressed against the under side of the table 7, as indicated in Fig. 2.

The operation of the grapefruit corer may be briefly described as follows:

Normally, the spring 35 holds the knife-blade holder 20 raised so that the point of the knife-blade 19 is within the opening 25. The raised knife-blade holder 20 in turn supports the shaft 27 raised with the tooth of the pinion 26 out of mesh with the ring gear 9, as indicated by broken lines in Fig. 2. The holder 40 is held, under the action of gravity, as indicated by broken lines in Fig. 2, and is stopped in this position by its engagement at one end of the slot 42 with the standard 14.

To remove the core 39 from one-half of a grapefruit 38, said grapefruit is placed in the holder 40 and the handle 41 depressed to carry the cut edge of the skin of the grapefruit against the under side of the table 7. While the operator holds the handle 41 depressed with one hand, he uses his other hand to release the latch 29, depress the shaft 27 and then release said latch to lock the shaft 27. This movement of the shaft 27 carries the pinion 31 into mesh with the gear 32, and the gear 26 into a position in which its tooth will mesh with the ring gear 9. The depressing movement of the shaft 27, through the cam 36 and projection 20′, depresses the knife-blade holder 20, against the tension of the spring 35, and thereby causes the knife-blade 19 to enter the grapefruit, as indicated by full lines in Fig. 2.

The operator uses the same hand, with which he depressed the shaft 27, to operate the crank 33 and impart a continuous rotary movement to the shaft 27. The cam 36 is so arranged, under the rotation of the shaft 27, to depress the knife-blade holder 20 and thereby cause the knife-blade 19 to enter the grapefruit 38 and then quickly release the same, as its flat side 37 is moved over the projection 20′, to permit the spring 35 to quickly raise said holder and withdraw the knife-blade 19 from the grapefruit.

During the time the knife-blade 19 is entering the grapefruit, the head 8 is standing still, and as soon as said knife-blade reaches its lowermost position the tooth of the gear 26 is brought into mesh with the ring gear 9 and thereby imparts a step of movement to the head 8 so that during the lifting movement of the knife-blade 19 the same cuts through the grapefruit with a drawing action. This action is repeated until the head 8 is given one complete rotation which in turn causes the knife-blade 19 to travel edgewise in a complete circle, except at its point when it stands substantially still, thereby cutting the core from the grapefruit which leaves the same, when said core is removed, as indicated in Fig. 6. The latch 29 is then released to permit the spring 35 to again move the parts into inoperative positions, as previously described. At the same time the handle 41 is released to permit the holder 40 to move, under the action of gravity, into an inoperative position, and in which position the grapefruit may be lifted therefrom.

By changing the offset of the knife-blade 19 on its holder, the size of a core removed from a grapefruit may be varied, at will. After the core is removed from a grapefruit, the pulp may be easily removed therefrom from between the radial webs by means of a spoon.

The above described invention has, in ac-

tual usage, proven highly efficient for the purpose had in view.

What I claim is:

1. A grapefruit corer including a holder and a knife blade-equipped head, one of which is rotatable, and means for imparting a plurality of complete endwise reciprocatory movements to the knife blade obliquely to the axis of rotation of the rotatable member, for each rotation of the rotatable member.

2. A grapefruit corer including a holder and knife blade-equipped head, one of which is rotatable, and means for imparting a plurality of complete endwise reciprocatory movements to the knife blade in substantially the arc of a circle, for each rotation of the rotatable member.

3. A grapefruit corer including a holder and a head, one of which is rotatable, a holder extending substantially radially over the axis of rotation of the rotatable member, said holder being pivoted to the head at one side of said axis and having at the other side of said axis a knife blade arranged to travel in the arc of a circle, the center of which is at the pivot of the holder, and means for moving the holder to reciprocate the knife blade.

4. The structure defined in claim 3 in which the knife blade may be adjusted toward and from the axis of rotation of the rotatable member.

5. A grapefruit corer including a holder and a knife-blade-equipped head, one of which is rotatable in respect to the other, means for imparting endwise reciprocatory movement to the knife-blade, means under strain to move the knife-blade in an inoperative position, and a latch operative to hold the knife-blade in an operative position.

6. In a grapefruit corer, the combination with a holder, of a rotatable knife-blade-equipped head, and means for imparting a step-by-step rotary movement to said head and for imparting endwise reciprocatory movement to the knife-blade.

7. In a grapefruit corer, the combination with a holder, of a rotatable knife-blade-equipped head, means for imparting a step-by-step rotary movement to said head, and means for imparting endwise reciprocatory movement to the knife-blade between the steps of rotation of said head.

8. The structure defined in claim 7 in which the means for reciprocating the knife-blade holds the same down during the steps of rotation of the head.

9. In a grapefruit corer, the combination with a holder, of a rotatable head, a knife-blade holder hinged to the head for vertical swinging movement and extending substantially radially thereacross, yielding means under strain to raise the knife-blade holder, and means operative on the knife-blade holder for intermittently depressing the same.

10. In a grapefruit corer, the combination with a rotatable head, a knife-blade holder hinged to the head for vertical swinging movement and extending substantially radially thereacross, a driving means for imparting a step-by-step rotary movement to said head, and a cam on the driving means for intermittently depressing the knife-blade holder.

11. In a grapefruit corer, the combination with a holder, of a rotatable head, a knife-blade holder hinged to the head for vertical swinging movement and extending substantially radially thereacross, a driving shaft hinged for vertical swinging movement and operative on said head for imparting a step-by-step rotary movement thereto, means for holding the shaft in an operating position, a cam on said shaft operative on the knife-blade holder for intermittently depressing the same, and a spring for holding the knife-blade holder in engagement and under strain to raise the driving shaft.

12. In a grapefruit corer, the combination with an annular table, of a head rotatably mounted on the table, a knife-blade-equipped holder mounted on the head, means for imparting a step-by-step movement to the head and imparting an endwise reciprocatory movement to the knife-blade-equipped holder, and a holder arranged to hold a grapefruit against the table.

13. The structure defined in claim 12 in which the holder is in the form of an intermediately pivoted lever having at one end a ring for holding a grapefruit, said holder being arranged to press the grapefruit against the table.

14. A grapefruit corer including a rotatable knife blade-equipped head, a table having an opening through which said blade operates, means for imparting a plurality of complete endwise reciprocatory movements to the knife blade obliquely to the axis of rotation of said head for each rotation of the rotatable member, and a holder for holding a grapefruit against the table.

15. The structure defined in claim 14 in further combination with means for imparting a step by step movement to the knife blade-equipped head.

In testimony whereof I affix my signature.

CARL J. ULRICH.