

July 3, 1934.

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1,965,501

CRISS-CROSS SLICING MACHINE

Filed Oct. 6, 1933

2 Sheets-Sheet 1

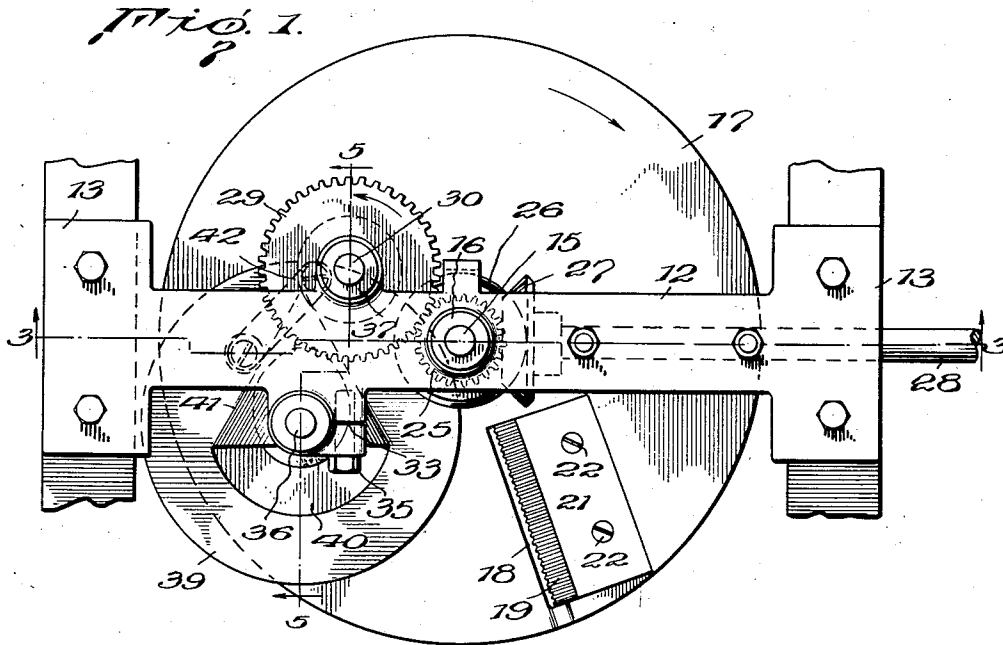
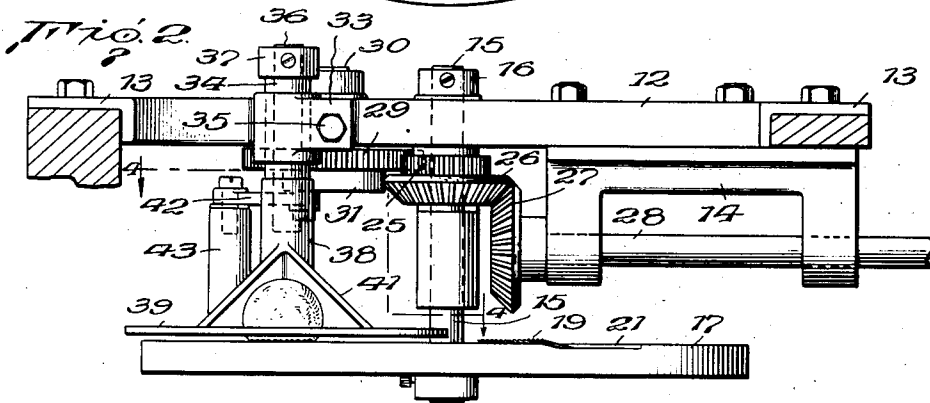
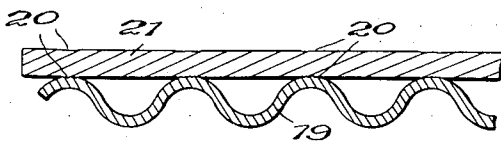


Fig. 8.

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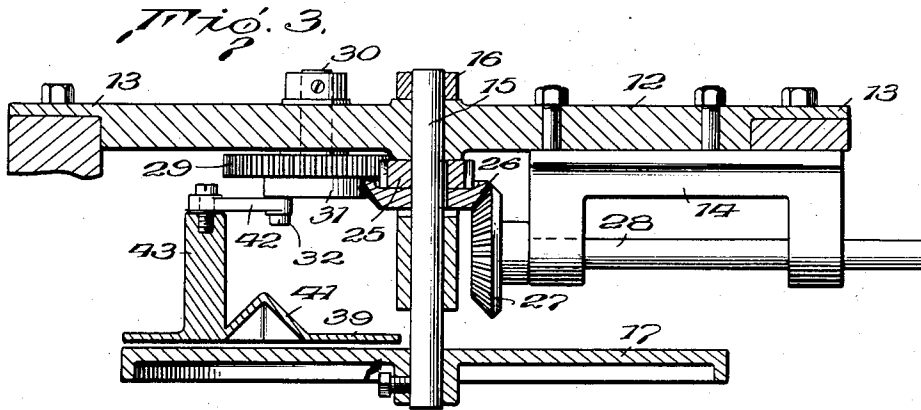
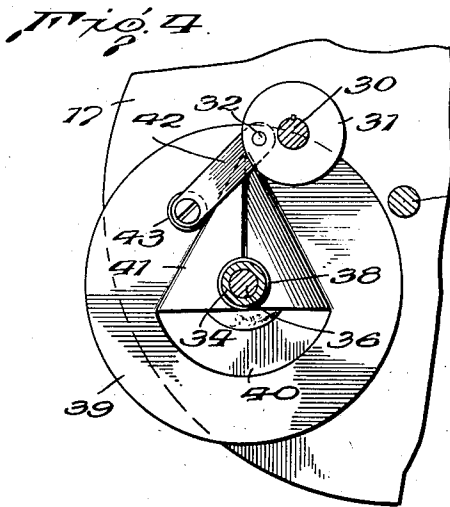
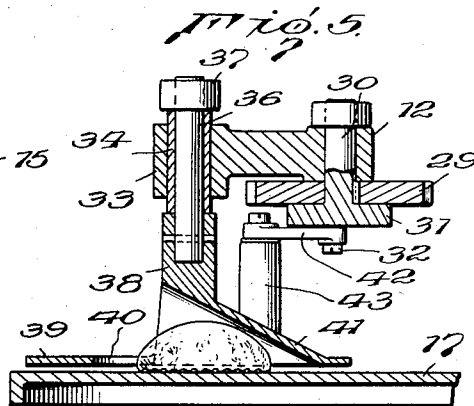
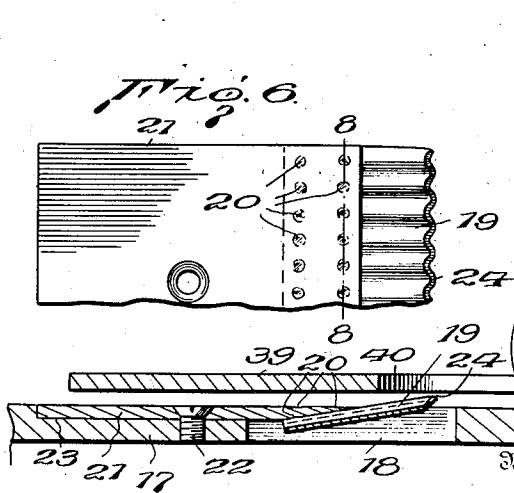
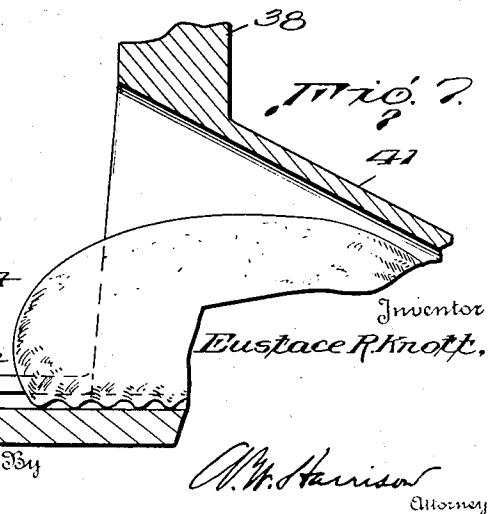
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CROSS-CROSS SLICING MACHINE

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2 Sheets-Sheet 2



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CRISS-CROSS SLICING MACHINE

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Application October 6, 1933, Serial No. 692,547

5 Claims. (Cl. 146—78)

This invention relates to vegetable slicing machines, and has particular reference to machines for cutting such vegetables as potatoes into thin slices or so-called "chips", which slices present grooved or corrugated surfaces.

A well-known potato slicer that is widely used consists of a frame having a handle at one end and a fluted knife at the other end, and provided with a slide which is operable by hand and which is pushed back and forth over the fluted knife to slice a potato carried by the slide. By manually twisting the potato between successive slicing movements thereof, the product can be so sliced that both surfaces are fluted and the slices have uniformly spaced perforations.

Another manually operable potato slicer comprises a frame on which is mounted a transverse corrugated knife strip, both edges of which effect cutting, a hopper for containing potatoes being slidable on the frame over the knife strip in one direction and then manually given a quarter rotation and slid back over the double-edged knife.

While both types of slicers referred to are serviceable in producing slices having their opposite surfaces fluted in different directions, they are slow in effecting production and necessarily tiresome for the users.

One of the objects of my invention is to provide a simple machine of rotary type and capable of continuous operation by a shaft which may have a crank for manual operation or may have a motor connected to it, and which will automatically effect the production of completely cut vegetable slices having fluted surfaces crossing each other.

Another object is to provide such a machine that is of low manufacturing costs, and that is capable of producing the slices at high speed.

Another object is to provide an improved structure of knife for effecting the cutting or fluted slices.

With said objects in view, and others hereinafter explained, my invention consists in the construction and combinations of parts substantially as hereinafter described and claimed.

Figure 1 is a plan view of the complete machine, with the outer end of the operating shaft broken away.

Figure 2 is a side elevation of the same.

Figure 3 represents a section on line 3—3 of Figure 1.

Figure 4 represents a section on line 4—4 of Figure 2.

Figure 5 represents a section on line 5—5 of Figure 1.

Figure 6 is a plan view of a portion of my improved knife or slicer.

Figure 7 is a view somewhat similar to a portion of Figure 5, on a larger scale and illustrating

how the cutter is mounted on the rotary disk or table.

Figure 8 represents an enlarged section on line 8—8 of Figure 6.

Similar reference characters indicate similar parts or features in all of the views.

In the following description, the articles to be sliced will be referred to as potatoes, but it is to be understood that the machine is not limited to use for slicing such specific vegetables.

What may be referred to as the frame of the machine consists of a simple bar or cross piece having widened ends 13 adapted to be mounted on any suitable supporting structure which may be cross strips on the top of a receptacle to which the slices made by the mechanism are delivered. Secured to the underside of the bar 12 is a bracket 14 which may be considered as another member of the frame which, in its entirety, is very simple.

Rotatably mounted in the bar 12, at about the mid-length thereof, is a shaft 15 having a collar 16 secured to its upper end, said collar bearing on the top of the bar or, if desired, on a ring of ball bearings.

Secured to the lower end of the shaft 15 is a disk 17 hereinafter referred to as a rotary table because the potatoes being sliced bear on it. An opening 18 (Figs. 1 and 7) permit slices to pass through into a suitable receptacle below.

The slicing cutter consists of a fluted or corrugated strip 19 of metal such as sheet steel spot welded at 20 to the bevelled or inclined under surface of the edge of a plate 21 removably secured by screws 22 in a shallow recess 23 (Fig. 6), in the upper surface of the table 17, the proportions of the recess 23 and plate 21 being such that when the machine is in operation as herein-after described, sliding contact with the potatoes will have no effect other than the slicing. In other words, the entire surface of the rotary table 17 is smooth, the upper edge of the knife 19 projecting slightly above the surface of said table (Figs. 2 and 7). Said upper edge is sharpened and bevelled rearwardly as at 24 to effect a shearing cut in operation, the location of the cutter relatively to the opening 18 in the rotary table being such that during the operation presently described, each slice will be directed by the cutter down through the said opening.

The potato to be sliced bears on the rotary table and is intermittently turned or twisted laterally on its vertical axis, such movement being so timed, relatively to the rotation of the table, that successive operations will form corrugated cuts in the article in different directions alternately. The mechanism for effecting this will now be described.

Keyed to the shaft 15 are a spur pinion 25 and a bevel pinion 26 meshing with a bevel pinion 27

of an operating shaft 28 mounted in the bracket 14 and which shaft, preferably, has a crank not necessary to illustrate, but which may be driven by power. The pinion 25 meshes with a gear 29 which, circumferentially, is twice the size of the pinion 25, so as to rotate once for each two rotations of the shaft 15 and table 17. Said gear 29 is keyed to a vertical stud shaft 30 mounted in bearings at one side of the frame bar 12 (Fig. 1). Below the gear 29 the shaft 30 has, integral therewith or secured to it, a disk 31 (Figs. 3 and 5) having an eccentrically located pin 32.

Mounted in a split bearing 33 provided in the other side of the frame bar 12 from the bearings for the shaft 30, is a sleeve 34 (Fig. 5) which is maintained in the desired vertical position in the split bearing by a screw 35 (Figs. 1 and 2) capable of clamping the bearing on the sleeve. The screw may be loosened, the sleeve adjusted up or down, and then re-clamped.

Mounted in the sleeve 34 is a pin 36 which provides the pivot or axle of the potato holder. A collar 37 is secured to the upper end of the pin 36 to support the latter in its adjustable bearing sleeve 34, and the lower end of said pin enters a socket in a stud portion 38 of the holder for the article to be sliced. The said holder comprises a plate 39 having a large opening 40, a portion of which is covered by a cone-shaped hood member 41 from the top of which the stud portion 38 rises.

The eccentric pin 32 of the disk 31 is connected by a link 42 with a fixed pin 43 rising from the holder plate 39 so that, as the shaft 30 is rotated, the plate 39 and its cone-shaped hood is turned or twisted laterally on the pivot provided by the pin 36 in the stud bearing 38.

In operation, the table 17, carrying the fluted knife, is rotated in the direction of the arrow, Figure 1, and the gearing described causes the holder 39, 41, to twist or turn first one way during one rotation of the table and then the other way during the next rotation of the table. An attendant merely drops a potato onto the plate 39 over the opening 40 so that it bears on the table 17 which, as it rotates, frictionally moves the potato toward the apex of the cone 41 which arrests it, and the first passage of the knife under it removes a bottom surface portion of the potato and leaves a fluted surface of the latter bearing on the table. Then, by the time the knife is approaching the potato to make the next cut, the holder has been twisted to its other position and the corrugations effected by the second cut cross those made by the first cut, and the resulting slice passes down through the opening 18 into a suitable receptacle. Continued rotation of the table and the timed twisting of the potato holder effects the successive removal of slices, each having upper and lower corrugated surfaces.

An important feature of my invention resides in the conical open-bottomed holder 41. Said holder 41 has two smooth inner surfaces at an angle to each other. Therefore, when the knife is operating to cut a slice off from the bottom of a potato in such holder, the action of the knife urges the potato toward the apex of the holder and the opposite converging sides of the holder so grip the potato that it can not turn sideways and interrupt proper continuity of the grooves made by the fluted knife.

When the slicing has proceeded so far that action begins on the upper or smaller portion of a potato and the remaining portion is being reduced in size, the successive slicing urges the remaining piece toward the apex of the holder.

Such smaller piece may be said to be gradually getting out of the way. At no time however is the potato moved into the path of the cutter at different points along the latter. It is simply twisted or turned about an axis substantially corresponding with the center of the potato.

Another important feature of my invention resides in the structure of the cutter or slicing member which is removably mounted so that a worn one can be replaced by a new one, or so that differently fluted cutters can be substituted for one another to vary the size of the flutings. Particular advantages other than facility of replacement are simplicity and low cost of manufacture. Each fluted blade 19 is made of thin sheet metal such as steel and the strip is transversely corrugated. The plate 21 has an upwardly inclined or bevelled edge to the under surface of which the blade or strip 19 is secured by spot welding as at 20. For convenience of description, the portions of the strip 19 which contact with the plate 21 are referred to as the humps. Said humps are the portions of the blade strip which provide the best locations for the welding spots 20, as illustrated in Figures 6 and 8. This structure enables a durable cutter unit as a whole to be made with a minimum of cost.

I do not limit myself to bevelling the edge of the plate 21, as the plane of the blade 19 might correspond with the plane of the plate 21, in which case the plate itself would be secured otherwise than in a flat shallow recess in the table 17, but with the blade 19 projecting sufficiently above the plane of the surface of the table to effect the slicing.

And I do not limit myself to a structure in which the table rotates in a horizontal plane. The mechanism as illustrated could be so mounted that the table would rotate in a vertical plane. For instance, by an examination of Figure 1 turned upside down, and considering that figure to be a front elevation of the machine, it will be readily understood that a potato then dropped into what would then be the wide open top of the cone 41, would be maintained against the face of the rotating member 17 and sliced by the cutter, due to the then downward inclination of the two tapering walls of the cone.

Having now described my invention, I claim:

1. A slicing machine having a rotary table provided with a corrugated slicing knife, a pivoted holder for an article to be sliced, said holder comprising a plate having an opening and a cone-shaped member over said opening, the pivot of said holder being at one side of the axis of rotation of the table, and means for intermittently turning said holder on its pivot alternately in opposition directions.

2. A slicing machine having a rotary table provided with a corrugated slicing knife, a pivoted holder for an article to be sliced, said holder comprising a plate having an opening and a cone-shaped member over said opening, the pivot of said holder being at one side of the axis of rotation of the table and means for intermittently turning said holder on its pivot alternately in opposite directions, said turning means including gearing for shifting the holder on its axis in timed relationship to the rotation of the table and its knife.

3. A slicing machine having a rotary table provided with a corrugated slicing knife, a pivoted holder for an article to be sliced, said holder comprising a plate having an opening and a cone-shaped member over said opening, the pivot of

said holder being at one side of the axis of rotation of the table and in line with a mid-portion of said cone-shaped member, and means for intermittently turning said holder on its pivot alternately in opposite directions.

4. A slicing machine having a rotary table provided with a fluted knife, a plate above said table, said plate being pivoted at one side of the axis of rotation of the table and having an open-bottomed conical potato-holder, and means for turning said plate on its pivot first in one direction and then in reverse direction.

5. A slicing machine comprising a frame member having a shaft mounted therein, a plate carried by said shaft and having an opening and a

slicing knife extending over said opening, a pivot pin supported by said frame member at one side of and parallel with said shaft, a potato holder carried by said pivot pin, a stud shaft mounted in said frame member, and gearing for transmitting motion from said first-mentioned shaft to the potato holder to turn the latter on the axis of its pivot pin, said gearing comprising a pinion carried by the first-mentioned shaft, a gear carried by said stud shaft, said gear being twice the size of said pinion and carrying an eccentric pin, and a link connecting said eccentric pin with the potato holder at a point aside from the pivot pin of the holder.

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