Feb. 2, 1960 G. L. JOUIN 2,923,337

SLICING MACHINE

Filed Oct. 14, 1957

2 Sheets-Sheet 1

FIG-1

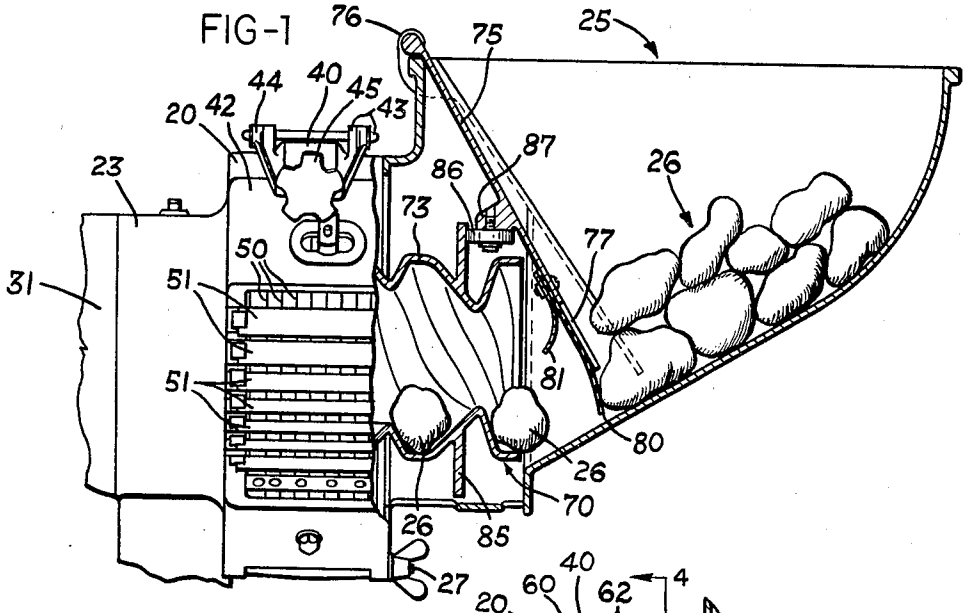


FIG-2

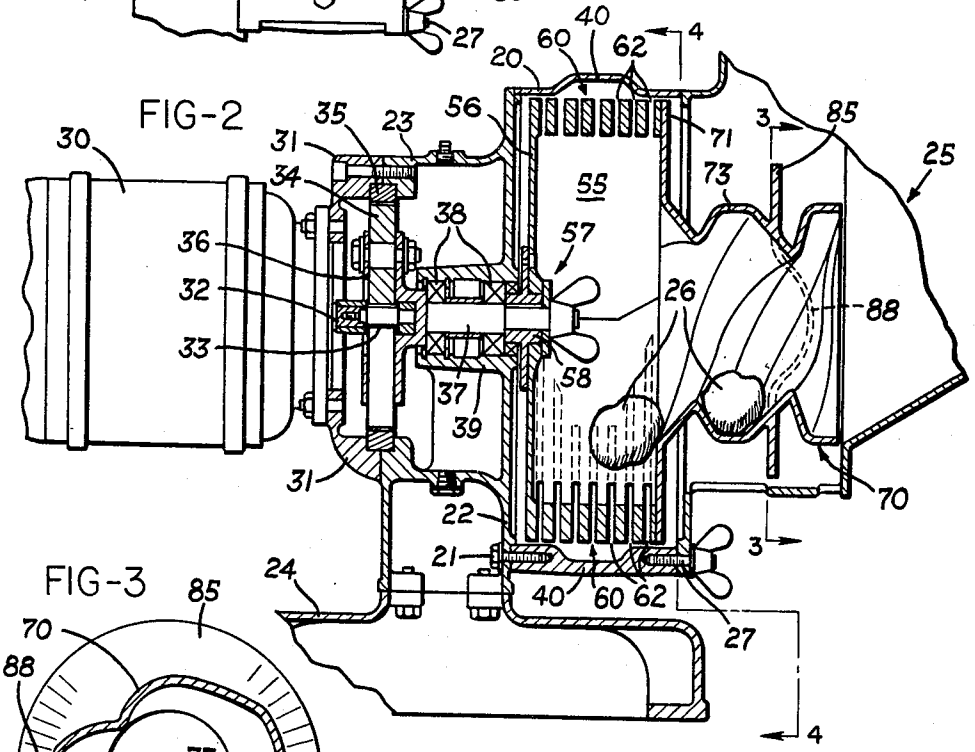
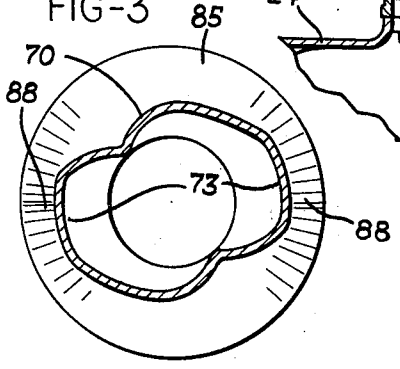


FIG-3



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FIG-4

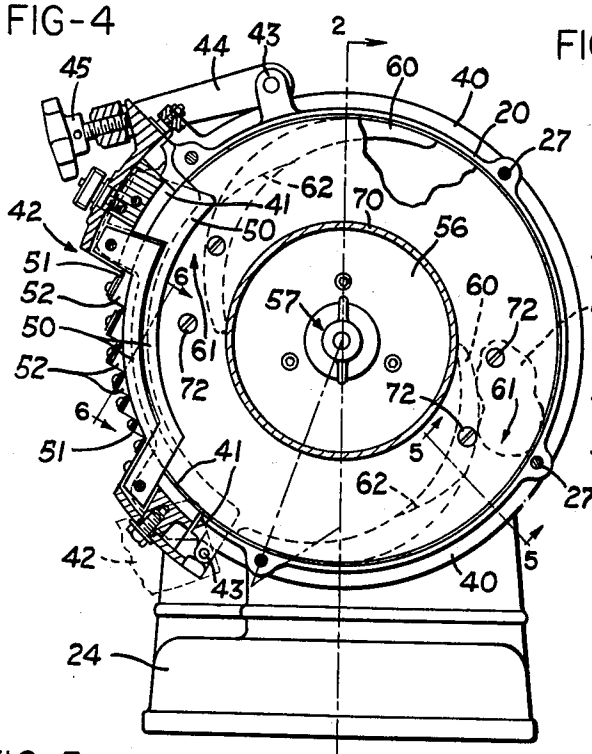


FIG-7

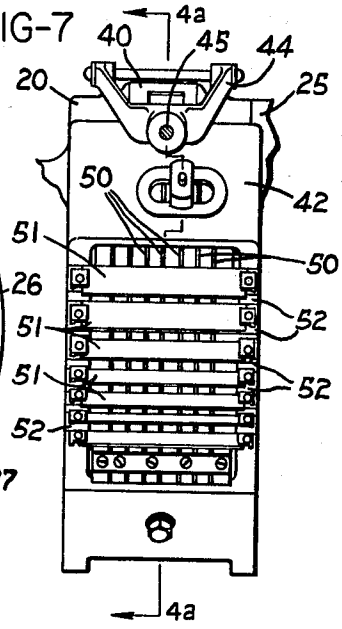


FIG-5

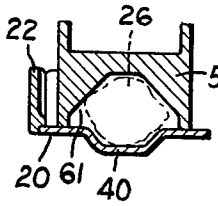


FIG-6

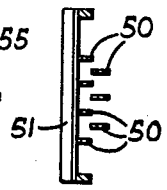


FIG-8

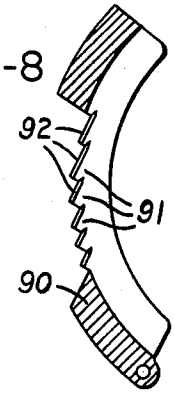


FIG-9

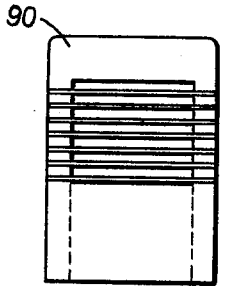


FIG-10

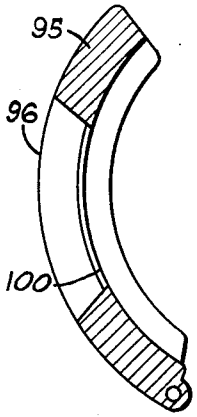


FIG-11

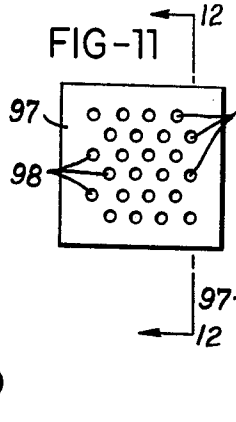


FIG-12

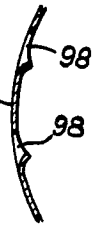
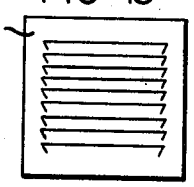


FIG-13



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2,923,337

SLICING MACHINE

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Application October 14, 1957, Serial No. 690,088

6 Claims. (Cl. 146—78)

This invention relates to vegetable slicers, and more particularly to a machine for slicing vegetables such as potatoes into shapes suitable for frying and the like.

It is a primary object of this invention to provide a machine for slicing potatoes into pieces suitable for frying which operates automatically to advance successive potatoes to a cutting station forming a part of the machine, which is of simple and novel construction facilitating both the initial production of the machine and also the maintenance thereof in use, and which also is highly efficient in operation.

Another object of the invention is to provide a slicing machine as outlined above wherein each potato is sliced entirely into pieces in a single pass through the cutting station, and wherein also the several pieces into which each potato is sliced are uniformly straight-sided.

It is also an object of the invention to provide a slicing machine as outlined above wherein the cutting station is constructed both to provide ready access to the interior of the machine and also for quick and easy change of the cutting mechanism in accordance with particular type of sliced product desired and without otherwise affecting the operation of the machine as a whole.

Additional objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

In the drawings:

Fig. 1 is a view partly in front elevation and partly in vertical section showing a vegetable slicing machine constructed in accordance with the invention;

Fig. 2 is a fragmentary view of the machine of Fig. 1 taken on the axis of the rotor as indicated by the line 2—2 of Fig. 4;

Fig. 3 is a detail section taken as indicated by the line 3—3 of Fig. 2;

Fig. 4 is a combined sectional view largely on the line 4—4 of Fig. 2 but with the left-hand portion on the line 4*a*—4*a* of Fig. 7;

Fig. 5 is a fragmentary section taken approximately on the line 5—5 of Fig. 4;

Fig. 6 is a fragmentary section taken approximately on the line 6—6 of Fig. 4;

Fig. 7 is an enlarged detail front elevational view of the cutter mechanism in Figs. 1–4;

Fig. 8 is a fragmentary section similar to Fig. 4 and showing another form of cutter mechanism;

Fig. 9 is a detail view in front elevation of the cutter mechanism of Fig. 8;

Fig. 10 is a view similar to Fig. 8 showing another form of cutter carrier for use on the machine of Figs. 1–4;

Fig. 11 is a front elevational view of one form of cutter unit for use on the cutter carrier of Fig. 10;

Fig. 12 is an enlarged fragmentary section on the line 12—12 of Fig. 11; and

Fig. 13 is a view similar to Fig. 11 showing another form of cutter member for use on the carrier of Fig. 10.

Referring to the drawings, which illustrate preferred embodiments of the present invention, the main housing

of the apparatus includes an annular casing 20 mounted by bolts 21 on the side wall portion 22 of a casting 23 which is in turn secured on a base 24. A hopper 25 for the potatoes 26 to be cut is mounted on the opposite side of the casing 20 by bolts 27. The drive motor 30 is also mounted on the casting 23 by a bracket 31, and the motor drive shaft 32 carries a gear 33 by which the drive of the motor is transmitted to a planetary transmission comprising a planet gear 34 and a ring gear 35 clamped between the bracket 31 and casting 23. The planet gear 34 is carried by a carrier 36 secured on the cutter drive shaft 37 which is mounted by suitable bearings 38 in an internal boss portion 39 of the casing 23.

The casing 20 includes a central portion 40 which is of generally channeled construction in radial section to form a generally cylindrical track along which the successive potatoes travel in the operation of the machine as described hereinafter. The track 40 has a cut-out 41 at the front side of the machine, and the cutting mechanism is installed at this cut-out. It includes a carrier member 42 which is pivoted on the casing at 43 for swinging movement between the retracted position indicated in dotted lines in Fig. 4 and its full line operative position in which it overlies the cut-out 41 and is locked on the casing by means of the arm 44 and lock screw 45 as shown in Fig. 4.

The cutting mechanism is shown in Figs. 1–7 as constructed for slicing potatoes into elongated pieces of generally square section for French frying. A plurality of elongated knives 50 are mounted at their opposite ends in the carrier 42 and project within the track 40 in parallel planes extending radially of the casing 20. An additional set of knives 51 is mounted on the front of the carrier 42 in horizontally extending and vertically offset relation on the stepped portions 52 of the carrier 42. With this arrangement, therefore, a potato moving along the track 40 will first be cut into slab-like portions by the knives 50 arranged radially of the track, and these slab portions will then be cut by the knives 51 into pieces of square section which are discharged at the front of the machine.

The individual potatoes 26 are carried along the track 40 for slicing by means of a rotor mounted within the casing 20 and indicated generally by the reference character 55. This rotor includes a back plate 56 secured as indicated at 57 on a hub 58 which is in turn keyed on the shaft 37 as shown in Fig. 2. The rotor 55 also includes one or more, shown as two, vane members 60, each of which is arranged to form a pocket 61 in the radially outer surface of the rotor. As best seen in Figs. 4 and 5 the pocket 61 is of generally channel shape in radial section, and its inner wall is arranged in diverging relation with the track 40 in the direction of rotation of the rotor to provide a wedging action toward track 40 on a potato 26 received in the pocket. This configuration of the pocket also tends to align a potato therein along its longest axis as indicated in Fig. 4. In addition, the radially outer portion of each vane 60 is provided with a plurality of slots 62 coinciding with the blades 50 to admit these blades to the interior of the pocket 61 for slicing a potato being carried therein through the cutting station.

Provision is also made for supplying potatoes one at a time to the interior of the rotor 55 to be picked up and carried through the cutting station for the desired slicing operation. Referring particularly to Figs. 1 and 2, a hollow screw conveyor 70 is secured at its inner end on the outer face of the rotor 55, as by means of its flange portion 71 and a plurality of screws 72, and the conveyor 70 includes relatively deep internal threads 73 running the full length thereof. The open outer end of the conveyor 70 extends to a position closely adjacent the inclined bottom portion of the supply hopper 25, and the

hopper is also provided with a bottom member in the form of a shutter 75 pivoted at 76 on the hopper. The lower edge of the shutter 75 is provided with an opening in the form of a cut-out 77 sized to permit the passage of a potato therethrough, but this cut-out is covered by a flapper 80 of heavy rubber or similar flexible material provided with a curved back-up plate 81 on the underside of the shutter.

The normal position of the shutter 75 is shown in full lines in Fig. 1, and in this position it extends sufficiently close to the inclined bottom wall of the hopper 25 to prevent the passage of a potato through the cut-out 77. There is an operative connection between the screw conveyor 70 and the shutter 75 causing the latter to oscillate in such manner as to admit potatoes to the outer end of the conveyor in timed relation with the rotation of the rotor. This drive includes a cam 85 formed by a circumferential flange on the conveyor and cooperating with a follower roller 86 carried by a bracket 87 on the underside of the shutter 75. The cam 85 has high points 88 on opposite sides thereof such that as the conveyor 70 rotates, the shutter 75 will be oscillated between the full and dotted line positions shown in Fig. 1. Each such movement of the shutter will permit a single potato to pass the cut-out 77 and flapper 80 for delivery to the open end of the conveyor 70 as shown in Fig. 2, and two such operations occur for each complete revolution of the conveyor 70. The continued rotation of the conveyor will cause the successive potatoes to travel along the internal threads 73 in the conveyor into the interior of the rotor, where the successive potatoes will in turn be picked up by the vanes 60 and carried through the cutting station as already described.

The construction of the slicing machine of the invention as shown in Figs. 1–7 offers substantial practical advantages. Thus the cutter carrier and its associated knife blades are proportioned to receive a complete potato therethrough and to have it slice each potato in a single pass through the cutting station, with the result that two potatoes are completely sliced for each complete revolution of the rotor. In addition, with the blades 51 of the straight cross section and small width shown in the drawings and with the stepped portions 52 of the character 42 constructed to position these blades tangentially of the rotor axis, all of the slices into which each potato is cut will be found to be substantially uniformly straight-sided.

The invention also provides for substantial variety in the shapes into which the potatoes are cut, by simple change of the parts at the cutting station. Thus Figs. 8 and 9 illustrate a mechanism for cutting the potatoes into flat slices of a thickness suitable for use in the preparation of scalloped potatoes. The cutter carrier 90 is similar to the carrier 42 but carries no vertically arranged knives, and its outer face includes stepped portions 91 whereon the steps are more closely spaced than on the carrier 42. The blades 92 may be mounted on the carrier 90 in the same manner as the horizontal blades 51 already described, and otherwise the operation of the cutter mechanism will essentially be the same as already described.

Fig. 10 shows still another form of cutter carrier 95 which is similar to the carriers 90 and 42 but is provided with a cylindrically curved outer face portion 96. This carrier 95 is adapted for use with cutter blades of the type shown in Figs. 11–13. The cutter plate 97 in Figs. 11 and 12 is provided with a cutting grating comprising a plurality of individual holes 98 each having a portion of its surrounding edge formed into a blade for the purpose of slicing the potatoes into straw or string like portions. The cutter blade 99 in Fig. 13 is formed with a different cutting grating comprising closely spaced parallel cutter portions adapted to slice the potato into the very thin flat strips for cooking as potato chips. Either of the cutters 97 and 99, or other similar constructed cutter plates may be mounted on the carrier 95, in overlying relation with the opening 100 therethrough, and will operate with the remainder of the machine in the same manner as already described.

While the forms of apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. In a machine of the character described for slicing potatoes and the like, comprising a hollow casing including a wall defining a generally cylindrical track, said wall having an opening therethrough, cutter means mounted in said opening and including a plurality of blades of thin flat section projecting within said track and arranged with the cutting edges thereof parallel with the axis of said track in circumferentially spaced relation with respect to the center of said track to effect successive cuts in a potato traveling along said track, a rotor mounted for rotation within said casing concentrically with said track, means on said rotor for carrying potatoes one at a time along said track for engagement with said cutter means, means for supplying potatoes to said rotor, the total circumferential spacing of said blades being sufficient to effect complete cutting of each said potato in a single pass through said cutter means, and means maintaining said blades with the flat sides thereof in substantially parallel relation with each other and in tangential relation with said track to effect cutting of each said potato into pieces of substantially uniform thickness.

2. A machine of the character described for slicing potatoes and the like, comprising a hollow casing including a wall defining a generally cylindrical track, said wall having an opening therethrough, cutter means mounted in said opening and including a plurality of blades of thin flat section projecting within said track and arranged with the cutting edges thereof parallel with the axis of said track in circumferentially spaced relation with respect to the center of said track to effect successive cuts in a potato traveling along said track, a rotor mounted for rotation within said casing concentrically with said track, means on said rotor for carrying potatoes one at a time along said track for engagement with said cutter means, means for supplying potatoes to said rotor, the total circumferential spacing of said blades being sufficient to effect complete cutting of each said potato in a single pass through said cutter means, means maintaining said blades with the flat sides thereof in substantially parallel relation with each other and in tangential relation with said track to effect cutting of each said potato into pieces of substantially uniform thickness, and additional blades mounted in underlying relation with said plurality of blades and extending generally radially of said track to slice said potatoes at substantially right angles to said plurality of blades into pieces of substantially rectangular section.

3. A machine of the character described for slicing potatoes and the like, comprising a hollow casing including a wall defining a generally cylindrical track, said wall having an opening therethrough, a cutter carrier mounted on said casing in overlying relation with said opening, a plurality of blades of thin flat section mounted on said carrier with the cutting edges thereof projecting within said track, said blades being arranged with said cutting edges parallel with the axis of said track and with the flat sides thereof in parallel and spaced relation circumferentially of said track to effect successive cuts on a potato traveling along said track, a rotor mounted for rotation within said casing concentrically with said track, means on said rotor for carrying potatoes one at a time along said track for engagement with said cutter means, means for supplying potatoes to said rotor, the total circumferential spacing of said blades being sufficient to effect

complete cutting of each said potato in a single pass through said blades, and means maintaining said blades in tangential relation with said track to effect cutting of each said potato into pieces of substantially uniform thickness.

4. A machine of the character described for slicing potatoes and the like, comprising a hollow casing including a wall defining a generally cylindrical track, said wall having an opening therethrough, a cutter carrier pivoted on said casing for movement between an operative position in overlying relation with said opening and a retracted position exposing said opening for access to the interior of said casing, a plurality of blades of thin flat section mounted on said carrier with the cutting edges thereof adapted to project within said track, said blades being arranged with said cutting edges parallel with the axis of said track and with the flat sides thereof in parallel and spaced relation circumferentially of said track to effect successive cuts on a potato traveling along said track, a rotor mounted for rotation within said casing concentrically with said track, means on said rotor for carrying potatoes one at a time along said track for engagement with said cutter means, the total circumferential spacing of said blades being sufficient to effect complete cutting of each said potato in a single pass through said blades, and means maintaining said blades in tangential relation with said track to effect cutting of each said potato into pieces of substantially uniform thickness.

5. A machine of the character described for slicing potatoes and the like, comprising a hollow casing including a wall defining a generally cylindrical track, said wall having an opening therethrough, a cutter carrier pivoted on said casing for movement between an operative position in overlying relation with said opening and a retracted position exposing said opening for access to the interior of said casing, a plurality of blades of thin flat section mounted on said carrier with the edges thereof adapted to project within said track, said blades being arranged with said cutting edges parallel with the axis of said track and with the flat sides thereof in parallel and spaced relation circumferentially of said track to effect successive cuts on a potato traveling along said track, means maintaining said blades in tangential relation with said track in said operative position of said carrier to

effect cutting of said potato into pieces of substantially uniform thickness, a rotor mounted for rotation within said casing concentrically with said track, means on said rotor for carrying potatoes one at a time along said track for engagement with said cutter means, the total circumferential spacing of said blades being sufficient to effect complete cutting of each said potato in a single pass through said blades, and additional blades mounted on said carrier and extending generally radially of said track to slice said potatoes at right angles to said plurality of blades into pieces of substantially rectangular section.

6. A machine of the character described for slicing potatoes and the like, comprising a hollow casing including a wall defining a generally cylindrical track, said track having an opening therethrough, cutter support means mounted in overlying relation with said opening, a plurality of knife blades proportioned to extend axially across said track in said opening, said blades being of thin flat section and relatively small width, means mounting said blades on said support means with the cutting edges thereof parallel with the axis of said track and with the flat sides thereof in spaced parallel relation with each other and in tangential relation with said track to effect successive parallel and straight slices in a potato traveling along said track, a rotor mounted for rotation within said casing concentrically with said track, means on said rotor for carrying potatoes one at a time along said track for engagement with said blades, the total number and spacing of said blades being sufficient to effect complete cutting of each said potato in a single pass therethrough, and means for supplying potatoes to said rotor.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,923,337

February 2, 1960

Germain Louis Jouin

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 12, for "In a machine" read -- A machine --.

Signed and sealed this 26th day of July 1960.

(SEAL)

Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents