H. G. MILLER.

SLICING MACHINE.

APPLICATION FILED JULY 20, 1916.

1,270,039.

Patented June 18, 1918.

4 SHEETS—SHEET 1.

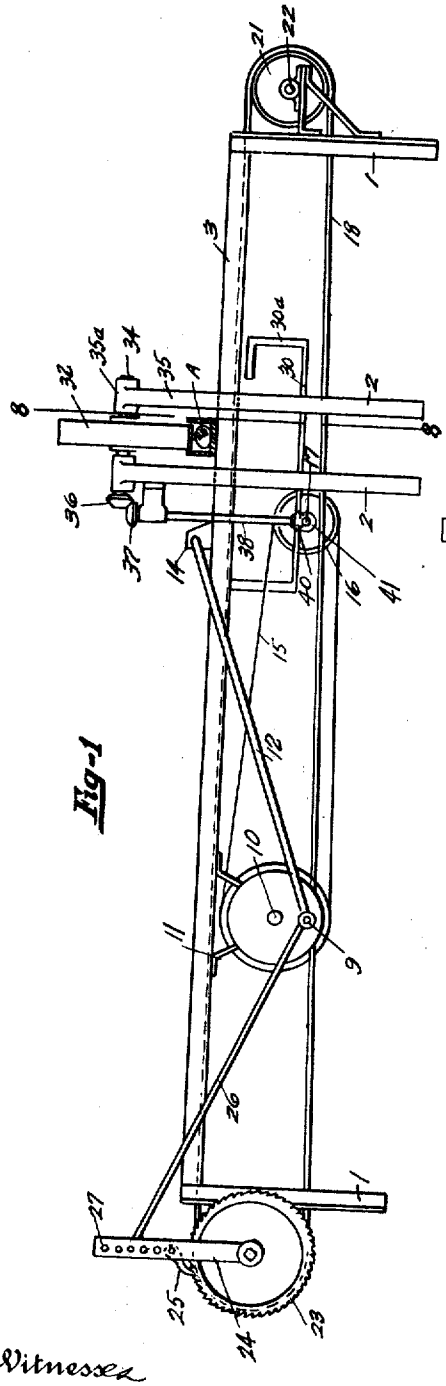


Fig-1

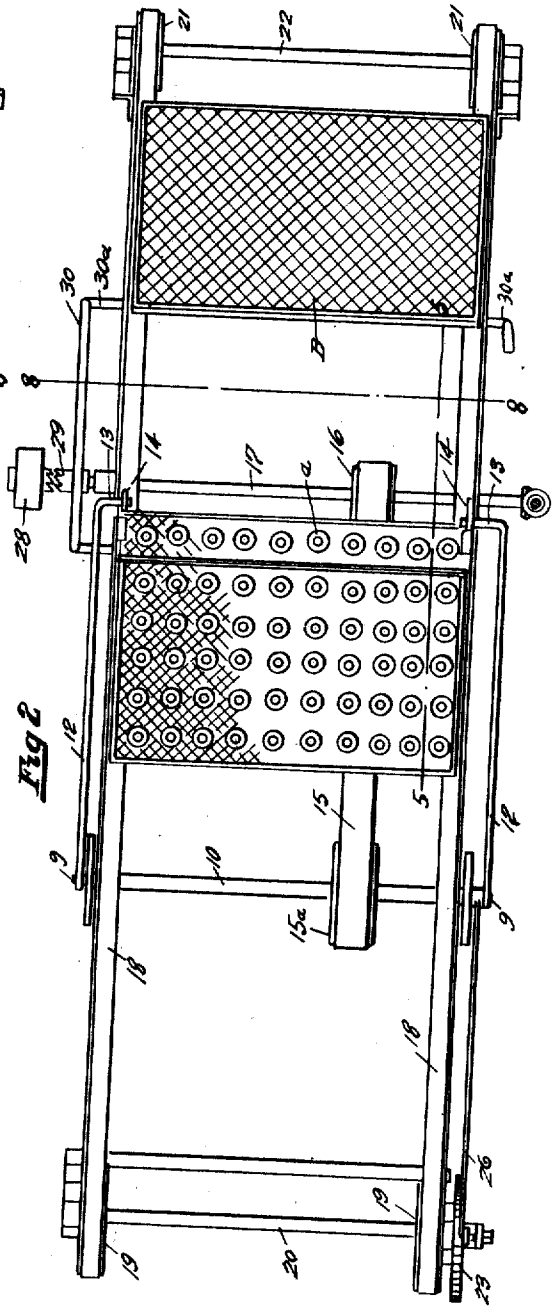


Fig 2

Witnesses

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4 SHEETS—SHEET 2.

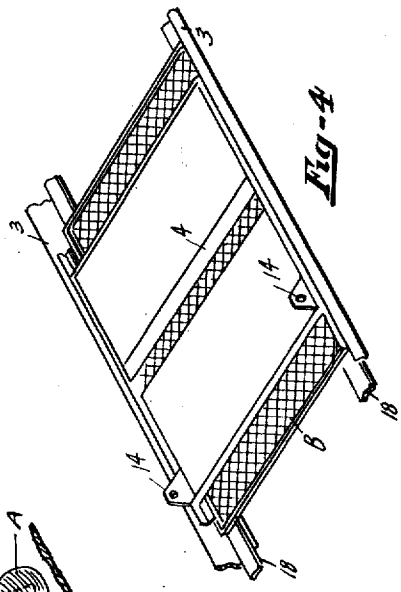


Fig-4

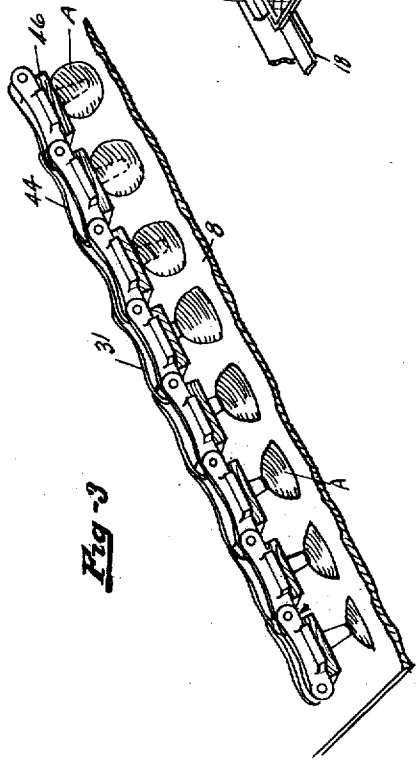


Fig-3

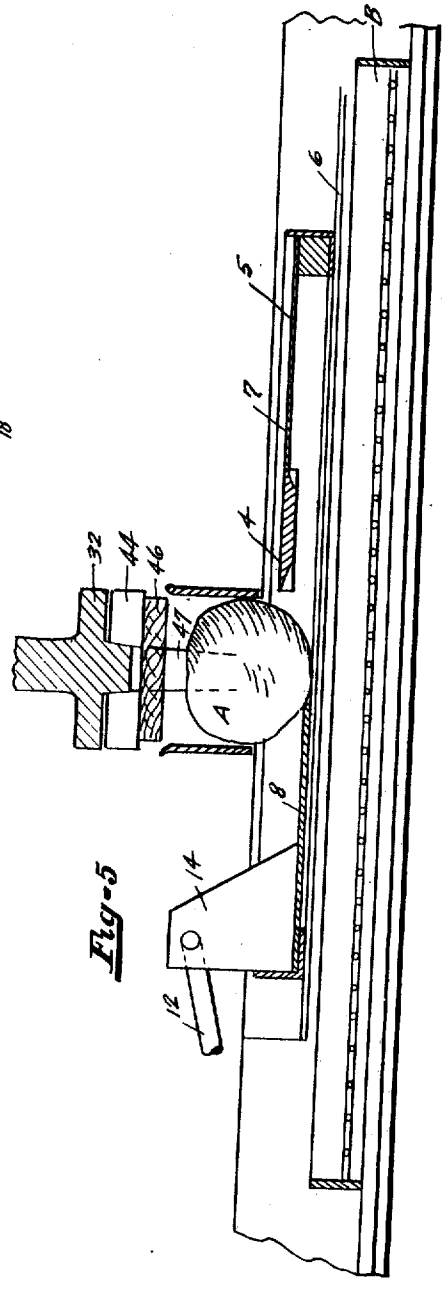


Fig-5

Witnesses

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4 SHEETS—SHEET 3.

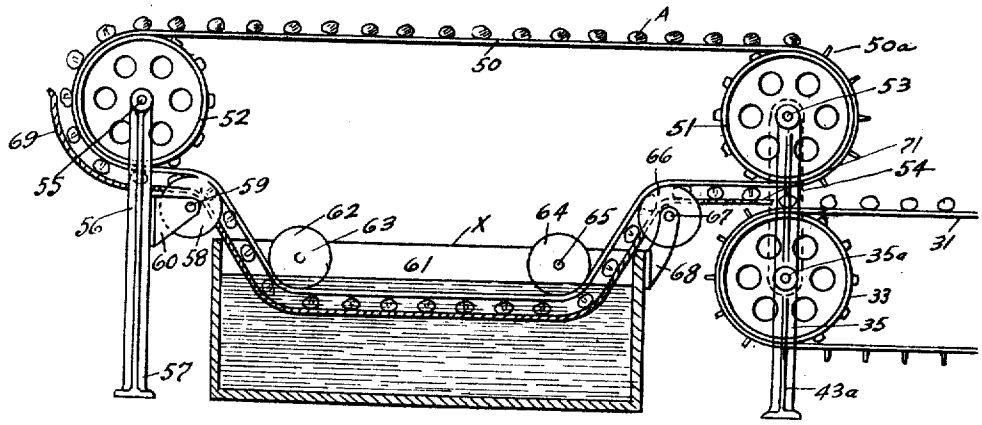


Fig-6

Fig-7

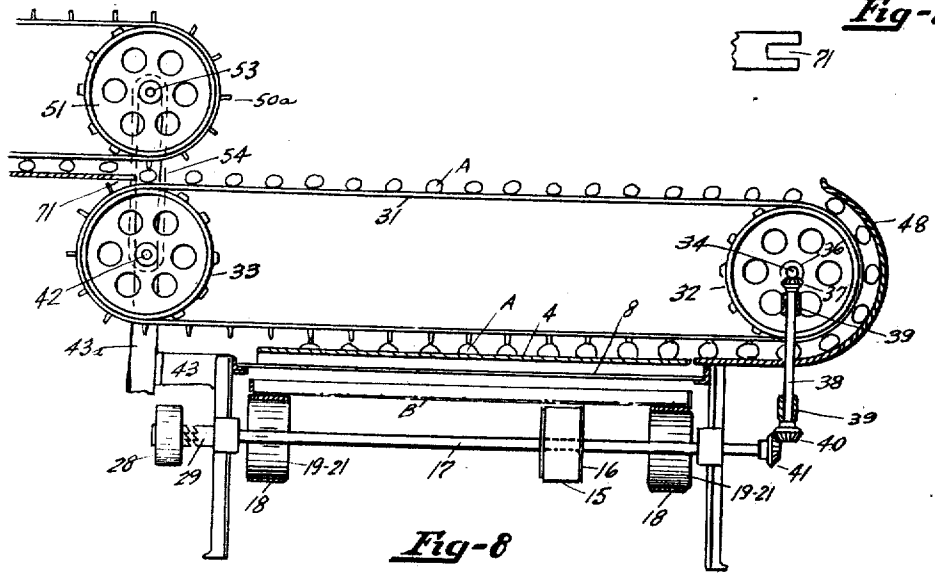


Fig-8

Witnesses,
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4 SHEETS—SHEET 4.

Fig-9

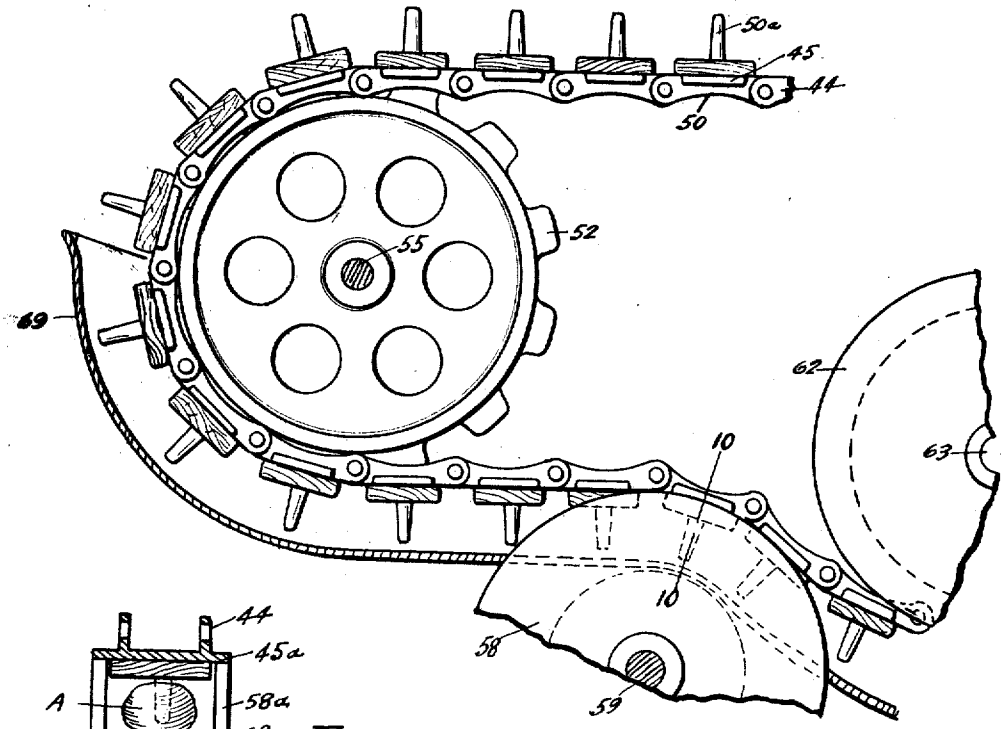


Fig-10

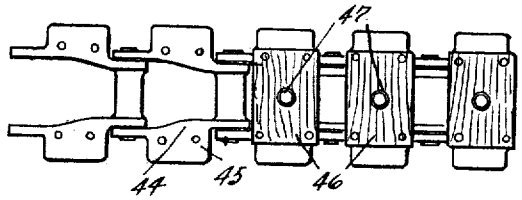


Fig-11

Witnesses

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UNITED STATES PATENT OFFICE.

HERBERT G. MILLER, OF THE DALLES, OREGON, ASSIGNOR OF ONE-HALF TO PACIFIC EVAPORATOR COMPANY, OF PORTLAND, OREGON, A CORPORATION OF OREGON.

SLICING-MACHINE.

1,270,039. Specification of Letters Patent. Patented June 18, 1918.

Application filed July 20, 1916. Serial No. 110,282.

To all whom it may concern:

Be it known that I, HERBERT G. MILLER, a citizen of the United States, residing at The Dalles, in the county of Wasco and State of Oregon, have invented new and useful Improvements in Slicing-Machines, of which the following is a specification.

This invention relates to slicing machines and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

The invention is particularly advantageous in connection with the slicing of fruit, particularly fruit having an opening therethrough, such as cored apples and the invention is illustrated as being adapted for this purpose although the device is adapted for different materials and particularly different fruits.

The invention is illustrated in the accompanying drawings as follows:—

Figure 1 shows a side elevation of the machine.

Fig. 2 a plan view, the feeding mechanism being removed to better show construction.

Fig. 3 an enlarged section of the feeding device directly at the knife.

Fig. 4 a perspective view of the knife and its mounting.

Fig. 5 a section of the parts immediately at the knife on the line 5—5 in Fig. 2.

Fig. 6 a central vertical section of a device acting with the slicer for treating the material.

Fig. 7 a plan view of the end of a feeding guide.

Fig. 8 a section on the line 8—8 in Figs. 1 and 2.

Fig. 9 an enlarged view of a portion of the device shown in Fig. 6.

Fig. 10 a section on the line 10—10 in Fig. 9.

Fig. 11 a plan view of one of the feeding chains showing its construction.

The slicer frame is supported by the legs 1 at the ends and the intermediately located legs 2. These are connected by a top frame 3. A cutting knife 4 is mounted in a rectangular-shaped frame 5 and the frame 5 is adapted to reciprocate in guides 6 carried by the frame. The platform 7 is formed in continuation of the blade forming a support for the fruit after the blade has passed through it and a spacing platform 8 is arranged at one side of and below the blade. This supports the fruit or material in front of the blade and the distance it is located below the blade determines the thickness of the slices. Cranks 9 are mounted at each end of the shaft 10 and the shaft 10 is mounted in brackets 11. Pitmen 12 extend through the cranks 9 and have the hooked ends 13 which extend into the brackets 14 on the frame 5. It will be readily seen that the motion of the crank will give to the knife frame a reciprocating motion.

The shaft 10 is driven by a belt 15 acting on a pulley 15ª fixed on the shaft 10. The belt runs from the pulley 16 fixed on the drive shaft 17. Conveyer belts 18 run over pulleys 19 at one end of the frame, the pulleys 19 being carried by the shaft 20 and the pulleys 21 at the opposite end of the frame, the pulleys 21 being carried by a shaft 22. The shafts 20 and 22 are mounted in suitable bearings on the frame. A ratchet wheel 23 is fixed on the shaft 20 and a rock arm 24 is journaled on the shaft 20 and carries a pawl 25 adapted to act on the ratchet wheel 23. A pitman 26 extends from one of the cranks 9 to the rock arm 24 and gives it an oscillatory movement, thus moving the belts 18 intermittently as the knife is actuated. The extent of the movement may be varied by an adjustment of the pitman 26 on the rock arm 24, a series of holes 27 being provided in the rock arm for this purpose.

Trays B are mounted on the belts 18 and are moved forward under the knife to receive the sliced material. These trays are moved forward a distance so as to bring the slices from one cut out of the register with the slices of a succeeding cut so that the slices are evenly spread over the trays to facilitate drying. These trays are placed upon the belts successively by the operator and taken from the belts as they are fed forward and then carried through the drying process.

The drive shaft 17 is driven from a drive pulley 28. This may be connected and disconnected from the drive shaft by a clutch 29 and the clutch may be thrown into and out of action by the operating levers and handles 30 and 30ª. The mechanism so far described is not of itself my invention.

I have provided a mechanism for holding and feeding the material to the knives. This is as follows: An endless belt, prefer-

ably in the form of a chain 31 is carried by the sprockets 32 and 33. The sprocket 32 is mounted on the shaft 34 and this shaft is mounted in bearings 35ª on the posts 35 extending from the frame. A beveled gear 36 is mounted on the shaft 34 and meshes a gear 37 on an upright shaft 38. The shaft 38 is mounted in bearings 39. A gear 40 is fixed on the shaft 38 and meshes a gear 41 on the drive shaft 17. Thus it will be seen that the chain or belt 31 and the slicing knife are driven from a common drive shaft and consequently their speed is related. The sprocket 33 is mounted on the shaft 42. The shaft 42 is carried by the uprights 43ª extending from the auxiliary frame 43. The chain 31 is made up of the links 44. These have the small perforated platforms 45. Wood blocks 46 are secured to the platforms 45 and pins 47 extend outwardly from the platforms 46. The platforms 45 are longer than the platforms 46 forming guide extensions 45ª. The pins 47 are preferably of wood because they are not susceptible to action by fruit acids.

The fruit A, which as shown, are apples have been cored and placed over the pins 47 on the top reach of the belt or chain and are carried forward as the chain is rotated. A guide 48 in the form of a plate extends around the sprocket 32 being spaced therefrom so as to clear the fruit carried by the pins 47. The guide terminates below the sprocket on a level with the knife 4. The fruit as it is inverted in its movement around the axis of the shaft 34 slides down on the pin into engagement with the guide 48 and moves from this onto the knife 4 or extension 7 of the knife, or the platform 8 depending on the position of the knife. The pins, however, are so timed with relation to the knife that a slice is made so as to be deposited adjacent to the side of the tray carried by the belts 18. As the fruit is carried forward along the knife, the knife reciprocates taking off successive slices, the fruit moving downwardly on the pins by gravity to the platform 8 with each backward movement of the knife. The thickness of the slices are such that the number of slices taken from one piece of fruit is sufficient to extend across the tray, each slice being out of register with the preceding slice. It will be seen, therefore, that the speed which the belt is given relatively to the reciprocation of the knife should be such as to advance the fruit the width of one slice with each reciprocation of the knife and that the total advance should be such as to complete the slicing of an individual piece of fruit as it reaches the end of the knife or the side of the tray. The progressive action on the fruit is clearly shown in Figs. 3 and 8. It will be understood that other means of holding other fruit may be supplied to the platforms 46 but the device is peculiarly advantageous with relation to devices holding the fruit in position with an opening because the fruit is then held so as to make the slices across this opening.

It will be readily seen that this device gives a continuous feeding action and that very little skill is required to place the fruit in position, all that is necessary being to place an individual piece of fruit on each platform as the feed chain advances.

It is often desirable to treat the fruit or material prior to or subsequent to the slicing. I have shown a device for treating the material prior to the slicing and for automatically transferring the same from said device to the feeding device of the slicer. A feed chain 50 similar in construction to the chain 31 is mounted on the sprockets 51 and 52. The sprocket 51 is mounted on a shaft 53 and the shaft 53 is carried by the post 43ª. A sprocket chain 54 conveys motion from the shaft 42 to the shaft 53 so that these shafts are timed to move together. Pins 50ª are arranged on the chain 50 and these are arranged to come into register or alinement with the pins 47 on the chain 31 at their adjacent points of travel over the sprockets 33 and 51. The sprocket 52 is mounted on the shaft 55 and this is mounted on the post 56. The post 56 extends upwardly from the frame 43, the outer end of this frame being supported by the legs 57.

The chain 50 in passing off the sprocket 52 passes over a guide wheel 58. The guide wheel 58 is carried by a shaft 59 and the shaft 59 is mounted in the brackets 60. The guide wheel 58 has the side flanges 58ª and the extensions 46 on the platforms 45 operate on these flanges so that the pins 50ª which extend toward the axis of this wheel are between these flanges. The chain also passes over the guide pulley 62 mounted on the shaft 63, the shaft being mounted in the sides of a tank 61. The chain then passes over a guide sprocket 64 mounted on a shaft 65 extending between the sides of the tank 61 and thence over a guide pulley 66 similar in form to the pulley 58 and mounted on the shaft 67 carried by the brackets 68 extending from the frame 43. A guide plate 69 extends along the chain through the pulleys 58 and 60 and forms a support for the fruit carried by the pins after said pins are inverted.

It will be noted that the fruit as it is carried through the tank is below the level of the liquid in the tank indicated at X so that the fruit as it is carried forward by the chain is subjected to any solution that may be desired, ordinarily a salt solution in the tank 61.

As the fruit approaches the end of the guide 69 the pin 47 on the chain 31 moves through the slot 71 in the end of the guide and enters the opening in the fruit. The

fruit moving off the end of the guide falls by gravity from the pin 50ª onto the pin 47 which has been brought into register with the pin 50ª.

Where this treating device is used, the operator places the fruit on the pins 50ª on the chain 50 and the fruit is transferred from this chain automatically as described to the chain 31 and then carried automatically through the slicing machine.

What I claim as new is:—

1. In a slicing machine, the combination of a knife; devices for feeding material along the cutting edge of the blade; and means for moving the blade and material into cutting relation a plurality of times during the traverse of the material along the cutting edge of the blade.

2. In a slicing machine, the combination of a knife; devices for feeding material along the cutting edge of the blade and at right angles to the blade; and means for moving the blade and material into cutting relation a plurality of times during the traverse of the material along the cutting edge of the blade.

3. In a slicing machine, the combination of a knife; devices for holding and feeding individual pieces of material along the cutting edge of the blade; and means for moving the blade and material into and out of cutting relation a plurality of times during the traverse of the material along the cutting edge of the blade.

4. In a slicing machine, the combination of a cutting device cutting by a movement of the cutting device; and mechanism for feeding material along the cutting device in a direction across the direction of movement of the cutting device, said mechanism and device being timed to make a plurality of movements of the cutting device during the traverse of material through the action of the mechanism along the cutting device.

5. In a slicing machine, the combination of a cutting device adapted to cut by a movement of the cutting device; and mechanism for feeding individual pieces of material into cutting relation with the cutting device by a movement along the cutting device and across the direction of movement of the cutting device, said mechanism and device being timed to make a plurality of movements of the cutting device during the traverse of material through the action of the mechanism along the cutting device.

6. In a slicing machine, the combination of a cutting device; and a feeding device, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction, the relative timing of said devices making a plurality of cuts with each cycle of the feeding device.

7. In a slicing machine, the combination of a cutting device; and a feeding device feeding individual pieces of material, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction, the relative timing of said devices making a plurality of cuts with each cycle of the feeding device.

8. In a slicing machine, the combination of a cutting device; and a feeding device adapted to cut material having openings therethrough, and holding the material by engaging with the walls of the openings, said devices cutting by relative movement of said devices in one direction and feeding by relative movement of said devices along each other in another direction.

9. In a slicing machine, the combination of a cutting device; and a rotary feeding device, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction, the relative timing of said devices making a plurality of cuts with each cycle of the feeding device.

10. In a slicing machine, the combination of a cutting device; and a feeding device comprising an endless belt by which the material is fed, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction, the relative timing of said devices making a plurality of cuts with each cycle of the feeding device.

11. In a slicing machine, the combination of a cutting device; and a rotary feeding device adapted to hold the material by engaging the walls of openings therein, said devices cutting by relative movement thereof in one direction and feeding by relative movement along each other in another direction.

12. In a slicing machine, the combination of a cutting device; and a feeding device comprising an endless belt having means thereon for engaging the walls of openings in the material to be sliced, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction.

13. In a slicing machine, the combination of a cutting device; and a rotary feeding device adapted to receive the material to be sliced and to invert the same in carrying it to slicing position to present the inverted face for slicing, said devices being timed relatively to each other to make a plurality of cuts on the inverted face of the material with each cycle of the feeding device.

14. In a slicing machine, the combination of a cutting device; and a rotary feeding device adapted to receive the material to be

sliced and to invert the same in carrying it to slicing position, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction.

15. In a slicing machine, the combination of a cutting device; and a feeding device adapted to hold the material to be sliced by engaging openings in said material, said feeding device inverting the material to be sliced in carrying the material to slicing position.

16. In a slicing machine, the combination of a cutting device; and a feeding device adapted to hold the material to be sliced by engaging openings in said material, said feeding device inverting the material to be sliced in carrying the material to slicing position, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction.

17. In a slicing machine, the combination of a cutting device; a rotary feeding device having a horizontal axis adapted to receive the material on its upper surface; and a guide spaced from the feeding device and adapted to retain the material with relation there to as it is inverted, said feeding device and guide holding the material against turning with relation to the feeding device as the material is inverted and said devices being timed relatively to each other to make a plurality of cuts on the inverted material with each cycle of the feeding device.

18. In a slicing machine, the combination of a cutting device; a rotary feeding device having a horizontal axis adapted to receive the material on its upper surface; and a guide spaced from the feeding device and adapted to retain the material with relation thereto as it is inverted, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction.

19. In a slicing machine, the combination of a cutting device; a rotary feeding device having a horizontal axis comprising an endless belt adapted to receive the material on its upper surface; and a guide spaced from the feeding device and adapted to retain the material with relation thereto as it is inverted, said feeding device and guide holding the material against turning with relation to the feeding device as the material is inverted and said devices being timed relatively to each other to make a plurality of cuts on the inverted material with each cycle of the feeding device.

20. In a slicing machine, the combination of a cutting device; a rotary feeding device having a horizontal axis comprising an endless belt adapted to receive the material on its upper surface; and a guide spaced from the feeding device and adapted to retain the material with relation thereto as it is inverted, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction.

21. In a slicing machine, the combination of a cutting device; a rotary feeding device having a horizontal axis and comprising means for holding the material by engagement with the walls of openings through the material; and a guide spaced from the feeding device adapted to hold the material in relation thereto when inverted.

22. In a slicing machine, the combination of a cutting device; a rotary feeding device having a horizontal axis and comprising means for holding the material by engagement with the walls of openings through the material; and a guide spaced from the feeding device adapted to hold the material in relation thereto when inverted, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction.

23. In a slicing machine, the combination of a cutting device; and a rotary feeding device having a continuous movement, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction, the feeding movement being timed with relation to the cutting movement to deposit the slices cut out of register.

24. In a slicing machine, the combination of a cutting device; and a rotary feeding device comprising an endless belt having a continuous movement, said devices cutting by relative movement thereof in one direction and feeding by relative movement of said devices along each other in another direction, the feeding movement being timed with relation to the cutting movement to deposit the slices cut out of register.

25. In a slicing machine, the combination of a cutting device having reciprocating movement; and a feeding device feeding along and across the cutting device in the plane of movement of the cutting device, said devices being timed relatively to each other to make a plurality of cuts with each cycle of the feeding device.

26. In a slicing machine, the combination of a cutting device having reciprocating movement; and a rotary feeding device feeding along and across the cutting device in the plane of movement of the cutting device, said devices being timed relatively to each other to make a plurality of cuts with each cycle of the feeding device.

27. In a slicing machine, the combination of a cutting device having reciprocating movement; and a rotary feeding device comprising an endless belt feeding along and across the cutting device in the plane of movement of the cutting device, said devices being timed relatively to each other to make a plurality of cuts with each cycle of the feeding device.

28. In a slicing machine, the combination of a cutting device having reciprocating movement; and feeding device holding the material to be fed by engagement with the walls of openings therethrough, said feeding device moving along and across the cutting device.

29. In a slicing machine, the combination of a reciprocating cutting device; and a continuously moving feeding device adapted to carry the material along and across the cutting device, said feeding device being timed with relation to the reciprocations of the cutting device to deposit the material cut out of register.

30. In a slicing machine, the combination of a cutting device having reciprocating movement; a rotary feeding device having a horizontal axis adapted to receive the material on its upper surface; and a guide spaced with relation to the feeding device to retain it as the material is inverted, said feeding device carrying the material along and across the cutting device.

31. In a slicing machine, the combination of a knife; a platform spaced with relation thereto to maintain material as it is cut by the knife; a feeding device in the form of an endless belt; pins arranged on the belt; pulleys carrying the belt; and a guide spaced from the belt to maintain the material in position with relation to the guide when inverted, said belt being positioned to travel along the cutting edge of the knife.

32. In a slicing machine, the combination of a cutting device; and a feeding device, said devices cutting by relative movement thereof and feeding by relative movement of said devices along each other in another direction, said feeding devices permitting a movement at right angles to the cutting device to successively advance the material to cut successive slices therefrom.

33. In a slicing machine, the combination of a cutting device; and a rotary feeding device, said devices cutting by relative movement thereof and feeding by relative movement of said devices along each other in another direction, said feeding device permitting a movement at right angles to the cutting device to successively advance the material for cutting successive slices therefrom.

34. In a slicing machine, the combination of a cutting device; and a rotary feeding device for holding the material by engagement with openings therethrough, said devices cutting by relative movement thereof and feeding by relative movement of said devices along each other in another direction, said feeding devices permitting a movement at right angles to the cutting device to successively advance the material for cutting successive slices therefrom.

35. In a slicing machine, the combination of a cutting device; a feeding device feeding individual pieces of material to the cutting device, said feeding device holding the material by engagement with the walls of openings therethrough; means acting with said feeding device for subjecting the material to the action of a liquid; and automatically acting mechanism for transferring the material between said means and devices.

36. In a slicing machine, the combination of a cutting device; a rotary feeding device having a series of pins for engaging material having openings therethrough, said feeding device being adapted to carry the material into cutting position with the cutting device; and means for subjecting the material to the action of a liquid, said means having pins for engaging the walls of openings through the material, said means and feeding device being adapted to bring the pins into alinement for the transfer of material from one to the other.

37. In a slicing machine, the combination of a cutting device; a feeding device comprising an endless chain having pins thereon adapted to engage the walls of openings in the material and to feed the material into cutting relation to the cutting device; and means for subjecting the material to the action of a liquid comprising an endless belt having pins thereon, said means and feeding device being timed and adapted to bring the pins of one into alinement with the other to effect the transfer of the material from one to the other.

38. In a slicing machine, the combination of a cutting device; a feeding device for feeding material thereto; means for subjecting the material to the action of a liquid comprising an endless belt having means thereon for engaging material to be sliced; a guide spaced from the belt adapted to hold the material in relation thereto when the material is inverted through the movement of the belt; and a receptacle through which the belt travels.

39. In a slicing machine, the combination of a reciprocating cutter; a feeding device comprising an endless belt having pins thereon adapted to receive the material at the top; a guide for retaining the material on the pins as the material is inverted by the movement of the belt, said belt extending along the cutting edge of the reciprocating

cutting device; means for subjecting the material to the action of a liquid comprising an endless belt having pins thereon adapted to be brought successively into alinement with the pins of the feeding device to effect the transfer of the material from one to the other; a receptacle; and mechanism for guiding the belt of said means through said receptacle, said mechanism comprising a guide spaced from the belt adapted to retain the material thereon in its passage through the receptacle.

In testimony whereof I have hereunto set my hand.

HERBERT G. MILLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."