United States Patent [19]

Cohen et al.

[11] **3,924,501**

[45] **Dec. 9, 1975**

[54] **CUTTING APPARATUS**

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[73] Assignee: **Model Builders, Inc.,** Chicago, Ill.

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[21] Appl. No.: **466,957**

[52] **U.S. Cl.** **83/404.3;** 83/437; 83/407; 83/662

[51] **Int. Cl.²** **B26D 1/02;** B26D 4/18

[58] **Field of Search** 83/437, 407, 662, 431, 83/467, 425, 425.3, 425.2, 651.1, 404, 404.1, 404.3

[56] **References Cited**

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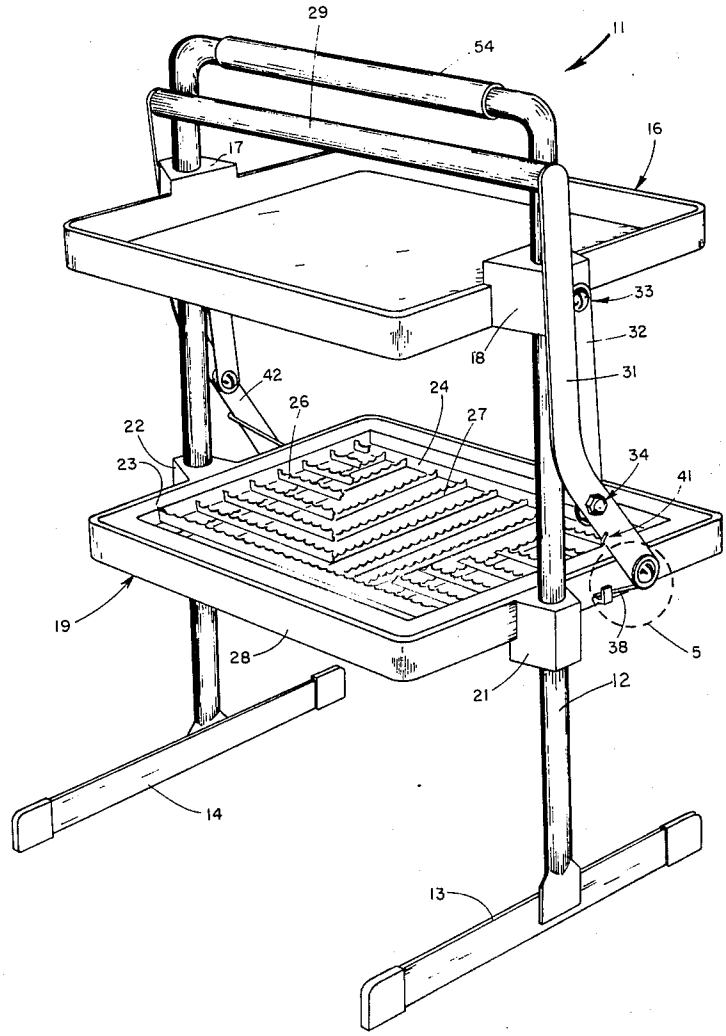
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Primary Examiner—Donald R. Schran
Attorney, Agent, or Firm—Woodard, Weikart, Emhardt & Naughton

[57] **ABSTRACT**

A cutting apparatus for slicing and dicing produce, most particularly lettuce. Two blade frames, each including a plurality of serrated blades, are maintained in a horizontal position by a blade frame holder which is rigidly attached to a main frame. A horizontal pusher head is slidably attached to the main frame above the blade frame holder and is operable to be moved between a position distant from the blades and a position adjacent the blades. A handle mechanism is pivotally attached to the blade frame holder and, through a linkage bar, to the pusher head, so that rotation of the handle in a downward arc relative to the frame moves the pusher head in a vertical direction toward the blades. The blades in one of the two blade frames may be oriented parallel or perpendicular to the blades in the other blade frame to provide for either slicing or dicing of the lettuce.

13 Claims, 7 Drawing Figures



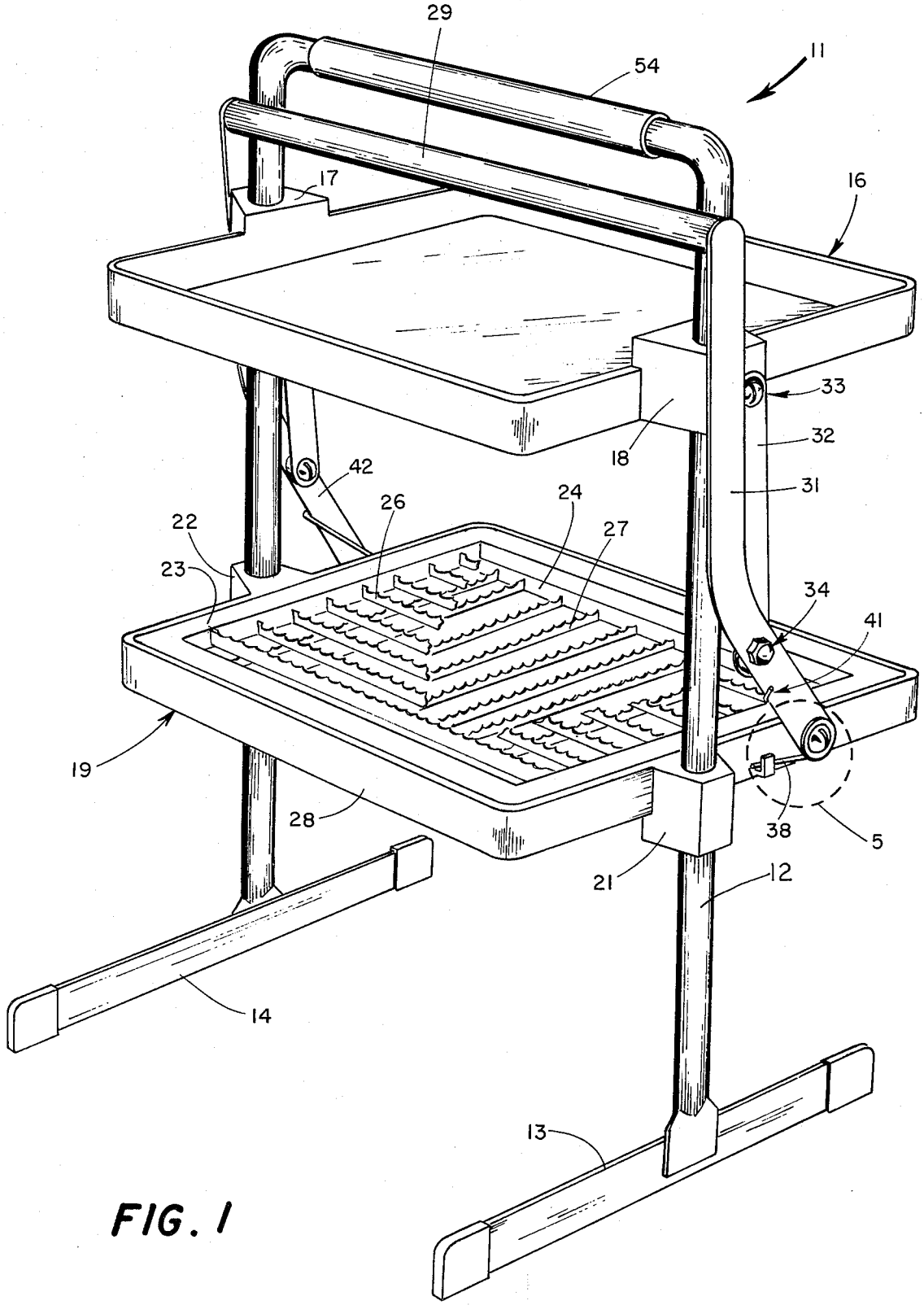


FIG. 1

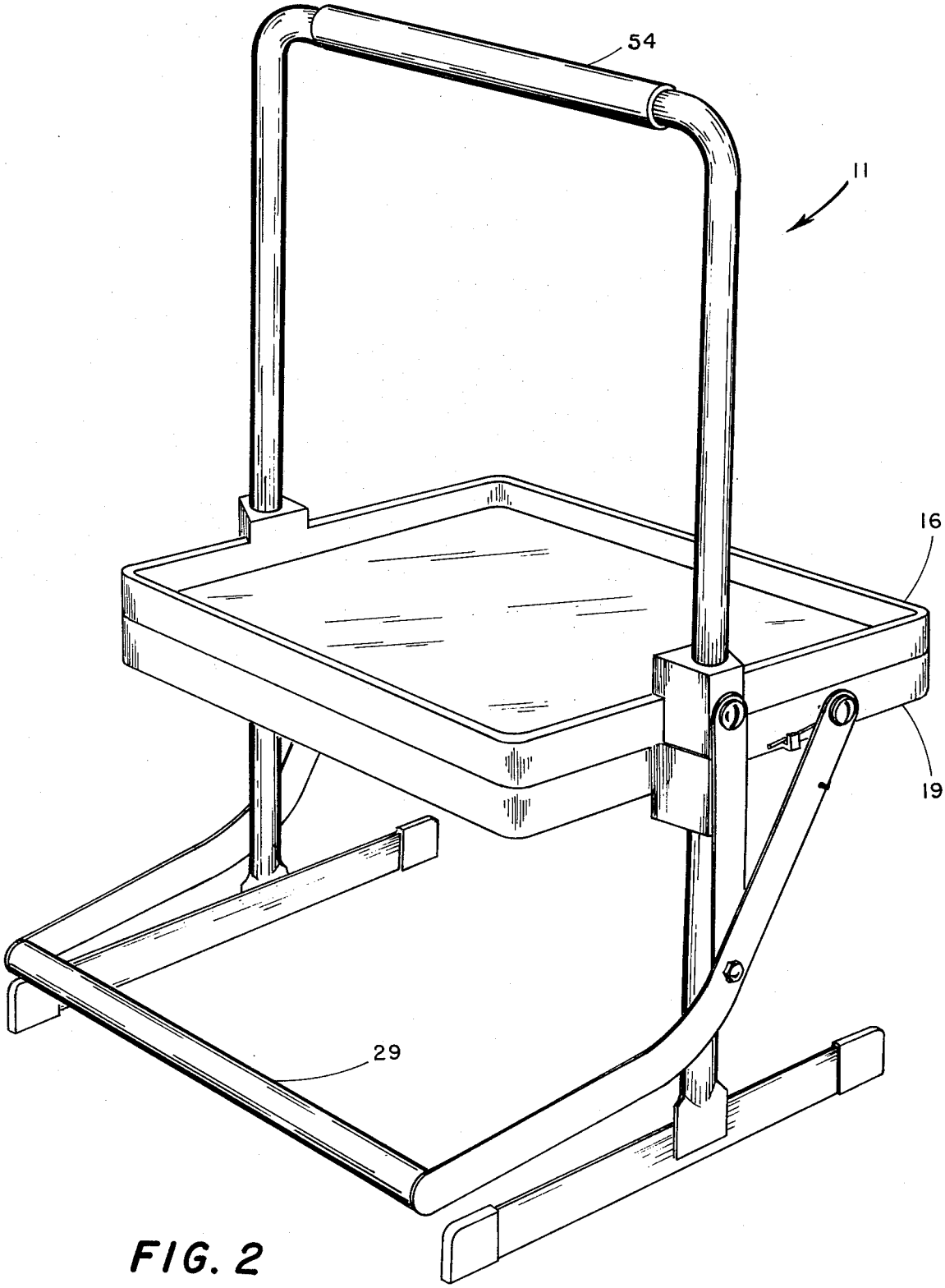


FIG. 2

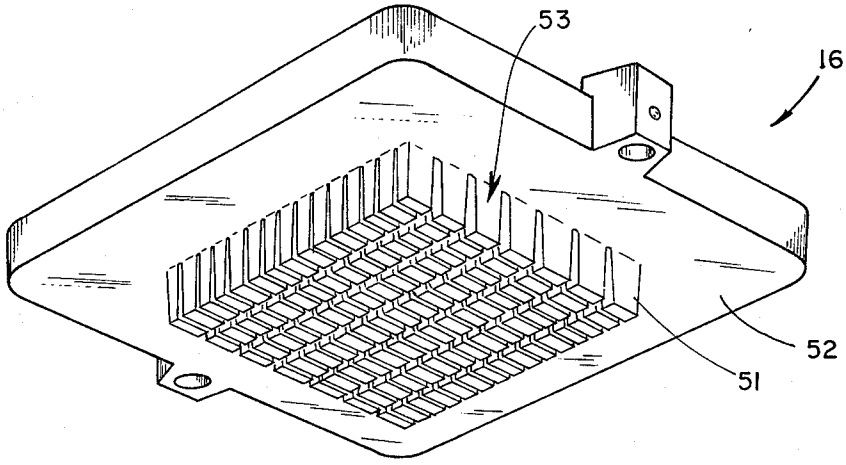


FIG. 3

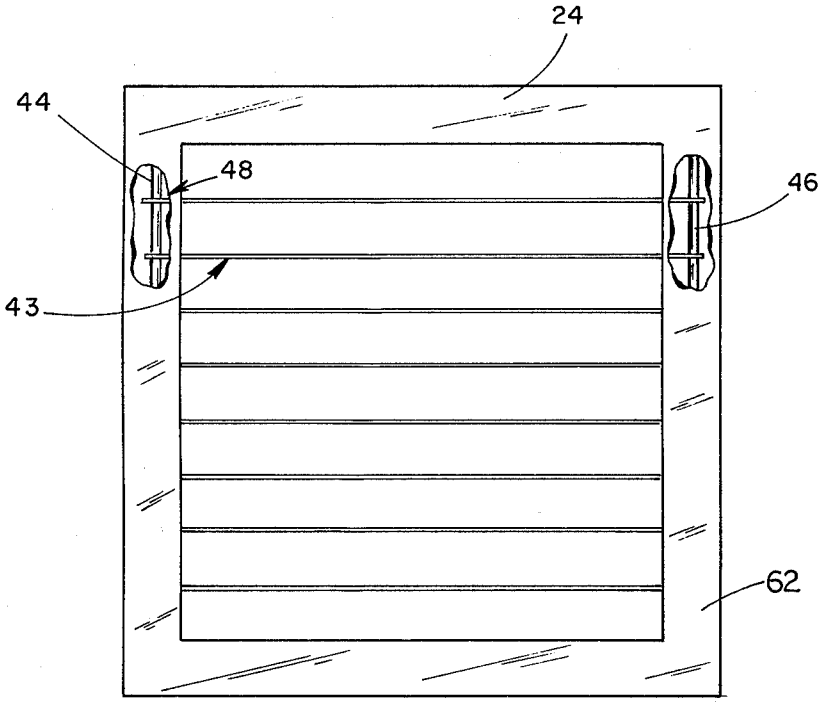


FIG. 4

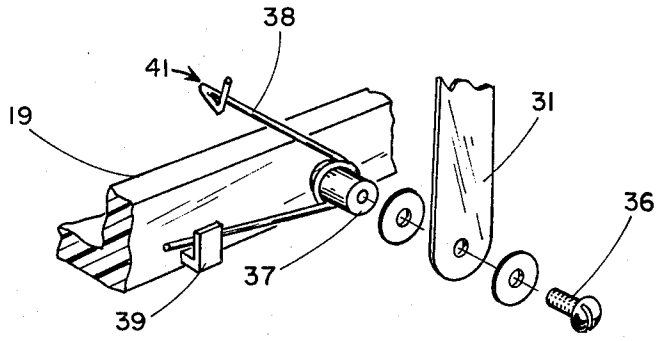


FIG. 5

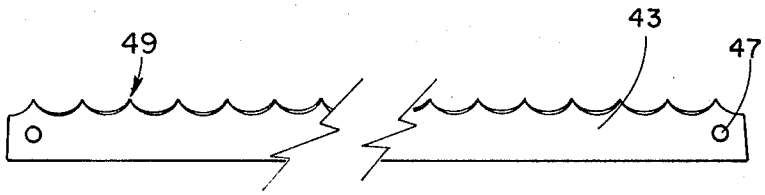


FIG. 6

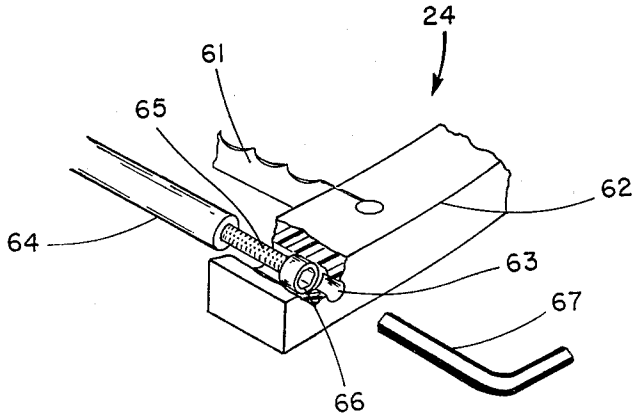


FIG. 7

CUTTING APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention is in the field of means for treating food.

2. Description of the Prior Art

In the past, various cutting devices for vegetables and the like have been devised which utilize the principle of forcing the article to be sliced through a set of fixed blades. Such devices are disclosed in U.S. Pat. No. 893,591 to Larsen, U.S. Pat. No. 2,621,691 to Brualdi, and British Patent No. 534,320 to Hall. These devices disclose neither a lever-type handle nor tensioned serrated blade arrangement useful for effectively slicing and dicing lettuce or equivalent vegetables. U.S. Pat. No. 3,112,781 to Popeil shows a widely recognized device for slicing and dicing a variety of vegetables and other items, but the Popeil device lacks a sufficient blade structure and handle apparatus for providing the mechanical advantage for slicing and dicing lettuce. U.S. Pat. No. 2,153,407 to Bell shows a vegetable dicing, slicing and shredding machine which is sized and structured for heavier cutting, such as for lettuce, but requires the use of a foot pedal which prevents its use in a convenient manner such as on a table. Further, the Bell device also fails to show means for obtaining a mechanical advantage for the force exerted in the cutting operation as well as optimum blade structure for the cutting of produce such as lettuce.

There has been a need, in a variety of types of restaurants, for a convenient and efficient means of slicing and dicing heads of lettuce for salads and other uses. A satisfactory device of this type would enable a restaurant owner to avoid the dangers of spoilage, discoloration, etc. of precut lettuce without requiring the expenditure of a great deal of time to slice and/or dice heads of lettuce by hand at the restaurant itself.

SUMMARY OF THE INVENTION

In response to these needs and others, the present cutting apparatus has been provided according to the present invention. The apparatus may be sized to be operated on a work surface such as a table, if desired, and includes a frame and a blade assembly supported by the frame which includes a plurality of blades. The apparatus further includes a pusher head slidably attached to the frame which has a first position remote from the blade assembly and a second position adjacent the blade assembly, and also a handle pivotally coupled to both the pusher head and the blade assembly and this handle is operable to move the pusher head between its first and second positions in response to angular movement of the handle relative to the frame.

It is an object of the present invention to provide a cutting apparatus operable to easily slice a head of lettuce with the exertion of a relatively small amount of force in the rotation of a handle pivotally connected to the apparatus.

Further objects and advantages of the present invention shall be apparent from the following detailed description and accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an embodiment of the present invention in the opened position with a portion of the blades of the upper blade frame removed.

FIG. 2 is a perspective view of the embodiment of FIG. 1 in a closed position.

FIG. 3 is a perspective view of the pusher head of the embodiment of FIG. 1.

FIG. 4 is a top view of a blade frame of the embodiment of FIG. 1 with portions removed.

FIG. 5 is an exploded view of the hinge and spring apparatus shown at 5 in FIG. 1.

FIG. 6 is an enlarged side view of a blade from the embodiment of FIG. 1 with a portion removed.

FIG. 7 is an exploded view of a portion of an end of the blade frame of FIG. 4, including a tool for tensioning the blades in the blade frame.

DESCRIPTION OF THE PREFERRED EMBODIMENT

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the embodiment illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated device, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

Referring in particular to FIG. 1, there is shown a cutter apparatus 11 according to the present invention. Cutter apparatus 11 has a frame 12 which includes base portions 13 and 14. Slidably attached to frame 12 is pusher head 16. Pusher head 16 includes frame-receiving portions 17 and 18 at either side, each of which include an opening therethrough to allow pusher head 16 to move along the vertical tubes of frame 12.

Blade frame holder 19 is rigidly attached at portions 21 and 22 to the tubing of frame 12 using conventional means. Supported within blade frame holder 19 are blade frames 23 and 24, each blade frame including a plurality of parallel blades such as 26 and 27 respectively, as shall be described more particularly hereinafter. Blade frame holder 19 includes four side walls such as 28 for restraining lateral movement of blade frames 23 and 24 as well as a lower platform surface extending inward from the bottom of the walls such as 28 for a short distance sufficient to support the blade frames. The bottom platform of blade frame holder 19 may be keyed to receive notched blade frames to assure the proper blade frame orientations within holder 19.

Cutting apparatus 11 further includes handle 29 which has side arms such as 31 extending along the outside of each side of the blade frame holder and pusher head. Linkage bar 32 is pivotally attached to the pusher head 16 at point 33 and also pivotally attached to side arm 31 of handle 29 at point 34. The pivotal attachments are by conventional means such as bolts. Side arm 31 of handle 29 is also pivotally attached to the blade frame holder 19 as shown more particularly in FIG. 5. Referring to FIG. 5, side arm 31 is pivotally attached to shaft 37 by screw 36. Spring 38 is mounted on shaft 37, one end of spring 38 being retained by holding member 39 which is attached to blade frame holder 19. The other end of spring 38 engages arm 31 at point 41 as also shown in FIG. 1. As can be seen in FIG. 1, the movement of handle 29 in an arc downward will compress spring 38, and spring 38 is selected such that the spring force is sufficient to return handle 29 to its upright position from a lowered position. Arm 42 on

the side of apparatus **11** opposite from that of arm **31** has analogous pivotal and spring connections.

Blade frame **24** is shown in greater detail in FIG. **4**, it being understood that blade frame **23** is constructed in a similar fashion and therefore only blade frame **24** shall be discussed in detail. In FIG. **4**, a plurality of blades such as **43** are shown in parallel relationship extending from one side of blade frame **24** to the opposite side. Blade frame **24** is sealed or enclosed so that food particles will not have openings in which to accumulate. However, for illustrative purposes, portions of the surface of frame **24** have been shown removed to illustrate the construction therein. As shown, rods **44** and **46** are mounted in clearance slots in opposite sides of blade frame **24**. Blade **43** is shown in greater detail in FIG. **6**, and it can be seen that holes such as **47** are included in each end of the blade. Bars **44** and **46** are positioned within holes such as **47** in each end of the blades of the blade frame **24**. There are blade-thickness slots in the sides of blade frame **24**, such as in the area **48**, which restrain lateral movement of the blades.

FIG. **7** shows a section of end bar **62** of blade frame **24**. Rod **46**, engaging the hole in the end of blade **61**, is enclosed within end bar **62**. A side of frame **24**, within which rod **64** is fixed, is removed in FIG. **7**, exposing rod **64**, whose end is tapped to receive Allen head cap screw **65**. Head portion **66** of screw **65** is retained in a cavity within end **62** but is free to rotate. When all the blades in frame **24** have been engaged at each end by rods **44** and **46**, which are mounted within the end bars of frame **24**, head **66** of screw **65** is positioned in its cavity in bar **62** with a portion of the threads of screw **65** already received within rod **64**. Another Allen head cap screw is similarly engaged and positioned on the other end of bar **62**.

End bar **62**, and the opposite end bar, are preformed in a curved configuration with the concave sides facing one another. The curvature of end bar **62** is shown somewhat exaggerated in FIG. **7** for illustrative purposes. After the blades and Allen head cap screws have been positioned as described above, tool **67** is used to rotate the screws, such as **65**, so as to move head portion **66** away from the rods such as **64**. Since head portion **66** is retained in a cavity in bar **62**, its movement away from rod **64** tends to move and straighten rod **62**, tensioning the blades. Because rod **62**, and the opposite end rod, are originally curved, and pressure is being applied to their ends, a uniform tension is achieved for all of the blades when the end bars, such as **62**, are straightened. As mentioned, once the blades are properly tensioned in the blade frame, the frame is sealed to cover areas of potential food-accumulation. The originally-curved end bars, such as **62**, are chosen of an aluminum material such that the tension developed in straightening them does not exceed the elastic limit of the prestressed curvature, thereby making them reusable, if desired.

In blade frames **23** and **24**, the blades are spaced one inch apart. However, the blades in blade frame **24** are offset one-half inch from the blades of blade frame **23** when the two blade frames are superimposed. Upper blade frame **23** may be oriented with its blades parallel to those of blade frame **24** or, with a 90° rotation of frame **23**, the blades of frame **23** may be oriented perpendicular to those of blade frame **24**. In this fashion, the apparatus **11** is operable to produce either one-inch square diced portions of lettuce or one-half inch slices.

Returning again to FIG. **6**, it should also be noted that blades such as **43** include a serrated edge having teeth **49**. These sharp points such as **49** on each blade enable the blades to puncture the head of lettuce easily when the lettuce is forced into the blades by pusher head **16** and also provides a plurality of sloped cutting surfaces on each blade so that as the lettuce is being forced downward onto the blades, there is also some cutting action along the blade edges due to the slopes.

As shown in FIG. **3**, pusher head **16**, on its underside **52**, includes a plurality of projections such as **51**. The projections are tapered as shown but essentially are sized at a two to one ratio to fit between the blades of blade frames **23** and **24** with the half inch spacing available when all of the blades are parallel. When the cutting apparatus is operated with the blade frames oriented so that the blades of each blade frame are perpendicular to those of the other blade frame, the wider side such as **53** of each of the projections is sized for the one inch spacing between the blades of upper blade frame **23**. The projections in underside **52** of pusher head **16** are provided to effect pushing of the entire head of lettuce through the blades to avoid remnants of lettuce remaining between the blades after a slicing or dicing operation.

In performing a cutting operation, the pusher head **16** and handle **29** are moved from the positions shown in FIG. **1** to those of FIG. **2**. To dice a head of lettuce, the blade frames **23** and **24** are arranged with the blades of the respective blade frames in perpendicular relationship as shown in FIG. **1**. A head of lettuce is placed generally in the central area of the blades of the top blade frame **23**. The operator of cutting apparatus **11** grips the top of frame **12** around handle **54** with one hand, and with the other hand, grips handle **29**. With the apparatus in the position shown in FIG. **1**, and with a head of lettuce resting toward the central area of the blade frames, the operator then pulls handle **29** downward and around blade frame holder **19** in an arc to the final position as shown in FIG. **2**. The lever action of handle **29** provides the operator with a mechanical advantage in applying force to pusher head **16** since the operator moves handle **29** over a wide arc in order to effect the shorter distance of movement of pusher head **16** from its position in FIG. **1** to that of FIG. **2**.

In addition, linkage bar **32** cooperates with guide portions **17** and **18** of pusher head **16** to maintain the downward force on pusher head **16** essentially level and even since the downward force is applied along the vertical guide tubes of frame **12**. As pusher head **16** is forced downward adjacent blade frame holder **19**, the head of lettuce is easily forced through the openings between the blades of blade frames **23** and **24**, with the final portions of lettuce being forced from between the blades by the projections **51** on the underside of pusher head **16**. The diced lettuce may be conveniently caught in a container placed beneath the apparatus for that purpose.

The portions of diced lettuce obtained from the operation described above are in one inch by one inch sections, and if the blades of both blade frames are oriented in parallel with one another, there are provided half inch slices of lettuce, due to the half-inch offset of the blades described above. From the position shown in FIG. **2**, handle **29** is returned to its upright position as shown in FIG. **1** when the handle is released by the operator due to the force exerted by springs **38** as described above. The movement of handle **29** upward of

course returns pusher head **16** to its raised position due to the force coupled through linkage bars **32.** A catch or other locking means may be provided to retain handle **29** in its lowered position if desired when the apparatus is not in use.

While there have been described above the principles of this invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation in the scope of the invention.

The invention claimed is:

1. A cutting apparatus comprising:

a frame;

a blade assembly supported by the frame including a plurality of blades;

a pusher head slidably attached to the frame having a first position remote from the blade assembly and a second position adjacent the blade assembly, each blade of the plurality of blades having a serrated edge directed toward the pusher head;

a handle pivotally coupled to both the pusher head and the blade assembly and operable to move the pusher head between its first and second positions in response to angular movement of the handle relative to the frame;

the blade assembly including a blade frame holder rigidly attached to the frame and a first blade frame supported within the holder and including a plurality of blades;

the first blade frame including,

1. first and second originally-curved bars each including a longitudinal clearance slot and a plurality of blade thickness slots essentially perpendicular to their associated clearance slot, the bars being oriented such that the originally-concave sides are facing one another,

2. first and second retaining rods positioned within the clearance slot of the first and second bars respectively, each blade of the plurality of blades having a hole at each end which is engaged by one of the retaining rods within one of the bars, and

3. means for maintaining the first and second bars in an essentially straight configuration and for maintaining tension on the plurality of blades.

2. The apparatus of claim **1** in which the means for maintaining the first and second bars comprises:

a rigid member attached at a first end to the first bar and including at a second end an opening;

a screw having a threaded portion received in threaded engagement within the opening at the second end of the rigid member and having a head portion retained within the second bar so as to prevent linear movement of the head portion relative to the second bar whereby rotation of the screw effects variation of the distance between the first and second bars.

3. The apparatus of claim **1** in which the blade assembly further comprises a second blade frame supported within the blade frame holder which includes a plurality of blades, the second blade frame comprising:

first and second originally-curved bars each including a longitudinal clearance slot and a plurality of blade thickness slots essentially perpendicular to their associated clearance slot, the bars being oriented such that the originally-concave sides are facing one another;

first and second retaining rods positioned within the clearance slot of the first and second bars respectively, each blade of the plurality of blades having a hole at each end which is engaged by one of the retaining rods within one of the bars; and

means for maintaining the first and second bars in an essentially straight configuration and for maintaining tension on the plurality of blades.

4. The apparatus of claim **3** in which each blade of the plurality of blades in each blade frame has a serrated edge directed toward the pusher head.

5. The apparatus of claim **4** in which the blade frame holder and pusher head are each oriented in an essentially horizontal plane and the movement of the pusher head is in an essentially vertical direction.

6. The apparatus of claim **5** in which the handle is operable to move in a forward arc around the pusher head and blade frame holder, the handle being pivotally attached at a first point to the rear portion of the blade frame holder, and pivotally coupled to the pusher head.

7. The apparatus of claim **6** which further comprises a linkage bar pivotally attached at a first end portion to the center of the pusher head and pivotally attached at the second end portion to the handle, whereby rotation of the handle relative to the frame exerts a lever-aided force upon the center of the pusher head through the linkage bar.

8. The apparatus of claim **7** in which the handle has essentially similar pivotal connections and linkage bars on opposite sides of the pusher head and blade frame holder.

9. The apparatus of claim **8** in which the blade of the first blade frame are essentially parallel to one another and are spaced apart at one inch intervals.

10. The apparatus of claim **9** in which the blades in the second blade frame are essentially parallel to one another, are spaced apart at one inch intervals, and are offset one-half inch from the blades in the first blade frame when the second blade frame is superimposed upon the first blade frame.

11. The apparatus of claim **10** in which the second blade frame may be oriented within the blade frame holder such that the blades of the second blade frame are either perpendicular or parallel to the blades of the first blade frame.

12. The apparatus of claim **11** in which the pusher head includes a plurality of projections extending from the face of the pusher head nearest the blade frames, the projections being sized to extend between the blades of the blade frames when the pusher head is in its second position adjacent the blade assembly.

13. An apparatus for cutting lettuce and similar produce comprising:

a frame having a base portion, a pair of essentially vertical guide posts, and an essentially horizontal platform above the base and between the guide posts;

a blade assembly including a blade frame, received on the platform, and a plurality of blades mounted within the blade frame, the blades having serrated edges directed generally upwardly for puncturing produce forced against the blades;

a pusher head, slidably mounted on the guide posts of said frame above the platform, operable to be positioned adjacent said blade assembly or remote from said blade assembly;

biasing means for yieldably maintaining said pusher head remote from said blade assembly;

a handle member having a handle rod extending transverse to the guide posts and first and second side arms each extending from an opposite end of the handle rod and each being pivotally attached to the platform of said frame near a different one of the guide posts; and

first and second linkage bars each pivotally attached at a first end to said pusher head and at a second end to the first and second side arms respectively.

* * * * *