May 12, 1942. S. BAKEWELL 2,283,030

VEGETABLE SLICER

Filed Aug. 26, 1940 2 Sheets-Sheet 1

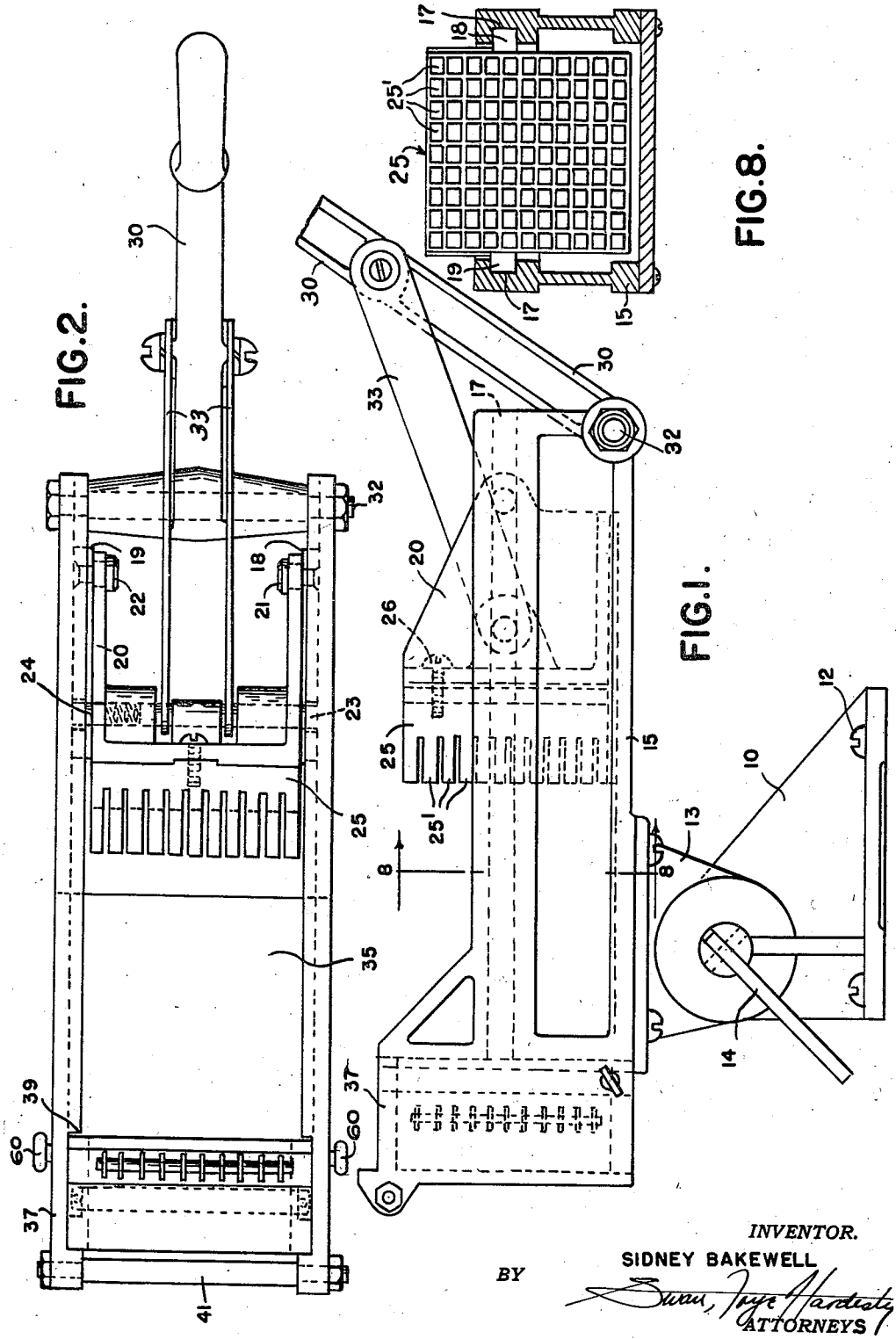


FIG. 2.

FIG. 1.

FIG. 8.

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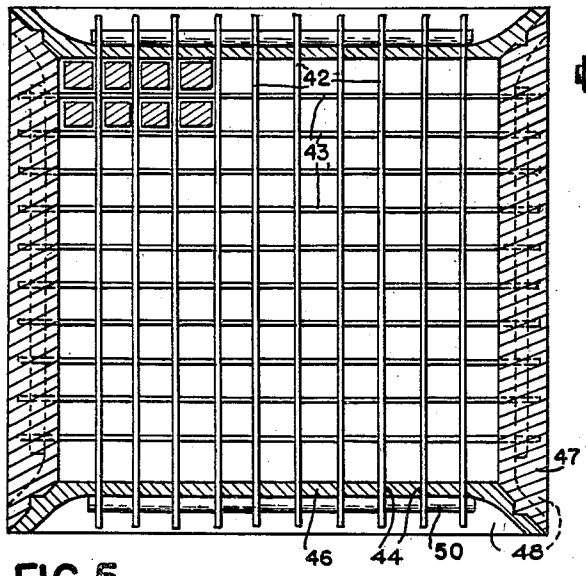
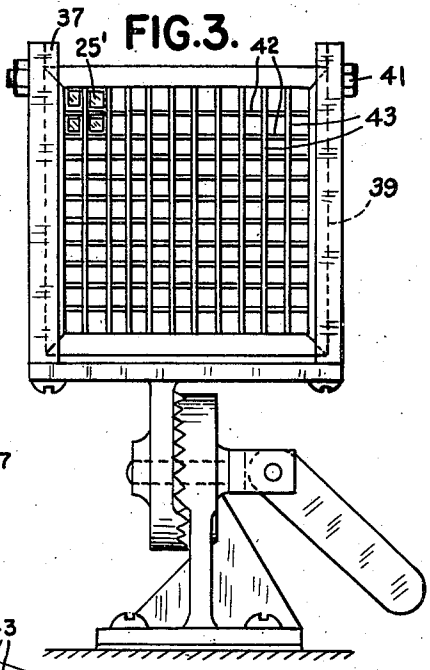


FIG.5.

FIG.3.



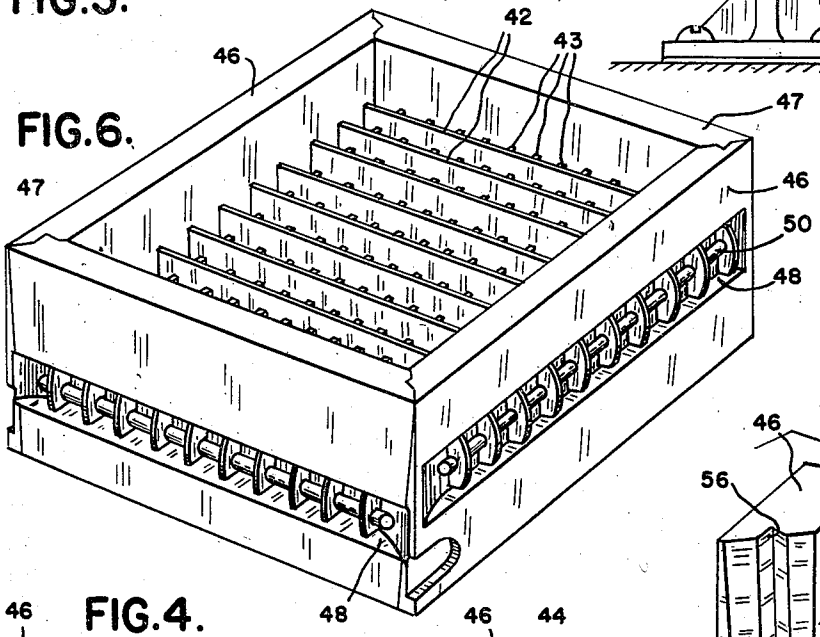


FIG.6.

FIG.4.

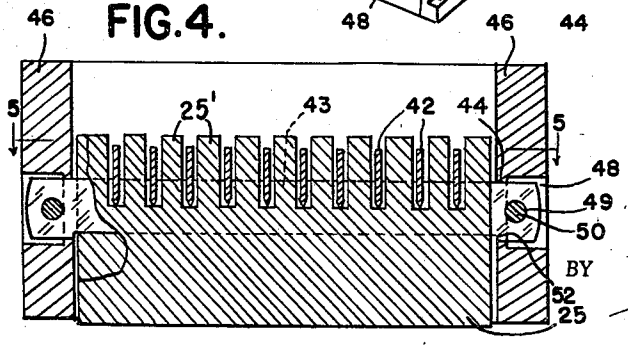
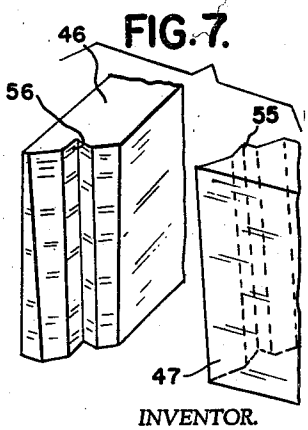


FIG.7.



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2,283,030

VEGETABLE SLICER

Sidney Bakewell, Detroit, Mich.

Application August 26, 1940, Serial No. 354,169

10 Claims. (Cl. 146—169)

This invention relates to cutting devices, particularly for foodstuffs, such as potatoes and other vegetables, and aims to provide improved apparatus for cutting such material into relatively small sections, of the sort required in the preparation of French fried potatoes, etc.

Such machines are used under circumstances which require maximum speed in the slicing of the potatoes or other vegetables. In large hotels and the like they are usually operated by unskilled labor, and are frequently subjected to rough handling. They must therefore be built to withstand considerable abuse. The knives must be thin, since otherwise too great effort would be required to operate the machine. It has been virtually impossible, however, to make the knives of such a machine both thin enough to work easily and strong enough to stand the severe stresses to which they are subjected. Potatoes, which are usually cut with the machine, are of relatively firm texture, so that if they are jammed through the blades too roughly, or are so placed in the machine as to tend to turn, and so to exert a twist or side thrust when pushed into the blades, breakage of the blades has frequently been caused, and has, in fact, come to be regarded as unavoidable with any ordinary or known means of supporting the blades.

With the foregoing considerations in mind, the present invention aims to provide improved knife supporting means for a machine of the character indicated, adapted to carry the knives in a novel manner which provides interlocked, self-bracing engagement between the several knives, and, in addition, exerts substantial tension upon the knives, thereby materially increasing their stiffness and their resistance to lateral deflection and breakage.

Still another important object lies in the provision of an improved knife assembly incorporated in a block-like supporting frame, carrying all of the knives and adapted to be inserted in and removed from the machine as a unit, and which is so arranged as to protect the knives against breakage and the operator against injury.

An object related to that last set forth is the provision of an improved knife block assembly which may be quickly and easily disassembled at will, and which automatically releases the tension upon the knives during disassembly, and automatically reapplies the correct tension during reassembly.

Still another object is to provide such a knife block assembly in which the fastening means by which the several knives are held in their supporting means is readily accessible, to permit convenient removal and replacement of individual knives at will, in which the fastening means lies within the periphery of the frame, and wherein the ends of the knives are fully protected against accidental breakage by engagement with other parts of the machine during insertion and removal of the knife block assembly.

A further object is to provide such a machine having mating knife block and ram assemblies, formed in pairs, different ones of which may be conveniently inserted in and removed from the machine to change the characteristics of the latter.

Other objects and advantages will be apparent from the following description, wherein reference is made to the accompanying drawings illustrating preferred embodiments of my invention and wherein similar reference numerals designate similar parts throughout the several views.

In the drawings:

Figure 1 is a side elevational view of an improved slicing machine, particularly for cutting potatoes, constructed in accordance with the present invention, the operating handle being partly broken away.

Figure 2 is a plan view of the machine.

Figure 3 is an end view thereof taken as indicated on the line and arrows 3—3 of Figure 1.

Figure 4 is a cross sectional view of the ram and knife block portions, showing the same in interengaged relation.

Figure 5 is a sectional view taken substantially on the line 5—5 of Figure 4 and looking in the direction of the arrows, only a part of the ram being shown.

Figure 6 is a perspective view of the knife block assembly,

Figure 7 is a fragmentary detailed perspective on a larger scale of the meeting edges of two of the knife block frame sections.

Fig. 8 is a cross section taken substantially on the line 8—8 of Fig. 1 and looking in the direction of the arrows.

The present application is a continuation in part of my previously filed copending application Serial No. 234,531, filed October 12, 1938.

Referring now to the drawings: reference character 10 designates a supporting base, which is adapted to be secured to a table or other support, as by means of screws 12. The frame 15 is attached to the base by means of a swingable bracket 13 which is adapted to be held in any desired relation with respect to the base by clamping means generally designated 14.

The frame is in the form of a heavy channel, having upwardly and longitudinally extending side webs, in the inner faces of which are formed slideways, 17, adapted to receive sliding guides 18, 19. The guides consist of metal plates to which a reciprocating pusher frame 20 is attached by means of shouldered rivets 21, 22, and pins 23, 24. The pins project from the ram or pusher frame laterally into the guide plates 18, 19 but are retractible therefrom to permit such frame to be swung upwardly, about the rivets 21, 22 to facilitate cleaning and replacement of the pusher block 25. The pusher block or ram proper, 25, is removably attached to the face of the frame 20 by means of one or more screws as 26, and is provided with a plurality of projecting portions 25', formed by slotting the same transversely, the slots being aligned with the knives of the cutter frame (presently to be described) so that the projecting portions 25' may extend between the knives. The pusher frame and block are actuated longitudinally of the frame 15 of the machine by means of a hand lever 30, pivoted in the frame, between the side webs thereof, upon a bolt 32. A link assembly 33 articulated at one end to the hand lever and at the other end to the pins 23, 24 serves to connect the ram to the hand lever.

At the opposite end of the main frame 15, a holder is provided for the cutter block assembly, which is so positioned, and provided with knives so located, that the ram 25 may be pushed toward it my means of the handle, to drive the individual pusher portions 25' through the spaces between the knives, and thus to force through the knives any food or other suitable material placed in the space 35 between the ram assembly and cutter assembly.

The upwardly projecting side web portions 37 which support the knife block assembly are cut out, as indicated at 39 to receive the latter, and the outer face of the block assembly is exposed open at the end of the machine, to permit the cut material to drop into a suitable receptacle (unshown) placed beneath this end of the device. A spacer bolt 41 braces the knife block supporting webs at this end of the assembly.

The cutter block assembly, best shown in Figures 3 to 7 inclusive, consist of a plurality of knives 42—43 arranged at right angles to each other and sharpened along their edges facing the ram. The front edges of knives 42 are notched at intervals conforming to the spacing of the knives 43, and the rear edges of knives 43 are similarly notched at intervals conforming to the spacing of the knives 42. The notched portions of the knives are partly interfitted, as shown in Figures 4 and 6, and so brace one another. The ends of the knives extend through appropriately spaced slots 44 in frame members 46, 47, which form the sides of the block. The frame members are preferably formed of heavy steel or other stiff material, and are provided along their outer faces with longitudinal channels 48, intersecting the slots 44. The knives are of such length that their ends lie in the channels 48, and are thus protected against breakage by accidental striking of the same. Apertures 49 are formed in the ends of the knives to receive retaining rods 50, which extend therethrough and lie in the slots 48, holding the knives firmly in place. The front or sharpened edges of the knives are somewhat cut back, as indicated at 52, to bring the cutting edge as near the line of tension between the retaining rods 50 as possible.

Interfitting tongue and groove portions, respectively designated 55, 56, are provided upon the abutting ends of the frame members 46, 47, which are mortised into one another. The ends of the frame elements are tapered, the front edges of elements 46 being longer than the rear edges, while the rear edges of frame elements 47 are longer than their front edges. Each pair of opposed frame elements may thus be assembled, with its knives extending therebetween, and the two complete assemblies, each consisting of a plurality of knives with a transverse frame element at each end, may be united to complete the assembly by first placing the same in transverse relation to each other, with the narrow ends of the frame elements adjacent one another but projecting in opposite directions, and simply sliding the two assemblies together until they appear as shown in Figure 6. The angularity of the ends of the frame elements is exaggerated in the drawings. It will be readily understood that this angularity is just sufficient to apply the requisite tension to the knives, which thus act to hold the frame elements together.

The knife block assembly is releasably held in the holding portion 37 by means of thumb screws 60, and it will readily be apparent that a plurality of knife block assemblies having different spaced knives, together with corresponding rams, may be provided, to enable slicing or dicing food stuffs to different sizes.

What I claim is:

1. A knife block assembly for slicing machine or the like, comprising two pairs of frame members adapted to be secured together with longitudinal ends abutting to form a hollow rectangular knife-supporting frame, each member of at least one of said pears having its said ends inclined with reference to the general plane of the frame, thereby forming wedges adapted to force apart said members abutting the ends of the same and so increase the size of the frame as said wedge members are forced between said ends of the abutting members from one side thereof, the frame members constituting each of said opposed pairs being provided with a plurality of oppositely aligned slots extending substantially perpendicularly therethrough but parallel to the plane of the rectangle, each of said frame members also having a longitudinal channel extending along its outer surface and intersecting said perpendicular slots, a plurality of knives extending through said slots in the frame members constituting each of said opposed pairs, the ends of said knives lying in said longitudinal channels and within the outer surface of said frame members, the knives carried by one pair of frame members being notched to receive, and interengaged with, those of the other, and holding means housed within said longitudinal channels and engaging the ends of the knives to retain the same and exert longitudinal stress thereupon.

2. A knife block assembly for a slicing machine, comprising a plurality of frame members having abutting longitudinal ends and securable together to form a hollow, knife-supporting frame, the opposite ends of at least two of said members being tapered in opposite directions transversely of the plane of the frame in those areas which engage the ends of abutting frame members, whereby said members form wedges, and whereby the size of the frame may be enlarged by forcing said members more tightly into engagement with the

abutting members from one side of said plane, said members being formed in opposed pairs which are forced apart in the plane of the frame when said plane is enlarged, knife members extending between and secured at their ends in said opposed pairs of frame members, whereby said knife members may be stressed longitudinally by inward movement of the wedge members, and keying portions holding the abutting ends of said members against disalignment.

3. A knife block assembly for a slicing machine, comprising a plurality of pairs of frame members having abutting longitudinal ends and securable together to form a hollow, knife-supporting frame, opposite ends of at least two of said frame members being tapered in opposite directions transversely of the plane of the frame, whereby they constitute wedges adapted to force the other members apart and so increase the size of the frame as said wedge members are pushed into position between abutting members from one side of said plane, a plurality of knife members extending between each of said opposed pairs of frame members and slidable therein but retained against sliding completely out of the same, whereby said frame members may move outwardly with relation to said knives as the frame is enlarged under the influence of said wedge members, to stress the knives longitudinally.

4. A knife block assembly for a slicing machine, comprising a plurality of pairs of frame members having abutting longitudinal ends and securable together to form a hollow knife-supporting frame, opposite ends of at least two of said frame members being tapered in opposite directions transversely of the plane of the frame, whereby they constitute wedges adapted to force the other members apart and so increase the size of the frame as said wedge members are pushed into position between their abutting members from one side of said plane, a plurality of knife members extending between and slidable in each of said opposed pairs of frame members, locking means preventing said knives from sliding completely out of said frame members and arranged to exert longitudinal stress upon the knives when said frame is enlarged as said wedge members are moved into place, said frame members being slidable inwardly along said knives when said wedge members are freed and said opposed pairs are separated from each other, said locking means being releasable when said frame members are so slid inwardly.

5. Means as set forth in claim 4 including slidable keying means extending along said tapered ends of the wedge members and slidably interengageable with the ends of the abutting members.

6. Means as set forth in claim 4 in which said longitudinal ends are also mitered, and keying means extending along said mitered ends transversely of the plane of the frame and adapted to prevent disalignment of said members in the plane of the frame.

7. In a knife block assembly for a food cutting machine or the like, a frame having four side portions formed of relatively stiff material and arranged with their longitudinal ends abutting to form a hollow rectangular frame, knives arranged in parallel rows and extending across said frame and secured in said side portions, two of said opposite side portions having ends inclined transversely of the plane of the frame, said side portions having the inclined ends being fitted at least partly between the ends of the other side portions and serving both as wedges and as side portions, said portions being movable transversely of the plane of the frame to change the wedging effect of said inclined ends.

8. In a knife block assembly for a food cutting machine or the like, a polygonal frame construction formed of sections arranged with their longitudinal ends abutting, including at least two frame sections movable toward and from one another in the plane of the frame to change the effective size of the frame, and at least two wedging sections arranged oppositely to one another and also forming part of said frame construction and having their longitudinal ends tapered transversely of the plane of the frame, said wedge sections being movable transversely of the plane of the frame to change their wedging effect, and knives stretched between and retained by said wedging sections and said movable frame sections.

9. In a knife block assembly for a food cutting machine or the like, a polygonal frame construction having sections abutting one another end-to-end, including at least two oppositely disposed frame sections movable toward and from one another in the plane of the frame to change the effective size of the frame, and at least two other oppositely disposed frame sections, also movable toward and from one another, said other frame sections also having their longitudinal ends inclined toward one another in a direction transverse with respect to the plane of the frame, to constitute wedges, said wedge sections being movable transversely of the plane of the frame, whereby their wedging effect upon the sections abutting the ends thereof may be varied, and knives stretched between and retained by each pair of said oppositely disposed frame sections.

10. A knife block assembly for a slicing machine or the like, comprising a plurality of pairs of frame members securable together in end-to-end relation to form a hollow, knife-supporting frame, at least two of said frame members having longitudinal ends tapered in opposite directions with respect to the general plane of the frame, whereby they may act as wedges upon longitudinally abutting members, adapted to force said members apart and so increase the size of the frame as said wedge members are pushed into position between the abutting members from a position to one side thereof, the frame members constituting each of said opposed pairs being provided with a plurality of oppositely aligned slots extending transversely therethrough from the inner to the outer surface, a plurality of knives, one extending through each of said aligned pairs of slots provided in said opposed frame members, each of said frame members also having a longitudinal channel extending along its outer surface and intersecting said slots and adapted to receive the ends of the knives, and a common holding element for retaining all of said knives against escaping from each of said frame members, said holding element being housed in said longitudinal channel.

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