

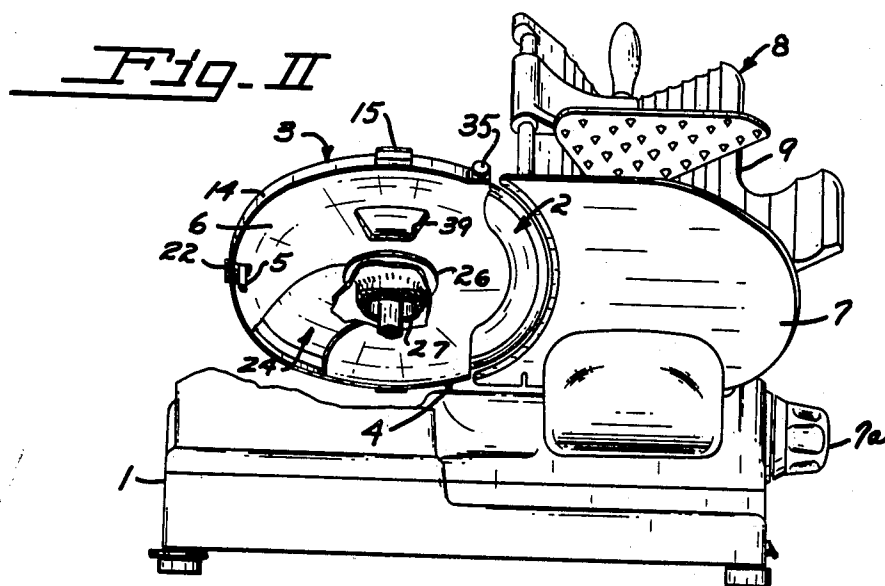
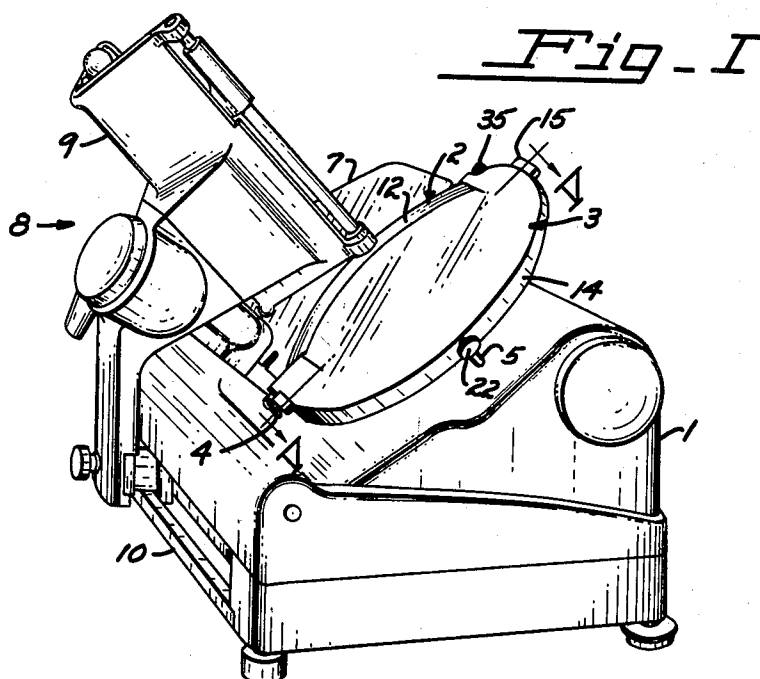
Dec. 27, 1955

J. D. BROWN
SLICER KNIFE GUARD

2,728,367

Original Filed March 28, 1952

4 Sheets-Sheet 1



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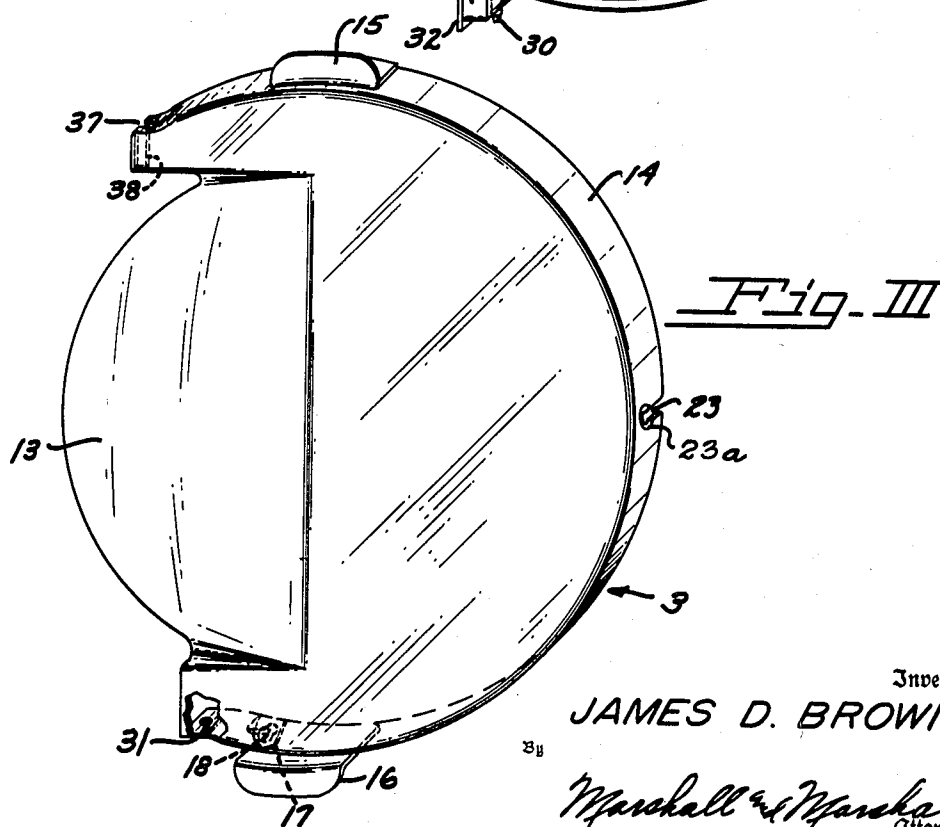
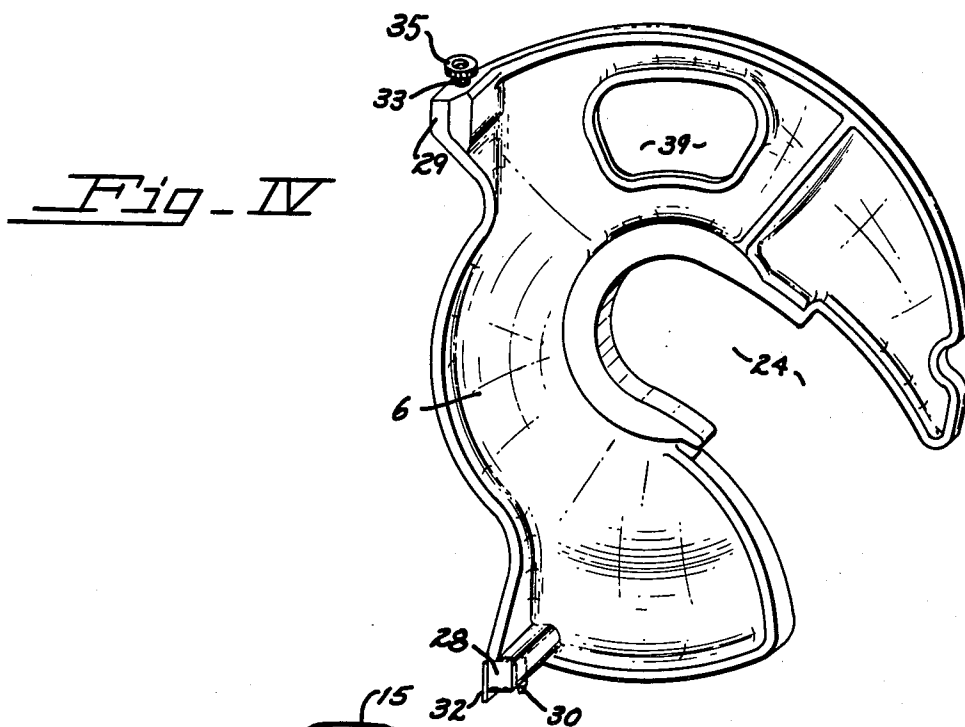
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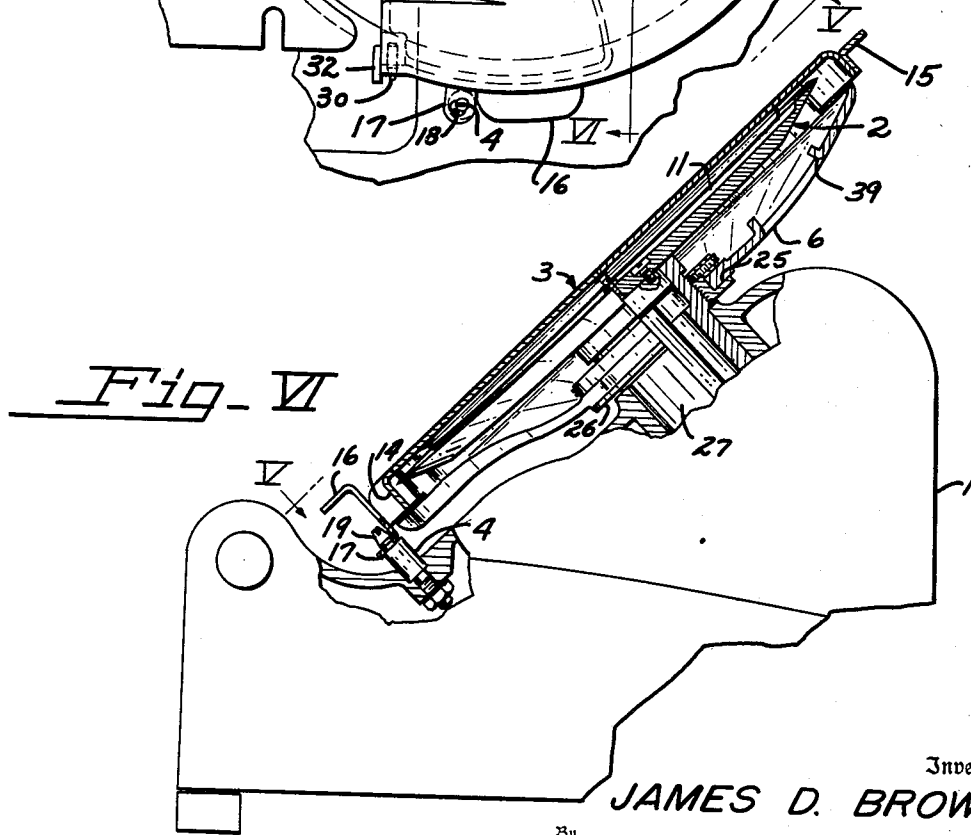
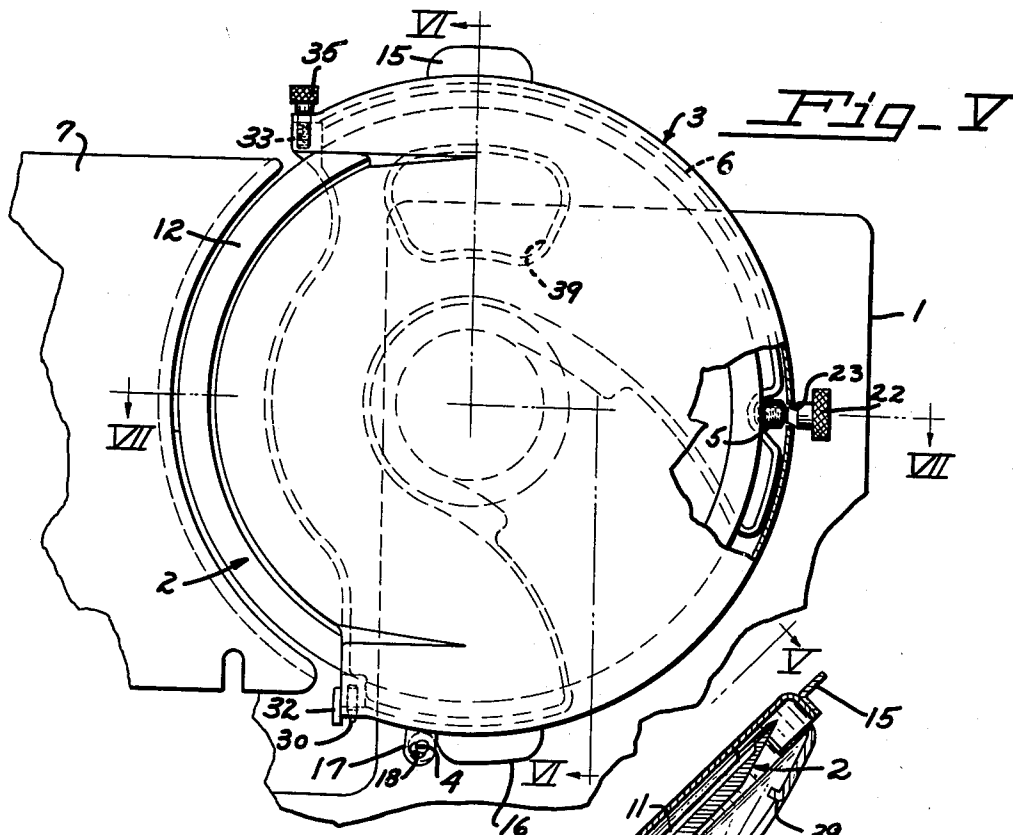
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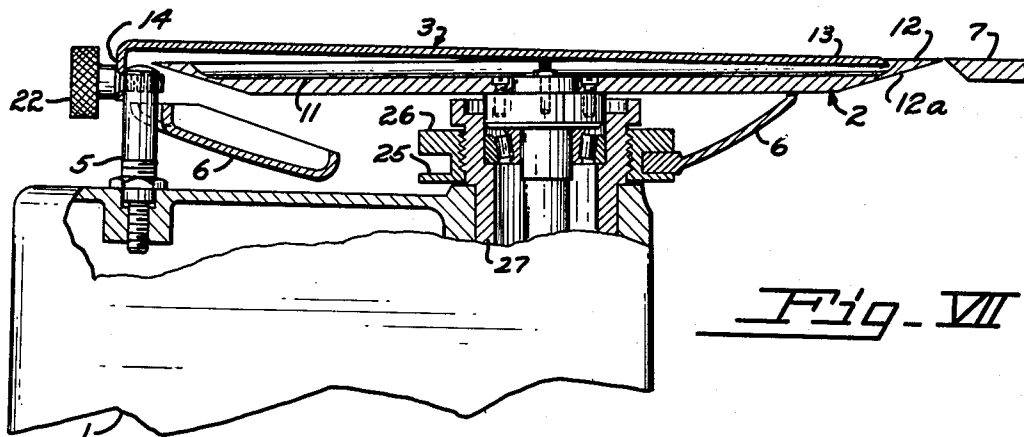


Fig. VII

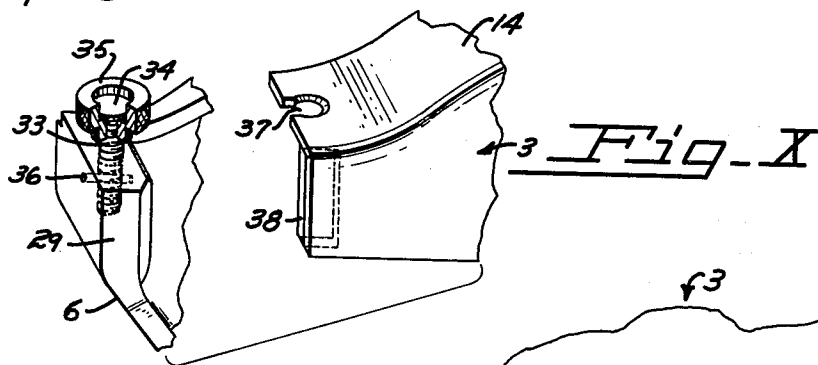


Fig. IX

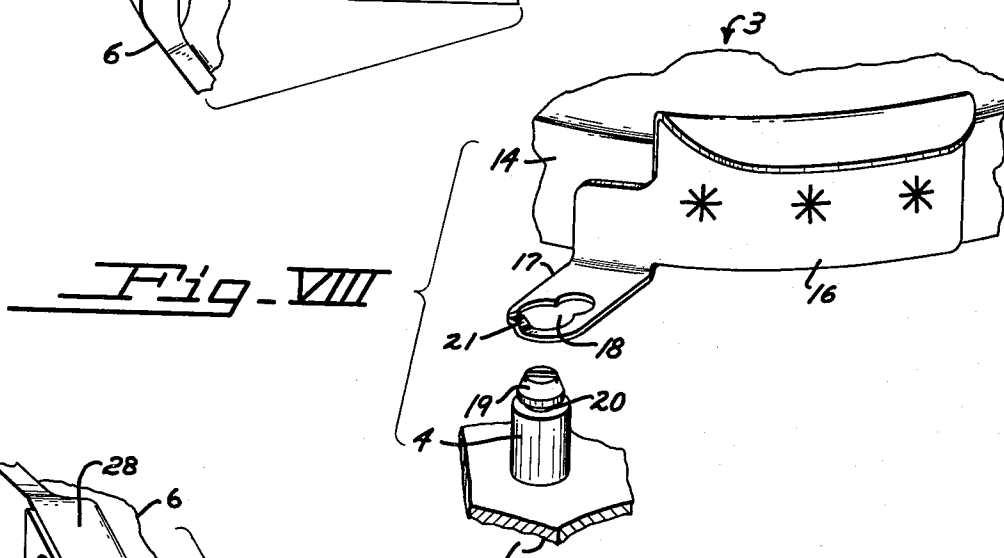


Fig. VIII

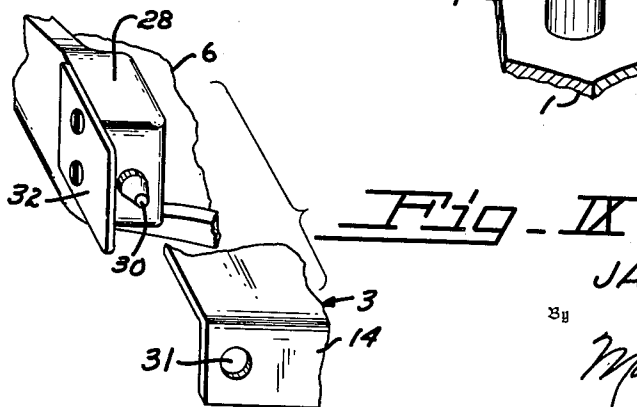


Fig. IX

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2,728,367

SLICER KNIFE GUARD

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Continuation of application Serial No. 279,096, March 28, 1952. This application May 17, 1954, Serial No. 430,011

4 Claims. (Cl. 146—102)

This invention relates to commodity slicing machines and particularly to protective guards for the rotating knives of slicing machines.

The knife of a slicing machine, if proper cutting is to be achieved, must be sharpened to a very high degree. The sharpness of such knives creates certain hazards. Primarily, an operator of such a slicing machine and others who come into contact with the machine must be protected from injury by the knife at all times. Secondly, from the standpoint of economy, it is wise to protect the extremely sharp edge of such a knife from being marred by objects which may come into contact with it.

For these and other reasons, plates of one type or another are generally provided to guard the circular knives of slicing machines. The provision of such guard plates creates additional problems, of which cleanliness is foremost.

In order that a guard plate may be properly cleaned it generally is necessary to remove it from the slicing machine. Such removal and the replacement which follows the cleaning must be simple and must be accomplishable with maximum safety to the operator.

It is, therefore, the principal object of this invention to provide for the circular rotary knife of a commodity slicing machine a knife guard mechanism which can be easily removed from or replaced on the machine with maximum safety to the operator.

It is a further object of this invention to provide a knife guard mechanism for the rotary knife of a slicing machine which encloses all but that small portion of the knife past which a substance being sliced moves.

It is a still further object to provide a knife guard mechanism which can be removed from or replaced on a slicing machine in only a certain prescribed way; that way providing the greatest amount of safety to the operator.

Another object is to provide a knife guard mechanism the contour of which is such as to permit easy cleaning thereof.

Further objects and advantages will be apparent from the following description in which reference is had to the accompanying drawings.

According to the invention, a front guard is provided to overlie the face of a circular knife of a slicing machine and be removably attachable to a pair of spaced apart posts on the housing of the machine. The guard covers all but a small segment of the knife past which a substance being sliced moves. Depending from the front guard, and surrounding all but the exposed segment of the cutting edge of the knife, is a rim or flange to protect the operator from injury and to prevent marring of the knife by its being struck by some object. Underlying the knife, and removably attached to the front guard is a rear guard which also acts as a slice deflector plate.

The two guards are arranged and constructed so that

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the rear guard must be removed before the front guard can be removed, and the front guard must be replaced before the rear guard can be replaced. This construction, as will be shown later, provides for maximum protection from injury to the operator and further provides for easy removal and replacement of the guards.

In the drawings:

Figure I is a view in perspective of a slicing machine embodying the invention.

Figure II is a rear view of the slicing machine shown in Figure I with parts broken away to show the manner in which the rear guard is positioned beneath the knife.

Figure III is an enlarged view in perspective of the front guard of the instant invention.

Figure IV is an enlarged view in perspective of the rear guard of the instant invention.

Figure V is an enlarged view taken substantially along line V—V of Figure I, parts being broken away.

Figure VI is a side view taken substantially along line VI—VI of Figure V, parts being broken away and other parts shown in section.

Figure VII is a fragmentary view taken along line VII—VII of Figure V, parts being broken away and other parts shown in section.

Figure VIII is a fragmentary assembly view of the means for attaching the front guard to the post at the lower left side of the knife.

Figure IX is a fragmentary assembly view of the means for attaching the rear guard to the front guard at the lower left side of the knife.

Figure X is a fragmentary assembly view of the means for attaching the rear guard to the front guard at the upper left side of the knife.

A slicing machine embodying the instant invention comprises a frame or housing 1 above which lies an inclined disk-like circular knife 2 rotated by a motor (not shown) enclosed in the housing 1.

Overlying the face of the knife 2 is a front guard or guard plate 3 having a substantially flat surface. The front guard 3 is attached to a pair of adjustable spaced apart posts 4 and 5 protruding from the housing 1. Underlying the knife is a rear guard or guard plate 6 which is attached to the front guard 3.

Substantially co-planar with the front guard 3 and laterally adjustable with respect to the plane of the guard is a gauge plate 7 against which a substance rests as it is being sliced. The gauge plate is adjustable to vary the thickness of slices. This adjustment is accomplished by rotation of a gauge plate knob 7a. The mechanism for adjusting the gauge plate is shown and described in detail in United States Patent No. 2,682,289 to James D. Brown.

A reciprocable commodity carriage 8 carries a substance to be sliced in a work support 9 mounted above the carriage in an inclined plane which is substantially perpendicular to the plane of the gauge plate 7 and the front guard 3 to permit gravity feeding of the substance. The carriage 8 reciprocates along a track 10 mounted along one side of the housing 1 beneath the housing.

The face of the knife 2 is provided with a dished central area 11 and a planar marginal cutting edge 12. The underside of the cutting edge of the knife is provided with a bevel 12a (Figure VII) to form a deflecting surface for the slices to be cut. The axis of rotation of the knife 2 is slightly out of perpendicular with the plane of the front guard 3 to facilitate reception of a partially curved portion 13 of the guard in the dished area of the knife to maintain the marginal cutting edge of the knife co-planar with the face of the front guard. (See Figures V and VII.)

Depending from the front guard 3, which is shaped

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substantially as shown in Figure III, is a flange 14 which surrounds all of the cutting edge of the knife 2 but that portion adjacent the gauge plate 7. It will be noticed that the guard 3 covers all but a small segment of the cutting edge of the knife over which a substance to be sliced

passes. Handles 15 and 16 are fixed to the flange 14 of the guard 3 to provide adequate means for safely lifting the guard from its position over the knife. Referring to Figure VIII, the lower handle is provided with a radially extending arm 17 through which are drilled overlapping holes of unequal sizes to form a substantial figure-eight opening 18 in the arm. The larger of the drilled holes is slightly greater in diameter than the head 19 of the post 4 mounted on the housing 1. The smaller of the two holes is slightly greater than a turned-down neck portion 20 of the post 4 immediately below the head 19.

The guard 3 is attached to the post 4 by engaging the larger hole of the opening 18 over the head 19 and moving the guard 3 to the left to engage the smaller hole around the neck portion 20 of the post. When so attached, the guard 3 cannot be lifted directly from the post 4 but must be moved to the right to position the larger hole of the opening 18 coaxial with the head of the post and then lifted. To provide for rapid alignment of the larger drilled hole and the post to facilitate removal of the front guard 3 from the post, a portion 21 on the arm 17 adjacent the larger hole has been raised to a height slightly greater than the width of the turned-down neck portion 20. When the guard 3 is being removed, as it is positioned to the right, the side of the head 19 strikes the raised portion (the raised portion being unable to pass into the neck portion) and the larger hole is aligned with the post 4 for removal by lifting.

The post 5 to which the front guard 3 is also attached is provided with a laterally projecting knurled thumb screw 22 threaded into the post. The flange 14 of the guard is provided with a slot 23 which is countersunk at 23a at its innermost end to receive the thumb screw 22 when the guard is positioned over the knife 2.

The rear guard 6 is shaped as shown in Figure IV with a generally U-shaped throat or opening 24 the end of which engages in a turned-down neck portion 25 of a collar 26 threaded on a knife support 27. (See Figures VI and VII.)

The rear guard 6 is provided with bosses 28 and 29 at the lower and upper corners respectively of the left side of the guard. Fixed in the lower boss 28 is a pin 30 (shown best in Figure IX) which engages in a hole 31 drilled in the lower left hand corner of the flange 14 of the guard 3. A plate 32 is attached to the boss 28 to facilitate proper alignment of the pin 30 in the hole 31.

Laterally threaded into the upper boss 29 of the rear guard 6 is a stud 33 with an enlarged flat head 34 at its outer end. (See Figure X.) A knurled thumb nut 35 is threaded onto the stud 33 in a manner such that it may be tightened or loosened, but not removed, because of the head 34 retaining said nut thereon. A pin 36 fixes the stud 33 in the boss 29 and prevents the stud from rotating.

Parallel with the face of the front guard 3 at the upper left end of the flange 14 is a slot 37 which is countersunk to receive the stud 33 and the thumb nut 35 and correctly position the rear guard 6 to the front guard 3. A small plate 38 is spot-welded to the underside of the face of the front guard 3 to snugly fit against its corresponding face of the boss 29 and accurately align the guards.

Operation

Let us assume an operator has completed slicing a messy substance, such for example, as cheese. If the guard plates have been besmeared to the extent that they must be removed for cleaning, the operator proceeds to remove the guard plates 6 and 3 as follows:

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The commodity carriage 8 is moved along the track 10 to its position furthest from the knife 2. The gauge plate 7 which was previously adjusted for slices of a certain thickness is then raised to its uppermost position by rotation of the gauge plate knob 7a. The uppermost position of the gauge plate is slightly above the plane of the knife 2, therefore the edge of the gauge plate adjacent the exposed cutting edge of the knife encompasses said cutting edge to protect the operator from injury during removal and replacement of the guards.

With the carriage 8 removed from its position above the knife 2 and the gauge plate 7 adjusted to its uppermost position the operator proceeds to remove the guard plates 6 and 3. The thumb nut 35 threaded on the stud 33 is loosened. The operator then grasps the rear guard 6 by placing his thumb in an aperture 39 and his fingers on the boss 29. The rear guard is pivoted on the pin 30 engaged in the hole 31 at the lower left hand corner of the front guard 3, and is shifted in its plane to disengage the throat 24 from the turned-down neck portion 25 of the collar 26. Lifting the rear guard 6 in its plane completes removal of the rear guard.

The front guard 3 is then removed by loosening the thumb screw 22 threaded in the post 5 to the right of the knife 2, and then pivoting the guard 3 in its plane on the thumb screw 22 in a slight counterclockwise direction. This pivoting of the guard results in the positioning of the larger hole of the figure-eight opening 18 coaxially with the post 4. The front guard 3 may then be removed by grasping the handles 15 and 16 and raising the guard laterally from the plane of the knife.

The two guards have thus been removed with the maximum amount of safety to the operator and may now be cleaned.

Upon reassembling the knife guards 3 and 6, the operator would reverse the order in which the guards were removed. He first replaces the front guard 3 by engaging the larger hole of the figure-eight opening 18 over the head 19 of the post 4 and engages the slot 23 over the thumb screw 22. Pivoting the front guard 3 in a clockwise direction on the thumb screw 22 locks the guard in position with the smaller hole of the figure-eight opening 18 engaged about the turned-down neck portion 20 of the post 4. The thumb screw 22 is then tightened to complete replacement of the front guard 3.

The rear guard is replaced by positioning the pin 30 in the hole 31 at the lower left hand corner of the front guard 3, and pivoting the rear guard until the throat 24 is snugly engaged about the turned-down neck portion 25 of the collar 26, and the stud 33 engages in the slot 37 at the upper left hand corner of the front guard. The thumb nut 35 is then tightened and the machine is ready for any subsequent operation.

Construction of the instant invention is such that it is impossible to remove either of the guards before the gauge plate 7 is adjusted to its uppermost position. The rear guard 6 cannot be removed with the gauge plate 7 in any position other than its uppermost position because it will strike the gauge plate as it is pivoted on the pin 30 and would not be able to move any further. Since the throat 24 would still be substantially about the neck portion 25 of the collar 26, the guard 6 could not be lowered to pass it beneath the gauge plate 7.

It is also impossible to remove the front guard 3 before the removal of the rear guard 6. Although both the thumb nut 35 and the thumb screw 22 may be loosened, the front guard cannot be removed with the rear guard 6 in place. The front guard 3 may be shifted to align the larger hole of the figure-eight opening 18 with the head 19 of the post 4, but the guard cannot be lifted because the stud 33 at the upper left hand corner of the lower guard will not permit same and at the lower left hand corner of the front guard the pin 30 is still engaged in the hole 31.

Various modifications in the details of construction may

be made without departing from the spirit and scope of the invention.

This is a continuation of application Serial No. 279,096, filed March 28, 1952, now abandoned.

Having described the invention, I claim:

1. In a slicing machine having a knife support and a rotary knife the marginal area of which lies in a plane above a dished central area, in combination, a front guard having a generally flat front portion that overlies said knife, said front guard having an interrupted front portion to expose a substantial portion less than half of the marginal area of the knife, a depending flange surrounding all but said interrupted portion of the front guard, said guard having that portion of its front surface adjacent the exposed marginal area of the knife substantially coplanar with the exposed marginal area, a pair of spaced apart posts mounted on the machine supporting said front guard, a rear guard substantially underlying a major portion of the back of said knife, an annular groove in said knife support, said rear guard having a substantially U-shaped throat the bottom of which engages in said annular groove thereby necessitating removal of said rear guard from the machine by sliding it in its plane until said throat is free from said groove, means for removably fastening said rear guard to said front guard, and a gauge plate generally coplanar with said knife and having an edge thereof adjacent the exposed cutting edge of the knife, said gauge plate being adjustable within limits from a plane whereby it encompasses the cutting edge of the knife to planes to the rear of said knife, the U-shaped throat being so directed and the plane of said rear guard being such that said gauge plate must be in encompassing relation with the cutting edge of the knife before removal of said rear guard can be effected.

2. In a slicing machine having a knife support and a rotary knife the marginal area of which lies in a plane above a dished central area, in combination, a front guard having a generally flat front portion that overlies said knife, said front guard having an interrupted front portion to expose a substantial portion less than half of the marginal area of the knife, a depending flange surrounding all but said interrupted portion of the front guard, said guard having that portion of its front surface adjacent the exposed marginal area of the knife substantially coplanar with the exposed marginal area, means for removably attaching said front guard to the machine, said means comprising a post mounted on the machine and having its longitudinal axis generally transverse to the plane of the knife, a rear guard substantially underlying a major portion of the back of said knife, an annular groove in said knife support, said rear guard having a substantially U-shaped throat the bottom of which engages in said annular groove thereby necessitating removal of said rear guard from the machine by sliding it in its plane until said throat is free from said groove, means for removably

fastening said rear guard to said front guard, and a gauge plate generally coplanar with said knife and having an edge thereof adjacent the exposed cutting edge of the knife, said gauge plate being adjustable within limits from a plane whereby it encompasses the cutting edge of the knife to planes to the rear of said knife, the U-shaped throat being so directed and the plane of said rear guard being such that said gauge plate must be in encompassing relation with the cutting edge of the knife before removal of said rear guard can be effected.

3. In a slicing machine having a knife support and a rotary knife only a segment of the cutting edge of which is exposed during operation, in combination, a frame, a front guard overlying the face of the knife and having a flange surrounding all but the exposed portion of the cutting edge of the knife, means for removably attaching the front guard to the frame, the means comprising a post fixed on the frame which post has its longitudinal axis substantially transverse to the plane of the knife and which post cooperates with the front guard, whereby removal of the front guard must be effected by lifting it laterally from the plane of the knife, a rear guard for the major portion of the back of the knife, and means for attaching the rear guard to the front guard, the latter means comprising a pin and a stud each fixed on the rear guard and each cooperating with the flange on the front guard, whereby the rear guard must be removed from the machine before removal of the front guard and whereby the front guard must be replaced on the machine before replacement of the rear guard.

4. In a slicing machine, in combination, a frame, a circular sharp edged knife supported from the frame, a front guard overlying the major portion of the front of the knife, a pair of spaced apart posts mounted on the frame and supporting the front guard, whereby removal of the front guard must be effected by lifting it laterally from the plane of the knife, a rear guard for the major portion of the back of the knife, and means for attaching the rear guard to the front guard, the means comprising a pin and a stud each mounted on the rear guard and each cooperating with the front guard, whereby the rear guard must be removed from the machine before removal of the front guard and whereby the front guard must be replaced on the machine before replacement of the rear guard.

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