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SHREDDING DEVICE FOR SLICING MACHINES

Filed Oct. 29, 1953

3 Sheets-Sheet 1

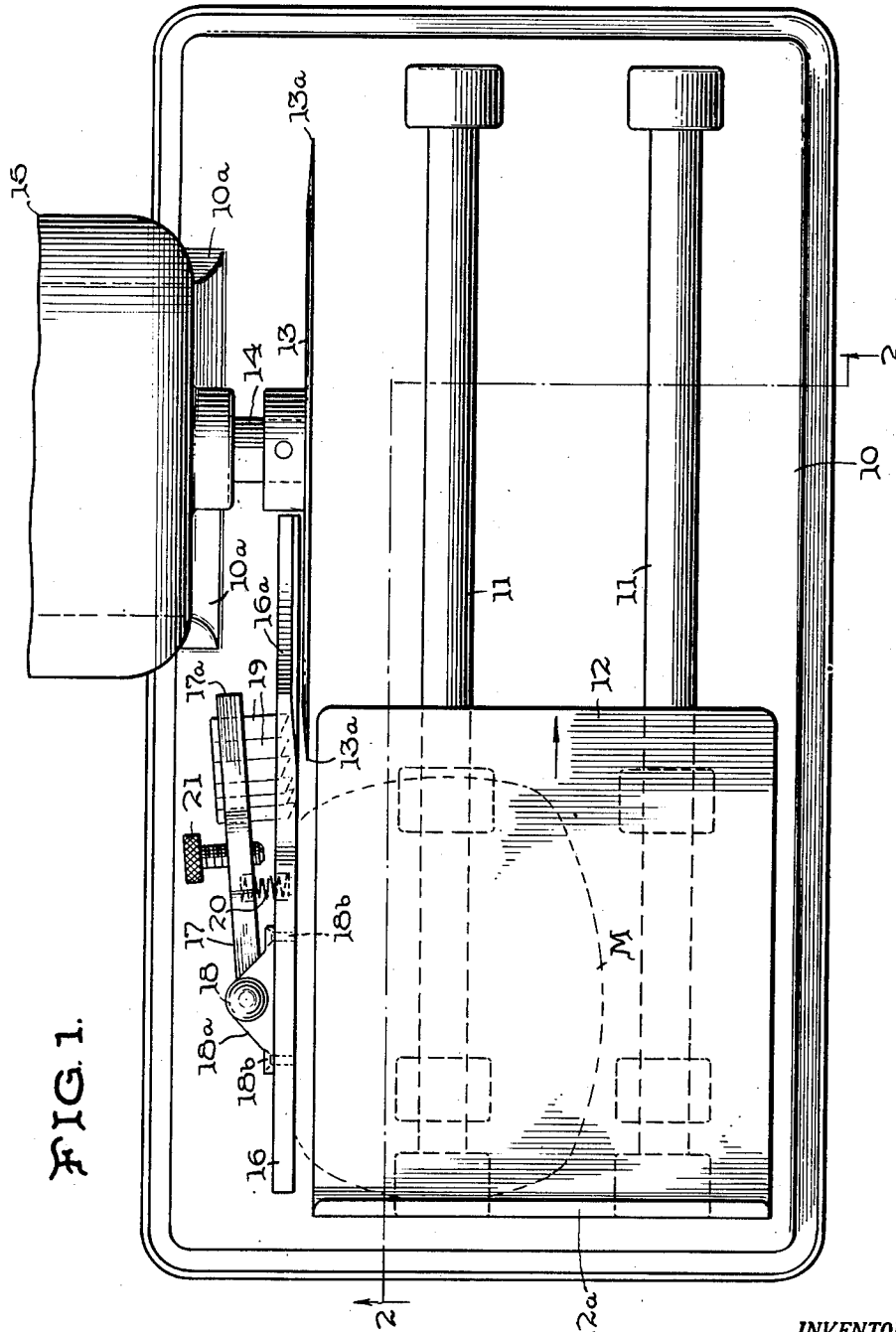


FIG. 1.

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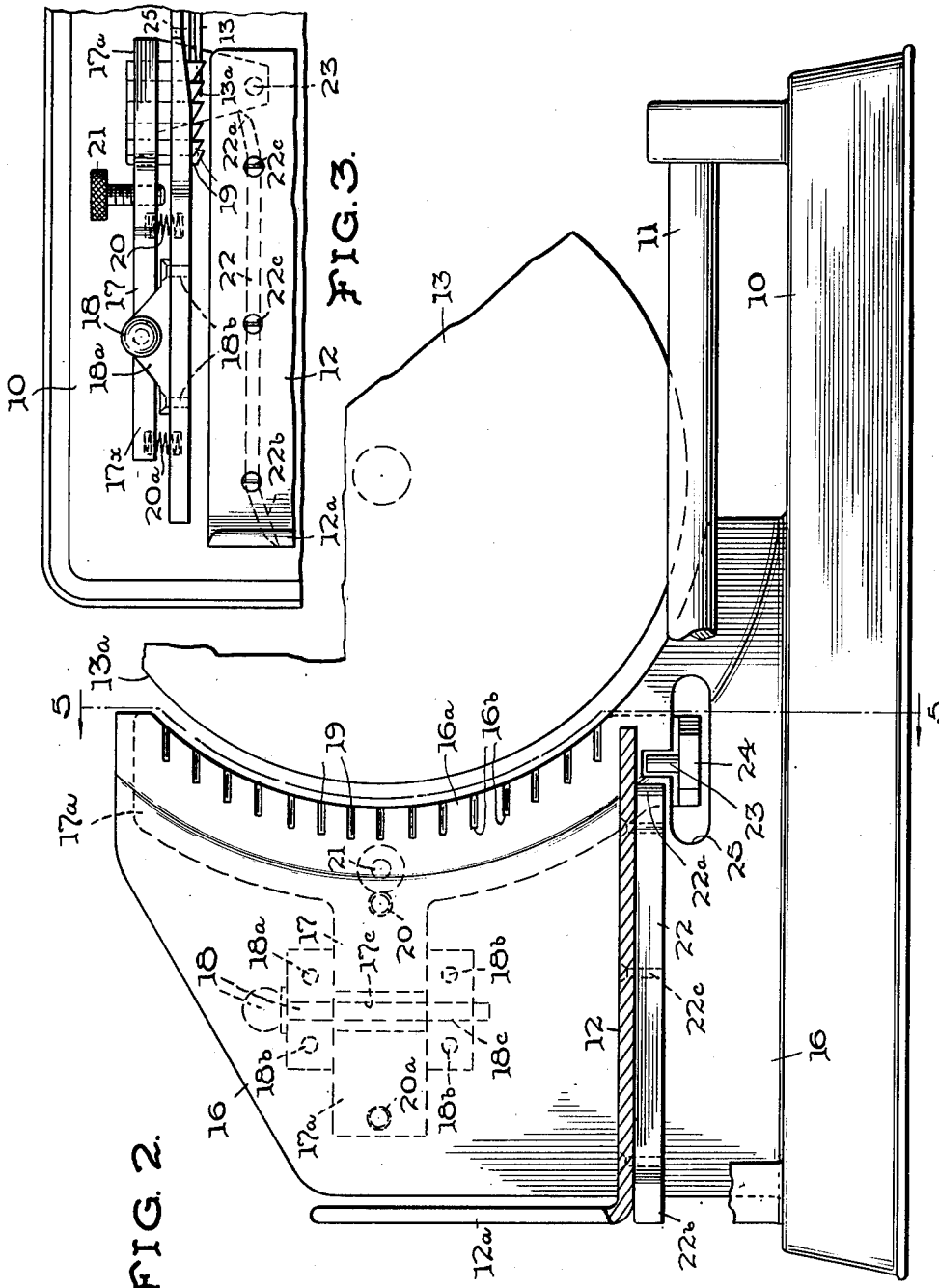


FIG. 2.

FIG. 3.

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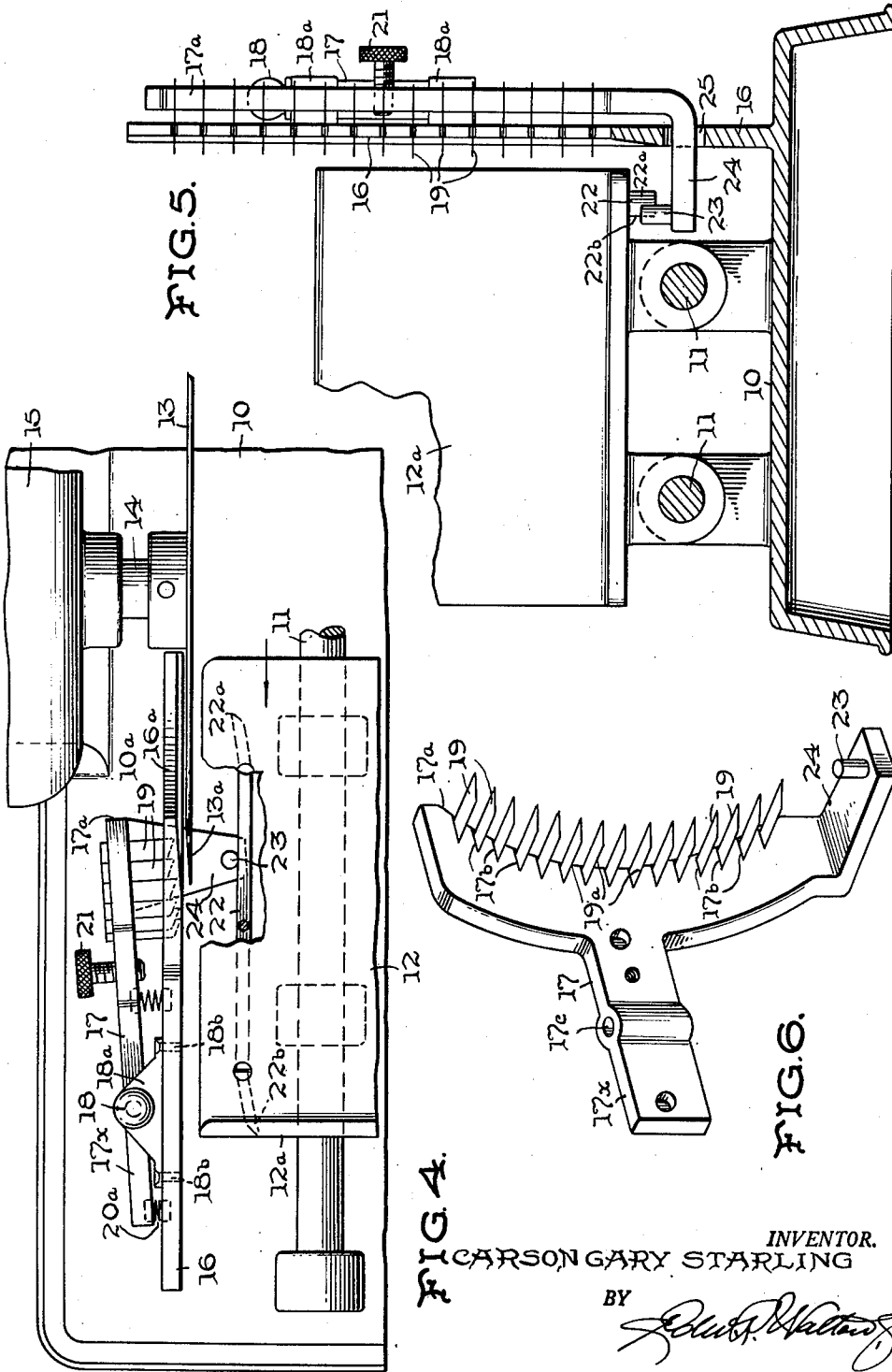


FIG. 4.

FIG. 6.

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1

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**SHREDDING DEVICE FOR SLICING MACHINES**

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8 Claims. (Cl. 146—78)

The present invention relates to improvements in slicing machines of the rotary-knife type for slicing food or other material and specifically relates to an improved shredding device that may be built originally in such machines or may be removably applied to such machines now in use for cooperation with the rotary slicing knife thereof.

The principal object of the present invention is the provision of a shredding device applicable to a rotary disc-knife slicing machine which, when functioning together, cause the machine to shred the materials and which shredding device may be readily rendered effective, at the will of the operator, for a shredding operation or ineffective to permit only a slicing operation.

Another object of the invention is a shredding device of the character just mentioned that is relatively inexpensive and simple to manufacture, that may be readily and quickly applied to and removed from slicing machines now in use, and, when so applied, the shredding element of which may be quickly and easily detached and replaced by means of a removable pintle, thus facilitating the cleaning of the parts or the renewal of said element.

A further object of the invention is to arrange the shredding device with respect to a reciprocating carriage that moves to and from a rotary slicing knife, so the shredding elements may be projected into the path of said material, to be sliced by said slicing-knife, as the carriage is advanced toward the latter and will be retracted from the path of said material as the carriage is moved back from the slicing-knife to repeat the next slicing cycle, thereby preventing injury to or undue laceration of the material to be shredded.

A still further object is the provision of a very simple and relatively inexpensive shredding device of the kind above mentioned for use in combination with a conventional rotary disc-knife type of slicing machine and which has novel features of construction and of operation and a novel combination of parts.

The above objects, as well as other objects which will be apparent from the following description, are attained, generally, by the provision of a wing or leaf-like member hingedly mounted about a substantially vertical axis on the outer face of the usual upstanding back-board or guide-board positioned in advance of the rotary slicing knife of slicing machines and adjacent and opposite a side edge of a reciprocating carriage upon which the material, to be sliced, is placed with one side portion in sliding contact with the back-board. The guide-surface of the back-board extends in the same direction as the plane of the slicing-knife and may be stationarily fixed in spaced substantially parallel relation to the plane of said knife to produce a slice of constant thickness or may be adjustable toward and from the plane of the slicing knife, in one or more conventional manners, so as to produce slices of different or desired thickness.

Said wing or leaf member has a vertical disposed distal edge portion extending upwardly, preferably, from the plane of the carriage to the upper edge portion of the back-board and has mounted on said edge portion a series of vertical and, preferably, equi-spaced horizontal disposed shredding blades, the cutting edges of which being directed rearwardly toward the material on the carriage, when the carriage is in its rearmost position, and the blades being substantially parallel with movement of the carriage. The shredding blades extend laterally from the said wing member toward the plane

2

of the slicing knife and are positioned to be projected into the path of movement of the material, to be sliced, between the plane of the slicing knife and the guide surface of the back-board. The projected movement of the shredding knife may be accomplished by manually pressing the wing member counter to the action of a biasing means, when the carriage is advanced toward the slicing knife, and then releasing said pressure, when the carriage is moved backwardly, whereby said biasing means retracts the shredding blade from the path of the material, this operation being repeated for each reciprocating cycle of the carriage. Thus, when it is not desired to shred the material, but only to slice it, the wing member is not actuated. Mechanism may be provided to automatically accomplish this operation of the shredding device; and one such means may comprise a camming member on the carriage and acting upon a cam follower on said wing member, other means being employed to hold the follower out of cooperative relation with the camming member when desired.

The invention resides, therefore, in the novel features of construction and in the combination and arrangement and operation of the parts hereinafter more fully described and pointed-out in the appended claims.

For a better understanding of the invention reference may be had to the accompanying drawings, in which—

Figure 1 is a plan of one type of conventional rotary disc-knife slicing machine equipped with a manually actuated form of my invention and showing the carriage of said machine in its rearmost position and just as the carriage is about to be moved forward toward the slicing knife;

Figure 2 is a view of a modified form of the invention shown in Fig. 1 and illustrating, partly in elevation and partly in section, the slicing-machine shown in Fig. 1, the section being taken substantially on line 2—2 of Fig. 1 and the machine being equipped with a modified form of shredding device that is automatically actuated;

Figure 3 is a fragmentary plan view of Fig. 2 illustrating the carriage, back-board and the shredding device and showing the position of the camming means and of the shredding blades when the carriage is in its rearmost position and just before it is moved forward for a shredding and slicing operation;

Figure 4 is a view similar to Fig. 3 and showing the position of the camming means and of the shredding blades on the backward movement of said carriage;

Figure 5 is a vertical transverse sectional view taken substantially on line 5—5 of Fig. 2; and

Figure 6 is a perspective view of the shredding device removed from the slicing machine.

Referring in detail to the drawings, in which like characters of reference refer to similar and like parts throughout the several views, the type of slicing device to which the present invention is particularly applicable comprises, generally, a base 10 having on its upper surface a guide means 11 for reciprocably mounting carriage 12 movable to-and-fro relative to a rotary disc-knife 13. The guide means, here shown, is a pair of spaced and parallel elongated guide rods upon which the carriage or platform 12 is slidably supported and is adapted to be reciprocated along the length of said rods to move the carriage, and the material carried thereby to be sliced, from its rearmost position, shown in Fig. 1, across the face of the rotating circular or disc-knife 13 positioned to one side of said carriage and parallel to the movement thereof at a position in advance of the rearmost position of the carriage 12.

For the purpose of this disclosure, the carriage 12 is shown as being manually reciprocable and the knife 13 as being mounted on the arbor 14 of an electrical motor 15 carried on an extension 10<sup>a</sup> of the base 10.

Also, in the slicing machine of the type described, it is usual to provide a vertically disposed back-board 16 which may be supported by the base 10 and positioned on the knife-side of the carriage 12. This back-board 16 spans an area from the rearmost position of the carriage 12 to a point adjacent the peripheral edge of the knife 13, usually with an arcuate side edge 16<sup>a</sup> spaced slightly from the knife's edge and conforming to the curvature thereof, as shown, the arrangement being such that the

carriage 12 and the back-board 16 lie on opposite sides of the plane of the knife 13 with the back-board 16 spaced from said plane in any manner well known in the art.

The present invention resides in the provision of an arm 17 hingedly mounted on a substantially vertical axis 18 at one end portion to the outer face of the back-board 16 and having an arcuate distal free end portion 17<sup>a</sup> substantially coextensive with the arcuate edge portion 16<sup>a</sup> of said back-board and carrying thereon a series of vertically spaced horizontally disposed shredding blades 19 projecting laterally inwardly from said arcuate edge 17<sup>a</sup>. The blades 19 may be mounted on the arcuate edge 17<sup>a</sup> of said wing member by forming the latter with a series of spaced substantially horizontal kerfs 17<sup>b</sup> extending substantially parallel with the movement of the carriage 12, the depth and width of each of the kerfs 17<sup>b</sup> being such as to fixedly receive and retain one end portion of a shredding blade 19 therein, and having its cutting edge 19<sup>a</sup> directed rearwardly of the machine. These shredding blades 19 may lie in the space between the peripheral edge 13<sup>a</sup> of the slicing knife 13 and the arcuate edge 16<sup>a</sup> of the back-board 16 (see Fig. 2) or said arcuate edge 16<sup>a</sup> may be provided with a plurality of transverse slots 16<sup>b</sup>, each aligned with one of said shredding blades 19, respectively, and through which said blades may be projected into effective operative position, the walls of the slots acting to give added support to the blades during their cutting operations.

The arm 17 is preferably mounted in position on a bracket 18<sup>a</sup> secured to the back-board 16 by screw 18<sup>b</sup> (so that the shredding device may be readily attached to existing slicing machines) and has a vertical pintle receiving opening 18<sup>c</sup> therein by which the pivotal end of the wing member may be removably and hingedly supported by the pintle 18.

A biasing means, such as a compression spring 20, is employed to normally bias the arm 17 to swing outwardly on its axis to its full line position (Fig. 1), thus retracting the blades out of the path of the material on the carriage and bearing against the back-board 16. The inward movement of the shredding blades 19 may be limited and adjusted by means of the thumb-screw 21 threaded into the arm 17 and having its free end engageable with the back-board 16, or by other like means.

Consequently, with the device of my invention, as thus far described, it is only necessary, when it is desired to use the slicing machine in its usual manner for slicing food or other material, to place the material M (Fig. 1) on the carriage and press it against the back-wall 12<sup>a</sup> of the carriage and against the back-board 16 and, with the same hand, push the carriage forward toward the rotating slicing knife 13, resulting in slicing the material M as often as the reciprocable cycle of the carriage 12 is repeated. However, when it is desired to shred the material M, the operator presses the arm 17 inwardly against its bias 20 each time the carriage 12 begins its advance toward knife 13, moving the shredding blades from their dotted line position (Fig. 1) to their full line position thus cutting the surface of the material M in a multiplicity of slashes or lacerations in advance of the action of the slicing knife 13 and to a depth slightly greater than the thickness of the slice to be severed by said knife 13, this slashed surface then being severed from the bulk of the material M by the slicing knife 13 as the carriage 12 advances; and, after the limit of the forward cutting stroke or movement of the carriage 12 has been reached, the operator releases the arm 17 and the bias 20 will retract the blades 19 to its dotted line position (Fig. 1) out of path of the material M on the return movement of carriage to its rearmost position.

In Figs. 2 to 6, inclusive, the drawings illustrate one arrangement whereby the projecting and retraction of the shredding blade 19 may be automatically performed. This automatic operation may be accomplished by utilizing the movement of the carriage 12 and arranging on the underside of said carriage a cam track 22 substantially parallel to the reciprocal movement thereof and which cooperates with a cam-follower 23 carried on a lateral arm 24 extending inwardly from the arm 17 through a slot 25 in the back-board 16. The cam track may be secured in place by screws 22<sup>c</sup> and has its end portions 22<sup>a</sup> and 22<sup>b</sup> flared in opposite directions so that the cam-follower 23 will be brought to contact and ride along opposite side faces of the track upon each to-and-fro movement, respectively, of the carriage 12.

To assist in this connection, the pivoted end of the arm or blade holding member 17 is provided with an extension 17<sup>x</sup> projecting beyond its pintle 18. Between said extension 17<sup>x</sup> and the back-board 16 is an additional compression spring 20<sup>a</sup>, the springs 20 and 20<sup>a</sup> being preferably equally distant from the pintle 18 thus affording a balanced normal position of the arm 17 as shown in Fig. 3 which normally maintains the cam follower in a position to be engaged by the outwardly flared end portions 22<sup>a</sup> and 22<sup>b</sup> on the cam track 22.

The arrangement is such, as can be seen from Figs. 3 and 4, that when the carriage 12 is moved in the direction of the arrows thereof the follower will ride on the inner surface of the cam track and draw and hold the shredding blades 19 in their effective lacerating position; and, when the carriage has reached the end of its forward stroke, the follower will ride over the oppositely flared end 22<sup>b</sup> of the track and, due to the action of the springs 20 and 20<sup>a</sup>, will be brought on the outer side of the cam track 22, as shown in Fig. 4; and, when the carriage is moved backwardly to its rearmost position, the cam follower will ride on the outer surface of the cam track 22 and move the shredding blades 19 out of the path of the material M on the carriage contacting the back-board 16 as shown in Fig. 4. In this latter movement and when the carriage has reached its rearmost position, the cam follower will move off the flared end 22<sup>a</sup> of the cam track and, by reason of the action of the springs 20 and 20<sup>a</sup> will assume the position shown in Fig. 3 for another cycle of operation of the machine.

In the form of the invention shown in Figs. 2 to 6, it is only necessary, when it is desired not to use the shredding blades 19 in a cutting operation of the machine, that the thumb screw 21 be threaded sufficiently into contact with the back-board 16 to compress the spring 20<sup>a</sup> and to move the shredding blades 19 in their fully retracted position and, by this same action, the cam follower will be retracted out of the path of the flared end 22<sup>a</sup> on the cam track.

From the above it will be observed that all of the objects above enumerated are attained and that the shredding device may be readily attached to existing slicing machines now in use and the attachment can be readily removed for cleaning or replacement by withdrawing the pintle 18.

Having thus described the invention in the manner in which the same may be performed, it is to be understood that the invention is not to be limited to the exact form and construction herein shown and described as the same is susceptible of many modifications and variations that fall within the spirit and scope of the appended claims.

That which is claimed, as new, and desired to secure by Letters Patent, is:

1. A shredding attachment for a slicing machine having a frame, a fixed position slicing knife mounted thereon, a back-board mounted on said frame and substantially parallel to the plane of said knife, and a carriage mounted for reciprocation on said frame for carrying material to be sliced toward said knife, said attachment comprising a bracket adapted to be attached to said back-board, pivot means on said bracket, an arm pivoted near one end on said pivot means, a plurality of shredding blades on the other end of said arm and disposed perpendicular to said knife and positioned adjacent said knife and said back-board and movable into the path of material on said carriage, means normally biasing said blades away from said knife and out of the path of material on said carriage.

2. The subject matter of claim 1 wherein the back-board is provided with a plurality of slots adapted for passage of said shredding knives to shredding position.

3. The subject matter of claim 1 wherein means are provided on the arm carrying the shredding knives to limit the penetration of said knives.

4. The combination of a rotary disk-knife slicing machine having a carriage reciprocable relative to said knife and a back-board radially spaced from and substantially parallel to said knife for guiding material on said carriage to be severed during reciprocation of said carriage in one direction, a shredding device including an arm pivotally mounted intermediate its ends on said back-board, a bracket on one end of said arm, a plurality of spaced shredding blades on said bracket, arranged substantially perpendicular to said disc-knife, said shredding blades being radially spaced from said disc knife, means normally biasing said shredding blades out of the path

5

of material on said carriage, and means associated with said blade carrying arm and said carriage for moving said blades across the plane of said knife into the path of material on said carriage during advance of said carriage toward said knife.

5. The subject matter of claim 4 wherein said back-board is provided with slots through which said blades project when moved across the plane of the said knife.

6. The subject matter of claim 4 wherein the means to move said blades comprise a cam track on said carriage and a cam follower on said arm.

7. The subject matter of claim 6 wherein balancing biasing means are located at the other end of the arm to

6

position the cam follower for engagement with the cam track.

8. The subject matter of claim 7 in which means are provided to lock said arm in a position wherein the cam follower does not engage the cam track.

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