Nov. 8, 1949 J. B. FLOYD 2,487,431

KNIFE HEAD FOR APPLE SLICING MACHINERY

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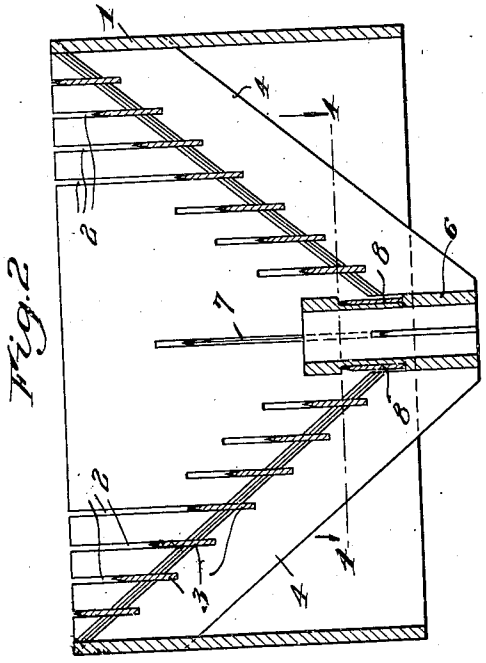


Fig. 2

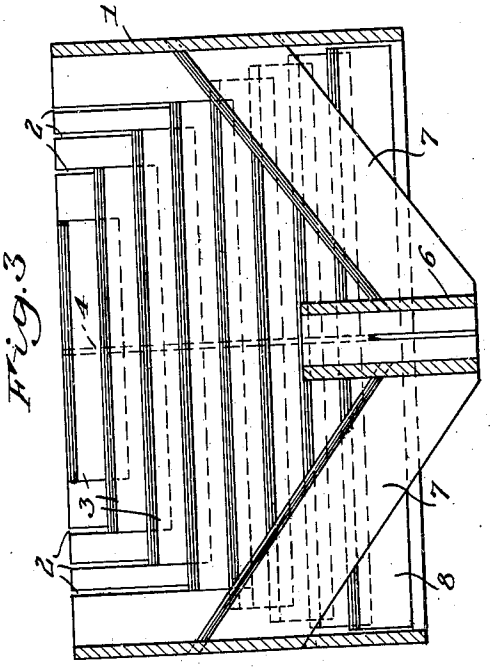


Fig. 3

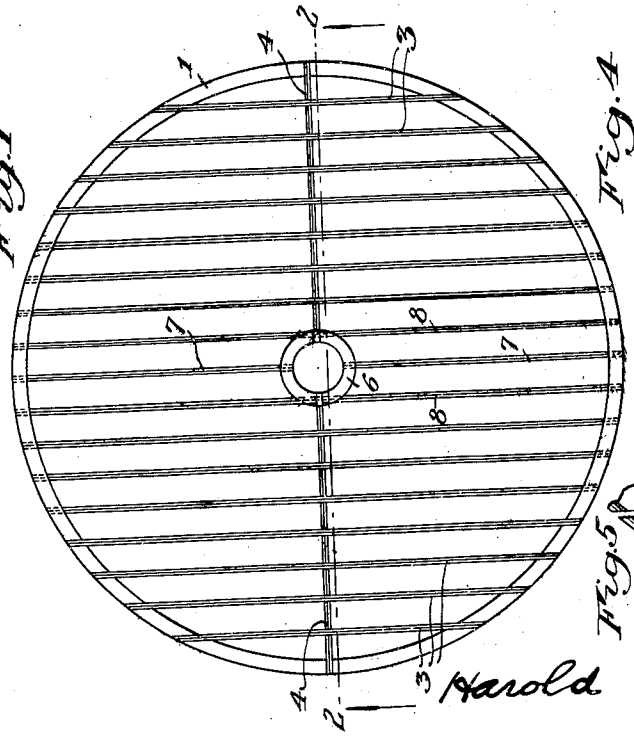


Fig. 1

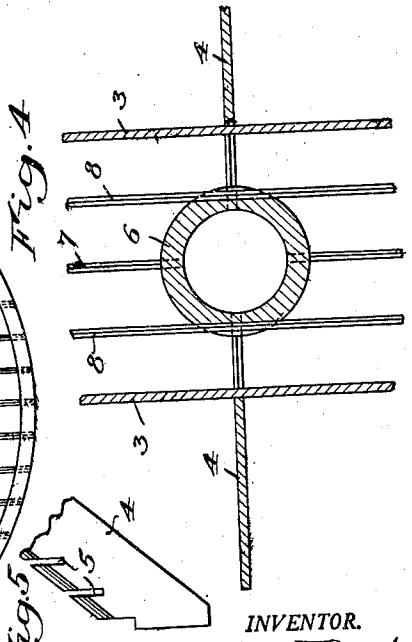


Fig. 4

Fig. 5

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KNIFE HEAD FOR APPLE SLICING MACHINERY

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1 Claim. (Cl. 146—169)

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This invention relates to a knife head for apple slicing machinery of the general character in which a cored apple is guided along a post and forced into engagement with a series of knives which cut the apple into quarters, eighths, or other segmental pieces, and it has for its purpose to provide a knife head that will efficiently and satisfactorily cut an apple into flat slices of uniform thickness throughout instead of segmental pieces of varying thickness.

In the processing of frozen sliced apples, the slices are treated with ascorbic acid in order to protect the apple flavor from loss of soluble solids and to delay browning action of the fruit, and it has been found that proper and uniform action of the ascorbic acid cannot be had on fruit when cut into segmental portions because of the varying thickness which results in uneven penetration of the ascorbic acid to different portions of the slice, and it is a purpose of the present invention to afford a knife head which makes possible cutting an apple into relatively thin slices of uniform thickness throughout and having flat sides instead of converging sides as in the case of a segmental slice.

Another object of the invention is to afford a knife head that will cut flat slices of uniform thickness without crushing or injuring the fruit.

Still a further purpose of the invention is to afford a knife head that utilizes a series of knives arranged in parallel planes and operable to cut a series of flat slices of uniform thickness and to support the knives in such a way as to brace them rigidly at points intermediate their ends and prevent their bending or flexing as they enter the fruit.

An additional object of the invention is to afford a knife head in which a series of slicing knives are arranged in parallel planes in stepped relation within a surrounding support and are engaged by transversely disposed bracing knives which are interlocked with the slicing knives and disposed for engagement with the apple after engagement of the slicing knives, the transverse knives acting to cut the slices in half or to sever them at points intermediate their ends.

Another purpose of the invention is to provide a knife head of practical and durable construction that is efficient in its operation and in which a series of knives in parallel planes braced by one or more interlocked transverse knives are rigidly mounted in a surrounding holder or support which is positionable in an apple slicing machine of conventional construction.

To these and other ends, the invention consists in the construction and arrangement of parts that will appear clearly from the following description when read in conjunction with the accompanying drawings, the novel features being pointed out in the claim following the specification.

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In the drawings:

Fig. 1 is a plan view of a knife head constructed in accordance with a preferred embodiment of the invention;

Fig. 2 is a transverse vertical sectional view on line 2—2 of Fig. 1 looking in the direction indicated;

Fig. 3 is a vertical sectional view taken centrally in a plane perpendicular to that of Fig. 2;

Fig. 4 is an enlarged horizontal sectional view on the line 4—4 of Fig. 2, and

Fig. 5 is a detail view in side elevation, partially broken away, illustrating one of the transverse knives which are interlocked with the parallel slicing knives.

Referring more particularly to the drawings in which like reference numerals refer to the same parts throughout the several views, the invention comprises a knife holder or support which may be in the form of an annular band or ring 1 of metal, the same being provided with a series of oppositely disposed slots 2 which receive the ends of the slicing knives 3, the latter being anchored in the slots for rigid attachment to the support 1 by soldering, welding, or in any suitable manner.

The slicing knives 3 are arranged in spaced parallel vertical planes as shown extending between opposite walls of the support and are distanced apart suitably to produce slices of any desired thinness as for instance from ¼" thickness to ⅝" thickness, the slices thus formed by the knives being flat, having parallel sides, and of substantially uniform thickness throughout.

In order to effect a uniform and efficient cutting action without crushing the fruit, the knives are disposed in stepped relation as shown so that their successive cutting edges are positioned along a line that forms an angle of approximately 45° to the horizontal, so that the several knives come into successive engagement with the apple as the latter is forced downwardly through the knife head.

The slicing knives 3 are of considerable length and susceptible of flexing at their central portions when an apple is forced therethrough unless they are adequately braced, and in order to prevent any such movement of the knives and to insure their being held rigidly throughout their

length, there are provided the transversely arranged bracing knives 4 which extend crosswise of the parallel slicing knives 3 and are provided with slots 5 extending downwardly from their cutting edges and arranged to receive the bottom portions of the slicing knives 3. The transverse knives 4 and their cutting edges are preferably arranged at the same 45° angle as the edges of the slicing knives, the cutting edges of the transverse knives 4 being disposed somewhat below the cutting edges of the adjacent parallel slicing knives with which they interlock, so that the parallel slicing knives 3 come into operation slightly before the cutting contact of the transverse knives 4.

The transverse knives 4 are preferably arranged centrally of the slicing knives 3 so as to effect endwise halving of the slices, and the transverse knives 4, which are rigidly mounted in slots in the support 1, also serve to retain a central sleeve 6 to which they are attached rigidly at their inner ends. The central sleeve 6 is further retained by a pair of slicing knives 7 arranged centrally of the support 1 and perpendicularly to the transverse knives 4, the knives 7 being secured at their outer ends in slots in the support 1 and at their inner ends to the lower portion of the sleeve 6, with their cutting edges angularly disposed, as shown in Fig. 3, and located between the lowermost of the aforesaid stepped parallel slicing knives indicated at 8, which latter at their central portions extend through slots formed in the side walls of the sleeve 6, as shown in Fig. 2.

The knives 4 and 7 being rigidly attached at their ends to the support 1 and to the central sleeve 6, and the knives 4 being interlocked with each of the parallel slicing knives 3, produces a rigid assembly that holds all the knives in fixed position against any flexing or yielding that might damage the fruit, and it will be understood that the central sleeve 6 receives a post or tube around which the cored apple is guided downwardly before being pushed into engagement with the knives, as usual in the operation of apple slicing machinery.

The knives 4 and 7 effect a virtual quartering of an apple while the parallel slicing knives 3 slice the quartered sections into thin flat slices of uniform thickness having parallel side walls and which may be as thick or thin as desired, depending upon the spacing between the parallel knives.

As a pre-cored apple is forced downwardly through the head, the parallel slicing knives which are arranged symmetrically on opposite sides of the center successively engage and penetrate the apple along parallel lines while the cutting edges of the transverse knives 4 engage the apple immediately after engagement of the adjacent parallel slicing knives so as to cut the slices in half endwise, although it will be understood that the transverse knives 4 need not necessarily be arranged perpendicularly to the parallel knives 3 but may be disposed in any transverse or crosswise relationship so as to anchor the parallel blades effectively at points between

their ends while at the same time permitting the slicing blades to be arranged in the stepped relation shown and by which the most effective contact with an apple is to be had. The support 1 also need not necessarily be annular or of the particular construction shown as long as it serves as a rigid mount for the ends of the parallel blades and permits their positioning in stepped relation at the required distances apart.

While the invention has been described with reference to the particular construction herein shown, it is not confined to the details disclosed, and this application is intended to cover such modifications or departures as may come within the purposes of the improvements or the scope of the following claim.

I claim:

A knife head for apple slicing machinery comprising a series of horizontally disposed slicing knives arranged in spaced parallel vertical planes, an annular support surrounding said knives and having a series of parallel vertical slots therein at opposite points in which the outer ends of said slicing knives are secured, the slicing knives being disposed in stepped relation symmetrically on opposite sides of the center of the support, a vertically disposed sleeve located centrally of the support and permitting downward movement around said sleeve of a seed-celled apple, a pair of transversely arranged downwardly converging knives disposed at an angle to the horizontal and parallel to a plane passing through the adjacent horizontally disposed knives, each of said transverse knives being anchored at its upper end to said support and at its lower end to said central sleeve and having in its cutting edge a series of spaced vertically arranged transverse slots each forming an acute angle with said edge and arranged to receive the bottom portions of the slicing knives at their central portions to prevent their buckling, the cutting edge of each of said transverse knives being located between the cutting and bottom edges of each slicing knife, and a pair of angularly arranged quartering knives disposed centrally of said support perpendicularly to said transverse knives at less inclination to the horizontal than said transverse knives and having their upper ends anchored in the support and anchored at their lower ends in said sleeve.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
269,835	De Puy & Burghardt	Jan. 2, 1883
590,129	Bulette	Sept. 14, 1897
1,399,950	Fish	Dec. 13, 1921
1,445,555	Ridpath	Feb. 13, 1923

FOREIGN PATENTS

Number	Country	Date
7,904	Great Britain	Dec. 12, 1838
239,979	Great Britain	July 30, 1924