Sept. 19, 1939. J. J. LAMERE ET AL 2,173,336

SLICING MACHINE

Filed June 22, 1937 2 Sheets-Sheet 1

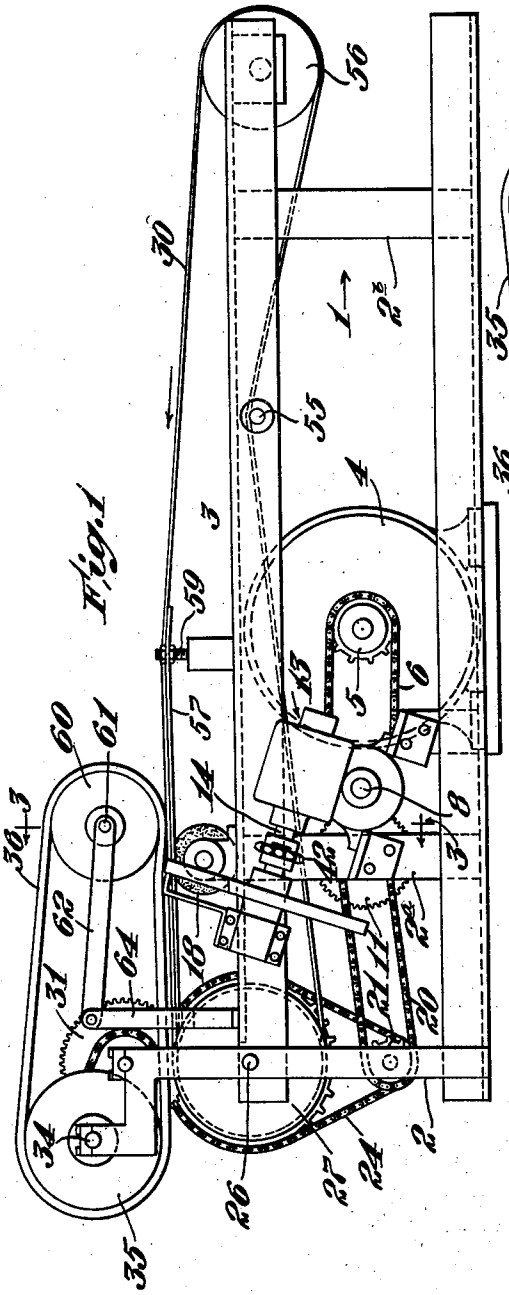

Fig. 1

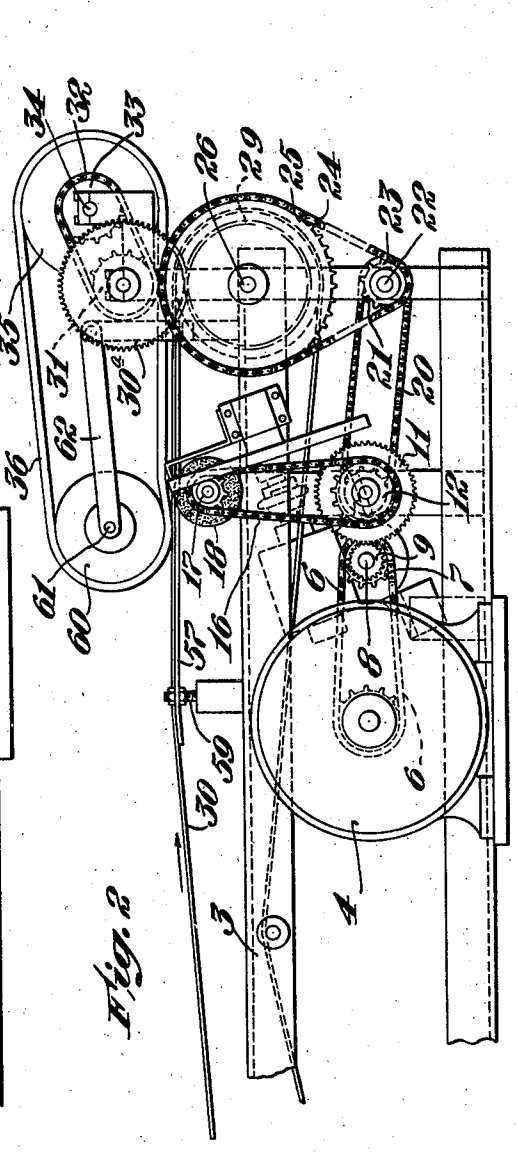

Fig. 2

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Fig. 3

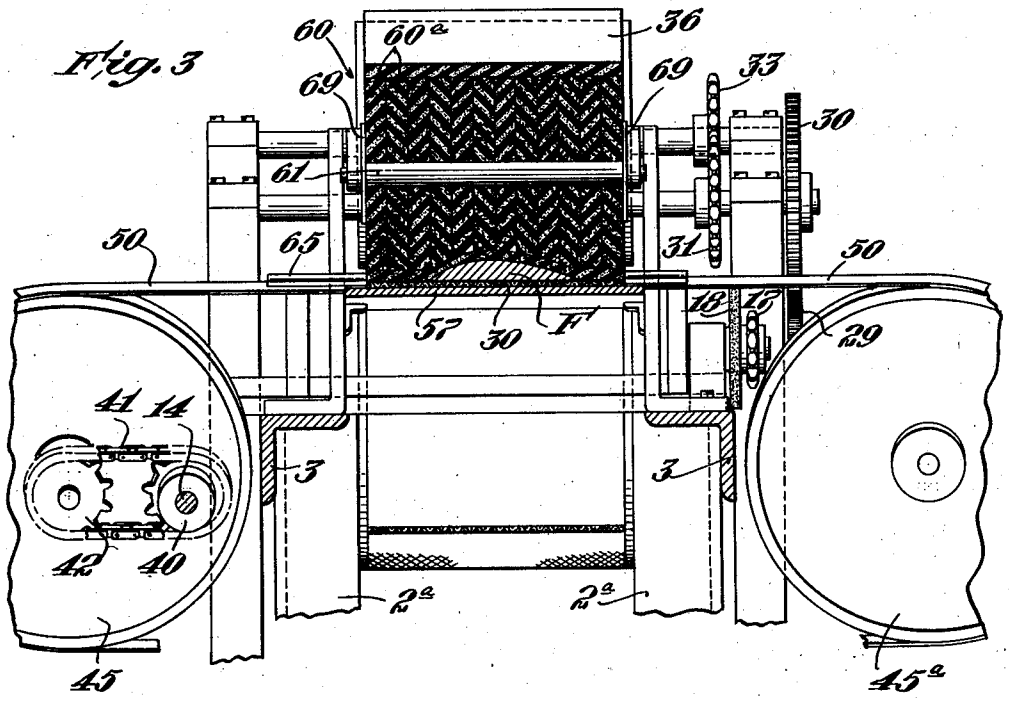
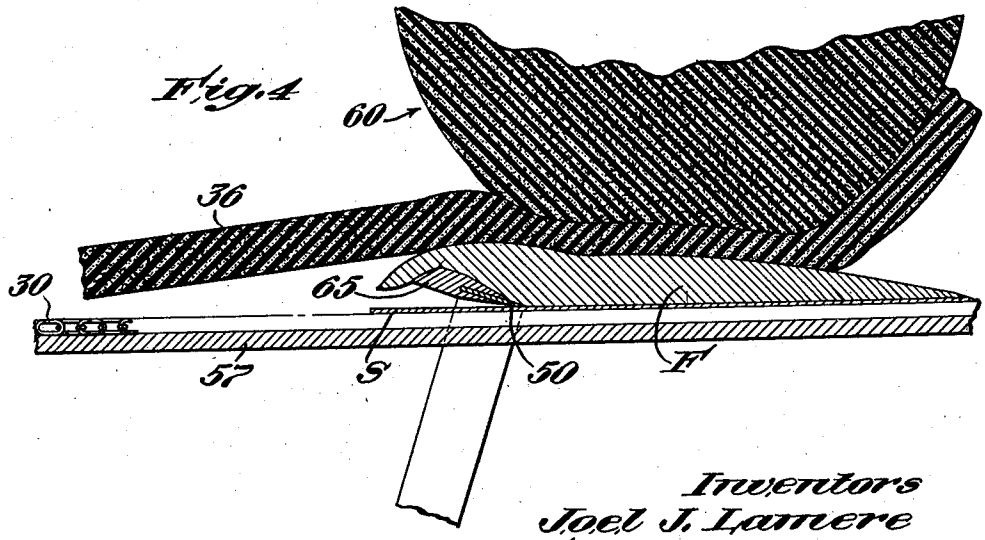


Fig. 4



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UNITED STATES PATENT OFFICE

2,173,336

SLICING MACHINE

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Application June 22, 1937, Serial No. 149,630

4 Claims. (Cl. 17—2)

This invention relates to an improved slicing machine and more particularly to such a machine for slicing or skinning fish fillets or the like. The present invention affords an improved machine of the general type disclosed in the copending application of Robert F. Jones, Serial No. 149,109, filed June 19, 1937. Such a machine is provided with a lower feeding belt on which irregular objects, such as fillets, may be advanced to a cutting knife. An upper presser means is arranged to press the distortable fillet or the like downwardly into firm engagement with a surface portion of the feeding belt that is parallel to the cutting edge of the knife. Thus a thin slice of uniform thickness may be severed from the irregularly shaped fillet or the like. Presser means of the type disclosed in the above-identified application may comprise a plurality of individual belts separately mounted on pulleys and provided with separate yieldable means allowing the belts to conform to the shape of the fillet or the like, or a single loosely meshed belt may be associated with a plurality of suitable weighted rolls or the like, so that the belt is pressed into engagement with the irregular upper surface of the fillets.

In accordance with this invention, the upper presser belt means is greatly simplified and may comprise a single wide belt of elastic material which extends between two rolls, one of which is located in the region of the cutting knife. This roll is mounted on the ends of swinging arms so that it has some freedom of vertical movement and is preferably formed of distortable material. In the preferred embodiment of the invention the presser belt is formed of a soft rather thick sheet of rubber, while the roll adjoining the knife is formed of soft, readily distortable rubber.

A machine constructed in accordance with our invention may be provided with a single driving motor to operate the feeding belt, the presser belt, the band knife and the sharpener for the latter, and in general the present invention affords various advantageous mechanical arrangements contributing to the provision of a simple and efficient slicing or skinning machine.

In the accompanying drawings:

Fig. 1 is a side elevational view of a machine constructed in accordance with this invention;

Fig. 2 is an elevation of the opposite side of one of the machines which is shown in Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 1; and

Fig. 4 is a longitudinal sectional detail showing the arrangement of the cutting portion of the knife and of related parts.

A machine constructed in accordance with this invention may comprise a frame 1 having side bars 3 which may be conveniently of angular cross section and which are supported by legs, 2, 2^a and 2^b, the side bars being connected by suitable transverse connecting elements. Such a machine may be provided with a single driving motor 4 provided with a sprocket 5 from which a chain 6 extends to a sprocket 7 (Fig. 2) on a transverse shaft 8. The shaft 8 also supports a pinion 9 which meshes with a gear 11 rotatable with a sprocket 12. A second sprocket is rotatable with the sprocket 12 and the gear 11 and drives a chain 20 which extends about a sprocket 21 mounted on a shaft 22. A second sprocket 23 on the shaft 22 drives a chain 24 extending about a large sprocket 25 on a transverse shaft 26. A roll 27 (Fig. 1) is mounted on the shaft 26 and the feeding belt 30 extends about this roll 27 at one end of the machine. A large gear 29 is also mounted on the shaft 26 and meshes with a gear 30^a which is arranged to drive a sprocket 31 and a chain 32 which in turn drives a sprocket 33 on a shaft 34. The latter supports an upper roll 35 about which the end portion of the presser belt 36 extends.

The shaft 8 extends across the machine and into a gear housing 13 at the opposite side of the machine from the driving motor 4. Suitable reduction gearing is provided in the housing 13 to drive a shaft 14 on which a sprocket 40 is located, Fig. 3. A short chain 41 extends about this sprocket and about a sprocket 42 rotatable with a pulley 45. The band knife 50 extends about this pulley 45 and about a correspondingly freely rotatable pulley 45^a at the opposite side of the frame 1.

The sprocket 12 drives a chain 16 and a sprocket 17 which in turn is connected to a sharpening disk 18 which rotates in a plane perpendicular to the direction of extent of the upper or cutting run of the band knife 50, the periphery of this disk engaging the edge of the band knife and thus sharpening the latter as it moves transversely above the upper run of the feeding belt 30.

The lower run of the belt 30 passes over a transverse bar 55 which extends between the frame members 3 at opposite sides of the machine, and the belt extends about a roll 56 at the end of the machine remote from the roll 27. The upper run of the belt 30 may incline upwardly from the roll 56 and may pass onto a metal apron 57 which extends beneath the cut-

ting portion of the knife **50** and to the region of the roll **27**. As shown, suitable adjustable supporting means **59** may be provided for the end of the apron **57** which is remote from the roll **27**, thus permitting some variation in the height of this portion of the apron and of the belt and consequent adjustment in the angular relationship of the cutting portion of the knife and the adjoining surface of the feeding belt.

The feeding belt **30** may be formed of any suitable material, but we prefer to employ a reticulated wire belt such as is disclosed in the above-identified Jones application. Suitable spray means (not shown) may be provided over the lower run of this belt in the manner shown in the above-identified application, if desired, thus to facilitate cleaning of the belt. The presser belt **36** may extend from the roll **35** about a roll **60** which is supported on a shaft **61** extending between the ends of arms **62**. The opposite ends of these arms are pivotally connected to uprights **64** so that the rolls **60** may move upwardly, but this upward movement is opposed by the weight of the roll and of the adjoining ends of the arms **62**.

Preferably, as shown, the pulleys **45** and **45a** are disposed in a plane which is inclined relative to the apron **57** and the adjoining portion of the belt **30**. The upper run of the band knife **50** accordingly is inclined at an angle to the adjoining portion of the belt, as shown in Fig. 4. Such an angle may conveniently be of the order of 15° to the adjoining portion of the upper run of belt **30**. This run of the band knife has a rear portion slidably received in a transverse slot in a knife guide **65** which has beveled surfaces inclining toward the cutting edge of the knife. The inclination of this knife guide corresponds to the inclination of the cutting run of the knife so that the upper portion of this guide is effective even when no fillets are passing through the machine in diverting the adjoining portion of the rubber presser belt **30** from the cutting edge of the knife. Thus accidental cutting of the presser belt itself is prevented.

Referring in more detail to the roll **60** it will be noted from an inspection of Figs. 1 and 4, that the cutting edge of the knife is disposed adjoining this roll but not directly beneath the axis of the same. The roll is, however, close enough to the knife to cooperate with the yieldable and elastic presser belt **36** in pressing the upper portion of the fish fillet downwardly so that its lower surface is pressed firmly against the planar surface of the feeding belt **30**. Accordingly, since the cutting edge of the knife is in closely parallel relation to this surface of the belt **30**, the knife may be effective in cutting a thin slice of uniform thickness from the irregularly shaped fillet. In fact the parts may be so positioned and adjusted that the thickness of this slice may be but little, if any, greater than the thickness of the skin itself. Accordingly, a machine of this type is adapted to skin fillets without substantial waste. The roll **60**, as shown in Fig. 3, preferably consists of a series of soft rubber disks **60a** which are held in place on the shaft **61** by metal end plates **69**.

When this machine is in operation, a fillet is disposed on the upper run of the feeding belt **30** in the region of the roll **56** and is carried by the belt over the metal apron **57** and beneath the presser belt **36** and the yieldable roll **60**. The manner in which the roll and belt are distorted as the fillet F passes beneath the same is illustrated in Figs. 3 and 4. The yieldable roll and the elastic nature of the belt itself cause the belt to be drawn downwardly in engagement with the irregularly convex upper surface of the fillet, thus distorting the same and pressing its lower surface downwardly so that it conforms to the planar surface of the lower belt. Accordingly the knife **50** may cut a thin uniform slice S from the body portion of the fillet, this slice passing beneath the knife **50** and the knife guide **65**, as shown in Fig. 4, while the fillet passes over the knife guide. The fillet and the slice or skin then pass along on the belt **30** over the roll **27**. The skin tending to cling to the belt may pass downwardly and drop into a suitable receptacle, not shown, while the fillet may be lifted therefrom.

It is evident that the present invention affords a simple, compact and convenient machine for slicing or skinning fish fillets or the like, and that such a machine is characterized by a particularly simple presser means adapted yieldably to press down upon substantially all portions of the upper surface of the irregularly shaped fillet.

We claim:

1. A slicing machine of the class described, comprising a knife providing a portion with a straight cutting edge, feeding belt means to carry an irregular distortable object to said knife portion, said means providing a surface in parallel juxtaposition to the knife edge, and an upper presser belt having a lower run above the feeding belt means in the region of the knife, said upper belt being formed of yieldable and readily stretchable material having the characteristics of rubber, the belt being arranged to conform to the irregular shape of the object and press it firmly against the said surface of the feeding belt means, and a yieldable roll disposed above the knife, the belt extending about said roll, the roll also being formed of resilient material having the characteristics of a rather soft rubber.

2. A slicing machine of the class described, comprising a knife providing a portion with a straight cutting edge, a feeding belt means arranged to carry an irregular distortable object to said knife portion, said means providing a surface in parallel juxtaposition to the knife edge, an upper presser belt of elastic resilient material arranged to conform to the irregular shape of the object and press it firmly against said surface of the feeding belt means, and a yieldable roll disposed above the knife, the belt extending about said roll, the roll being deformable when tension is imposed upon the belt as it conforms to an irregular object.

3. A slicing machine of the class described, comprising a knife providing a portion with a straight cutting edge, a feeding belt means arranged to carry an irregular distortable object to said knife portion, said means providing a surface in parallel juxtaposition to the knife edge, an upper presser belt of elastic resilient material arranged to conform to the irregular shape of the object and press it firmly against said surface of the feeding belt means, said knife being a band knife and having a run disposed at an angle of the order of 15° to the upper run of the feeding belt means, and a knife guide engaging the margin of the knife opposite its cutting edge and extending upwardly above the knife to divert the presser belt over the cutting edge of the knife.

4. A slicing machine of the class described, comprising a frame, a knife providing a portion with a straight cutting edge, a feeding belt means arranged to carry an irregular distortable object

to said knife portion, said means providing a surface in parallel juxtaposition to the knife edge, an upper presser belt of elastic material arranged to conform to the irregular shape of the object and press it firmly against said surface of the feeding belt means, a first and a second roll upon which the presser belt is mounted, said second roll being disposed above said knife but not directly over the same whereby the presser belt is drawn over the knife, and bars pivotally mounted on the frame and rotatably supporting said second roll, the weight of said second roll and of the adjoining portions of the bars tending to press the second roll yieldably downwardly so that a yieldable pressure is imposed by the elastic presser belt upon the portion of the irregular object being cut by the knife.

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