# United States Patent

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[54] **EXTENSION DOG SYSTEM FOR VENEER SLICER**


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[52] **U.S. Cl.** ..... **144/178,** 143/125 A

[51] **Int. Cl.** ..... **B27l 5/06**

[58] **Field of Search** ..143/125, 125 A, 126, 127, 128, 143/129, 130; 144/178–181, 162



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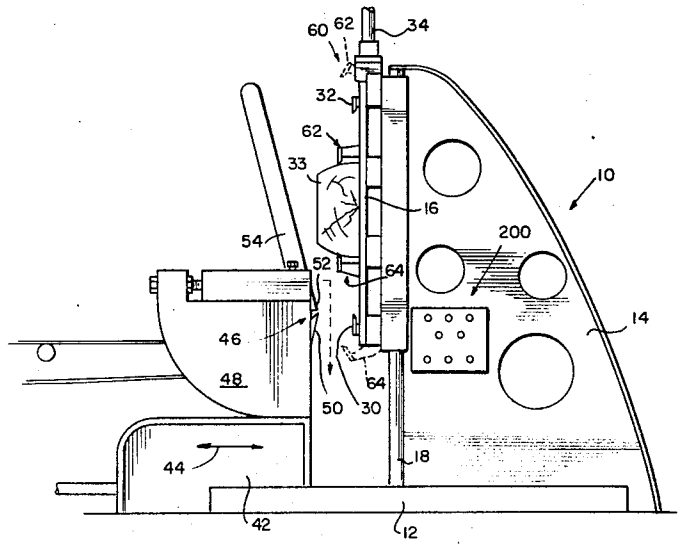
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[57] **ABSTRACT**

A veneer slicer comprising a flitch table providing a mounting surface, dogs for gripping a flitch at a first distance from the mounting surface, and a knife and pressure bar assembly movable along a path toward and away from the mounting surface, the flitch table being reciprocable between first and second opposite positions transversely relative to the path of the knife and pressure bar assembly. Extension dog assemblies are mounted on the flitch table and proportioned and designed to grip a flitch at a second and greater distance from the mounting surface, each extension dog assembly including opposing jaws positioned and designed to engage generally opposite portions of a flitch, means for guiding the jaws for movement toward the central portion of a mounting surface to their gripping positions and away from the central portion to their releasing positions, and power means for moving the opposing jaws between their respective gripping and releasing positions. The guiding means and power means are proportioned and designed such that, when the flitch table reciprocates between its opposite positions and the jaws are in their respective releasing positions, the jaws will not interfere with the knife and pressure bar assembly when it moves toward the mounting surface with the space defined by the said second distance.


**11 Claims, 4 Drawing Figures**



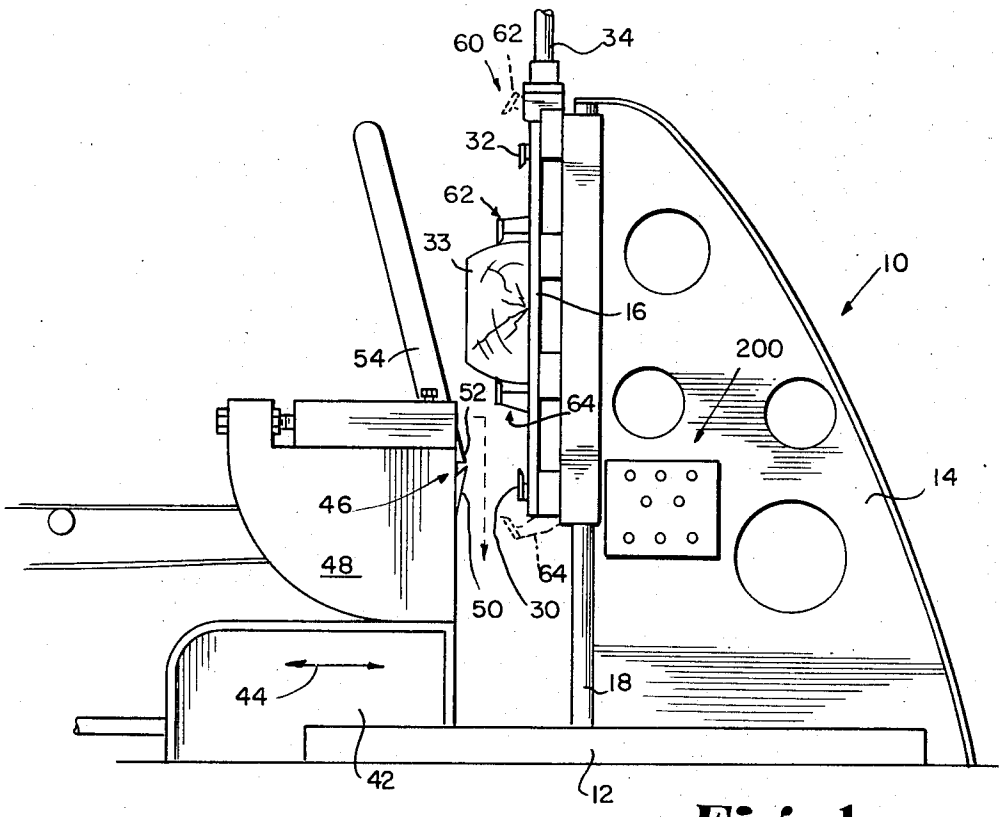



Fig. 1

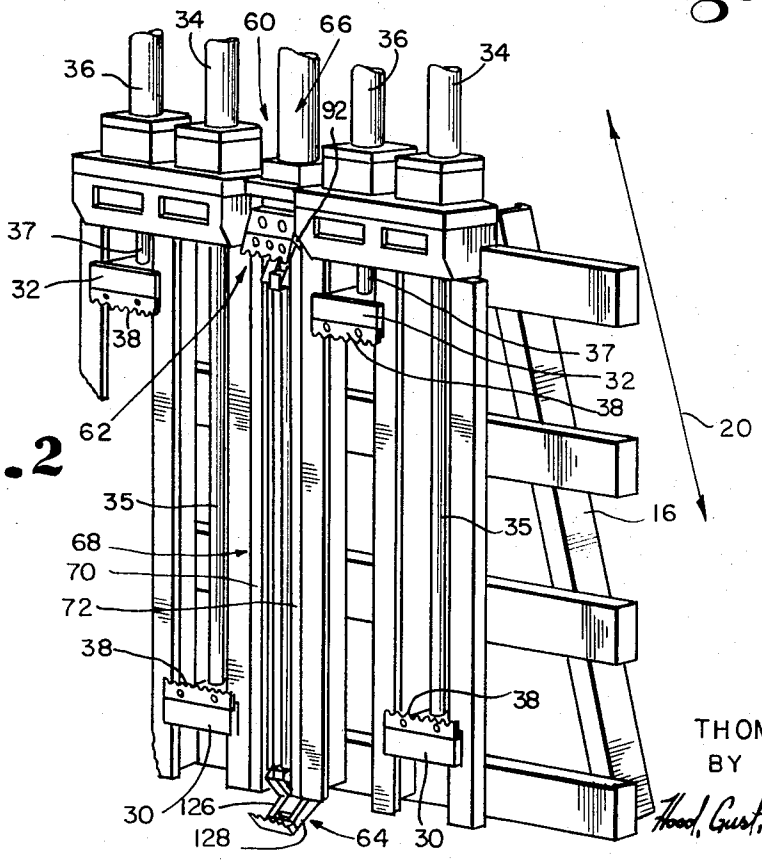



Fig. 2

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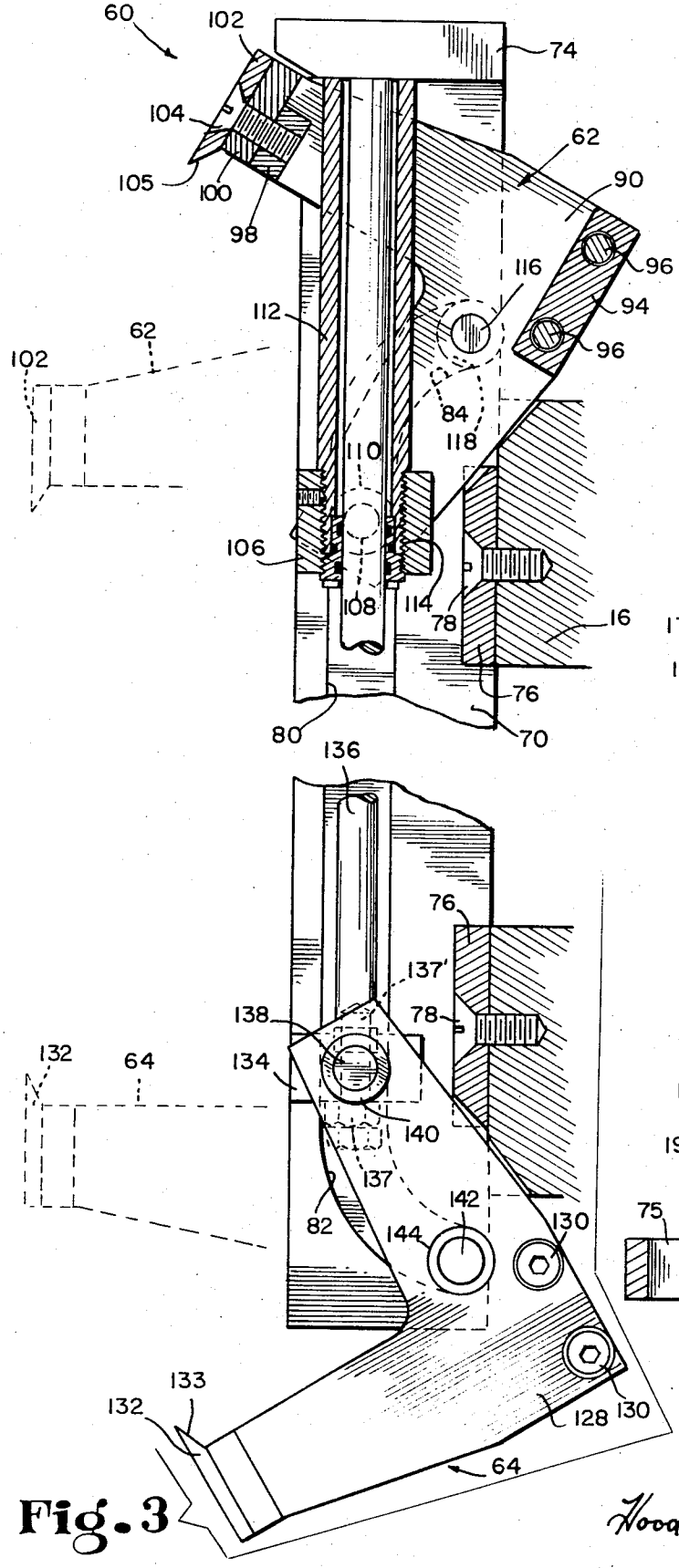



Fig. 3

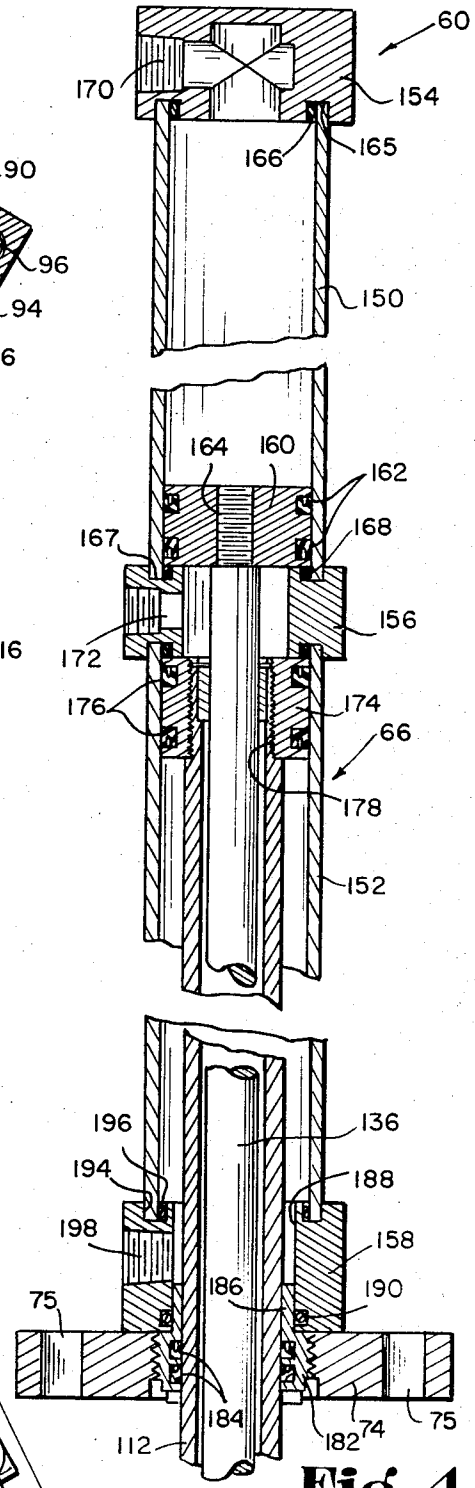



Fig. 4

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# EXTENSION DOG SYSTEM FOR VENEER SLICER

It is a primary object of my present invention to provide, for use on a conventional veneer slicer, a plurality of extension dog assemblies mounted on the flitch table of the slicer and proportioned and designed to grip a flitch at a greater distance from the mounting surface of the flitch table than the gripping distance of the dogs conventionally provided on the flitch table. My extension dog assemblies include opposing jaws positioned and designed to engage generally opposite portions of a flitch, means for guiding the jaws for movement toward the central portion of the flitch table to their gripping positions and away from the central portion to their releasing positions, and power means for moving the opposing jaws between their respective gripping and releasing positions. The guiding means and power means of my extension dog assemblies are proportioned and designed such that, when the flitch table reciprocates between its opposite positions and the jaws of the extension dog assemblies are in their respective releasing positions, the jaws will not interfere with the knife and pressure bar assembly when it moves toward the mounting surface of the flitch table and within the space defined by the jaws when they are in their gripping positions.

My extension dog assemblies are constructed so that their jaws can be moved from their gripping positions to their releasing positions during the slicing operation merely by operating a valve and without disturbing or halting the slicing operation.

Further, my extension dog assemblies are laterally narrow assemblies which can be inserted into laterally narrow spaces between the conventional dogs on a flitch table, each assembly including a vertically elongated rigid frame which is rigidly connected to the flitch table and the vertically extending members of which provide means for guiding the opposing jaws of my extension dog assemblies.

Other objects and features of my present invention will become apparent as this description progresses.

To the accomplishment of the above and related objects, my invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific construction illustrated and described, so long as the scope of the appended claims is not violated.

In the drawings:

FIG. 1 is a fragmentary elevational view of a veneer slicer on which my extending dog assemblies are mounted;

FIG. 2 is a fragmentary perspective view of a portion of the flitch table of the slicer of FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view showing the opposing jaws of one extension dog assembly and the means by which the opposing jaws are guided for movement between their gripping positions and releasing positions; and

FIg. 4 is a fragmentary enlarged sectional view showing my preferred power means for moving the jaws shown in FIG. 3.

Referring now to the drawings, and particularly to FIGS. 1 and 2, it will be seen that I have illustrated a veneer slicer 10 of conventional form comprising a base 12, flitch table supports 14 (only one of which is shown in the drawings), and a flitch table 16. This type of flitch table 16 and the means by which it is supported for reciprocation is well known and was disclosed as early as June 27, 1905 in U.S. Pat. No. 793,306 issued to Louis Koss. Particularly, the plurality of transversely spaced apart supports 14 provide guides such as indicated at 18 upon which the flitch table 16 reciprocates as indicated by the arrow 20 in FIG. 2. For reasons which are well known in the veneer slicing art, the table 16 reciprocates in a generally vertical plane, but the reciprocation is along a line inclined with respect to vertical.



Conventionally, a plurality of transversely spaced apart dogs 30, 32 for gripping a flitch 33 at relatively short distances from the mounting surface of the flitch table 16 and holding the flitch rigidly against a central portion of the mounting surface is provided. In the illustrated conventional system, the lower dogs 30 and the upper dogs 32 are guided for vertical reciprocation on the flitch table 16 and driven by hydraulic cylinders 34, 36, respectively. Conventionally, a flitch 33 is held against the central portion of the mounting surface of the flitch table 16 to extend longitudinally therealong and the lower dogs 30 are driven upwardly and the upper dogs 32 are driven downwardly to engage the flitch at a point approximately five-eighths inch from the mounting surface to hold the flitch rigidly against the mounting surface. The hydraulic cylinders 34, 36, and their respective piston rods 35, 37 are effective to drive the teeth potion 38 of the dogs 30, 32 into the flitch 33, the teeth portions being proportioned and designed to wedge the back surface of the flitch tightly against the mounting surface of the flitch table 16.

The slicer 10 includes a carriage 42 mounted on the base 12 for guided shiftable movement toward and away from the plane of reciprocation of the flitch table 16 as indicated by the arrow 44. The means by which the carriage 42 is shifted in the direction of the arrow 44 is well known and conventional. A knife and pressure bar assembly, indicated generally by the reference numeral 46, is mounted on the carriage 42 so that the assembly is movable along a path toward and away from the mounting surface of the flitch table 16. In the illustrated slicer 10, a member 48 (commonly called a skirt) is provided for supporting the knife 50 at a point just below the pressure bar 52, the pressure bar 52 being carried by an assembly 54 (commonly called a cap) which is adjustably movable on the skirt 48. This arrangement of a knife 50, pressure bar 52, skirt 48, a cap 54 are well known and disclosed, for instance in the early Koss U.S. Pat. No. 793,306 issued June 27, 1905 and a later Koss U.S. Pat. No. 3,441,069 issued Apr. 29, 1969.

From the description thus far, it will be appreciated that the flitch table 16 reciprocates transversely in a generally vertical plane relative to the path of the knife and pressure bar assembly 46 and between first and second opposite positions, i.e., its upper and lower positions. The knife 50 and pressure bar 52 move inwardly toward the flitch table 16 and the flitch 33 carried thereon. As the flitch 33 moves downwardly, the knife and pressure bar assembly 46 slices a thin sheet of veneer from the flitch. The assembly 46 is advanced step-by-step toward the flitch table 16, the distance of each step being approximately equal to the thickness of

the slice of veneer being cut and each step being completed before the table **16** begins to move downwardly. Means, not shown, are provided for tilting the assembly **46** rearwardly to permit the table **16** and the flitch **33** to move to its upper position from its lower position.

Conventionally, during the slicing operation, the assembly **46**, i.e., the cutting edge of the knife **50** and the contacting edge of the pressure bar **52** move toward the flitch table **16** to the point where the assembly is just to the left (FIG. **1**) of the plane defined by the movement of the dogs **30, 32**. Of course, further movement of the assembly **46** to the right (FIG. **1**) will bring the knife **50** and pressure bar **52** into contact with the reciprocating dogs **30, 32**, thereby damaging the knife **50**, pressure bar **52**, and dogs **30, 32**.

Thus, the portion of the flitch to the right (FIG. **1**) of the plane defined by the dogs **30, 32**, i.e., the portion of the flitch engaged by the dogs **30, 32**, conventionally cannot be sliced into veneer. For this reason, the distance from the mounting surface of table **16** at which the dogs **30, 32** engage the flitch **33** is kept at an absolute minimum because this distance establishes the amount of valuable flitch which cannot be sliced into veneer.

Often it is desirable to slice flitches which are extremely large and which are not so easily clamped by the conventional dogs **30, 32** which are spaced so closely to the mounting surface of the flitch table **16**. In other words, the conventionally spaced dogs **30, 32** often will not engage and grip a sufficient portion of a rather large flitch securely to fasten it to the flitch table **16**. Further, sometimes it is advantageous to slice a log which has not been split longitudinally to provide the relatively large flat bearing surface provided by the flitch **33** in FIG. **1**. In such a case, the log is usually cut to provide only a relatively small flat longitudinally extending surface which is placed against the mounting surface of the table **16**. When the dogs **30, 32** engage the log adjacent this rather small flat area, the vertical distance between the dogs **30, 32** is not as great as the diameter of the log and there is a considerable portion of the log extending outwardly from the mounting surface of the flitch table.

Further, some veneer slicers are using backing boards which are glued to flitches and which are engaged by the dogs **30, 32** so that the entire flitch can be sliced down to the plane at which the flitch is glued to the backing board. This procedure, of course, results in a greater number of veneer slices from a flitch because the glue plane between the flitch and the backing board is disposed to the left (FIG. **1**) of the vertical plane in which the dogs **30, 32** reciprocate. This concept of gluing flitches to backing members and then slicing down to the glue plane is disclosed in U.S. Pat. No. 3,295,571 issued Jan. 3, 1967 to Per Bork and in a subsequent U.S. Pat. No. 3,397,723 isSued Aug. 20, 1968 to David E. Hervey.

One of the problems with the gluing operation just described is that the person operating the veneer slicer is often concerned about whether or not the glue joint will hold during the slicing operation, especially when rather large flitches are glued to backing boards which are clamped to the flitch table. If the glue joint fails, the flitch could fall from the flitch table and damage the veneer slicer. My invention facilitates the slicing of large flitches, whole logs which have not been cut to provide a large flat bearing surface and flitches which have been glued to backing boards.

My invention, therefore, comprises extension dog assemblies mounted on the flitch table and proportioned and designed to grip a flitch at a distance from the mounting surface of the flitch table **16** greater than the gripping distance of the conventional dogs **30, 32**, the extension dog assemblies being retractable to a position such that they will not cross the path of the knife and pressure bar assembly **46** when the table **16** reciprocates.

My extension dog assemblies, one such assembly being indicated generally by the reference numeral **60** in the drawings, are proportioned and designed to be incorporated on flitch tables of veneer slicers of the type described above. The number of extension dog assemblies **60** utilized on a slicer will depend on the length of the slicer, i.e., the length of flitches which can be cut in the slicer. Further, my extension dog assemblies **60** are laterally narrow assemblies which can be inserted into laterally narrow spaces on the flitch table **16**, each assembly including a frame portion which is connected to the flitch table.

Each extension dog assembly **60** includes opposing jaws **62, 64**, power means **66** and guide means **68** for the jaws. The jaw **62** is the upper jaw and the jaw **64** is the lower jaw in the illustrative embodiment, the power means **66** including a hydraulic cylinder drive for the lower jaw and a hydraulic cylinder drive for the upper jaw as will be explained hereinafter.

The guide means **68** is provided by the main support frame of the assembly **60**, this frame including laterally spaced apart and vertically extending guide and frame members **70, 72**, which are rigidly connected together, for instance, by a cross bar **74** at their tops and cross bars **76** at their backs. The power means **66** is mounted on the cross bar **74** as best seen in FIG. **4**. The cross bar **74** may be provided with openings such as indicated at **75** through which fastening elements extend to engage, respectively, guide and frame members **70, 72**. The frame assembly just described may be rigidly attached to the flitch table **16** by means such as the illustrated fastening elements **78** which extend through the cross bars **76**.

The inwardly facing surfaces of the members **70, 72** are provided with allochirally arranged longitudinally extending grooves **80** having lower cured portions **82** and upper curved portions **84**, the groove **80** in the member **70** being shown in FIG. **3**. The function of these grooves **80** is to provide guides or ways for rollers, as will be more fully explained hereinafter.

The upper jaw **62** includes a pair of laterally spaced apart arm members **90, 92** which may be rigidly fastened together by means such as the illustrated back brace **94** (FIG. **3**) and fastening elements **96** and by the illustrated front braces **98, 100** to which the blade **102** is connected by means such as the illustrated fastening element **104**. It will be appreciated that the arm members **90, 92** and, for instance, the brace member **100** may be integrally formed such as by casting processes. The blade **102** is provided with a wedging surface **105** as illustrated.

I provide a block **106** from each side of which extends a trunnion **108**, the block and trunnions constituting first trunnion means for the jaw **62**. The arm members **90, 92** are mounted, respectively, on these trunnions **108** for rocking movement. The ends of the trunnions **108** extend, respectively, into the grooves **80** in the members **70, 72** and rollers **110** are journal mounted on the ends of the trunnions **108** to roll in the grooves **80**. A sleeve-type piston rod **112** of the power means **66** extends downwardly through the cross bar **74** to have its distal end threadedly engaged in a vertically extending opening in the block **106** as indicated at **114**.

Each arm member **90, 92** also carries a trunnion **116** which extends outwardly into the adjacent groove **80** in the member **70, 72** and a roller **118** is journal mounted on that trunnion **116** to roll in the groove, the trunnions **116** constituting second trunnion means for the jaw **62**. The grooves **80** have a rectangular cross section throughout their extent and the rollers **110, 116** have a similar but slightly smaller cross section so that the rollers can roll freely in the grooves.

The lower jaw **64** is provided by a pair of arm members **126, 128** which correspond to the arm members **90, 92** and which may be fastened together by cross bars and by fastening elements such as indicated at **130**. A blade **132** having a wedge surface **133** as illustrated is fastened to the arm members **126, 128**.

I provide a block **134** from each side of which extends a trunnion **138**, the block **134** and trunnions **138** constituting first trunnion means for the jaw **64**. The arms **126, 128** are journal mounted on these trunnions **138** for rocking movement. The outer end of each trunnion **138** extends into the adjacent groove **80** and a roller **140** is journal mounted on the outer end of each such trunnion. The rollers **140** correspond to the rollers **110** and roll, respectively, in the grooves **80** in the members **70, 72**. A trunnion **142** extends outwardly from each member **126, 128** into the adjacent groove **80** and a roller **144** corresponding to the roller **118** is mounted on each trunnion **142** to roll in the adjacent groove **80**, the trunnions **142** constituting second trunnion means for the jaw **64**.

The block **134** is rigidly connected to the distal end of a piSton rod **136** by means such as the illustrated screw **137** which extends through the block to engage the piston rod as indicated at **137'**.

Thus, each jaw **62, 64** is rockable about its associated trunnion **110, 138** axis and movable vertically along the coinciding axes of the piston rods **112, 136** which are parallel to the intermediate portions of the grooves **80**. In FIG. **3**, the jaws **62, 64** are illustrated in solid lines in their respective releasing positions. The jaws **62, 64** move from their respective releasing positions to their respective gripping positions shown in broken lines in FIG. **3**. In their releasing positions, the jaws **62, 64** are tilted rearwardly so that their blades **102, 132** are in a non-interference position relative to the knife and pressure bar assembly **46**. The jaw **62** is moved to its rearwardly tilted position as the sleeve-type piston rod **112** is reciprocated upwardly and the rollers **118** move upwardly about the curved portions **84** of the grooves **80**. Similarly, the jaw **64** is moved to its rearwardly tilted position when the piston rod **136** is reciprocated vertically downwardly and the rollers **144** move downwardly about the curved portions **82** of the grooves **80**. When the jaws **62, 64** move into engagement with a flitch, they are moving vertically along the path defined by the axes of the piston rods **112, 136** and the straight intermediate portions of the grooves **80**.

My illustrative power means **66** includes an upper hydraulic cylinder **150** and a lower coaxially arranged hydraulic cylinder **152** as best seen in FIG. **4**. I provide an upper end cap **154** closing the upper end of the upper cylinder **150**, an intermediate cap **156** closing the lower end of the upper cylinder **150** and the upper end of the lower cylinder **152** and a lower end cap **158** closing the lower end of the lower cylinder. A piston **160** conventionally provided with a pair of peripherally extending sealing rings **162** reciprocates in the upper cylinder **150** with the piston rod **136** threadedly engaged therewith as indicated at **164**. In the illustrative embodiment, the end cap **154** is provided with a peripherally extending slot **165** receiving the upper end of the cylinder **156** and a sealing ring **166** is disposed in the slot as illustrated. Similarly, the intermediate end cap **158** is provided with a peripherally extending a slot **167** receiving the lower end of the cylinder **150** and a sealing ring **168** is disposed in that slot as illustrated. A fluid access port **170** is provided in the end cap **154** and a port **172** is provided on the cap **156**. A piston **174** having a pair of peripherally extending sealing rings **176** is axially shiftable in the lower cylinder **152** with the sleeve-type piston rod **112** engaged therewith as indicated at **178**.

A fitting **182** is threadedly engaged in a concentric opening in the cross bar **74** as clearly seen in FIG. **4** with the eternal diameter of the fitting being provided with peripherally extending slots holding sealing rings **184** which engage the outer periphery of the rod **112**. The fitting **182** provides a peripherally and upwardly extending sleeve portion **186** which extends into a bore **188** of the lower end cap **158**, the bore **188** being provided with a peripherally extending slot holding a sealing ring **190** engaging the outer diameter of the sleeve portion **186**. The lower end of the cylinder **152** is received in a peripherally extending slot **194** in the end cap **158** and a peripherally extending sealing ring **196** is disposed in that slot. The end cap **158** is provided with a port **198** through which hydraulic fluid is admitted to the lower cylinder **152**.

When the pistons **160, 174** are in their positions illustrated in FIG. **4** and fluid is admitted under pressure to the port **172**, the piston **160** and piston rod **136** move vertically upwardly to move the jaw **64** from its lower, rearwardly tilted releasing position upwardly to its gripping position and the piston **174** and piston rod **112** move vertically downwardly to move the jaw **62** from its upper, rearwardly tilted releasing position downwardly to its gripping position.

The jaw **64** is returned to its lower, rearwardly tilted releasing position when hydraulic fluid under pressure is admitted to the cylinder **150** through the port **170** and the jaw **62** is returned to its upper, rearwardly tilted position when hydraulic fluid is admitted to the cylinder **152** through the port **198**.

In FIG. **1**, I show a control valve panel **200** which includes valves for controlling the pistons **160, 174**. The flow of hydraulic fluid through the cylinders **150, 152** may be controlled in a conventional manner which does not need to be described, in detail, herein.

My extension dog assemblies **60** are designed to be used in conjunction with the conventional dogs **30, 32**. Particularly, the flitch is placed against the mounting surface of a flitch table **16** by conventional hoist means or the like and then the flitch is engaged by the conventional dogs **30, 32** as well as by the jaws **62, 64** of the extension dog assemblies. The blades **102, 132** of the jaws **62, 64** engage the flitches at a distance of, for instance, four inches from the mounting surface of the flitch table **16** while the teeth portions **38** of the dogs **30, 32** engage the flitch at a distance of, for instance, five-eighths inch from the mounting surface of the flitch table. Then, the slicing operation can begin and the slicing of the flitch can continue until the knife and pressure bar assembly **46** approach the jaws **62, 64** at which time the jaws **62, 64** are retracted to their perspective releasing positions leaving the flitch held by the dogs **30, 32**. The jaws **62, 64** can be retracted from their gripping positions to their releasing positions without, in any manner, disturbing or halting the slicing operation.

The flitch table **16** is shown in its uppermost position in FIG. **1**. When the flitch table is in its uppermost position and the jaws **64** of the extension dog assemblies are in their lowermost position, the jaws **64** are still below and out of the path of the knife and pressure bar assembly **46**. Similarly, when the flitch table **16** is in its lowermost position and the jaws **62** of the assemblies **60** are in their releasing position, the jaws **62** are above and out of the path of the knife and pressure bar assembly **46**. Particularly, the guiding means **68** and power means **66** are proportioned and designed such that, when the flitch table **16** reciprocates between its opposite positions and the jaws **62, 64** are in their respective releasing positions, the jaws do not cross the path of the knife and pressure bar assembly **46** as the knife **50** and pressure bar **52** advance toward the mounting surface of the flitch table.

Conventionally, a person, commonly called a veneer cutter, supervises the operation of a veneer slicer and operates its controls to stop the advancement of the knife and pressure bar assembly **46** as well as the reciprocation of the flitch table **16** if anything goes wrong and especially when the knife and presSure bar assembly approach the plane of movement of the dogs **30, 32**. This person can operate the control panel **200** to move the jaws **62, 64** of the extension dog assemblies **60** to their respective releasing positions when the knife and pressure bar assembly **46** reaches a position relatively close to the plane of reciprocation of the blades **102, 132**. This movement of the jaws **62, 64** to their releasing positions can be accomplished by admitting hydraulic fluid to the ports **170, 198** of the power means **66** of each extension dog assembly **60**. This operation, of course, can be performed by operating a single valve or a pair or plurality of valves which are operated by a single lever or the like. Alternatively, a valve actuator, not shown, may be placed in a position to be operated by movement of the carriage **42** to a predetermined position relative to the plane of reciprocation of the blades **102, 132**, thereby automatically to retract the jaws **62, 64** to their releasing positions when the carriage strikes the actuator.

When the slicer equipped with my extension dog assemblies is being used to slice flitches glued to backing boards, the backing board of each flitch is gripped by the dogs **30, 32** while the flitch itself is gripped by the jaws **62, 64**. After the flitch has been sliced down to the point where the knife and pressure bar assembly **46** is approaching the plane of reciprocation of the blades **102, 132**, the jaws **62, 64** may be retracted to their releasing positions so that it is only necessary for the glue between the flitch and the backing board to support a flitch which is, for instance, approximately four inches thick.

My extension dog assemblies have been incorporated in a veneer slicer and used in the manner described above. The results obtained have been outstanding.

What is claimed is:

**1.** In a veneer slicer comprising a flitch table providing a mounting surface, dogs for gripping a flitch at a first distance from said mounting surface and holding the flitch securely against a central portion of said mounting surface, and a knife and pressure bar assembly movable along a path toward and away from said mounting surface, said flitch table being reciprocable between first and second opposite positions transversely relative to the path of said knife and pressure bar assembly, the improvement comprising extension dog assemblies mounted on said flitch table and proportioned and designed to grip a flitch at a second and greater distance from said mounting surface, each extension dog assembly including opposing jaws positioned and designed to engage generally opposite portions of a flitch, means for guiding said jaws for movement toward said central portion to their gripping positions and away from said central portion to their releasing positions, power means for moving said opposing jaws between their respective gripping and releasing positions, said guiding means and said power means being proportioned and designed such that, when said table reciprocates between said opposite positions and said jaws are in their respective releasing positions, said jaws will not interfere with said knife and pressure bar assembly when it moves toward said mounting surface within the space defined by said second distance.

**2.** The improvement of claim **1** in which each extension dog assembly includes a rigid frame providing a pair of spaced apart and parallel elongated members having facing inner surfaces, said surfaces being provided with allochirally related longitudinally extending grooves providing said guiding means, said opposing jaws being received between said members, trunnion means extending outwardly from said jaws into said grooves, and roller means journalled on each said trunnion means to roll in said grooves.

**3.** The improvement of claim **2** in which said flitch table reciprocates in a generally vertical plane and said frame is mounted on said flitch table to extend generally vertically, and in which said power means includes a lower generally vertically extending hydraulic cylinder mounted on said frame and an upper hydraulic cylinder coaxially mounted on said lower cylinder, a piston having a coaxially extending bore mounted for vertical reciprocation in said lower cylinder with a sleeve-type piston rod connected thereto to extend downwardly between said elongated members, a piston mounted for reciprocation in said upper cylinder with a second piston rod connected thereto to extend downwardly between said elongated members coaxially through said bore in said first-mentioned piston and

said sleeve-type piston rod, said opposing jaws including a lower jaw connected to the distal end of said second piston rod and an upper jaw connected to the distal end of said sleeve-type piston rod.

4. The improvement of claim 3 in which each groove includes a straight vertically extending intermediate portion and an upper portion curved rearwardly away from said knife and pressure bar assembly and a lower portion curved rearwardly away from said knife and pressure bar assembly, said rearwardly curved portions defining said releasing positions respectively of said jaws.

5. The invention of claim 4 in which said trunnion means includes, for each said jaw, a first horizontally extending trunnion means, the distal ends of which extend into said grooves and on which said jaw is mounted for rocking movement, and second horizontally extending trunnion means rigidly connected to said jaw and the distal ends of which extend into said grooves, the second trunnion means of said upper jaw being movable into said upper curved portions to tilt said upper jaw about is first trunnion means rearwardly to its releasing position and the second trunnion means of said lower jaw being movable into said lower curved portions to tilt said lower jaw about its first trunnion means rearwardly to its releasing position.

6. The invention of claim 5 in which the first trunnion means of said lower jaw if rigidly connected to the distal end of said second piston rod and the first trunnion means of said upper jaw is rigidly connected to the distal end of said sleeve-type piston rod.

7. The invention of claim 6 in which the second trunnion means of said upper jaw is disposed above its said first trunnion means and the second trunnion means of said lower jaw is disposed below its said first trunnion means.

8. The invention of claim 7 in which the coinciding axes of said piston rods are parallel to the intermediate portions of said grooves and in a common generally vertical plane with the axes of said first trunnion means.

9. The improvement of claim 1 in which each extension dog assembly includes a rigid frame providing a pair of spaced apart and parallel elongated guide members receiving therebetween and guiding said opposing jaws, in which said flitch table reciprocates in a generally vertical plane and said frame is mounted on said flitch table to extend generally vertically, and in which said power means includes a lower generally vertically extending hydraulic cylinder mounted on said frame and an upper hydraulic cylinder coaxially mounted on said lower cylinder, a piston having a coaxially extending bore mounted for vertical reciprocation in said lower cylinder with a sleeve-type piston rod connected thereto to extend downwardly between said elongated members, a piston mounted for reciprocation in said upper cylinder with a second piston rod connected thereto to extend downwardly between said elongated members coaxially through said bore in said first mentioned piston and said sleeve-type piston rod, said opposing jaws including a lower jaw connected to the distal end of said second piston rod and an upper jaw connected to the distal end of said sleeve-type piston rod.

10. The improvement of claim 2 in which said flitch table reciprocates in a generally vertical plane and said frame is mounted on said flitch table to extend generally vertically and in which each groove includes a straight vertically extending intermediate portion and an upper portion curved rearwardly away from said knife and pressure bar assembly and a lower portion curved rearwardly away from said knife and pressure bar assembly, said rearwardly curved portions defining said releasing positions respectively of said jaws.

11. The improvement of claim 10 in which said opposing jaws include a lower jaw and an upper jaw, and in which said trunnion means includes, for each said jaw, a first horizontally extending trunnion means, the distal ends of which extend into said grooves and on which said jaw is mounted for rocking movement, and second horizontally extending trunnion means rigidly connected to said jaw and the distal ends of which extend into said grooves, the second trunnion means of said upper jaw being movable into said upper curved portions to tilt said upper jaw about its first trunnion means rearwardly to its releasing position and the second trunnion means of said lower jaw being movable into said lower curved portions to tilt said lower jaw about its first trunnion means rearwardly to its releasing position.

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# UNITED STATES PATENT OFFICE
# CERTIFICATE OF CORRECTION

Patent No. 3,680,612 Dated August 1, 1972

Inventor(s) Thomas F. Hale

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Abstract, line 25, "with" should be -- within --.
Column 1, line 49 after the Title, "extending" should be -- extension --.
Column 2, line 30, "potion" should be -- portion --; line 49, "a" (last occurrence) should be -- and --.
Column 4, line 49, "cured" should be -- curved --.
Column 6, line 22, delete "a" (last occurrence); line 26, "on" should be -- in --; line 33, "eternal" should be -- internal --.
Column 7, line 16, "per-" should be -- re- --; line 64, "the" should be -- a --.
Column 9, line 28 (Claim 6, line 2), "if" should be -- is --.

Signed and sealed this 2nd day of January 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patent