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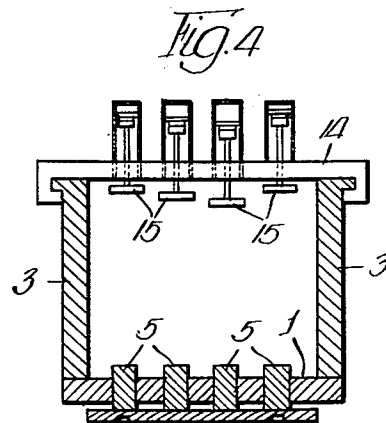
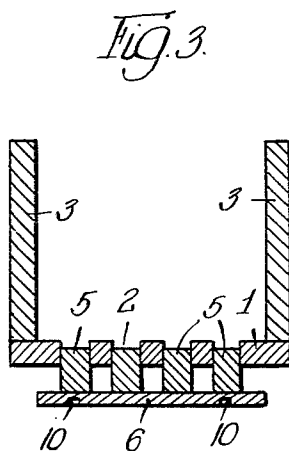
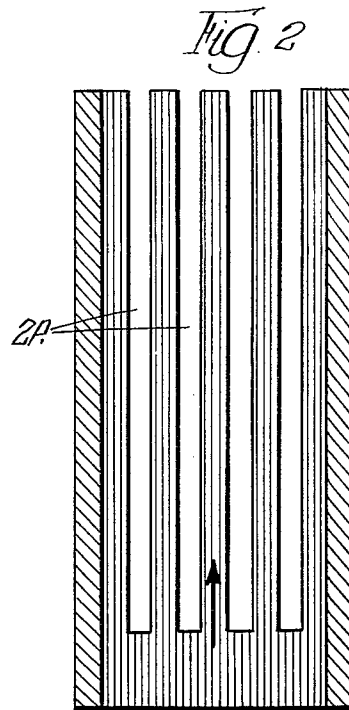
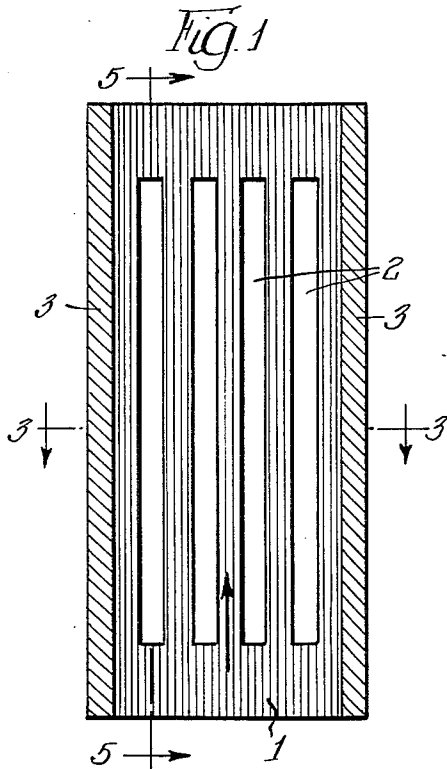
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2,940,490

DEVICE FOR FEEDING WOOD INTO CUTTING MACHINE

Filed Sept. 17, 1957

2 Sheets-Sheet 1



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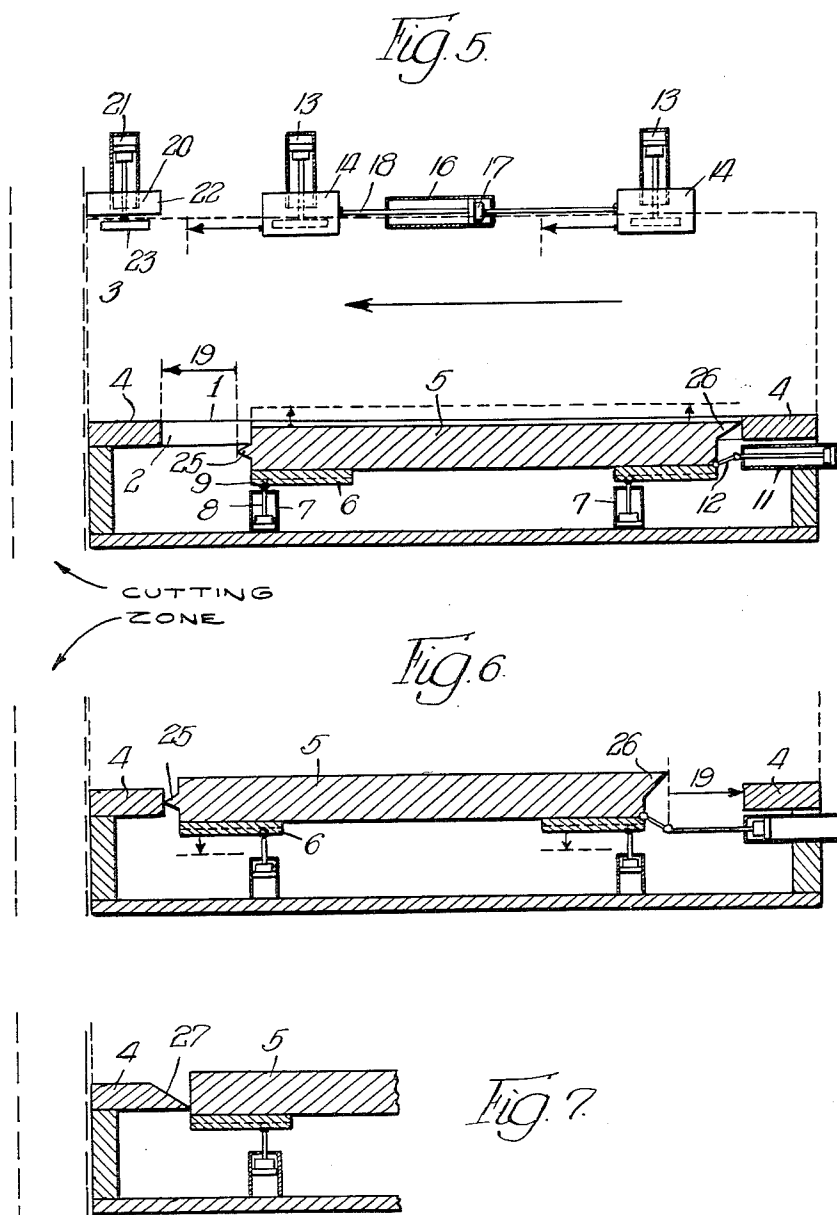
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DEVICE FOR FEEDING WOOD INTO CUTTING MACHINE

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2 Sheets-Sheet 2



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DEVICE FOR FEEDING WOOD INTO CUTTING MACHINE

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2 Claims. (Cl. 144—242)

This invention relates to feeding devices for projecting wood members into the cutting zone of a machine that cuts the wood into shavings, and has for its principal object the provision of a new and improved device of this kind.

It is a main object of the invention to provide a wood feeding device in which a stack of wood is firmly clamped prior to being fed into the cutting zone of a machine and is maintained lightly clamped and held stationary throughout the cutting operation.

Another object of the invention is to provide a wood feeding device that advances a stack of wood step by step in steps of uniform length, thereby to project the leading end of the stack into the cutting zone of a machine a fixed distance that is constant with each operation of the device.

Another object of the invention is to provide a wood feeding device that is of simple construction which can be operated and maintained economically.

Devices for feeding wood into cutters usually consist of a troughlike frame that is open at both ends and also at the top. The wood to be cut up into shavings is placed in this trough with its longer dimensions lengthwise thereof and then advanced periodically therethrough so as to extend beyond the forward end of the trough a fixed distance. The wood in the trough is then clamped and a cutter or shaving tool, which moves transversely of the trough or vertically with respect thereto, or in both of these directions, is brought into engagement with the projecting end of the wood to cut it into shavings. After the thus projecting end of the wood has been completely cut into shavings, the clamping pressure is removed and the frame of the feeding device moved backwardly into position to again advance the wood contained in it beyond the end of the feeding device and into the zone of travel of the cutter.

Devices of this kind, in the prior art of which I am aware, have clamped the wood in the feeding device by moving the side members of the troughlike device laterally thereby to apply pressure upon the wood therein. While thus clamped, these side members and the wood have been advanced longitudinally. Other clamping means located adjacent the cutting zone have then applied pressure to the wood in a vertical direction.

Also in the prior art of which I am aware, the wood to be cut up into shavings has been supported upon rollers or traveling belts or chains and moved forwardly thereby during the feeding cycle of the device. Since in these rollerlike devices an appreciable distance must be provided between the cutting zone and roller next thereto, a fixed plate has been provided at this point. Clamping pressure has been applied in a vertical direction to the material on this plate during the shaving operation.

Neither of these prior art arrangements has been altogether satisfactory, particularly when short pieces of wood are involved. Oftentimes sufficient friction is present to interfere with the intended movement of the

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wood through the feeding device and jamming has resulted.

The device of the present invention seeks to eliminate the difficulties present in the prior art devices by providing a feed trough having a floor or bottom formed as a grid that has slots extending longitudinally of the device. Support rods, which are shorter than the slots in the floor of the device, are fitted in these slots and are fixed together as a unit. The feeding device has side members which are fixed on the two longitudinal sides of the floor and extend thereabove forming a trough which is open at both ends and at the top.

Wood to be reduced to shavings is laid in this trough with its longer dimensions extending longitudinally thereof, care being taken to fit together the individual pieces of wood as closely as possible. When it is desired to advance this wood toward the cutting zone, the rods are elevated by suitable means, such as fluid pressure cylinders acting directly or through toggle levers, cams or the like, so as to raise the wood off of the floor of the trough.

Overhead clamps are then operated to apply pressure vertically on the wood to clamp it securely upon the rods. These overhead clamps may also be actuated by fluid pressure cylinders acting directly or through toggle levers, cams or the like. The overhead clamps are mounted so as to be movable longitudinally of the trough.

Other fluid pressure cylinders are then activated to move the rods, the clamps, and the wood clamped therebetween longitudinally in the trough thereby to project the leading end of the wood into the cutting zone.

Clamping devices, preferably also actuated by fluid pressure cylinders, are located adjacent the cutting zone and apply pressure in a vertical direction to the wood in the trough. If desired, the rods can be lowered to lower the wood onto the floor of the trough. The overhead clamps are maintained operated so that, during cutting, the wood is clamped immediately adjacent the cutting zone and also at several points rearwardly thereof.

The cutters by which the thus projecting ends of the wood are cut into shavings may move transversely of the trough or vertically with respect thereto, or both transversely and vertically as desired. Since the wood is firmly clamped during cutting, chattering thereof is eliminated. When the entire projecting end of the wood has been cut into shavings, the fluid pressure cylinders by which the rods were elevated, are de-activated, permitting the rods to retract into the floor of the trough, if it has not already been so retracted, and the overhead clamps are released. The clamps adjacent the cutting zone are maintained operated. The fluid pressure cylinders by which the rods and the overhead clamps were advanced longitudinally are then operated in a reverse direction to back up the rods and overhead clamps which are at this moment not in engagement with the wood in the trough since that wood is now supported upon the floor of the trough, and the overhead clamps are raised off of the wood.

When the rods and overhead clamps have thus been returned to their initial position, the vertically applied pressure adjacent the cutting zone is released and the rods again elevated, the overhead clamps again operated, and both are advanced forwardly to advance a new length of wood in the trough into the cutting zone.

Preferably the slots in the floor of the trough are rectangular in cross section and the rods are likewise rectangular in cross section and disposed with their longer sides vertically. When retracted into the slots, the tops of the rods are disposed a short distance below the upper surface of the floor of the trough. When in elevated

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position, the rods are guided by the engagement of their longer sides with the walls forming the sides of the slots in the floor. Through this arrangement random lengths and widths of wood can be fed into the cutting zone and securely held therein during the cutting operation. Jamming of the wood in the feeding device is thereby eliminated.

The invention will be best understood by reference to the drawings in which a preferred embodiment of the invention is shown by way of example and in which:

Fig. 1 is a plan view of the feed trough of the present invention;

Fig. 2 is a view similar to Fig. 1, showing a slightly modified form of trough;

Fig. 3 is a cross sectional view taken along the line 3—3 of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a view similar to Fig. 3, showing the rod assembly elevated and also showing an overhead clamp mounted upon the trough;

Fig. 5 is a cross sectional view along the line 5—5 of Fig. 1, looking in the direction of the arrows and showing all apparatus in unoperated position;

Fig. 6 is a fragmentary view similar to Fig. 5, showing the support rods elevated and fully advanced; and

Fig. 7 is a fragmentary view similar to Fig. 6, showing a modified form of the end plate of the trough.

Referring now to the drawings in more detail, the feeding device of the present invention consists of a floor 1 containing a plurality of longitudinally extending slots 2, and side members 3 which upstand from the edges of the floor 1 forming therewith a troughlike member that is open at both ends and on the top. The slots 2 in the floor preferably do not extend from end to end of the floor 1, but rather cross portions 4 (Figs. 5 to 7) of the floor are disposed adjacent its ends. If desired, the slots may extend to the forward or cutting end of the trough, as shown at 2a in Fig. 2.

Located in the slots 2 are rods 5 which are secured together as a unit by cross members 6. As will be seen best in Fig. 5, the rods 5 are shorter than the slots 2 in which they are disposed.

Provisions are made for raising the assembly of rods 5 vertically and also for moving the rods longitudinally in the slots 2. To this end, as will be seen in Fig. 5, fluid pressure cylinders 7 may be provided and the pistons of these cylinders connected to piston rods 8 which terminate in rollers 9 that fit in grooves 10 in the cross members 6. When fluid pressure is admitted to the cylinder 7, the pistons rise therein elevating the unit of rods 5. As will be seen in Fig. 3, when in their lowermost positions, the upper surfaces of rods 5 are disposed slightly below the upper surface of the floor 1. It will be noted that the rods are of rectangular cross section and that they fit snugly against the side walls of the slots 2 in the floor 1. When the unit has been raised to a maximum extent, the upper edges of the rods 5 are disposed above the upper surface of the floor 1 in the manner shown in Fig. 4.

In order to move the assembly of rods 5 longitudinally of the floor 1, there is provided another cylinder 11, the piston rod of which is connected by a suitable link 12 to the adjacent cross member 3. Movement of the piston in the cylinder 11 responsive to the admission of fluid pressure thereto will move the cross member and rods carried thereby longitudinally of the floor 1 from the position shown in Fig. 5 into the position shown in Fig. 6.

When it is desired to feed wood that is to be cut into shavings into the cutting zone of the machine, that wood is placed on the floor 1 in the trough with its longer dimensions extending longitudinally therein. After the trough has been filled with wood, fluid pressure is admitted to cylinders 7 thereby to raise the rods 5 which support the stack of wood off of the floor 1 of the trough.

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The feed device of the present invention is also preferably provided with overhead clamps consisting of cylinders 13 supported upon suitable supports 14 which may be movably secured on the side walls 3 of the trough in the manner shown in Fig. 4. Each cylinder 13 carries a piston and rod, and on the lower ends of the rods presser bars 15 are installed. After the rods 5 and wood carried thereby have been elevated off the floor of the trough, fluid pressure is admitted to the cylinders 13, operating them to force the presser feet downwardly onto the upper surface of the stack of wood. Thus the wood that is to be advanced is securely clamped between the rods 5 and the overhead clamps.

In order to move the overhead clamps longitudinally of the trough, a fluid pressure cylinder 16 is provided and the piston 17 of this cylinder connected by rods 18 to the supports 14 that carry the overhead clamp assemblies. The load of wood now being elevated and clamped, fluid pressure is admitted simultaneously to the cylinder 11 and cylinder 16, and the rods 5, the overhead clamps and the wood secured therebetween are moved forwardly a fixed distance, as indicated at 19 in Fig. 5.

Through this movement, the forward end of the wood is projected beyond the forward end of the feed trough and into the zone of cutting of the machine that is to reduce this wood to small shavings. Located at the forward end of the trough is a fixed overhead clamp 20 consisting of fluid pressure cylinders 21 carried upon a cross member 22 which corresponds in structure and mounting to the cross member 14, except that the support 22 is fixed with respect to the side walls 3 of the trough. The pistons of cylinders 21 carry presser bars 23 which are forced into engagement with the upper surface of the stack of wood in the trough.

If desired, fluid pressure may be maintained in the cylinders 7 during the cutting operation; however, preferably the pressure in these cylinders is exhausted, permitting the rods 5 to descend and thereby lower the load of wood on the floor 1 of the trough. During cutting, fluid pressure is maintained in the cylinders 21 and 13 thereby to securely clamp the stack of wood on the floor 1 of the trough. Through this arrangement uniform cutting of the projecting ends of the wood into shavings by the shaving machine is accomplished without chatter.

When the end of the wood in the cutting zone has been completely reduced to shavings, fluid pressure is released from the overhead clamps and if the rods 5 have not already been lowered they are then lowered out of engagement with the wood in the trough. Fluid pressure is then admitted to the cylinders 11 and 16 in the opposite direction to move the overhead clamps and rods 5 back into the normal position in which they are shown in Fig. 5. It will be noted that the ends of the rods 5 remote from the cutting zone, abut against the cross portion 4 of the floor 1 located at the remote end of the trough. After the overhead clamps and rods 5 have thus been restored to normal, fluid pressure is admitted to cylinder 7 to again raise the rods 5 above the level of the floor 1. Fluid pressure is then released from the stationary clamp 20 and fluid pressure is again admitted to the overhead clamp cylinders 13 to re-clamp the stack of wood on the rods. Fluid pressure is then again admitted to cylinders 11 and 16 to push forward the wood another step thereby again projecting it into the cutting zone. Since the length of longitudinal travel of the support rods 5 is fixed as shown at 19, and since the wood is securely clamped to those rods during forward movement thereof, the amount of wood projected into the cutting zone with each cycle of operation of the feed device is uniform.

Since the wood to be advanced into the cutting zone is raised off of the floor of the trough by the rods 5 during the forward movement of this wood, and since the wood is securely clamped on these rods by the overhead clamps during the advance thereof, short pieces

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of wood which have caused trouble heretofore can be successfully reduced to shavings with the device of the present invention. Because of this clamping of the wood during movement thereof, and further clamping adjacent the zone of cutting during the cutting operation, the cross section of the trough can be larger than has been possible heretofore, and in addition scrap veneers and the like can be reduced to shavings successfully in the device. Since the cross sectional area of the trough can be made larger than has been possible heretofore, the capacity of the cutting machine to produce shavings can be increased without increasing the distance which the wood is projected into the cutting zone.

It will be noted in Figs. 5 and 6, that the forward ends of the rods 5 contain wedgelike projections 25 which abut against the cross member 4 of the floor when the rods are in their foremost position. Through this arrangement, any small pieces of wood which may have fallen into the slots at the ends of the rods 5, when those rods were in retracted position, will be squeezed out by the wedge 25 and jamming of the feed device thereby prevented. It will also be noted that at the opposite or rear ends of the rods 5, wedgelike projections 26 are provided, and these projections function in the same manner against the cross member 4 at the rear of the trough.

If desired, the ends of the rods 5 may be square, as shown in Fig. 7, and wedges 27 provided on the cross members 4 with the same result.

While fluid pressure cylinders and pistons are preferred as a means for raising the rods 5 and moving the same longitudinally, and also for operation of the overhead clamps, other equivalent devices, such as levers or cams, may be employed within the teachings of the invention. Fluid pressure cylinders equipped with presser feet such as shown in Fig. 4 are advantageous in that uniform pressure is applied to the wood, notwithstanding that there may be variations in the height of that wood in the trough.

While I have chosen to illustrate my invention by showing and describing a preferred embodiment of it, I have done so by way of example only, as there are many modifications and adaptations which can be made by one skilled in the art within the teachings of the invention.

Having thus complied with the statutes and shown and described a preferred embodiment of my invention, what I consider new and desire to have protected by Letters Patent is pointed out in the appended claims.

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What I claim is:

1. A device for feeding wood members into the cutting zone of a wood shaving machine which comprises: a trough open at both ends and on the top and consisting of a floor with side members upstanding from the sides of the floor, there being a plurality of longitudinally extending slots in said floor the ends of which slots are defined by portions of the floor at the ends of the trough; a plurality of support rods fitted one in each of said slots, said rods being shorter than the slots; means securing said rods together as a unit; means for elevating said unit to position the upper surfaces of the rods above the upper surface of the floor; fluid pressure means for moving said unit longitudinally of said trough; and movable overhead fluid pressure clamps comprising a plurality of individual units operable to bind the wood uniformly on the rods during movement of the wood longitudinally in the trough.

2. A device for feeding wood members into the cutting zone of a wood shaving machine which comprises: a trough open at both ends and on the top and consisting of a floor with side members upstanding from the sides of the floor, there being a plurality of longitudinally extending slots in said floor the ends of which slots are defined by portions of the floor at the ends of the trough; a plurality of support rods fitted one in each of said slots, said rods being shorter than the slots; means securing said rods together as a unit; means for elevating said unit to position the upper surfaces of the rods above the upper surface of the floor; fluid pressure means for moving said unit longitudinally of said trough; and an overhead fluid pressure clamp consisting of a plurality of individual units fixedly disposed adjacent the cutting zone of the machine and operable to clamp the wood during cutting and to hold the wood during the return to normal movement of the rod.

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