July 8, 1930. C. J. A. JOHNSON 1,770,106

PLANING MACHINE PROVIDED WITH FIXED KNIVES DRAWERS

Filed June 20, 1927

Fig: 1.

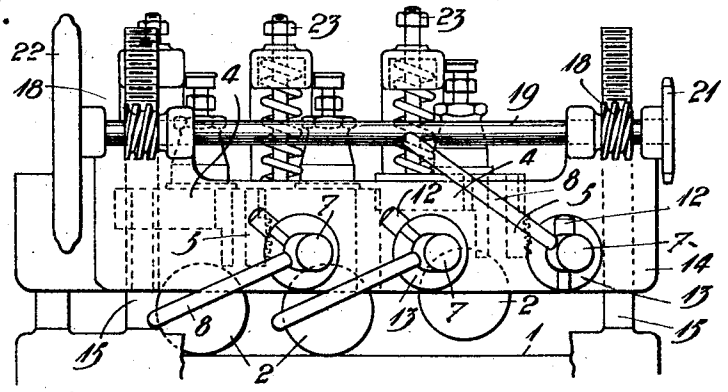


Fig: 3.

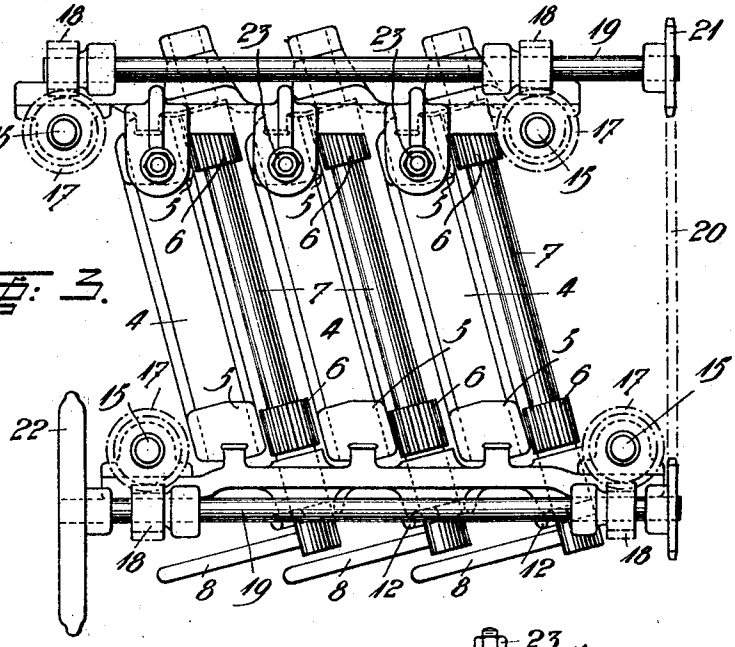
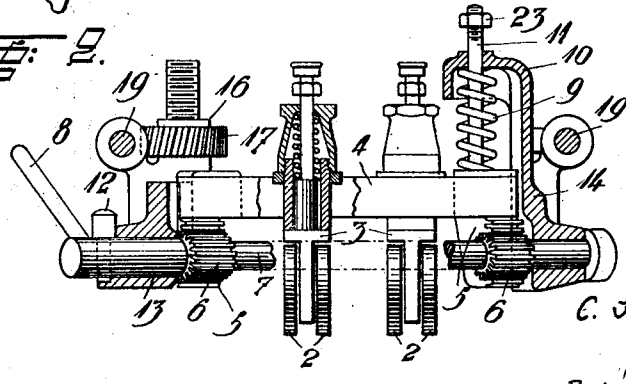


Fig: 2.



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UNITED STATES PATENT OFFICE

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PLANING MACHINE PROVIDED WITH FIXED-KNIVES DRAWERS

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In planing machines provided with fixed-knives drawers, each planing knife in the drawer or the drawers cooperates with spring actuated pressure rollers, which during the planing operation bear on that side of the wood material which is opposed to that of the planing knives, and keep such material pressed against the working plane, particularly near the cutting edges of the knives, in front of the same. The rollers are mounted in spring actuated spindles adapted to be displaced in beams which, in turn, are spring loaded at or near their ends, so that the beams will be acted upon, together with the rollers, in a direction against the drawers.

In order to make it possible to adapt the roller pressure on each one of the rollers either uniformly or in some other way, in accordance with different widths of material, the spring loads must be accurately adjusted at or near the ends of the beams. This adjustment requires great practice and may often be connected with difficulty, so much more so as readjustments are not infrequently required. Consequently, removal of a drawer for regrinding or readjustment of the planing knife cannot be effected, without the pressure rollers being relieved, that is to say, the beam with the rollers must be removed from the drawer, which generally cannot take place, without the springs adapted to actuate the beam being relieved. When the rollers are then to be set anew, the springs have to be readjusted with respect to the tension.

The present invention provides an arrangement, through which all such readjustment is dispensed with.

The invention is principally characterized by the fact that the beam carrying the pressure roller or rollers corresponding to a planing knife in the knife drawer is connected, in order to be moved in a direction toward or from the drawer, with a gearing so devised that the beam can be moved by the same in the manner set forth, in parallel to itself, that is to say, in such a manner that on approaching the beam to the drawer or on removing the same therefrom, all of the pressure rollers will be set in the same degree in a direction against the drawer, or be relieved to the same extent in a direction from the drawer. Therefore, no adjustment of the position of the beam per se need be reckoned with.

Preferably, the arrangement is devised so that the beam is connected at or near its ends with toothed racks engaged by pinions attached to one and the same shaft adapted to be turned by means of a lever or the like. Thus, the beam can be moved in parallel to itself simply by turning the shaft, while it is being actuated by its spring load which, in the form of a single spring, need only be provided at the one end of the beam.

In addition, the invention comprises an arrangement by means of which the whole group of pressure rollers can be removed from the drawer or the drawers, without the adjustment of the spring load on the beams having to be altered.

The accompanying drawings illustrate an embodiment of the invention disclosed by way of example. Fig. 1 shows the apparatus viewed from the side of the planing machine, Fig. 2 the arrangement viewed in the longitudinal direction of the machine, and Fig. 3 the arrangement viewed from above.

1 designates the working plane of the planing machine, beneath which plane the knife drawer or drawers (not shown in the drawing) provided with the planing knives are arranged with the cutting edges of the knives intersecting the working plane. 2 are the pressure rollers, which according to Fig. 2 are journalled in pairs in spring loaded spindles 3 adapted to be displaced up and down in beams 4. According to Fig. 2, each beam carries two pressure rollers or pairs of rollers 2, and according to Fig. 1, three such beams are provided, corresponding to three planing knives situated therebeneath and attached in one and the same drawer or each in a separate drawer. Attached to the ends of each beam are toothed racks 5 cooperating with pinions 6 secured on a common shaft 7 having a lever 8 attached to the outer end thereof. Provided at the one end of the beam 4 is a spring 9 inserted between the beam and a support 10 which also serves as a guide

for the spindle 11 attached to the beam, said spindle having the spring 9 threaded thereon. Screwed onto the upper threaded end of the spindle 11 is a nut 23 which serves as an abutment to prevent the beam from being lowered underneath a certain limit, for instance, when a space is produced between the ends of two boards fed the one after the other, into which space the rollers 2 may sink down.

If either one of the beams 4 is to be raised with its pressure rollers 2, it is only necessary that the corresponding lever 8 be swung upwards, as shown in Figs. 1 and 2, the pinions 6 then uniformly actuating the racks 5 and also raising the beam uniformly at every point along the whole of its length.

The beam is locked in its raised position by means of a cotter which is loosely threaded through a transversal opening in the shaft 7 and adapted to fall into a recess in the hub 13. When the beam is thus raised, the spring 9 is compressed, and when by releasing the cotter 12 the beam will again become free for being lowered, it is actuated for such lowering by the spring 9, the lowering then taking place uniformly along the whole length of the beam, which is also effected through the medium of the toothed racks 5 and the pinions 6.

The frame 14 carrying all of the beams 4, the shafts 7 and the pressure rollers 2, is displaceable up and down on four posts 15 secured in the frame of the machine. The upper portions of these posts are formed into screws having nuts 16 adapted to be screwed thereon, said nuts being rotatable in the frame 14 and formed into worm wheels 17 cooperating with worms 18 attached to shafts 19. Both of these shafts are in driving connection with each other through the medium of a chain 20 and sprocket wheels 21. Attached to the one shaft 19 is the hand wheel 22. When this wheel is turned, all of the nuts 17 are turned by the same amount, and the whole frame 14, together with the parts mounted therein, is raised and lowered uniformly, that is to say in such a manner that readjustment of the pressure action of the separate pressure rollers is not required. Setting or relieving of the pressure rollers in accordance with different thicknesses of material can thus be effected without adjustment of the pressure action of the pressure rollers.

What I claim is:—

1. A planing machine provided with fixed knives, pressure rollers for said knives, beams supporting said rollers, a frame supporting said beams, toothed racks rigidly connected at the ends of each beam, shafts journalled in said frame, pinions on said shafts and engaging said racks for controlling the vertical movement of the beams in the frame and means for adjustably securing the frame to the planing machine comprising screw threaded posts mounted on the planing machine in parallel spaced relation, nut members mounted on said frame and rotatably secured to said frame, and means to simultaneously rotate said nut members to move the same up or down said posts whereby the frame, the beams and the rollers can be adjusted towards and from said knives, substantially as and for the purposes set forth.

2. In a planing machine as claimed in claim 1, means for mounting said beams on said frame comprising brackets on said frame, spindles secured to said beams slidably mounted in said brackets, springs on said spindles interposed between said beams and said brackets.

3. A planing machine provided with fixed knives, pressure rollers for said knives, beams supporting said rollers, means for mounting said beams on said frame comprising brackets on said frame, spindles secured to said beams slidably mounted in said brackets, springs on said spindles interposed between said beams and said brackets, and means to selectively move the beams relatively to the frame comprising toothed racks secured to the ends of the beams, pinions engaging said racks, shafts in said frame supporting pinions which are common to the racks of each beam, means to rotate said shafts, and spring means for mounting said rollers on said beams, said spring means being of a lower capacity than the springs mounting the beams on the frame.

In testimony whereof I affix my signature.

CARL JOHAN AXEL JOHNSON.