Feb. 2, 1937. J. J. WAAGE 2,069,431

GRINDER

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Fig. 1.

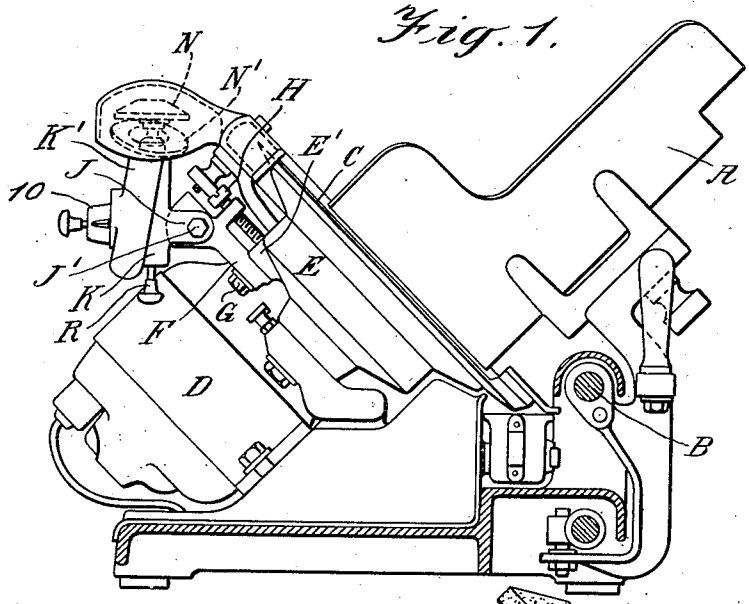
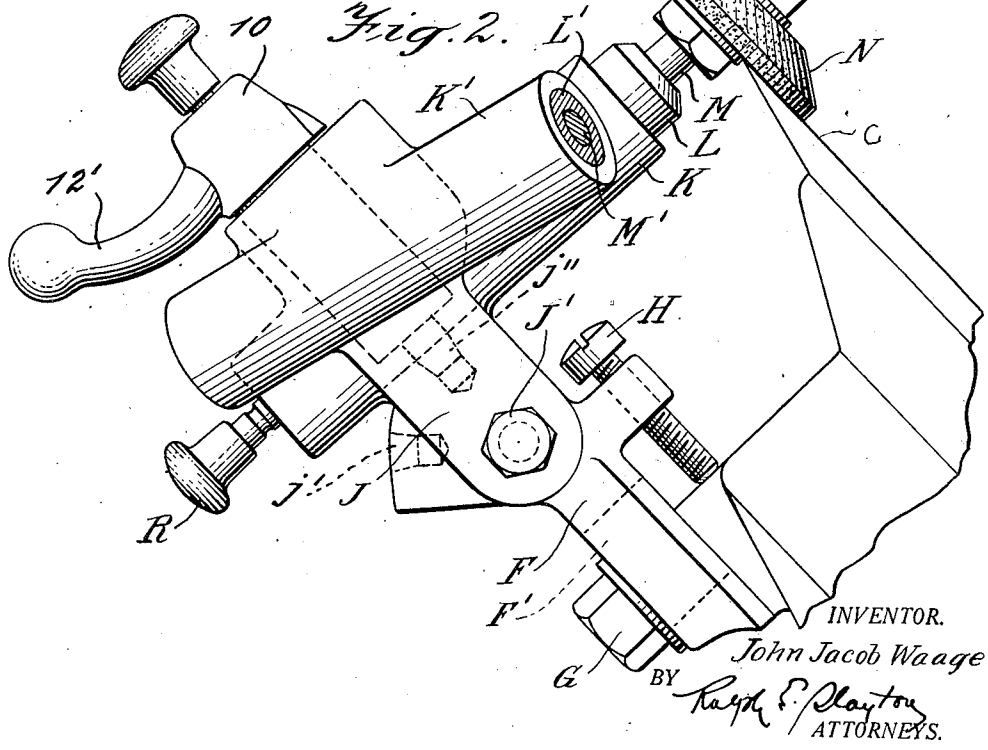


Fig. 2.



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Fig. 3.

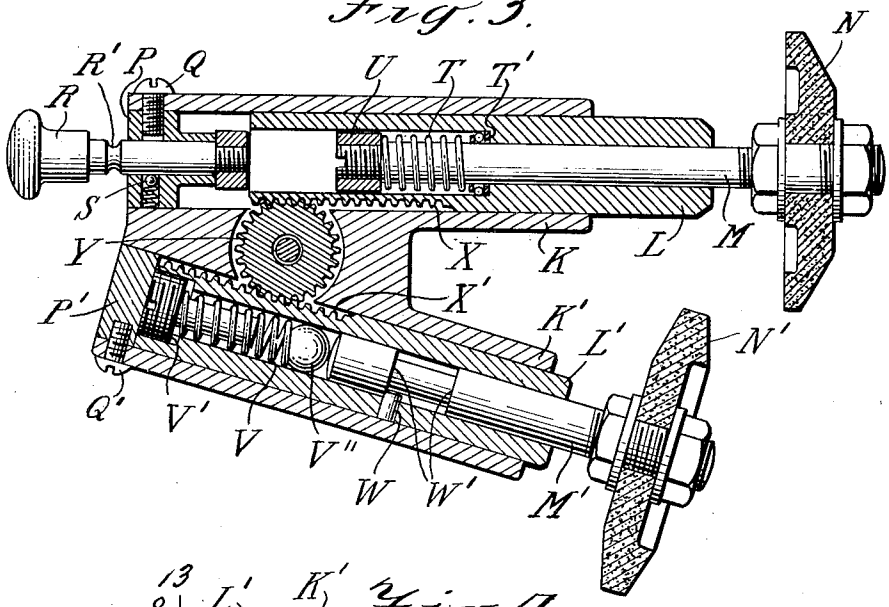


Fig. 4.

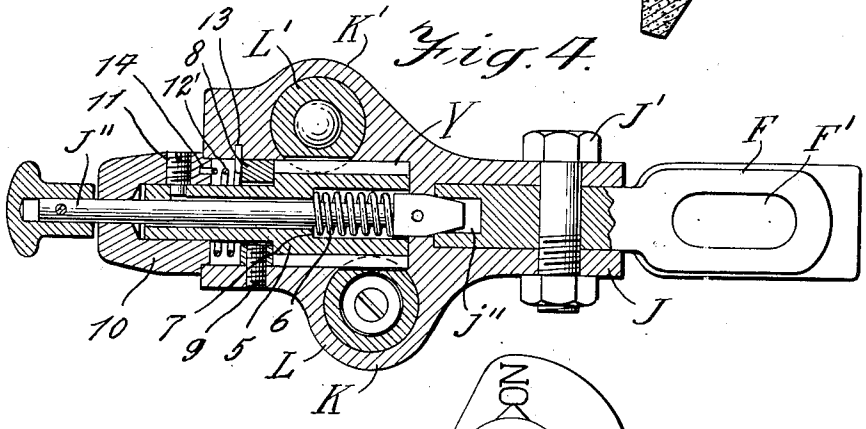
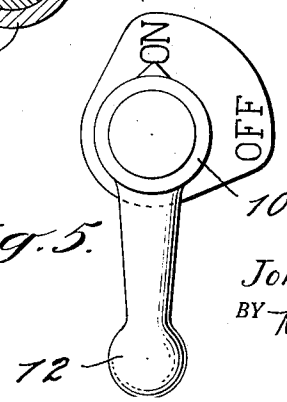


Fig. 5.



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UNITED STATES PATENT OFFICE

2,069,431

GRINDER

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Application February 17, 1932, Serial No. 593,498

6 Claims. (Cl. 51—248)

This invention relates to knife sharpening mechanism and has more special reference to knife sharpening mechanism for slicing machines.

The object of the present invention is to provide a simplified sharpening mechanism which can be operated without danger by an unskilled operator and which will insure accurate grinding of the knife. The usual type of slicing machine to which the present invention is more particularly applicable comprises a rotary knife having a bevelled periphery to form the cutting edge. This knife or cutting edge must be sharpened from time to time and in order to obtain the best results it is desirable that the bur formed by the grinding operation be removed. To this end a pair of abrasive elements concurrently acting on opposite sides of the knife edge are sometimes used, as, for instance, shown in patent to Stukart #1,331,596. In the present invention, however, one of the abrasive elements may be "thrown in and out" at the will of the operator so that the grinder acting to remove the burr may be disengaged while the opposed grinder is operating, instead of acting concurrently as is the case in the construction shown in the Stukart patent. Since it is customary to rotate the slicing machine knife during the grinding operation with the attendant danger of an exposed knife edge rotating at high speed, it is desirable for the safety of the operator that the operation of the sharpener in applying the grinders and swinging the device to inoperative position, be readily controlled without bringing the operator's hands near the rotating knife edge.

Comprehensively stated, the present invention comprises a pair of grinders mounted as to be simultaneously swung to position for application of the grinders to the opposite faces of the knife edge from an inoperative position without danger to the operator and having means for holding at the will of the operator one of the grinders in idle position while the other one is operating.

While one embodiment of my invention is shown, it is to be understood that this embodiment merely serves to illustrate the underlying principles of the invention and is not intended as limiting the invention to the specific form disclosed in the drawings, the illustrated embodiment together with the description thereof being of such a nature as to enable those skilled in the art to practice the invention and to devise other equivalent modifications thereof without departing from the underlying principles of the invention.

In the accompanying drawings,

Fig. 1 is a side elevation of the invention as applied to a slicing machine.

Fig. 2 is an enlarged side elevation of the invention.

Fig. 3 is a horizontal section.

Fig. 4 is a transverse section, and

Fig. 5 is a top plan view of the manually operable control member.

Continuing now by way of more detailed description and referring more particularly to Fig. 1, a reciprocating object holder A of any convenient type is slidably mounted on guide rods B, so that it can be moved relatively to the rotary knife C which may be driven, for instance, by motor D through suitable gears within the gear box E. While the present invention is shown as applied to a type of machine characterized as above, it is to be understood that the particular type of machine to which the sharpener is applied is immaterial so far as the present invention is concerned, the foregoing slicing machine elements merely being for the purpose of illustrating a particular type of machine to which the invention may be readily applied. The gear box or casing E in the illustrated embodiment has a suitable extension piece or seat E′ to which an adjustable bracket F is bolted. The bracket F has an elongated bolt receiving opening F″ (as shown more particularly in Fig. 4) to receive the shank of the clamping bolt G which secures the bracket F to the extension F′. By loosening the bolt G the elongated opening F″ affords vertical adjustment to the sharpener relatively to the knife edge C, as will be readily understood. In order, however, to insure the proper position of the grinder with respect to the knife edge C, the end of a stop screw H bears on any convenient stationary portion of the slicing machine, although for convenience the extension or bracket seat E′ formed with or secured to the gear box E as illustrated may serve this purpose. The stop screw H may be threaded in a lug on bracket F and may have either a knurled manually operable head or a slotted tool receiving head. Normally, it is desirable to swing the sharpener when not in use away from the knife edge so that the sharpener will not operate accidentally, and to this end the body of the sharpener has a projecting lug or arm J pivoted at J′ to the bracket F by means of a suitable bolt or other arangement and is conveniently held in operative or inoperative position by the engagement of the end of a manually operated plunger engaging locking orifices j' and j'' formed in the arcuate end of bracket K

shown in Figs. 2 and 4. The manually operable locking plunger R which serves to hold the grinding device either with the grinders in proximity to the knife edge or in concealed position by engaging either the recess *j'* and *j''* as is readily understood, is slidably mounted in sleeve 5 and is normally pressed by spring 6 to lock with either of the locking orifices *j* and *j''*, the spring 6 being located in an enlarged bore in the sleeve 5 and having one end bearing against shouldered portion 7 found in the sleeve and the other end against a tapered nose piece engaging orifices *j'* and *j''*. The sleeve 5 is held in place in the casting by a collar 8 held in place by a set screw 9. A manually operable rotatable journal bearing 10 fitted over one end and locked to the sleeve 5 by a set screw 11. A projecting handle 12' (better shown in Fig. 5) serves to rotate the bearing 10 and the sleeve 5 and this rotates the pinion Y for causing the wheels N and N' to engage the opposite faces of the knife edge. In order that the wheels N and N' may be normally kept in spaced relation from the knife edge, a spring 12 surrounds the restricted end of the sleeve 5 and has one end anchored at 13 in a stationary portion of the grinding mechanism and the other end anchored at 14 in the bearing 10 operated by the handle 12'.

It will be evident from the foregoing that the handle under the influence of the spring will always tend to rotate the bearing 10 to the "off" position (shown in Fig. 5) and simultaneously rotate pinion Y when viewed as in Fig. 3 in a clockwise direction so as to normally space the wheels N and N' from the knife edge but by throwing the handle 12 to "on" position the wheels N and N' are brought to bear on opposite faces of the knife edge, provided the plunger R is in the retracted position as shown in Fig. 3, as will be evident from the description which follows. If, however, the plunger R is moved to its forward position—that is with the ballbearing lock S engaging the annular groove R' the end of the plunger will serve to hold the wheel N away from the knife edge despite any retrograde movement of the cylinder L on release of handle 12. When the grinder is in inoperative position it may be and conveniently is covered by a shield which, however, forms no part of the present application. The pivoted bracket J carries a pair of preferably integrally cast forked or diverging bearing cylinders K and K', the cylinders diverging so as to afford clearance for the grinding wheels mounted on the ends of the shaft and permit the cylinders to be compactly cast in one piece without waste of metal in the connecting web as will be readily understood. Sleeves L and L' are slidably mounted in the bore of the bearing cylinders K and K' and support longitudinally slidable shafts M and M' on the end of which are rotatably mounted the grinding wheels N and N'. The ends of the bearing cylinders K and K' opposite to the ends carrying the grinding wheels are closed by the end members P and P' fitted in the cylinders and which are suitably held in place in any convenient manner as, for instance, by the screws Q and Q'. The end member P axially supports a reciprocable manually operable plunger R having a preferably annular recess R', the latter serving to lock the plunger R in its advanced position when the recess R' is moved to a position opposite the spring-pressed ballbearing S which serves to hold the plunger in advanced position. The shaft M which carries the grinder is adapted to ride on the face of the knife edge remote from the grinding mechanism, that is the flat side of the knife edge and is normally retracted by spring T, one end of which bears against the shouldered portion T' in the bore of sleeve L and the other end of which bears against a stop U threaded on the end of the shaft M. The shaft M' carrying the grinding wheel N' is pressed by a spring V toward the wheel N, one end of the spring bearing against the stop V' threaded in a shouldered portion of the bore of the sleeve L and the other end bearing against a ballbearing V'', which presses on the end of the shaft M'. The longitudinal movement of shaft M' is limited by a stop pin W engaging the shoulders W' of the shaft M'.

It will be observed from the foregoing that the grinding wheels N and N' are normally spring-pressed towards each other under the influence of springs T and V for grinding. To release the wheels from the knife edge the sleeves L and L' have racks X and X' facing each other and moved by a pinion Y which is preferably located in a suitable recess in the portion of the casting bridging and supporting the bearing cylinders K and K'. When the pinion Y is rotated in a counter clockwise direction as shown in Fig. 3 the sleeve L is moved to the left and the sleeve L' to the right thereby bringing the grinding wheels N and N' into contact with the oppposite sides of the knife edge, each grinder being spring-pressed against the opposite faces of the knife edge. When it is desired to prevent the grinding wheel N from engaging the knife edge the manually operable plunger R may be forced to position where the annular groove R' locks with the ballbearing S. When the plunger R is in the last-named position and the pinion Y is moved in a counter clockwise position as heretofore indicated, the shaft M will be stopped by striking the end of the plunger R while at the same time the grinder N' will be advanced to grinding position. Under these circumstances the grinder N' will engage the knife edge while the grinder N is spaced from the edge. By retracting the plunger R and freeing it from the spring-pressed ballbearing S, the shaft M will be released and under the influence of the spring will move toward the left as shown in Fig. 3 and the grinding wheel N brought to a position to engage the knife edge. In order to swing the grinder to an inoperative position provision has been made by reason of the hinged connection at J' to swing the grinder wheels away from the knife edge. When such release is desired the handle 12 is released whereby pinion Y is rotated by spring 12 to free the grinders, and then the grinders may be swung to retracted position about the hinged connection J'.

I claim:

1. The combination of a slicing machine having a rotary knife, with a grinder support pivoted at a point spaced from the knife, a pair of grinders supported thereby and movable toward and away from the face of the knife in a plane at right angles to the plane of the knife concurrently with the support, means to simultaneously move the grinders in opposite longitudinal directions independently of the support one of said means comprising a resilient connection, and means comprising a longitudinally movable plunger to overcome the resiliency of said resilient connection to hold one of the grinders away from the knife while the other grinder is in operating position, and means to lock said plunger in such position.

2. The combination of a slicing machine having

a rotary knife, with a movable grinder support, a pair of grinders supported thereby moving away from the face of the knife in a plane at right angles to the plane of the knife concurrently with the support, means to simultaneously move the grinders in opposite longitudinal directions independently of the support, one of said means comprising a resilient connection, and means comprising a longitudinally movable plunger to overcome the resiliency of said resilient connection to hold one of the grinders away from the knife while the other grinder is in operating position, and means to lock said plunger in such a position.

3. The combination of a slicing machine having a rotary knife with a grinder support, a pair of grinders supported thereby, means to simultaneously move the grinders in opposite longitudinal directions independently of the support, one of said means comprising a resilient connection, and means comprising a longitudinally movable plunger to overcome the resiliency of said resilient connection to hold one of the grinders away from the knife while the other grinder is in operating position, and means to lock said plunger in such position.

4. The combination of a slicing machine having a rotary knife with a grinder support, a pair of grinders supported thereby, means to move the grinders in opposite longitudinal directions independently of the support, one of said means comprising a resilient connection, and means comprising a longitudinally movable plunger to overcome the resiliency of said resilient connection to hold one of the grinders away from the knife while the other grinder is in operating position, and means to hold said plunger in such position.

5. The combination of a slicing machine having a rotary knife, with a grinder support pivoted at a point spaced from the knife, a pair of grinders supported thereby moving away from the face of the knife in a plane at right angles to the plane of the knife concurrently with the support, means to simultaneously move the grinders in opposite longitudinal directions independently of the support, one of said means comprising a resilient connection, and means comprising a longitudinally movable plunger to overcome the resiliency of said resilient connection to hold one of the grinders away from the knife while the other grinder is in operating position.

6. The combination of a slicing machine having a rotary knife with a grinder support, a pair of grinders supported thereby, means to move the grinders in opposite directions, one of said means comprising a resilient connection, and means comprising a plunger to overcome the resiliency of said resilient connection to hold one of the grinders away from the knife while the other grinder is in operating position, and means to temporarily hold said plunger in such position.

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