Feb. 6, 1934. J. A. COMEAU 1,946,311

KNIFE GRINDING MECHANISM

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Fig. 1.

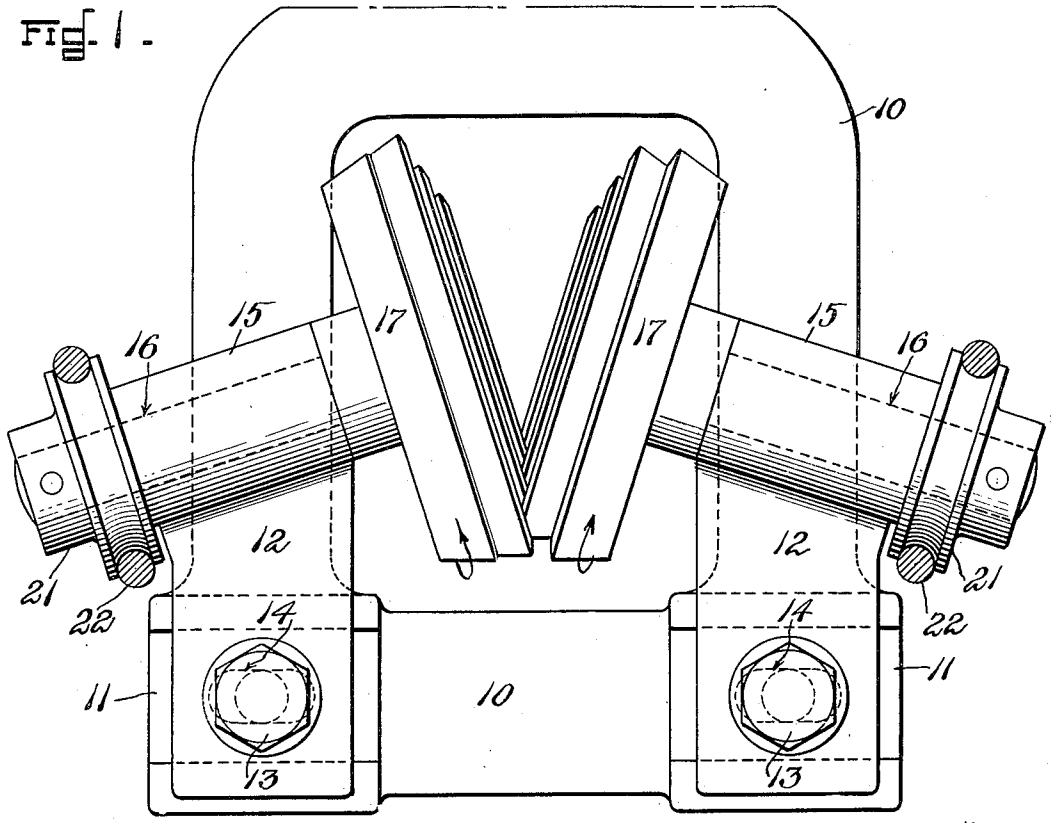
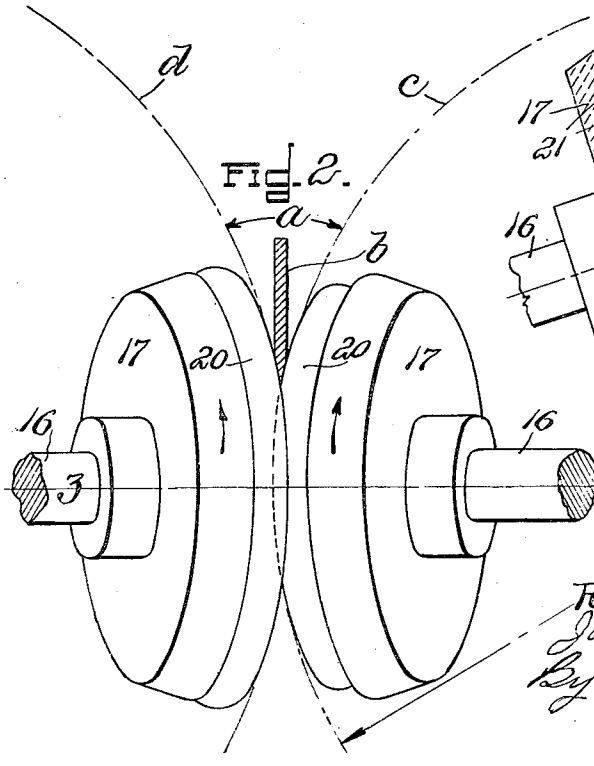


Fig. 2.



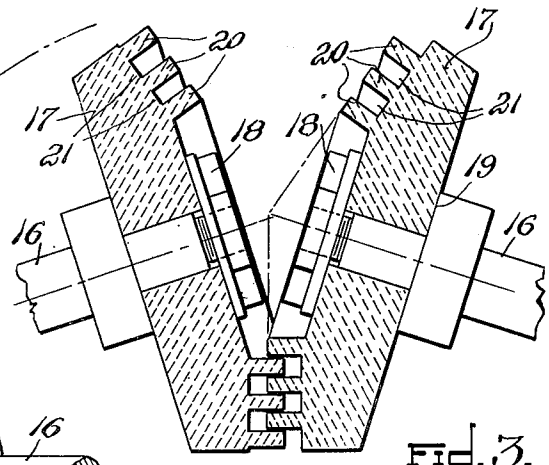


Fig. 3.

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KNIFE GRINDING MECHANISM

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3 Claims. (Cl. 51—111)

My invention relates to knife grinding mechanisms of that class which comprises a pair of rotatable grinding wheels between which a knife-blade or the like is inserted to be sharpened, and it has for its object to provide an improved mechanism of this class which will be of efficient and inexpensive construction; wherein grinding wheels of comparatively small diameter may be employed to produce a more acute beveled edge on the knife blade than has heretofore been possible with grinding wheels of the same, or even larger, diameter; and which, in its preferred form, may be adjusted to vary the bevel of the cutting edge that is produced by the mechanism.

To these ends I have provided a grinding mechanism comprising a pair of grinding wheels supported side by side with their axes intersecting but relatively disposed at an obtuse angle; that is, so that the smaller angle between said axes is less than one hundred and eighty degrees. The chief advantage to this construction is that the action of two wheels of a given diameter upon a knife blade is equivalent to the action of two wheels of much larger diameter having their axes disposed relatively parallel as has heretofore been the case. In other words, the oblique relative disposition of the axes of the two grinding wheels of my improved mechanism may be utilized to produce a longer or more acute bevel upon the knife blade than is possible with two grinding wheels of the same diameter whose axes are parallel.

In the best form of my invention the proximate faces of the two wheels are made with overlapping, or intermeshing, conical ribs or flanges and the knife blade that is to be sharpened is placed within the angle between these ribs or flanges while the two wheels are rotated toward said blade.

Other features and advantages of my invention are hereinafter pointed out.

In the accompanying drawing:

Figure 1 is a plan view of a grinding mechanism constructed in accordance with my invention.

Figure 2 is a front elevation of the two grinding wheels of the mechanism shown in Figure 1.

Figure 3 is a section on line 3—3 of Figure 2.

The embodiment of my invention herein illustrated comprises a frame or fixture 10 constructed with ways 11, 11 at opposite sides thereof which are alined and parallel. Within each way 11 is mounted a bracket arm 12 that is rigidly fastened to the frame 10 by means of a bolt or screw 13. Each bolt or screw 13 occupies a slot 14 formed through its bracket arm 12, and it will be clear that by loosening said bolts or screws the bracket arms may be adjusted toward and from each other, or either bracket arm may be adjusted toward and from the other bracket arm.

At its free end each bracket arm 12 is made with a bearing 15 for a spindle 16 upon the inner end of which is mounted an abrasive grinding wheel 17 which may be a molded structure of emery, carborundum or the like. Each grinding wheel 17 is fixedly secured upon its spindle 16 by means of a nut 18 screwed into position upon the inner threaded end of the spindle so that the wheel is clamped between said nut and a shoulder 19 on the spindle.

The proximate faces of the grinding wheel 17 are made with conical ribs or flanges 20 alternating with conical grooves 21. As shown in Figs. 1 and 3 the bracket arms 12 are positioned relatively so that the flanges of the wheels 17 overlap or intermesh at the place where the two wheels are nearest together. Since the two spindles have their axes disposed in one horizontal plane, this place of closest approach of the wheels is in the same horizontal plane with said axes and as will be clear from Fig. 3 the conicity of the ribs or flanges 20 is such that the middle portions of the intermeshing parts of said ribs or flanges are parallel with the ways 11 on frame 10 and are also parallel with the slots 14 of the bracket arms. It is thus possible to adjust the two wheels toward and from each other while the flanges or ribs are intermeshed to an extent or degree approximating the depth of the grooves or channels 21. When the two wheels are thus adjusted toward and from each other not only is the apex of the angle *a*, Fig. 2, adjusted toward and from the horizontal plane 3—3 within which the axes of spindles 16 are disposed, but such adjustment also varies the length or acuteness of the bevel that is produced upon the knife blade *b*, Fig. 2.

Owing to the relatively oblique disposition of the two wheels the grinding action of the right hand wheel 17, Fig. 2, is equivalent to that of a grinding wheel having a radius R which is very much greater than the actual radius of said wheel. In other words the right hand wheel, Fig. 2 has a blade-shaping effect that is the equivalent of a wheel of the size indicated by the curved dot and dash line *c*, while the left hand wheel 17 of Fig. 2 has a grinding effect upon the blade that is the equivalent of a wheel of the size indi-

cated by the dot and dash line *d*. That is, the effective diameters of the two wheels 17 are the equivalent of two wheels *c* and *d* whose axes are parallel.

At its outer end each spindle 16 has fastened to it a pulley 21 that is engaged by a continuously running belt 22 driven from any suitable source of power. The belts 22 drive the two wheels 17 in one and the same direction as indicated by the arrows in Fig. 1 while the knife blade *b* is placed against said wheels within the angle *a*, Fig. 2, in a vertical position.

The pair of complementary abrasive wheels of my improved sharpener are disposed side by side and rotatably supported with their axes obliquely disposed relatively in one plane with the result that the opposite sides of the knife blade are engaged by the marginal portions of the proximate end faces of said wheels and as will be clear from Fig. 3, said end marginal portions are conically crowned and formed with intermeshing conical flanges and it is a feature of this improved construction that the tops of these flanges of each wheel where they intersect the plane of the two spindles are coincident with a line that is parallel with a vertical plane bi-secting the angle of said two spindles. It will thus be clear that if the knife blade is held within the angle *a*, Fig. 2, it will occupy a position within and parallel with this vertical plane and its edge will contact with all of the flanges of each wheel.

What I claim is:

1. A knife-sharpener comprising a pair of complementary rotatably supported abrasive wheels disposed side by side so as to receive between them the knife blade that is to be sharpened and having their proximate faces each formed with a plurality of concentric conical ribs alternating with conical grooves, and means rotatably supporting said wheels in close proximity to each other with their axes obliquely disposed relatively in one plane so that the opposite sides of a blade that is to be sharpened are engaged by the crests of all of said ribs, the ribs of each wheel being intermeshed with the ribs of the other wheel and the crests of the ribs of each wheel being relatively offset axially so that all of the ribs of each wheel mesh with and overlap the ribs of the other wheel uniformly.

2. A knife-sharpener constructed in accordance with claim 1 and also including means connected with said wheels that is operable to rotate both of said wheels simultaneously in one direction.

3. A knife-sharpener constructed in accordance with claim 1 wherein a vertical plane bisecting the angle between the axes of said wheels is parallel with a vertical plane that is tangent with respect to the crests of the intermeshed portions of the ribs of each wheel.

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