

Sept. 16, 1924.

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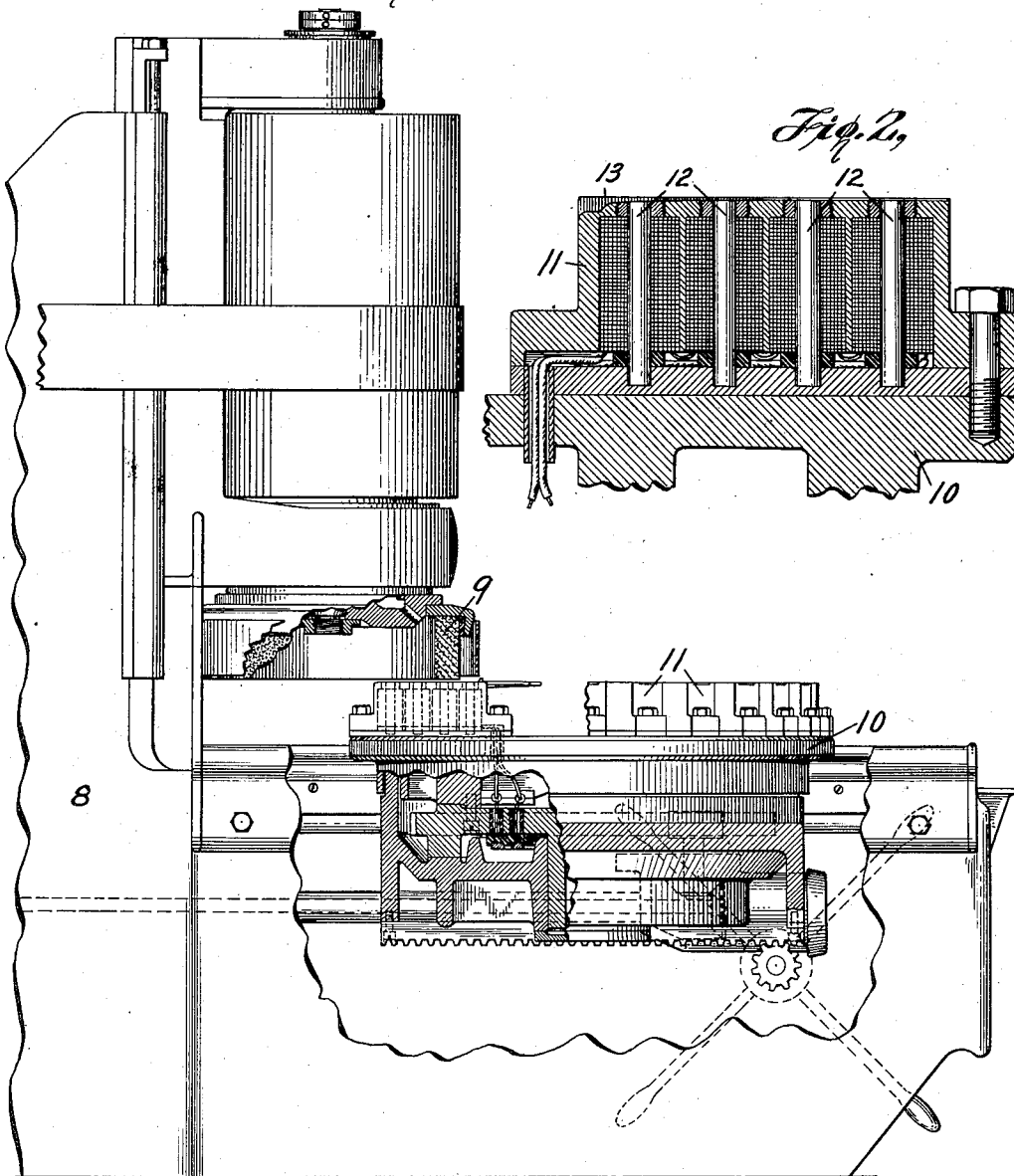
T. C. SHEEHAN

KNIFE GRINDER

Filed Aug. 31, 1921

2 Sheets-Sheet 1

Fig. 1,



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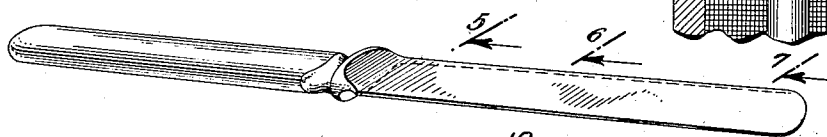
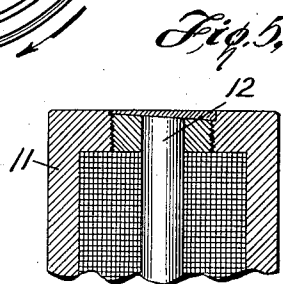
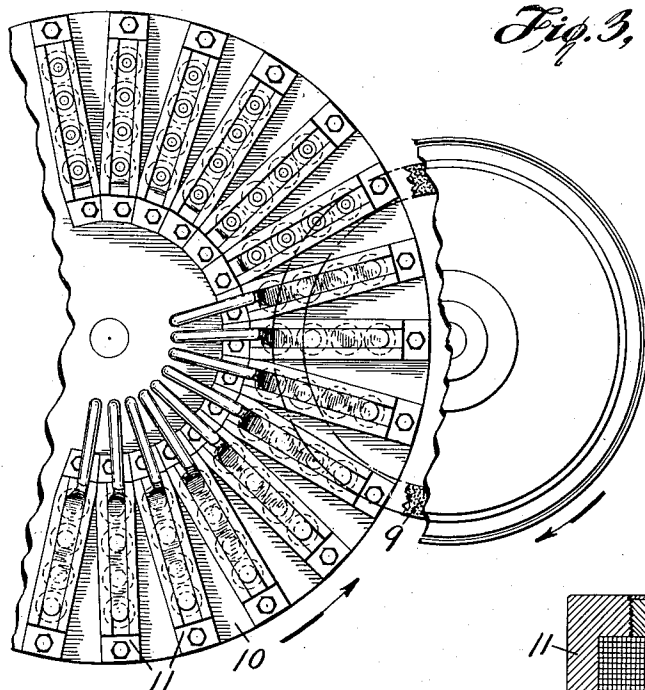
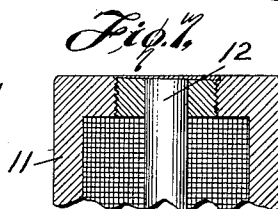
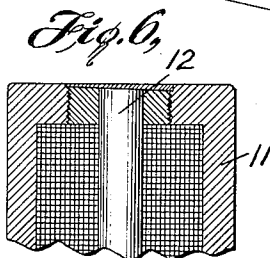
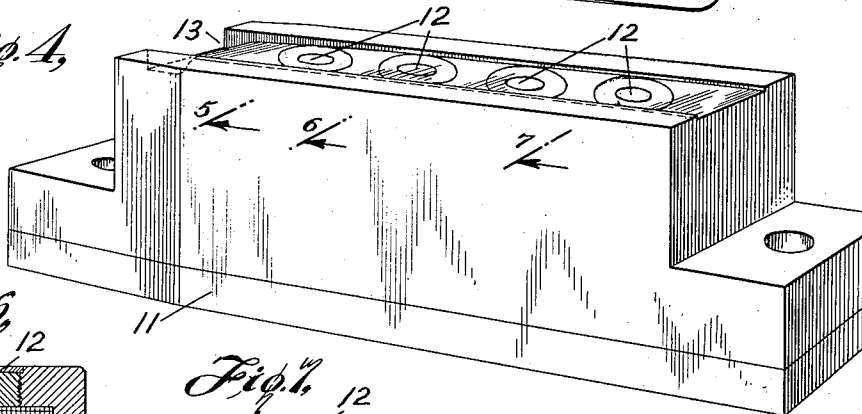


Fig. 4,



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UNITED STATES PATENT OFFICE.

THOMAS CORNELIUS SHEEHAN, OF UPPER MONTCLAIR, NEW JERSEY, ASSIGNOR TO
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KNIFE GRINDER.

Application filed August 31, 1921. Serial No. 497,191.

To all whom it may concern:

Be it known that I, THOMAS CORNELIUS SHEEHAN, a citizen of the United States, residing at Upper Montclair, county of Essex, and State of New Jersey, have invented a new and useful Improvement in Knife Grinders, of which the following is a specification.

This invention relates to an improvement in knife grinders, particularly to those adapted to grind table knives.

Table and other knives are customarily forged with longitudinally and transversely tapered blades the opposite surfaces of which are then ground, one after the other, in the planes of the opposite surfaces as forged. This grinding operation does not produce a knife edge of equal thickness throughout its length because the surfaces are farther apart adjacent the bolster than they are at the point, and these surfaces, therefore, both before and after grinding, lie in planes which intersect the median plane of the blade beyond but not equidistant from its edge throughout its length, the point on the line of intersection nearest the bolster being farthest from the blade edge because the latter is thickest at this point. Further grinding operations are therefore necessary to reduce the ground blade edge to approximately uniform thickness. These further operations are usually hand operations, and in any event the result effected is a blade flat at the point but more or less convex near the bolster.

It has been discovered that by temporarily distorting or twisting a longitudinally and transversely tapered blade to successively cause its surfaces to be ground in planes which intersect the median plane of the blade equidistant from its edge throughout its length, a blade having an edge of perfectly uniform thickness throughout its length can be produced, without hand or machine edge reducing operations, and that a blade so ground presents a better appearance and has improved efficiency as a cutting instrument.

The invention consists in certain constructions and combinations which will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification and in

which like characters of reference indicate the same or like parts, Fig. 1 is a fragmentary view in elevation of a device constructed in accordance with the invention, Fig. 2 is a longitudinal sectional elevation, on an enlarged scale, of one of the knife supporting and grinding devices shown in Fig. 1, Fig. 3 is a plan view of a part of the knife supporting and grinding devices shown in Fig. 1, Fig. 4 is a perspective view, on an enlarged scale, of a knife and holder as used in the structure shown in Fig. 1, and Figs. 5, 6 and 7 are respectively cross-sectional and fragmentary views taken on the lines 5-5, 6-6 and 7-7 in Fig. 4.

The method of grinding employed in the present invention consists in temporarily distorting a longitudinally and transversely tapered blade to cause one surface thereof to lie in a plane which intersects the median plane of the blade equidistant from its edge throughout its length, then grinding the surface so disposed, then temporarily distorting the blade in like manner in the opposite direction, and then grinding the opposite surface. As the method is ordinarily employed, a plurality of knife blades are arranged in a circle and temporarily distorted, and the whole series rotated so that their exposed surfaces are ground by a single grinding device in a single operation; after which, the blades are reversely positioned and distorted and similarly ground on their opposite surfaces.

Referring to the drawings which illustrate one embodiment of the invention, 8 indicates generally what is known as a Blanchard grinding machine the particular construction of which is well known and lies wholly outside the present invention. This grinding machine is as usual provided with a rotating annular grinding wheel 9 and with a circular work holder or table 10 which also rotates but at a lower speed than the grinding wheel.

For the purpose of temporarily distorting and holding a plurality of knife blades on the table 10, a corresponding number of magnetic devices are provided, one half of which may be right-hand and the other half left-hand; that is to say, one half of these devices may be adapted to distort blades in one direction to prepare them for grinding one surface, and the other half adapted to distort other blades in the op-

posite direction to prepare them for the grinding of the opposite surfaces. With this exception, all of these devices are alike, and therefore a description of one will suffice for a description of all.

The annular magnetic chucks ordinarily employed on grinding machines have been found unsuitable for present purposes because they are inherently incapable of distorting knife blades. The present device is therefore provided with a plurality of individual knife supports or holders 11, each having a plurality of electro-magnets 12 connected in series. The operative ends of the magnet cores terminate in a recess 13 sunk in the upper face of the support or holder 11, and are of different angularity as clearly shown in Figs. 5, 6 and 7. The recess 13 is not the shape of a knife blade as forged but as temporarily distorted by the magnets to cause its upper or exposed surface to lie in a plane which intersects the median plane of the blade equi-distant from its edge throughout its length. In other words, the cross-sectional form of the recess is such that when the magnets pull a blade down, twisting it by reason of the different angularity of the magnet ends, the blade rests solidly on the bottom of the recess, with its exposed surface but slightly above the upper surface of the support 11. As shown in Figs. 1 and 3, the supports 11 are bolted to the table 10 and arranged in a circle about the table axis.

By an inspection of Figs. 1 and 3, it will be understood that the grinding wheel 9 sweeps across the entire exposed surfaces of the temporarily distorted blades as the grinding wheel and table rotate at different speeds, grinding twelve right-hand surfaces and twelve left-hand surfaces. When this operation is completed, half the blades, then finished, are removed from their supports, the other half reversed in the supports just vacated, and twelve unground blades placed in the supports from which transfer has just been made. The opposite surfaces of partially ground blades and the initial surfaces of the unground blades are then ground in a single operation. When both surfaces of a blade have been thus ground, and the blades return to their normal undistorted condition, the ground surfaces are flat and lie in planes which intersect the median plane of the blade equi-distant from its edge throughout its length, it being understood that the position of the line of intersection depends upon the keenness it is desired to give the cutting edge, and that in any case it is a matter of a few thousandths of an inch. By so grinding the blades, the necessity heretofore existing for subsequent edge reducing operations is avoided and an edge of uniform thickness is produced on a blade presenting a uni-

formly flat appearance and possessing increased efficiency as a cutting instrument.

Changes and variations may be made in the structure by means of which the invention is carried into effect, within the scope of the claims. The invention, therefore, is not to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. In a grinder, the combination with a support, of means coacting with said support and adapted to twist a longitudinally and transversely tapered blade on said support to cause one surface thereof to lie in a plane which intersects the median plane of the blade equi-distant from its edge substantially throughout its length, and a co-acting grinding device adapted to act on the surface so disposed.

2. In a grinder, the combination with a support provided with a recess in one of its faces, of means coacting with said support at said recess and adapted to twist a longitudinally and transversely tapered blade in said recess to cause one surface thereof to lie in a plane which intersects the median plane of the blade equi-distant from its edge substantially throughout its length and lies slightly beyond the face of said support at said recess, and a coacting grinding device adapted to act on the surface so disposed.

3. In a grinder, the combination with a support, of a magnetic device coacting with said support and having a distorted operating face adapted to twist a longitudinally and transversely tapered blade on said support to cause one surface thereof to lie in a plane which intersects the median plane of the blade equi-distant from its edge substantially throughout its length, and a co-acting grinding device adapted to act on the surface so disposed.

4. In a grinder, the combination with a support, of a series of electro-magnets coacting with said support and having operating faces of different angularity and adapted to twist a longitudinally and transversely tapered blade on said support to cause one surface thereof to lie in a plane which intersects the median plane of the blade equi-distant from its edge substantially throughout its length, and a coacting grinding device adapted to act on the surface so disposed.

5. In a grinder, the combination with a support provided with a recess in one of its faces, of a series of electro-magnets coacting with said support at the bottom of said recess and having operating faces of different angularity and adapted to twist a longitudinally and transversely tapered blade in said recess to cause one surface thereof to lie in a plane which intersects the median plane of the blade equi-distant from its edge substantially throughout its

length and lies slightly beyond the face of support to cause one surface thereof to lie in a plane, and a coating grinding device adapted to act on the surface so disposed. 10

5 6. In a grinder, the combination with a support, of means coating with said support and adapted to twist an article on said support to cause one surface thereof to lie in a plane, and a coating grinding device adapted to act on the surface so disposed. 10

In testimony whereof, I have signed my name to this specification.

THOMAS CORNELIUS SHEEHAN.