C. L. COOK.

GRINDER.

APPLICATION FILED APR. 17, 1919.

1,422,035. **Patented July 4, 1922.**

Fig. 1

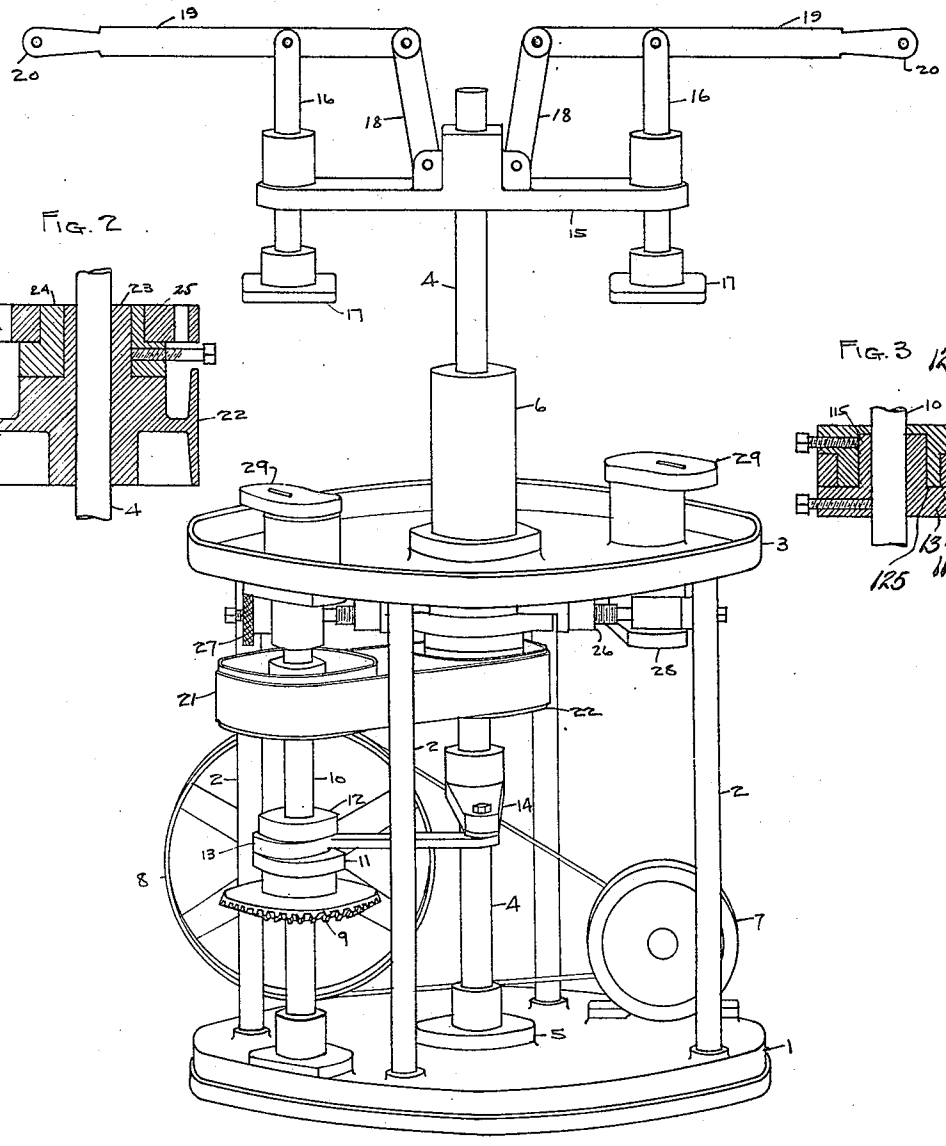
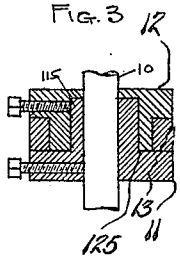


Fig. 2

Fig. 3



CHARLES LEE COOK
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UNITED STATES PATENT OFFICE.

CHARLES LEE COOK, OF LOUISVILLE, KENTUCKY.

GRINDER.

1,422,035. Specification of Letters Patent. Patented July 4, 1922.

Application filed April 17, 1919. Serial No. 290,724.

To all whom it may concern:

Be it known that I, CHARLES LEE COOK, a citizen of the United States, residing at Louisville, Jefferson County, Kentucky, have invented certain Improvements in Grinders, of which the following is a specification.

My invention relates particularly to plane surface grinders, and more especially to those used in grinding plane gas-tight joints. It has for its object to increase the efficiency of such grinders and of grinders generally.

In the drawings, in which similar characters of reference refer to corresponding parts in the different views, Figure 1 is a perspective view of an embodiment of my invention; and Figure 2 is a detail sectional view of the double eccentric, for reciprocating the lower holders; and Figure 3 is a detail sectional view of the double eccentric reciprocating the upper holders.

On the base 1 I support the oil pan 3 by the supporting rods 2. On the base 1 I also support the thrust bearing 5 in which rotates the vertical main shaft 4 reciprocally. The shaft 4 is further positioned by the main bearing 6, which is fixed to the oil pan 3.

From a source of power 7 I drive the set of bevel gears 9, and through them rotate the vertical shaft 10. Fixed to the shaft 10 is the collar 11 with the sleeve 115 extending along the shaft and into the sleeve extension 125 of the collar 12. The collar 12 is adjustably fixed preferably by setscrew to the sleeve 115 of the collar 11. The bores of the sleeves 115 and 125 are both eccentric of the axes of the sleeves, the throw of each eccentric being preferably the same. On the sleeve 125 is pivoted the connecting rod 13 which oscillates the arm 14 and thereby the main shaft 4.

The reciprocal rotation of the shaft 4 correspondingly causes oscillation of the multiple arm 15 and of each work holder 17, connected with a respective extension of the arm 15 by the vertically adjustable rod 16. The holders 17 are vertically adjusted with respect to the arm 15, by the double levers 18 and 19, each having a handle 20.

The multiple arm 15 is adjustable up and down the main shaft 4, being preferably held by setscrew.

The shaft 10 drives the pulley 21, which in turn drives the pulley 22 running loosely on the main shaft 4. The pulleys 21 and 22 may be a pair of cone pulleys to permit of much greater variation of speed. The pulley 22 rotates at different speed from the horizontal bevel gear 9, the difference being such that coincidence of phase is as rare as practicable.

Loose on the main shaft 4 is the sleeve 23, preferably integral with the loose pulley 22, with its bore eccentric with its axis. On the sleeve 23 is the second eccentric sleeve 24, its eccentric throw being preferably the same as the eccentric throw of the sleeve 23, and it being adjustably fixed to the sleeve 23. On the sleeve 24 rides the ring 25, to which is pivotally connected each connecting rod 26. The connecting rods 26 can be lengthened or shortened by thumb screws 27. They connect with and oscillate the arms 28 and through them the lower workholders 29.

In the lower workholders 29 or in place thereof could be mounted grinding or polishing wheels for grinding and polishing other kinds of surfaces.

The pair of double eccentric adjustments allows unlimited variation in the scope of the relative movements of the upper and lower holders. The axial adjustment of the holders 29 through the extension of the rods 26, gives an easy variation of the mean positions of the upper and lower pieces of work, and aids the adjustable variation in comparative extent of movement in securing perfectly true plane surfaces in true position.

I do not limit myself further than is indicated in the claims which follow.

I claim:

1. A plane surface grinder comprising a holder, means for giving said holder an oscillating movement in a plane parallel to the plane of the surface ground, and adjustable double eccentric means for setting the extent of either movement at any distance from zero to the sum of the throw of said eccentrics.

2. A plane surface grinder comprising a pair of holders, means for giving one of said holders an oscillating movement in a plane, and means for giving the other holder simultaneously a different oscillating movement in a plane parallel to said first plane.

3. A plane surface grinder, comprising a pair of holders, means for giving one of said holders an oscillating movement in a plane, and means for giving the other holder simultaneously an oscillating movement in a plane

parallel to said first plane, and at a timing ratio to the first of said movements to cause rare phase coincidence.

4. A plane surface grinder, comprising a pair of holders, means for giving one of said holders an oscillating movement in a plane, and means for simultaneously giving the other holder an oscillating movement in a plane parallel to said first plane, and in a direction substantially transverse to the movement of the first holder.

5. A plane surface grinder comprising a pair of holders, means for moving one of said holders in a plane, means for simultaneously giving the other a different movement in a plane parallel to said first plane, and adjustable means for changing the relative amount of movement of said holders.

6. A plane surface grinder comprising a pair of holders, means for moving one of said holders in a plane, means for giving the other a different movement in a plane parallel to said first plane, and adjustable double eccentric means for setting the extent of either movement at any distance from zero to the sum of the throw of said eccentrics.

7. A plane surface grinder comprising a vertical, rotatable spindle, means for oscillating said spindle, a plurality of work-arms extending radially and horizontally from said spindle and oscillating therewith.

8. A plane surface grinder comprising a vertical, rotatable spindle, means for oscillating said spindle, and a plurality of work-arms extending radially and horizontally from said spindle and oscillating therewith; each work-arm being diametrically opposite to another and the working positions of each diametric pair being approximately equi-distant from the axis of said spindle.

9. A plane surface grinder comprising a vertical, rotatable spindle, means for oscillating said spindle, a plurality of work-arms extending radially and horizontally from said spindle and oscillating therewith, a work-holder positioned in each of said arms, and means for manually raising and lowering said work-holders with respect to said arms.

10. A plane surface grinder comprising a vertical rotatable spindle, an auxiliary vertical, rotatable spindle, means on said auxiliary spindle for oscillating said first spindle, a second mechanism for imparting oscillatory motion mounted loosely on said first spindle, and a work-holder oscillated thereby.

11. A plane surface grinder comprising a pair of bases, one above the other and positioned with respect to each other, a main vertical spindle journalled in each, means for oscillating said spindle, a work-arm above said upper base fixed to and oscillating with said spindle, a work-holder rotatably positioned in said upper base, and means for oscillating said work-holder running freely on said main spindle.

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Witnesses:
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