Jan. 26, 1926. 1,570,684

F. KUHN ET AL

GRINDING AND POLISHING MACHINE

Filed July 24, 1922 2 Sheets-Sheet 1

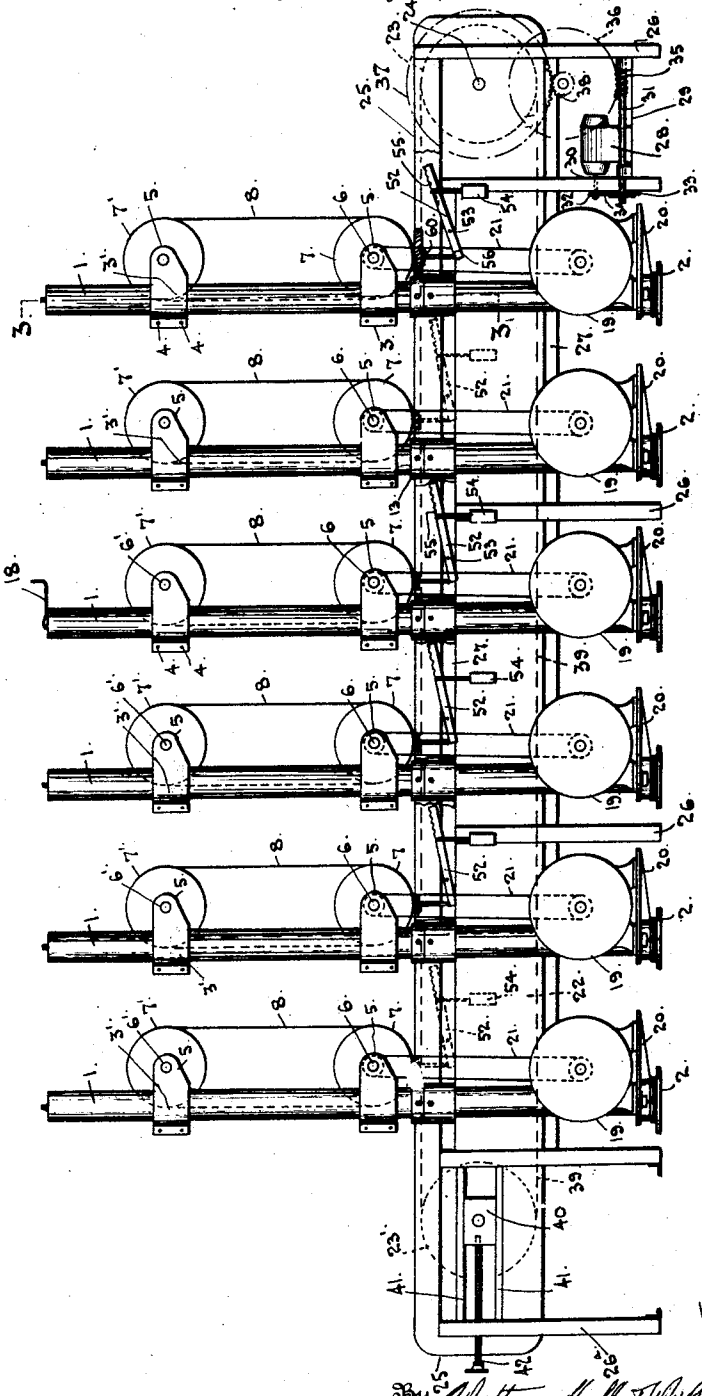


Fig. 1.

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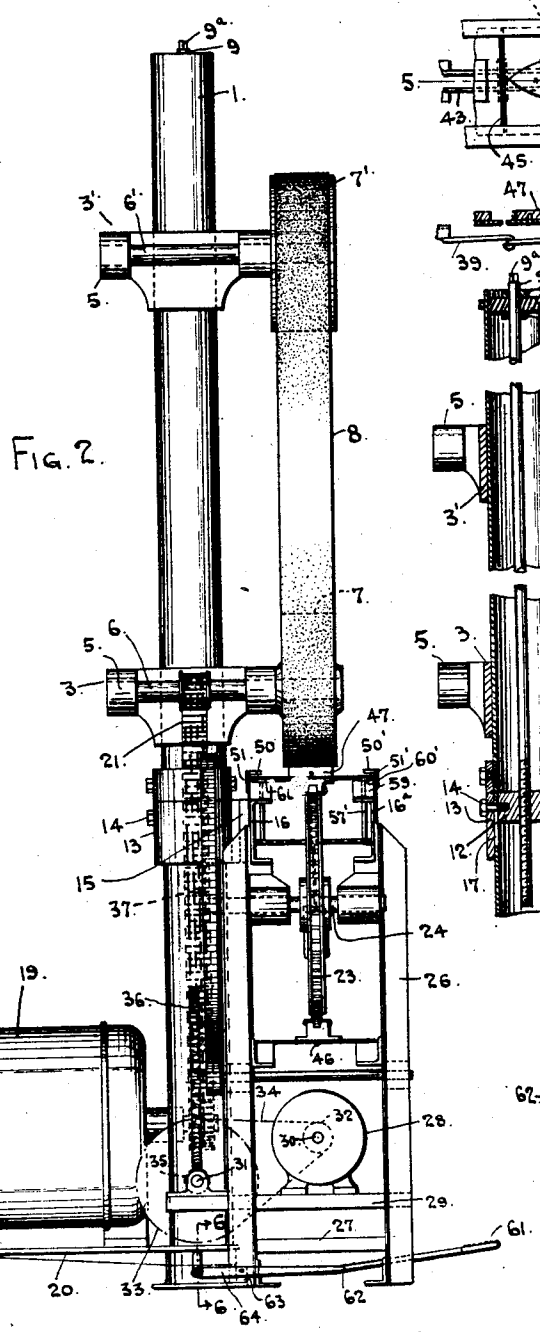


Fig. 2.

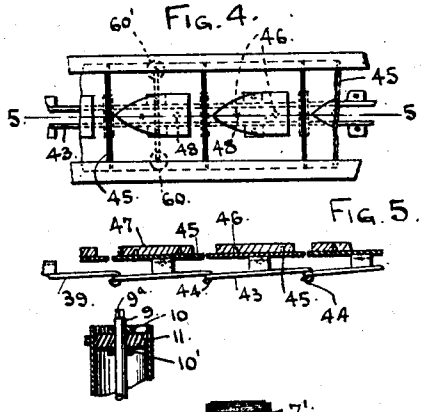
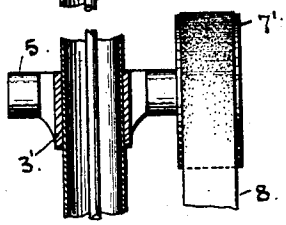


Fig. 4.

Fig. 5.



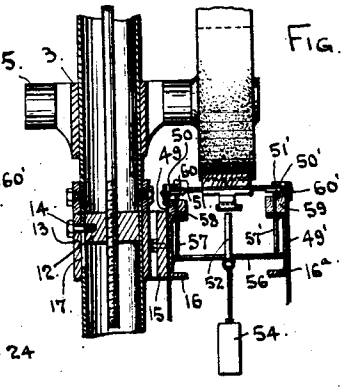


Fig. 3.

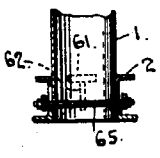


Fig. 6.

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UNITED STATES PATENT OFFICE.

FRANK KUHN AND LAURENCE H. THOMAS, OF DETROIT, MICHIGAN, ASSIGNORS TO AMERICAN ELECTRICAL HEATER COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

GRINDING AND POLISHING MACHINE.

Application filed July 24, 1922. Serial No. 577,188.

To all whom it may concern:

Be it known that we, FRANK KUHN and LAURENCE H. THOMAS, both citizens of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Grinding and Polishing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to grinding and polishing machines and is especially adapted for the grinding and polishing of flat-work pieces, such as the base of an electric flat-iron.

One of the objects of the invention is to obtain a machine which is adapted for large production, whereby the work may be completely finished in one operation.

Another object is to provide a machine which will produce a high polish on the work. Still other objects reside in the novel features of construction and the combination of parts as hereinafter set forth, and shown in the accompanying drawings, wherein—

Figure 1 is a side elevation of the complete machine;

Figure 2 is an end elevation thereof;

Figure 3 is a vertical section on the line 3—3 of Figure 1;

Figure 4 is a plan view of the work conveyor;

Figure 5 is a vertical section on the line 5—5 of Figure 4;

Figure 6 is a vertical section on the line 6—6 of Figure 2.

In general construction the machine consists of a plurality of grinding units which are arranged in operative relation with a traveling work holder, which presents the work successively to the different units. Preferably the grinding units are provided with different grades of abrasive, whereby the first unit performs the rough grinding and the last unit gives the work its finishing polish.

While the grinding units may be of any suitable construction, in the preferred form, they consist of a pair of rotatable wheels and a traveling abrasive belt operating thereover. The work-piece is moved tangentially of one of the wheels and is yieldingly pressed radially thereof in order to bring the work piece in contact with that portion of the abrasive belt which is supported by said wheel.

In carrying out this construction we preferably provide a plurality of vertical hollow posts 1 which are suitably supported on bases 2. Adjustable collars 3 and 3′ are slidably mounted on the posts 1 and are secured thereto by suitable means such as the screws 4. The collars 3 and 3′ are provided with outwardly extending arms 5, in which are rotatably mounted the arbors 6 and 6′. Wheels or pulleys 7 and 7′ are mounted upon the respective arbors and an endless abrasive belt 8 operates thereover.

For vertical adjustment of the grinding unit the rod 9 extends within the hollow post 1 and is provided with collars 10 and 10′ on either side of a disk 11 which is secured to the post 1. The lower end of the rod 9 is threaded and engages with a disk 12, which is secured by means of screws 14 to a tubular member 13 telescopically engaging the post 1. The member 13 is supported by a bracket 15 which is secured to the frame member 16 hereinafter more fully described. The tubular post 1 is provided with vertical slots 17 through which the screws 14 extend, so that by turning the rod 9 a relative movement is obtained between the disks 11 and 12, thereby moving the tubular post 1 within the member 13 and raising or lowering the grinding unit with respect to the frame member 16. The upper end of the rod 9 is preferably provided with a squared portion 9^a for engagement with a handle wrench 18.

For operating the belts 8, separate motors 19 are preferably provided for each unit, the motors being suitably supported on the posts 1 by means of brackets 20. The motors are connected to the pulleys 7 by suitable means such as the chain belts 21.

For bringing the work into operative relation with the various grinding units, an endless conveyor 22 is provided which consists of the sprocket wheels 23 and 23′ over which operates the chain 39. The sprocket wheel 23 is mounted upon an arbor 24, which is journaled in a frame 25 consisting

of the vertical legs 26 and any suitable cross members 27, bracing and stiffening the frame. A separate motor 28 is supported on a platform 29 in the frame 25 and is connected to the sprocket wheel 23 by suitable gearing. As shown, the motor shaft 30 is connected to a countershaft 31 by means of the pulleys 32 and 33 and the belt 34. A worm 35 on the countershaft meshes with a worm wheel 36, which in turn drives a gear 37 upon the shaft 24 by means of a pinion 38.

The sprocket wheel 23′ is journaled in the opposite end of the frame 25 and is provided with a suitable take-up for regulating the tension of the chain 39. As shown, the take-up consists of blocks 40 which are longitudinally slidable in the guideways 41 and are adjustable by means of screws 42 which threadedly engage the frame legs 26ª and are secured to the blocks 40.

The frame member 16, previously referred to, extends longitudinally of the frame 25 and is secured to the vertical legs 26. A similar frame member 16ª secured in the same manner forms with the member 16 a support for the conveyor. The endless chain 39 consists of links 43 having cross members 44 which engage with the teeth of the sprocket wheels 23 and 23′. Each of the links 43 supports a rectangular plate 45 which is provided with upstanding pins 46 for positioning and holding the workpiece 47 thereon. As shown in the drawings, the workpiece is the base of an electric flatiron and the pins 46 are arranged upon the plate 45 to correspond with apertures 48 in the base, which are used in assembling the same.

For guiding the plates 45 the side members 49 and 49′ are secured to the longitudinal frame members 16 and 16ª respectively and angle irons 50 and 50′ are fastened thereto, so that the horizontal portions 51 and 51′ form stops for limiting the upward movement of the plates 45. Under each of the wheels 7 is located suitable means for yieldingly pressing the work into operative relation with the abrasive belt and, as shown, this means includes levers 52 which are pivoted upon shafts 53 extending transversely of the frame. Each of the levers is provided with a weight 54 which is hung in the notches 55 in one end of the lever. The other end of the lever bears against a cross rod 56 having vertically extending portions 57 and 57′ which are slidable in vertical holes 58 in the longitudinally extending members 59. The rods 57 and 57′ are provided at their ends with transversely extending members 60 and 60′ which bear against the under side of the plates 45. Thus the weight, acting through the lever arm, yieldingly presses the plates 45 towards the wheel 7 and the angle bars 50 and 50′ form stops which prevent the plates from contacting with the wheel. The pressure may be varied by adjusting the position of the weight 54 and thereby increasing or decreasing the effective leverage.

For convenience in changing the belts, it is desirable to move the grinding units away from the conveyor and for this purpose each of the posts 1 is provided with a pedal 61 which serves this function. The pedal 61 is located at one end of a lever 62, which is fulcrumed upon lugs 63 on the base 2. The opposite end of the lever 62 is bifurcated and the arms 64 are connected by a transversely extending rod 65, which is secured to the tubular post 1. The base 2 is slotted to permit the movement of the rod 65. With this arrangement, when pressure is applied to the pedal 61, the tubular post 1 is raised relative to the base 2 and in this movement carries the grinding unit vertically a sufficient distance to withdraw it from operative position with respect to the work conveyor.

In the operation of the machine, the grinding units are provided with different grades of abrasive belts ranging from the coarsest grade for rough grinding the work to the finest grade for giving it the finishing polish. Each of the units is set in operation by starting the respective motors 19 and the conveyor is set in motion by the motor 28. The grinding units are adjusted relative to the conveyor and the pressure on the respective units is adjusted by means of the weights 54. The workpieces 47 are then placed upon the conveyor and positioned by means of the pins 46. The workpieces are thus carried into operative relation with each of the grinding units, and after completing the operation, may be removed from the conveyor at the opposite end thereof.

What we claim as our invention is:

1. A grinding and polishing machine comprising a horizontal frame, a pair of sprockets journalled in opposite ends thereof, an endless link chain engaging said sprockets, plates secured to the links of said chain, longitudinal guide ways on said frame for receiving the edges of said plates, flanges extending inwardly from said guide ways forming stops for said plates to limit the upward movement thereof, levers pivoted to said frame, weights depending from the ends of said levers, a vertically movable rod attached to each of said levers at the end opposite said weights, and a head on said rod adapted to bear against the under side of said plate, said head being arranged beneath one of said flanges.

2. In a grinding and polishing machine, the combination with a frame having spaced longitudinal side members, a pair of sprocket wheels, an endless chain engaging said sprockets and adapted to move intermediate said side members, said chain having a series of links, a plate attached to one

of said links, a pair of vertically movable rods guided in said side members and extending beneath the side edges of said plate, a cross member connecting said rods, a lever pivoted to said frame having one end engaging said cross member, a weight on the opposite end of said lever, a rotatable grinding unit adapted to engage the work carried by said plate and flanges extending inwardly from said side members forming a stop for limiting the upward movement of said rods relative to said grinding unit.

In testimony whereof we affix our signatures.

FRANK KUHN.
LAURENCE H. THOMAS.