

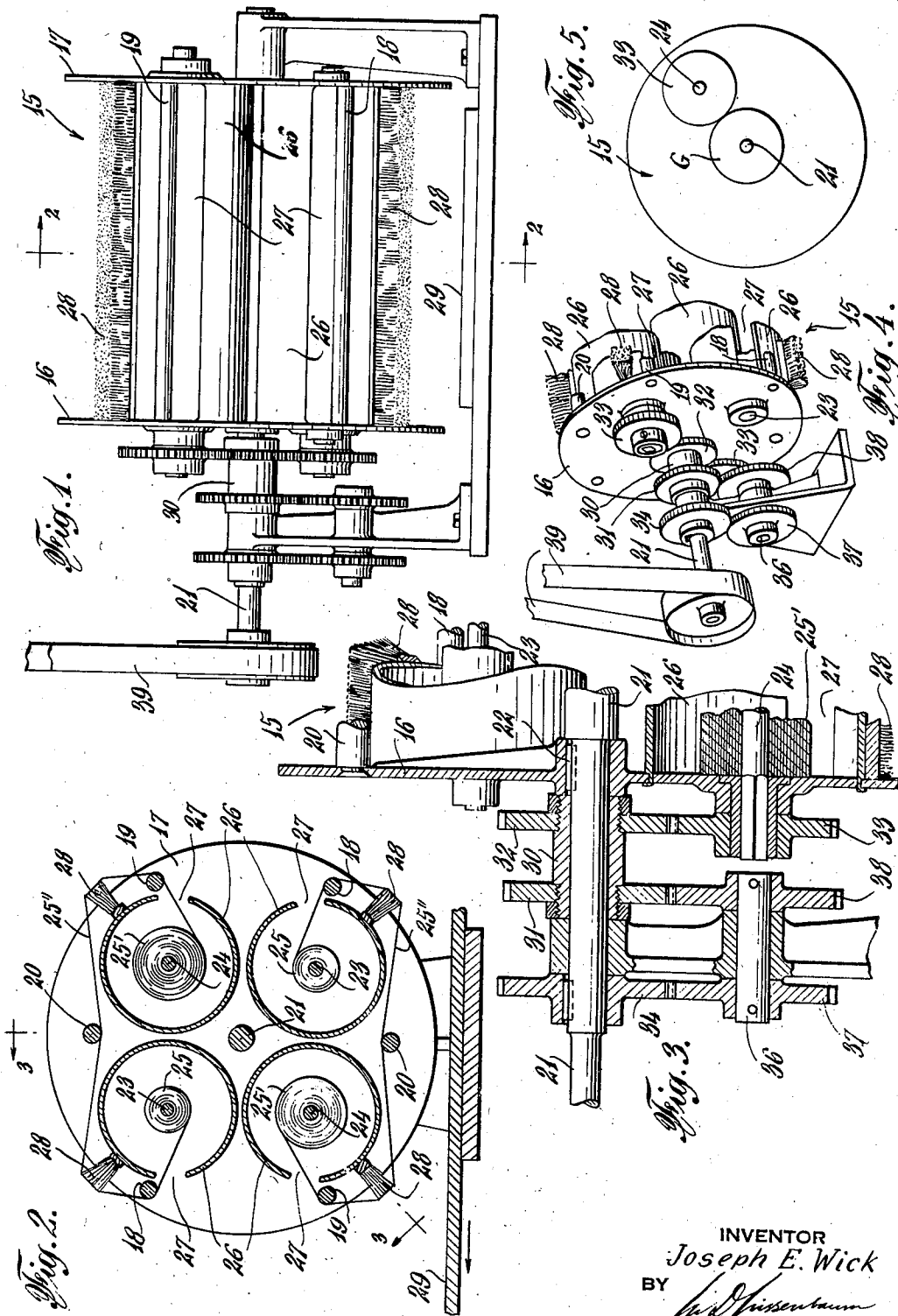
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J. E. WICK

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SANDING AND SURFACE FINISHING MACHINE

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INVENTOR
Joseph E. Wick
BY *[Signature]*
ATTORNEY

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SANDING AND SURFACE FINISHING
MACHINEJoseph E. Wick, Carlstadt, N. J., assignor to
Jack Siegel, New York, N. Y.

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The present invention relates to sanding and surface finishing machines, and more particularly to the type employing one or more rolls of sand paper, emery cloth or other suitable abrasive or finishing material, a very narrow lane of which is presented for operating contact with the surface to be treated.

An object of this invention is to provide a machine of the type mentioned of novel and improved construction, designed to so function that the surface treated shall receive a finish of extreme evenness.

Another object hereof is to provide a novel and improved machine of the character set forth, which insures maximum effective use of the abrasive or other finishing agent employed.

A further object of the present invention is to provide a machine of the class mentioned, of novel and improved construction, which is simple to manufacture, easy to operate, employing no mechanism which is apt to get out of order other than by natural wear, and which is highly efficient in carrying out the purposes for which it is designed.

Other objects and advantages gained, will become manifest as this disclosure proceeds.

In the accompanying drawing forming part of this application, similar characters of reference indicate corresponding parts in all the views.

Fig. 1 is a front view of a machine embodying the teachings of this invention, shown however without the finishing material.

Fig. 2 is a section taken at line 2—2 in Fig. 1.

Fig. 3 is an enlarged fragmentary, partially sectional view taken of the machine at line 3—3 in Fig. 2.

Fig. 4 is a perspective view in reduced scale, showing the gearing system included in said embodiment.

Fig. 5 is a diagram used in the following description to aid in explaining operation of the machine.

In the drawing, the numeral 15 designates generally a revolvably mounted drum or reel structure, comprising the end disc members 16 and 17, maintained in spaced relation by the tie rods 18, 19 and 20 between them; said rods being parallel with the main shaft 21 to which the drum 15 is keyed as at 22, or otherwise suitably secured. Each roll of finishing material is mounted on a shaft 23, and is adapted to be wound up on shaft 24 by mechanism hereinafter described. Each roll of such finishing material, therefore has an unused portion 25 and a used portion 25' with connecting web portion 25''. I have chosen to

show a machine employing two such rolls of material to accomplish balance. Of course, machines constructed in accordance with this invention may be made having any number of such roll systems, depending upon the size of the machine and its intended use. The pairs of shafts 24 and 23, all parallel with the main shaft 21, are preferably, but not of necessity, equi-distant from said main shaft, and equi-distant from each other, for symmetry of design and balance.

The roll portions may reside in casings 26, cylindrical in shape, extending across the end members 16 and 17, each of which casings has a longitudinal opening 27 through which the roll material runs. Brushes 28, or other resilient means in place thereof, extend across the reel structure 15, projecting radially outwardly, one beyond each of the casings 26, and create the operating lanes for the web 25' of the finishing material passing over said resilient means, from the shaft 23 to the rewind shaft 24 in each instance, when said brushes 28 pass over the surface 29 to be treated. The tie rods 18, 19 and 20 are so placed that they serve as guide rollers for the web 25'. In order that the web 25' come in contact with the surface 29 only at the operating lanes, it is desirable that rods 20 lie nearer to the main shaft 21 than the brushes 28.

On the main shaft 21, is a loose sleeve 30 carrying the gears 31 and 32. Each of the rewind shafts 24 is demountable from, and is driven by a gear 33; each such shaft carrying one such gear 33. A gear 34 is keyed as at 35 or otherwise securely mounted on the main shaft 21. A countershaft 36 has mounted thereon the gears 37 and 38; the former in engagement with gear 34, and the latter in engagement with the gear 31. By example, and not as a limitation, the gears 32, 33, 34 and 37 are identical, in that, let us say, they each have sixty teeth, while gear 38 has sixty-one, and the gear 31, fifty-nine teeth. Now I will refer to the diagram shown in Fig. 5, which will aid in explaining the operation of the machine.

If gear G is secured to the main shaft 21, and is in engagement with gear 33, then upon rotation of the drum structure 15, as for instance by the belt drive 39, gear 33 will not be revolved about its own axis. If gear G is loose on shaft 21, and is in engagement with the gear 33, then upon rotation of 15, the gear 33 will not revolve about its own axis, if the angular velocity of gear G equals the angular velocity of the shaft 21, but will revolve when such angular velocities are different; the amount of angular movement of any

radius of gear 33, being a measure of such difference. Referring now to the gearing system included in the machine, I have chosen that the angular velocity of the sleeve 30 shall slightly
 5 exceed the angular velocity of the main shaft 21, that is, the effective driving of the gears 33, is about the movement of two teeth per full revolution of the main shaft 21. In other words, what I have accomplished is that the finishing
 10 material will be wound up on the shafts 24, extremely slowly as the drum structure 15 revolves in the relation of about one revolution of the wind up shafts 24 to about thirty revolutions of the main shaft 21. More particularly, upon rotation of the main shaft 21, gear 34 will drive
 15 gear 37, gear 38 will drive gear 31, and due to the slight difference in the number of teeth in said gears 38 and 31, the latter will have an angular velocity slightly higher than the former.
 20 It is only this small increment in angular velocity which drives the gears 33 through the master gear 32, causing the rolls of finishing material to be wound up very slowly on shafts 24, hence new material of said rolls is always presented at the
 25 lanes of operation against the brushes 28, thus accomplishing an extreme evenness of action on the surface 29 treated, and consequently extreme evenness of result.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the specific description and embodiment herein be deemed illustrative and not restrictive, and that the patent shall cover whatever features of patentable
 35 novelty exist in the invention herein disclosed; reference being had to the following claims rather than to the specific description herein to indicate the scope of this invention.

40 I claim:

1. In a surface finishing machine, the combination of a revolvably mounted main shaft, a frame member securely mounted on the main shaft, an unwinding shaft and a winding-up shaft mounted
 45 on the frame member in spaced relation parallel with the main shaft, a roll of surface finishing

material carried on the unwinding shaft; the unwinding end of said roll being secured to the winding up shaft, a rotatably mounted gear, unsecured to the main shaft, adapted to rotate about the axis of the main shaft, a gear securely mounted
 5 on the winding-up shaft adapted to be driven by said first gear and means adapted upon rotation of the main shaft, to rotate said first gear in the same direction and at an angular velocity different than that of the main shaft, whereby
 10 the surface finishing material will be comparatively slowly wound up on the winding-up shaft.

2. In a machine as in claim 1 including a countershaft, a gear securely mounted on the main shaft, a gear of similar size securely
 15 mounted on the countershaft; one of said gears being adapted to drive the other, and another gear securely mounted on the countershaft adapted to drive the first gear mentioned in said claim; the
 20 said first gear and the gear last mentioned on the countershaft being of different size.

3. In a surface finishing machine, the combination of a revolvably mounted main shaft, a frame member securely mounted on the main shaft, an unwinding shaft and a winding-up shaft mounted
 25 on the frame member in spaced relation parallel with the main shaft, a roll of surface finishing material carried on the unwinding shaft; the unwinding end of said roll being secured to the winding-up shaft, a counter shaft, a pair of gears
 30 of equal size, in engagement, securely mounted, one on the main shaft and one on the countershaft, another gear securely mounted on the countershaft, a gear loosely mounted on the main shaft, in engagement with the second gear on the
 35 countershaft; the sizes of the last mentioned engaging gears being unequal, another gear loosely mounted on the main shaft and secured to the first loosely mounted gear, a gear securely mounted on the winding-up shaft in engagement
 40 with said second loosely mounted gear, whereby upon rotation of the main shaft, the surface finishing material will be comparatively slowly wound up on the winding-up shaft.

JOSEPH E. WICK.