A. A. CLARKE.

SURFACE TREATING MACHINE.

APPLICATION FILED NOV. 23, 1918.

1,356,337. Patented Oct. 19, 1920.

2 SHEETS—SHEET 1.

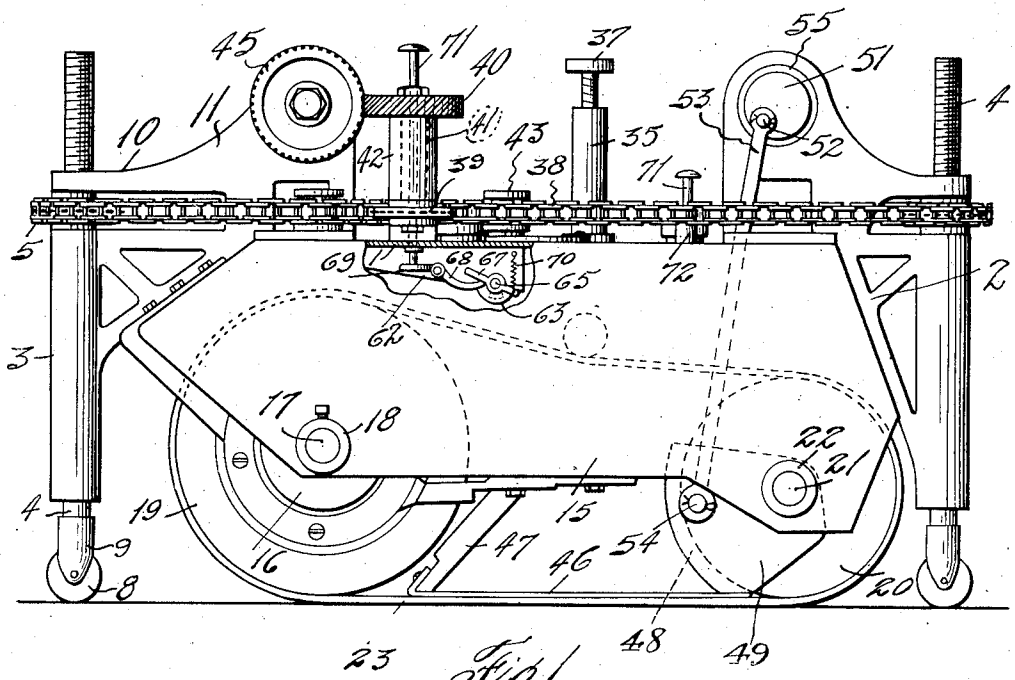


Fig. 1.

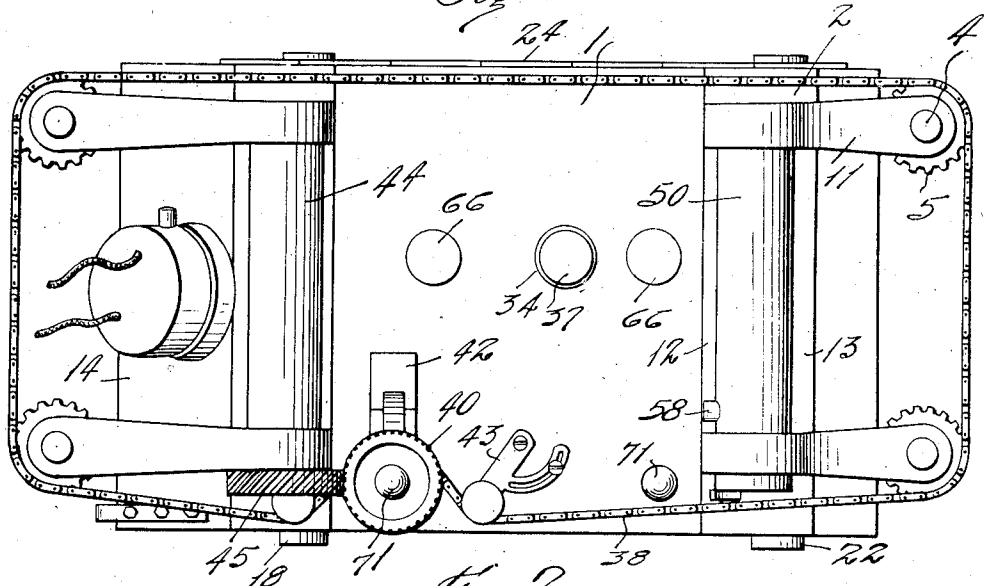


Fig. 2.

INVENTOR.
A. A. CLARKE.
By Jackson & Ackley
ATTORNEY

A. A. CLARKE.

SURFACE TREATING MACHINE.

APPLICATION FILED NOV. 23, 1918.

1,356,337.

Patented Oct. 19, 1920.

2 SHEETS—SHEET 2.

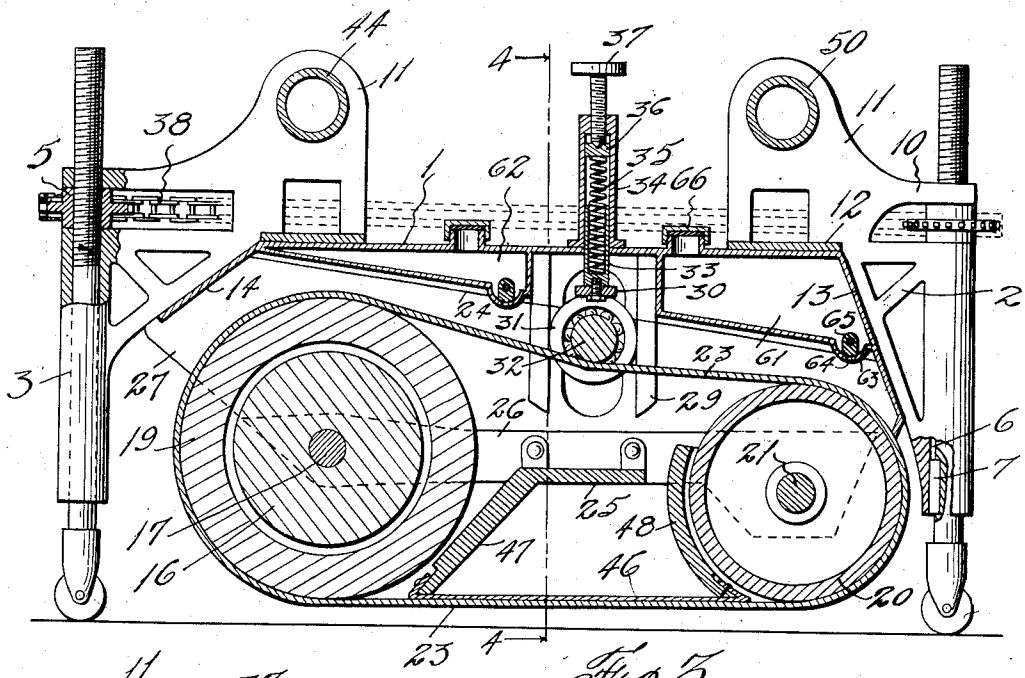


Fig. 5

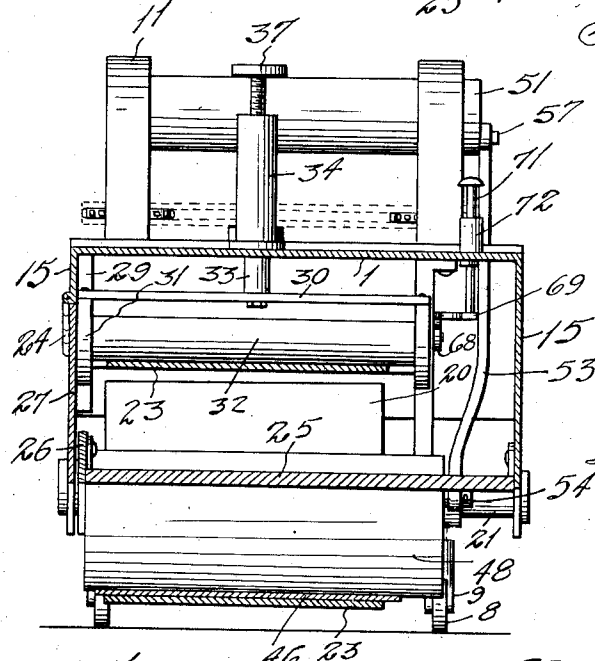


Fig. 4

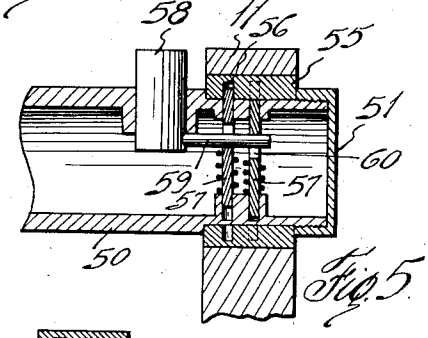


Fig. 5

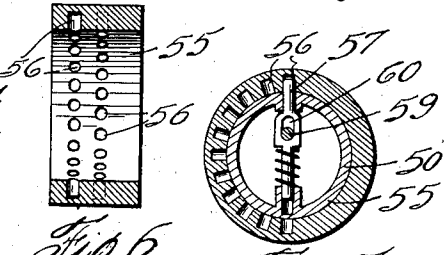


Fig. 6

Fig. 7

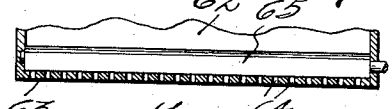


Fig. 8

INVENTOR
A. A. CLARKE
By Jackson & Ahlp
ATTORNEY.

UNITED STATES PATENT OFFICE.

ALEX A. CLARKE, OF DALLAS, TEXAS.

SURFACE-TREATING MACHINE.

1,356,337. Specification of Letters Patent. Patented Oct. 19, 1920.

Application filed November 23, 1918. Serial No. 263,812.

To all whom it may concern:

Be it known that I, ALEX A. CLARKE, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Surface-Treating Machines, of which the following is a specification.

This invention relates to new and useful improvements in surface treating machines.

The purpose of the invention is to provide a continuously moving surface treating member and support the same so that its application to the surface to be treated may be adjusted to a minute degree and effected by the operator while the device is in operation; and without removing the machine from the working surface while the adjustment is being made. A further purpose is to provide an element for conforming the surface treating member to curved surfaces and capable of adjustment so that the said member may be applied to surfaces having different degrees of curves.

Another feature of the invention contemplates reservoirs from which polishing materials may be supplied to the surface treating member and by it applied to the surface worked on.

In carrying out the invention a supporting frame carries a surface treating member and means for driving the same. The frame is mounted on adjustable working gaging elements which control the application of the surface treating member to the work, said surface treating member being disposed between the elements. The frame is portable and is provided with handles so that the operator may readily grasp the same and traverse the work. The work adjusting elements are arranged to be adjusted in unison and one of the handles is connected with the adjusting means whereby the adjustment may be carried out by simply manipulating the handle.

In this machine the surface treating member assumes the form of a belt supported at one end on a drum and supported at the other end and driven by a revolving motor housing surrounding a fixed armature. Adjustable means of a flexible nature engages the lower run of the belt, which is the surface treating run, for conforming the same to curved surfaces. Reservoirs are mounted in the frame over the upper run of the belt and provided with valves for supplying polishing and other surface treating material to the belt.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is illustrated, and wherein—

Figure 1 is a side elevation of a machine constructed in accordance with this invention, a portion being shown in section,

Fig. 2 is a plan view of the same,

Fig. 3 is a longitudinal sectional view,

Fig. 4 is a transverse vertical sectional view on the lines 4—4 of Fig. 3,

Fig. 5 is a detail of the handle locking means,

Fig. 6 is a sectional detail of the locking ring,

Fig. 7 is a sectional detail of the locking means, and

Fig. 8 is a detail of the reservoir valve mechanism.

In the drawings the numeral 1 designates the top plate of a supporting frame disposed between end standards 2 having vertical sleeves at each side. A vertical post 4 is mounted in each sleeve and has its upper end screw-threaded and passing through a sprocket wheel 5. Each post has a keyway 6 receiving a key 7 mounted in the sleeve whereby the post is held against rotation. A caster wheel 8 is journaled in a foot 9 at the bottom of each post and supports the same on the surface which is being worked. It will be seen that the machine may be easily moved on the wheels 8.

Each sprocket 5 is confined against the upper end of its sleeve by an arm 10 projecting from a bracket 11 formed integral with the associated end standard and rising above the plate 1. At each end of the frame the standards and brackets are connected by cross plates 12 which are fastened on top of the plate 1. End plates 13 and 14 respectively depend from the ends of the plate 1 and are inclined outward, the standards being shaped to be attached to the end plates. The frame also comprises side plates 15 having rigid connection with the top and end plates and depending below the same.

A fixed armature 16 has its shaft 17 secured in collars 18 at that end adjacent the plate 14. A cylindrical motor housing 19 surrounds and revolves on the armature 16, these parts constituting the motor. At the opposite end of the frame a transverse drum

20 is mounted to revolve on a shaft 21 having its ends fastened in collars 22. An endless belt 23 is supported at one end by the drum 20 and passes around the housing 19 at the other end whereby it is driven.

This belt may be made of any suitable material according to the purpose for which it is to be used; it may have a surface of abrading material or felt or other surface treating material such as chamois skin, flannel, etc.

It is obvious that the frame must be made so that the belts may be changed and the slack taken out of the belt in use. To do this one of the side plates 15 is hinged at 24 on an incline conforming somewhat to the upper run of the belt. In view of this hinged arrangement a transverse bracket 25 is necessary and this bracket is located between the housing 19 and the drum 20. One end of the bracket is securely fastened to the integral side plate while the other end supports a longitudinal bar 26 adjacent the inner side of the hinged portion 27 of the other plate. The collars 18 and 22 are supported in the integral plate and in the bar 26, the hinged portion 27 having holes receiving the said collars. The hinged portion 27 is suitably engaged with the bracket 25 and bar 26 and may be detached and swung outward when desired.

Guides 28 depend from the plate 1 over the bracket 25 and are spaced inward from the integral side plate 15; while similar guides 29 are fastened to the inner side of the other plate 15 and its hinged portion 27. A yoke 30 has depending bearing rings at each end engaging in the guides 28 and 29. A belt-tightening roller 32 has its ends supported on ball bearings within the rings and bears transversely on the upper run of the belt 23. The yoke has a tubular shank 33 extending up through the top plate 1 and into a cylindrical housing 34. A coiled spring 35 in the housing is seated in the tubular shank and placed under tension by a follower 36 controlled by a thumb-screw 37 projecting from the top of the housing. By adjusting the screw 37 the tension of the spring 35 may be varied and thus the pressure of the roller 32 on the belt is thus controlled and the slack taken out of the belt. When it is desired to change the belts the screw 37 is adjusted to relieve the tension on the roller 32 and the portion 27 released and swung outward so that the belt may be easily removed and replaced.

It will be seen that by extending the posts 4 or retracting the same the surface treating belt will be moved from or toward the working surface. There are a pair of posts at each end of the frame and the belt is disposed intermediate the ends of the frame. In order that the lower run of the belt may be evenly adjusted with relation to the working surface it is necessary to adjust the posts in unison and therefore the sprockets 5 are traversed by a sprocket chain 38. This chain is driven by a sprocket 39 which in turn is driven by a spiral gear 40. The sprocket 39 is connected with the gear 40 by a vertical tubular shaft 41 mounted in a bracket 42 on the top plate 1. A slack adjuster 43 is mounted on the top plate and engages the sprocket chain.

In the brackets 11 at the left hand end (Fig. 2) of the frame a transverse handle 44 is mounted to revolve. This handle projects through one of the brackets and has fixed on its projecting end a spiral gear 45 meshing with the gear 40. It is obvious that by rotating the handle 44 the sprocket 39 is rotated and the chain 38 thus propelled. The chain rotates the sprockets 5 which owing to their screw-threaded engagement with the posts 4 adjust the latter longitudinally so that the frame is moved toward or from the surface being treated and thus the application of the belt to the work is controlled. A slight movement of the handle 44 will adjust the parts so that the belt will engage the working surface to a greater degree and either exert a polishing pressure thereon or cut into the surface according to the kind of belt used. If too much of the surface is removed or the pressure is too great the counter adjustment is easily had by rotating the handle in the opposite direction. The workman does not have to remove the machine from the work during this adjustment.

It is obvious that some means for conforming the lower run of the belt to the working surface is desirable if high grade work is to be done as the intermediate portion of the belt would otherwise not be applied to the work with the same pressure as its ends. I have provided a transverse metal plate 46 bearing on the upper or inner side of the lower run of the belt and extending from the drum 20 to the housing 19. The bracket 25 carries a depending support 47 inclined toward the housing 19 and extending under the same. The plate 46 has one end bent up and fastened around the lower end of the support 47.

A segmental yoke 48 extends across the face of the drum 20 and has ears 49 pivoted on the shaft 21. The yoke has substantially the same radius as the drum and is spaced sufficiently therefrom to give clearance. The opposite end of the plate 46 is bent around and secured to the lower edge of the yoke. It is apparent that the ends of the plate are held well under the drum 20 and housing 19 so that said plate contacts with the belt throughout nearly the entire length of the lower run of the latter. The plate 46 is made flexible and it is obvious that by swinging the yoke 48 upward the

plate will be bowed or sprung inward and thus made to conform to a curved surface to which it will evenly apply the belt. For adjusting the yoke I provide a rotatable tubular handle 50 mounted in the brackets 11 and arranged opposite the handle 44. The handle 50 projects through one of the brackets. On the projecting end of the handle a cap 51 is threaded. This cap carries an eccentric pin 52 pivoted to one end of a link 53 which extends down through the top plate to a pin 54 carried by one of the ears 49. By rotating the handle 50 the link is raised and lowered and the yoke 48 thus swung whereby the plate 46 is given the desired curvature.

It is desirable to lock the plate 46 in its adjusted position and therefore a locking ring 55 is fixed in one of the brackets 11 and receives the reduced end of the handle 50 which is confined by the cap 51. The locking ring has two rows of radial notches 56 in its inner surface. These rows extend only part of the way around the ring and the notches of one row are disposed in staggered relation to those of the other row. Within the radius end of the handle a pair of spring pressed locking plungers 57 are mounted so as to project through the handle and engage in the notches 56. The plungers are parallel so that when one engages in a notch of one row the other plunger will engage the ring between the notches of the other row. The purpose of this staggered disposition of the notches is to afford a minute adjustment. A button 58 is mounted radially in the handle 50 and carries a laterally extending pin 59 engaging in slots 60 in the plungers. As shown in Fig. 5 the slots permit one of the plungers to engage in the notches 56 and the other to ride on the inner surface of the locking ring 55. When it is desired to rotate the handle 50 the button 58 must be pressed inward to withdraw the locking plunger and thus held while the handle is rotated. When the button is released one of the plungers will spring into the first notch approached.

In polishing surfaces it is often advantageous to use a polishing material on the belt 23, therefore between the guides 29 and the end plate 13 I mount a reservoir 61 under the top plate 1; while between the end plate 14 and the guides 29 I mount a second reservoir 62. These reservoirs have their bottoms inclined to conform to the upper run of the belt and at the lower end of each reservoir a transverse discharge trough 63 is formed. At the bottom of each trough perforations 64 are provided, as is shown in detail in Fig. 8. A transverse valve-bar 65 is disposed in each trough and normally covers the perforations 64 thereof; but is arranged to be rocked transversely to uncover the perforations and permit the contents of the reservoir to be discharged therethrough. Each reservoir has a filling cap 66 on the top plate.

The means for operating each valve-bar is substantially the same and a description of one will suffice for both. An arm 67 is fastened intermediate its ends on the reduced bearing end of the valve-bar 65 which projects through the side of the reservoir. The curved finger 68 of a lever 69 engages under the arm 67 on one side of the valve-bar; while that portion of the arm on the other side of the valve-bar is attached to the end of a coiled spring 70 which has its upper end fastened to the reservoir. When the lever 69 is swung to operate the valve-bar the finger 68 is swung upward whereby the arm 67 is swung against the tension of the spring 70 and the valve-bar rocked from over the perforation 64. For operating the lever 69 a plunger 71 is employed. One of these plungers 71 passes through the tubular shaft 41, as is shown in Fig. 1, while the other plunger 71 is mounted in a collar 72 on the top plate 1. It is obvious that material from either reservoir may be discharged on to the belt by simply depressing the plunger 71 controlling the valve-bar 65 of said reservoir.

What I claim, is:

1. In a surface treating machine, a wheeled supporting frame, a surface treating belt carried by the frame, means to drive the belt, a flexible plate having one end secured to the supporting frame and engaging the inner surface of the lower portion of the belt, an element pivoted to the frame and connected with one end of the plate, a handle pivoted upon the frame, an eccentric pin secured to the handle, and a link pivotally connected with the eccentric pin and the pivoted element.

2. In a surface treating machine, a supporting frame, a surface treating belt, a drum mounted transversely of the frame and supporting one end of the belt and driving the same, adjustable work engaging elements supporting the frame at each end of the belt and controlling the application of the belt to the surface to be worked upon, means mounted on the frame for adjusting the work engaging elements in unison, and a surface conforming member engaging the belt between the drum and the motor housing, and means for varying the curvature of the surface conforming member.

3. In a surface treating machine, a supporting frame, a surface treating belt, a drum mounted transversely of the frame and supporting one end of the belt, a motor driven member supporting the other end of the belt and driving the same, adjustable work engaging elements supporting the frame at each end of the belt and controlling the application of the belt to the sur-

face to be worked upon, means mounted on the frame for adjusting the work engaging elements in common, and a pair of handles connected with the frame, one of said handles having operative connection with the adjusting means.

4. In a surface treating machine, a supporting structure, adjustable posts at each end of the structure, an endless surface treating belt mounted longitudinally of the frame between the posts, means for driving the belt, means for adjusting the posts longitudinally to control the application of the belt to the surface to be treated, a flexible plate engaging the inner side of the belt to conform the same to the working surface, means for flexing the plate from a plane to an arc, and a locking device for the flexing means whereby the plate is held to the curvature or plane to which it is adjusted.

5. In a surface treating machine, the combination with an adjustably supported frame, and a surface treating belt carried by the frame, of a flexible belt conforming the plate engaging the inner side of the belt along the run thereof which is applied to the work, a device for flexing the plate from a plane to an arc, a rotatable handle mounted on the frame and having operative connection with the flexing device, and means for locking the handle against rotation.

6. In a surface treating machine, the combination with an adjustably supported frame, and a surface treating belt carried by the frame, of a flexible belt conforming the plate engaging the inner side of the belt along the run thereof which is applied to the work, a device for flexing the plate from a plane to an arc, a rotatable handle mounted on the frame and having operative connections with the flexing device, means for locking the handle against rotation, a second rotatable handle mounted on the frame, and having connection with the adjustable supports of the frame for operating the same.

7. In a surface treating machine, a supporting frame, a surface treating belt carried by the frame, means to drive the belt, a flexible plate engaging the inner surface of the lower portion of the belt, a supporting element secured to the supporting frame and attached to one end of the flexible plate, an element pivoted to the supporting frame and connected with the opposite end of the flexible plate, a handle pivoted to the supporting frame and having an eccentric pin, and a link pivoted with the eccentric pin and pivotally connected with the pivoted element.

8. In a surface treating machine, a supporting frame, substantially vertical posts connected with the supporting frame in a manner to move vertically with relation thereto and being incapable of turning upon their longitudinal axes with relation to the supporting frame, said posts extending downwardly below the supporting frame and serving to support the same and having their upper portions screw-threaded, substantially horizontal sprocket wheels having screw-threaded engagement with the screw-threaded portions of the posts and serving to longitudinally adjust them, a single sprocket chain engaging said sprocket wheels, a pair of handles connected with the supporting frame near its ends, one handle being rotatable, means operated by the rotatable handle to move the sprocket chain, and a movable surface treating member secured to the supporting frame.

In testimony whereof I affix my signature.

ALEX A. CLARKE.