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A. JOOSEPSON  
SEMI-AUTOMATIC ROTO SCALER

2,889,612

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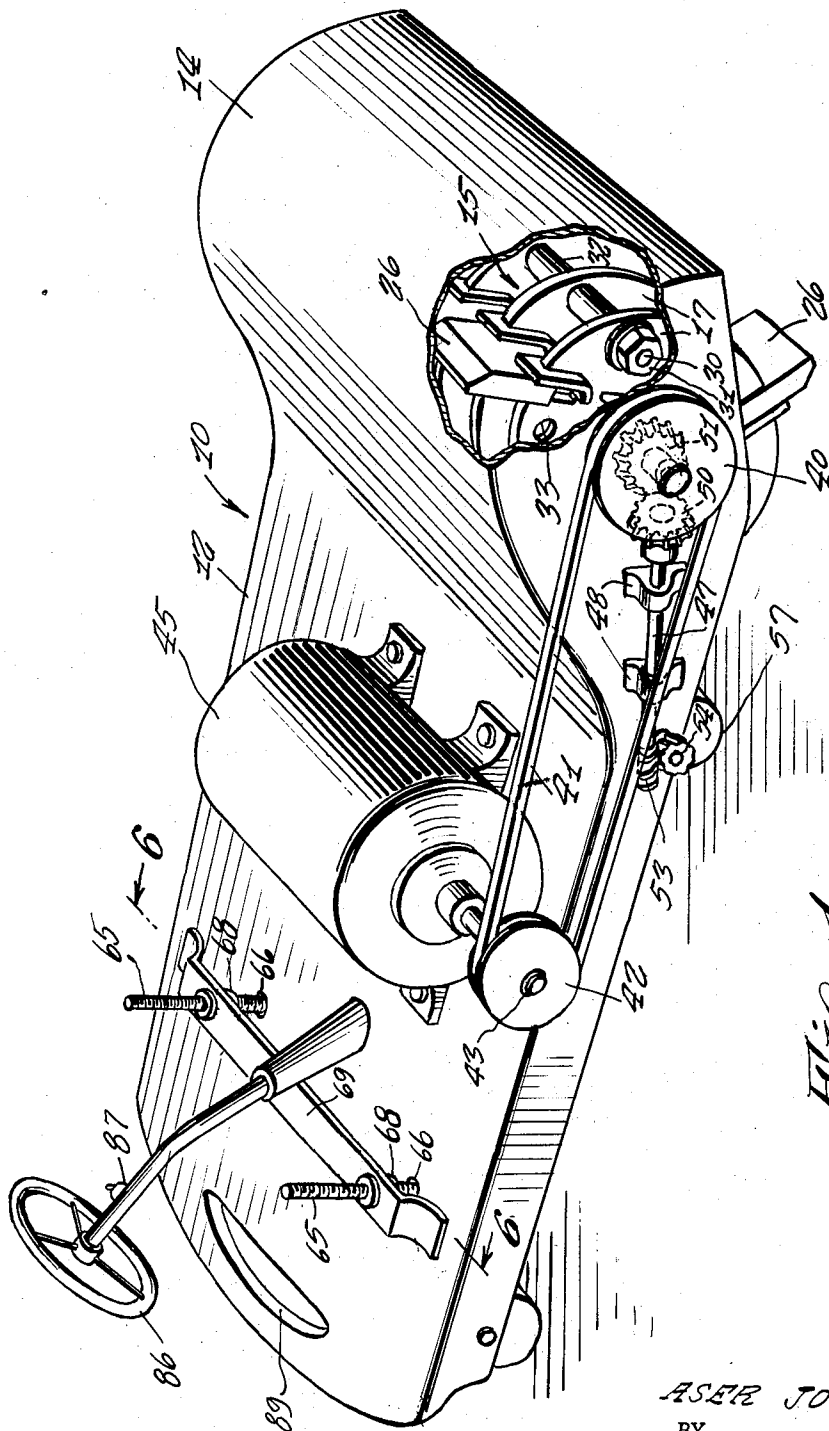


Fig. 1

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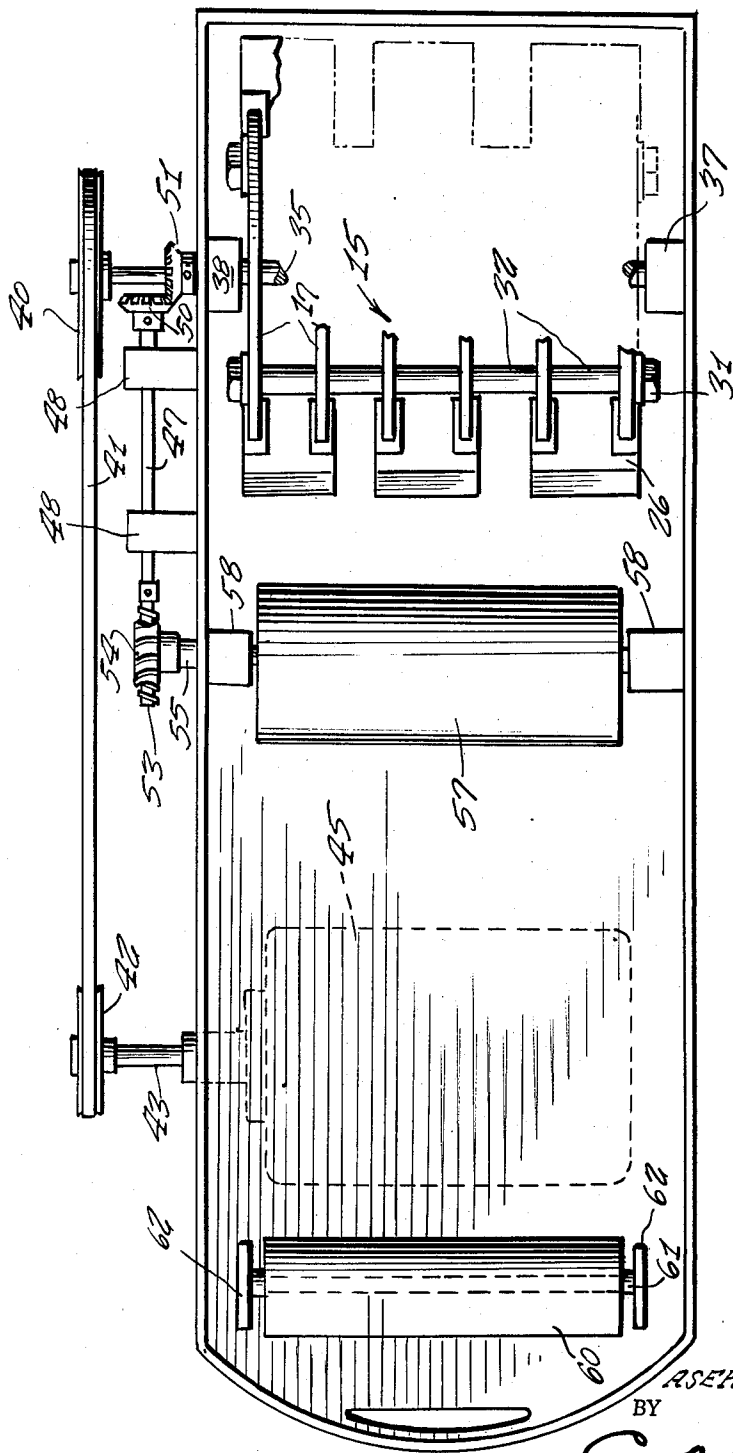
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*Fig. 2*

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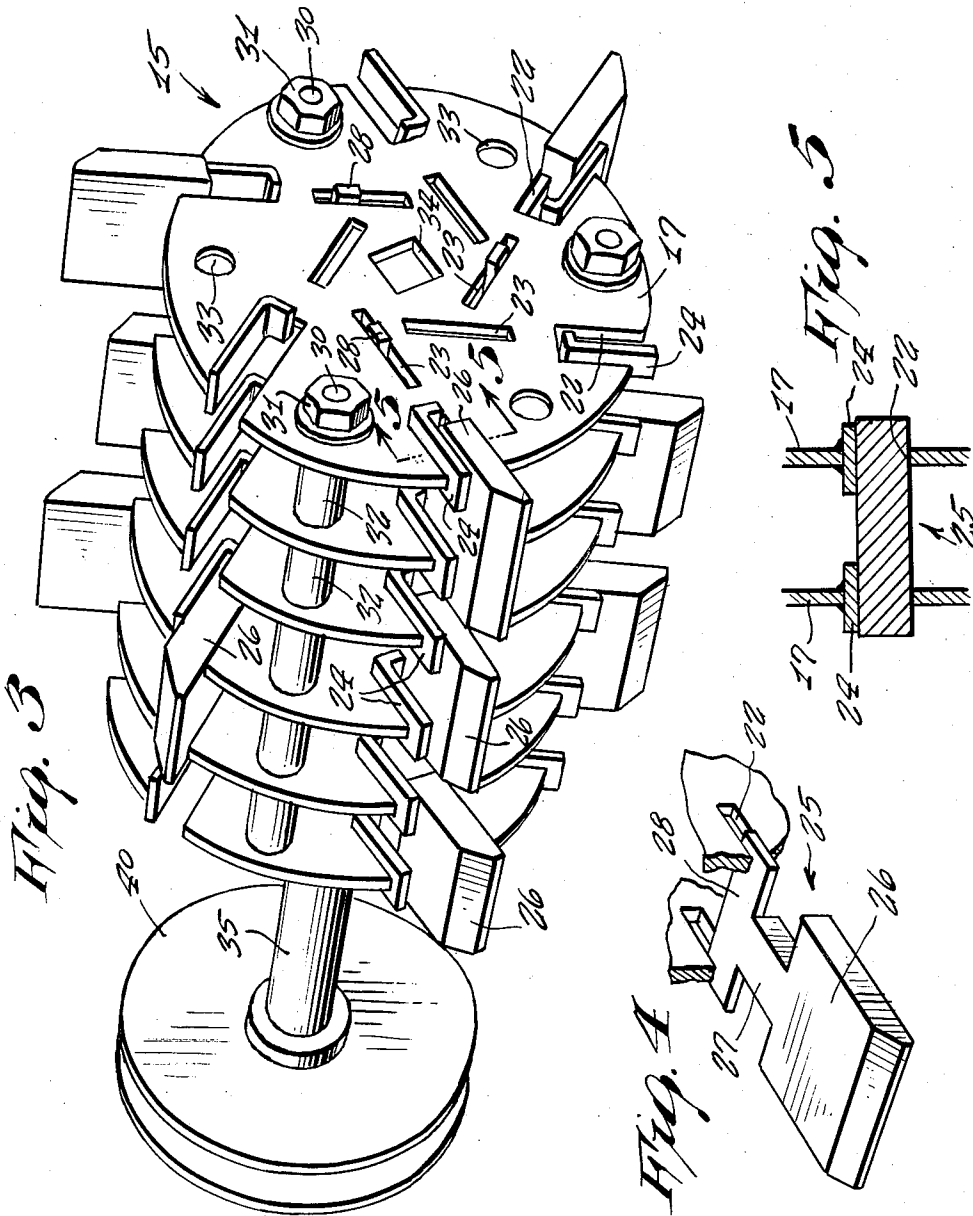
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Fig. 6

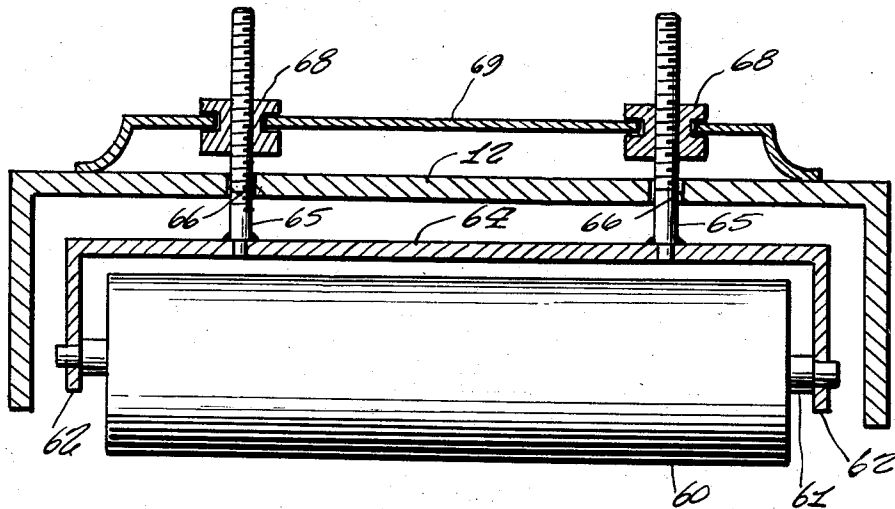
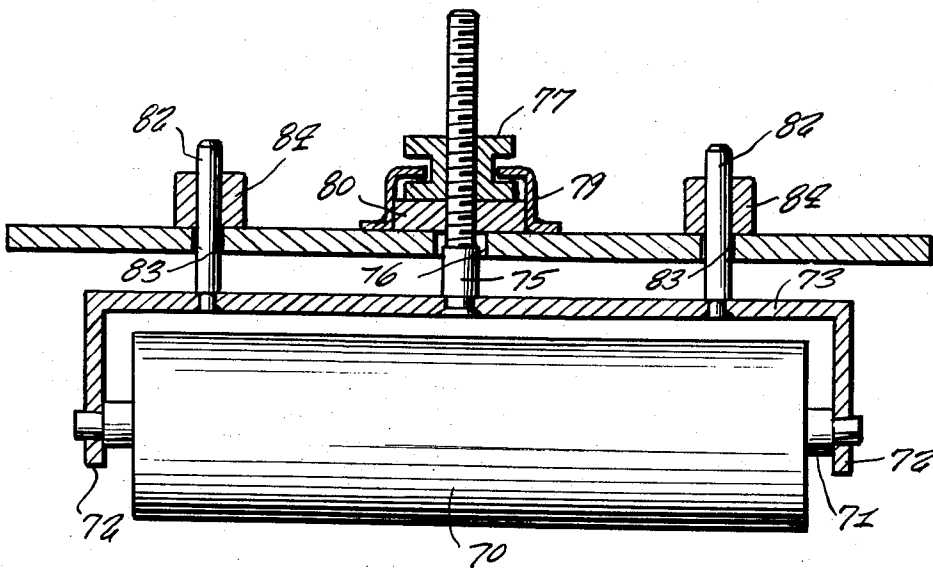


Fig. 7



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**SEMI-AUTOMATIC ROTO SCALER**

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4 Claims. (Cl. 29—81)

This invention relates to power tools and more particularly to a scraping machine.

Various types of descaling machines have been provided for removing corrosion and scale from metal surfaces. However, many of these devices are difficult to handle, are quite slow in operation, and which do not provide sufficient adjustment means for obtaining accurate and precision removal of the material. It is therefore an object of the present invention to provide a descaling machine that is simple in construction, efficient in operation, and which will overcome the aforementioned difficulties.

Another object of the present invention is to provide a descaling machine for removing corrosion and scale from large metal surfaces, such as on ships and boats, which can also be used for removing scale from corners and small congested areas.

Another object of the present invention is to provide a descaling machine which is practically automatic in operation, and which may be minutely adjusted to control the depth of cut of the cutting blades.

Still another object of the present invention is to provide a descaling machine of the type described which may be used for close scaling on corners, inside of U-beams, angle beams, and which may be used in vertical descaling operations through the additional use of guide rails and magnetic holding means.

All of the foregoing and still further objects and advantages of this invention will become apparent from a study of the following specification, taken in connection with the accompanying drawing, wherein:

Figure 1 is a perspective view of a machine made in accordance with the present invention;

Figure 2 is a bottom plan view of the apparatus shown in Figure 1;

Figure 3 is a perspective view of the descaling drum forming a part of the present invention;

Figure 4 is a perspective view showing the manner in which the cutting blades are supported within the descaling drum;

Figure 5 is an enlarged transverse cross sectional view taken along line 5—5 of Figure 3;

Figure 6 is a transverse cross sectional view taken along line 6—6 of Figure 1, showing certain parts of the machine made in accordance with one form of the present invention; and

Figure 7 is a view similar to Figure 6, showing a modified form of construction.

Referring now to the drawing, and more particularly to Figures 1 to 5 thereof, a descaling machine 10 made in accordance with the present invention is shown to include a main housing 12 having an auxiliary segmental cylindrical housing 14 at the forward end thereof for substantially enclosing the descaling drum 15. As is more clearly shown in Figures 3 to 5, the descaling drum 15 includes a plurality of identical circular discs 17, each of which is provided with a plurality of symmetrically arranged groove and slot sets. Each such

set includes an outwardly opening groove 22 and an inwardly disposed slot 23 which lie along a line common to a chord of the disc 17. Each of the grooves 22 is provided with an L-shaped bearing plate 24 which slidably engages with the head 26 of a cutting tool or plate 25 that is slidably supported in predetermined groove and slot sets of adjacent discs. Each such cutting tool 25 is provided with the cutting head 26, a shank 27, and a laterally extending base 28. The base 28 is received within the slots 23 while the head 26 is received within the grooves 22 of corresponding groove and slot sets of adjacent plates 17. Preferably, each disc 17 is provided with six such sets in symmetrical relationship with each other and the cutting tools are received within alternate slots on each pair of discs. With the cutting tools in proper position, bolts 30 are extended through the aligned openings 33 in the plates and secured in place therein by means of nuts 31. Tubular spacer elements 32 carried by the respective bolts 30 maintain the plates 17 in equally spaced apart relationship. The center of each disc is provided with a non-circular opening 34 for driving engagement by the drive shaft 35 which extends therethrough and is rotatably supported in bearings 37, 38 carried by the housing. A pulley 40 is secured to the outer end of the drive shaft 35 for engagement by the belt 41 which is driven from the pulley 42 secured to the drive shaft 43 of a motor 45. This motor may be of the internal combustion type, electrically operated type or pneumatically operated type, as may be desired.

A take-off shaft 47 rotatably supported in bearings 48 carried along one side of the auxiliary housing 14 has a bevel gear 50 at one end in driven engagement with a bevel gear 51 secured to the drive shaft 35 of the scaling drum. A worm gear 53 connected to the opposite end of the take-off shaft 47 is in driving engagement with a worm wheel 54 secured to the shaft 55 of a feed or motion roller 57 carried beneath the housing 12. This roller 57 is intermediate the motor 45 and the descaling drum 15 and is in driving engagement with the surface on which the machine is supported. The gearing ratio may be of any desired value, as may suit the particular job. However, a speed of ten feet per minute for the machine has been found to be very satisfactory, in which case the cutting tools are capable of hitting fifteen times for each linear inch of movement of the machine.

Referring to Figures 1 and 6 of the drawing, a depth or height control roller made in accordance with one form of the present invention is shown in operative association with the machine for controlling the depth to which the cutting tools will extend below the surface upon which the driving roller 57 is supported. This depth control roller 60 includes a shaft 61 which is rotatably carried upon the sides 62 of an inverted yoke. The base 64 is provided with a pair of integral upwardly extending threaded studs 65 which are slidably received within aligned openings 66 in the housing 12. A thumb nut 68 in threaded engagement with each respective stud 65 is rotatably supported upon a mounting plate 69 so that the relative height of the adjustment roller 60 may be readily controlled.

In Figure 7 of the drawing, a modified form of construction 70 is shown wherein the roller is mounted upon a shaft 71 that is rotatably carried by the sides 72 of the inverted yoke shaped bracket. The base 73 of this bracket is provided with a single upwardly extending centrally located threaded stud 75 which passes through the opening 76 in the housing 12 into threaded engagement with the thumb screw 77 rotatably supported within the bracket 79 and upon a bearing member 80. A pair of longitudinally spaced apart guide pins 82 carried by the yoke shaped bracket also extend upwardly through aligned openings 83 in the housing 12 and through bush-

ings 84 for maintaining the roller 70 in laterally extending relationship with the main housing 12. Inasmuch as these depth adjustment rollers 60, 70 are located at the end of the housing 12 opposite from the descaling drum 15, adjustment of the height thereof to the associated manually operated thumb nuts, is operative to lock the housing about the line of engagement of the feed roller 57 with the supporting surface so that the height of the cutting tools above this surface is readily adjusted.

Referring again to Figure 1 of the drawing, a handle 86 is carried upon the mid portion of the main housing 12 for manually guiding the machine along a desired path. An enlarged cutout 89 at the adjacent end of the housing provides a grip for the other hand so that the tool may be securely held. The start-stop switch 87 may be conveniently located upon the handle 86 so that the starting and stopping of the machine can be effectively controlled while it is being guided along the aforementioned path.

While this invention has been described with particular reference to the construction shown in the drawing, it is to be understood that such is not to be construed as imparting limitations upon the invention, which is best defined by the claims appended hereto.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A descaling machine comprising, in combination, a main housing having an auxiliary segmental cylindrical housing at one end, a descaling drum rotatably supported within said auxiliary housing, a motor carried by said main housing, means drivingly connecting the motor to said drum, a feed roller carried by said main housing, means drivingly connecting said motor to said feed roller, means carried by said housing for controlling the depth of cut of said descaling drum, said descaling drum comprising a plurality of discs, means securing said discs in concentric spaced apart relationship, a plurality of cutting heads carried by pairs of adjacent ones of said discs for removing scale from a surface, each said disc comprising a plurality of symmetrically arranged groove and slot sets, one of said cutting heads being supported in predetermined groove and slot sets of adjacent ones of said discs for limited sliding movement along a chord of said discs beyond the outer periphery thereof, said means drivingly connecting said motor to said drum comprising one pulley secured to the motor

shaft, another pulley secured to said drum, and a belt drivingly connecting said one and said other pulleys together, said means drivingly connecting said motor to said feed roller comprising a take-off shaft, one end of said take-off shaft drivingly connected to said feed roller, and reduction gearing connecting the other end of said take-off shaft to said drum, said feed roller being intermediate said drum and said motor along the length of said main housing.

2. A descaling machine as set forth in claim 1, wherein said means carried by said housing for controlling the depth of cut of said descaling drum comprises a roller rotatably carried by the extremity of said main housing opposite said drum, said depth control roller having means for adjusting the movement thereof in a direction perpendicular to said housing for effecting pivotal movement of said housing about said feed roller.

3. A descaling machine as set forth in claim 2, wherein said depth control roller adjusting means comprises a frame for rotatably supporting said depth control roller having a pair of threaded studs extending upwardly through said housing, and a thumb nut carried by said housing threadingly engaging each of said studs.

4. A descaling machine as set forth in claim 2, wherein said depth control roller adjusting means comprises a frame for rotatably supporting said depth control roller having a centrally located threaded stud extending upwardly through said housing, and a thumb nut carried by said housing threadingly engaging said stud.

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