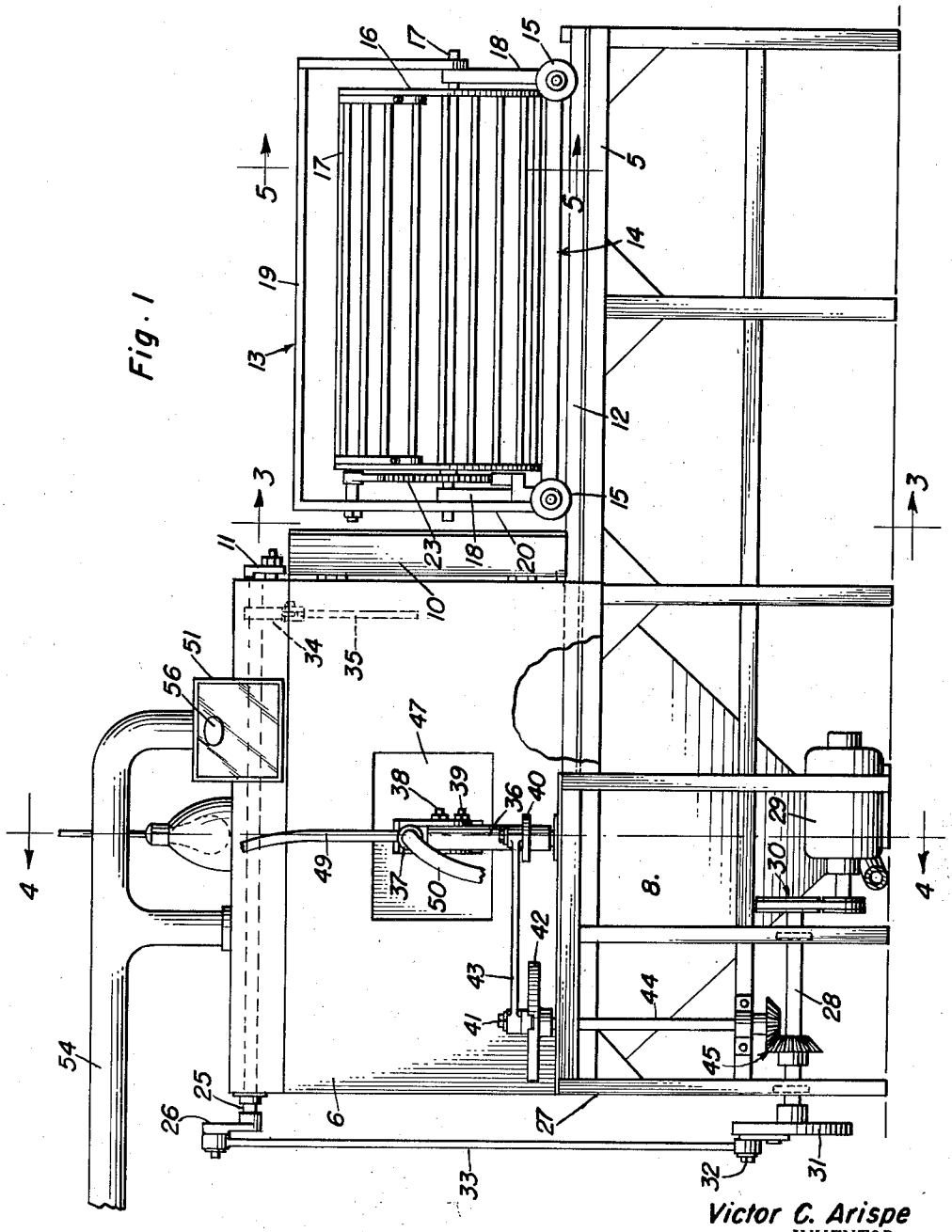
Aug. 21, 1951 V. C. ARISPE 2,565,341

SAND-BLAST APPARATUS

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Fig. 1



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Fig. 3

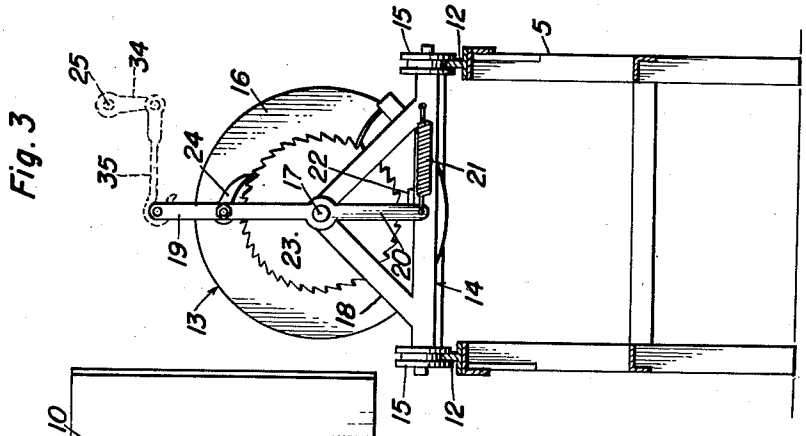
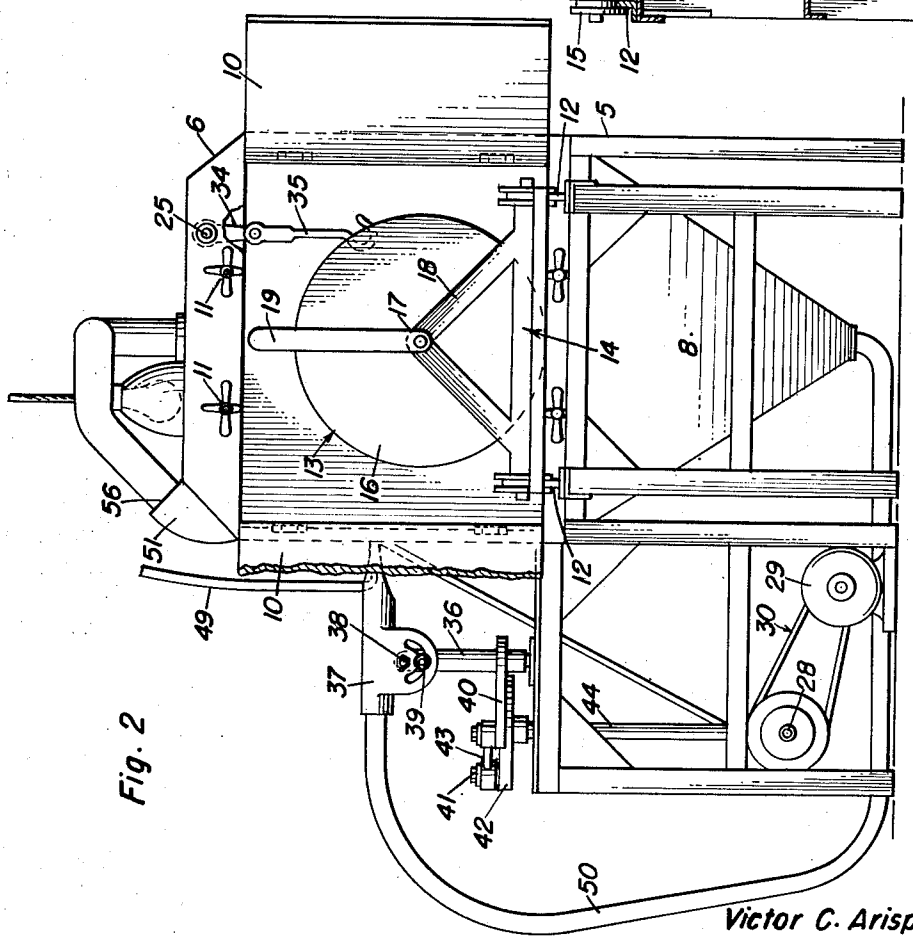


Fig. 2



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Fig. 5

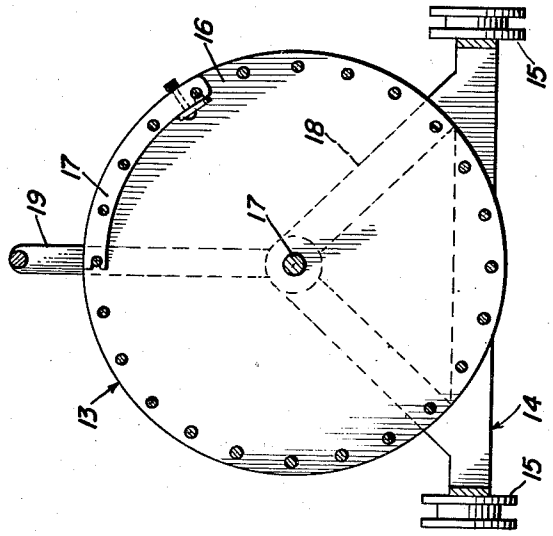
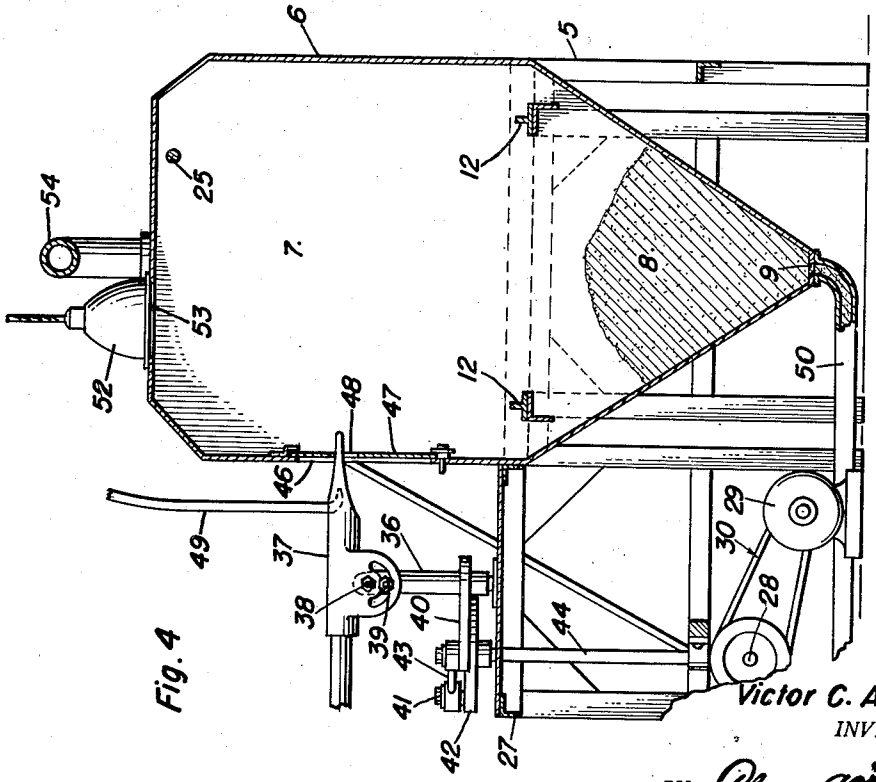


Fig. 4



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UNITED STATES PATENT OFFICE

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SANDBLAST APPARATUS

Victor C. Arispe, Los Angeles, Calif.

Application June 26, 1950, Serial No. 170,429

6 Claims. (Cl. 51—15)

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This invention relates to sand-blast apparatus of the type embodying a housing forming a treatment chamber, a work holder movable into and out of said housing through one end thereof, and a sand-blast nozzle adapted to receive sand from the bottom of said housing and arranged to discharge the sand through the front side of the housing onto the work carried by the work holder when the latter is positioned in said chamber.

An object of the invention is to provide an apparatus of the above kind wherein the work holder includes a wheeled carriage having a horizontal rotatable work-receiving drum journaled thereon, and which includes operating means on the carriage operable to impart intermittent turning movement to the drum, and power-driven actuating mechanism quickly connectable to said operating means when the work holder is positioned within the housing to effect such movement of the drum and quickly disconnectable therefrom to permit movement of the work holder out of the housing.

Another object of the invention is to provide means to mount the sand-blast nozzle for oscillation about a vertical axis with its discharge end projecting into the housing, and to provide power-operated driving mechanism for oscillating the nozzle about such axis so as to effect a thorough sand-blasting operation.

Further objects are to provide means for adjusting the actuating mechanism to vary the degree of each movement imparted to the drum, and to provide means for adjusting the driving mechanism to vary the extent of oscillation of the sand-blast nozzle.

Still further objects and features of the invention will appear from the following description when considered with the accompanying drawings, in which:

Figure 1 is a front elevational view, partly broken away, of an apparatus embodying the present invention, with the work holder positioned outside the housing.

Figure 2 is an end elevational view thereof, partly broken away, looking to the left of Figure 1.

Figure 3 is a vertical transverse section, taken on the line 3—3 of Figure 1.

Figure 4 is a vertical transverse section, partly broken away, taken on the line 4—4 of Figure 1.

Figure 5 is a transverse section taken through the work holder on the line 5—5 of Figure 1.

Referring in detail to the drawings, 5 indicates a supporting frame in one end portion of which is mounted a housing 6 whose upper portion forms

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a treatment chamber 7 and whose lower portion forms a tapered sand reservoir or hopper 8 having a bottom outlet 9. The inner end of the upper portion of housing 6 is closed by hinged doors 10 adapted to be secured in tightly closed position by means of fastening clamps 11. Track rails 12 are mounted on the top of frame 5 and extend from one end of the latter into the housing 6 at the bottom of the treatment chamber. A work holder 13 is movable into and out of the chamber 7 and includes a carriage 14 having wheels 15 which run on the rails 12, and a slatted horizontal rotatable work-receiving drum 16 having a shaft 17 journaled at its ends in bearing brackets 18 rigid with and extending upwardly from the ends of the frame of carriage 14. The drum 16 has a removable peripheral section 17 to facilitate insertion of work into and removal of the same from said drum. Operating means is provided on the carriage which is operable to impart intermittent turning movement to the drum 16. As shown, this means includes a bail-like member 19 having its end portions pivoted on the ends of shaft 17, one of said end portions having an extension 20 connected at its lower end by a tension spring 21 to the frame of carriage 14 to swing said member 19 in one direction to a substantially vertical position as limited by a stop 22 fixed to said frame in the path of said extension. Secured on the shaft 17 at one end of drum 16 is a ratchet wheel 23 engaged by a pawl 24 pivoted to the adjacent end portion of member 19. Thus, by oscillating the member 19, the intermittent movement may be imparted to drum 16.

Journaled in the ends of the housing 6 and extending therethrough near the top thereof is a rock shaft 25 which has a crank 26 secured on an end thereof which projects from the outer end of housing 6.

The frame 5 has a portion 27 which extends in front of housing 6 and within the lower portion of which is journaled a horizontal shaft 28 connected at one end to an electric motor 29 by a belt gearing 30. A crank disk 31 is secured on the other end of shaft 28 and has a radially adjustable crank pin 32 operatively connected to crank 26 by a connecting rod 33. Secured on the rock shaft 25 within and near the front of housing 6 is an arm 34 to which is pivoted a hook 35 adapted to be engaged with the intermediate portion of member 19 when the work holder is located in housing 6, as indicated in Figure 3, so as to intermittently swing the member 19 against the action of spring 21 and impart

step-by-step rotation to drum 16 when the shaft 25 is rocked by motor 29 through the medium of the gearing 30, shaft 28, crank 31, 32, connecting rod 33, and crank 26. By adjusting the throw of crank pin 32, the degree of movement imparted to drum 16, each time the member 19 is swung against the action of spring 21, may be varied.

A vertical rock shaft 36 is journaled on the frame portion 27 in front of housing 6, and a sand-blast nozzle 37, of a conventional type, is pivoted at 38 on the upper end of this rock shaft for vertical tilting adjustment about an axis transverse to the nozzle. Suitable means 39 is provided to secure the nozzle in any of its tiltably adjusted positions. The shaft 36 is provided near its lower end with an arm 40 which is operatively connected to the radially adjustable crank pin 41 of a horizontal crank disk 42 by means of a connecting rod 43. The crank 41, 42 is secured on the upper end of a vertical shaft 44 journaled in the frame portion 27 and connected at its lower end with shaft 28 by means of a bevel gearing 45. Thus, the shaft 36 is oscillated horizontally by motor 29 through the connections described, the extent of oscillation being variable by adjusting the crank pin 41. The housing 6 has a front opening 46 which is kept substantially closed by a horizontally movable slide 47 having a vertical slot 48 through which the discharge end of nozzle 37 projects into chamber 7. By tiltably adjusting and horizontally oscillating the nozzle 37 to a predetermined extent, the work in drum 16 may be most effectively treated according to the existing conditions. Air under pressure is supplied from a suitable source to nozzle 37 by a pipe 49, and sand is supplied from the bottom of hopper 8 to said nozzle by a flexible hose 50. The upper front portion of housing 6 is provided with a dormer window structure 51 through which the sand-blasting operating may be viewed, and the chamber 7 may be illuminated by means of an electric lamp 52 mounted on top of the housing 6 in registry with an opening 53 provided therein. A suction pipe 54 has a branch 55 communicating with the top of chamber 7 to reduce the air pressure within the latter. The pipe 54 also has an end communicating at 56 with the window structure 51 to remove dust therefrom.

In use, the work is placed in drum 16 and the work holder 13 is moved into housing 6 whose doors 10 are secured in closed position after hook 35 is engaged with the member 19. Assuming that the nozzle 37 has been properly adjusted, compressed air is supplied to hose 37, and motor 29 is thrown into operation so as to rotate drum 16 step-by-step and to oscillate nozzle 37 as the sand is drawn from hopper 8 and forcibly discharged onto the work from said nozzle. When the sand-blasting operation is finished, the motor 29 is stopped, doors 10 are opened, hook 35 is disengaged from member 19, and the work holder 13 is moved out of the housing so that the finished work may be removed therefrom. After the sand acts on the work, it flows back into hopper 8. The nozzle does not have to be manually supported and directed, and the attendant's work is minimized, as will be evident.

What is claimed as new is:

1. In a sand-blast apparatus, a housing whose upper portion forms a treatment chamber and whose lower portion forms a sand hopper adapted to receive sand initially and from said chamber, one side of said housing being provided with an opening to permit the insertion and horizontal movement of a sand-blast nozzle connected to the bottom of said hopper, horizontal track rails extending into and through one end of said housing at the bottom of said chamber, a work holder including a carriage movable on said rails into and out of said chamber, and a horizontal slatted work receiving drum journaled on said carriage, operating means on the carriage operable to impart intermittent turning movement to the drum, and power-operating actuating mechanism for said operating means quickly connectable to and disconnectable from the latter when the work holder is positioned in said chamber.

2. In a sand-blast apparatus, a housing whose upper portion forms a treatment chamber and whose lower portion forms a sand hopper adapted to receive sand initially and from said chamber, one side of said housing being provided with an opening to permit the insertion and horizontal movement of a sand-blast nozzle connected to the bottom of said hopper, horizontal track rails extending into and through one end of said housing at the bottom of said chamber, a work holder including a carriage movable on said rails into and out of said chamber, and a horizontal slatted work receiving drum journaled on said carriage, operating means on the carriage operable to impart intermittent turning movement to the drum, power-operating actuating mechanism for said operating means quickly connectable to and disconnectable from the latter when the work holder is positioned in said chamber, said operating means including a bail-like member pivotally mounted on the carriage and carrying a pawl, a ratchet wheel rotatable with the drum and engaged by said pawl, yieldable means to swing said member in the direction wherein the pawl is inactive, and a stop for limiting swinging of said member in said direction.

3. In a sand-blast apparatus, a housing whose upper portion forms a treatment chamber and whose lower portion forms a sand hopper adapted to receive sand initially and from said chamber, one side of said housing being provided with an opening to permit the insertion and horizontal movement of a sand-blast nozzle connected to the bottom of said hopper, horizontal track rails extending into and through one end of said housing at the bottom of said chamber, a work holder including a carriage movable on said rails into and out of said chamber, and a horizontal slatted work receiving drum journaled on said carriage, operating means on the carriage operable to impart intermittent turning movement to the drum, power-operating actuating mechanism for said operating means quickly connectable to and disconnectable from the latter when the work holder is positioned in said chamber, said operating means including a bail-like member pivotally mounted on the carriage and carrying a pawl, a ratchet wheel rotatable with the drum and engaged by said pawl, yieldable means to swing said member in the direction wherein the pawl is inactive, a stop for limiting swinging of said member in said direction, said actuating mechanism including a driven rock shaft, an arm fixed to said rock shaft, and a hook pivoted to said arm and engageable with said member to actuate the latter against the action of said yieldable means.

4. In a sand-blast apparatus, a housing whose upper portion forms a treatment chamber and whose lower portion forms a sand hopper adapted to receive sand initially and from said chamber, one side of said housing being provided with an

opening to permit the insertion and horizontal movement of a sand-blast nozzle connected to the bottom of said hopper, horizontal track rails extending into and through one end of said housing at the bottom of said chamber, a work holder including a carriage movable on said rails into and out of said chamber, a horizontal slatted work receiving drum journaled on said carriage, operating means on the carriage operable to impart intermittent turning movement to the drum, power-operating actuating mechanism for said operating means quickly connectable to and disconnectable from the latter when the work holder is positioned in said chamber, and means to adjust said actuating mechanism to vary the degree of turning movement imparted to said drum.

5. In a sand-blast apparatus, a housing whose upper portion forms a treatment chamber and whose lower portion forms a sand hopper adapted to receive sand initially and from said chamber, one side of said housing being provided with an opening to permit the insertion and horizontal movement of a sand-blast nozzle connected to the bottom of said hopper, horizontal track rails extending into and through one end of said housing at the bottom of said chamber, a work holder including a carriage movable on said rails into and out of said chamber, a horizontal slatted work receiving drum journaled on said carriage, operating means on the carriage operable to impart intermittent turning movement to the drum, power-operating actuating mechanism for said operating means quickly connectable to and disconnectable from the latter when the work holder is positioned in said chamber, said housing having

a dormer window structure at the upper front portion thereof, and a suction pipe communicating with the upper portion of said housing and said window structure.

6. In a sand-blast apparatus, a housing forming a treatment chamber and having a front opening, a vertical rock shaft journaled in front of said housing, and having an arm fixed thereto, motor-driven mechanism connected to said arm for oscillating said rock shaft, a sand-blast nozzle mounted on said rock shaft to oscillate therewith and projecting into said chamber through said opening, said nozzle being pivoted to said rock shaft for vertical tilting adjustment about a transverse horizontal axis, means to secure the nozzle to tiltably adjusted positions, and a horizontally movable slide for keeping said opening substantially closed, said slide having a vertical slot receiving the discharge end of said nozzle.

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