May 22, 1962 A. L. JENNINGS 3,035,539

FORM CLEANING APPARATUS

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FIG. 1

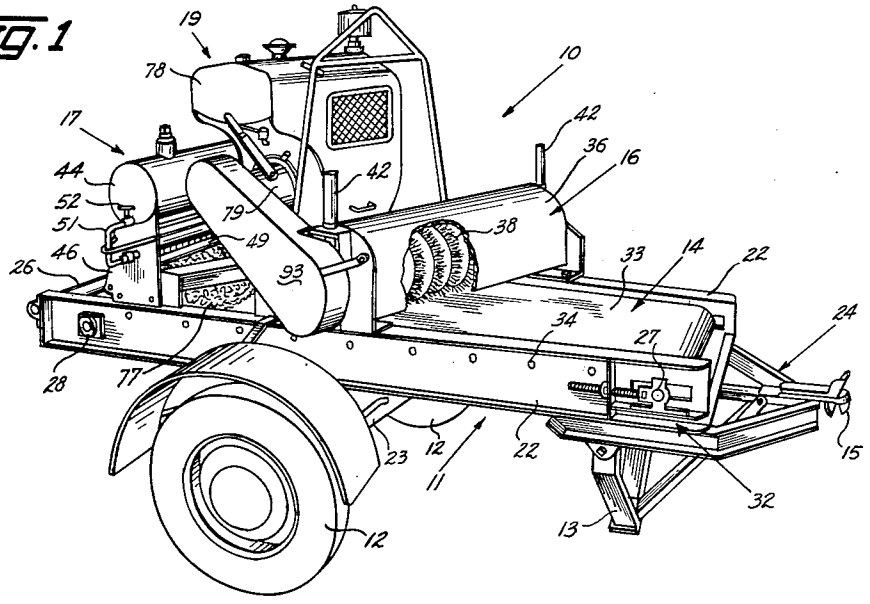
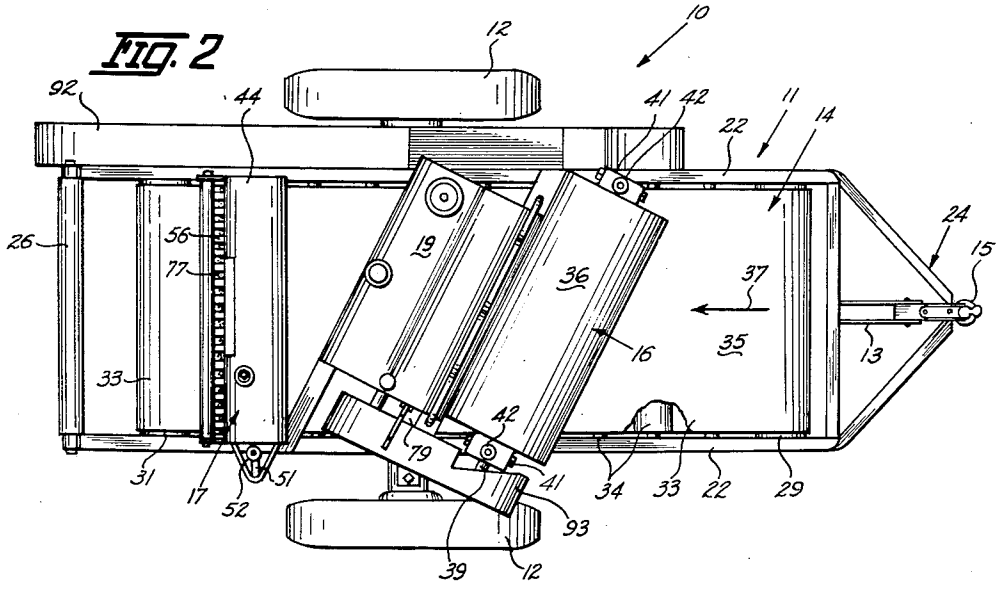


FIG. 2



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FIG. 3

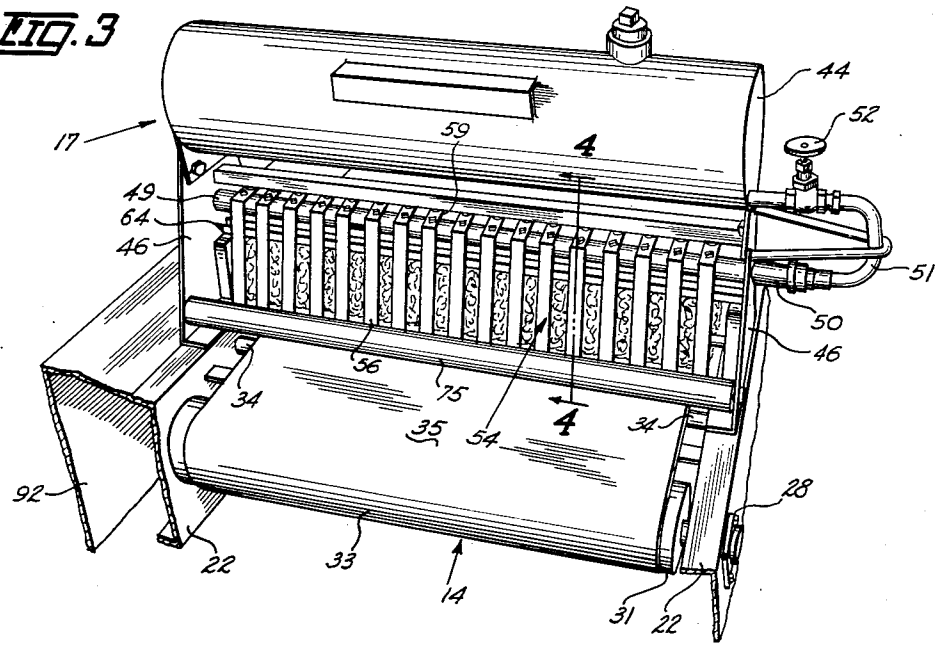


FIG. 4

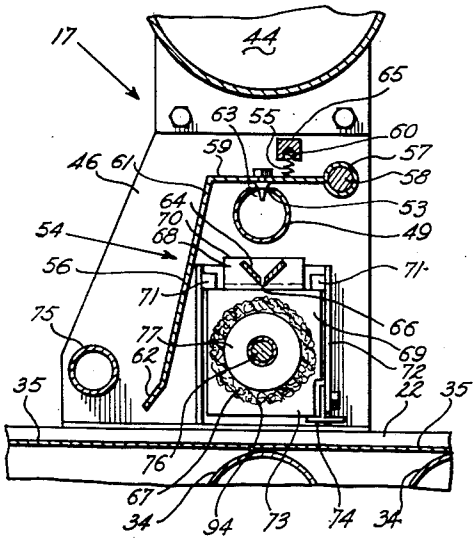
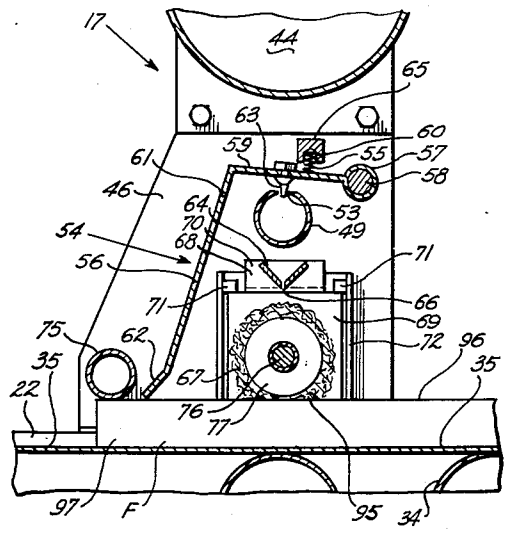


FIG. 5



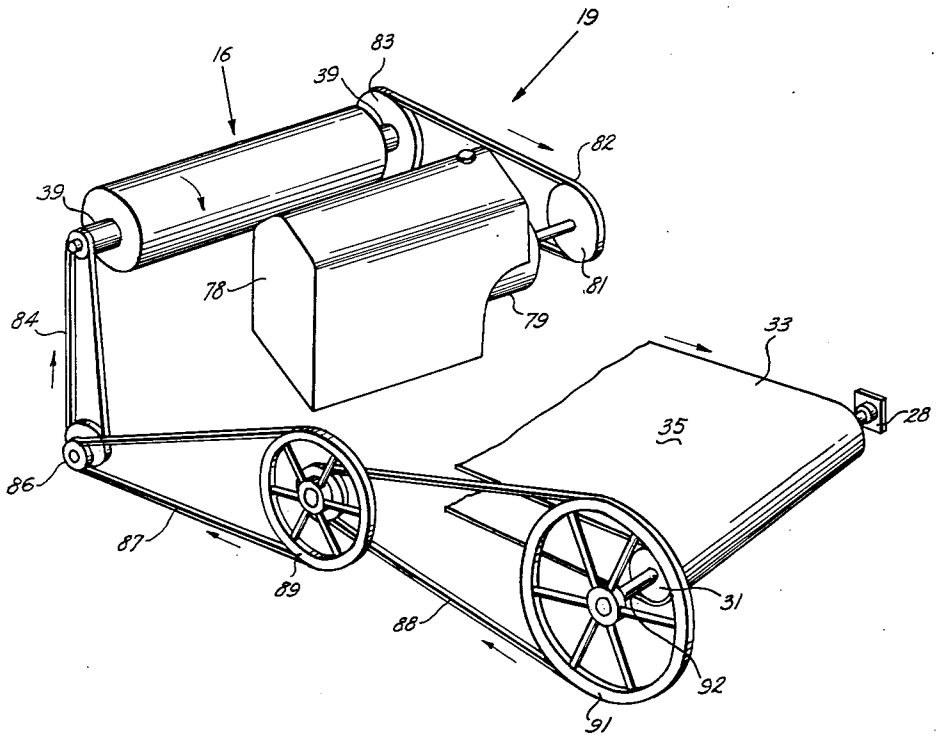
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FIG. 6



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3,035,539

FORM CLEANING APPARATUS

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2 Claims. (Cl. 118—2)

This invention relates generally to a form cleaning apparatus and more particularly, to a portable apparatus on which one or more metal forms used on concrete construction may be placed for mechanized cleaning and lubricating.

It is an object of this invention to provide a new and novel portable apparatus for cleaning and lubricating steel forms used on concrete construction.

Another object of this invention is to provide a readily portable apparatus on which a concrete metal form is mechanically conveyed from one end of the apparatus to the other, and during which conveyance the form is subjected to a sequential cleaning and lubricating action.

A further object of this invention is to provide a portable apparatus for cleaning a form used on concrete construction wherein a lubricating unit has a lubricant applicator arranged and constructed so as to be automatically maintained at all times in a saturated condition.

A still further object of this invention is to provide a concrete metal form cleaner apparatus having a form conveyor, and a lubricating unit which includes a lubricant applicator and a trip valve mechanism associated therewith which is actuated by a conveyed form whereby lubricant is supplied to the applicator only during a lubricating operation.

Another object of this invention is to provide a portable apparatus for cleaning and lubricating a metal form used on concrete construction which is simple and rugged in construction, economical to manufacture, and efficient in operation.

Further objects, features and advantages of this invention will become apparent from a consideration of the following description, when taken in connection with the accompanying drawings, wherein:

FIG. 1 is a perspective view of the portable form cleaner of this invention, with some parts broken away for the purpose of clarity;

FIG. 2 is a plan view of the form cleaner of this invention;

FIG. 3 is an enlarged, fragmentary perspective view of the form cleaner of this invention, showing particularly the discharge end of the form conveyor in assembly relation with the lubricating unit;

FIG. 4 is an enlarged sectional view of the lubricating unit as seen substantially along line 4—4 in FIG. 3 showing the trip valve mechanism thereof in a first or closed position;

FIG. 5 is an enlarged sectional view similar to FIG. 4 and showing the trip valve mechanism moved to a second or open position in response to a form moving under the lubricant applicator of the lubricating unit; and

FIG. 6 is a diagrammatic perspective view of the power transmission system for the form cleaning and the conveying units.

Referring now to the drawings, the form cleaner apparatus of this invention is indicated generally at 10 in FIG. 1 and comprises a portable frame assembly 11 mounted on a pair of wheels 12 and having a hitch 15 adapted for connection to a towing vehicle (not shown). For supporting the frame 11 in a substantially horizontal position, when the hitch 15 is disconnected, there is provided at its front end a retractable leg unit 13.

Additionally, the apparatus 10 includes the following assemblies which are mounted on the frame assembly 11: a conveyor 14 for moving a form to be cleaned from one end of the frame to the other, a brush assembly 16 for cleaning the conveyed form, a lubricating assembly 17 for lubricating the cleaned form, and a power unit 19 for operating the conveyor 14 and the brush assembly 16.

The frame assembly 11 includes a pair of longitudinally extended, transversely spaced channel members 22, mounted on axle supports 23 (only one shown) and connected at the front end by a towing hitch unit 24 and at the rear end by a roller unit 26. Two longitudinally spaced pairs of transversely aligned bearing mountings 27 and 28 (FIG. 1) are provided on the channel members 22 for rotatably supporting the front and rear conveyor rolls 29 and 31 respectively. The front bearing mountings 27 are movable longitudinally of the frame members 22 as they are part of a pair of conveyor belt takeup units 32 (FIG. 1) (only one showing) of a conventional type.

The conveyor belt assembly 14 includes an endless belt 33 of preferably an oil resistant type belting. The belt is trained about the front and rear pulleys 29 and 31 respectively each of which is built with a crown (not shown) for proper tracking of the belt. A plurality of ball bearing rollers 34 (FIGS. 2 and 3) are mounted on the inside of the channel members 22 for maintaining the top portion 35 of the belt 33 in a horizontal plane.

The brush assembly 16 includes a housing 36 (FIGS. 1 and 2) extended across the conveyor belt 33 and mounted at each end on top of the channel members 22 toward the front end of the frame assembly 11. As shown particularly in FIG. 2, the housing 36 extends angularly to the direction of travel of the belt top 35 as indicated by the arrow 37. A rotary brush unit 38 (FIG. 1) which preferably comprises a plurality of transversely spaced, individual steel wire circular brushes mounted on a shaft 39 is contained within the housing 36, the ends of the shaft 39 being rotatably mounted in bearing units 41 (FIG. 2) at each end of the housing. Standard type takeup units 42 (FIG. 1) are provided at each end of the shaft 39 for adjusting the brush unit 38 relative to the conveyor belt 33.

The lubricating assembly includes a fluid lubricant tank or reservoir 44 (FIGS. 1 and 3) extended transversely across the conveyor belt 33, and mounted at each end to a pair of end plates 46 (FIG. 3) secured to and projected upwardly from respective frame members 22. As shown in FIG. 2, the reservoir 44 is mounted adjacent the rear end of the frame assembly 11 and rearwardly of the brush assembly 16. Directly below the reservoir, and extended transversely across the belt 33 is an elongated pipe 49 (FIG. 3), the ends of which are supported on the plates 46. The end 50 of the pipe 49 is connected through a hose unit 51 with the reservoir 44. A plurality of valve ports 53 (FIGS. 4 and 5) are formed in a longitudinally spaced relation in the top of the pipe 49.

For complementary action with the valve ports 53, a plurality of longitudinally spaced valve trip or actuator units 54 (FIGS. 4 and 5) are provided. As each unit 54 is the same, only one will be described, with like reference numerals indicating like parts. A unit 54 includes a trip lever 56 having a circular portion 57 formed at one end which is rotatably mounted on a stationary rod 58, and having a straight portion 59 extended from the rod directly over a valve member 53 and a portion 61 depending therefrom to where its end 62 is spaced a predetermined distance above the upper length 35 of the conveyor belt. Attached to the straight portion 59 is a downwardly tapered valve seat 63 insertable within, so

as to close, the respective valve port 53 therebelow. Of note, the rod 58 is common to all the valve trip actuators 54. For biasing the trip lever 56 downwardly so as to normaly maintain the valve port 53 (FIG. 4) closed, a coil spring 55 is arranged in compression between the lever's straight portion 59 and a seat or socket 60 provided therefor in the underside of a bar 65 extended transversely between and secured to the end plates 46.

Mounted directly below the lubricant feed pipe 49 is a transversely extended V-shaped trough member 64 (FIGS. 4 and 5) which has a plurality of longitudinally spaced openings 66 formed in the apex thereof, each of which is located directly below a respective valve port 53. The ends of the trough member 64 are each mounted on an angle iron 68 (FIG. 4) which is secured by bolts to the top of a box housing 69 having a vertical groove (not shown) on each side thereof. By virtue of the ends of the trough 64 abutting the upstanding legs 70 of the angle irons 68, the trough is closed off at each end thereof. The housing 69 is slidably inserted in place by registering the grooves with a pair of longitudinally spaced, parallel guide bars 71 secured to a channel shaped end member 72, the base 73 (FIG. 4) of the box housing 69 resting on an adjusting unit 74 whereby to space the base 73 above the frame member 22 a predetermined distance. Directly below the trough member 64 is an elongated lubricant applicator 77 comprised of a roller rotatably mounted on a tube 76 (FIGS. 3 and 4) provided therefor extended transversely between and secured to the end plates 46. A layer 67 of fibrous material for holding the lubricant is secured to the roller. The lower peripheral portion or surface 94 of the applicator 77 is spaced a predetermined distance from the belt's top length 35 for a purpose hereinafter described. Mounted a spaced distance in front of the applicator 77 is a bar 75 (FIG. 4) which is secured to the end plates 46, the purpose of which is to limit the upward movement of the lever 56.

The apparatus 10 is utilized in the most efficient manner by cleaning a plurality of forms of the same size and at the same location. Its size is such that it may easily be moved by hand from one stack of forms to another, the retractable leg 13 being dropped as mentioned hereinbefore to place the frame assembly 11 in a level condition.

Depending on the thickness of the forms, the take-up units 42 for the brush assembly 16 are adjusted so as to set the brush unit 38 at the proper height above the belt 33. Additionally, the height of the applicator 77 is also properly set by moving the box housing 69 on the vertical guide bars 71, the adjusting unit 74 holding the housing 69 at the desired place.

In the operation of the apparatus, the power unit 19 is started so as to operate the conveyor 33 and the brush unit 38 in a manner hereinafter described. The main valve 52 (FIG. 3) is opened so as to ensure that the feed pipe 49 is continually full of lubricant.

A form F to be cleaned is placed smooth side up on the belt 33 at the front of the apparatus 10. It is recommended that the form be loaded on the belt with its length parallel the length of the apparatus as opposed to being loaded transverse or parallel with the brush unit 38. The form F is carried under the brush unit where the form face is thoroughly cleaned. The form F (FIG. 5) is then conveyed under a certain longitudinal portion of the applicator 77, the layer 67 of which is saturated with oil prior to the operation. As the moving form contacts the lower surface 95 (FIG. 5) of the layer 67, it forces the applicator to rotate about its shaft 76. Thus, as the applicator rotates, the face 96 of the form is lubricated by a continually changing peripheral portion of the layer 67, ensuring a complete lubrication of the face 96.

As the moving form is lubricated, the front part 97 thereof contacts and forces upwardly or clockwise (as viewed in FIG. 5) the particular actuator lever 56 immediately behind or to the rear of that part of the applicator used to lubricate. This action raises the valve seat 63 whereby the lubricant within the pipe 49 is forced out of the opening provided by the valve member 53. Of note, as the valve port 53 is on top of the pipe 49, lubricant is taken from the top of the pipe so that dirt or foreign matter will settle out and not clog the ports. The lubricant then dribbles down and around the pipe 49 and drips directly into the trough 64 and through an opening 66 to fall onto that particular peripheral longitudinal portion of the applicator's layer 67 used to lubricate. As the motion of the form F continually forces the applicator to rotate, it may readily be seen that that peripheral longitudinal portion thereof used to lubricate is the only one replenished with lubricant.

The cleaned and lubricated form F is then carried on the conveyor belt 33 to the rear end of the conveyor assembly from whence it may be taken off as it is moved out over the rear roller unit 26. The same operation is then repeated for the next form.

Referring now to FIG. 6, the power unit 19 includes a conventional engine 78 having a clutch operated power take-off unit 79 for driving a pulley 81 and a belt 82 therefor. The belt 82 in turn drives a pulley 83 attached to one end of the brush unit shaft 39, the drive being taken off from the other end of the shaft by another belt 84 and transmitted to a double pulley unit 86.

A pair of belts 87 and 88 and another double pulley unit 89 are provided to transmit the drive from the unit 86 to a driven wheel 91, and a shaft 92 attached thereto then transmits the drive to the rear conveyor roll 31 whereby drive is imparted to the conveyor belt 33. It may thus be seen that operation of the engine 78 causes the brush unit 38 and the conveyor belt 33 to operate simultaneously. Protective housings 92 and 93 (FIGS. 1 and 2) are provided by the pulleys and belts of the power system.

It should be noted that although the operation is described by the moving form F contacting one actuator lever 56, in all practicality a plurality of adjacent levers will be contacted depending on the width and construction of the form.

Although only one embodiment of the invention is disclosed herein, it is to be remembered that various alterations may be made within the full scope of the invention as defined by the appended claims.

I claim:

1. An apparatus for cleaning a form used on concrete construction comprising; a frame, rotatable conveyor means mounted on said frame for moving a form from one end of said frame to the other end thereof, means mounted on said frame for cleaning a moved form, means mounted on said frame for lubricating a moved form, said lubricating means including a fluid reservoir, a closed end conduit member connected at one end to and mounted below said fluid reservoir and having at least one valve port formed therein for the emission of said lubricant, a valve mechanism including a pivotally mounted actuator member and a valve seat carried thereby, means biasing said actuator member toward a first position, said actuator member extended in the path of a form on said rotatable conveyor means and movable upon contact by a form to a second position, said valve seat being movable from a position closing said valve port to a position opening said valve port upon movement of said actuator member from said first position to said second position, and a rotatably mounted work actuated applicator having an outer porous material, said applicator being mounted between said means for cleaning and said actuator member directly beneath said valve port above said movable conveyor means, whereby said applicator engages a form and is actuated thereby.

2. In an apparatus for cleaning a form used on concrete construction and having a portable frame and a conveyor belt mounted on said frame for conveying a form thereover; means for lubricating said form con-

currently with its conveyance comprising, an elongated tubular container for holding a supply of fluid lubricant extended transversely over said conveyor belt, a plurality of valve ports formed in said container in longitudinally spaced relation substantially the entire length thereof, a plurality of valve actuator members one for each valve port and each of which is independently and pivotally mounted so as to extend above a respective valve port with one end thereof spaced above said conveyor belt whereby to be moved upwardly in response to a conveyed form passing under said container, a valve seat element connected to each actuator member and adapted to close said respective valve port when said actuator member is non-actuated and to open same when said actuator member is moved upwardly, a drip trough extended transversely across said conveyor belt and below said container and having a plurality of openings formed therein each of which is directly under a valve port, and a rotatably mounted porous roller extended under said drip trough and transversely across and above said conveyor belt so as to contact a conveyed form, said roller being actuated by contact with a conveyed form, whereby a conveyed form is adapted to be lubricated by said roller at any longitudinal portion thereof and also to contact at least one or more of said plurality of actuator members so as to relubricate only that longitudinal portion used to lubricate said form.

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