Dec. 13, 1955 J. T. LINDQUIST 2,726,414

DEVICE FOR WASHING, CLEANING AND DRYING LITHOGRAPHIC PLATES

Filed Jan. 9, 1953 2 Sheets-Sheet 1

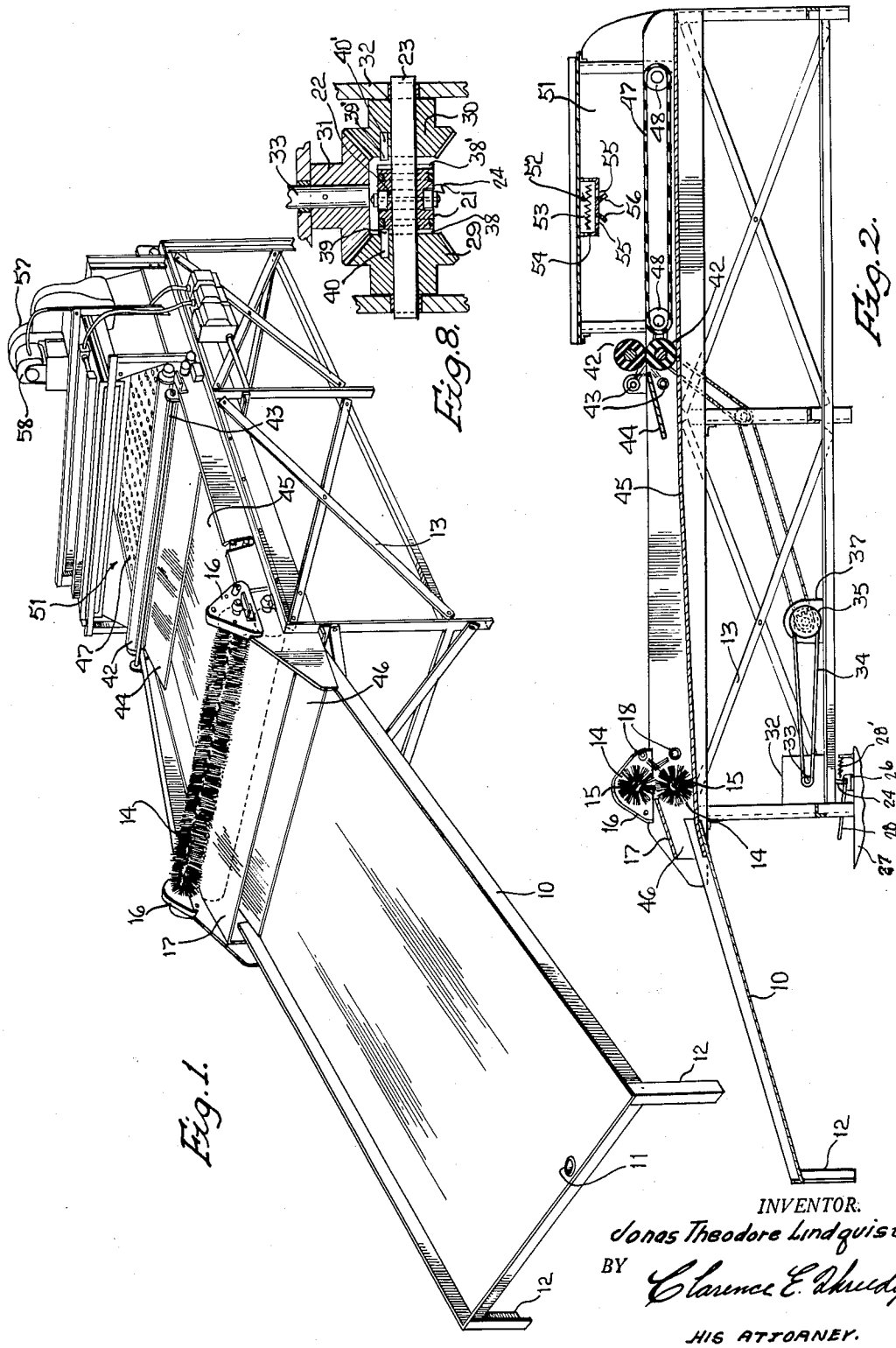


Fig. 1.

Fig. 3.

Fig. 2.

INVENTOR.
Jonas Theodore Lindquist
BY Clarence E. Ahrendy
HIS ATTORNEY.

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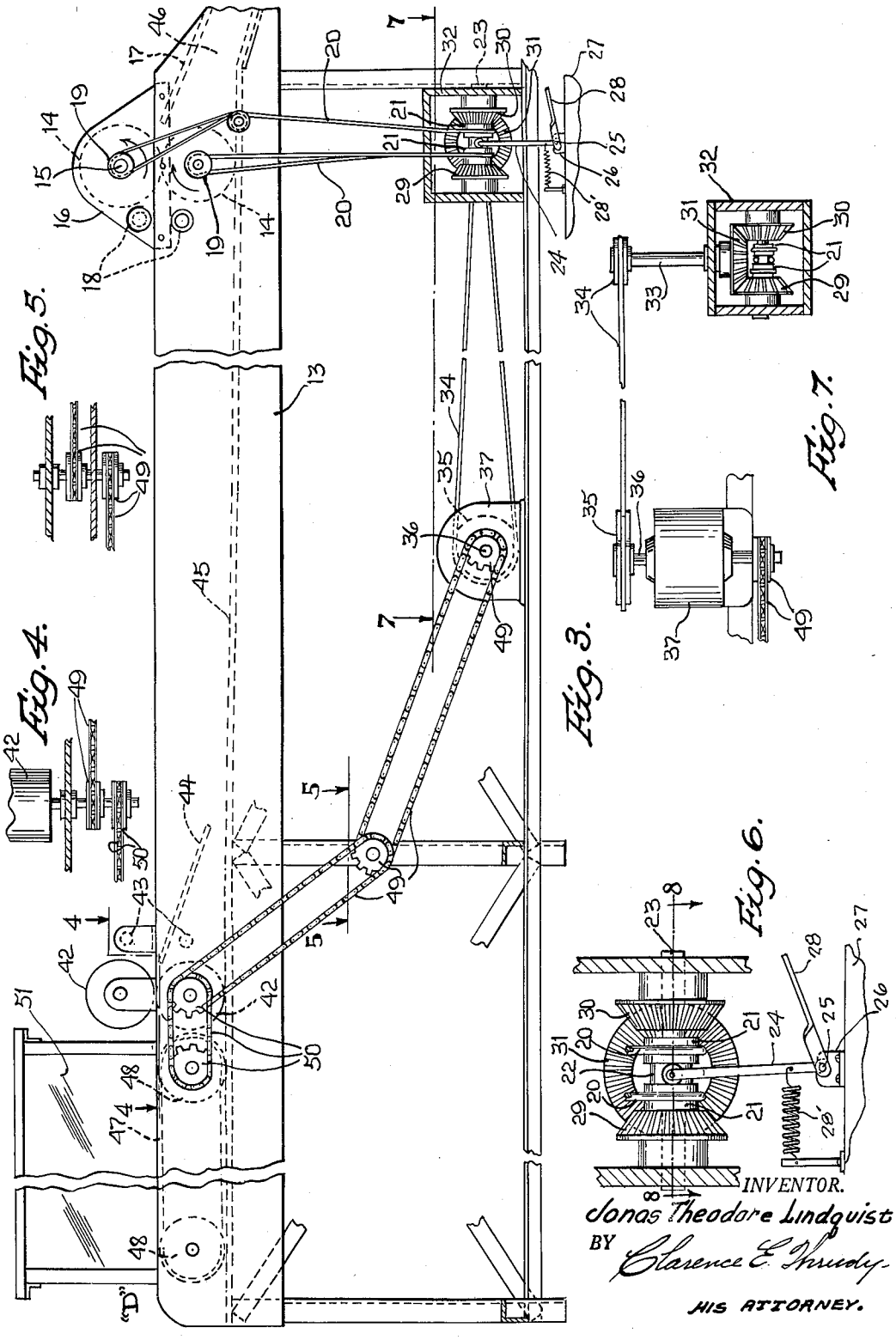


Fig. 5.

Fig. 7.

Fig. 3.

Fig. 4.

Fig. 6.

INVENTOR.
Jonas Theodore Lindquist
BY Clarence E. Trundy
HIS ATTORNEY.

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DEVICE FOR WASHING, CLEANING, AND DRYING LITHOGRAPHIC PLATES

Jonas Theodore Lindquist, Skokie, Ill., assignor to Lind-Hog Machine Co., Chicago, Ill., a partnership consisting of Jonas Theodore Lindquist and Henry Hogstrom

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3 Claims. (Cl. 15—4)

This invention relates to a device for washing, cleaning and drying lithographic plates, particularly plates which have been subjected to a graining operation.

Among the several objects of the invention is to provide a device which will effectively and speedily wash, clean and dry lithographic plates with the minimum degree of labor.

Another and equally important object of the invention is to provide such a device which will be economical in manufacture.

Yet another and important object of the invention is the provision of a device for successively washing, cleaning and drying lithographic plates.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction and in which:

Fig. 1 is a perspective view of the invention;

Fig. 2 is a longitudinal sectional detail view of the same;

Fig. 3 is an enlarged fragmentary side elevational view of the device shown in Fig. 1, as viewed from the left thereof;

Fig. 4 is a sectional detail view taken substantially on line 4—4 of Fig. 3;

Fig. 5 is a sectional detail view taken substantially on line 5—5 of Fig. 3;

Fig. 6 is a fragmentary sectional detail view of the reversing mechanism embodied in the invention;

Fig. 7 is a fragmentary detail view taken substantially on line 7—7 of Fig. 3;

Fig. 8 is a sectional detail view taken substantially on line 8—8 of Fig. 6.

The several objects of my invention are accomplished by the preferred form of construction shown in the accompanying drawings.

In this connection an elongated substantially rectangularly shaped drain pan is indicated at **10** and includes a suitable drain opening **11** which may be connected to any suitable drain such as a sewer outlet or the like, or which may be drained directly upon the floor.

The drain pan **10** at its outer end portion is supported by legs **12**. The forward portion of the drain pan **10** is secured to a table **13** of any approved construction. This table at its end adjacent the drain pan **10** supports a pair of roller brushes **14** of any approved construction and which are reversely rotatable. These roller brushes **14** are mounted upon suitable shafts **15** journalled in suitable bearings **16**. These brushes extend substantially parallel with respect to each other in a horizontal plane.

To facilitate feeding a lithographic plate for passage between the brushes **14**, is a plate **17** which also functions to drain any water passing thereover into the drain pan **10**. Adjacent the brushes **14** at one side thereof are

spaced spray pipes **18** each arranged to direct streams of water toward the meeting surfaces of the brushes in a manner such that a plate passing between the brushes will pass between the sprays of water from the spray pipes **18**.

The shafts **15** supporting these roller brushes **14** each have at their corresponding end portions a pulley **19** which, by means of belts **20**, are connected to pulleys **21** carried upon a sleeve **22** mounted for longitudinal movement upon a shaft **23**. The sleeve **22** is shifted longitudinally of said shaft **23** by means of an arm **24** fixedly connected to a shaft **25** rotatably journaled in bearings **26** secured to the floor **27**. On this shaft **25** is fixed a foot lever **28** by means of which the shaft **25** is rotated to shift the sleeve **22** against the action of a spring **28'**, Figs. 3 and 6.

On the shaft **23** are rotatably mounted bevel gears **29** and **30** adapted to alternately engage a bevel gear **31**. These gears are arranged within a suitable housing **32**. The gear **31** is mounted on a shaft **33**. This shaft **33** by means of a pulley and belt **34** is connected to a pulley **35** mounted on the armature shaft **36** of a motor **37**. In the normal operation of the roller brushes **14**, they rotate in the direction of the arrows (Fig. 3) so as to bring the bristles thereof into contact with the lithographic plate in a direction opposite to the direction of movement of such plate. This arrangement will effectively remove any and all dirt, grit and other matter from the plate. However, when first introducing the leading edge of the lithographic plate between the brushes, it is desirable that they rotate in an opposite direction to that indicated in Fig. 3.

In order to accomplish this function, the outside faces of the sleeve **22** are each provided with a groove **38** and **38'**. Adapted to engage in these grooves **38** and **38'** are the heads **39** and **39'** of pins **40** and **40'** which are carried by the bevel gears **29** and **30**. When the head **39** engages in the groove **38**, the roller brushes **14** will rotate in the direction indicated by the arrows in Fig. 3. This rotates the bristles of the brush against the surfaces of the lithographic plate in a direction opposite to the latter's movement between the roller brushes **14**. However, when the head **39'** engages the groove **38'** by the shifting of the sleeve **22** through the action of the foot lever **28**, the roller brushes **14** will rotate in an opposite direction or in the direction of movement of the plate between the brushes. This condition facilitates the insertion of the lead end of the plate between the roller brushes.

From the roller brushes **14**, the lithographic plate passes between the water sprays from the spray pipes **18** to a position where its lead edge is manually directed between squeegee rollers **42** arranged in parallel relation with respect to each other. At the point of entrance of the plate for movement between these squeegee rollers, the plate again passes through the water spray from the spray pipes **43**. The water from the plate is drained by a drain board **44** into a pan **45** above and supported by the table **13**. From this pan **45** the water passes beneath the plate **17** as at **46** into the drain pan **10**.

The squeegee rollers **42** function to remove substantially all of the water from the lithographic plates. As the plate passes between the squeegee rollers **42**, it moves upon a conveyor belt **47** preferably foraminated and supported by suitable rollers **48**.

The squeegee rollers are operatively connected by sprocket chains and gears **49** to the motor shaft **36**, and the rollers **48** by means of sprocket chains and gears **50** are connected to the squeegee rollers **42** for operation in unison therewith.

The conveyor belt **47** is arranged within a drying chamber **51**. This drying chamber **51** includes a heating unit

52 of any approved construction, the unit being symbolically indicated at 53. This heating unit 53 is arranged in an enclosure 54 having a plurality of slits 55 and downwardly extending deflecting fins 56 for deflecting heat down upon the lithographic plate. A suitable blower 57 communicates with the heating chamber 51 to circulate the heat therein. This blower is driven by a suitable motor 58.

A lithographic plate is washed, cleaned and dried by my apparatus in the following manner:

The operator places the lead end of the plate to be treated, upon the plate 17 and projects the end of such lithographic plate between the brushes 14. Before projecting such end between the brushes 14, the operator reverses the direction of rotation of the brushes from that shown in Fig. 3, by shifting the sleeve 21, which is accomplished by pivoting the foot lever 27. This operation will rotate the brushes in a direction toward the movement of the plate with respect to the brushes, so that it will require very little effort on the part of the operator to introduce the lead end of the plate between the brushes. After this lead end has been started through the brushes, the foot lever 27 is released, the collar 21 shifted automatically by the spring 41, and the brush rollers 14 rotated in a direction against the movement of the plate. The operator in manually pushing the plate between the brushes, thereby thoroughly cleans all grit and other foreign matter from the plate, the plate being sprayed in the meantime by the spray from the spray pipes 18. After the plate has partially or entirely passed between the brushes 14, depending upon the length of the plate, the lead end of the plate is projected between the squeegee rollers 42 and by these squeegee rollers all water is removed from the plate. From the squeegee rollers 42, the plate moves upon the conveyor belt 47 and, as it is conveyed through the chamber 51, it is substantially dried by heat from the heating unit 52, which heating unit, as before stated, may be of any approved construction. After the plate has thus been dried, the operator manually removes the plate from the conveyor belt 47 at the discharge end D of the apparatus.

From the foregoing description, it will be seen that I provide an apparatus in which lithographic plates may be successively washed, cleaned and dried in a relatively short space of time and with the least amount of labor.

The apparatus comprises relatively few parts, is substantially simple in construction, and therefore can be manufactured at an economical cost.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. In combination in an apparatus for washing, cleaning and drying lithographic plates, a table consisting of a tapered drain pan extending from one end thereof and a drying chamber at the opposite end, a conveyor in said drying chamber, squeegee rollers adjacent the drying chamber and at one end of said conveyor and through which said plates are manually passed, a drain pan beneath said rollers and having communication with said other pan, a pair of parallelly extending rotating brushes above and in spaced relation to the line of connection between said drain pans, rotating means for said brushes and said squeegee rollers and having operative connection to said conveyor, and means for operatively controlling the direction of rotation of said brushes upon manually passing a plate therebetween.

2. In combination in an apparatus for washing, cleaning and drying lithographic plates, a table consisting of a tapered drain pan extending from one end thereof and a drying chamber at the opposite end, a conveyor in said drying chamber, squeegee rollers adjacent the drying chamber and at one end of said conveyor and through which said plates are manually passed, a drain pan beneath said rollers and having communication with said other pan, a pair of parallelly extending rotating brushes above and in spaced relation to the line of connection between said drain pans, rotating means for said brushes and said squeegee rollers and having operative connection to said conveyor, and means for operatively controlling the direction of rotation of said brushes upon manually passing a plate therebetween, said last named means including a shaft carried by said apparatus, a pair of spaced apart confronting gears on said shaft, a beveled gear having operative connection with said pair of gears and said rotating means, a sleeve adapted for longitudinal movement on said shaft, means on said sleeve for alternately engaging one of said pair of gears to operatively connect said sleeve for rotation with said one gear, and means on said sleeve for operatively connecting individually each of said pair of brushes for effecting rotation thereof in opposite directions with respect to each other.

3. In combination in an apparatus for washing, cleaning and drying lithographic plates, a table consisting of a tapered drain pan extending from one end thereof and a drying chamber at the opposite end, a conveyor in said drying chamber, squeegee rollers adjacent the drying chamber and at one end of said conveyor and through which said plates are manually passed, a drain pan beneath said rollers and having communication with said other pan, a pair of parallelly extending rotating brushes above and in spaced relation to the line of connection between said drain pans, rotating means for said brushes and said squeegee rollers and having operative connection to said conveyor, and means for operatively controlling the direction of rotation of said brushes upon manually passing a plate therebetween, said last-named means including a shaft carried by said apparatus, a pair of spaced apart confronting gears on said shaft, a beveled gear having operative connection with said pair of gears and said rotating means, a sleeve adapted for longitudinal movement on said shaft, means on said sleeve for alternately engaging one of said pair of gears to operatively connect said sleeve for rotation with said one gear, and pulley and belt connection between said sleeve and each of said pair of brushes for effecting rotation thereof in opposite direction with respect to each other.

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