

[54] **APPARATUS FOR DEVELOPING LITHOGRAPHIC PLATES**

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[51] Int. Cl. **B65g 15/00**

[58] Field of Search. 198/184, 230, 1, 198/19; 271/74, 33, 45; 101/450, 451, 463

[56]

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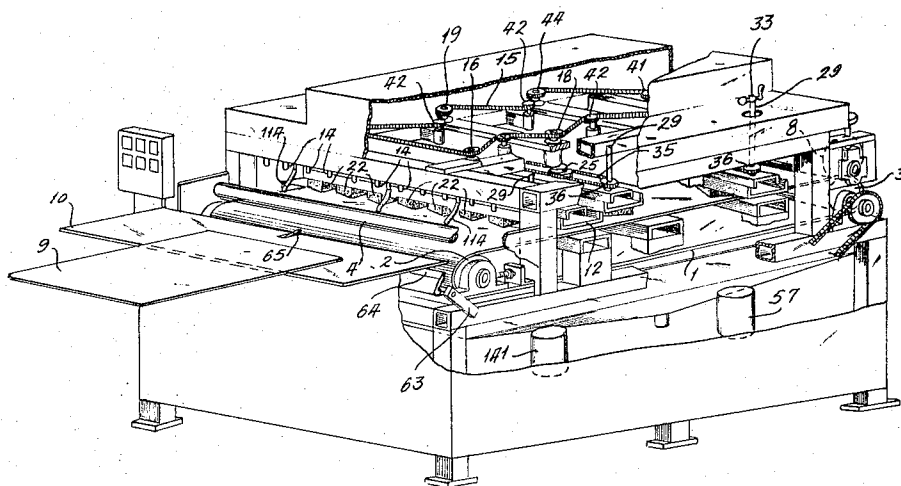
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[57]

ABSTRACT

Apparatus for post-exposure treatment of lithographic plates having an endless belt on which such a plate is transported to, through, and beyond, at least one operating station, and in which the belt is wetted and the plate undergoing treatment is held fast on the wetted belt by interfacial tension.

4 Claims, 9 Drawing Figures



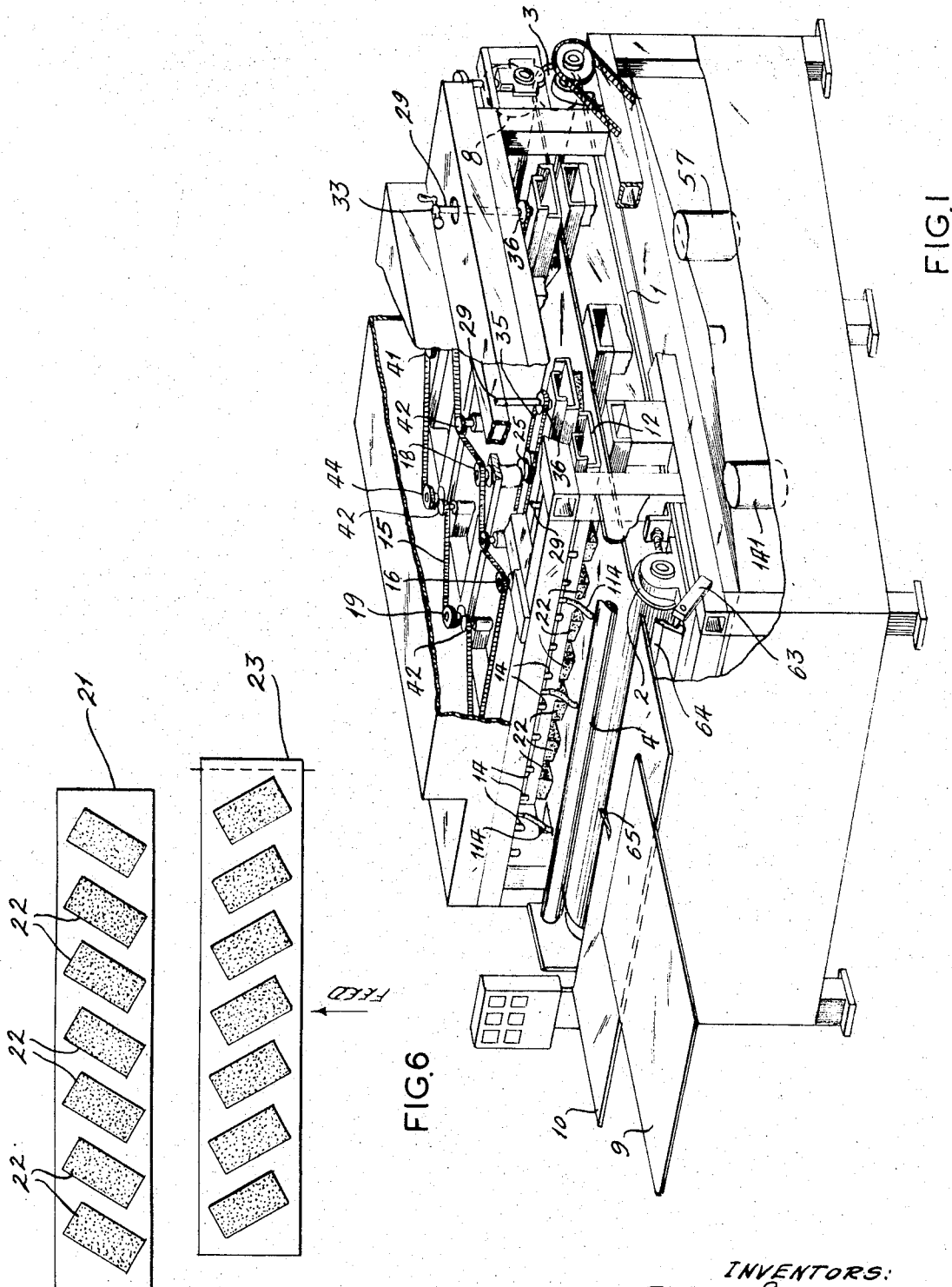


FIG. 6

FIG. 1

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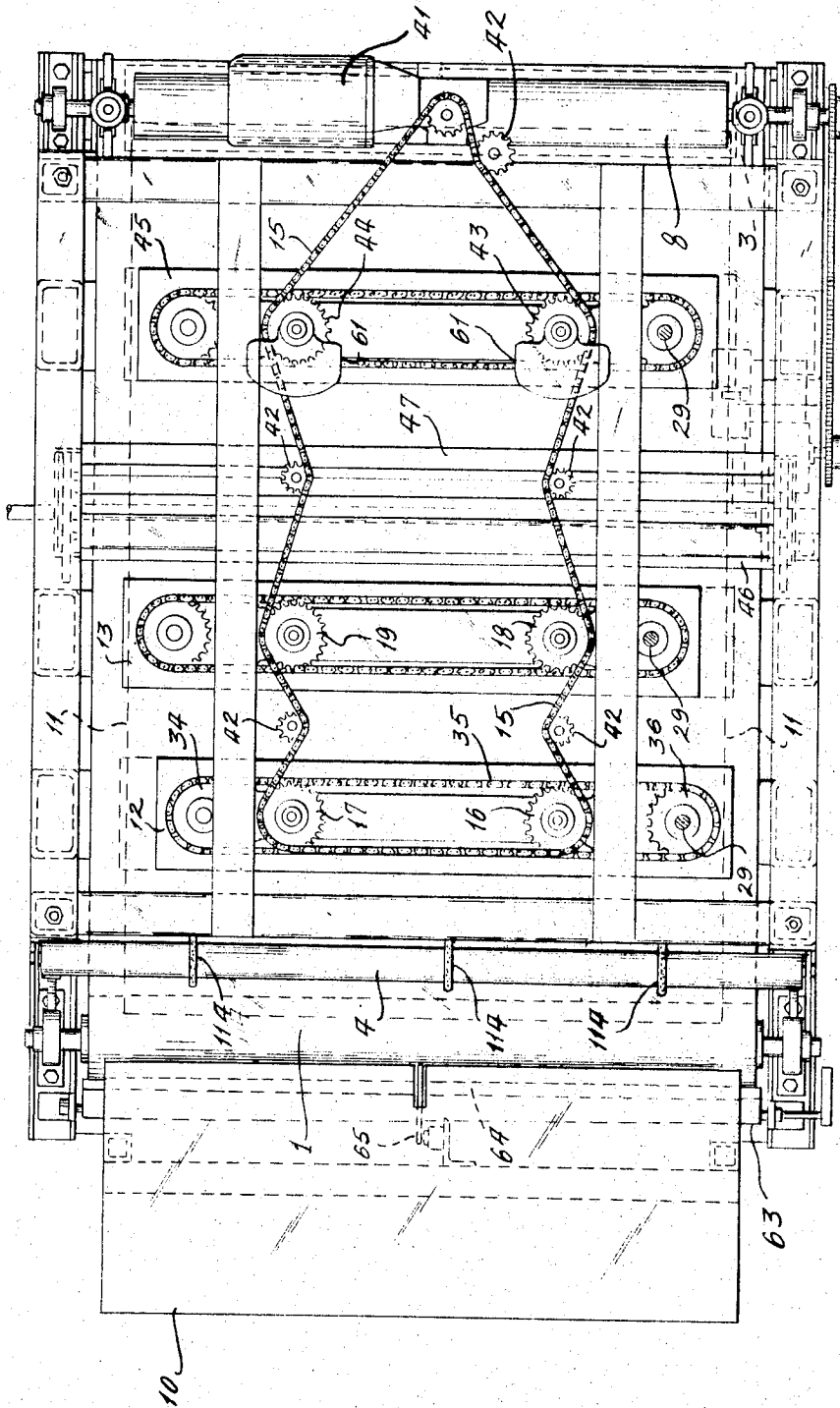


FIG. 2

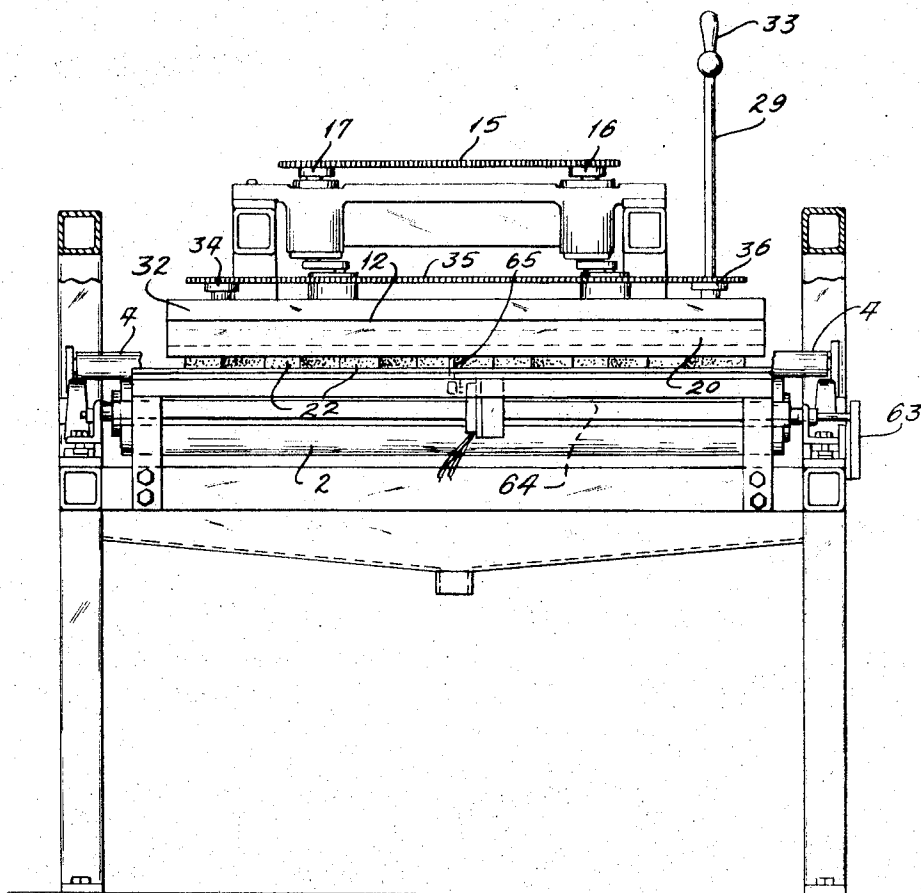


FIG. 3

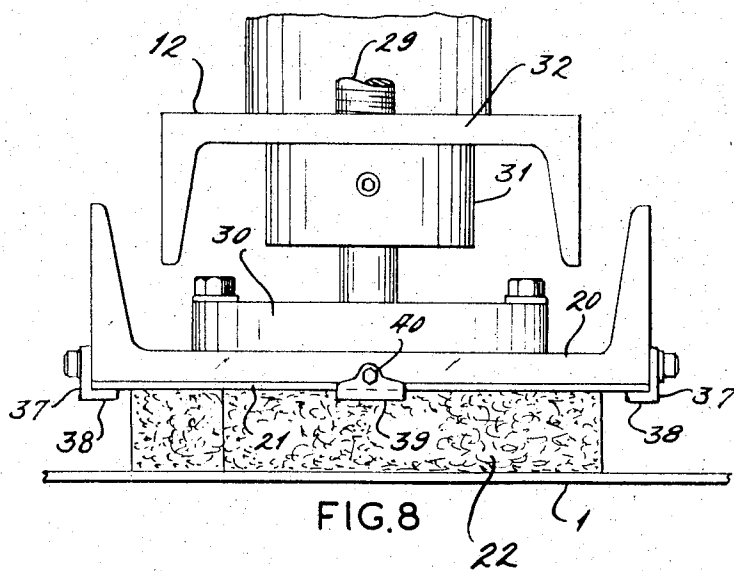
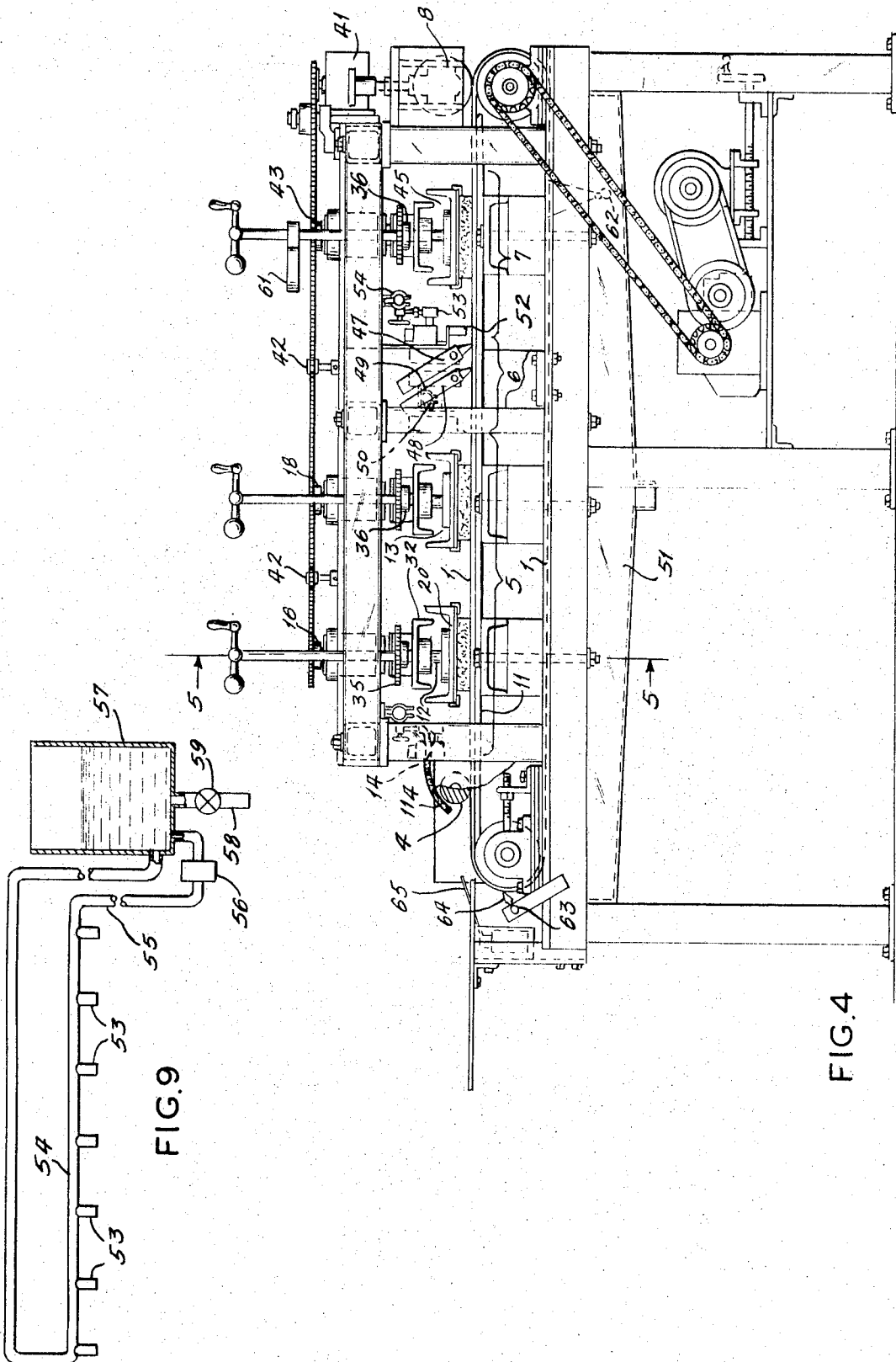
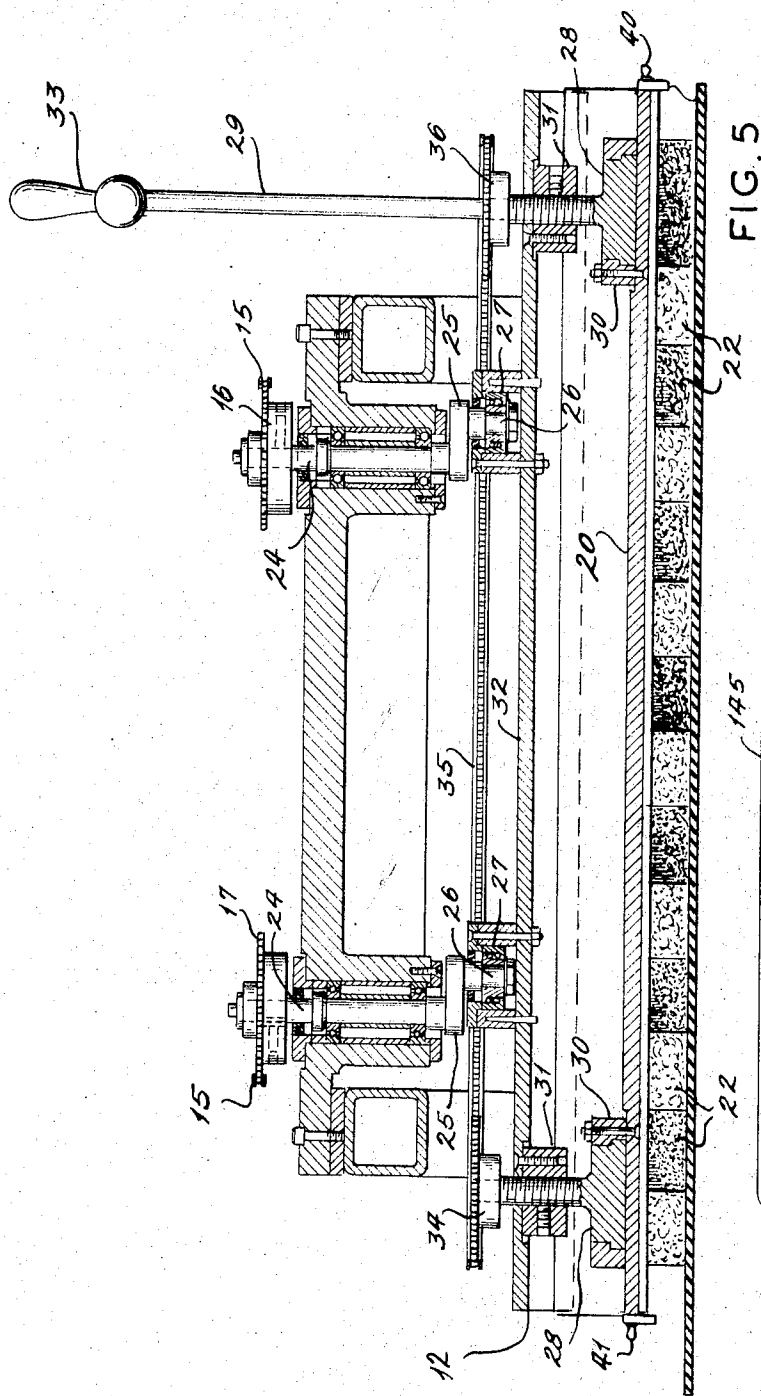
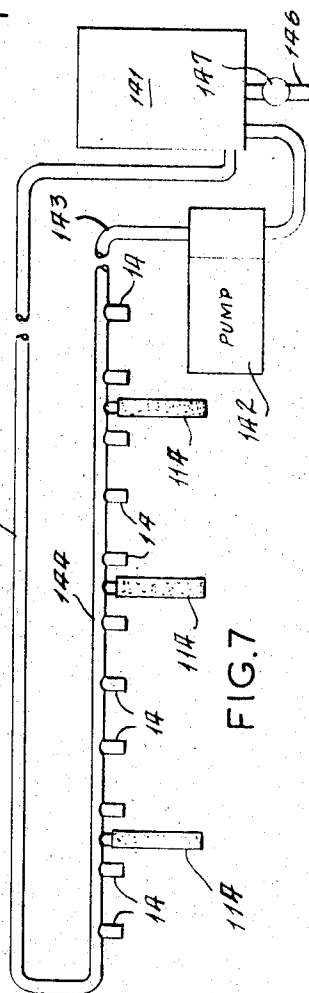


FIG. 8





APPARATUS FOR DEVELOPING LITHOGRAPHIC PLATES

CROSS-REFERENCE TO RELATED APPLICATION

This application is a division of copending application Ser. No. 729,040, filed May 14, 1968, issued as U.S. Pat. No. 3,608,464, Sept. 28, 1971.

The invention relates to apparatus for post-exposure treatment of lithographic plates to press-ready condition.

These and other objects of the invention, which will become apparent to the skilled in the art as the description proceeds, are accomplished by providing a machine having an endless belt for moving the exposed lithographic plate successively to, through and beyond, stations at each of which an operation is performed, and preferably without interrupting the movement of the endless belt or moving the plate relative to the belt. The endless belt is preferably smooth enough and held flat enough that when a thin flexible sheet of metal, such as a common lithographic plate, is laid upon it, air is excluded from the interface, and the two "stick" together so long as the flat coincidence is maintained, an action which is facilitated if either contacting face is damp with a liquid which, at least to some extent, wets both. Accordingly, the belt is preferably made of a material which is, at least to some extent, phillic to liquids which are phillic to the reverse (non-active) surface of the plate, and the belt is preferably of a material, for example neoprene, which may be vulcanized into endless condition in situ, i.e., while trained around one or more drive-, or guide-, rollers forming a permanent part of the apparatus; and means is provided for assuring that the belt is damp, but substantially devoid of unsorbed or flowable liquid at the time it receives a plate.

FIG. 1 is an isometric view taken from a front or input corner of one embodiment of the apparatus, with portions of the covers and other parts broken away to reveal the relation-ship of working parts;

FIG. 2 is a plan view of the apparatus shown in FIG. 1 with the covers removed;

FIG. 3 is an end elevation of the apparatus shown in FIG. 1 with the covers removed, some parts broken away, and taken from the front end, addressed toward the reader in FIG. 1;

FIG. 4 is a side elevation of the apparatus shown in FIGS. 1, 2 and 3, taken from the right side, addressed toward the reader in FIG. 1;

FIG. 5 is a partial sectional view taken along line 5-5 of FIG. 4, and showing the mechanism associated with one of the rubbing heads of said apparatus;

FIG. 6 is a bottom plan view showing the preferred arrangement of plate rubbing members on the pair of rubbing heads at the developer station of said apparatus;

FIG. 7 is a somewhat diagrammatic view showing the system for supplying developer to plates at the developer station;

FIG. 8 is a partial end view on enlarged scale and showing, in detail, a manner of securing a demountable rubbing assembly on a rubbing head; and

FIG. 9 is a somewhat diagrammatic view showing the system for supplying preservative composition to plates at the preservative station.

The apparatus shown in the drawings has an endless belt 1, the front loop of which is trained about an idler roller 2, and the rear loop of which is trained about a

driven roller 3, so that the upper reach of the belt 1 moves from the roller 2 toward roller 3 to, through, and beyond, a superimposed front idler roll 4, a developing station 5, a washing station 6, a preservative station 7, and a rear squeegee roll 8, in succession.

The endless belt 1 is preferably made of neoprene, or other material which is flexible, substantially non-stretchable, and wettable by liquids which wet the reverse (inactive) surface of a lithographic plate to be treated. Such wetting liquid is usually water, but, under certain circumstances, may be organophile, so it is preferred that the belt material be, at least to a substantial extent, amphiphilic, which condition is satisfied by neoprene.

A lithographic plate 9 to be treated is fed into the apparatus across a feed apron 10 into the nip between front idler roll 4 and the upwardly addressed exterior surface of the upper reach of belt 1. From beneath idler roll 4, a platen 11, in the nature of a table-top, extends continuously beneath the upper reach of belt 1 through stations 5, 6 and 7, and terminates just short of squeegee roll 8, thereby sustaining the upper reach of the belt in a substantially level or slightly sloping course, and providing a firm base for sustaining any vertical load imposed upon the upper reach of the belt as the plate 9 is transported on the belt 1 from the front end of the apparatus to the rear end thereof.

DEVELOPING STATION

At the developing station 5 of the embodiment shown, two spaced rubbing heads 12 and 13 are mounted for planar movement relative to, but parallel with, the plane of the upper reach of belt 1. In front of the leading rubbing head 12 there is affixed to a part of the stationary framework of the apparatus a series of metering devices 14, which periodically measure and drop charges of developer liquid upon the active surface of a lithographic plate, such as 9, traveling on the belt therebeneath. Optionally, for a purpose later to be described, some of the metering devices may be equipped with tubes 114 to lead their discharge onto the idler roll 4, or into the nip between that roll and an incoming plate.

An advantageous system for supplying developer liquid to the several metering devices 14 is shown in FIG. 7, and consists of a supply tank 141 connected to deliver liquid developer to the intake of a pump 142, which discharges through tube 143 to a header 144 to which the several metering devices 14 are connected. From the end of header 144 (remote from tube 143), a tube 145 extends back to tank 141. With such an arrangement, a stream of liquid developer is continuously moving under pressure through header 144 at all times during operation of the apparatus, and hence is available in well-agitated condition to supply developer liquid to all metering devices 14 simultaneously as demanded. Each of the metering devices has an electrically controlled valve which opens and closes in predetermined coordination with the movement of a plate therebeneath, or for preconditioning the apparatus as will be described later. The tank 141 is also provided with a drain line 146 having a valve 147, which is closed during operation of the apparatus, but may be opened to drain the developer liquid from the system when the apparatus is to be shut down for a substantial period of time.

Each of the rubbing heads 12 and 13 is driven with a "doubly cranked link motion," of the character above described, through mechanism later to be described in detail. The driving force is imparted by an endless chain 15 which engages sprockets 16 and 17 on rubbing head 12, and sprockets 18 and 19 on rubbing head 13. In the form shown, all four sprockets are rotated clockwise, as seen in FIG. 2, but the general arrangement provides for numerous variations. For example, all sprockets may be rotated in the counterclockwise direction; the sprockets on one of the rubbing heads may be rotated in the clockwise direction, while the sprockets on the other rubbing head are rotated in the counterclockwise direction; the respective rubbing heads may be driven in phase (wherein the respective rubbing heads maintain the same spaced relationship between each other, and occupy no position which is not parallel with all other positions during a cycle), or out of phase (i.e., the respective rubbing heads occupy no position which is not parallel with every other position occupied during a cycle, but the spaced relationship between the two does vary during a cycle). In fact, given freedom for slight lost motion at one sprocket or the other, the respective sprockets on the same rubbing head may be rotated in opposite senses, a condition in which the given rubbing head occupies a multiplicity of positions in the course of a cycle which are not parallel with any other position, and the spacing from the companion rubbing head is constantly varying at opposite ends of the given rubbing head. Preferably, however, the rubbing heads 12 and 13 are driven as shown in the drawings, i.e., with all sprockets rotating in the same direction, but with rubbing head 13 moving 180° out of phase with the movement of rubbing head 12.

In the embodiment shown, each of the rubbing heads 12 and 13 is provided, at its lower extremity, with a platen 20 to the lower face of which there is detachably mounted an assembly of rubbing members. Such assembly preferably consists of a flat plate 21, to which there is appropriately secured, as by cementing, a series of seven rubbing members 22 each spaced from its neighbor, as shown in FIG. 6. The individual rubbing members are preferably a rectangular slab of coarse grain cellulose sponge, or other comparable material, and the spaces between them preferably approximate half the amplitude of movement of the rubbing head in the horizontal direction which is at right angles to the movement of belt 1. Such spaced relationship of the individual rubbing members one from the other permits some increments of developer liquid deposited on a plate ahead of the leading rubbing head 12 to pass through the space between adjacent rubbing members on the leading rubbing head, and thus to be available at the trailing rubbing head 13. The spaced relationship of the rubbing members, coupled with the motion of the rubbing head, also induces turbulence in the circumambient air which expedites evaporation of the volatile components in the developer liquid being rubbed. Angular orientation of the respective rubbing elements 22 relative to their supporting plate 21 is preferred, and while such is not essential, excellent results are achieved when rectangular-shaped rubbing members are oriented on the plate 21 with one of their diagonals substantially parallel with the direction of movement of belt 1. The latter orientation minimizes the tendency of the leading increments of the respective rub-

bing members to bat increments of liquid developer, which they encounter in the course of their orbits, back toward the front of the apparatus.

In the embodiment shown, the rubbing assembly 23 for the trailing rubbing head 13 is identical with that employed on the leading rubbing head 12, but with opposite slope. However, it should be pointed out that neither the spaced relationship nor the angular orientation of the rubbing members on the trailing rubbing head is of equal practical importance to those features on the leading rubbing head. In fact, a continuous slab of cellulose sponge, or equivalent material, having dimensions substantially corresponding with its supporting plate has some advantage over the spaced and angularly oriented arrangement shown in the drawings, but has the disadvantage that, in the field, an attendant may inadvertently put the wrong rubbing assembly on the leading rubbing head. Such disadvantage assumes overriding importance because the rubbing members are expendable, and require frequent replacement.

The mechanism for moving the respective rubbing heads with the "doubly cranked link motion" aforesaid is shown in detail in FIG. 5, and is identical for each of the rubbing heads, as well, in the embodiment shown, as being identical at opposite ends of a given rubbing head. Such mechanism comprises a shaft 24 journaled in a stationary part of the apparatus, and connected in rotational force-transmitting relationship with sprocket 16. At the lower end of shaft 24, a crank arm 25 is connected in rotational force-transmitting relationship. An eccentric stub shaft 26, projecting from crank arm 25, is journaled in a bearing 27 fixedly secured to rubbing head 12. The same organization of parts is provided for cooperation with sprocket 17. Consequently, upon rotation of the sprockets 16 and 17 in phase with each other, every individual point on rubbing head 12 revolves in a circular orbit about a center which is different from that about which any other point (in the same horizontal plane) in the rubbing head revolves. Preferably, the throw of crank 25 and its counterpart is substantially the same as the spacing between the respective rubbing members 22 on the leading rubbing head.

Since, in the preferred form, the several rubbing members 22 are resiliently compressible, and since greater pressure of the rubbing members is desirable on fine grained plates than on coarse grained plates, means is provided for adjusting the degree of compression of the rubbing members and hence the pressure exerted by them upon a plate being operated upon. Such means is also shown in FIG. 5, and consists of a disc 28 fixed to a shaft 29, and secured for rotation within an annular cage 30 affixed to the upper side of platen 20. The shaft 29 is externally threaded to mate with internal threads on nut 31, which latter is affixed to the same part 32 of the rubbing head to which bearing 27 is affixed. At the upper end of shaft 29, there is a handwheel 33, or other manipulating device, whereby, upon turning shaft 29, the displacement between platen 20 and rubbing head part 32 is varied. An identical arrangement is provided at the other end of the rubbing head, save that the counterpart of shaft 29 is foreshortened and provided with a sprocket 34 which is interconnected by a chain 35 with a sprocket 36 secured for rotation with shaft 29. Consequently, upon turning shaft 29, both ends of platen 20 are moved vertically relative to rubbing head part 32 to the same extent, thereby to regulate the degree of compression in

rubbing members 22, and the load imposed by them on a subjacent lithographic plate.

In order to facilitate the removal and replacement of the rubbing assemblies on the rubbing heads, the platens 20 of each rubbing head are provided with a pair of strips 37 extending along the opposite long sides thereof. Each of the strips 37 has a lip 38 which respectively extend toward each other in spaced relationship to the lower face of platen 20, as shown in FIG. 8. The spaced relationship approximates the thickness of rubbing assembly plate 21, so that a given plate 21 may be slid into and out of the raceway defined by the opposite lips 38. To secure the plates 21 in operative position, tag-shaped keepers 39 are connected eccentrically by belts 40 to opposite ends of platen 20, so that when in the position shown in FIG. 8, with the bolts 40 run up tight, the keepers 39 prevent removal of plate 21, but when it is desired to remove the latter, one of the bolts 40 can be relaxed sufficiently to permit its associated tag-shaped keeper 39 to be rotated 180° out of the way of removing plate 21 by the sliding section above described.

The endless chain 15, which drives the several sprockets 16, 17, 18 and 19, is driven by a motor 41 in the conventional manner, and is engaged not only with the sprockets mentioned, but also with idler sprockets 42 appropriately positioned and equipped with any suitable means for adjusting the axis of rotation of at least one of them, so as to properly regulate the tension on the endless chain. The endless chain 15 also engages a pair of sprockets 43 and 44, which drive a comparable rubbing head 45 at the preservative station later to be described.

WASHING STATION

After having been transported on the endless belt 1 under and beyond the rubbing heads 12 and 13, the leading edge of plate 9 emerges into washing station 6. A squeegee member 47 delineates the rear of the washing station, but one or more additional squeegee members, such as 48, may be provided if desired. Each of the squeegee members is equipped with a wiping blade, of resiliently flexible material such as rubber, or the like, which rides upon, and makes substantially water-sealing contact with, the subjacent increments of belt 1 or a lithographic plate thereon, as the case may be. Such blade on the squeegee members 47 and 48 form dams to prevent the water released within the washing station from flowing to the rear past squeegee member 47.

Within the washing station, there is provided, in spaced relationship to the upper surface of belt 1, a water supply header 49 having a plurality of nozzles 50 from which there issues a shower of water directed toward the active surface of a subjacent plate, such as 9, as it passes therebeneath. The streams of water are so controlled and directed that substantially all increments of the active surface of the plate will be subjected to the rinsing and, to a minor extent, eroding action of the water streams, thereby to remove the hydrophile components of the developer liquid previously applied at the developing station, to the extent that the solids thereof are not already adhered to the already-hardened lacquer-forming components of the developer. The water released within the washing station is prevented from flowing back toward the developing station by tilting the entire apparatus, or at least the

portion of platen 11 subjacent the washing station, in a direction such as to make it almost 2° uphill from the squeegee 47 to the developing station. Water accumulated ahead of squeegees 47 and 48 flows sideways of belt 1, and if desired, the entire apparatus, or at least the portion of platen 11 beneath the washing station, may be tilted about one degree sideways so that the water, squeegeed off, will flow by gravity over the opposite longitudinal edges of the belt and platen. If unlike the showing in the drawings, the table-top platen 11, or a part thereof, has greater width than the belt 1, perforations may be provided in the portion of platen 11 which lies outboard of belt 1 so as to permit the escape of water therethrough, but in the embodiment shown, the squeegee members 47 and 48 extend for the full width of belt 1, the water released in the washing station flows over the edges of the belt, and is caught by a sink 51 disposed beneath the lower reach of belt 1. As the lithographic plate moves on the belt past squeegee members 47 and 48, the active surface thereof is substantially denuded of water by the squeegees.

PRESERVING STATION

Upon emerging from the washing station 6, the lithographic plate, such as 9, passes under a proximity switch 52, which senses the presence of a subjacent plate on belt 1, and closes an electrical circuit which actuates a plurality of metering devices 53, and results in the dropping of measured charges of preservative composition at predetermined intervals onto the active surface of a subjacent plate as it moves on belt 1 therebeneath into and through preserving station 7. As shown in FIG. 9, the several metering devices 53 connected at spaced intervals of about 5 to 6 inches in the widthwise direction (of the belt) to a header 54, which is fixedly mounted upon the framework of the apparatus, and connected through tube 55 to a pump 56 which receives the preservative composition from tank 57. This organization is such that the preservative composition is under constant pressure and continuous flow in header 54, but tank 57 is vented to prevent the pump 56 from drawing a vacuum. While the tank 57 is shown with an open top, it will be understood that a lid may be applied to reduce evaporation of volatile components of the developer. A drain line 58, having a valve 59, is provided for draining the contents of tank 57 when operation of the apparatus is to be discontinued for a substantial period of time.

Also included within the preserving station 7 is the rubbing head 45 previously mentioned, whose construction and mode of operation is, in the embodiment shown, identical with that of developer rubbing head 12, except that where a single rubbing head is provided as at the preserving station, it is preferred that the shafts thereof, corresponding to 24 in FIG. 5, be provided at their upper ends with counterweights 61, or other balancing means, to minimize vibration, which balancing means is not necessary with rubbing heads 12 and 13 when driven in the same sense of rotation, but 180° out of phase, as previously described. The counterweights 61 are mounted on the upper extremities of shafts corresponding to 24 in FIG. 5, and so oriented that the mass centers of the respective counterweights are in 180° displacement from the pivot axis of bearing 27 about stub shaft 26. Hence, the rubbing head 45 performs the same type of operation on a subjacent plate with preservative composition, as rubbing heads

12 and 13 performed at the developing station with developing composition, and rubbing head 45 is driven by the endless chain 15 in engagement with sprockets 43 and 44 in like manner to that previously described.

Upon emerging from the rubbing head 45, a lithographic plate, such as 9, is transported on the belt 1 into the nip between the belt 1 and a squeegee roller 8 which squeezes off any excess of preservative composition on the active surface of the plate, and accumulates it ahead of the nip between the belt and idler roll 10, so that it may drain sidewise of the belt and flow into sink 57, as in the case of the water discharged at the washing station 6.

When a lithographic plate, such as 9, emerges from between the roller 8 and belt 1, it is, under most conditions prevailing in the industry, ready for the press, but, depending upon ambient atmospheric conditions prevailing and the mode of handling in a given plant, it may be desirable to provide a heater and/or fanning means beyond roller 8, particularly if the plates undergoing treatment in the apparatus are stacked one upon the other immediately as they emerge from the squeegee 8. Accordingly, where such stacking is practiced, any suitable device, such as an oven, for expediting the natural evaporation of water and organic solvent from the preservative on the plate is recommended. Such an oven or other drying device is preferably arranged to receive the plates, one by one, as they emerge from squeegee 8, dry them, and automatically deliver them to a stacking device from which they may be removed at will in multiple.

ENVIRONMENT AND CONDITIONING

In order to assure not only that the belt 1 is damp to the extent sufficient to exclude air from the interface between the exterior surface of the belt which comes into contact with the inactive (reverse) surface of an incoming plate at the front loop of belt 1, but also to remove from the belt, before it comes into such contact with the plate, substantially all liquid which is neither absorbed nor adsorbed by the belt, the invention further contemplates that the lower reach of the belt be sprayed with water as it passes above sink 51, and that the unsorbed or flowable water on the belt be removed therefrom as it turns at the front loop thereof about idler roll 2. This is accomplished by the provision of a water spray head 62, whose nozzle is addressed toward the exterior surface of the lower reach of the belt, and by the provision of a squeegee 63 having a blade 64, of material such as rubber, in wiping contact with the exterior surface of belt 1 adjacent roller 2. Thus, both spray head 62 and squeegee 63 are arranged so that the drainage therefrom is accumulated in sink 51. The residual water on an increment of belt 1 which has just passed squeegee 63 is substantially all sorbed by the belt so that the belt is damp when the reserve (inactive) surface of an incoming plate, such as 9, first makes contact with the belt. Such dampness is enough to exclude air from the plate-belt interface when the two are squeezed together by the idler roll 4, and the resultant interfacial tension holds the plate in position on the belt, without relative movement, while the active (obverse) surface of the plate is undergoing the rubbing action of the heads 12, 13 and 45, and undergoing the wiping action of squeegees 47 and 48.

In some localities, the water supply, while potable, contains solutes which have a deleterious effect when

such water is brought into contact with the active face of an undeveloped, but exposed, lithographic plate. In such circumstances, some precaution should be taken to prevent the unsatisfactory water transferred from the belt 1 to idler roll 4 from being retransferred to the active surface of an incoming plate when the latter passes under the roll 4. Such problem is adequately overcome by running the roll 4 wet with developer composition. Hence, as shown in the drawing, three of the developer metering devices 14 are equipped with tubes 114 which direct their discharge either onto roll 4 or into the nip between it and belt 1 (or an incoming plate on belt 1). Another solution is to dampen the belt 1 with a liquid, other than water, which is phillic toward both the exterior surface of belt 1 and the reverse face of a lithographic plate. The usual developer liquids of commerce suffice for this purpose.

The input apron 10 is equipped with means for sensing the presence, on the apron, of an incoming exposed lithographic plate, such as 9. In the form shown in the drawings, such a plate-presence sensor is in the form of a whisker switch 65, which normally projects above the level of plate 10, but is pressed down into electrical circuit-closing position when an incoming plate engages it.

In normal operation, the apparatus is started manually to precondition it for operation, a few seconds before a plate, such as 9, is inserted. At such start-up, after the apparatus has been idle for a considerable period, the several components of the apparatus are actuated in sequence. First, the pumps 142 and 56 are energized to build up a head of developer composition in the developer header 144, and a head of preservative composition in header 54. Secondly, the movement of belt 1 is initiated simultaneously with turning on the water to headers 49 and 62. After the belt has moved at least for the distance between water header 62 and rubbing head 12, the several metering devices 14, which control the discharge of developer liquid, are opened to deposit on the belt a sufficient amount of developer liquid to impregnate at least the surface increments of the several rubbing members 22 on the developer heads 12 and 13. At the same time, and without regard to the control by proximity switch 52, the metering devices 53 are opened to deposit a charge of preservative composition on the belt for the purpose of impregnating at least the surface increments of the rubbing members on preservative head 45. This actuation of the several metering devices is brief, for example, one or two squirts from each metering device, whereupon the electrical circuits which control the metering devices during the preconditioning stage are de-energized, and control of the metering devices is taken over by the whisker switch 65 and the proximity switch 52, respectively. Concurrently with the first preconditioning discharge from the several metering devices, motion of the several rubbing devices 12, 13 and 45 is initiated and continued for as long as desired, without actuation of the whisker switch by an incoming plate, but if, during this period, an incoming plate does actuate the whisker switch 65, the movement of the rubbing heads, as well as belt 1, continues without interruption. If desired, however, the electrical control circuitry may be automated to interrupt the continued movement of the belt and rubbing head upon either the lapse of a chosen increment of time, or belt travel for a chosen distance, since the last actuation of the whisker switch.

In the continuous operation following preconditioning, the belt 1 and all rubbing members continue to move; and once the whisker switch 65 is actuated, the metering devices 14 will be automatically energized to deliver a charge from each of the metering devices, and to drop that charge upon the subjacent plate near the leading edge thereof, as well as to automatically drop succeeding charges on the plate every 4 or 6 inches. Likewise, whenever the proximity switch 52 senses the presence of a plate beneath it, the control circuitry for metering devices 53 is energized to cause periodic discharge of preservative after the plate has reached a position to intercept the dropping discharges. The electrical circuitry and equipment for so controlling the metering devices 14 can take any form well known in the art, and forms no part of the present invention. The time at which movement of the rubbing heads 12, 13 and 45 is initiated is not critical, save that such initiation of each such rubbing head should occur prior to the time the leading edge of an approaching plate reaches it. The discharge of water from nozzles 50 may be continuous once motion of the belt 1 has been initiated, but, if desired, means for sensing the approach of a plate can be provided to turn the water discharge on when there is need for it, and off when there is no need for it. As pointed out hereinbefore, the discharge of preservative composition from metering devices 53 is under the control of proximity switch 52, so that discharge of preservative liquid commences after the leading edge of a plate undergoing processing has reached a position below the metering devices 53, continues periodically as long as a plate is present beneath proximity switch 52, and is terminated when there is no plate beneath proximity switch 52. The frequency of the discharges from metering devices 14 and 53 depend, to some extent, upon the developer and preservative compositions employed, as well as the character of the plate being treated and its area. Accordingly, it is contemplated that the timing of such discharges be adjustable to best suit the prevailing conditions of operation, but the specific means for accomplishing such variation are well known in a variety of forms for comparable situations, and form no part of the present invention.

While one complete embodiment of the invention has been described in detail, it is not to be understood that the invention is limited to the embodiment so disclosed. On the contrary, it is realized that numerous modifications and variations will occur to those skilled in the art without departing from the spirit of the inven-

tion or the scope of the appended claims.

We claim:

1. In apparatus for processing lithographic plates, means for conveying lithographic plates one after another in a predetermined generally horizontal path, to, through and beyond at least one operating station, with one face of each plate facing up at said station, comprising an endless belt having a generally flat and generally horizontal upper reach for conveying a plate along said path, the plate being applied to said upper reach of the belt at a place in advance of said operating station, means for wetting the belt in advance of said place of application of the plate, means for pressing the plate down flat on the said upper reach of said wetted belt at said place to exclude air from between the plate and the belt so as to cause the plate to be gripped flat to the belt, said plate being applied to the upper reach of the belt adjacent one end thereof constituting its starting end, said wetting means being located to wet the belt ahead of said starting end of said upper reach, the belt having a lower return reach, said wetting means comprising means for spraying water on the exterior surface of said lower reach, and means for removing excess water from the belt between the spray means and said point of application of the plate to the upper reach of the belt.

2. Apparatus as set forth in claim 1 wherein the belt is made of a flexible substantially non-stretchable material which is wettable by water.

3. Apparatus as set forth in claim 1 wherein the belt is made of neoprene.

4. In apparatus for processing lithographic plates, means for conveying lithographic plates one after another in a predetermined generally horizontal path, to, through and beyond at least one operating station, with one face of each plate facing up at said station, comprising an endless belt having a generally flat and generally horizontal upper reach for conveying a plate along said path, the plate being applied to said upper reach of the belt at a place in advance of said operating station, means for wetting the belt in advance of said place of application of the plate, and means for pressing the plate down flat on the said upper reach of said wetted belt at said place to exclude air from between the plate and the belt so as to cause the plate to be gripped flat to the belt, said pressing means comprising a squeeze roller for squeezing the plate flat against the upper reach of the belt.

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