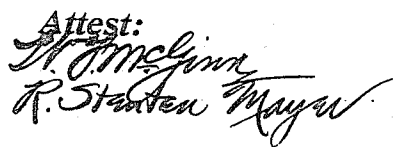


APPARATUS FOR TREATING ARTICLES WITH FLUID.

Patented May 28, 1918.

2 SHEETS--SHEET 1.



by

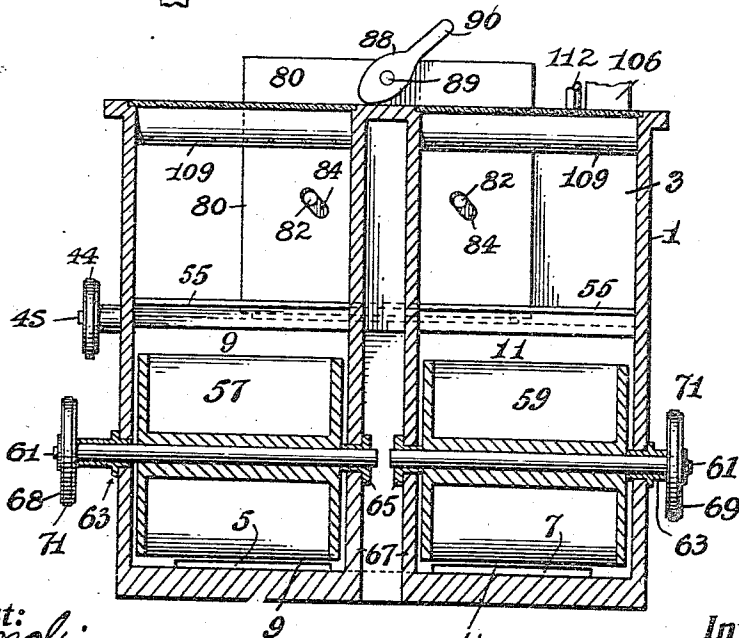
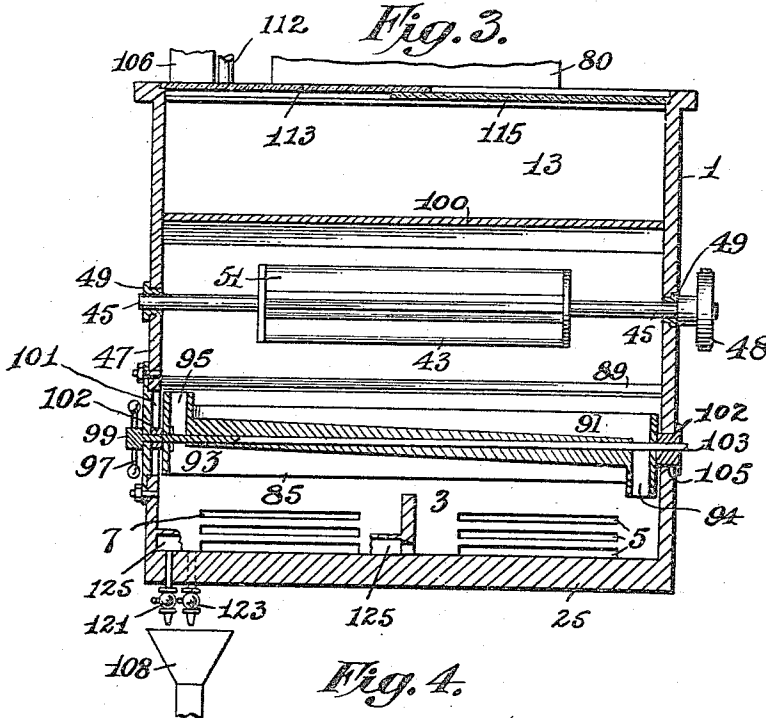
Alexander C. Prongit, Atty.

F. A. FLICK.
 APPARATUS FOR TREATING ARTICLES WITH FLUID.
 APPLICATION FILED MAR. 3, 1915.

1,267,754.

Patented May 28, 1918.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FREDERICK A. FLICK, OF NEW YORK, N. Y.

APPARATUS FOR TREATING ARTICLES WITH FLUID.

1,267,754.

Specification of Letters Patent.

Patented May 28, 1918.

Application filed March 3, 1915. Serial No. 11,912.

To all whom it may concern:

Be it known that I, FREDERICK A. FLICK, a citizen of the United States, and a resident of New York, N. Y., have invented certain

5 Apparatus for Treating Articles with Fluid, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings designating like parts.

10 This invention relates to apparatus for the treatment of articles with fluids, and is of special utility when embodied in apparatus for etching printing plates, although I contemplate the use of my improvements
15 in any field for which they are adapted by their nature.

An important object of my invention is to provide in such apparatus a suitably constructed container with means to spray with
20 one or more fluids the article to be treated, and means controlling the flow of the fluids from said article so that these fluids may be collected at will in any one or more of a plurality of compartments, a further important
25 object of my invention being to provide these compartments with elevating means respectively acting upon the fluids separately to raise said fluids into position for delivery independently of each other, or
30 mixed in the relative proportions desired, to the spraying device or devices.

My present invention is an improvement upon the etching apparatus disclosed in Letters Patent No. 1,133,547, granted March 30,
35 1915, and the various features of my invention will be illustrated and described fully in the accompanying drawings and specification and pointed out in the claims.

In the drawings,

40 Figure 1 is a view in plan of an apparatus for etching in the construction of which my improvements have been embodied;

Fig. 2 is a view of the same in vertical section upon the line x^2-x^2 , Fig. 1;

45 Fig. 3 is a vertical sectional view on the line x^3-x^3 , Fig. 2; and

Fig. 4 is a similar view on the line x^4-x^4 , Fig. 2.

In the embodiment of my invention selected for illustration and description to enable ready and complete understanding of my improvements, the part designated by the reference numeral 1 is an acid-proof container of any suitable size, shape and material, being shown, in the instance illustrated,

as a rectangular box molded of glazed earthenware and divided into compartments by a partition 3, preferably also made of earthenware and which may be of any suitable construction, as for example formed integrally
60 with the sides of the container, as shown.

This partition may be provided with suitable openings to permit passage of fluid between the compartments, as for example the openings 5 and 7 near the bottom of the
65 partition, these openings permitting access to compartments 9 and 11 for fluid from the compartment 13, which latter may, and preferably will, serve as the receptacle for the article to be treated, as for example a
70 printing plate 15 to be etched, to support which the container may be provided with any suitable device.

I prefer to use for this purpose a rotary platen or table 17, with stepped, graded
75 ledges 19, forming a series of recesses in which may be placed plates of different sizes, as provided in my aforesaid patent, this form of structure permitting the plates to be readily emplaced and removed for inspection, as no clamps are required to hold
80 the plate from sliding, when as I prefer, the support is mounted at an angle to facilitate application of the fluids and their drainage. The numerals 18 designate drainage apertures.

The supporting table 17 may be of any suitable material, as for example the glazed earthenware, and may be carried and rotated by any suitable means, such as the
90 shaft 21, mounted rotatably in a bearing 23, which latter may be, and preferably is, formed integrally with the material of the container 1, the shaft 21 passing out through the bottom 25, and having suitable driving
95 means such as the worm-gear 27 in mesh with a worm shaft 28 mounted in bearings 29 secured to the base at 30, this worm-shaft having a pulley 31 driven by a belt 32 running from a pulley 34 on shaft 36 of a motor
100 38, constituting one suitable form of prime mover for the apparatus. Any suitable base 39 may be provided to support the container 1 and motor 38, and preferably the base will be somewhat elevated, as by feet 41, to give
105 access conveniently to the under parts of the apparatus.

In accordance with an important feature of my invention, means are provided for supplying separately controllable fluids for
110

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treatment of the article being operated upon, and any suitable devices may be utilized for this purpose, in connection with the supply compartments 9 and 11 to which reference
5 has already been made, and as one convenient form of device for receiving the fluids from these compartments, and applying them to the article supported on the rotating table 17, I have shown a rotating
10 mechanical spreader 43, having shaft pivots 45, journaled in the walls 47 of the container, which may have socket devices 49 to receive the pivots.

In the instance illustrated, this spreader
15 extends partly across the container at a region somewhat below the center of the table 17 and the spreader comprises blades 51 to which fluid is delivered through an opening or openings 53 in partition 3, over a supply
20 member 55 extending across said compartments adjacent to said opening 53, the fluid passing from the compartments 9 and 11, in streams which can be blended in flowing over the supply member and by the subsequent action of the blades 51 of the spreader,
25 so that the fluid from one compartment or the other compartment can be applied separately to the article to be treated, or a blended fluid therefrom can be applied to
30 said article; and to accomplish the control of the fluids supplied, in order to effect one or another of these triple forms of treatment, it is sufficient to deliver one or the other stream, or cause both to run. A baffle
35 plate 100 may, and preferably will be provided to aid in directing the blended fluid upon the support 17. The supply member 55 is preferably removable.

Any suitable means may be provided to
40 introduce a supply fluid from the supply compartments 9 and 11 respectively to the supply member 55, and one convenient arrangement for this purpose is simply to pour the several fluids separately into their
45 appropriate compartments 9 and 11, and to provide means for elevating said fluids separately from the lower portions of said compartments to the supply member 55, and as one convenient form of means for this
50 purpose I have shown a rotary elevator 57 in the compartment 9, and a rotary elevator 59 in the compartment 11, these elevators having respectively operating shafts 61 extended out through the walls of the container, as at 63, and having their inner ends
55 journaled in bearing sockets 65 in the transverse double partition 67, which I prefer to provide for the more complete separation of the fluids in the supply compartments 9 and
60 11 respectively.

To operate these rotary elevators, suitable means may be provided, as for example the pulleys 68 and 69 driven by belts 71 from driving pulleys 73, 75 on the shaft 36 and
65 by changing the relative sizes of these pul-

leys, the relative speed of the elevators 57 and 59 and the rotary spreader 43 can be determined, if, as I prefer, the rotary spreader 43 is driven by belt 44 running from a pulley 46 on shaft 36 to a pulley 48 70 on the spreader shaft 45. A removable baffle plate is shown at 66.

Each of the sets of pulleys 73, 75 preferably comprises a fast and loose pulley, and the belts 71 can be controlled individually 75 by any suitable means, such as the shipper handles 77, 79, in well-known fashion, to throw on or off either of the belts 71 and consequently cause the operation of elevator 57 or elevator 59, or both, and thus to supply a stream of fluid from compartment 9 80 or compartment 11, or streams from both, to supply member 55, spreader 43 and thence to the article to be treated.

The amount of fluid allowed to pass from 85 the supply member 55 through aperture 53 in partition 3 can be regulated by any suitable means, and as one convenient form of device for the purpose, I have shown a vertical gate 80 mounted on pegs 82 passing 90 through slots 84 in the gate, which is actuated in the instance illustrated by a cam-lever 88 pivoted at 89 upon the gate 80, and having an operating handle 90.

In accordance with another highly important 95 object of my invention, I provide means for controlling the drainage of the fluids after treatment of the article in compartment 13, so that the drainage fluid can be returned at will to either of the compartments 9, 11 or 13, according to the future 100 disposition to be made of the drainage fluid, and any suitable form of means for this purpose may be utilized.

As one convenient form of device for this 105 purpose, I have shown an improved type of deflector 85, comprising the essential features and functions of the deflector illustrated and described in my Patent No. 1,133,547, but which is constructed and arranged 110 in accordance with my present invention to effect the direction of the drainage fluid to one side or to the other side of the container corresponding to the locality of the compartments 9 and 11, the deflector 115 being positioned across the container approximately at the region of the plane of the drainage apron 87 and baffle plate 89 which I prefer to provide below the table 17, as in my Patent No. 1,133,547, the rotary 120 deflector receiving the fluid flowing from the lower edge thereof.

In accordance with my improvements, this controlling drainage member has a plurality of peripheral channels 91 and 93, best seen 125 in Figs. 2 and 3, running longitudinally in position to receive the drainage fluid from the table, and having outlets 94 and 95, of which the former is so placed as to discharge into the bottom of the container at a region 130

where the drainage fluid will pass through opening 5 in the lower part of partition member 3, into supply compartment 9, when channel 91 is presented upwardly to receive the drainage, while outlet 95 is so placed as to discharge into the bottom of the container at a region where the drainage fluid will pass through opening 7 in partition 3 into supply compartment 11 when channel 93 is presented upwardly to receive the drainage.

At 97, I have shown a handle constituting one convenient form of means for regulating the position of the controlling drainage member, this handle being secured to an extension of the shaft 99, at one end of the deflector, which shaft is journaled in a wall opening 101, while a similar pivot 103 at the other end of the deflector is journaled in a similar wall opening 105, bushings 102 being preferably provided therefor.

The container chamber 13 may have an upper vent 106 for fumes, and a discharge outlet 107 in its bottom by which to draw off any fluid gathered there accidentally, or which may be purposely directed therein by moving the deflector 85 into a suitable angular position to pass drainage fluid directly from the table 17 through channels 91 or 93 and outlets 94 or 95 into the bottom of compartment 13 and thence through valve 107 when the latter is opened to discharge the drainage fluid into the drain 108 or other suitable place for final disposition thereof.

Water for washing the article on platen 17 may be introduced through either of the compartments 9 or 11 and applied by the elevators and rotary spreader 43, or it may be supplied by a perforated water channel 109 molded in the top member 110, and provided with a nipple 111 to receive a water supply pipe 112.

The reference numerals 113 and 115 designate glass cover plates, being arranged to slide over one another (see Figs. 2 and 3) and through which the etching operations may be observed, and similar plates 114 may be provided over compartments 9 and 11.

At 117 I have shown a closure member to check the escape of drainage fluid through the aperture 119 in apron 87, so that all of the drainage fluid will be under control of the deflector 85.

Outlets 121 and 123 are preferably provided for the fluids in supply compartments 9 and 11 respectively, and for the sake of convenience I have shown these outlets as located adjacent to the outlet 107 and drain 108, a channel 125 being molded along the partition 127 to lead the fluid from compartment 9 to outlet 121.

In operation, the article 15 to be treated will be placed upon the rotary platen 17; the supplies of etching or other fluids will be poured into their appropriate compartments

9 and 11, either or both; and the covers 113, 114 and 115 will be drawn to inclose the container.

The motor 38 will then be started, causing rotation of shaft 36 and spreader 43 by means of belt 44, and upon throwing on either or both of the shipper handles 77 and 79, the belts 71 may be shifted to the fast pulleys 73, 75 and the elevators 57, 59 operated to raise fluid from supply compartments 9 and 11, and discharge the supply upon supply member 55, whence it passes by aperture 53, under the regulation of gate 80, and is caught by the blades 51 of the rotating spreader 43, which distributes it in spray to the plate 15 or other article on the table 17, the latter being rotated simultaneously under the action of shaft 21, worm-gear 27 and worm shaft 28 driven by belt 32 from the motor 38.

If the elevator 57 is being run, the deflector 85 will preferably be positioned as shown in Fig. 3, with its channel 91 in place to receive the fluid draining from plate 15, support 17 and baffle plate 89, the fluid passing by outlet 94 back to the compartment 9 by the bottom apertures 5 in partition 3.

When the etching operation shall have been completed, the shipper handle 77 can be thrown to shift belt 71 to loose pulley 73, stopping the elevator 57, and washing-fluid can be introduced to supply member 55 through supply pipe 112 and perforated channel 109, acting first to wash the supply member 55 and thence passing to spreader 43 which sprays it upon plate 15 and support 17, washing these thoroughly, the deflector 85 being turned to direct outlet 94 toward compartment 13, so that the washing fluid can be drawn off through outlet 107 into drain 108.

If it is desired to wash out the supply compartments 9 and 11, the supply member 55 can be removed, the contents of the compartments drawn off through outlets 121 and 123, and washing fluid delivered through supply pipe 112 and perforated channel 109, the elevators 57 and 59 being operated, if desired, to agitate the washing fluid.

Having illustrated and described my invention thus fully, and suitable means by which it may be carried into effect, I wish it to be understood that I do not limit myself to the specific materials and forms of structure selected for illustration and description by way of example, nor do I limit myself in general otherwise than as set forth in the claims, read in connection with this specification.

What I claim as new, and desire to secure by Letters Patent, is:—

1. Apparatus for the treatment with a plurality of fluids of such articles as printing plates, said apparatus comprising a container having a plurality of supply com-

partments for said fluids, means to support said article for treatment, means to apply to said article the fluids from said supply compartments respectively, and means to
 5 return to said several compartments at will the fluid drained from said article.

2. Apparatus for the treatment with a plurality of fluids of such articles as printing plates, said apparatus comprising a container having a plurality of supply compartments for said fluids, means to support
 10 said article for treatment, means to apply to said article the fluids from said supply compartments respectively, and means to return to said several compartments at will the fluid drained from said article, said
 15 means comprising elevators in said compartments respectively.

3. Apparatus for the treatment with a plurality of fluids of such articles as printing plates, said apparatus comprising a container having a plurality of supply compartments for said fluids, means to support
 20 said article for treatment, means to apply to said article the fluids from said supply compartments respectively, and means to return to said several compartments at will the fluid drained from said article, said
 25 means comprising elevators in said compartments respectively and means to receive fluids from said elevators and apply said fluids separately or in blended condition to said article.

4. Apparatus for the treatment with a plurality of fluids of such articles as printing plates, said apparatus comprising a container having a plurality of supply compartments for said fluids, means to support said
 35 article for treatment, means to apply to said article the fluids from said supply compartments respectively, and means to return to said several compartments at will the fluid drained from said article, said means comprising
 40 elevators in said compartments respectively and means to receive fluids from said elevators and apply said fluids separately or in blended condition to said article, said means comprising a delivery controlling member and means to apply forcibly
 45 to said article the fluid received from said controlling member.

5. The combination with a container having a plurality of compartments for fluids and a support for an article to be treated
 55 by said fluid, of a drainage controlling device comprising a member having a recessed portion to receive fluid drained from said article, said member having outlets to direct said drainage toward said compartments selectively.

6. The combination with a container having a plurality of compartments for fluids and a support for an article to be treated
 65 by said fluid, of a drainage controlling device comprising a member channeled longi-

tudinally to receive fluid drained from said support.

7. The combination with a container having a plurality of compartments for fluid and a support for an article to be treated
 70 by said fluid, of a drainage controlling device comprising a member having a plurality of longitudinal peripheral channels to receive fluid drained, with outlets to discharge said drainage fluid at different
 75 regions, and means to support said member rotatably to present one or another of said longitudinal channels for the reception of said drainage fluid.

8. The combination with a fluid-container
 80 and a support for an article to be treated with fluid, of a rotatable drainage-controlling cylinder having peripheral channels with outlets, and means to direct into said channels the fluid draining from said
 85 article.

9. A drainage-controlling member for apparatus of the class described, said member comprising an extended body with peripheral longitudinal grooves having outlets
 90 respectively constructed and arranged to deliver at different longitudinal regions fluid introduced to said grooves substantially throughout their length.

10. Apparatus for treating articles with
 95 fluids, comprising a container having a compartment provided with a support for an article to be treated, and a plurality of supply compartments respectively in communication with said article compartment to receive
 100 fluid drained from said article, a supply member common to said supply compartments and extended between them and said article compartment, elevators in said
 105 supply compartments respectively, to transfer fluid supplies from their lower portions to said supply member, means to operate said elevators selectively, a spreading device to receive fluid from said supply member
 110 and apply it to said article, and means to control the return to said supply compartments selectively of the fluid drained from said article.

11. Apparatus for treating articles with
 115 fluids, comprising a container divided by partitions into a compartment having a rotatable support for the article to be treated and a plurality of compartments having each a rotary elevator to dip into the fluid
 120 in said supply compartments respectively, said partitions having lower and upper apertures for transfer of fluid to and from said supply and article compartments, a supply member extended in a substantially
 125 horizontal position to receive fluid supplies from said supply compartments respectively and to deliver said fluid supplies through the upper apertures to said article compartment in blended condition or separately, at will,
 130 a gate for said supply aperture, a spreader

to receive said supply from said supply-member and apply it to said article, and a drainage member to control the return of fluid drained from said article to said compartments selectively.

12. Apparatus for treating articles with fluids, comprising a container divided by partitions into a compartment having a rotatable support for the article to be treated and a plurality of compartments having each a rotary elevator to dip into the fluid in said supply compartments respectively, said partitions having lower and upper apertures for transfer of fluid to and from said supply and article compartments, a supply member extended in a substantially horizontal position to receive fluid supplies from said supply compartments respectively and to deliver said fluid supplies through the upper aperture to said article compartment in blended condition or separately, at will, a gate for said supply aperture, a spreader to receive fluid from said supply-member and apply it to said article, a drainage member to control the return of fluid drained from said article to said compartments selectively, and a driving shaft with connections to operate said rotary support, spreader and elevators respectively.

13. Apparatus for treating articles with

fluids, comprising a container divided into supply compartments and a compartment for the article to be treated, a removable supply member to receive fluids from said supply compartments respectively, a spreader to receive fluid from said supply member and apply it to said article compartment, and a flushing channel constructed to supply washing fluid to said supply member, and in its absence to said supply compartments.

14. Apparatus for treating articles with fluids, comprising a container divided into supply compartments and a compartment for the article to be treated, a supply member to receive fluids from said supply compartments respectively, a spreader to receive fluid from said supply member and apply it to said article compartment, and a flushing channel constructed to supply washing fluid to said supply member and thence to said article compartment.

Signed at New York, in the county of New York and State of New York this 26th day of February, 1915.

FREDERICK A. FLICK.

Witnesses:

ALEXANDER C. PROUDFIT,
EVA J. PETTIT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."