June 16, 1931. E. R. STEVENS ET AL 1,809,991

DEVICE FOR TIME DIPPING

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Fig. 1

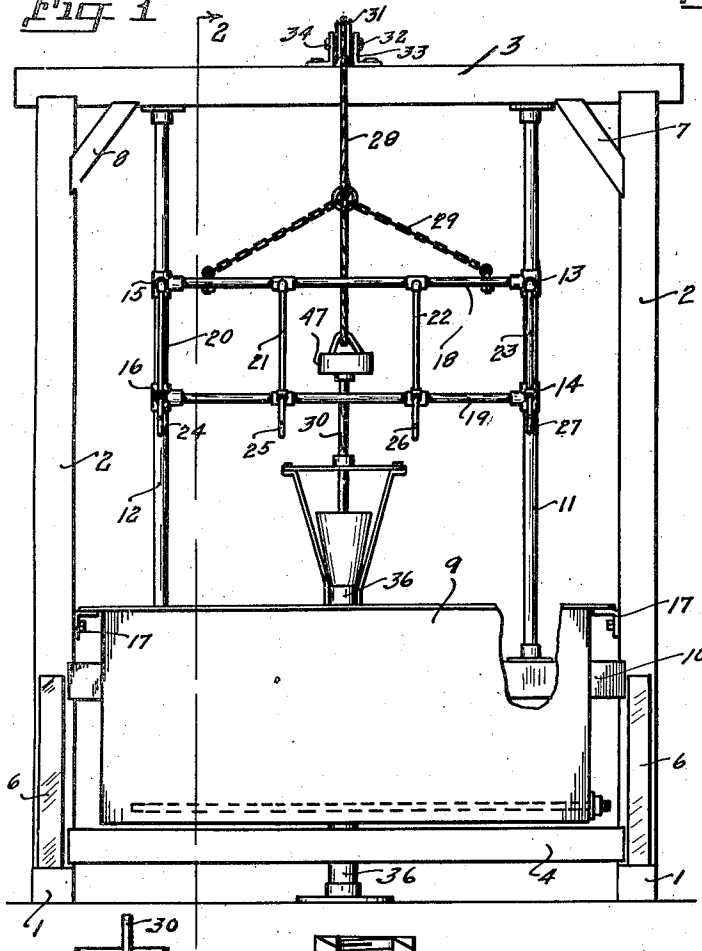
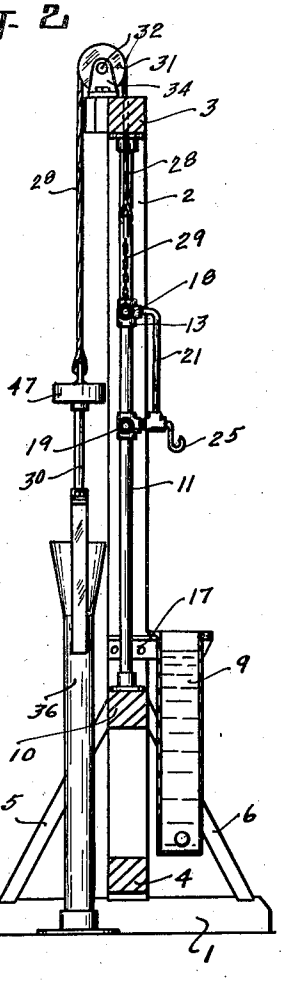


Fig. 2.



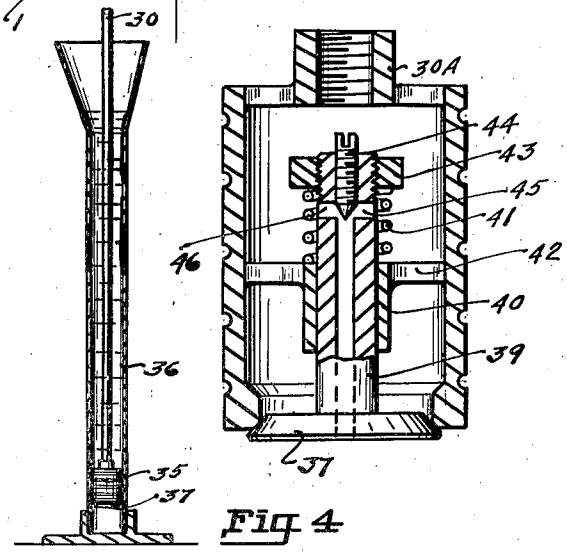


Fig. 4

Fig. 3

Edward R. Stevens
Arthur F. Nicolai
INVENTOR

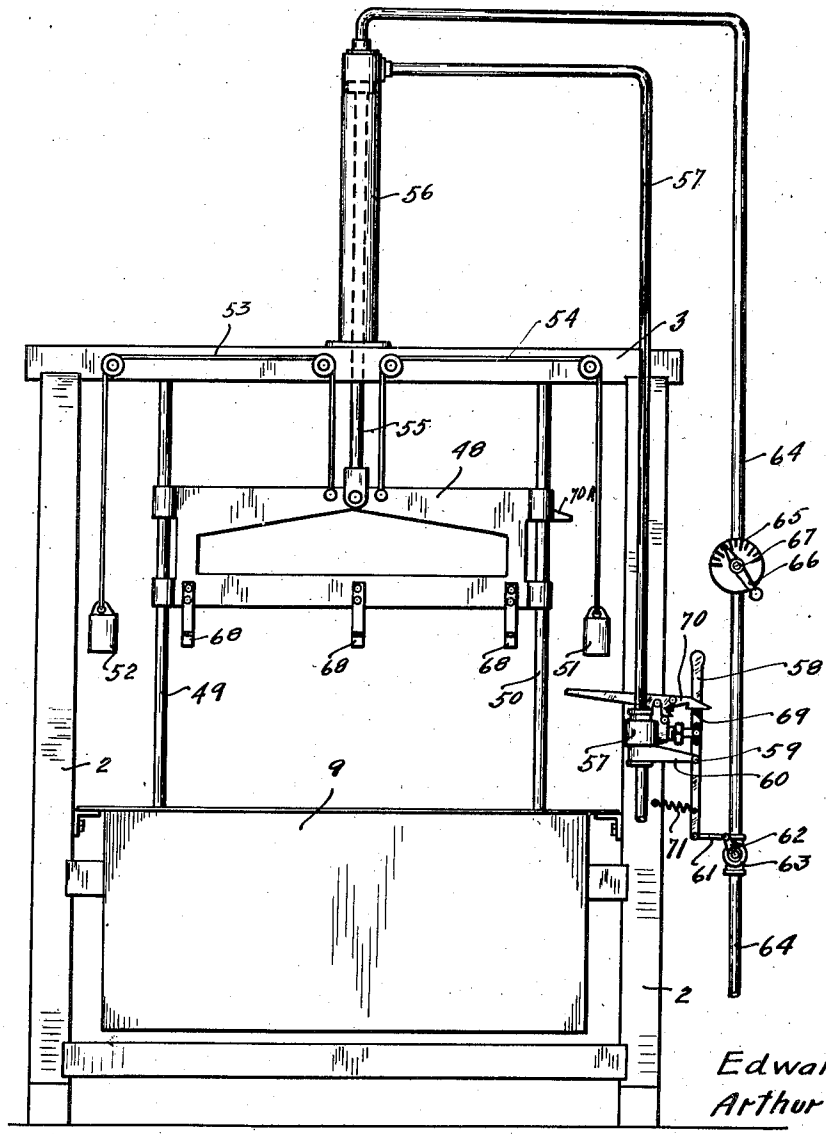
By Thurman Bilyeu
ATTORNEY

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DEVICE FOR TIME DIPPING

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Fig. 5



Inventors
Edward R. Stevens
Arthur F. Nicolai

By Thomas Bilyeu
Attorney

Patented June 16, 1931 1,809,991

UNITED STATES PATENT OFFICE

EDWARD R. STEVENS AND ARTHUR F. NICOLAI, OF PORTLAND, OREGON

DEVICE FOR TIME DIPPING

Application filed October 24, 1929. Serial No. 402,079½.

Our device is primarily intended for the painting, enameling, or coating of products with varnish, paint, oil coatings and the like and is primarily adapted for mass production.

The device consists primarily of a supporting head. Guideways are disposed in the line of travel of the head for predetermining the path of travel of the supporting head. A counter-balanced weight is associated with the head for maintaining the supporting head in a normal state of repose. Means are provided for settably predetermining the rate of return of the supporting head to normal position when the same has been actuated into a cycle of operation.

One of the objects of our invention is to coat articles of manufacture, in mass production to produce a coating of uniform quality.

A further object of our invention consists in providing means for coating articles of manufacture by immersing the same for a predetermined time within a vat in which the coating solution is provided.

A further object of our invention consists in providing means for predetermining the time of immersion of articles of manufacture within the coating solution and for predetermining the temperature of the coating solution during the coating operation.

A further object of our invention consists in providing means for automatically lowering a supporting head upon which articles of manufacture are supported for immersion within a coating solution disposed within a tank therebelow and for automatically determining the rate of return of the materials from the coating solution.

With these and incidental objects in view, the invention consists in certain novel features of construction and combination of parts, the essential elements of which are set forth in the appended claim, and a preferred form of embodiment of which is hereinafter shown with reference to the drawings which accompany and form a part of this specification.

In the drawings:

Fig. 1 is a front view, partially in section, of the assembled device.

Fig. 2 is a longitudinal, sectional, side elevation of the assembled device illustrated in Fig. 1, the same being taken on line 2—2 of Fig. 1 looking in the direction indicated.

Fig. 3 is a longitudinal, sectional, side view of a valve for predetermining the rate of return of the supporting head to normal position after the same has been mechanically, or manually, actuated.

Fig. 4 is a sectional, vertical, side view of a valve through the lowering of which a liquid is trapped within the valve body.

Fig. 5 is a front view of a modified form of supporting structure and having settable means for predetermining the rate of return through hydraulic control valves of the supporting head.

Like reference characters refer to like parts throughout the several views.

We preferably form our device of a fabricated frame, consisting of base elements 1 and having supporting posts 2 upwardly extending from the base. A cross girder 3 rests upon the posts, and extends from one to the other. Resting upon the base elements 1 is a cross base support 4. The posts are maintained in a substantially vertical position through the action of braces 5 and 6 extending diagonally from the base to the vertical posts. Side sway is prevented in the assembled frame through the action of brackets 7 and 8 extending from the posts to the cross bar 3. A tank 9 is disposed within the frame and normally rests upon the support 17. A second cross bar 10 is disposed between the vertical posts 2. Guide bars 11 and 12 are positioned between the cross bars 10 and 3. These guide bars are parallelly disposed in vertical position and are preferably made of finished metal to reduce the frictional engagement between the bearings or blocks disposed upon the head, to form guideways upon which the supporting heads are disposed. The supporting head is made of guide blocks 13, 14, 15 and 16 that are slidably positioned upon the guide bars. A frame is composed of the guide blocks and cross bars 18 and 19. The cross bars 18 and 19 may be made of threaded elements, or pipe and pipe fittings, but we do not wish to be limited to this form

of construction as equally satisfactory results may be had from other materials. The cross bars 18 and 19 are secured together and are maintained in spaced relationship with each other by struts 20, 21, 22 and 23. Supporting hooks 24, 25, 26 and 27 downwardly extend from the cross bars 19 upon which articles to be immersed within the tank or vat may be supported. A counter-balanced relationship is maintained between the supporting head and the valve assembly for normally maintaining the supporting head in raised position through the action of a flexible line 28. The line 28 is secured to a bridle 29 upon its one end and to the valve stem 30 upon its oppositely disposed end. The line passes over a pulley 31 disposed upon the upper side of the cross bar 3, the pulley being rotatably disposed upon a shaft 32 that is journaled within the supporting brackets 33 and 34. The valve stem 30 is removably secured to the piston head 30A of piston 35 that is reciprocably disposed within the cylinder 36. The cylinder 36 is partially filled with a fluid, as oil, and the piston 35 has an escapement disposed therein, consisting of a valve 37 that is adapted to being seated upon the lower periphery of the piston 35. The valve 37 has a stem 39 that upwardly extends therefrom which has a passageway 38 longitudinally disposed centrally thereof. The valve stem 39 passes through a support or journal 40 that is disposed centrally of the piston valve 35. A compressible spring 41 rests upon the spider 42 disposed within the body of the piston valve upon its one end and is adjustably supported upon the threaded nut 43 upon its other end for predetermining the compression upon the spring 41 relative to the valve stem 39. A needle valve 44 is disposed within the upper end of the valve stem 39 and is adjustably positioned and adapted to be seated upon the passageway 38. The passageway 38 terminates in a dual passage 45 and 46 and the valve 44 is adapted to regulate the mouth of the opening disposed within the passageway for predetermining the return of flow of the fluid through the valve. The counter-balance 47 is disposed upon the flexible line 28 that normally returns the piston to its lower position and the supporting head in its raised position. When the head is manually operated to immerse materials supported upon the supporting head, within the vat, the opening disposed within the passageway 38 predetermines the rate of return of the supporting head and predetermines the time of immersion of the materials being treated within the vat.

It may be found desirable to make the device operate automatically through a combination of hydraulic and mechanical elements. Where this is desired, the device may be made as illustrated in Fig. 5 wherein the supporting head 48 is mounted upon guideways 49 and 50. The head is normally held in raised position through the counter weights 51 and 52 secured to the flexible lines 53 and 54. The oppositely disposed ends of the lines 53 and 54 are secured to the supporting head 48. A piston rod 55 is secured upon its one end to the supporting head and a piston is disposed upon the oppositely disposed end and is actuated within the cylinder 56. Operating fluids under pressure are supplied to the cylinder through the pipe 57. A hand operated valve 57A is disposed within the pipe 57 and the same is adapted to be manually set through the action of a hand lever 58. The hand lever 58 is supported about a journal pin 59 that is disposed within the bracket 60 outwardly extending from the base of the valve assembly. The lower end of the lever 58 is secured to a link 61 that connects the lower end of the operating lever 58 with a bell crank 62 that is adapted to actuate the valve 63 disposed within the return line 64 of the piping system. Each of the pipes 57 and 64 are connected to a sump not here shown. A valve 65 is disposed within the line of the pipe 64. A hand operated lever 66 is disposed upon the valve stem 67 of the valve 65 and is settable for predetermining the amount of opening within the valve 65 and therefore predetermining the rate of return of the fluid from the cylinder 36. When it is desired to actuate the device, the materials to be immersed are supported upon the hooks 68 of the supporting head and the lever 58 is thrown over until the locking pin 69 engages the locking latch 70 that is journaled to support 2 and the free end of the locking latch 70 is in registerable alignment with the trip lug 70A and the opening of the valve 57A forces the immersing head downward. The operating fluid is for actuating the piston, the fluid being admitted into the upper end of the cylinder 56. The engagement of the trip lug 70A with the free end of the locking latch 70 unlocks the latch from the locking pin and the spring 71 returns the valve 57A to its normal position through its connection with lever 58. Simultaneously the valve 63 is opened through the tensioning of the spring 71 and the fluids leave the cylinder 56 and the counter weights 51 and 52 return the supporting head to its normal position.

While the form of mechanism herein shown and described is admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form of embodiment herein shown and described, as it is susceptible of embodiment in various forms, all coming within the scope of the claim which follows.

What we claim is:

A device of the class described comprising a fabricated frame, guide bars vertically

disposed in spaced relationship within the frame, an article supporting head slidably disposed upon the guide bars, a liquid holding cylinder vertically disposed between the guide bars, a piston reciprocably disposed within the cylinder, said piston having a plurality of valves disposed within its body, one of said valves being an adjustable needle valve, the other of said valves having a hollow valve stem and being adapted to be maintained in closed position, a piston rod secured to the piston, a counter balance secured to the piston rod, and a flexible support secured to the article supporting head and to the counter balance for connecting the supporting head to the piston and valve mechanism disposed within the cylinder.

EDWARD R. STEVENS.
ARTHUR F. NICOLAI.