Aug. 5, 1969 C. F. ROBERSON 3,459,202

MATRIX WASHER AND DRIER

Filed Aug. 17, 1967 2 Sheets-Sheet 1

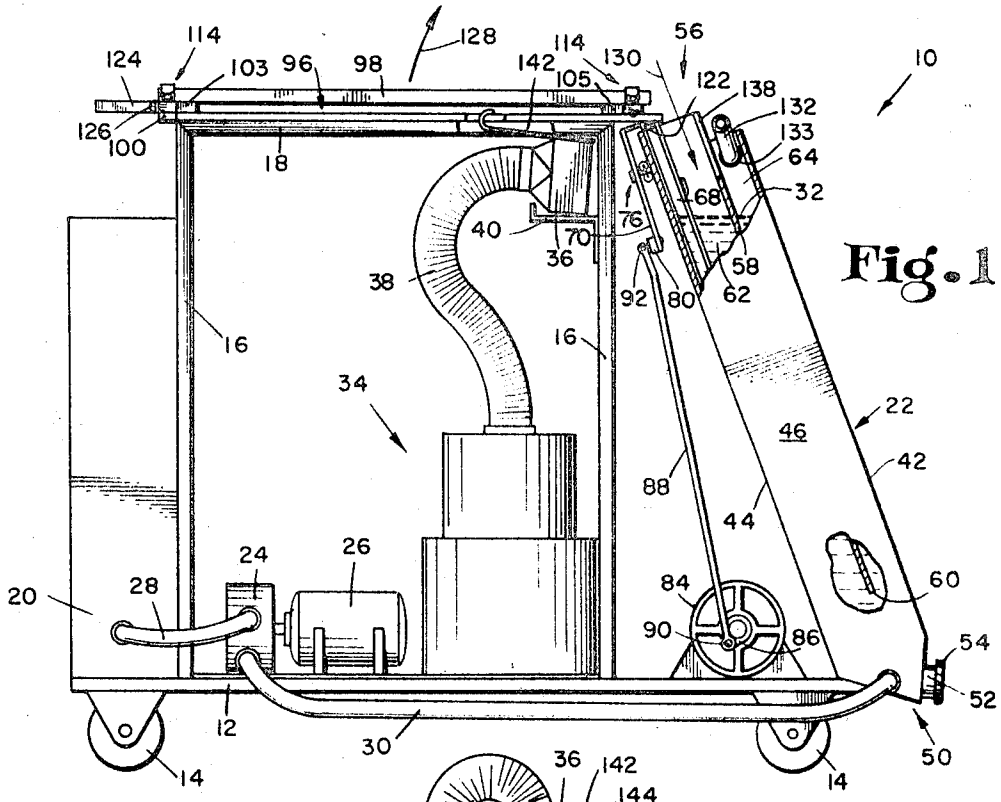


Fig. 1

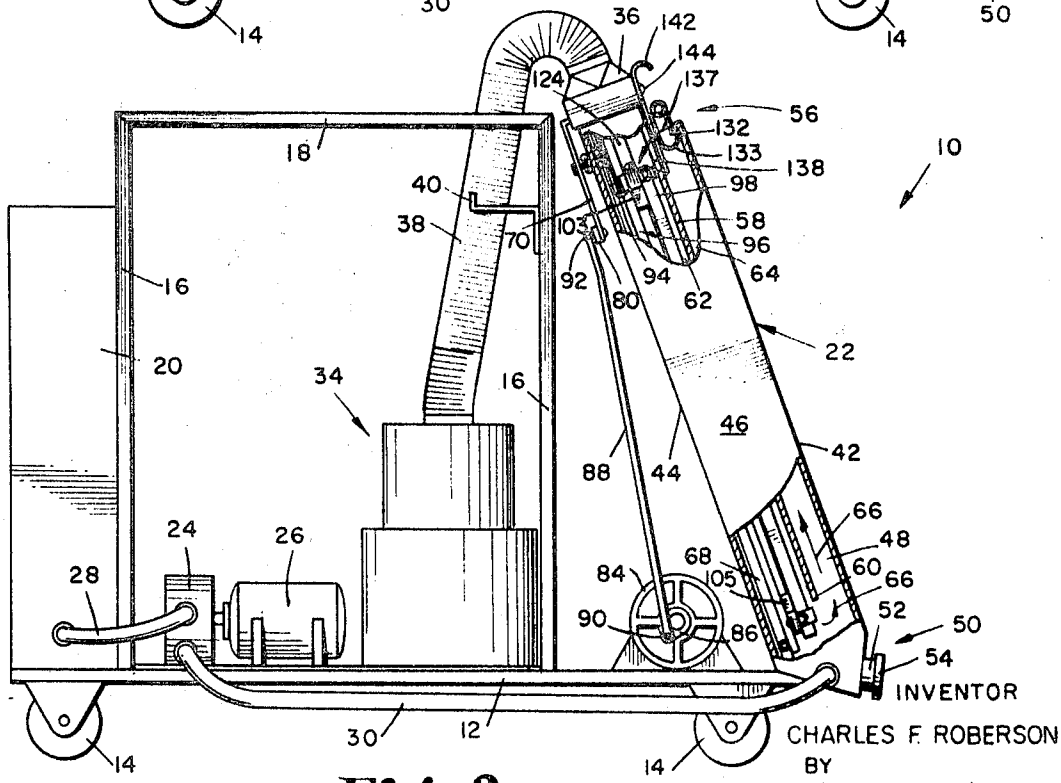


Fig. 2

INVENTOR
CHARLES F. ROBERSON
BY
Hood, Gust & Irish
ATTORNEYS

Aug. 5, 1969 C. F. ROBERSON 3,459,202

MATRIX WASHER AND DRIER

Filed Aug. 17, 1967 2 Sheets-Sheet 2

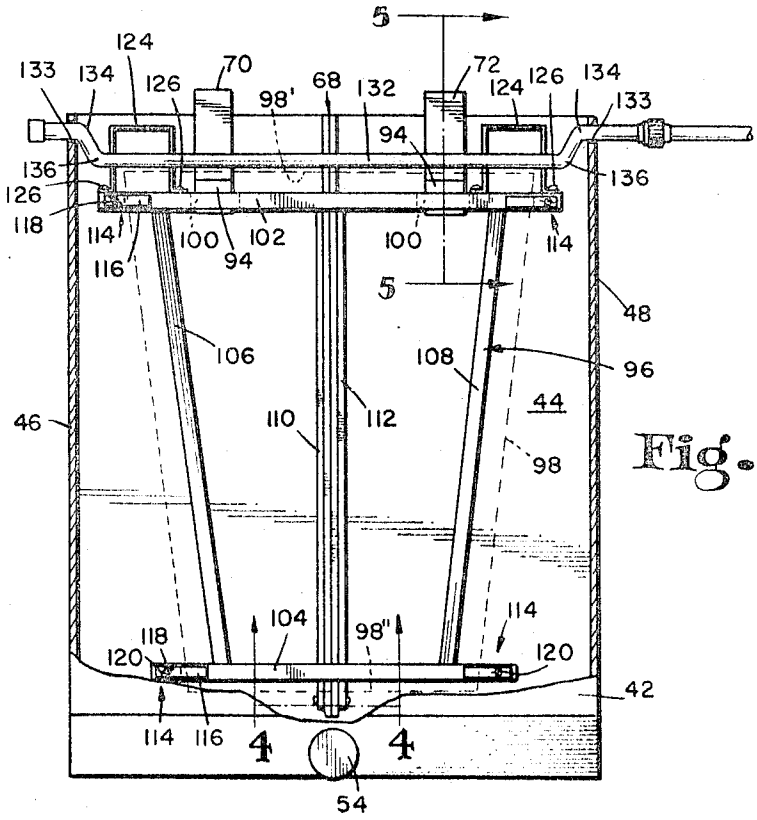


Fig. 3

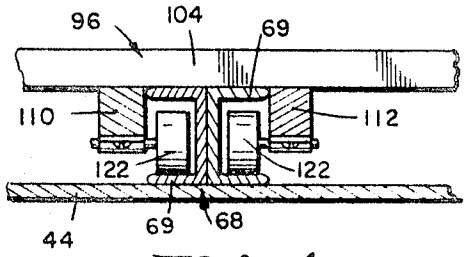


Fig. 4

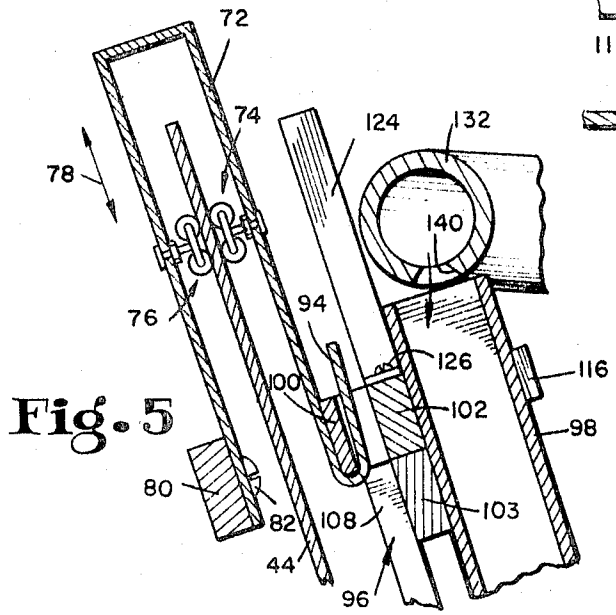


Fig. 5

INVENTOR
CHARLES F. ROBERSON

BY
Hood, Gust & Irish
ATTORNEYS

United States Patent Office 3,459,202
Patented Aug. 5, 1969

3,459,202

MATRIX WASHER AND DRIER

Charles F. Roberson, 3842 S. Olney,
Indianapolis, Ind. 46227

Filed Aug. 17, 1967, Ser. No. 661,445
Int. Cl. B08b 3/04
U.S. Cl. 134—99 10 Claims

ABSTRACT OF THE DISCLOSURE

An apparatus for cleaning articles such as type matrices comprising a holder for such articles, a reservoir for containing a cleaning liquid, the holder being receivable in the reservoir so that the articles are wholly submerged in such liquid, and means for agitating the holder in such liquid. The holder may be a matrix magazine from a Linotype machine, in which case, the magazine is reciprocated in the direction of its tracks effectively to agitate the matrices individually in the liquid contained in the reservoir. In a preferred embodiment of my apparatus, means are provided for rinsing and drying the articles while they are in the reservoir.

The present invention relates generally to washers and driers, and more particularly to the provision of an apparatus for cleaning articles such as type matrices, which articles are contained in a holder such as a magazine of a Linotype machine.

A type matrix is a mold in which printers' letters are cast. Immediately, therefore, the matrix assumes a position of paramount importance to the printer because the ultimate quality of his product lies in the perfection of the type mold, or matrix. Thus, the importance of proper matrix care cannot be overly stressed.

In the first place, matrices must be cleaned periodically to prevent what is commonly called "hairlines" in the printed matter. Hairlines are caused primarily by dirty matrices. That is, in a perfectly justified line, there is always a slight amount of air space between the matrices, but not enough to permit metal (hot lead) to pass between adjacent matrices. However, if the matrices are dirty and there is an increased amount of space between the matrices, the hot metal, under the pressure of a plunger in the Linotype machine, will flow between adjacent matrices.

Presently, however, it is quite difficult and time-consuming to clean the matrices used in a Linotype machine. In fact, it is a common practice to remove several matrices from their magazine, place them into a holder, and clean them with a wire brush while they are in the holder. Since there are thousands of matrices in a Linotype machine, cleaning takes a great deal of time when such manual techniques are used.

It is an object of my invention, therefore, to provide an apparatus for cleaning an entire magazine full of matrices at the same time and while the matrices are contained in the magazine. Thus, I have provided a reservoir for containing a cleaning liquid, means for positioning the magazine in the reservoir so that the matrices are wholly submerged in such liquid, and means for agitating the magazine in such liquid. In the preferred embodiment of my invention, I reciprocate the magazine in the direction of its tracks effectively to agitate the matrices in the liquid contained in the reservoir.

Since the matrices are fabricated from brass, I have found it desirable quickly to rinse the matrices after they are agitated in a cleaning liquid and, then, quickly to dry the matrices. In still a further preferred embodiment of my invention, means are provided for rinsing and drying

the matrices while they are in the above-mentioned reservoir and while they are being agitated.

It is still another object of my invention to provide such a cleaning apparatus comprising a carriage for supporting a magazine of a Linotype machine, the carriage being supported for reciprocation on track means extending downwardly into the reservoir which contains the cleaning liquid.

Still further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, my invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific construction illustrated and described, so long as the scope of the appended claims is not violated.

In the drawings:

FIG. 1 is a side elevation view, partially sectioned, of a preferred embodiment of my cleaning apparatus;

FIG. 2 is a side elevation view similar to the view of FIG. 1 except that the matrix magazine and the carriage on which the matrix magazine is mounted are shown disposed in the reservoir and the hot-air source is shown connected to the upper end of the reservoir;

FIG. 3 is a partially sectioned view of the reservoir taken from the right-hand side of FIG. 2 and showing the manner in which the carriage is received in the reservoir, the outline of the matrix magazine being indicated in dashed lines and the spray tube being shown in its use position;

FIG. 4 is an enlarged, fragmentary sectional view taken from FIG. 3 generally along the line 4—4 to show the roller means which movably supports the carriage in the reservoir; and

FIG. 5 is a fragmentary, enlarged, sectional view taken from FIG. 3 generally along the line 5—5 and showing the manner in which the carriage is connected to the driving means which reciprocates the carriage and further showing the spray tube arranged to direct a rinsing spray downwardly into the matrix magazine.

Referring particularly to the drawings, it will be seen that I have illustrated a cleaning apparatus, indicated generally by the reference numeral **10**, for cleaning a number of small articles which are carried in a holder. The apparatus **10** is ideally suited for cleaning type matrices of the kind used in Linotype machines while the matrices are contained in the matrix magazines of such Linotype machines. Although the following description is directed toward the cleaning of type matrices, it will be clear that the principles of my invention are equally applicable to the cleaning of other articles.

The apparatus **10** comprises a lower, horizontal frame **12**, which is preferably supported on wheels **14**, upstanding frame members **16** and a platform **18** supported on the members **16**.

A storage tank **20** is mounted on the rear end (left-hand end as viewed in FIG. 1) of the frame **12** and a reservoir, indicated generally by the reference numeral **22**, is mounted on the forward end of the frame **12**. A pump **24**, which is driven by a motor **26**, is mounted on the frame **12** between the upstanding frame members **16**, the pump **24** being connected to the storage tank **20** by a conduit **28** and to the reservoir **22** by a conduit **30**. The pump **24** is arranged alternatively to pump liquid from the tank **20** into the reservoir **22** and, then, from the reservoir **22** back into the tank **20** which may thus be considered to be a second reservoir. Preferably, the pump **24** is arranged to pump the liquid to the level indicated by the reference numeral **32** in FIG. **1**, which level is sufficient wholly to submerge the matrices when the magazine is disposed in the reservoir as shown in FIG. 2.

The pump 24 is conventional and, therefore, the pump and the controls necessary to operate the pump alternatively to transfer liquid between the storage tank 20 and the reservoir 22 do not have to be discussed in this description.

I have also provided a source of hot, dry air, indicated generally by the reference numeral 34, which is utilized to dry the matrices after they are washed and rinsed. The source 34 may be any sort of heater-blower arrangement. Such heater-blower arrangements are also conventional and need not be discussed in this description.

I have also provided a hood 36 which is arranged to be placed over the upper, open end of the reservoir 22, as shown in FIG. 2, to direct hot air downwardly into the reservoir 22 to dry the matrices, the hood 36 being connected to the source 34 by the flexible duct 38. When the hood 36 is not being used as shown in FIG. 2, it may be supported on the bracket 40 as shown in FIG. 1.

The reservoir 22 comprises a front wall 42, back wall 44, and side walls 46 and 48. The lower end, indicated generally by the reference numeral 50, of the reservoir 22 is formed as shown in FIGS. 1 and 2 so that liquid in the reservoir 22 will drain out through the spout 52 which is closed by the cap 54. The upper end, indicated generally by the reference numeral 56, of the reservoir 22 is open as shown in FIGS. 1 and 2.

In a preferred embodiment of my invention, I provide a panel 58 which extends laterally across the reservoir 22 from the side 46 to the side 48 and downwardly into the reservoir to the point indicated by the reference numeral 60 in FIGS. 1 and 2, the panel 58 being generally parallel to the back wall 44. Thus, the panel 58 divides the reservoir 22 into a first chamber 62 which is adjacent the back wall 44 and a second chamber 64 which is adjacent the front wall 42, both of the chambers 62 and 64 being open at their tops. Referring to FIG. 2, it will be seen that, in the illustrative embodiment, the hood 36 is arranged to close the upper, open end of the chamber 62. Thus, the hot, dry air which is supplied from the source 34 will be directed downwardly through the chamber 62 and then upwardly through the chamber 64 as suggested by the arrows 66. The chamber 64, therefore, provides means for exhausting the air which is forced down into the chamber 62.

The back wall 44 is at an obtuse angle relative to the horizontal platform 18. Mounted in the center of the wall 44 on its inside surface is a track 68 which extends from the upper end of the wall 44 to its lower end. In the illustrative embodiment, the track 68 is constructed by welding or otherwise securing a pair of channel members 69 to the back wall 44 as shown in FIG. 4.

I have provided a pair of brackets 70 and 72 arranged for reciprocation on the upper portion of the back wall 44. Each bracket 70, 72 is supported by roller means, indicated generally by the reference numeral 74 riding on the inside surface of the wall 44 and additional roller means, indicated generally by the reference numeral 76, riding on the outside surface of the wall 44. Thus, each bracket 70, 72 is arranged to reciprocate in the direction of the arrow 78 (FIG. 5) which is parallel to the wall 44. The reciprocable brackets 70 and 72 are connected by a bar 80 which extends across the back of the reservoir 22, the bar 80 being fastened to the brackets 70 and 72 by means such as the illustrated screw 82.

In order to reciprocate the brackets 70 and 72, I have provided a motor 84, an eccentric block 86 and a rod 88 connected between the eccentric block 86 and the bar 80. Specifically, the eccentric block 86 is mounted on the output shaft of the motor 84 and the lower end of the connecting rod 88 is connected to the eccentric block 86 by means of a pin 90 which is journalled in the eccentric block 86 at a point displaced from the axis of the output shaft of the motor 84. The upper end of the connecting rod 88 is pivotally connected to the bar 80 as indicated by the reference numeral 92. Thus, when the motor 84 is energized, the brackets 70 and 72 will be reciprocated. It will be apparent that the motor 84 must operate at a speed less than the normal speed of an electric motor.

Each of the brackets 70, 72 is provided with a hook portion 94 as shown in FIG. 5. The hook portions 94 are provided to support a carriage, indicated generally by the reference numeral 96, on which the matrix magazine 98 is mounted, when the carriage 96 and the magazine 98 are disposed in the reservoir 22 as shown in FIG. 2. Specifically, the carriage 96 comprises a pair of brackets 100, one of which is clearly shown in FIG. 5, and each of which is engageable with one of the hook portions 94.

Referring to FIG. 3, it will be seen that the carriage 96 further comprises a rigid frame consisting of an upper cross bar 102, a lower cross bar 104, side bars 106 and 108 and spaced apart center bars 110 and 112, all of the bars 102, 104, 106, 108, 110 and 112 being welded or otherwise securely fastened together. At each end of each of the bars 102 and 104 is a clamping means, indicated generally by the reference numeral 114, arranged releasably to fasten the magazine 98 to the carriage 96. In the illustrative embodiment, each clamping means 114 comprises a short bar 116, a stud 118 extending through an opening in the bar 116 and a wing nut 120. Conventionally, a matrix magazine for a Linotype machine is provided with a pair of ridges 103 and 105 extending laterally across the back thereof. Preferably, these ridges (shown in FIG. 2) fit snugly between the frame members 102 and 104 further to secure the magazine on the carriage 96 when the carriage is reciprocated along the track 68.

Referring to FIG. 4, it will be seen that I have provided a pair of rollers 122 for movably supporting the carriage 96 on the track 68, one of the rollers 122 being journalled on the lower end of the bar 110 and the other of the rollers 122 being journalled on the lower end of the bar 112. Each of the rollers 122 is rollably carried between the opposing flanges of one of the channel members 69 comprising the tracks 68. Thus, as shown in FIG. 2, the carriage 96 is supported at its lower end by the rollers 122 which engage the track 68 and at its upper end by the brackets 100 which are engaged by the hook portions 94. In this manner, the carriage 96 is supported for reciprocation along the track 68.

A pair of handles 124 is provided for lifting the carriage 96 from the reservoir 22 and, then, when the rollers 122 are at the upper end of the track 68 as shown in FIG. 1, pivoting the carriage 96 downwardly onto the platform 18. Each handle 124 is secured to the carriage 96 by means such as the screws 126.

In order to move the carriage 96 from the platform 18 into the reservoir 22, it is necessary to pivot the carriage 96 in the direction of the arrow 128 until the carriage is generally parallel with the track 68 and, then to let the carriage move parallel with the track 68 (in the direction of the arrow 130) until the brackets 100 are engaged with the hook portions 94. Thus, the carriage 96 is pivotally movable about the common axis of the rollers 122 and the rollers 122 are rectilinearly movable along the track 68.

After the matrices in the magazine 98 have been agitated in the cleaning fluid, and the cleaning fluid has been pumped from the reservoir 22 back into the storage tank 20, it is desirable to rinse the matrices with water and/or steam. Thus, I have provided a spray tube 132 arranged to spray fluids downwardly into the open, upper end of the magazine 98 as shown in FIG. 5. In the illustrative embodiment, the spray tube 132 extends laterally across the reservoir 22 and loosely through openings 133 in each of the side walls 46 and 48. Further, the tube 132 is provided with opposing bends 134 and 136 in each of its ends so that the tube 132 can be rocked from its position shown in FIGS. 1 and 2 to its position shown in FIGS. 3 and 5. That is, the tube 132 can be moved in the direction of the arrow 137 (FIG. 2) through an opening 138 in the panel 58 to place the openings 140

(FIG. 5) in the tube **132** in a position to direct a spray uniformly downwardly into the magazine **98**.

In order to close the opening **138** in the panel **58** when hot air is being provided through the hood **36**, I have provided a shield **142** which is loosely and slidably mounted on the hood **36** by means such as the screw **144** which extends through a slotted opening in the shield **142**. I have also provided slots, not shown, in the hood **36**, which slots receive the reciprocable brackets **70** and **72**.

In FIG. 3, the dashed line **98'** represents the upper, open end of the magazine **98** and the dashed line **98''** represents the lower, open end of the magazine **98**. Thus, since the matrices are conventionally loosely received in tracks running from the upper end to the lower end of the magazine, the matrices are cleaned by agitation of the magazine in the direction of its tracks.

When a magazine of matrices or the like is to be cleaned, such magazine is placed on the carriage **96** in the position of FIG. 1 and is secured thereto by the clamping means **114**. The carriage **96** is then placed into the reservoir **22** in the position of FIG. 2. The reservoir **22** is then filled with a cleaning liquid to the level **32**, which, of course, will be the level in chambers **66** and **68**, and the magazine is agitated in the liquid. After a predetermined time, the cleaning liquid is pumped back into the storage tank **20** and the matrices are rinsed with water from the spray tube **132**. Preferably, the magazine is agitated during the rinsing step. After the rinsing step, the hood **36** is placed in its use position of FIG. 2 and the matrices are dried. Preferably, the magazine is also agitated during the drying step. After the drying step, the carriage **96** is raised and pivoted onto the platform **18**.

What is claimed is:

1. An apparatus for cleaning an article comprising a reservoir, track means arranged in said reservoir, carriage means for supporting said article, said carriage means being supported for reciprocation on said track means, driving means, means for connecting said driving means to said carriage means so that said carriage means will be agitated when said driving means is energized, first means for admitting a cleaning liquid to said reservoir wholly to submerge said article, second means for admitting fluid to said reservoir to rinse said article, third means for supplying fluid to said reservoir to dry said article, roller means journalled on one end of said carriage means, and a platform adjacent the upper end of said reservoir, said platform being arranged to support said carriage means transversely to said track means when said carriage means is removed from said reservoir, said carriage means being pivotally movable about the axis of said roller means when said roller means is at the upper end of said track means, whereby said carriage means is movable from its position on said platform to a position generally parallel to said track means.

2. An apparatus as in claim **1** wherein said second means comprises spray means disposed in said reservoir and arranged to direct fluid toward said article.

3. An apparatus as in claim **1** wherein said third means comprises a hot air source and duct means for connecting said source to said reservoir.

4. An apparatus as in claim **1** wherein said platform is generally horizontal and wherein said track means is arranged at an obtuse angle relative to said platform.

5. An apparatus for cleaning type matrices comprising a holder for said matrices, a reservoir adapted to contain a cleaning liquid having an opening in its upper end, track means extending downwardly through said opening into said reservoir, frame means for supporting said holder, roller means journalled on one end of said frame means, said roller means being engaged with said track means for movement therealong, a generally horizontally extending platform adjacent the upper ends of said reservoir and said track means, said platform being arranged to support said frame means when said roller means is at the upper end of said track means, said frame means being pivotally movable about the axis of said roller means and rectilinearly movable along said track means, and drive means for reciprocating said frame means relative to said track means when said roller means is near the lower end of said track means.

6. An apparatus as in claim **5** further comprising a second reservoir and pump means arranged to transfer liquid from said second reservoir into said first-mentioned reservoir wholly to submerge said matrices and, then, to pump said liquid back into said second reservoir.

7. An apparatus as in claim **5** wherein said holder is a conventional matrix magazine used in Linotype machines, and further comprising a spray tube disposed in said reservoir adjacent its upper end, said spray tube being arranged uniformly to spray fluid downwardly into the open end of said magazine.

8. An apparatus as in claim **7** further comprising a hood arranged to cover the opening in said reservoir to direct fluid downwardly into the opening in said magazine, and duct means for connecting said hood to a dry fluid source.

9. An apparatus as in claim **8** wherein said duct means is flexible and wherein said hood is movable from its position covering said opening to permit said frame means to be removed from said reservoir and supported on said platform.

10. An apparatus as in claim **5** further comprising a panel extending across said reservoir and downwardly into said reservoir to a point adjacent the lower end of said reservoir, thereby dividing said reservoir into first and second chambers, said track means being disposed in said first chamber, hood means arranged to cover said first chamber and to direct fluid downwardly thereinto, and means for connecting said hood means to a pressurized dry fluid source, said second chamber having an opening in its top to provide an exhaust for the dry fluid supplied from such fluid source.

References Cited

UNITED STATES PATENTS

423,402	3/1890	Wilson	134—153 XR
1,804,331	5/1931	Freund	134—32
2,112,365	3/1938	Guire et al.	134—120
2,347,608	4/1944	Owen	134—160 XR
2,485,673	10/1949	State	134—86 XR

FOREIGN PATENTS

975,834	10/1950	France.

ROBERT L. BLEUTGE, Primary Examiner

U.S. Cl. X.R.

15—302; 134—103, 135, 148, 155, 164, 165