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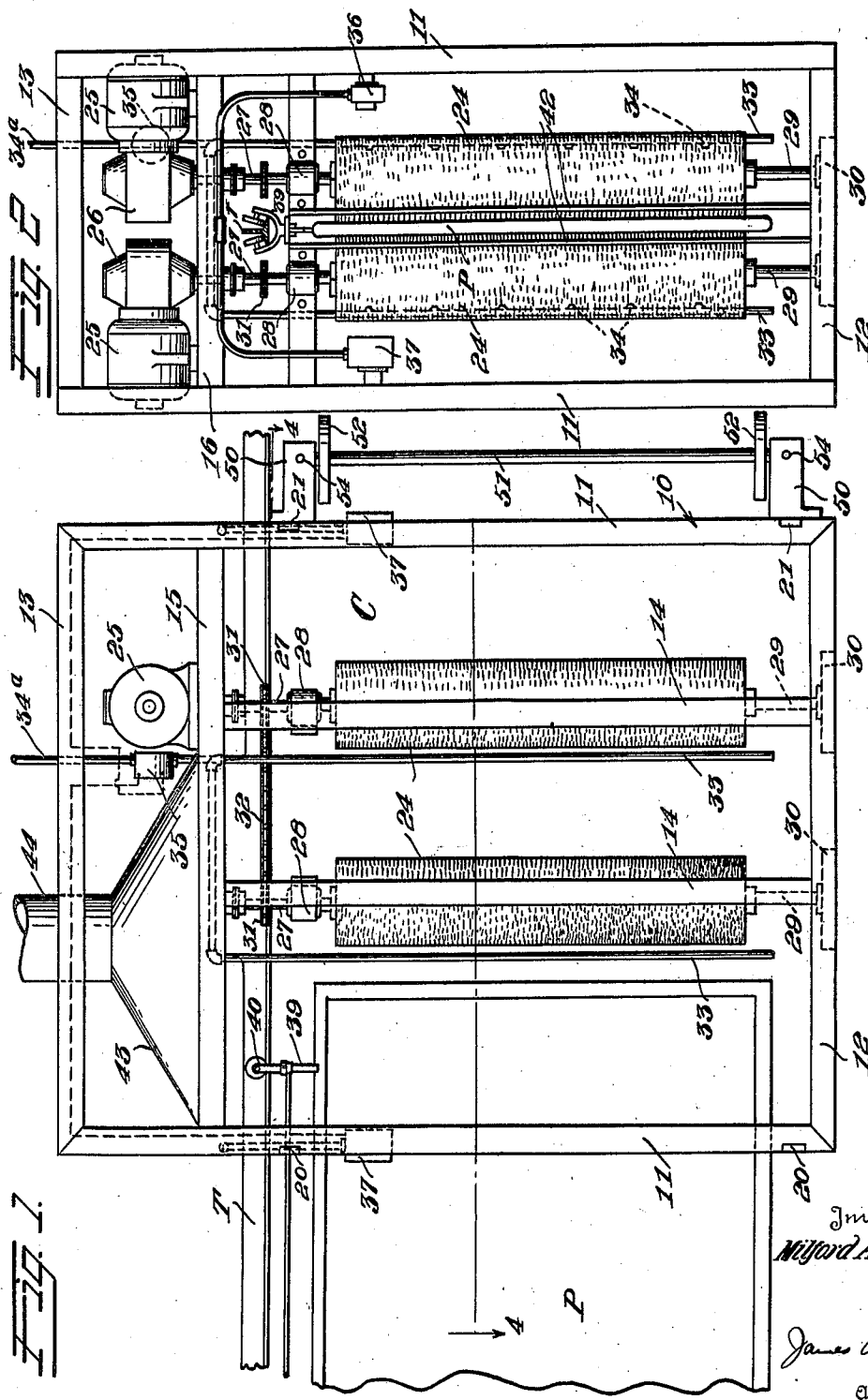
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SCRUBBING OR CLEANING MACHINE

Filed Jan. 19, 1940

2 Sheets-Sheet 1



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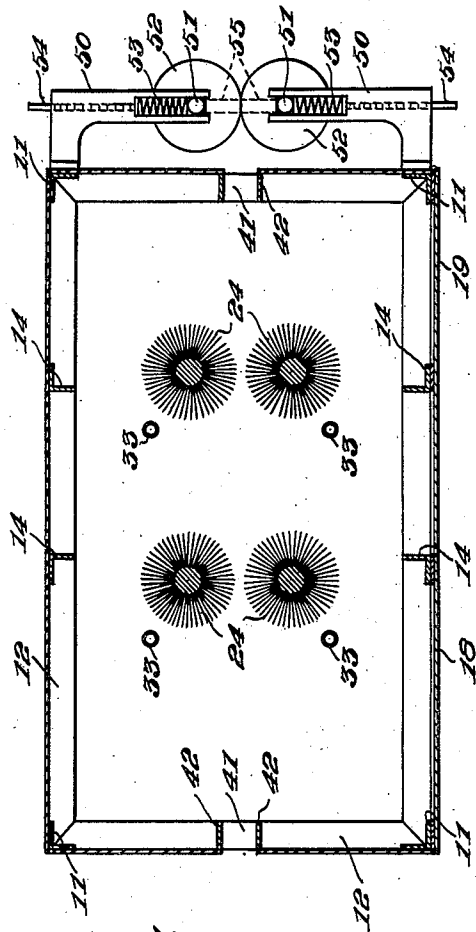
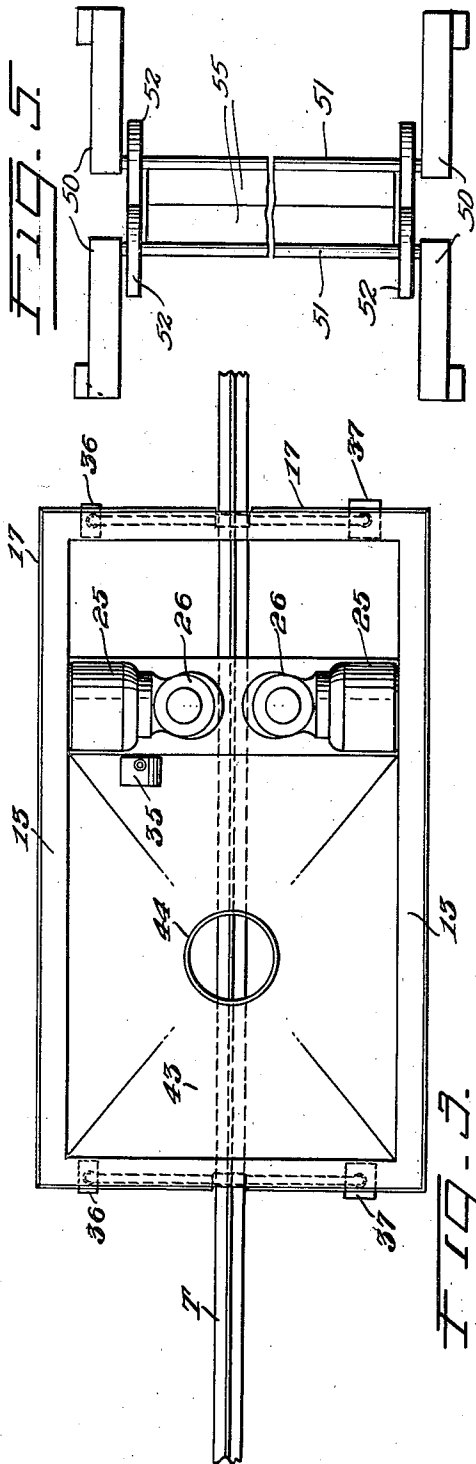
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UNITED STATES PATENT OFFICE

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SCRUBBING OR CLEANING MACHINE

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3 Claims. (Cl. 15-77)

The present invention relates to a scrubbing or cleaning machine. While the machine in accordance with the present invention is adapted for simultaneously cleaning both faces of rectangular plates of various forms and constructions, it is nevertheless particularly adapted for removing the paste from pasting plates which are used in tanneries in the process of manufacturing leather. Such plates as now in use are of relatively large rectangular form, consisting of glass and porcelain or other material sheets having marginal frames which may be of various transverse sectional forms.

These plates necessitate cleaning at intervals and the practice has heretofore been to remove the paste from these plates by hand which, of course, required considerable time that might well be employed to advantage in other work in connection with tanneries.

A primary object of the invention is the provision of a scrubbing or cleaning machine comprising an enclosed scrubbing chamber having entrance and exit openings at opposite ends thereof for the passage of vertically disposed rectangular plates through the chamber, together with opposed power driven rotary fiber brushes contacting the opposed faces of the plates, and means for spraying water on such faces of the plates in advance of the brushes.

A further object of the invention is to provide a scrubbing and cleaning machine of the above noted character wherein means are provided for turning the water on and off, which means are operable upon movement of the plates into and out of the scrubbing chamber.

A still further object of the invention is the provision of a scrubbing or cleaning machine of the above noted character comprising a glass enclosed scrubbing compartment for confining the water within the compartment while at the same time providing unobstructed visibility of the operating mechanism within the compartment.

With the above objects in view, together with others that will become apparent in the course of the following disclosure, reference will now be had to the accompanying drawings forming part of such disclosure, and wherein:

Figure 1 is a side elevational view of the improved machine in accordance with a preferred embodiment of the invention.

Fig. 2 is an end elevation of the machine as observed from the right of Fig. 1.

Fig. 3 is a top plan view of the machine.

Fig. 4 is a horizontal sectional view in a plane

substantially as represented by the line 4-4 in Fig. 1.

Fig. 5 is an end elevational view of Fig. 1 showing only the wiping means and mountings therefor.

Referring now in detail to the drawings by reference characters, and wherein like characters designate like parts in the different views, 10 designates the frame in its entirety. This frame preferably comprises angular vertical corner supports 11, base supports 12, and supports 13 interconnecting the tops of the vertical supports 11. The frame further includes vertical supports 14 at opposite sides thereof, as well as longitudinal supports 15 adjacent the top of the frame and which longitudinal supports are interconnected at their ends by transverse supports 16.

The frame is preferably enclosed from the base supports 12 to the longitudinal supports 15 by glass plates 17 on one side and the opposed ends of the frame, while at one side or at the front of the frame it is provided with a pair of doors 18 and 19 hingedly connected with the frame at 20 and 21. These doors include glass panels and afford ready access to the interior of the scrubbing chamber, as well as affording visibility of the operating parts when the doors are closed.

Vertically disposed within the chamber C provided by the enclosed casing are scrubbing brushes 24 which are arranged in transversely aligned pairs, as is more particularly illustrated in Fig. 2, with the peripheries of the opposed brushes of each pair so spaced as to receive the plates to be cleaned therebetween with sufficient friction between the brushes and plates to effect proper cleansing action.

While the machine would properly function with the use of one pair of the brushes, nevertheless it is much more efficient when utilizing two such pairs as illustrated in the drawings.

Corresponding brushes 24 of the opposed pairs of brushes, or in other words, those brushes disposed at each side of the path of travel of the plates to be cleaned, are independently driven by a separate motor 25. These motors 25 are supported on the longitudinal supports 15 adjacent one end of the frame 10 and preferably with their shaft axes in transverse alignment.

Each of the motors 25 has associated therewith a reduction gear set 26, and such gear sets impart rotation to the brushes 24 of one pair thereof through vertical shafts 27 journaled in bearings 28 which are secured to the frame 10, as is clearly indicated in Fig. 2. These shafts 27

are rigid with the upper ends of the brushes 24, and the lower ends of the brushes include shafts 29 suitably journaled in a base member 30.

The brushes 24 of the other pair thereof are similarly mounted to those already described and include the shafts 27 and 29, as well as the respective bearings 28 and 30.

Any suitable means may be employed for imparting rotation to the last mentioned shafts 27 from the positively driven shafts 27; such means, however, preferably comprise sprocket wheels 31 secured to all of the shafts 27 and a sprocket chain 32 operatively engaged with the sprocket wheels 31 at each side of the vertical path of travel of the plates to be cleaned.

The brushes 24 may be of desired diameter as well as length, and preferably such brushes are made of palmetto fiber and are driven approximately 288 R. P. M.

A water pipe line 33 is arranged in vertical disposition in advance of each brush 24 and preferably outwardly of the axis thereof. However, such pipe lines may be disposed closer to the vertical path of travel of the plates than as indicated in the drawings. These pipe lines are provided with closely spaced nozzles 34 for effecting sprays of water on the opposite faces of the plates P to be cleaned.

The pipes 33 are preferably closed at the lower ends thereof and are all in communication at the tops thereof with the main water feed line 34* having incorporated therein a valve controlled device 35 for turning the water on and off.

It is highly desirable that the water be turned on only while the plates are being cleaned and that it be shut off immediately after the successive plates have been cleaned, and while this may be effected by various mechanical means operative through movement of the plates through the chamber C, a preferred means for this purpose comprises an electric eye or photo-electric cell 36 adjacent each end of the frame 10, and transversely opposite each of these electric eyes is an electric switch control apparatus 37.

The switch control apparatuses are in electric circuit with the valve control device 35, as is clearly indicated in Fig. 1 for operating such valve control device into the open or closed position, dependent on whether a plate P is entering the chamber C or emerging therefrom.

A plate transporting track T extends through the chamber C medially of the opposite sides thereof for supporting and conveying the successive plates P to, through, and from the scrubbing and cleaning chamber C.

The plates P are preferably detachably supported by trolleys 39 having casters 40 engaged with the track T. These plates P may be, by suitable means, mechanically propelled along the track T but preferably they are manually propelled independently of one another and are carried through the chamber C through the action of the scrubbing brushes 24.

While the casing 10, as before stated, is enclosed with glass a vertical opening or slot 41 is provided at each end of the frame, such slots being defined by vertical members 42.

Supported by the longitudinal supports 15 is a dome 43 for collecting the vapor produced by the hot water used in the cleaning and such vapor is conveyed from the dome 43 through a stack 44.

By the provision of the dome 43 and vapor conveying stack 44 the accumulation of moisture

on the glass, which would otherwise obscure visibility, is substantially eliminated.

Having described the preferred mechanical embodiment of the improved scrubbing and cleaning machine, the operation thereof may be summarized as follows:

The plates P supported by the trolleys 39 are successively propelled toward the scrubbing chamber C, and such plates are advanced into the adjacent slot 41 until the leading edges thereof are engaged by the first pair of brushes 24 which are rotated through the drive connections above described, and as each plate enters the slot 41 it activates the photo-electric cell 36, whereupon the water is turned on through the electric switch control apparatus 37 and the valve control device 35.

The plates are thereby thoroughly moistened by the sprays of hot water from the pipe lines 33 in advance of the adjacent brushes 24 and which brushes not only effectively scrub the moistened faces of the plates, but at the same time advance them through the chamber C, and as each plate P emerges from the chamber C it activates the other electric eye 36 whereby by similar apparatus the water to the pipe lines 33 is immediately shut off.

Due to the fact that hot water is employed in the cleaning of the plates, such plates will, in most instances, become sufficiently dry for use in pasting leather thereon during the interval of time from which they leave the machine until being put to use. Nevertheless, the invention includes a plate-wiping means which may be readily attached to the frame should it be found that the plates do not become dry enough for use after leaving the machine.

The wiping means is illustrated only in Figs. 1 and 4 for the reason that it is an optional attachment and may or may not be used, dependent on the temperature of the plates for an efficient drying thereof when passing through and leaving the cleaning machine.

This wiping means, while not being limited to the specific construction illustrated, preferably embodies a pair of brackets 50 detachably securable to each of the opposed upright members 11 at one end of the frame. A vertical shaft 51 is supported by the pair of brackets 50 common to each of the upright members 11 whereby the shafts are disposed equidistantly from the adjacent opening 41, as is clearly indicated in Fig. 4.

These shafts 51 adjacent their ends are laterally and non-rotatably movable in elongated slots in the free ends of the brackets 50. Rotatably journaled on the shafts 51 immediately within each of the brackets 50 is a yieldable roller 52, and the shafts 51 are backed by coil springs 53 for yieldably maintaining the rollers 52 in engagement at points longitudinally aligned with the vertical center plane of the openings 41. The springs 53 are preferably adjustable by means of adjusting screws 54 threaded into the brackets 50 and manipulatable exteriorly thereof.

Secured to each of the shafts 51 is a vertically disposed felt strip 55 whose adjacent edges are normally in contact with and terminate at the peripheries of the rollers 52.

While it is the felt strips which act to wipe the plates P as they leave the cleaning machine, nevertheless it is necessary that such strips be separated for admitting the advancing edges of the plates, and accordingly the rollers 52, rotatable upon the shafts 51, will upon engagement

with the advancing plates move, together with the felt strips, away from each other against the action of the springs 53, which springs will thereafter force the shafts 51 toward each other with the felt strips 55 in wiping engagement with the opposed faces of the plates P.

While, as disclosed, the machine is preferably designed for and adapted to clean paste from pasting plates, nevertheless, it will be obvious that it will find equal adaptation to other forms of rectangular plates even though they may vary somewhat in thickness.

From the foregoing disclosure, it should be readily appreciated that a machine is provided in accordance with this invention whereby plates of the character referred to are thoroughly cleaned with a minimum expenditure of time and labor and that the hot water employed in the cleaning of the plates is wholly confined within the chamber C whereby workmen can attend to their duties without their clothes becoming wet and soiled, as has been experienced in the hand cleaning of these plates as heretofore practiced.

While I have disclosed but a single specific embodiment of the invention, such is to be considered as illustrative only and not restrictive, the scope of the invention being defined in the subjoined claims.

What I claim and desire to secure by U. S. Letters Patent is:

1. Plate drying means comprising opposed felt strips, means for yieldably pressing the strips against the opposed faces of advancing plates, and rotary means engageable by the advance

edges of the plates for separating the strips for admission of the plates therebetween.

2. A scrubbing machine comprising a casing enclosing a scrubbing chamber, two pairs of vertically disposed brushes rotatably supported within the chamber with one pair thereof in advance of the other pair and with the brushes of each pair spaced apart for movement of the plates therebetween during the scrubbing operation, hot water plate spray means within the casing, a pair of motors supported by the frame adjacent one end thereof and above the brushes of one pair thereof, driving connections between the motors and the respective brushes of said one pair thereof for rotating same, means for conveying vapor exteriorly from within the chamber including a dome supported by the casing adjacent the other end thereof and above the other pair of brushes, and drive means operative by said driving connections and extending beneath said dome for rotating the other pair of brushes.

3. A scrubbing and cleaning machine comprising an enclosed chamber defined by transparent side and end walls, longitudinally aligned slots in the end walls, a trolley supporting track extending through the chamber and slots in the end walls for conveying plates through the chamber, a vertically disposed brush rotatably supported within the chamber at each side of the track, a spray pipe in advance of each brush, means for establishing and restricting flow of water through the pipes, and means for conveying vapor away from within the chamber.

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