Feb. 21, 1933. W. S. FINNELL 1,898,357

FLOOR WAXING MACHINE

Filed Oct. 22, 1930 2 Sheets-Sheet 1

Fig. 1.

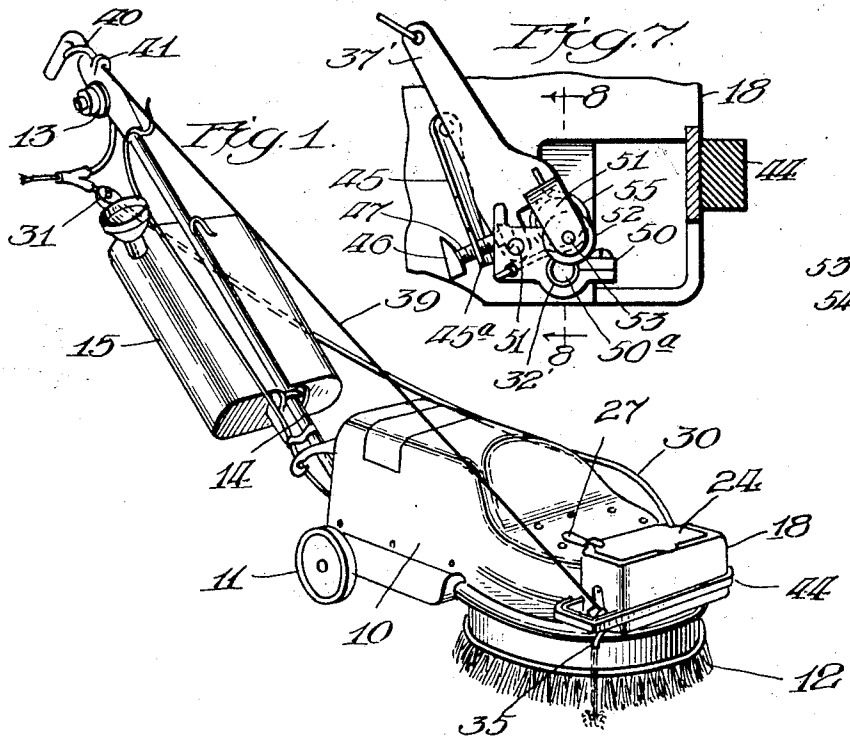


Fig. 7.

Fig. 8.

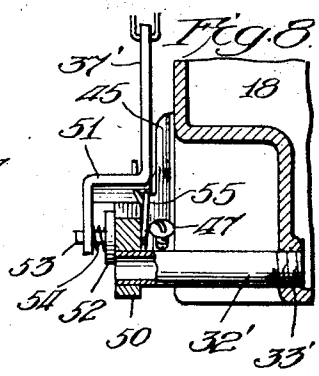


Fig. 6.

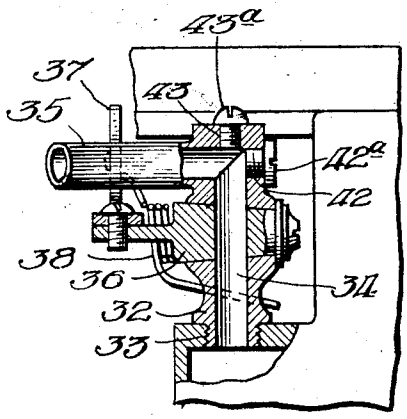


Fig. 4.

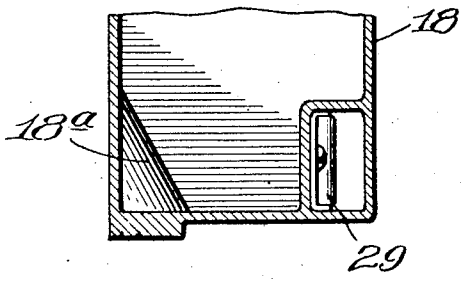
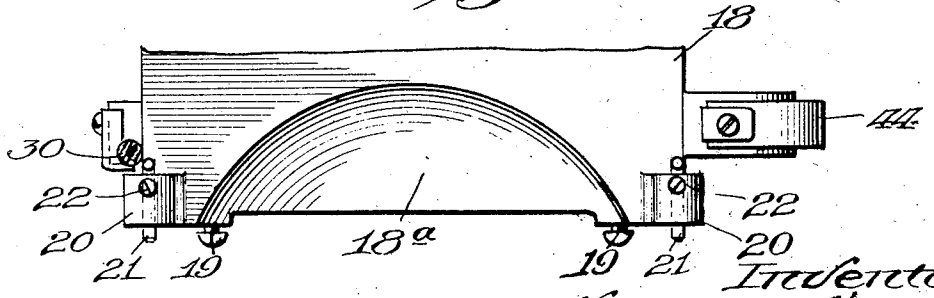


Fig. 5.



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FLOOR WAXING MACHINE

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Fig. 2.

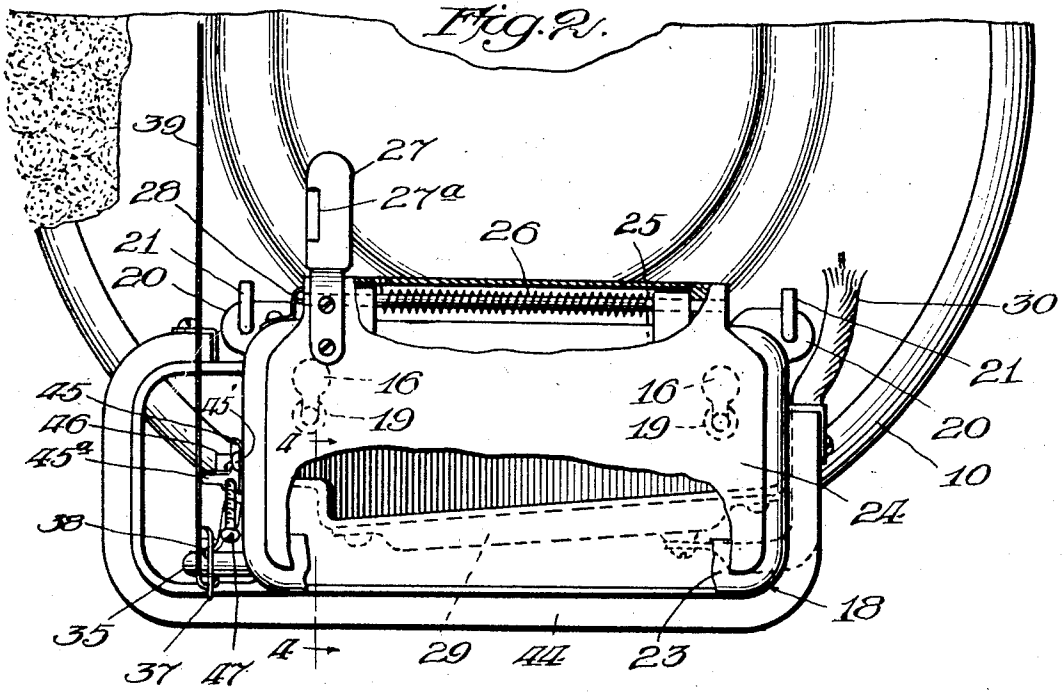
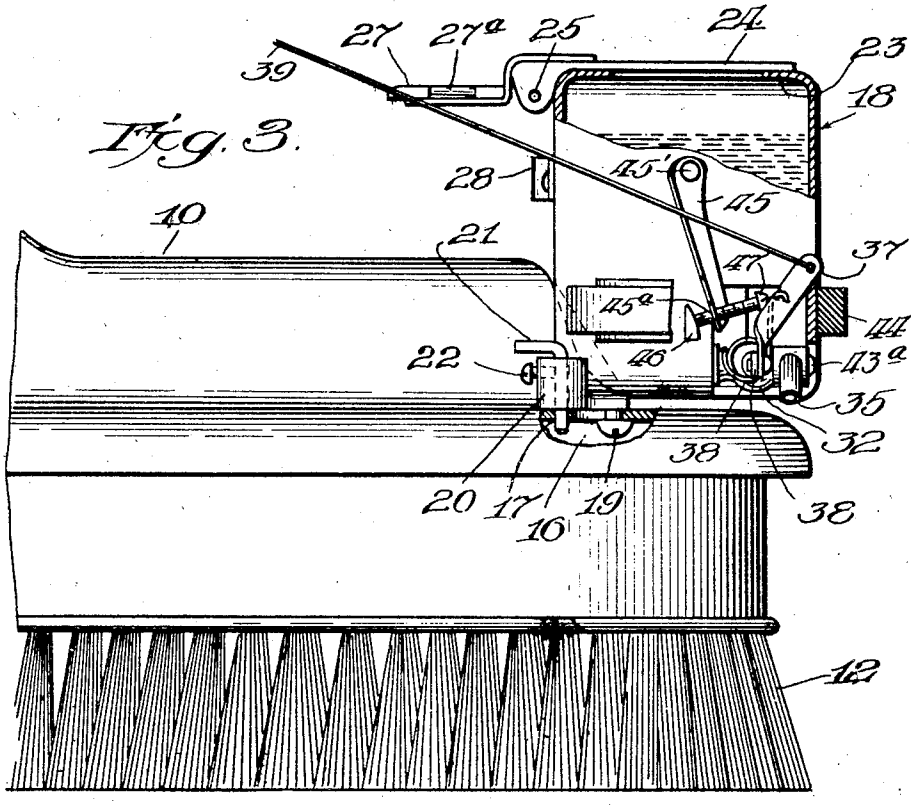


Fig. 3.



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UNITED STATES PATENT OFFICE

WALTER S. FINNELL, OF ELKHART, INDIANA

FLOOR WAXING MACHINE

Application filed October 22, 1930. Serial No. 490,372.

My invention relates to floor treating machines and has to do particularly with a machine of this character adapted for the application of hot liquid-form wax or other floor coatings to the floor surface.

As is well known, it is highly desirable in many instances to treat floors with wax, for example, in order to preserve the floor material and to give a lustrous appearance to its surface. Heretofore, wax used for this purpose has taken a liquid or paste form in a cool condition, but this is quite objectionable for various reasons. An excessive amount of the liquid or paste wax must be applied to the floor surface and, the original cost of this kind of wax being quite high, this makes the cost of floor wax-treatment very expensive so far as both original treatment and maintenance are concerned. This form of wax is also difficult to apply uniformly to get the desired floor appearance. This prior-used wax does not penetrate the floor surface and leaves a greasy-like surface which is readily marked; which quickly collects and holds dirt and dust; and which forms a slippery coating. A floor so treated also requires frequent attention to maintain the desired lustrous surface and the wax surface is destroyed in a relatively short period of use.

One of the objects of my invention is to provide an arrangement for waxing the floor surface and by which all of the advantages to be attained by waxing are accomplished without any of the objectionable features of the prior-employed methods. More particularly, I employ an apparatus including brush-form wax-applying means and which is also adapted for the application of hard wax to the floor surface by heating the wax to a sufficiently high temperature to render it of a highly fluid, penetrative form, the same being delivered while hot to the floor directly in front of, and within the sweep-range of, the brush means.

Another object of my invention is to provide a novel form of means for applying a hard wax or other floor coating to the floor in such a way that the same is caused to penetrate, or is forced into, the pores of the floor surface so that surplus material is not left on the floor. With such an arrangement, and with wax, for example, a highly lustrous floor surface is provided, which is a hard wearing surface requiring only a minimum of attention to maintain its lustrous appearance; it is not slippery; and it will not collect dirt, whereby the floor so treated may be more easily kept clean and sanitary.

A further object is to provide for the attainment and maintenance of a beautified, long-wearing floor surface of the foregoing character at a very small cost so far as both initial cost of material, cost of application and cost of maintenance are concerned. My invention further provides an arrangement whereby the floor surface may be more quickly and uniformly treated thereby further cutting down initial cost and general maintenance expense.

I have found by practical demonstration that this hot wax may be well applied to the floor surface by means of a rotating brush structure sufficiently weighted (as by the weight of the machine itself). Such brush structure may be found in various forms of floor treating machines, such as scrubbing machines and the like. My invention provides the wax-heating and delivery means as a separate, detachable unit which may be readily applied to various forms of floor treating machines as desired. It will be appreciated that this hard wax, when delivered in the above-stated hot liquid form, will tend to cool and harden quickly and, for that reason, I provide for immediate treatment of the hot wax as it is applied to the floor surface; and I accomplish this (with rotating brush structure) without the possibility of wax being smeared upon the brush structure or any of its operating mechanism.

I have further learned that the application of the hot liquid wax to the floor surface must be positively and accurately controlled in order to obtain best results. This positive control should be under the continuous observation of the operator. Another object of my invention is, therefore, to provide for the delivery of the hot wax to the floor surface at such a point that the oper-

ator may without effort observe such delivery to insure at all times, by manual control, accurate wax flow, thereby making certain the desired wax application, distribution and floor treatment.

Additional objects and advantages will become apparent as this description progresses and by reference to the drawings, in which:

Figure 1 is a perspective view of one form of floor treating machine embodying my invention;

Fig. 2 is an enlarged top plan view of the forward portion of the structure shown in Fig. 1, certain of the parts being cut away to more clearly illustrate the structure;

Fig. 3 is a side elevational view of the structure shown in Fig. 2, certain parts thereof being shown in section;

Fig. 4 is a section taken substantially on line 4—4 of Fig. 2;

Fig. 5 is a partial rear elevational view of the structure shown in Fig. 2;

Fig. 6 is an enlarged parti-sectional view of the wax-control valve structure shown in Figs. 1, 2, and 3; and

Figs. 7 and 8 are views showing a modified form of floor-control means, such means being shown in open position.

Referring particularly to the form of machine shown in the drawings, it comprises a housing 10 supported at its rear by wheels 11 (one on each side) and at its forward part by the brush 12. The brush 12, preferably, is of the rotating type being driven by any suitable form of drive mechanism and motor (not shown) under the control of electric switch 13. The machine is adapted to be propelled along the floor with substantially its entire weight acting on the brush 12, by means of a handle 14 (preferably hinged to the rear of the housing 10) which supports the electric switch 13 and a scrubbing fluid receptacle 15. Obviously, the receptacle 15 may be omitted but, if it is included, it may be connected by a suitable conduit (not shown) to the interior of the housing and so located that it discharges the fluid centrally within the brush 12, thus adapting the machine for scrubbing purposes. As will be understood by those skilled in the art, one form of brush 12 may be used for scrubbing and another form may be used for waxing purposes.

In adapting this machine for waxing in accordance with my invention, I provide the following: The forward, horizontal shelf-like nose of the machine housing above the brush 12 is provided at laterally-spaced intervals with T-shaped slots 16 and suitable openings 17 spaced rearwardly therefrom for detachable, interlocking engagement (or attachment) of a waxer casing 18. More particularly, this casing is provided in its bottom with depending headed studs 19, the heads of which pass through the enlarged portions of the T-slots 16 and upon movement of the casing forwardly become locked against detachment by outward pull movement as will be readily understood. To hold the casing in this latter-attached condition, the rear of such casing is provided with laterally-projecting bosses 20 having vertical openings therethrough adapted to receive L-shaped pins 21 which engage the openings 17 in the housing 10 when they are forced downwardly as far as their handle will permit. Thusly, the waxer casing 18 is not only held against outward pull displacement, but also is held against longitudinal or horizontal displacement. The locking pins 21 may be secured in their locking position by means of set screws 22, or these screws may be adjustable to prevent too free a movement of such pins, the part of the pins engaged by the ends of these screws being, preferably, flat-sided for best results and to prevent turning of the pins in their supporting bosses. The rear wall of the casing 18 has a rounded contour as at 18a so that the same will fit conveniently to the adjacent front rounded portion of the housing 10 as best illustrated in Fig. 3.

The waxer casing provides a wax-heating receptacle having an opening in its top with a wide baffler ledge 23 therearound to prevent a substantial support for the cover 24 and to provide splashing out of the hot liquid wax during movement of the machine along the floor. The cover 24 is hingedly mounted as at 25, its hinge having associated therewith a spring 26 which tends at all times to move the cover to and hold it in its closed position. This cover is provided with a rearwardly-extending handle 27 for ease in operation of the cover when the waxer is heated, which handle is provided with a notched portion 27a adapted to engage a spring snap 28 on the rear of the casing when the cover is fully opened to hold the cover in that position.

The hard wax may take any suitable form and is adapted to be placed within the casing 18 in contact with the bottom thereof. Along the bottom of the casing, I provide an electric heating element 29, connected to the electric source, back of the switch 13, by means of an electric cord 30. In the cord 30, I provide a cut-out switch 31, by which arrangement the wax heater may be cut in or out independently of the structure driving the brush 12. In other words, the machine may be operated with the brush only in use and with the wax in a heated or cold state. If the switch 13 is turned to "off" position and the machine remains at rest for a time, the waxer may continue to heat the wax by throwing the switch 31 to "on" position.

For attainment of the results which I seek, the hard wax must be reduced to, and delivered to, the floor in a highly heated, fluid condition whereby it will readily and quickly

penetrate the pores of the floor material, such as wood. The heating element 29 reduces the hard wax to that desirable condition; and the next problem is to deliver the heated wax to the floor in substantially that condition. I accomplish that as follows: A valve is connected to the forward bottom portion of the casing 18 in communication with the wax chamber, which valve takes the form of a body 32 screw-threaded at 33 into the casing wax chamber as stated. This valve body is provided with a flow channel 34 communicating at its outer end with a, preferably, right angle discharge nozzle 35. This nozzle is so located with respect to the waxer casing, the machine housing 10 and brush 12 that it discharges laterally from one end of the waxer casing downwardly upon the floor immediately in front of and to one side of the center of the brush 12; whereby the rotating brush 12 with the entire weight of the machine upon it passes over the hot wax immediately after it is delivered to the floor and spreads and forces the same into the pores of the floor material while it is still in its hot, penetrating condition.

It is highly desirable, in order to avoid waste and to secure a uniform flow and distribution of the wax, that it be controlled according to the conditions of the floor surface and the general conditions of use. The valve passage 34 is, therefore, controlled by the usual valve plug 36 which, in Fig. 6, is shown in its full open position; but by turning this valve plug, as will be well understood, the rate and amount of flow through the valve and nozzle 35 will be definitely controlled. The valve plug 36 is provided with an extension to which is connected an upward-projecting handle 37 (Fig. 3) with which (and the valve structure) there is associated a spring 38 which tends at all times to throw the valve plug to its closed position illustrated in Fig. 3. The valve plug handle 37 has connected thereto a cable 39, or other suitable flexible connector, which terminates in a handle portion 40 reciprocably supported in a bracket 41 at the outer end of the machine handle 14 with the wax-flow valve in its normal closed position (Fig. 3). To open the same, the operator need only grasp the handle 40 and move the valve plug handle 37 rearwardly to a sufficient extent to permit the desired flow through the nozzle 35. Upon releasing the handle 40, the valve will immediately close.

To further insure proper and uniform wax-flow under all conditions of use, I provide stop means for limiting the extent of opening of the valve, whereby guesswork (once proper adjustment has been made) on the part of the operator is eliminated. More particularly, I provide a stop bar 45 pivoted (as at 45′) to the end wall of casing 18 adjacent the wax-flow valve, with the other or free end of this bar normally swinging downwardly. The free end of this bar 45 is provided with an arm 45^a projecting laterally into the path of swing movement of the valve-operating arm 37. To hold the bar 45 at predetermined positions, the casing 18 is provided with a laterally projecting lug 46 which is adapted to be abutted by the end of a stop-screw 47 adjustably carried by the arm 45^a. It is obvious with this arrangement the lip or arm 45^a limits the opening movement of the wax-flow valve and, since the position of this arm is adjustable, the extent of predetermined opening of the valve is adjustable.

It will be appreciated that, if the flow nozzle 35 were hidden from the view of the operator, such operator could not determine during operation the character of, or extent of, the flow of the wax through the nozzle 35. However, with my particular arrangement, the operator positioned at the end of the handle 14 may readily observe the nozzle 35 and the flow of liquid therethrough due to the relative positions of these parts. This insures the proper flow and proper distribution of the wax upon the floor surface and further insures the production of a better floor surface.

The wax used is of such character that it tends to quickly assume its natural hardened state when the heater 29 is cut out. Conditions may arise where the wax may tend to harden in the valve passage 34. If this should occur, or if any clogging should take place, I provide openings 42 and 43 in the end of the valve body, communicating with the valve passage 34, through which any suitable instrument may be inserted to quickly open up the valve passages and start flow of the liquid. These openings are normally closed, respectively, by screw plugs 42^a and 43^a. It will be observed that, by removing the screw plug 42^a and turning the valve plug 36 to its full opened position (of Fig. 6), an instrument may be readily inserted entirely through the valve passage into the form of the wax receptacle. The stop arm may be swung counter-clockwise to the other side of the lug 47 to permit of full opening of the valve.

This machine is adapted to be used in the home and in environments where furniture and other similar objects may be located. It may also be moved close to wall surfaces. To guard against injury to these surfaces and objects, I provide a rubber bumper 44 extending around the waxer casing and it will be noted that I extend the same at one end outwardly beyond the valve body 32 and nozzle 35. In this manner, I protect the valve and nozzle structure from striking objects in the use of the machine, at the same time, the parts being so relatively positioned

(Figs. 1 and 2) that the operator's view of the nozzle 35 remains unobstructed.

In Figs. 7 and 8, I show another form of valve structure which I may employ for controlling the flow of wax or other coating. Specifically, a discharge pipe 32′ is mounted in the bottom opening 33′ of the casing and at its outer end I mount a clamp support 50 upon which I pivotally mount as at 51 an operating handle 37′ which supports an inverted L-shape arm 51. The lower end of the depending part of this arm supports a disk valve 52 having a shaft 53 freely engaging an opening in such arm. The disk 52 is adapted to slidably engage the smooth outer surface of the clamp support 50 to close the discharge opening 50ª and, to insure a tight slide-fit and closure, a spring 54 is disposed between the disk 52 and adjacent portion of the arm 51 tending to press the disk yieldably toward the clamp support 50. I also employ a spring 55 having one end engaging the handle 37′ and its other end engaging the support 50 to hold the handle 37′ and disk 50 yieldably in closed position, similarly to the action of the spring 38. By moving the disk 52 to uncover the opening 50ª to varying extents to vary the flow the proper amount, the desired amount of wax, or the like, is delivered. The means for limiting the opening movement of the handle 37 and further construction and operation of this form are the same as that of the form of Fig. 6. As will be readily appreciated, this arrangement permits of ready access to the flow control means, for cleaning, etc. purposes, by merely moving the disk to full open position and inserting a suitable object into the pipe 50. Furthermore, the operating parts are readily detachable.

The operation of structure shown will be readily understood from the foregoing. When it is desired to wax or otherwise treat the floor, the heater 29 is cut in and when the wax has been sufficiently heated to reduce it to the desired fluid state, the machine as a whole is propelled along the floor by the handle 14, the control valve being opened to an extent sufficient to discharge the desired size stream of wax or the desired amount of wax. As the machine is propelled along, with the wax being delivered to the floor, the brush immediately distributes the wax over its rotary range, forcing the same into the floor material, this action being materially aided by not only the weight upon the brush structure, but by the natural ability of the heated wax to quickly penetrate such floor material. After the floor surface has been thus treated, due to the rapid cooling of the wax, it is immediately ready for the final brushing or polishing treatment. If a coating other than wax is employed, the foregoing operations may be carried in substantially the same manner, the heater being controlled as conditions require.

Thusly, the floor may be treated in a very short time with a minimum of labor and at a small cost. The cost is materially reduced due to the fact that the hard wax is a much cheaper product than the former liquid or paste wax. A highly lustrous and beautified floor surface is provided which will not wear away quickly, which will not collect dust and dirt, which does not present a greasy appearance, which is not slippery and which provides maximum protection toward the preservation of the floor material. A better floor surface is provided and maintained for a longer time at a much less cost than in the use of the undesirable liquid and paste wax methods.

It will be understood that while I have shown only two forms of my invention, changes in details and arrangement of parts may be made therein without departing from the spirit and scope of my invention as defined by the claims which follow.

I claim:

1. In a floor treating machine adapted for scrubbing operations as well as the handling of hard wax, the combination of a frame, wheel means supporting the rear of said frame, a rotary brush device supporting the front of said frame, a wax receptacle supported by the forward portion of said frame, a heater associated with said receptacle for heating initially-hard wax therein and reducing it to a highly fluid and floor penetrative form, and regulable means positively controlled during operation for delivering said wax in fluid form from said receptacle under predetermined flow conditions directly upon the floor surface immediately in front of said brush device, said receptacle, heater and regulable means being mounted upon said frame for detachment as a single unit.

2. In a floor treating machine adapted for scrubbing operations as well as the handling of hard wax, the combination of a frame, wheel means supporting the rear of said frame, a rotary brush device supporting the front of said frame, and a complete unit detachably mounted on the forward part of said frame including a wax receptacle located above said brush device, a heater associated with said receptacle for heating initially-hard wax therein and reducing it to a highly fluid and penetrative form, a discharge nozzle leading from said receptacle and adapted to discharge hot liquid wax directly upon the floor immediately in front of said brush device, and valve means positively controlled during operation predetermining the manner and extent of flow of said wax in fluid form through said nozzle to the floor.

3. In a machine of the type described, a frame; wheel means supporting the rear of said frame; a rotary brush device supporting

the forward part of said frame; a handle for propelling said frame along the floor with said brush device engaging the latter; and a structure detachably mounted as a complete unit comprising a wax receptacle carried at the front of said frame and in which hard wax is received, means for heating and reducing the wax in said receptacle to a hot fluid condition in which it will readily flow, a wax discharge nozzle leading from said receptacle toward the floor directly in front of and close to said brush device, a valve for controlling the flow of wax through said nozzle, operating means adapted to be associated with both said handle and said valve for actuating the latter, and stop means associated with said valve predetermining the extent of its opening.

4. In a machine of the type described, a frame; wheel means supporting the rear of said frame; a rotary brush device supporting the forward part of said frame; a handle for propelling said frame along the floor with said brush device engaging the latter; and a unitary structure applicable to and removable from said frame as a completely assembled unit which comprises a receptacle adapted to receive wax in a hardened form and carried at the front of said frame, means for heating and reducing the wax in said receptacle to a hot fluid condition in which it will readily flow, a wax discharge nozzle leading from said receptacle toward the floor directly in front of and close to said brush device, a valve for controlling the flow of wax through said nozzle, spring means normally tending to close and hold closed said valve, operating means carried by said handle and associated with said valve for actuating the latter in opposition to said spring means, and adjustable stop means associated with said valve predetermining the extent of its opening.

5. In a machine for variable treatment of floors as well as scrubbing including the application of wax initially of a hardened character, brush means adapted to engage the floor surface, a wax receptacle associated with said brush means and adapted to receive wax in hardened form, means for heating the wax in said receptacle, a discharge nozzle leading from said receptacle, a valve controlling the flow of wax through said nozzle, means for moving said valve in one direction, yieldable means opposing movement of said valve in said one direction, and adjustable means limiting movement of said valve in said one direction, said receptacle, heating means, nozzle, valve, yieldable means and adjustable means being so related with respect to each other that they may be applied to and detached from the machine as a single, completely assembled and operative unit.

6. In a machine for treating floors, means adapted for the treatment of the floor with hard wax, which comprises a receptacle adapted to receive the hard wax, a heating element in the bottom of said receptacle for heating the wax to a highly fluid and penetrative form, a conduit connected to the bottom of said receptacle for discharging the hot liquid wax upon the floor, a valve in said conduit, spring means opposing opening movement of and tending at all times to close said valve, manual valve operating means for opening said valve against the action of said spring means, adjustable stop means limiting the opening movement of said valve, said conduit having an opening therein intermediate its ends for the insertion of an object for cleaning and unclogging purposes, and removable means for closing said opening.

7. In a machine for treating floors, means adapted for the treatment of the floor with hard wax; which comprises a supporting member having therein a plurality of spaced T-shaped slots and a plurality of openings; and a unitary structure which comprises a receptacle adapted to receive the hard wax, a heating element associated with said receptacle for heating the wax to a highly fluid and penetrative form, a conduit for discharging the hot liquid wax upon the floor, and means for mounting said receptacle upon said support which comprises a plurality of headed studs depending downwardly from the bottom of said receptacle and interlockingly engageable with said T-shaped slots; and vertically adjustable pins carried by said receptacle and movable into said openings when said studs and slots are fully engaged to lock said receptacle detachably to said support.

8. In a floor treating machine, a frame having a comparatively flat supporting surface with a pair of laterally spaced T-shaped slots and a pair of laterally spaced openings therein, means for heating and delivering hot liquid-form wax to the floor which includes a casing, and means for detachably mounting said casing upon said surface which comprises a pair of headed members depending from said casing and engageable with the larger portion of said T-shaped slots and slidable therein into the narrow stem-portion thereof to hold said casing against outward displacement, and a pair of pins reciprocably carried by said casing and movable into said openings when said headed members are fully engaged in the stem-portions of said T-shaped slots.

9. In a floor treating machine, a frame having a comparatively flat supporting surface with a pair of laterally spaced T-shaped slots and a pair of laterally spaced openings therein, means for heating and delivering hot liquid form wax to the floor which includes a casing having a chamber therein adapted to receive hard wax to be reduced to hot liquid form, the upper part of the casing wall being turned inwardly to a substantial

distance to avoid splashing of the liquid wax therefrom, members on said casing interlockingly engageable with said T-slots for supporting said casing and its related parts on the machine, a cover hinged to said casing and adapted to seat on said inturned wall part, spring means tending to close and hold closed said cover, a handle attached to said cover, and spring clip means on said casing adapted to be engaged by said handle for holding said cover open when moved to its full-open position.

10. In a machine of the character described, a housing, brush means at the forward end of said housing adapted to engage the floor, a wax receptacle at the forward end of said housing above said brush means, a wax discharge nozzle connected to one end of said receptacle and projecting lateraly therefrom to one side of said housing where it is visible to the operator from all positions to the rear of said housing, the projecting end of said nozzle being turned forwardly within said vision range to discharge downwardly immediately in front of said brush means, and valve means under the control of the operator at the rear of said housing for controlling flow of wax through said nozzle, said receptacle, nozzle and valve means constitute a single unitary structure capable of being applied to and removed from said housing as a completely operative unit.

In testimony whereof, I have subscribed my name.

WALTER S. FINNELL.