

Dec. 6, 1932.

H. SCHLESINGER

1,889,761

HAT CLEANING AND DRYING MACHINE

Filed July 29, 1929

3 Sheets-Sheet 1

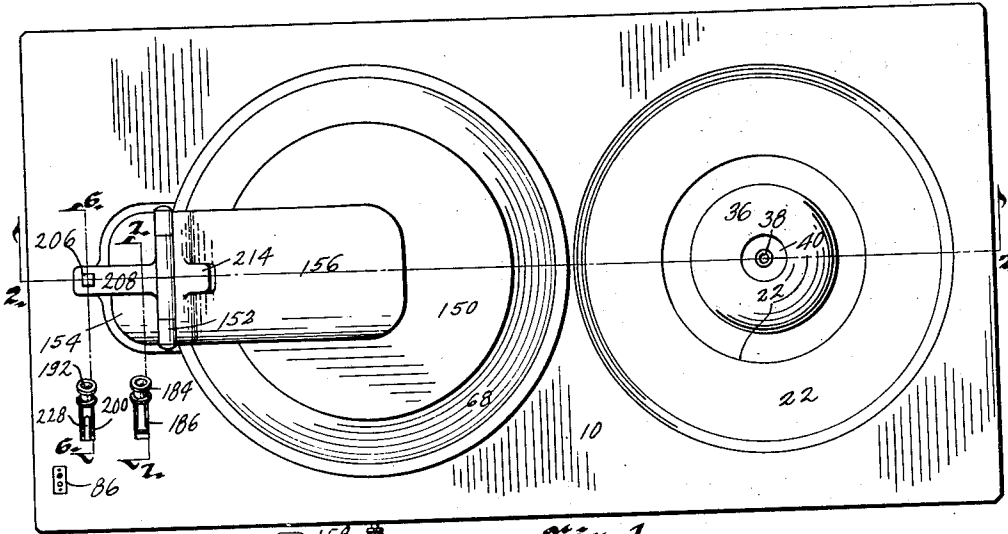


Fig. 1.

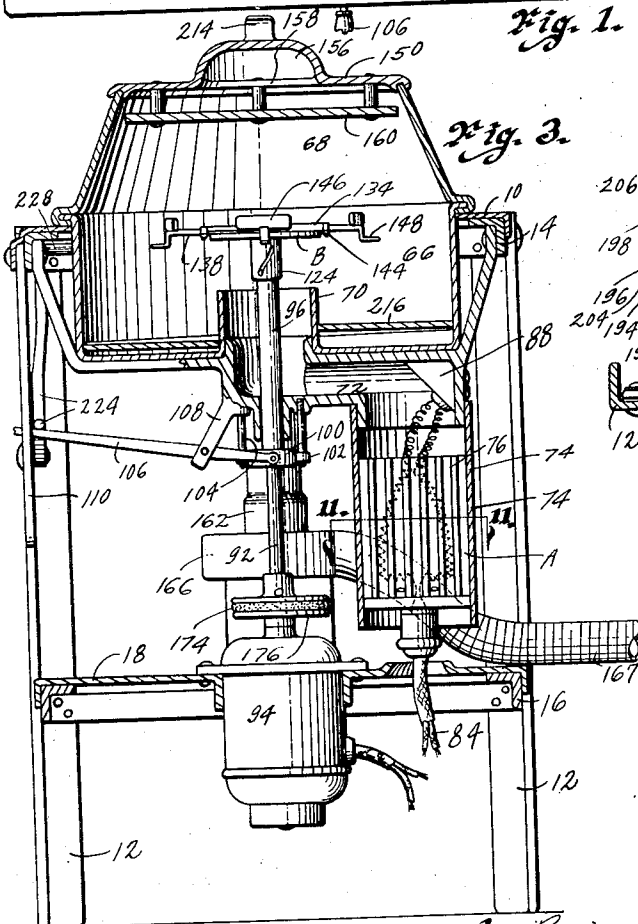


Fig. 3.

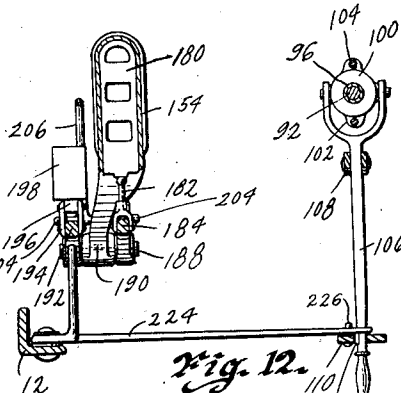


Fig. 12.

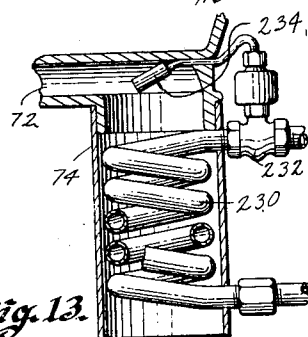


Fig. 13.

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3 Sheets-Sheet 3

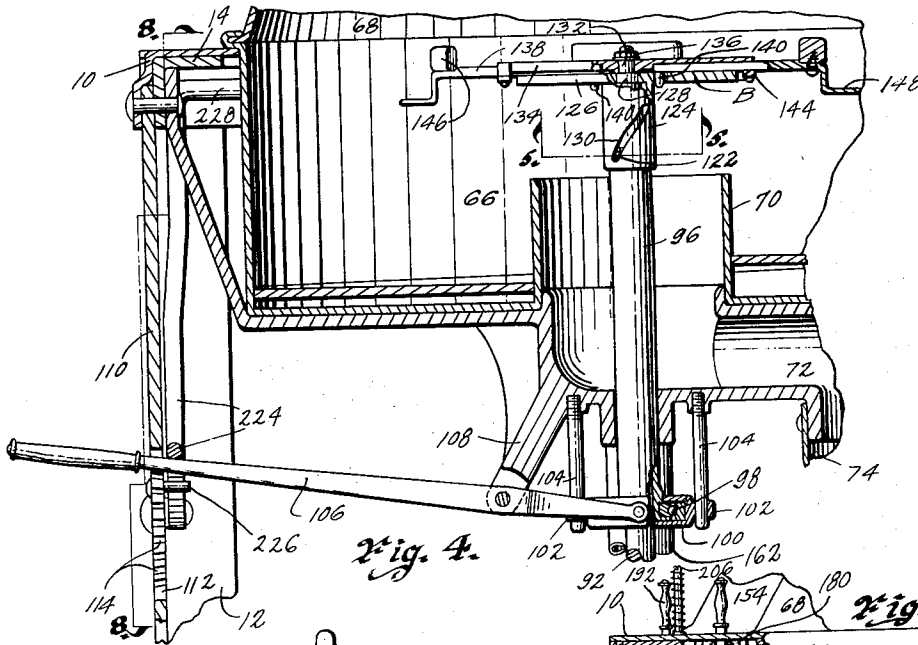


Fig. 4.

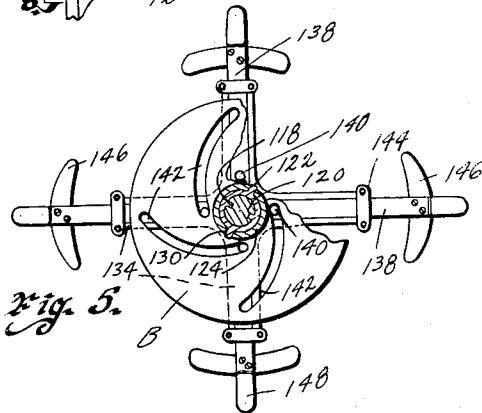


Fig. 5.

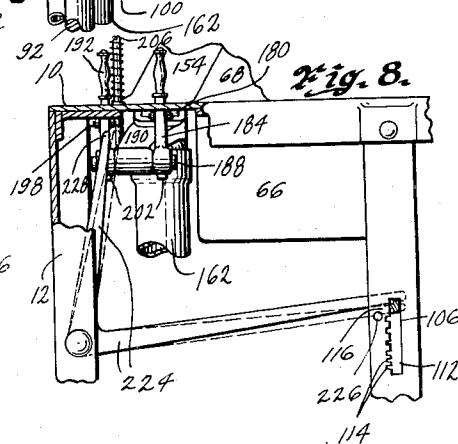


Fig. 8.

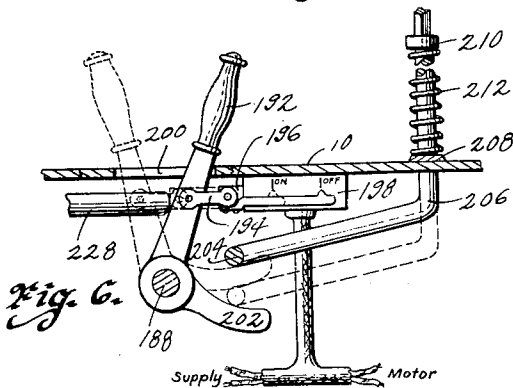


Fig. 6.

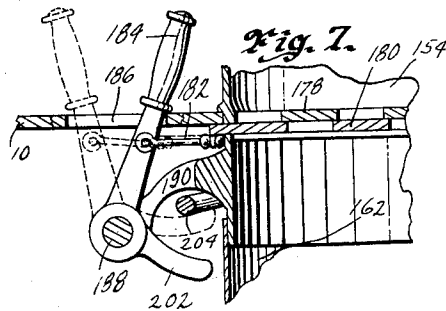


Fig. 7.

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UNITED STATES PATENT OFFICE.

HARRY SCHLESINGER, OF DES MOINES, IOWA, ASSIGNOR OF SEVENTY-FOUR ONE-HUNDRED-AND-EIGHTY-THIRDS TO ALFRED F. YOERG AND THIRTY-FIVE ONE-HUNDRED-AND-EIGHTY-THIRDS TO JACK GOLDBERG, BOTH OF DES MOINES, IOWA

HAT CLEANING AND DRYING MACHINE

Application filed July 29, 1929. Serial No. 381,972.

The object of my invention is to provide a hat cleaning and drying machine of simple, durable and inexpensive construction.

A further object of my invention is to provide a hat cleaning and drying machine with which all operations relative to cleaning a hat may be performed, the machine being arranged to facilitate such operations.

More particularly, it is my object to provide a table-like device, having a hat cleaning chamber extending downwardly from the top thereof in which a hat block is mounted in such a way that the under surface of the rim of a hat may be cleaned by allowing the crown thereof to extend into the chamber or the block may be raised out of the chamber for pushing the crown of the hat thereover, so that the block supports the crown of the hat when cleaning it.

Still a further object is to provide a hat drying device in connection with my machine in which the cleaning fluid is first removed from the hat by centrifugal action and heat is thereafter used for completing the drying process to a point where all fumes are expelled from the hat.

Still a further object is to provide novel mechanism for the accomplishment of the objects just referred to.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings. Although the invention is susceptible of a variety of embodiments, it is unnecessary to fully describe and illustrate more than one in order to give a full understanding of the invention both from its structural and functional standpoints. Accordingly, I have illustrated a preferred and desirable embodiment of the invention in the accompanying drawings, in which:

Figure 1 is a plan view of my hat cleaning and drying machine.

Figure 2 is a sectional view thereof on the line 2—2 of Figure 1.

Figure 3 is a sectional view on the line 3—3 of Figure 2.

Figure 4 is an enlarged, detail, sectional view on the line 4—4 of Figure 2.

Figure 5 is a sectional view taken on the line 5—5 of Figure 4, and showing a hat holding chuck which I use in connection with my machine.

Figure 6 is a sectional view on the line 6—6 of Figure 1, showing an automatic switch structure.

Figure 7 is a sectional view on the line 7—7 of Figure 1, showing an automatic slide valve.

Figure 8 is a front elevation of a portion of the machine showing cooperating levers used in operating the machine.

Figure 9 is a sectional view on the line 9—9 of Figure 2.

Figure 10 is a sectional view on the line 10—10 of Figure 2.

Figure 11 is a sectional view on the line 11—11 of Figure 3 showing a heating unit used in connection with the drying operation.

Figure 12 is a sectional view on the line 12—12 of Figure 2, illustrating cooperating control mechanisms in the machine; and

Figure 13 is a sectional view through a steam heater, which may be substituted for the electric heater shown in Figures 3 and 11 of the drawings.

In the accompanying drawings, I have used the reference numeral 10 to indicate generally a table top. The table top 10 is supported on legs 12, which are suitably braced by angle iron frames 14 and 16 vertically spaced with relation to each other. A shelf 18 is supported on the frame 16.

The cleaning portion of my machine includes a chamber-like device 20 extending downwardly from a depressed top portion 22 of the table top 10. A removable cover 24 is provided for the chamber 20 when not in use.

A bearing sleeve 26 is secured to the bottom of the chamber 20 and a hat block rod 28 is slidably mounted in such bearing. The lower end of the rod 28 is slidably mounted in a bearing 30 formed on a bracket 32. A cross

bar 34 is provided for supporting the bracket 32 relative to the frame 16.

A hat block 36 is removably positioned on a reduced portion 38 at the upper end of the rod 28. Sockets 40 are formed in the hat block 36, so that it may extend down over the bearing sleeve 26.

Thus it will be seen that the block 36 is capable of being rotatably positioned on the rod 28 as shown in full lines and by dotted lines at 36a in Figure 2, or in a reversed position as shown in dotted lines at 36b.

A drain spout 42 is provided at the lower portion of the chamber 20 and extends to a discharge nozzle 44. A glass jar 46 is adapted to receive cleaning fluid from the nozzle 44 and has a cover member 48 provided with a tubular receiving neck 50 adapted to fit over the nozzle 44. An annular projecting bead 52 may be provided on the shelf 18 to properly position the jar 46 relative to the nozzle 44.

For the purpose of raising the hat block 36 to its highest dotted line position shown in Figure 2 and holding it in such position, I provide a lever 54 pivoted to a set collar 56. The set collar 56 is secured to the rod 28. The lever 54 is provided with a handle 58 for the convenience of the operator.

A pair of spaced links 60 are pivoted to the bracket 32 and to the lever 54. The lever 54 may be caused to assume the dotted line position shown in Figure 2 by swinging downwardly on the handle 58. When in the dotted line position, a stop pin 62 engages the links 60 after an over-center position has been reached, whereby the hat block 36 will remain in the highest dotted line position without fastening means being provided therefor.

The hat block may be maintained in the intermediate dotted line position when reversed for straw hats by means of a set screw 64.

The hat drying mechanism consists of a chamber 66 extending downwardly from the table top 10 of my machine and having an upwardly extending cone-shaped portion 68. The bottom of the chamber 66 is provided with an upstanding tubular flange 70 at its center. A hot air conducting tube 72 is positioned below the bottom of the chamber 66 and discharges into the tubular portion 70 of the chamber. The conducting tube 72 terminates in a heater casing 74 containing a heating unit A.

The heating unit A consists of a plurality of castings 76 and 78 assembled together in such a way as to form cavities 80. Electric heating elements 82 are mounted in the cavities 80. Current conducting wires 84 extend to the heating elements 80 and are connected with a heater switch 86, whereby the heating elements may be rendered operative or inoperative as desired.

I preferably provide a thermostat 88

mounted in the hot air conducting tube 72 to prevent overheating of the elements 82, the heat flowing through the tube 72 serving to actuate the thermostat 88 for cutting off the supply of current when the heat rises to a predetermined degree.

Within the chamber 66, I provide a hat chuck B adapted to support a hat 90 as shown in dotted lines in Figure 2. The hat chuck B is driven by a drive shaft 92 connected with an electric motor 94.

The hat chuck B consists of a tube 96 longitudinally slidable on the shaft 92 and having its lower end connected with the inner race of a ball type bearing 98. The outer race of the bearing 98 is supported in a housing 100 having a perforated pair of ears 102. The ears 102 are slidably positioned on guide rods 104 whereby the housing 100 and bearing 98 may be moved vertically relative to the guide rods.

A hat chuck lever 106 is provided for the purpose of raising and lowering the housing 100 as desired.

The lever 106 is pivoted to a bracket 108 and extends outwardly through an adjustment retainer member 110. The member 110 has a vertical slot 112 therein, as best shown in Figure 8 of the drawings, provided with a plurality of notches 114 in one side thereof. The chuck lever 106 is provided with a lug 116 adapted to selectively coact with the notches 114 as desired.

The tubular sleeve 96 is provided at its upper end with a pair of in-turned fingers 118 adapted to coact with vertical key-ways 120 formed in the drive shaft 92, as clearly shown in Figure 5.

The upper end of the tube 96 is also provided with a pair of out-turned fingers 112.

Rotatably mounted outside of the tube 96 is a sleeve 124 fixed to a disc 126 (see Figure 4). The disc 126 is rotatably mounted on a reduced portion 128 of the drive shaft 92. The sleeve 124 is provided with a pair of spirally arranged slots 130 with which the out-turned fingers 122 coact.

Securely clamped against the shoulder formed by a reduced portion 132 of the drive shaft 92 is a cross arm 134. A nut 136 is provided for clamping this cross arm relative to the drive shaft 92. The cross arm 134 has a plurality of four arms, each of which is grooved on its under surface to provide a radial guideway for a hat supporting arm 138.

Each of the hat supporting arms 138 is provided with a downwardly extending pin 140 adapted to coact with a spirally arranged slot 142 formed in the disc 126. A cross bar 144 is provided for each arm of the member 134 to hold the hat supporting bars 138 in properly supported position.

A hat engaging block 146 is mounted on the outer end of each hat supporting arm 138

and the end of the arm terminates in a hook portion 148 adapted to engage the rim of a hat adjacent the crown thereof.

For the chamber 66 and its cone-shaped upper portion 68, I provide a cover member 150 hinged as indicated at 152 to a manifold device 154. The manifold device 154 consists of three sides for forming a passageway, the fourth side of which is formed by the cone-shaped portion 68 of the chamber 66, as illustrated on the drawings.

The member 154 is preferably soldered or brazed to the cone-shaped portion 68.

The cover member 150 is provided with a passageway 156 leading from an opening 158 in the center of the cover 150 to the upper end of the manifold device 154. A disc-shaped baffle plate 160 is mounted on the cover 150 and slightly spaced therebelow, the edges of the baffle plate 160 leaving a small annular passageway around the edge of the cone-shaped member 68. The manifold device 154 is connected by a tube 162 with the intake spout 164 of a blower 166. The blades of the blower are indicated at 168 and are secured to a blower shaft 170.

A pulley 172 is mounted on the shaft 170 and is driven by a belt 174 from a pulley 176. The pulley 176 is mounted on the drive shaft 92 of the motor 94.

In connection with the manifold 154, I provide a perforated partition plate 178 (see Figure 7) and a sliding valve plate 180. The valve plate 180 is connected by a link 182 with a control lever 184 extending upwardly through a slot 186 in the table top 10. The valve lever 184 is pivoted on a shaft 188 supported by a bracket 190. Beside the valve lever 184 I provide a switch lever 192 also pivotally supported on the shaft 188. The switch lever 192 is connected by a link 194 with the movable switch member 196 of a sliding type switch 198. The switch lever 192 extends upwardly through a slot 200 formed in the table top 10. The switch 198 is provided for controlling the motor 94 in a manner hereinafter to be described.

The valve lever 184 and the switch lever 192 are each provided with an arm 202 adapted to be struck by a cross piece 204 of a buffer rod 206 in a manner hereafter to be described. The buffer rod 206 extends upwardly through a pair of bosses 208 formed on the manifold member 154 and is provided with a collar 210 secured thereto. A spring 212 normally forces the collar 210 against the upper boss 208. The buffer rod 206 above the collar 210 is preferably angular-shaped as shown in Figure 1 to prevent rotation of the buffer rod 206.

A buffer extension 214 is formed on the cover 150 and is adapted to coact with the upper end of the buffer rod 206 for a purpose hereinafter to be set forth.

In connection with the chamber 66, I provide a false bottom 216 having a sump-like depression 218 terminating in a drain spout 220. The drain spout 220 is in communication with the drain pipe fitting 42 already described in connection with the chamber 20. Adjacent the drain spout 220 the false bottom 216 has a wall-like baffle 222, projecting upwardly above the bottom of the chamber 66. From the top of the wall 222, the false bottom gradually slopes downwardly in a circumferential direction as best shown in Figure 10 of the drawings.

Pivoted to one of the supporting legs 12, I provide a bell crank lever 224 having a horizontal arm adapted to be normally held against a stop pin 226 by gravity as shown by dotted lines in Figure 8. The vertical arm of the bell crank lever 224 is adapted in one of its positions to prevent movement of the switch lever 192 to "on" position, due to a projection 228 extending in front of the lever 192 as shown in Figures 6 and 8.

Practical operation

My machine is used for the cleaning and drying of hats, wherein gasoline or some suitable cleaning fluid is used with a brush to first clean the hat, and thereafter the hat is dried.

In using the machine, the lid 24 is removed and the under surface of the rim of the hat, when positioned, as shown in dotted lines, with the crown of the hat extending down into the chamber 20, may rest on the depressed portion 22 of the top 10 and thus be conveniently cleaned with a brush dampened with the cleaning fluid. Any surplus fluid will run down into the chamber 20 by gravity and be collected in the jar 46.

After the under surface of the rim has been cleaned, the upper surface may be cleaned by turning the hat over, and swinging the lever 58 to the dotted line position, whereby the hat block 36 assumes its highest dotted position as shown in Figure 2, the crown of the hat is supported to be easily cleaned.

The block 36 being rotatable facilitates the cleaning operation.

The upper surface of the rim may rest upon the table top 10 around the opening for the top of the chamber 20, so that it can be conveniently cleaned.

In the case of straw hats, the hat block 36 may be turned over as shown by the intermediate dotted line position, so that the square end thereof may be used as a rest for a straw hat.

The rod 28 may be stationarily positioned relative to the chamber 20 by tightening the set screw 64 in any desired position, so that the block 36 can be adjusted to the proper height for cleaning straw hats.

After the hat has been cleaned, the lid 150 of the chamber 66 is moved to open position

with the projection 214 merely resting on the upper end of the rod 206. The spring 212 is sufficiently strong to maintain the collar 210 against the upper boss 208 when the lid 150 is open position.

The cleaned hat is positioned on the chuck B with the rim thereof resting on the fingers 148, the hat chuck being adjusted to its smallest position. Such adjustment occurs when the lever 106 is in its uppermost position.

The next step in the process is to expand the hat chuck B, which is accomplished by pushing down on the lever 106. It will be noted that when the lever 106 is up, the vertical arm of the bell crank lever 224 is in the way of the switch lever 192, so that the motor 94 can not be started before the lever 106 is pushed down for expanding the hat chuck.

There is sufficient spring in the lever 106 to cause it to frictionally engage the left-hand edge of the slot 112 when in raised position as shown in Figure 8, and to cause the lug 116 to enter any one of the notches 114 when the lever is lowered, so that the adjustment of the chuck may be maintained.

The chuck operates in the following manner:

When the housing 100 is moved upwardly by the lever 106, it also moves the sleeve 96 upwardly. The sleeve 96 will slide longitudinally relative to the shaft 92, due to the coaction of the fingers 118 and keyways 120 without rotating relative to the shaft.

The fingers 122 coacting with the spiral slots 130 of the sleeve will cause it rotate, whereby disc 126 will also rotate for expanding the chuck.

Such expansion occurs because of the rotation of the disc 126 relative to the cross member 134, whereby the spiral grooves 142 move relative to the pins 140 for forcing the hat supporting arms 138 outwardly.

After the hat has been properly chucked, the switch lever 192 may be moved to "on" position as shown by dotted lines in Figure 6. The motor 94 will then rotate for causing the hat chuck and the cleaned hat to also rotate, whereby the cleaning fluid therein will be extracted by centrifugal force. This cleaning fluid will flow into the jar 46, the false bottom 216 being provided in the shape already described to cause the fluid to forcibly flow into the discharge spout 220.

The hat chuck and hat rotating in a predetermined direction will cause the cleaning fluid to be thrown therefrom and the cleaning fluid will have a tendency to also rotate with the hat and chuck. This rotation is taken advantage of in designing the false bottom 216, so that when the cleaning fluid strikes the wall 222 it will immediately flow into the jar 46, and the operator can observe the flow of fluid, so that when it stops, he knows that all of the fluid has been extracted that can be extracted by centrifugal force.

Centrifugal force, however, does not entirely extract the heaviest portions of the fluid, and therefore a heating process is used for completing the drying out of the hat, and thereby removing all odor of the cleaning fluid after the hat is taken from the machine.

The blower 166 is in operation all of the time the motor 94 is running, but is normally rendered ineffective by the valve plate 180 being closed.

After the gasoline has stopped running into the jar 46, the valve plate 180 is moved to the open position shown in dotted lines in Figure 7, so that air may be drawn through the heating unit A, conducting tubes 72 and into the chamber 66. This air will be caused to rotate due to the rotation of the hat on the inside of the chamber 66, and will consequently condense adjacent the outside edge of the chamber. The baffle plate 160 is thereby provided to collect the air from the outside wall of the chamber 66, and the opening 158 is provided at the center of the cover 150 to cause an even collection of such air.

The air is drawn through the passageways 156 and 154 through the openings in the partition 178 and in the valve plate 180 and discharged from the blower 166 through a discharge pipe 167.

In passing the castings 76 and 78 in which the heating elements 82 are embedded, the air will become heated, so that in coming in contact with the hat, it will expand any cleaning fluid left therein and cause it to also flow into the jar 46, after which it will evaporate the rest of the cleaning fluid.

The discharge tube 167 may lead to the outside of the building, so that the fumes are not discharged where they are not wanted.

After the drying process just described has been completed, which takes but a very short time when using the heating unit for heating the drying air, the device may be stopped by opening the cover 150, and causing the projection 214 to press downwardly on the rod 206, which moves the arms 202 on the control levers 184 and 192 downwardly for shutting off the motor and the valve plate.

Thereafter when the lid 150 is released, the spring 212 will raise the rod 206 to its normal position. The chuck lever 106 may now be raised for contracting the hat chuck, so that the hat can be removed therefrom.

Safety features

When in its raised position, the lever 106 causes the bell crank lever 224 to assume the full line position shown in Figure 8 for preventing the operator from throwing the switch 198 to "on" position when a hat is not chucked on the chuck.

Another safety feature is the rod 206, which is forced downwardly against the action of the spring 212 when an explosion accidentally occurs in the chamber 66. Such explosion will

throw the door 150 open, thereby causing the projection 214 to move the rod downwardly to the dotted line position shown in Figures 6 and 7. This moves the valve plate 180 to closed position and the switch 198 to off position, so that the current to the motor is shut off and the draft of air passing through the machine will immediately cease.

The compression of the spring 212 will cause the rod 206 to again move upwardly, whereby the door 150 is thrown shut for smothering any flames in the chamber 66.

In Figure 13, I have illustrated a modified form of heater construction in which a steam coil 230 replaces the heater A where electricity is not available. The thermostat 88 controls the electric heater A to prevent it from overheating, and a valve thermostat 232 could similarly be provided for the steam line of the coil 230. The unit 234 adapted to be heated for causing the valve 232 to be closed at a predetermined position would preferably be mounted within the passageway 72. The thermostatic valve 232 and unit 234 can be of any well-known construction now on the market. The coil 230 can be utilized for hot water or other hot liquid, as well as steam.

Some changes may be made in the construction and arrangement of the various parts of my hat cleaning and drying machine, without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. Hat drying mechanism comprising a drying chamber, an expansible centrifugal hat chuck therein, a hand control for expanding said chuck, propelling means for rotating said chuck, control means for selectively controlling the operation of the propelling means, and a latch mechanism to prevent movement of the control means to operative position except after the hat chuck is adjusted from its contracted position.

2. Hat drying mechanism, comprising a drying chamber, a cover therefor, means for supplying heated air thereto, a control valve included in such means, a hat support in said chamber, power means for rotating said support, control means for said power means, and mechanism for moving said control means to inoperative position and for closing said valve in the event said cover is opened.

3. In a hat drying mechanism, a drying chamber, a hat chuck comprising a shaft, a sleeve longitudinally slidable thereon, a disc rotatably mounted thereon, a second sleeve affixed to said disc, a spiral slot in said second sleeve to coact with said slidable sleeve and hat engaging members arranged to expand when said sliding sleeve is slid and said disc

is consequently rotated, both relative to said shaft.

4. In a hat drying mechanism, a drying chamber, a hat chuck comprising a shaft, a sleeve longitudinally slidable thereon, a disc rotatably mounted thereon, a second sleeve affixed to said disc, a spiral slot in said second sleeve to coact with said slidable sleeve, a head on said shaft having a radially movable member, said disc having a spiral slot to coact therewith.

5. Hat drying mechanism comprising a drying chamber, a shaft extending thereinto, an expansible hat chuck on said shaft and in said chamber, means for supplying heated air to said chamber, a sleeve on said shaft and operatively connected with said chuck to control the expansion thereof and means, outside of said chamber, to actuate said sleeve.

6. Hat drying mechanism comprising a drying chamber, a cover therefor, a hat chuck therein, means for rotating said hat chuck, means for supplying air to said chamber and exhausting it therefrom, said last means comprising a blower and valve means to render the blower ineffective and mechanism for closing said valve in the event said cover is opened and maintaining said valve means closed when the cover is subsequently closed whereafter said valve means is capable of being manually opened.

7. Hat drying mechanism comprising a drying chamber, a cover therefor, a hat chuck therein, means for rotating said hat chuck, means for supplying air to said chamber and exhausting it therefrom, said last means comprising a motor and a blower, a switch for the motor and a valve for the blower and mechanism for opening said switch and closing said valve when said cover is opened.

8. Hat drying mechanism comprising a drying chamber, a cover therefor, a hat chuck therein, means for rotating said hat chuck, means for supplying air to said chamber and exhausting it therefrom, said last means comprising a motor and a blower, a switch for the motor and a valve for the blower and mechanism for preventing closing of the switch and opening of the valve when said cover is open.

9. In a hat drying mechanism, the combination of a drying chamber with a rotatable hat chuck therein, the chamber having its entire bottom sloping spirally downwardly from a high point to a low point in the general direction of rotation of the chuck with the exception of a portion forming an abrupt transition from said low point to said high point.

10. In a hat drying mechanism, the combination of a drying chamber with a rotatable hat chuck therein, said drying chamber having its entire bottom sloping from a high point to a low point and a radial baffle adja-

cent said low point and spanning the space between it and said high point.

11. Hat drying mechanism comprising a drying chamber, a rotatable adjustable hat chuck therein, means for rapidly rotating said hat chuck for discharging a cleaning fluid from a hat thereon, said drying chamber having a fluid outlet at its bottom, means operable from said first means, for drawing heated air through said chamber and means for rendering said drawing means inoperative while said first means is operative.

12. In a hat drying mechanism, a drying chamber, an openable lid therefor, a rotatable hat support therein, a baffle plate between said hat and said lid and supported by the latter and means for withdrawing air from the space between said baffle plate and said lid.

13. Hat drying mechanism comprising a drying chamber, a cover therefor, a hat chuck therein, means for rotating said hat chuck, means for moving air through said chamber, said last means comprising a blower and valve means to render the blower ineffective and mechanism for closing said valve means in the event said cover is thrown open, said mechanism including resilient means for reclosing said cover after being thrown open, without causing said valve means to again render the blower effective.

Des Moines, Iowa, June 21, 1929.

HARRY SCHLESINGER.

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