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SPRAYING DEVICE FOR APPLYING MINERAL BLACKING TO MOLDS

Filed March 31, 1927

2 Sheets-Sheet 1

Fig. 1.

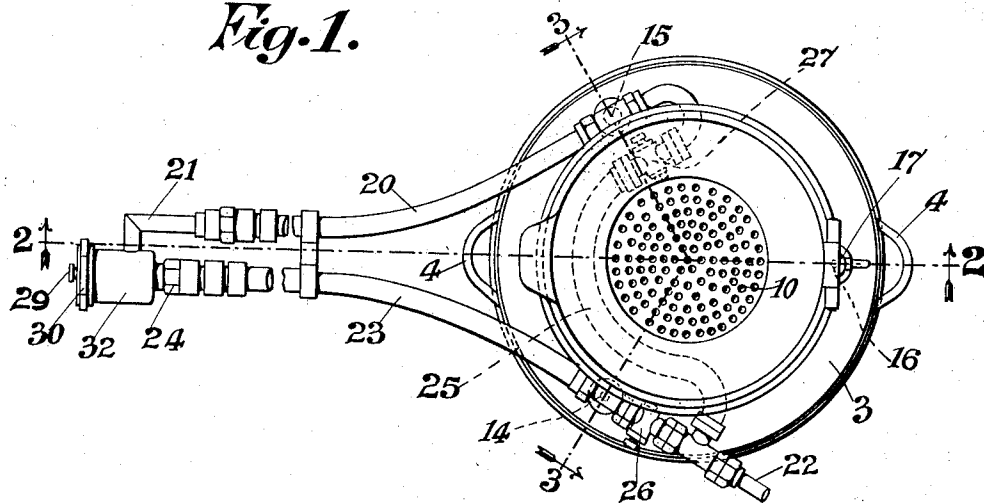
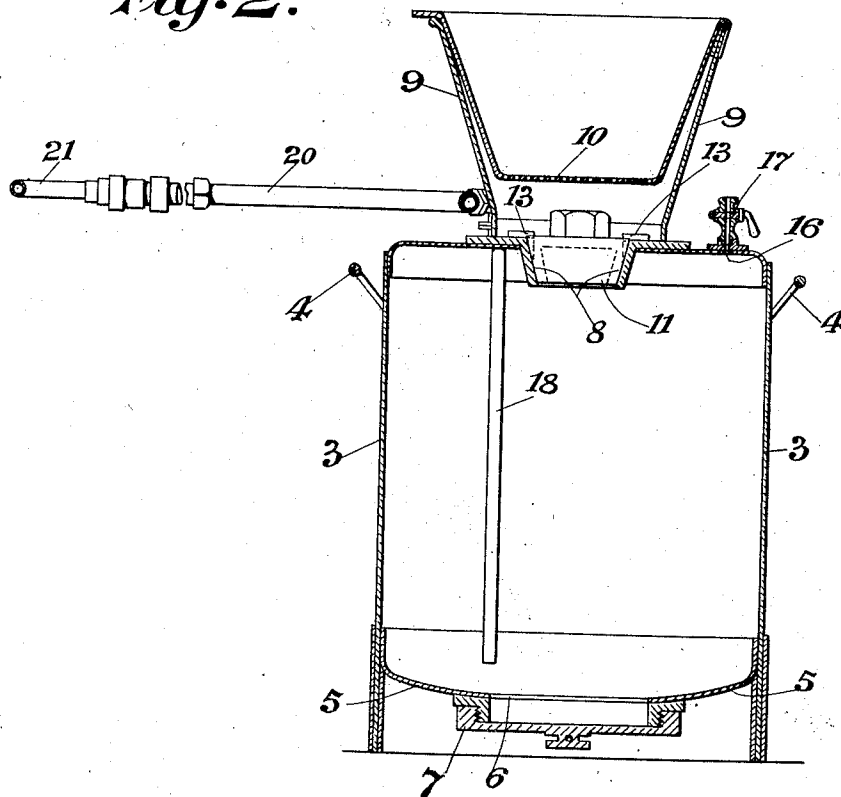


Fig. 2.



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Fig. 3.

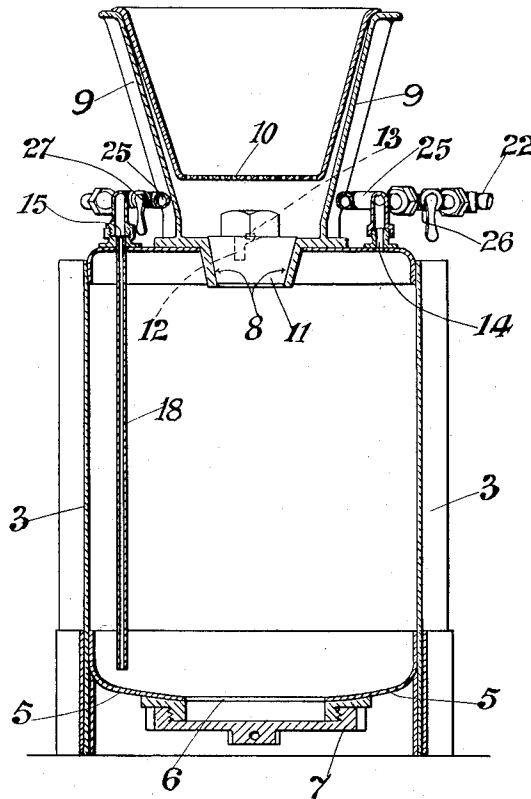
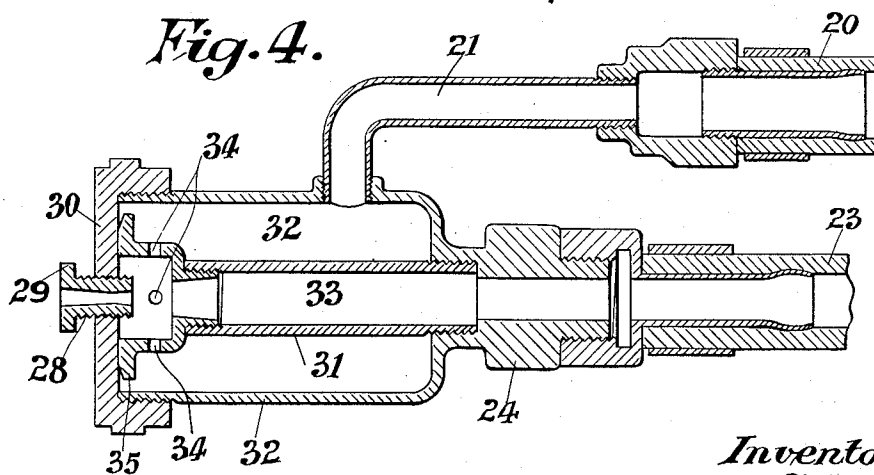


Fig. 4.



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UNITED STATES PATENT OFFICE

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SPRAYING DEVICE FOR APPLYING MINERAL BLACKING TO MOLDS.

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This invention relates to devices for the application of mineral blacking to foundry molds.

Hitherto such blacking, owing to its being a liquid of thick consistency liable to very quickly and easily separate into its solid and liquid constituents, had to be swabbed on by hand or in some cases was applied by a small spraying device adapted to contain only a very small quantity of blacking and operated by the user blowing therethrough with his mouth. This resulted in a considerable length of time being occupied in the application of the blacking, particularly to large molds and in the case of swabbing rendered the molds readily liable to be damaged or spoiled by carelessness when applying the blacking. The said blacking could not hitherto be economically sprayed onto molds by compressed air devices having spraying nozzles owing to the repeated clogging of such devices.

I overcome these disadvantages by the novel construction shown in the accompanying drawings and hereinafter claimed. In the said drawings—

Figure 1 is a plan view of a device for spraying blacking.

Figure 2 is a view in vertical section on line 2—2 of Figure 1 regarded in the direction of arrow 1.

Figure 3 is a view in vertical section on line 3—3 regarded in the direction of arrow 2.

Figure 4 is a plan view in section of the spraying nozzle of the device, the said nozzle being shown larger than in Figure 1.

Referring to the drawings, in the construction shown therein, I provide a cylindrical container 3 having handles 4 whereby it can be transported and adapted to stand on the floor, the container 3 having a saucer-shaped bottom 5 provided with a central opening 6 which serves for emptying and cleaning the interior of the container 3 and is closed by a screw-on cap 7, the cap 7 and opening 6 preferably forming a sump in which sediment or grit can settle.

The top of the container 3 is provided with a conical filling opening 8 surrounded by a funnel or tun-dish like part 9 adapted to guide the blacking to the filling opening 8 and having a sieve 10 hinged to it. The sieve 10 when in operative position lies below the top of the funnel-like part 9 and the conical opening 8 is adapted to be hermetically

closed by means of a conical plug 11 having bayonet-slot like parts 12 adapted to be engaged by pins 13 provided on the top of the container 3 and projecting over the opening 8 and be locked by the pins 13 when partially rotated.

In the top of the container 3 openings 14, 15 and 16 are provided around the central filling opening 8. The opening 16 is controlled by an adjustable vent, for example in the form of a tap or cock 17. The opening 15 serves to accommodate a pipe 18 which depends into the container 3 to within a short distance of the bottom thereof and is connected, for example by a flexible pipe 20 to the blacking connection 21 of the spraying nozzle. The opening 15 is hermetically closed round the depending pipe 18. The opening 14 is connected to a compressed air supply pipe 22 which has a flexible portion 23 connected to a compressed air connection 24 of the spraying nozzle. A by-pass pipe 25, which may also be flexible is connected at one end to the compressed air supply pipe 22 before the pipe 22 reaches the opening 14 and at the other end to the pipe 20 supplied with blacking from the depending pipe 18. A cock 26 or the like is provided in the compressed air supply pipe 22 between the opening 14 and the point of connection of the by-pass pipe 25 and the by-pass pipe is provided with a cock 27.

The opening 14 is of comparatively small size and is preferably of the same size as the spraying hole 28, Figure 4, in the nipple 29 carried by the cap 30 of the spraying nozzle.

The spraying nozzle is arranged so that the compressed air enters at the rear and flows through a tube 31 in a straight line direct to the spraying hole 28. The blacking connection 21 is arranged at the side of the nozzle and leads to a circular chamber 32 formed between the tube 31 and the casing 32 and communicating with the central air passage 33 near the front end of the nozzle by means of radial passages 34 provided in a hollow head 35 screwed into the tube 31 and forming a part of the central passage 33. The interior of the head 35 is of larger diameter than the interior of the tube 31, where the radial passages 34 enter it and thereby forms an annular recess in the air passage 33 immediately adjacent the spraying hole 28.

In operation assuming that the container 3 has been filled by first removing the conical

plug 11, tipping the blacking into the funnel-like part 9 and allowing it to sieve through the sieve 10 into the container 3, and then replacing the plug 11 to form an air tight closure, and the blacking to have then been allowed to stand for sometime, the solid constituent or constituents of the blacking will have settled to the bottom of the container 3 and the liquid constituent or constituents of the blacking will be floating above the solid constituent or constituents. The procedure is then as follows:—

The cock 26 on the air supply pipe 22 is closed, the vent 17 is opened and the cock 27 on the by-pass pipe is opened. Compressed air then flows from the supply pipe 22 through the by-pass pipe 25 and down the depending pipe 18 and by forcing its way through the blacking in the container 3 displaces the settled constituent or constituents from around the bottom of the depending pipe 18 and causes the said constituent or constituents to be thoroughly mixed with the liquid constituent or constituents in the vicinity of the pipe 18. Thus the blacking is brought into a condition suitable for passage through the pipe 18. The cock 27 on the by-pass 25 is now closed and the cock 26 on the air supply pipe 22 is opened. Compressed air is then able to flow direct from the supply pipe 22 to the spraying nozzle through the pipe 23 and also into the container 3 through the opening 14. By controlling the vent 17, a low, regulatable air pressure is set up in the container 3 to assist in causing the blacking to pass up the depending pipe 18 and along the pipe 20 to the spraying nozzle. The amount passing to the spraying nozzle is controlled by regulating the vent 1. When the blacking reaches the spraying nozzle it fills the annular chamber 32, oozes through the radial passages 34 and fills the annular recess into which the passages 34 open, being then caught by the stream of air which flows along the central passage 33 and passing out of the spraying hole 28 with the said stream in the form of a spray. Owing to the provision of the annular recess at the mouths of the passages 34 and the consequent accumulation of blacking mixture in the said recess, the stream of air is prevented from drying up the blacking in the radial passages 34 or at the mouths thereof and thus causing a blocking of the passages 34. Owing to the proximity of the said recess to the spraying hole 28, the blacking taken by the air stream from the said accumulation arrives outside of the nozzle before the air has time to dry it up. Thus the possibility of clogging of the nozzle is eliminated or reduced.

As the blacking passes up the depending tube 18 an erosion of the settled constituents which remained at a certain distance from the depending pipe 18 takes place, this erosion being assisted by the flow or circulation in the

container of the compressed air introduced by way of the opening 14. Thus the whole or practically the whole of the constituents become mixed to a uniform and correct consistency ready for passage up the depending tube 18 as spraying proceeds.

Should a choking of the pipe 20 or other part of the connection between the depending tube 18 and the spraying nozzle or choking of the spraying nozzle take place, such as when the device is stopped for a time, the cock 26 on the air supply pipe 22 is closed, the vent 17 is closed and the cock 27 on the by-pass pipe 25 is opened, whereupon the whole of the compressed air acts on the pipe 20 and other parts of the said connection and forces the blacking along the same and out of the spraying nozzle, and thus removes the blockage.

By manipulating the cocks 26 and 27 and the vent 17, all of the pipes 20, 23 and 25 can be cleaned out by the compressed air after the work has been finished. Any undesirable sediment by settling to the lowermost part of the container comes to lie in the sump formed by the opening 6 and cap 7 and therefore does not interfere with the action of the device. It can be removed by screwing off the cap 7, whereupon the interior of the container 3 can be emptied and cleaned out if desired, for example by sluicing or rinsing with water.

It will be observed that owing to the method provided in the said device for controlling the mineral blacking, the mineral blacking does not pass through any controlling or regulating member such as a cock or valve, and that the said method of control therefore strongly conduces towards a blockage-free action of the device, and towards a quick and easy placing of the device into condition for use when the mineral blacking has been allowed to settle in and clog parts of the device. Notwithstanding the absence of a control member or members from the spraying nozzle or the connections through which the mineral blacking passes, the force of the spray and the amount of blacking contained therein can be adjusted to suit different requirements, the adjustment being effected by means of the cock 26 and vent 17.

I claim:

1. In a spraying device for applying mineral blacking to foundry molds and comprising a mineral blacking container, a compressed air supply pipe connected to the container, and a compressed air control valve in the said pipe in a position which is in advance of its connection to the chamber, the combination of a valveless spraying nozzle, a compressed air delivery pipe uninterruptably connecting the compressed air supply pipe to the said nozzle, a mineral blacking delivery pipe uninterruptably connecting the said nozzle to the said container, a controllable vent

on the container for controlling the working pressure therein, and a by-pass pipe connected to the air supply pipe at a point thereof which is in advance of the compressed air control valve and also connected to the end of the mineral blacking delivery pipe at a point which is in advance of the connection of the mineral blacking delivery pipe with the said container.

2. In a spraying device for applying mineral blacking to foundry molds and comprising a portable container for the blacking, a compressed air supply pipe connected to the container, control means provided on the supply pipe in advance of its connection with the container, a regulatable air vent provided on the container, a compressed air delivery pipe separate from the blacking delivery pipe but connected to the said nozzle and supply pipe and controlled only by the said control means, the combination of a non-closable and non-regulatable blacking delivery pipe non-closably and non-regulatably connected to the container, a non-closable and non-regulatable spraying nozzle connected to the said pipe, a clearing pipe connected to the supply pipe in advance of the said control means and connected to the blacking delivery pipe in advance of its point of connection with the container, and control means provided on the clearing pipe adjacent the said point of connection.

3. A spraying device according to claim 1, wherein the spraying nozzle comprises a straight central air passage connected at the rear of the nozzle to the compressed air delivery pipe and extending in an uninterupt-

ed manner from the rear to the front of the nozzle, a circular recess in the said passage immediately adjacent the front of the nozzle, a blacking chamber surrounding the said passage, radial blacking apertures provided in the said recess and forming the only means of communication of the said chamber with the said passage and a spraying jet forming a direct continuation of the said recess.

4. In a spraying device for applying mineral blacking to foundry molds and comprising a mineral blacking container, a valve controlled compressed air supply pipe connected to the container, a compressed air delivery pipe connected to the compressed air supply pipe, a separate mineral blacking delivery pipe independently connected to the container, a spraying nozzle connected to the compressed air delivery and mineral blacking delivery pipes and a controllable air vent on the container, the combination of a feed pipe depending into the container and connected to the blacking delivery pipe with a branch pipe leading direct from a point in the compressed air supply pipe which is not affected by the valve control to the upper end of the said feed pipe and a valve on the branch pipe whereby compressed air can be driven at will down the feed pipe only in contra-direction to the flow of mineral blacking up the said feed pipe.

In testimony whereof, I have signed my name to this specification at Manchester, in the county of Lancaster, England, this 22nd day of March, 1927.

JAMES DEAN.