Aug. 25, 1953 G. A. HARKER ET AL 2,650,080

WASTE COATING MATERIAL LOCALIZER

Filed May 16, 1950 3 Sheets-Sheet 1

Fig. 1.

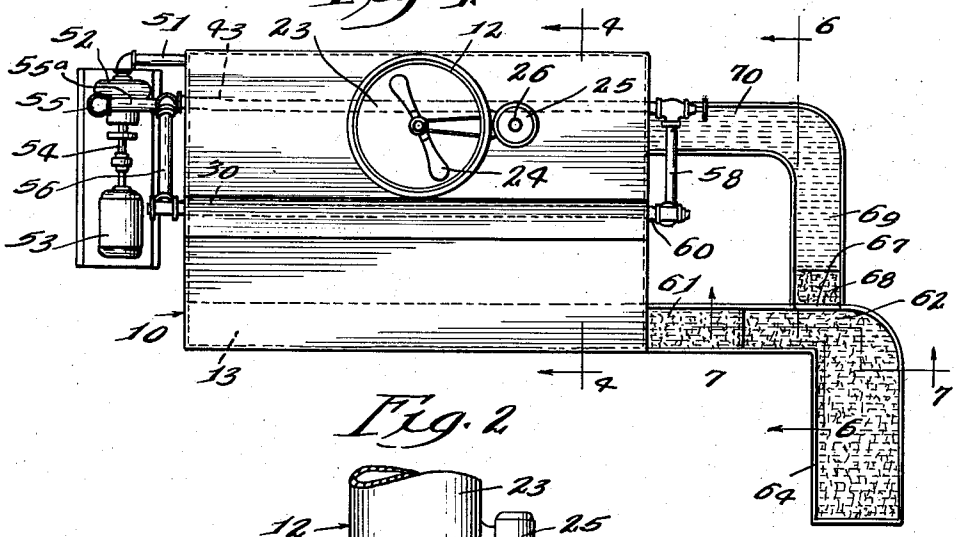


Fig. 2

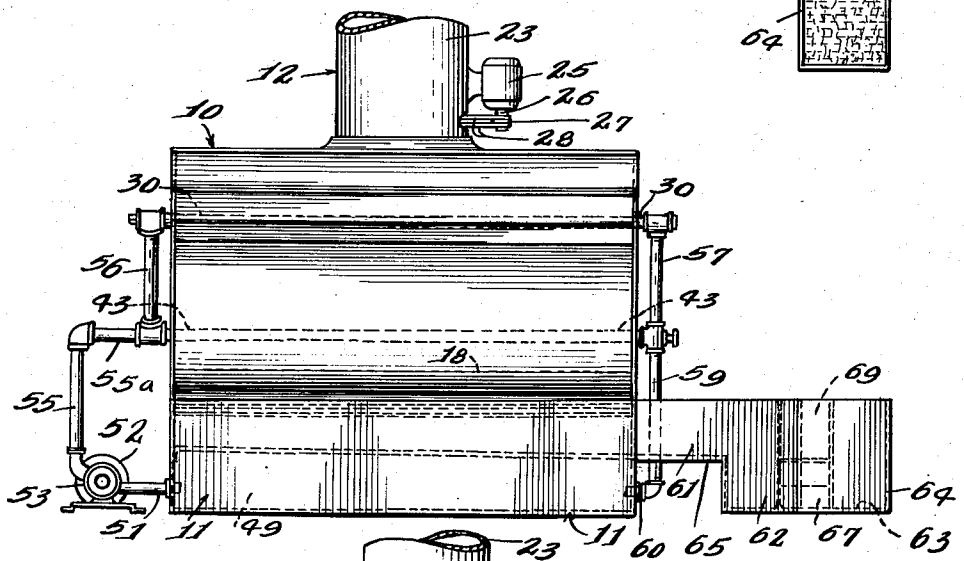
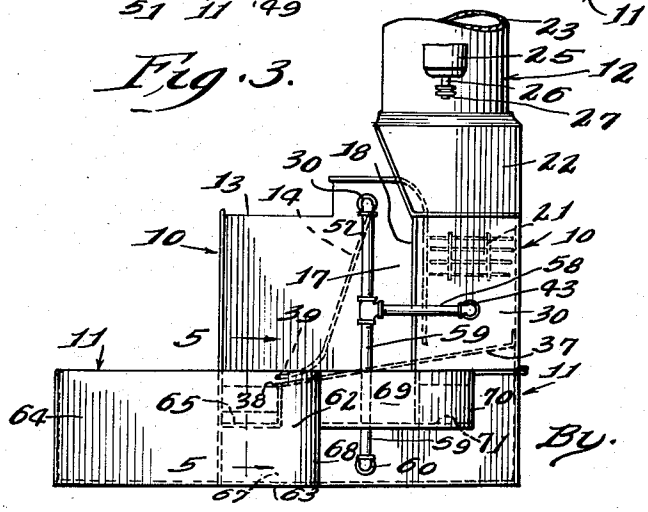


Fig. 3.



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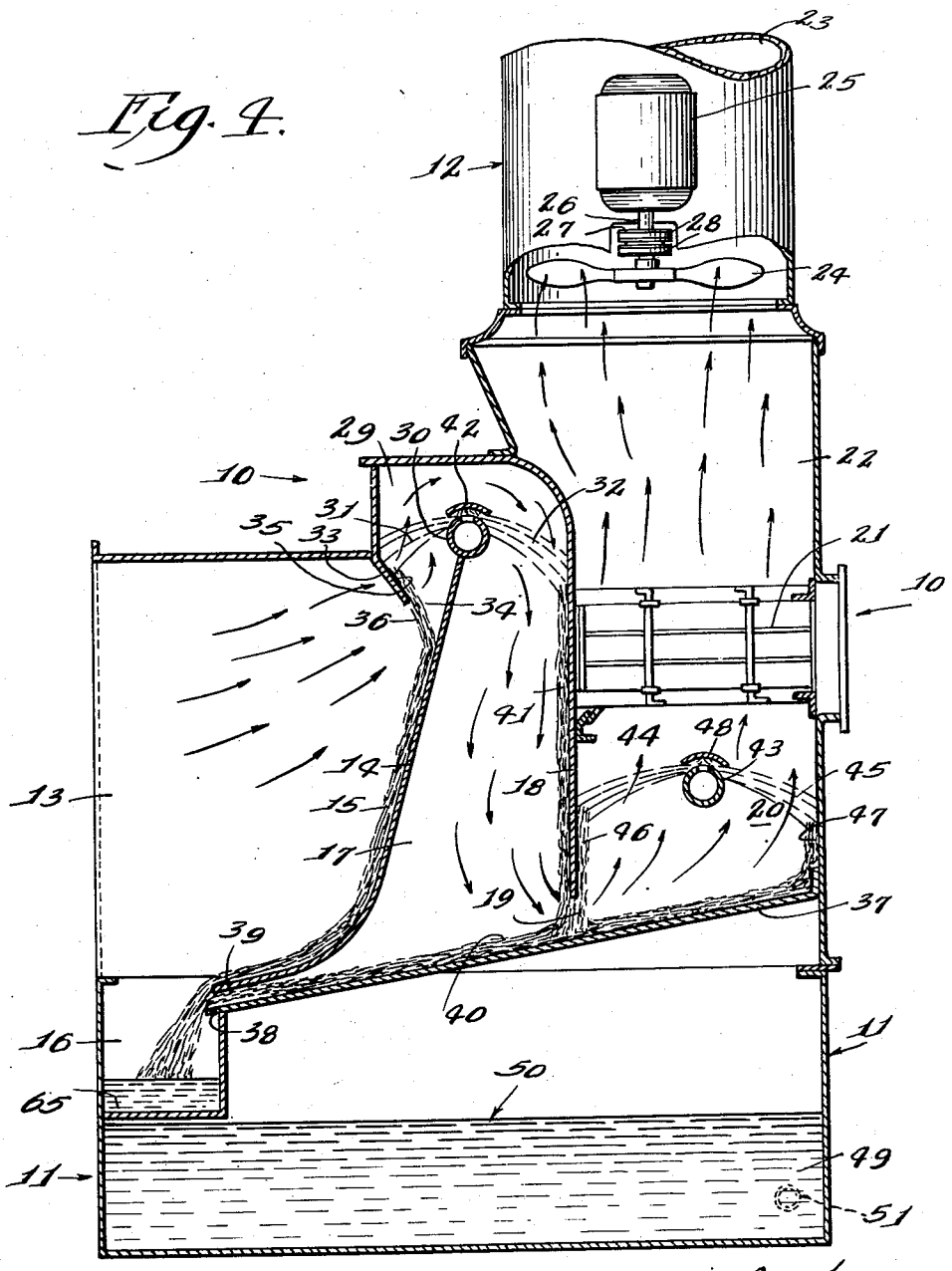
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Filed May 16, 1950 3 Sheets-Sheet 2

Fig. 4.



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Filed May 16, 1950 3 Sheets-Sheet 3

Fig. 5.

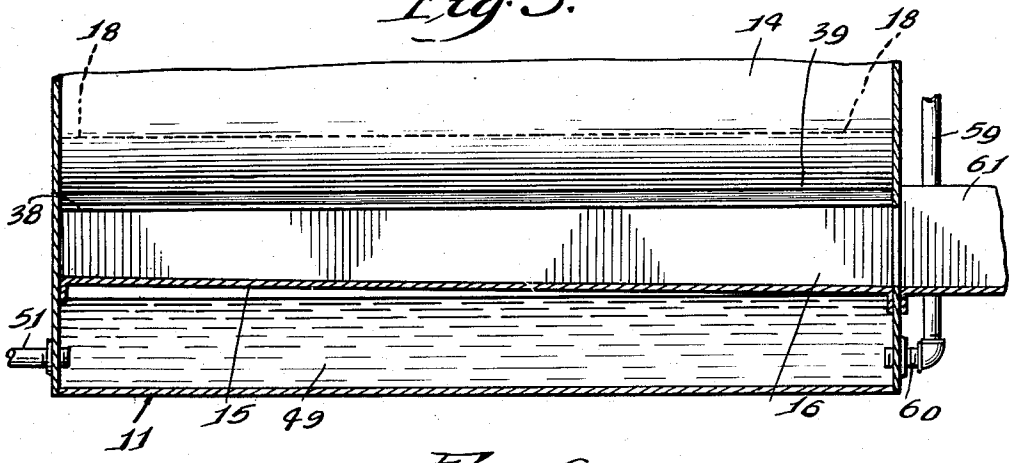


Fig. 6.

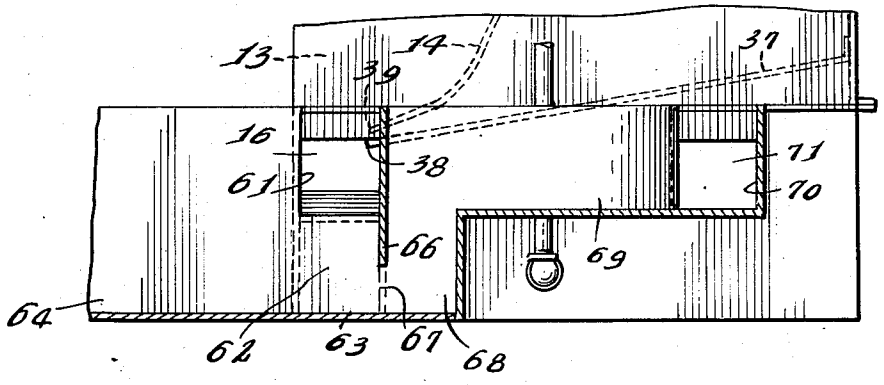
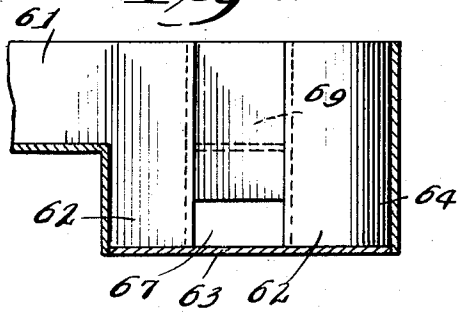


Fig. 7.



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Patented Aug. 25, 1953 2,650,080

UNITED STATES PATENT OFFICE

2,650,080

WASTE COATING MATERIAL LOCALIZER

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Application May 16, 1950, Serial No. 162,244

8 Claims. (Cl. 261—8)

1

The present invention relates to the art of coating, such as spray coating with such means as spray guns or the like, and wherein the coating is performed at a locus where the over spray or coating material that is not applied to the surface or article intended, is captured, as in a spray booth or the like, and is reclaimed, as in the form of a foam, or froth, or scum, or similarly, for the ultimate purpose of preventing the contaminating of the atmosphere with such coating material.

An object of the invention is to provide a novel means for collecting and localizing collected waste coating material, such as paint or the like.

Other objects, advantages, capabilities, features, and the like are comprehended by the invention as will later appear, and as are inherently possessed by the invention.

Referring briefly to the drawings;

Fig. 1 is a top plan view of a device constructed in accordance with the invention;

Fig. 2 is a front view in elevation of the device as shown in Fig. 1;

Fig. 3 is an end view in elevation of the same;

Fig. 4 is a transverse sectional view, on an enlarged scale, taken in a plane represented by line 4—4 in Fig. 1 of the drawings;

Fig. 5 is a fragmentary sectional view taken in a plane represented by line 5—5 in Fig. 3 of the drawings;

Fig. 6 is a fragmentary sectional view taken in a plane represented by line 6—6 shown in Fig. 1 of the drawings; and,

Fig. 7 is a fragmentary sectional view taken in a plane represented by line 7—7 shown in Fig. 1 of the drawings.

Referring more in detail to the drawings the device as shown comprises, in general, an upper air cleaning structure portion 10, a lower washing structure 11, and a delivery structure 12 for cleaned air or the like.

The structure 10 has a spray or like receiving chamber 13 (see Fig. 4 in particular) having a wash wall or apron 14 or the like over which flows down a sheet of liquid, as water 15, for washing down or carrying down waste spray or the like of coating material, such as paint or the like, down in a well or cross-channel or duct 16.

At the rear of the wash wall or apron 14 is a wash chamber 17 having a rear wall 18 having a lower opening 19 for affording flow of fluids from the chamber 17 to a rear wash chamber 20 for the upward flow or movement of air, moisture, and eventually freed of suspended particles of coating material and the like, to and through a suitable eliminator 21 and thence to an upper chamber 22 of the rear wash or cleaning chamber 20. To the upper end of the chamber 22 is an outlet duct or the like 23 in which may be located a suitable suction or exhaust fan or the like 24 operated by a suitable motor 25 by way of a motor shaft 26, pulley 27 and belt or the like 28 operatively connected to the fan or the like 24.

2

At the upper portion or end of the chamber 17 and part of the chamber 13 is a chamber 29, which may be called a reverse flow chamber, in which is a spray means 30, in the form of a duct having means for spraying sheets 31, 32 or the like of water or other cleaning or washing fluid across the flow of air or the like through such sheets 31, 32. The sheet 31 strikes an inclined wall 33 dipped toward the apron 14 and running short thereof to provide therebetween a gap 34 for the flow of a sheet of liquid 35 on the wall 33 and a sheet of liquid 36 across the gap 34 to the apron 14 to flow down as a sheet 15 over said apron 14.

At the lower portion of the structure is an inclined wall 37 beneath the chamber 20 and also beneath the chamber 17 and leading to the duct 16 and having a discharge lip 38 spacedly below the discharge lip 39 of the apron 14 for flow of water and carried particles of coating material 40 over the inclined wall 37 and lip 38, and water and carried particles of coating material 15 over the apron 14, and lip 39, into the cross duct 16 (see Fig. 4).

Referring back to the spray duct 30 the sheet 32 spraying rearwardly contacts the wall 18 and forms a descending sheet 41 of water and particles to the lower end of the wall 18 and across the opening 19 to the inclined wall 37. Over the duct 30 may be a deflector plate or member 42 for directing the sheets of water 31 and 32 to and toward the walls 35 and 18 respectively.

The flow of laden air is from the chamber 13 (see arrows) through the water sheet 36 where some of the suspended or carried particles of coating material will be washed down with the liquid sheet 36 to the sheet 15 and thence to the duct 16; and the air flows up to and through the sheet 31 for further washing out of coating material particles in the sheet 15 etc; and then the air makes a half turn or whip snap in the upper part of the chamber 29 and passes through the sheet 32 for further removal of the coating material particles to the sheet 18 and thence to the sheet 40 and to the chamber or duct 16.

In the chamber 20 is a liquid duct 43 for spraying liquid sheets 44, 45 across the chamber 20,

to extract further particles of coating material that might still be in the air rising in the chamber 20, and to flow down in sheets 46, 47 on the walls of the chamber 20 to the wall 37, the former to flow across the opening 19 to the sheet 40 on the wall 37. Above the duct 43 is a deflector 48 for forming the sheets 44, 45.

Thus as the air or the like moves up through the sheet of liquid 36 in the gap 34 and then up through the sheet of liquid 31, and then reverses its general upward movement, reverses its path in the chamber 29 to then pass down through the sheet of liquid 32 and thence downward in the chamber 17 and to and through the lower opening 19 below the wall 18 and above the wall 37 also through the liquid sheet or sheets 41 and 46 flowing down the forward and rear surfaces of the lower portion of the wall 18 and across the gap or opening 19 to the liquid sheet or the like 40 flowing down the inclined wall 37 to the trough or cross duct 16 (see Fig. 4). And then the air flows upward in the chamber 20 through the sheets of liquid 44, 45 for further washing out of particles of coating material that might be present, and thence to and through the eliminator device 21, of any suitable structure, to eliminate moisture, and the like from the air, which will drip or the like down in the chamber 20 to the sheet of water 40 flowing down the wall 37, and also flow down the inner sides of the walls of the chamber 20 to also unite with the sheets of water 46, 47 flowing down to the wall 37 and sheet 40 thereon. The air passing up through the chamber 22 and to the fan 24 and by way of duct 12 is practically clean and dry.

Referring now to the lower structure 11 it normally contains therein a wash or cleansing liquid, as water 49, to a normal level as indicated at 50 (see Fig. 4) and at an end of said chamber 11 (see Figs. 1 and 2) is an intake pipe 51 leading to a pump 52 or the like suitably driven or operated by a suitable motive member, such as a motor 53, by way of a suitable power connection, such as a shaft or the like 54. The pump has an outlet duct or the like 55, 55a leading by way of a duct 56 connected to the spray duct 30, and the duct 55, 55a is also suitably connected to the duct 43. At the other ends the ducts 30 and 43 are connected by ducts 57, 58 both of which are connected by way of a duct 59 (see Figs. 1, 2, 3) to a return duct 60 into the tank 11 and to the liquid 49 therein.

The chamber or channel part 16 has an outward or lateral extension 61 (see Figs. 1, 2 and 5) leading to a well 62 having a floor 63 forming the rear end, so to speak, of a chamber 64, this floor being at a lower level than the floor 65 of the chamber or duct 16 so liquid and collected coating particles usually floating on the liquid will flow from the duct 16 into the well or well portion 62 where the liquid and floating particles of coating material on the liquid will move to and spread in the forwardly extending chamber 64. In that chamber may be located any suitable means for engaging and removing such accumulated and floating material and to bring it out of the chamber 64, while the cleared water remains in the latter. It is not deemed necessary to show such removing means.

The rear wall 66 (see Fig. 6), so to speak, of the well has a low opening 67 behind which is a water well 68 leading up to a flow back channel or the like 69 (see Fig. 1 too) having a return arm 70 leading to an opening 71 to afford communication with the interior of the lower structure

11 and also for the clear or cleared liquid to return to and replenish the liquid 49 in the chamber 11 and, hence, to be used over again and again.

In the operation, the liquid sprayed from the ducts 30, 43 while collecting, or trapping stray coating particles, will flow down to the well or duct 16 and flow to the well portion 62 of the chamber 64 and move to and into the chamber 64 to sort of become more or less quiet where the floating coating particles will be available to any suitable means as above mentioned to engage and carry out the collected and floating material or the like therein formed on the water in the chamber 64. The cleared liquid will move through the opening 67 to the well 68 and return by way of the ducts or channels 69, 70 and port 71 to the liquid 49 in the liquid chamber 11. The liquid 49 serves as a reservoir from which the pump 52 draws or drafts its supply and supplies it to the ducts 30, 43 to form cleaning or washing sheets of liquid as above described and herein disclosed.

While we have herein described and upon the drawings shown an illustrative embodiment of our invention, it is to be understood that the invention is not limited thereto, but comprehends other constructions, arrangements of parts, details, features, or the like without departing from the spirit of the invention,

Having thus disclosed the invention, we claim:

1. A waste coating material localizer for a spray receiving chamber having an inclined wall over which flows a sheet of liquid for capturing fugitive particles of coating material and to flow down with the same to the lower end thereof, an elongated channel formed receptacle having an open top near the lower end portion of said inclined wall for directly receiving throughout the length of said channel and along the base of said inclined wall said liquid and fugitive particles of coating material, said channel at an end thereof and spacedly beyond said chamber and said inclined wall being provided with a receiving and settling well which is in direct communication with said channel for the flow into said well from said channel of said liquid and material, said well extending down from said channel to receive the liquid and material at a lower level than in said channel where said liquid and material will be at rest for settling of said material in said well, and means for conducting the liquid cleared of said material from said well.

2. A device as set forth in claim 1, and wherein said receiving well is provided with an opening at the rear part thereof, and a clear liquid collecting well exteriorly of said settling well and in communication with said opening for the receiving therein of said cleared liquid.

3. A device as set forth in claim 1, and wherein said receiving well extends forwardly and transversely of said channel to provide ample room for the settling of said material therein.

4. A device as set forth in claim 3, and wherein said receiving well is provided with an opening at the rear part thereof, and a clear liquid collecting well exteriorly of said settling well and in communication with said opening for the receiving therein of said cleared liquid.

5. A device as set forth in claim 1, and wherein said receiving well is provided with an opening at the rear part thereof, and a clear liquid collecting well exteriorly of said setting well and in communication with said opening for the receiving therein of said cleared liquid, and a flow-back channel connected to said clear liquid col-

lecting well for feeding back said clear liquid.

6. A device as set forth in claim 5, and wherein said flow-back channel has a return arm portion provided with an opening for the flow therethrough of said clear liquid.

7. A device as set forth in claim 6, and wherein is provided a clean liquid chamber in communication with said back-flow return arm portion of said back flow channel by way of said opening of said return arm.

8. A device as set forth in claim 7, and wherein is provided a pump means for supplying clear liquid from said latter chamber to said inclined wall for flow of said sheet of liquid for said

capturing of fugitive particles of coating material.

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