June 13, 1950 H. B. EINBECKER 2,511,626

APPARATUS FOR PRODUCING SPATTER FINISH COATINGS

Original Filed April 17, 1942 2 Sheets-Sheet 1

Fig. 1.

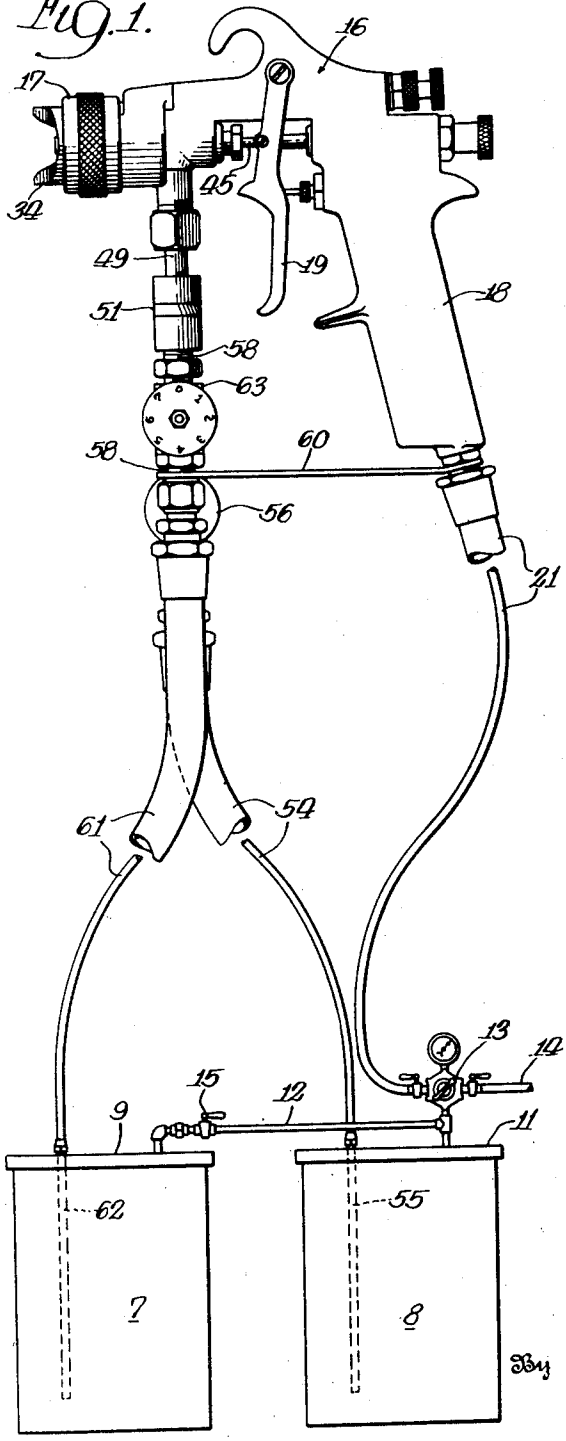


Fig. 2.

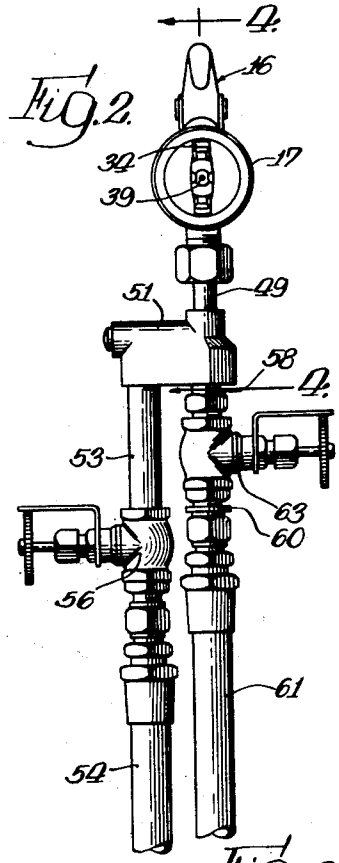
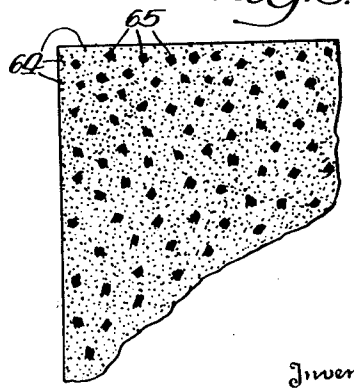


Fig. 3.



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Fig. 4.

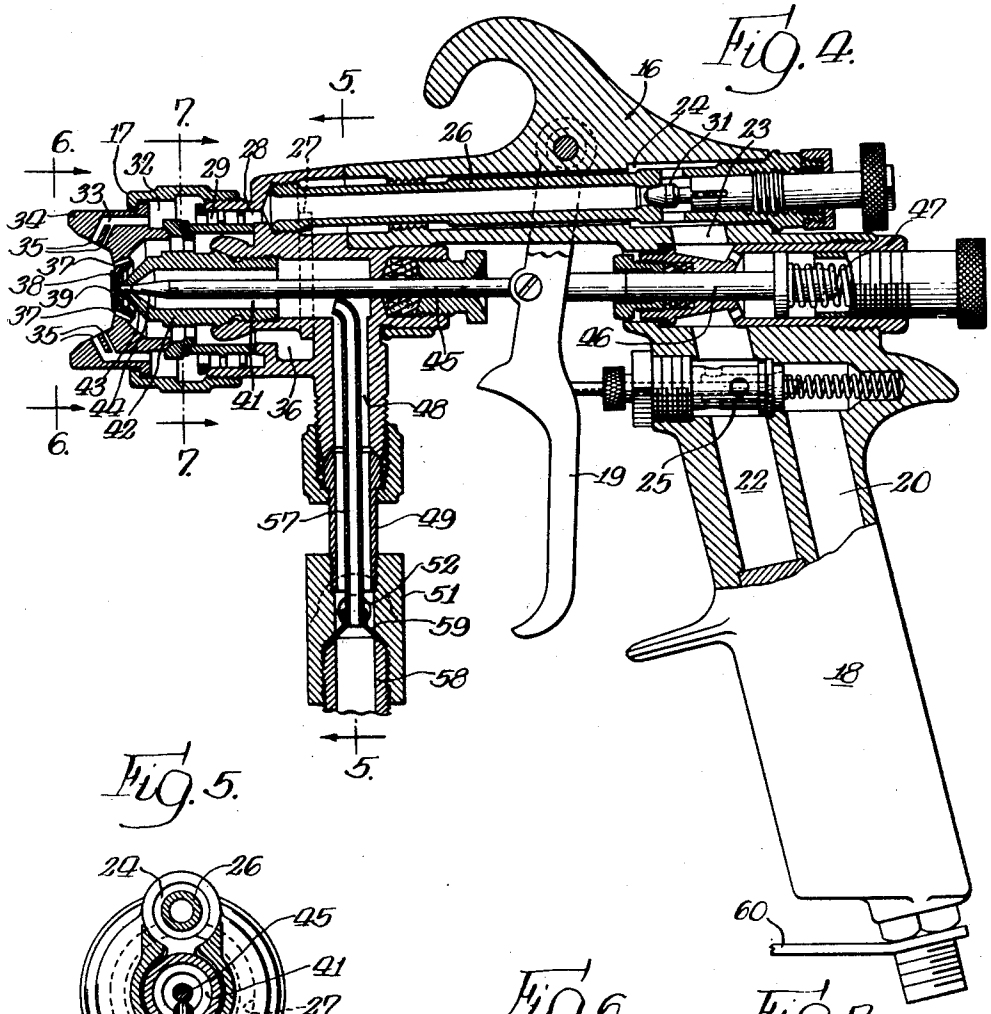


Fig. 5.

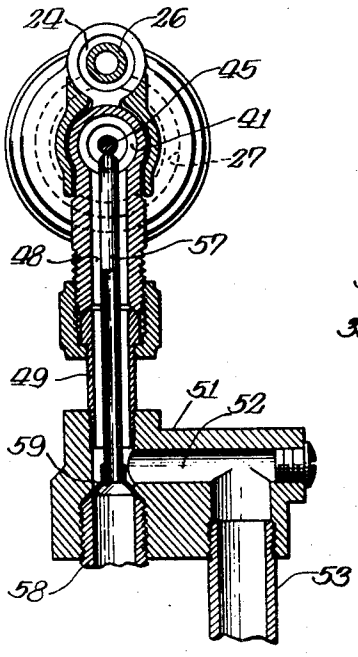


Fig. 6.

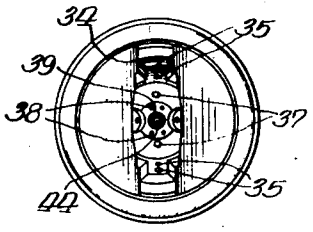
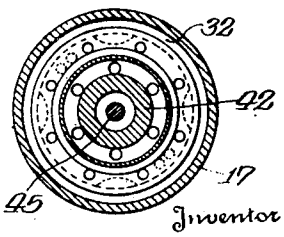


Fig. 7.



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APPARATUS FOR PRODUCING SPATTER FINISH COATINGS

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Original application April 17, 1942, Serial No. 439,361. Divided and this application October 2, 1946, Serial No. 700,702

3 Claims. (Cl. 299—140)

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This invention relates to surface coatings and particularly to apparatus for producing the same, and aims to produce a spatter finish coating of uniform pattern, attractive appearance and durable wearing qualities. The invention enables such an improved finish to be produced by one application of paint instead of a plurality of applications, which have heretofore been required for the production of a spatter finish.

Spatter finishes are desirable on many commercial products, particularly those rougher metals which do not produce a smooth appearing finish. The pattern effect, as produced by spatter finishes, tends to break up the reflection, and the roughness of the metal is considerably less noticeable than if a solid color were used.

In applying spatter finishes consisting of two or more contrasting colors distributed to give a freckled or mottled effect, it has heretofore been necessary to go over the surface at least twice, that is, once for each color comprised in the finish. The first color application would completely cover the surface. After this color was applied, the product was returned for the application of another color which was imposed upon the first color in spots or blotches distributed over the first color with such uniformity as the skill of the applier would permit. Usually both colors were applied with a paint spray gun, the first color being the basic or background coating and the second color being applied in droplets of substantial size scattered over the first coating. This second application necessitated a second handling operation before the coated product could be fabricated or shipped, as the case might be.

In addition to the labor cost involved in making two or more independent applications of color, and in the incident handling and rehandling of the product, further disadvantages in the product itself resulted from the multi-operation method just explained. One objection was the non-uniformity in the appearance of the product. This was occasioned by the fact that in applying the second color it was practically impossible for the operator to apply the spatters with uniformity. Any slight variation in the rate of movement of the gun relatively to the surface being sprayed would produce a concentration or a sparseness of spatters in accordance with the speed variations. Another objection was that the spots or spatters of one color which were imposed upon the solid background of another color would, if the coated product was subjected to abrasion become worn off, leaving

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only the solid color exposed in the effected areas. A product thus easily disfigured presented an unattractive and unsatisfactory appearance.

My present invention aims to provide an improved product over the product of the multi-operation process, and to reduce the cost of manufacture by eliminating a substantial portion of the time and labor involved. The superiority of the product produced by my apparatus resides in the uniformity of the finish, in which the spots or spatters are uniformly distributed, instead of being concentrated over some areas and sparsely applied over others. Furthermore, my improved finish is more uniform in its wearing qualities because the plurality of colors are applied simultaneously and constitute a single integral coat which at any point is the same color throughout the thickness of the coat, as distinguished from the finishes heretofore produced in which the spattered color is superimposed upon a previously applied coat, and is consequently easily worn off, leaving in such effected areas only the one color background coat.

My invention, in addition to improving the character and quality of the product, also greatly reduces the cost of production by applying the multi-colors simultaneously to the surface. This method requires only one application of color and consequently materially reduces the application costs as well as eliminating several handlings of the product.

For the purpose of facilitating an understanding of my invention, I have disclosed on the accompanying drawings one practical and preferred apparatus by means of which the improved spatter finishes may be produced.

Referring to the drawings,

Fig. 1 is an elevation of an apparatus constructed in accordance with the principles of my invention;

Fig. 2 is a fragmentary view looking toward the right at Fig. 1;

Fig. 3 is a fragmentary face view roughly exemplifying a surface coated in accordance with my invention;

Fig. 4 is a sectional view through the spraying device shown in Fig. 1;

Fig. 5 is a sectional view on the line 5—5 of Fig. 4;

Fig. 6 is an end view of the nozzle viewed on the line 6—6 of Fig. 4; and

Fig. 7 is a sectional view on the line 7—7 of Fig. 4.

Referring to the drawings more in detail, ref-

erence characters 7 and 8 indicate a plurality of liquid receptacles each adapted to contain a pigment carrying liquid, such as paint, the liquid in each receptacle being of a different color from that in the other receptacle or receptacles. While only two receptacles are here shown for illustrative purposes, it will be apparent hereafter that more than two colors may be employed, if desired, in the production of a spatter finish coat. The colors, whether two or more, are delivered simultaneously to a receiving chamber, from which they are discharged in a composite stream and applied to a surface in a manner hereinafter disclosed.

In order to obtain a spatter effect, it is necessary that the plurality of colors employed do not blend or intimately mix so as to produce or give the effect of a homogeneous intermediate color. This result is accomplished by employing substantially immiscible liquids as the pigment carriers in the various receptacles exemplified by 7 and 8. The degree of immiscibility required for satisfactory results does not necessarily involve the employment of carriers basicly foreign in character. On the contrary basicly similar carriers differing sufficiently in consistency or viscosity to inhibit blending together in the receiving chamber will meet the immiscibility requirements. It should therefore be understood that the word "immiscible" is used herein in that broader sense.

The receptacles 7 and 8 are provided with hermetically sealable covers 9 and 11, respectively, through which air under pressure is introduced from a common branch pipe 12 connected through a reducing valve 13 by means of a pipe 14 with a source of air under pressure. It will be observed that, since the supply branch 12 is connected with both receptacles, these receptacles will be under a common pressure. A shut-off valve 15 is provided to render receptacle 7 inoperative by cutting off its air supply, in the event that it should become desirable to use the apparatus in some particular instance for the application of a single color only.

The colors are applied with a tool resembling in outside appearance an ordinary spray gun, but differing from the ordinary gun in that it comprises a liquid receiving chamber having a plurality of connections thereto through which the liquids from the plurality of containers are simultaneously delivered into the chamber. Except for those structural features incident to the simultaneous handling of a plurality of liquids, the structural details of the gun may be of standard or any preferred form. It will accordingly be unnecessary to describe in detailed particularity the well known features of the gun here shown for illustrative purposes.

Generally speaking, such a gun comprises a handle by which it may be held and manipulated, a nozzle from which liquid and compressed air are discharged, and suitable passages and valves by which the discharge of air and liquid are controlled.

Referring to Figs. 1 and 4 illustrating a gun of this general character, the body of the gun is indicated by 16, the nozzle generally by 17, the handle by 18, and the valve controlling lever or trigger by 19. The handle includes a passage 20 which is connected by a flexible conduit 21 to the air supply pipe 14 through the valve 13. This valve is so constructed that the pressure delivered to conduit 21 is greater than that delivered to the branch 12 supplying the receptacles 7 and 8, or, if preferred, two pressure reducing valves may be employed. In either event, the pressure delivered through conduit 21 should be about one-third greater than that delivered to the liquid receptacles. I have found that excellent results are obtainable by employing an air pressure of approximately thirty pounds in the liquid receptacles, and a pressure of about forty pounds in the conduit 21, although my invention is in no wise limited to the utilization of these particular pressures. The passage 20 communicates with a second passage 22 which communicates through a port 23 with the rear portion of the bore 24. A main, normally closed, shut-off valve 25 is provided in the passage 22, and is adapted to be opened by operation of the trigger 19 in a well known manner.

The bore 24 opens at the rear end of the body 16 to receive a tube 26 which is threaded at its forward end in a restricted portion of the bore 24 in advance of a port 27, and the forward end of the tube communicates with the orifice 28 through which air is supplied to the chamber 29. The flow of air through the tube 26 will be regulated by a valve 31, and this air is delivered from the chamber 29 through the annular chamber 32 into the passage 33 in the head 34 of the nozzle, from whence it is discharged from the nozle openings 35 diagonally toward the longitudinal axis of the gun. The air from the bore 24 surrounding the tube 26 passes through the annular port 27 into the chamber 36, from which it is discharged at the nozzle through the ports 37, 38 and 39.

A receiving chamber 41, formed by a bore in the housing 16 and a tubular extension 42 threaded into the bore, is provided with a discharge orifice 43 positioned coaxially with the nozzle head 34. The discharge orifice is controlled by a valve 44 carried by a stem 45 which is connected with the trigger 19. A plunger 46 and an expansion spring 47 normally urge the valve 44 into position to close the orifice 43 and hold the trigger in the position shown in Fig. 4.

The receiving chamber 41 is connected to receive liquids simultaneously from the containers 7 and 8. A passage 48 communicating with the rear end of the chamber is connected by a coupling 49 with the interior of a head 51 having a laterally extending passage 52 which is connected, through a pipe 53, with a flexible conduit 54. Conduit 54 in turn is connected to the upper end of a pipe 55 extending downwardly into the container 8. A regulating valve 56 interposed in the pipe 53 affords provision for regulating the flow of liquid from the container 8 into the receiving chamber 41.

Within the passage 48 is disposed a tube 57 opening at its upper end into the chamber 41 and at its lower end into a pipe 58 threaded into the head 51. A frustro-conical partition 59 into which the lower end of tube 57 is threaded affords support for the tube and separates the interior of pipe 58 from the head passage 52. A continuation of pipe 58 is connected to a flexible conduit 61, which in turn is connected with the upper end of pipe 62 extending downwardly into container 7. A regulating valve 63 interposed in pipe 58 affords provision for regulating the flow of liquid from container 7 into receiving chamber 41. Rigidity is added to the structure by a brace bar 60 cross-connecting the lower end of the handle 18 with the pipe 58.

My improved apparatus is employed in accordance with the invention in the following manner. Assuming that the containers 7 and 8 are filled

or partially filled with substantially immiscible liquids impregnated with pigments of the desired contrasting colors, air pressure of, for instance, thirty pounds is applied to the liquids in the containers and a higher air pressure is delivered to the spray gun through the conduit 22. The operator grasps the gun, directs the nozzle toward the surface to be coated, positions it the requisite distance from such surface, and pulls the trigger 19 to the right viewing Figs. 1 and 4. This action opens the air valve 25, permitting a flow of air under pressure to the nozzle and its discharge therefrom in converging jets through the orifices 35, 37, 38 and 39. Simultaneously the valve 46 is opened, permitting the discharge through the orifice 43 of a composite stream of the contrastingly colored liquids which have been received in the chamber 41 from the containers 7 and 8 through the tube 57 and passage 48, respectively. The issuing composite stream of substantially immiscible contrastingly colored liquids is disseminated by the converging higher pressure air jets into droplets of various sizes which are directed toward and deposited upon the surface to be coated. The size of the disseminated droplets will be determined to some extent by the viscosities of the liquids constituting the issuing stream. Consequently, it is usually desirable to utilize for the carrier of the color which is to appear predominant as spots or spatters a liquid of a higher viscosity than the liquid carrying the background color. If the liquids be of substantially equal viscosity, neither color will predominate in the spots or spatters of the finish.

In Fig. 3 I have attempted to crudely illustrate the spatter finish contemplated by my invention. On this figure, which represents a fragment of a coated surface, the color of lesser viscosity which forms the background is indicated by the smaller dots 64, while the predominantly larger spots or spatters of the contrasting color, and which result from the larger droplets of the liquid of higher viscosity, are indicated by reference character 65.

It will be apparent from the foregoing that the color effect or appearance of the coating may be varied by utilizing pigment carrying liquids of various viscosities and also by regulating the relative proportions of the individual liquids used through the setting of the control valves 56 and 63.

It will also be manifest that the coating produced by my method is unitary and integral as distinguished from a coating composed of two or more superposed separately applied coats and that the color presented to view at any point in my coating extends substantially through the entire thickness of the coating at such point.

While I have shown and described one practical apparatus for carrying my method into effect, it should be understood that the details thereof, as well as variations in the steps of the method, may be resorted to without departing from the spirit of the invention as defined in the following claims.

This application is a division of my copending application Serial No. 439,361, filed April 17, 1942, now abandoned for Spatter finish coating and method and apparatus for producing the same.

I claim:

1. In a spray gun apparatus comprising a gun body defining a liquid receiving chamber and having a discharge orifice communicating with said chamber at one end thereof for discharging a liquid stream therefrom and a single inlet opening into said chamber, a liquid control valve associated with said orifice for opening and closing the same, air passages in said body for receiving air under pressure and exhausting the same as a plurality of atomizing jets into the path of liquid discharged from said orifice, an air control valve controlling the admission of air to said passages, and manual control means for simultaneously opening both of said valves; the combination of a plurality of conduits separately opening into said chamber through said single inlet opening, means for propelling a corresponding plurality of different liquids under a common superatmospheric pressure into said chamber through said conduits respectively and from said chamber through said orifice as a composite stream, and means associated with said conduits for fixing at selected predetermined relative proportions the respective rates of flow of liquids therethrough, said last mentioned means being independent of said manual control means for said air control valve and said liquid control valve.

2. In a spray gun apparatus comprising a gun body defining a liquid receiving chamber and having a discharge orifice communicating with said chamber at one end thereof for discharging a liquid stream therefrom and a single inlet opening into said chamber, a liquid control valve associated with said orifice for opening and closing the same, air passages in said body for receiving air under pressure and exhausting the same as a plurality of atomizing jets into the path of liquid discharged from said orifice, an air control valve controlling the admission of air to said passages, and manual control means for simultaneously opening both of said valves; the combination of a pair of conduits separately opening into said chamber through said single inlet opening, means for propelling a pair of different liquids under a common superatmospheric pressure into said chamber through said conduits respectively and from said chamber through said orifice as a composite stream, and means associated with said conduits for fixing at selected predetermined relative proportions the respective rates of flow of liquids therethrough, said last mentioned means being independent of said manual control means for said air control valve and said liquid control valve.

3. The apparatus of claim 2 in which a first one of said conduits is connected to said single inlet opening for conducting one liquid into said chamber, and the other of said conduits extends into and through the first of said conduits for conducting a second liquid through said single inlet opening and into said chamber.

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