

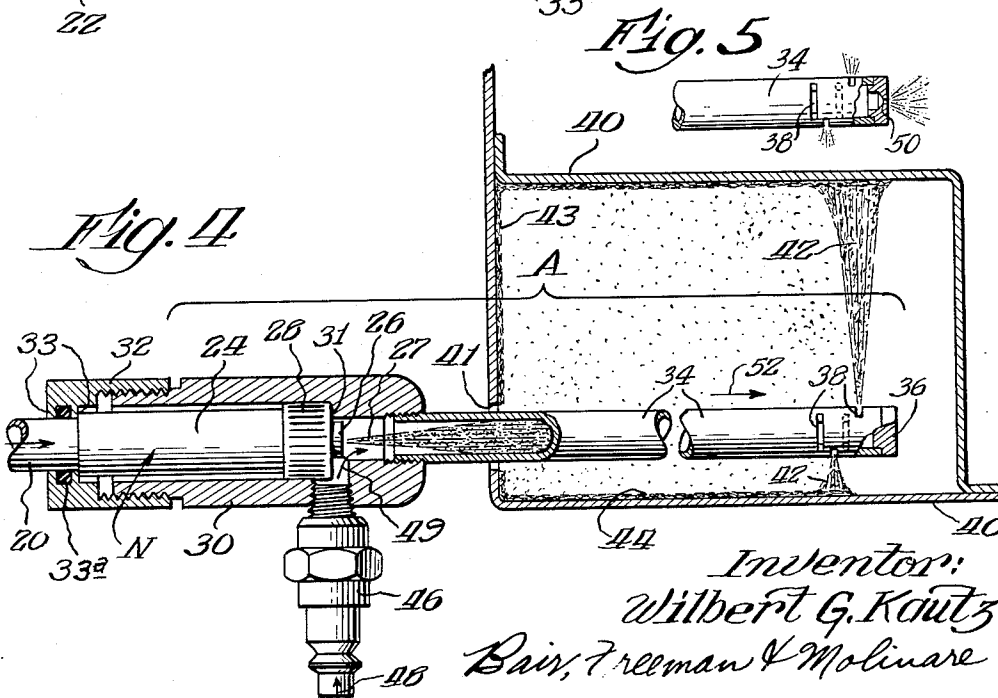
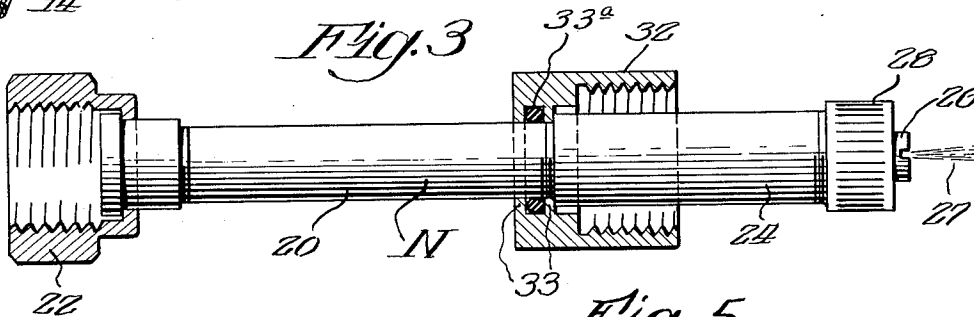
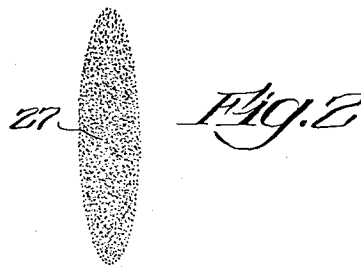
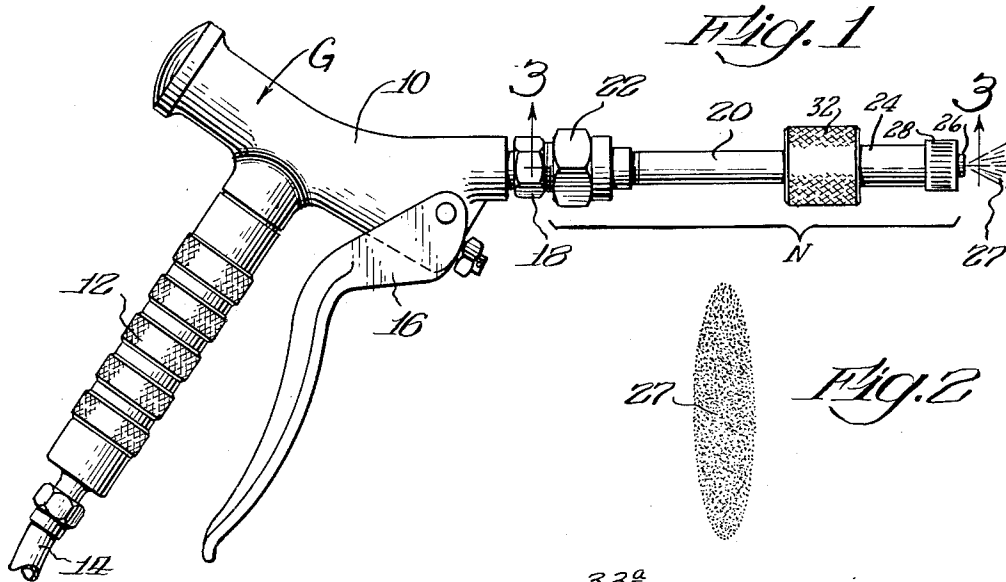
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W. G. KAUTZ

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AIR ATOMIZER FOR AIRLESS SPRAY GUN

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Inventor:

Wilbert G. Kautz

Bair, Freeman & Molinare

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AIR ATOMIZER FOR AIRLESS SPRAY GUN

Wilbert G. Kautz, West Unity, Ohio, assignor to The Aro Corporation, Bryant, Ohio, a corporation of Ohio
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This invention relates to an air atomizer in the form of an attachment for an airless spray gun.

In the field of automobile preservation, an effective anti-rust undercoat program is desirable, and involves not only the objective of anti-rust underbody undercoating but the objective of anti-rust body undercoating. Heretofore underbody undercoating has been practiced wherein anti-rust material is applied to the underbody chassis and running gear which give considerable protection to the vehicle but does not protect the automobile body itself from the scourge of rusting. A really effective anti-rust program must include those areas within the body itself where corrosion starts and advances through the thickness of the metal and finally appears as unsightly rust on the outside surface of the body where it is readily seen. This rust appears at fender beads or lips, front and rear bumper splash panels, headlight areas, rocker panels, and in certain areas of vertical posts, doors, trunk lids and the like, many of which are "boxed in" areas difficult to get at with the ordinary type of spray equipment.

For undercoating the underbody, an "airless" spray nozzle is preferable to minimize overspray or fogging, but in box sections such as doors, posts and the like which are usually accessible only through blind openings, airless spraying is not suitable. On the other hand, a "fog" spray from a discharge tube or "wand" is much more efficient for this purpose providing the end of the wand is completely or nearly closed and there are discharge openings 360° around the circumference of the wand adjacent such end.

Accordingly an object of my invention is to provide an air atomizer to produce fog spray when used in conjunction with an airless spray gun, the atomizer being in the form of an attachment for the airless spray nozzle instead of having to use two separate spraying devices, one the airless spray nozzle and the other a fog-spray nozzle.

Another object is to provide an air atomizing attachment that can be removed for normal use of the airless spray nozzle or readily attached for using the spray gun with its airless spray nozzle and the attachment as a fog-spray gun particularly suitable for spraying the inside surfaces of box sections.

Still another object is to provide the combination with an airless spray gun nozzle of a hollow body to fit over the nozzle, an elongated spray tube being carried by the hollow body in alignment with the discharge orifice of the nozzle and the spray tube having a closed end remote from the nozzle and provided with a lateral discharge openings inwardly of this closed end, means being provided to introduce air under pressure into the body between the nozzle and the spray tube to fog material from the nozzle as it is discharged from the discharge openings of the spray tube.

Still another object is to provide a particular form of discharge tube in which the discharge openings comprise slots laterally of the tube and arranged in different radial directions around the tube.

Still a further object is to provide an attachment in the form of a collar rotatable on and sealed relative to the nozzle, the hollow body and its discharge tube wherein the body is screw-threadedly connected with the collar and thereby removable from the collar and the nozzle to

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permit normal functioning of the nozzle for airless spraying.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my air atomizer for an airless spray gun, whereby the objects above contemplated are attained, as hereinbefore more fully set forth, pointed out in my claims and illustrated in detail on the accompanying drawing, wherein:

FIG. 1 is a side elevation of an airless spray gun with which my air atomizer may be associated, the nozzle of the gun having a collar thereon for screw-threaded connection of the air atomizer attachment thereto;

FIG. 2 illustrates the pattern of the hydraulic spray from the airless spray gun;

FIG. 3 is an enlarged sectional view on the line 3-3 of FIG. 1;

FIG. 4 shows my air atomizing attachment associated with the spray nozzle and illustrates the operation thereof for coating the interior of a box section of an automobile or the like, and

FIG. 5 shows a modified discharge tube.

An airless spray gun G is shown in FIG. 1 provided with an airless spray nozzle N. The gun G comprises a valve body 10 with a suitable shut-off valve therein, a handle 12 to which a hydraulic connection 14 is connected, a valve lever 16 for opening the valve in the body 10 and a discharge fitting 18. The nozzle N comprises a tube 20, a connecting nut 22 for connecting the tube hydraulically to the fitting 18, a strainer housing 24, a nozzle tip 26 and a nozzle tip nut 28. An airless spray gun of the type disclosed usually receives the material to be sprayed such as paint, undercoating grease, oil or mastic sound deadener under high pressure such as 1,000 to 4,000 p.s.i. hydraulic pressure.

Referring to FIG. 4 a hollow body 30 is shown telescoped over the nozzle N and enclosing the elements 24, 26 and 28 thereof. An attaching nut 32 is screw-threadedly associated with the hollow body 30 and has an in-turned flange 33 provided with an O-ring 33a for sealing purposes. The flange 32 is stopped against the gun end of the strainer housing 24 while the hollow body 31 has a shoulder 31 stopped against the outer end of the nozzle tip nut 28 when the parts 30 and 32 are screwed tightly together.

A discharge tube or wand 34 extends from the hollow body 30 and its bore is in alignment with the nozzle 26 to receive the spray 27 therefrom. The discharge tube 34 has a closed outer end in the form of a plug 36, inward of which is a series of slots 38 adjacent the plug, arranged laterally of the tube and spaced around it with their ends in overlapping relationship to insure that fog spray 42 therefrom may be discharged in all directions 360° around the tube. A compressed air connection 46 communicates with the body 30 in proximity to the nozzle tip 26 and adjacent the beginning of the spray pattern, preferably in such position as to introduce the compressed air directly from behind and around the nozzle tip. The compressed air flows as indicated by the arrows 48 and 49 to mix with the hydraulic spray 27 and transport the spray to a remote location at the far end of the spray tube 34. The air mixes with the hydraulic spray as indicated by stippling as it enters the spray tube 34, the spray issuing in a desired pattern as at 42 from the slots 38. Some "fog" will thus issue from the slots depending upon the physical properties of the material being sprayed.

Instead of the plug 36 closing the end of the tube 34, it may be provided with one or more spray orifices 50 as shown in FIG. 5 of less area than the slots 38 to secure a desired additional spray pattern such as one to cover the far end of the box section 40. The tube 34 may be

straight as shown or curved, and/or flexible as desired to suit different box sections.

The screw-threaded connection between the hollow body 30 and the attaching nut 32 permits ready removal of the air atomizing unit 30-34-46 as in FIGS. 1 and 3 when it is desirable to use the gun G and the nozzle N in the normal high pressure hydraulic or "airless" manner.

Practical operation

In the operation of the spray gun and the air atomizing attachment therefor as above described when coating a surface that is accessible such as the underbody surface of an automobile with coating material such as paint, grease, oil or mastic, the atomizer attachment A is removed as in FIGS. 1 and 3 and the spray 27 of the pattern shown in FIG. 2 will be discharged whenever the valve lever 16 is depressed. High pressure hydraulic spray is preferred for these heavy or viscous liquids as there is very little overspray or fogging whereas conventional air atomization broadly distributes the spray in droplet size, the fine droplets failing to reach the surface being coated but rather contaminating the air and falling to the floor, thereby being wasted. By subjecting the coating material to high hydraulic pressure there is high impact of the material on the work, droplets being effectively carried into recesses of the work and penetrating rough surfaces. There is no splatter of large droplets when spraying grease or heavy viscosity liquid. The atomizer effect produced by hydraulic pressure produces a more uniform and finely atomized material than air atomization. It is very directional and covers the target and not much else.

When spraying box sections inside the doors, rocker panels, posts, etc. however it does a good job of coverage only with very thin water-like liquids. This is because it is easy to "fog" thin liquids with hydraulic pressure but not heavy ones. Thin liquids, however, are unsatisfactory as an effective coverage medium. The usual procedure is to use thick grease-like materials for open target areas and a similar material or grease greatly thinned with solvent in the closed box sections. In these locations it is common to use air atomization for maximum fogging. This, however, requires two pieces of equipment and there is resistance to the sale and use thereof.

Accordingly I provide the adapter or attachment A which requires only the one gun G shown in FIG. 1 for either hydraulic or fog atomization. The attachment A converts the airless gun into a combination airless-air atomizing gun. I have found the airless gun plus the air atomizer attachment very effective in fogging the material as indicated at 42 in FIG. 4 so that after the discharge openings 38 have just entered the box section, the hydraulic spray may be turned on and the air from the connection 46 will flow as indicated by the arrow 49 to mix with the spray and fog it as indicated by stippling, thereby coating even the back surface of the box section 40 as shown at 43, and as the tube 34 advances as indicated by the arrow 52, the sides of the box section will be coated as indicated at 44. The closed end 36 may be advanced until it strikes the end of the box section and the spray continued for a short period and it will coat the far end of the box section also due to the fogging of the spray.

My air atomizer makes it possible to supply one piece of equipment (pump, hose 14 and gun G) which is available for all operations. The attachment A makes it possible for effective air-atomizing and thereby fogging grease or the like as if it were a light liquid. The tube 34 gives the advantage of a long small diameter probe or wand to fit into small holes in box sections, and the fogging operation gives the advantage of diffusing the spray in all directions covering all interior surfaces of the box section.

From the foregoing description it is obvious that I have provided a combination gun in which hydraulic spraying of airless type in the normal manner is accomplished

when the attachment is not in use. After readily accessible surfaces are all sprayed, then the attachment A may be mounted on the gun G and the wand 34 manipulated to spray the interiors of box sections and other surfaces not readily accessible by the hydraulic spray illustrated in FIGS. 1, 2 and 3, the surfaces being coated by fog spray in a very efficient manner. Many box sections already have blind openings or drain holes, or holes can be drilled in non-critical structural areas of posts, doors and the like to permit entrance of the wand 34 into hollow sections that should be interiorly sprayed.

Some changes may be made in the construction and arrangement of the parts of my air atomizer for airless spray gun without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims and modified forms of structure or use of mechanical equivalents which may reasonably be included within their scope.

I claim as my invention:

1. A high pressure hydraulic atomizing device comprising the combination with a hydraulic spray gun nozzle, of a hollow body surrounding said nozzle and providing a cavity into which said nozzle discharges hydraulic spray, an elongated spray tube carried by said body and having an open end in alignment with the discharge orifice of said nozzle to unobstructedly receive the full hydraulic spray therefrom, said spray tube having a substantially closed end remote from said nozzle and lateral discharge openings spaced inwardly with respect to said end, and means for introducing air under pressure into said cavity of said body to also enter said spray tube with the material issuing from said nozzle to thereby fog such material, said discharge openings directing and distributing the fogged material as it is discharged therefrom.
2. An atomizing device in accordance with claim 1 wherein said discharge openings comprise slots laterally of said spray tube and arranged in different radial directions around the tube, the extent of said slots being such as to overlap each other and thereby provide a 360° range of spray.
3. An atomizing device in accordance with claim 1 wherein said hollow body is removably positioned on said spray gun nozzle and there is means to seal said hollow body relative to said spray gun nozzle.
4. An atomizing device in accordance with claim 3 wherein said means to seal comprises a collar rotatable on said nozzle, said hollow body being screw-threadedly connected therewith and thereby removable from said collar and nozzle to permit normal hydraulic functioning of said spray gun nozzle.
5. In an air atomizer for a airless spray gun, the combination with an airless spray gun nozzle having a supply tube, of a collar rotatable and slidable on said supply tube, means for sealing said collar relative to said supply tube, a hollow body adapted to telescope over said nozzle and seat against the front end thereof, a screw-threaded connection between said hollow body and said collar for seating said hollow body against the front end of said nozzle and for sealing said hollow body relative to said supply tube, an elongated discharge tube extending from said hollow body and adapted to receive in one end thereof all the material sprayed from said nozzle, the other end of said discharge tube being substantially closed, discharge openings through the wall of said discharge tube adjacent said closed end, and a compressed air connection to said hollow body at the portion thereof seated against said nozzle to introduce air for additional atomization of the material discharged from said discharge openings.
6. In an air atomizer for a hydraulic spray gun, the combination with a hydraulic spray gun nozzle having a supply tube, of a collar on said supply tube, means for sealing said collar relative to said supply tube, a hollow body adapted to telescope over said nozzle and seat against the front end thereof, means for connecting said hollow body to said collar and for thereby seating said

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hollow body against the front end of said nozzle, an elongated discharge tube extending from said hollow body and adapted to receive in one end thereof all the material which is hydraulically sprayed from said nozzle, the other end thereof being closed, discharge openings 5 through the wall of said discharge tube adjacent said closed end, and a compressed air connection to said hollow body at the portion thereof seated against said nozzle to introduce air for transportation, distribution and additional atomization of the material discharged from 10 said discharge openings.

7. An atomizer as claimed in claim 6 wherein said closed end is provided with an orifice for additional atomization and spraying from the outer end of said discharge tube.

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EVERETT W. KIRBY, *Primary Examiner.*

15 LOUIS J. DEMBO, RAPHAEL M. LUPO, *Examiners.*