United States Patent [19]

Gerlovich

[11] **3,842,798**

[45] **Oct. 22, 1974**

[54] **SHROUD FOR SPRAYING APPARATUS**

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[73] Assignee: **Rheem Manufacturing Company,** New York, N.Y.

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Related U.S. Application Data

[62] Division of Ser. No. 126,201, March 19, 1971, Pat. No. 3,741,149.

[52] **U.S. Cl.** **118/326**

[51] **Int. Cl.** **B05c 1/00**

[58] **Field of Search** ..... 118/326, 634; 98/115 SB

[56] **References Cited**

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2,827,009	3/1958	Norris	118/326 X

Primary Examiner—Ronald Feldbaum

Attorney, Agent, or Firm—Watson Leavenworth Kelton & Taggart

[57] **ABSTRACT**

A shroud for engagement over the end of a hollow body being sprayed by a head projected progressively into the body, the shroud having a connection to a source of suction and an assembly of baffles and gas passages arranged in a manner and relation such as to draw off fumes and paint mist and result in uniform evacuating gas currents in and around the body end and maintain a balanced condition and uniform application of the sprayed material.

9 Claims, 4 Drawing Figures

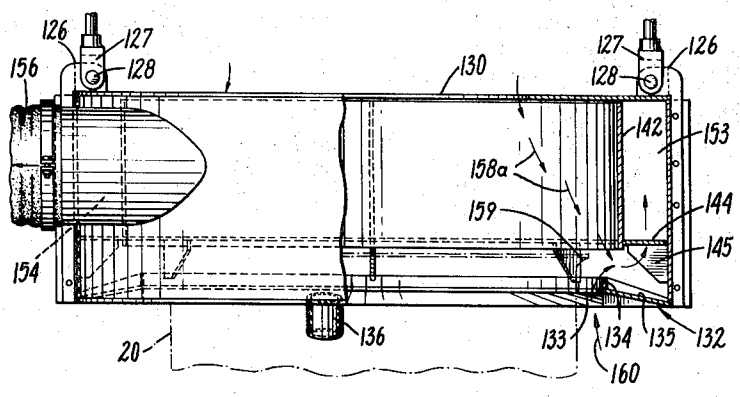


FIG. 1

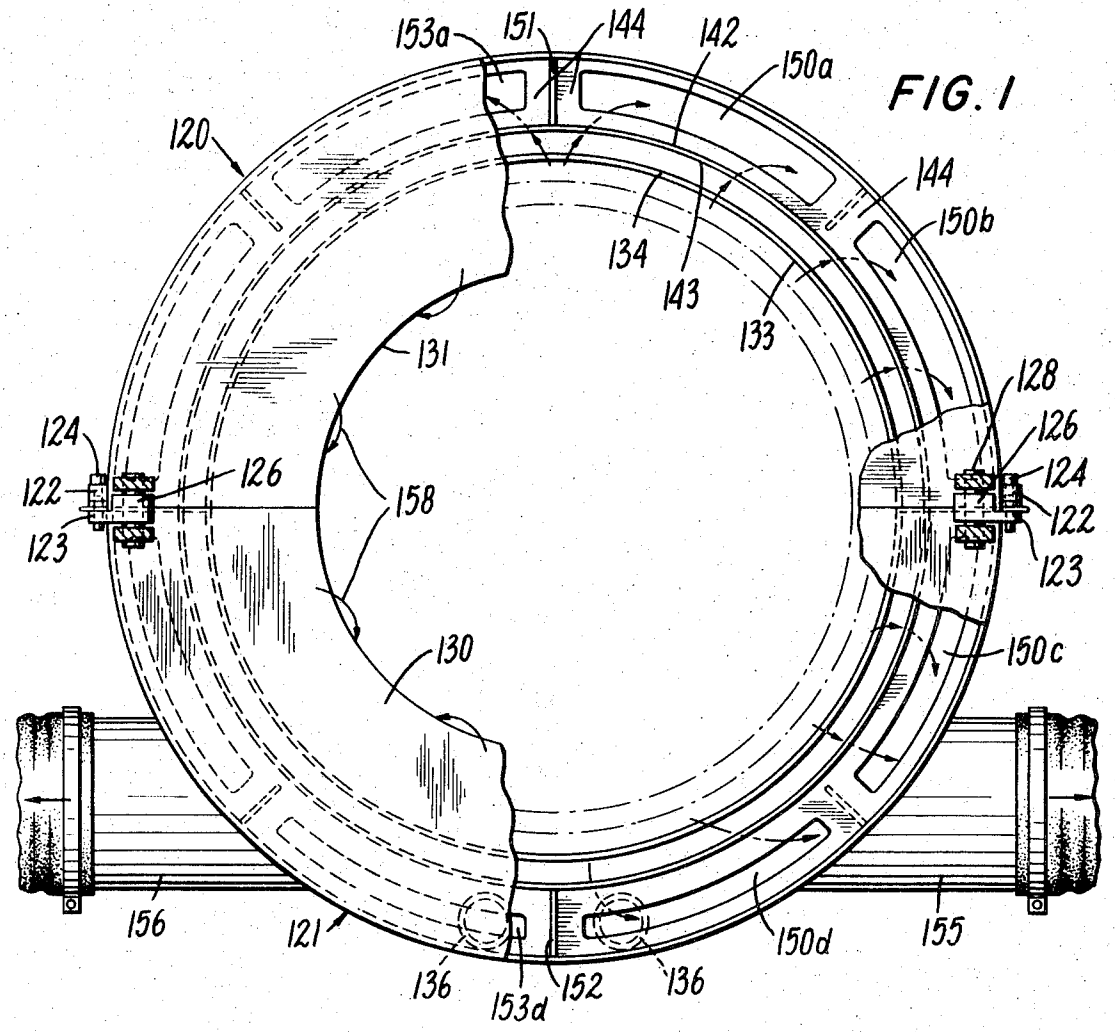

153a
151
144
142
150a
120
144
150b
134
143
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122
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158
130
150c
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121
136
153d
152
136
150d
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FIG. 2

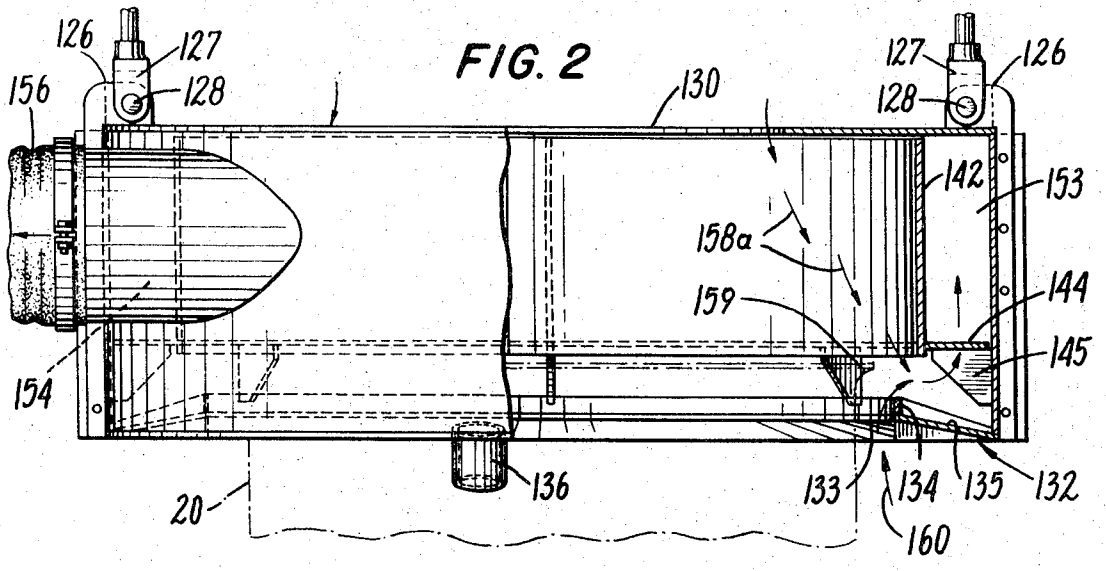

126
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156
130
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142
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158a
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160

FIG. 3

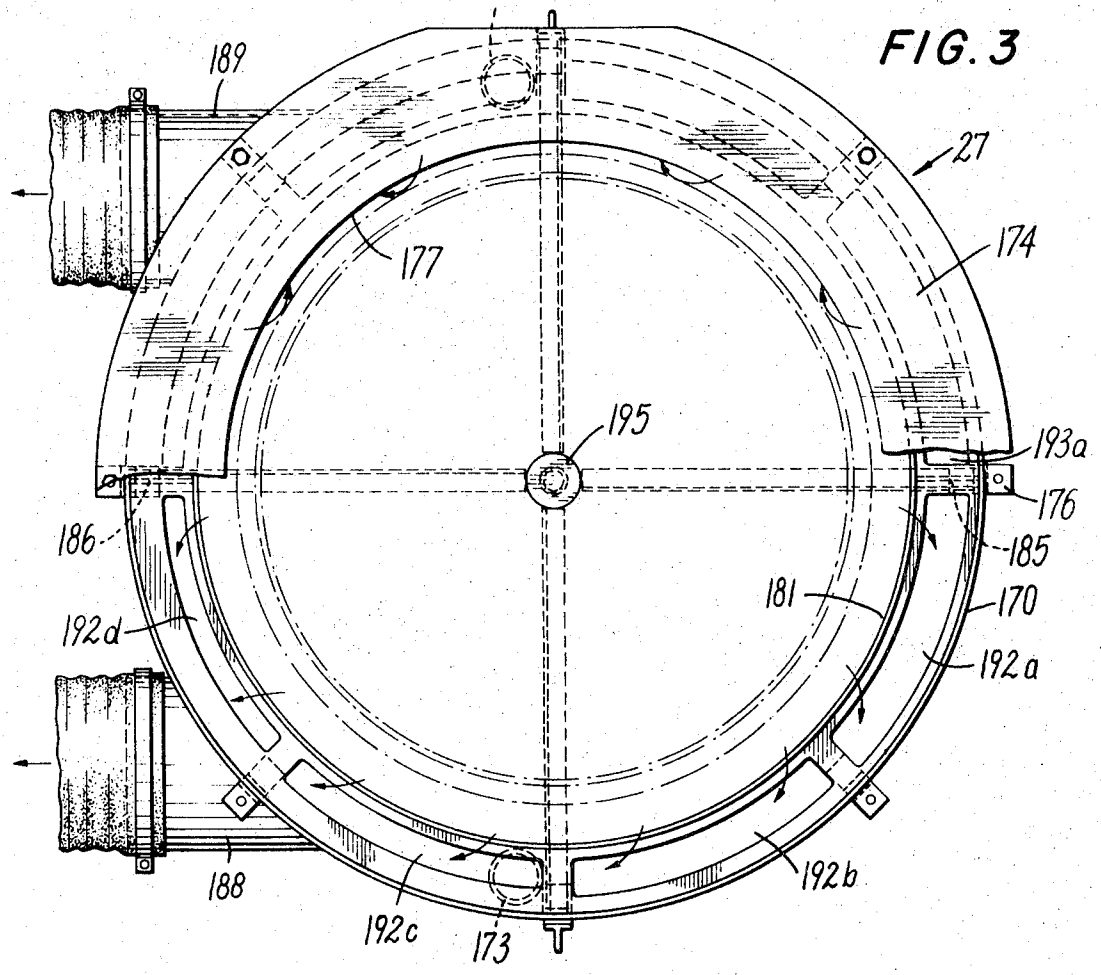
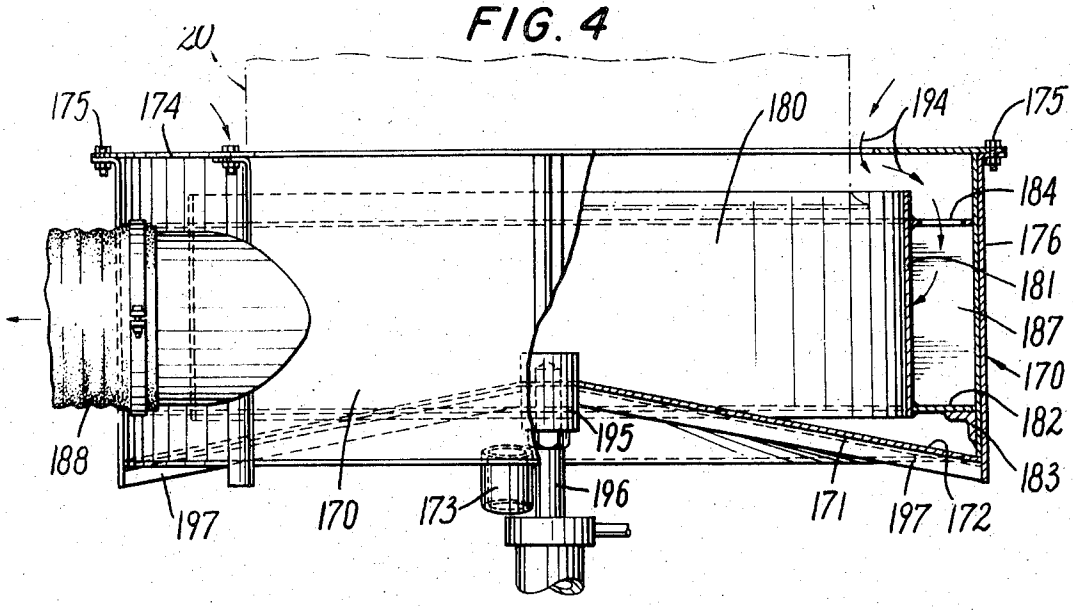

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193a
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192d
192a
188
192c
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192b

FIG. 4


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SHROUD FOR SPRAYING APPARATUS

The present patent application is a division of my patent application Ser. No. 126,201 filed Mar. 19, 1971 now Pat. No. 3,741,149 which discloses a complete machine for the automatic spraying of the interior of bodies such as drum shells or pails or other hollow bodies, this present application being concerned with shroud constructions engageable over the ends of the hollow bodies during the spraying operations.

Automatic systems and machines of many varied types for transporting and spraying are old in the prior art said original application Ser. No. 126,201 noting several patents illustrative thereof. Many of the machines embody a shroud positioned adjacent to or engageable over the end of the body being sprayed and exhaust fan and connecting ducts for drawing off vapors from the spraying operation, the U.S. Pats. to Ziska No. 2,026,080, March No. 2,103,270, Eberhart No. 2,189,783 and Norris No. 2,827,009 being examples.

The invention which is the subject of this divisional application concerns a shroud construction including baffle means and related air or vapor passages so arranged as to result in a uniform flow of the gases and a controlled uniform coating of paint on the desired areas.

The novel features and advantages and principles of the invention will be made more apparent from a consideration of a particular embodiment thereof as described hereinafter and illustrated in the drawings, in which:

FIG. 1 is a plan view of an upper shroud with some parts of the outer shell broken away;

FIG. 2 is a vertical view partly in section of the shroud of FIG. 1;

FIG. 3 is a plan view of a lower shroud with upper portions of the casing broken away; and

FIG. 4 is a vertical view of the shroud of FIG. 3 with parts of the vertical walls of the shell broken away.

As just described FIGS. 1 and 2 show a shroud adapted to be positioned over the top end of a hollow article and FIGS. 3 and 4 a shroud adapted to be positioned over the lower end of the article during a spraying operation. Each shroud is adapted to be connected through flexible conducts to a source of suction to draw off fumes and paint mist, of importance is the fact that the shrouds and their respective connections to the suction are arranged and related such that a substantially uniform evacuating force is applied throughout the annular peripheral area at each end of the article such as a hollow drum to maintain a proper balance and a uniform application of paint. As another major result and advantage the arrangement functions to produce air flow paths such as to prevent paint from being deposited on the exterior of the drums.

Referring first to the upper shroud **26** shown in detail in FIGS. **1** and **2** it comprises an outer cylindrical shell made in two semicircular halves **120** and **121.** The half section **120** has vertical flanges **122** projecting radially from the outer surface at the faces adjoining the section **121** and the latter has similar complementary flanges **123** whereby bolts **124** may be inserted in holes in the opposed flanges to secure together the two half sections. One of the flanges of each pair has a lug **126** extending radially inwardly over the top whereby a U-shaped clevis **127** may be hinged at **128** thereon the clevises being connected to a cross bar which in turn is connected to a suitable means for raising and lowering the shroud such as disclosed in said U.S. Pat. No. 3,741,149. The shell includes an annular top plate **130** having a central opening **131** to permit free passage there through of a spray head column. The shell also has annular bottom plate **132** with a central opening **133** adapted to receive the upper end of the drum shown in broken lines at **20** in FIG. **2.** The bottom plate includes a vertically extending flange **134** and the plate is dished upwardly toward the center to provide an inclined annular surface **135** resulting in an outer trough wherein any excess paint may collect and drain off through stub pipes **136.**

Mounted within the shell is an annular baffle means which includes an open ended cylindrical part **142** providing a central open space having a diameter determined by the inner wall of the cylindrical part as indicated at **143** in FIG. **1.** The peripheral surface of the cylindrical part **142** has an outwardly horizontally extending flange **144** adapted to rest on small vertical flanges or lugs **145** rigid with and extending radially inwardly from the inner wall of the outer shell thereby to position and support the inner baffle part. The flange **144** has a series of segmental openings, as may be noted in FIG. **1,** for the flow of air therethrough. The openings **150***a*, *b*, *c* and *d* progressively decrease in radial width and area beginning with **150***a*.

Vertical walls **151** and **152** projecting radially outward from the periphery of cylindrical part **142** define a semi-cylindrical annular collector space or chamber **153** between the cylindrical part **142** and the outer shell. The opposite half of the baffle means includes segmental openings **153***a* to **153***d* in the horizontal flange **144** similar to the openings **150***a* to **150***d* communicating with a space **154** similar to space **153.** Opposed suction pipes **155, 156** communicate through the outer shell with the inner spaces **153** and **154,** respectively, and at or near the respective smaller segmental openings **150***d* and **153***d*. The pipes are connected to a suitable source of suction. Functionally, therefore, a suction force is applied in the shroud and adjacent the drum end which is substantially uniform throughout the peripheral extent. The air mingled with paint vapors drawn out by the suction follows two general paths. At the top air flows downwardly through the opening **130** around the spray head following the paths indicated by the arrows **158, 158***a*. At the bottom of the shroud the air path is upwardly along the exterior surface of the drum flange past **159** in accordance substantially with the arrows **160.** This upward flow of air past the drum end and to the suction is an important feature. Commonly the drums have been painted and/or lithographed exteriorly prior to the internal spraying and any deposit on the outer surface from the internal spray would ruin the appearance. The current of air upwardly along the drum end prevents spray particles from reaching the outer surface of the drum. The air following the paths **158***a* and **160** continues up through the segmental openings in flanges **144** into the spaces **153** and **154** and out the corresponding pipes **155, 156.** Since the suction normally would be the strongest adjacent the outlet to the suction pipes, such effect in the present construction is offset by restricting the air path by the narrower segmental openings **150***d* and **153***d* and progressively the size of the openings the farther they are positioned from the outlet pipe. The degree of

variation in the size of the openings depending upon the circumstances. In a particular case illustrated herein where the central opening of the baffle is about 2 feet the segmental opening **150***a* had about twice the area of the opening **150***d*. Other specific arrangements may be employed to obtain uniform suction distribution as by varying the angular extent or the spacing of the openings.

The lower shroud **27** shown in detail in FIGS. **3** and **4** differs structurally from the upper shroud but embodies the same principles. It includes an outer cylindrical shell **170** with a bottom wall **171** which is dished upwardly toward the center to result in an inclined surface **172** whereby paint drippings are collected and drain off through a pair of stub pipes **173.** A flat annular top cover plate **174** is secured to the outer shell by means of set screws **175** threaded into vertical strips **176** secured to the peripheral surface of the shell. The cover plate has a central opening **177** through which the drum indicated at **20** in broken lines is adapted to extend. Mounted within the shell is the baffle part **180** which includes a main cylindrical part defined by the wall **181** having a bottom flange **182** extending radially outwardly from the periphery. A series of lugs **183** are secured to the inner wall of the outer shell and serve to support the flange **182** and thereby the baffle part **180** thereon. An upper flange **184** also extends radially outwardly from the periphery of the wall **181** with a close fit within the shell. Also extending outwardly from the periphery of wall **181** are a pair of vertical flanges **185, 186** located 180° apart thereby defining two semicircular spaces enclosed between the inner cylindrical part **181** and the outer shell, one such space being indicated at **187** in FIG. **4.** A suction pipe **188** communicates with the space **187** and a suction pipe **189** communicates with the other semicircular space.

The top flange **184** has two sets of segmental openings one set being indicated at **192***a*, *b*, *c* and *d* which are progressively smaller in radial width from the opening **192***a* to the opening **192***d*. A similar arrangement of segmental openings extends counterclockwise in FIG. **3** from the opening **193***a*. The functioning is similar to that described in connection with the upper shroud of FIGS. **1** and **2,** the smaller openings being nearest the outlet pipe. Air is drawn from around the lower drum and particularly downwardly along the exterior surface of the drum and outwardly in a path indicated generally by the arrows **194** and continues through the segmental openings in flange **184** into the semi-annular spaces with which the exhaust pipes communicate. As in the case of the upper shroud the segmental openings in the radial baffle flange **184** increase in size progressively away from the connection to the respective suction pipes **188** and **189** to produce a uniform suction pressure and air flow around the drum end. Also the air paths are such as to prevent particles of the internal spray from being deposited on the exterior surface of the drum. The bottom plate **171** of the shell has a central boss **195** which may be connected to the piston rod of an air cylinder for vertically shifting the shroud such as disclosed in said U.S. Pat. No. 3,741,149. Preferably the bottom plate has radially extending reinforcing strips **197.**

Since various structural changes may be made in the shrouds and different embodiments made thereof within the principles of the invention, it is intended that all matter contained herein shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A shroud for engagement over the end of a body being sprayed comprising inner and outer shells radially spaced and having transverse partitions between them to define a fluid space, a suction conduit with an outlet from said fluid space, fluid passage means connecting the area around the body end to said fluid space including a plurality of spaced flow openings through one of said transverse partitions, said openings progressively increasing in size in the direction away from said outlet.

2. A shroud for engagement over the end of a body being sprayed comprising a main outer shell and a hollow inner smaller shell with a pair of transverse partitions between the shells defining an arc-shaped space between the shells, a suction conduit connected to said space, fluid passage means connecting the area around the body end to said space, and baffle means in said conduit means having a plurality of flow openings progressively increasing in size in the direction away from the outlet to said suction conduit.

3. A shroud in accordance with claim **2** in which said inner shell has a central opening into which the end of the body is adapted to project.

4. A shroud in accordance with claim **2** in which said baffle means comprises one of said partitions extending transversely of said space between said fluid passage means and the outlet to said suction conduit.

5. A shroud in accordance with claim **3** in which said fluid passage means and partitions are arranged to direct the fluid through said central opening of the inner shell and then through the partition having the flow passages.

6. A shroud in accordance with claim **3** in which said fluid passage and partitions are arranged to conduct fluid from around the body end directly through the partition having the flow passages into said space.

7. A shroud arranged to be positioned at the end of a hollow container body being sprayed interiorly comprising a chamber extending radially outwardly beyond the periphery of the body, a source of suction connected to said chamber, and air conducting passages arranged to direct air longitudinally along the periphery of the outer end of the body and then radially outward into said chamber whereby the air flow prevents the spray material from depositing on the outer surface of the container.

8. A shroud in accordance with claim **7** in which said collector chamber comprises an annular chamber extending around the entire periphery of the body with a central opening into which the container body extends during spraying.

9. A shroud in accordance with claim **7** in which the shroud is mounted for movement relative to the container body for selective positioning adjacent the container body end or in a retracted ineffective position.

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