United States Patent [19]
Winkless

[11] **3,713,862**
[45] **Jan. 30, 1973**

[54] **METHOD FOR PIGMENTED SIDE STRIPING OF CAN BODIES**

[75] Inventor: **Robert A. Winkless,** Oak Lawn, Ill.

[73] Assignee: **Continental Can Company, Inc.,** New York, N.Y.

[22] Filed: **Nov. 16, 1970**

[21] Appl. No.: **89,958**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 767,582, Oct. 3, 1968, abandoned.

[52] **U.S. Cl.** **117/17.5,** 117/18, 117/19, 117/21, 117/25, 117/38, 117/43, 117/94, 117/17, 117/DIG. 6, 118/621, 118/624, 118/627, 118/629, 118/630, 118/301, 118/308

[51] **Int. Cl.** **B05b 5/02,** B44d 1/09, B44d 1/094

[58] **Field of Search**...117/17, 21, 38, 43, 94, DIG. 6, 117/18, 19, 17.5; 118/621, 624, 627, 629, 630, 301, 308

[56] **References Cited**

UNITED STATES PATENTS

2,672,842	3/1954	Winters et al.	118/2
1,839,731	1/1932	Baum	118/301
3,377,183	4/1968	Hurt et al.	117/17
3,377,184	4/1968	Kukoff	117/19
3,523,319	8/1970	Stoever	117/19
3,575,138	4/1971	Austin et al.	117/19
2,412,139	12/1946	Fink et al.	118/301
2,974,060	3/1961	Dettling	117/21
2,996,040	8/1961	Bufinger	118/301
3,248,253	4/1966	Barford et al.	117/17
3,295,440	1/1967	Rarey et al.	101/114
3,296,999	1/1967	Gamble	118/301
3,327,948	6/1967	Gignoux	239/3
3,336,903	8/1967	Point	118/624

FOREIGN PATENTS OR APPLICATIONS

530,198	7/1931	Germany	118/301
618,597	2/1949	Great Britain	118/301

Primary Examiner—William D. Martin
Assistant Examiner—M. Sofocleous
Attorney—Americus Mitchell, Joseph E. Kerwin and William A. Dittmann

[57] **ABSTRACT**

A method for side striping cans which uses a single belt having slots of can seam length along its middle. A stream of fluidized powder is shaped and is jetted toward the side seam of the can at an angle less than 30 degrees. The side seam of the can is moving at a uniform speed and in this way the powdered material settles onto the can side seam with an even distribution of powdered material across each lateral unit of the side seam. The edges of the stripe are sharp because the side seam lies in the segmented belt.

9 Claims, 10 Drawing Figures

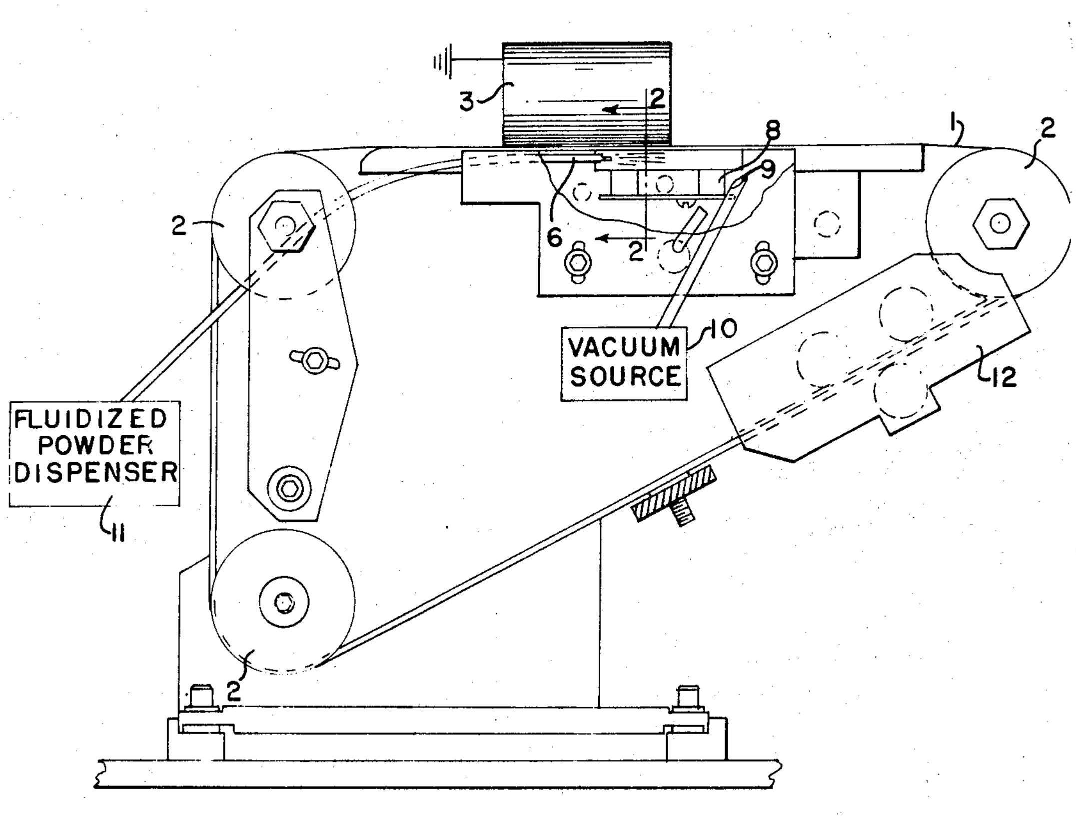


FIG. 1

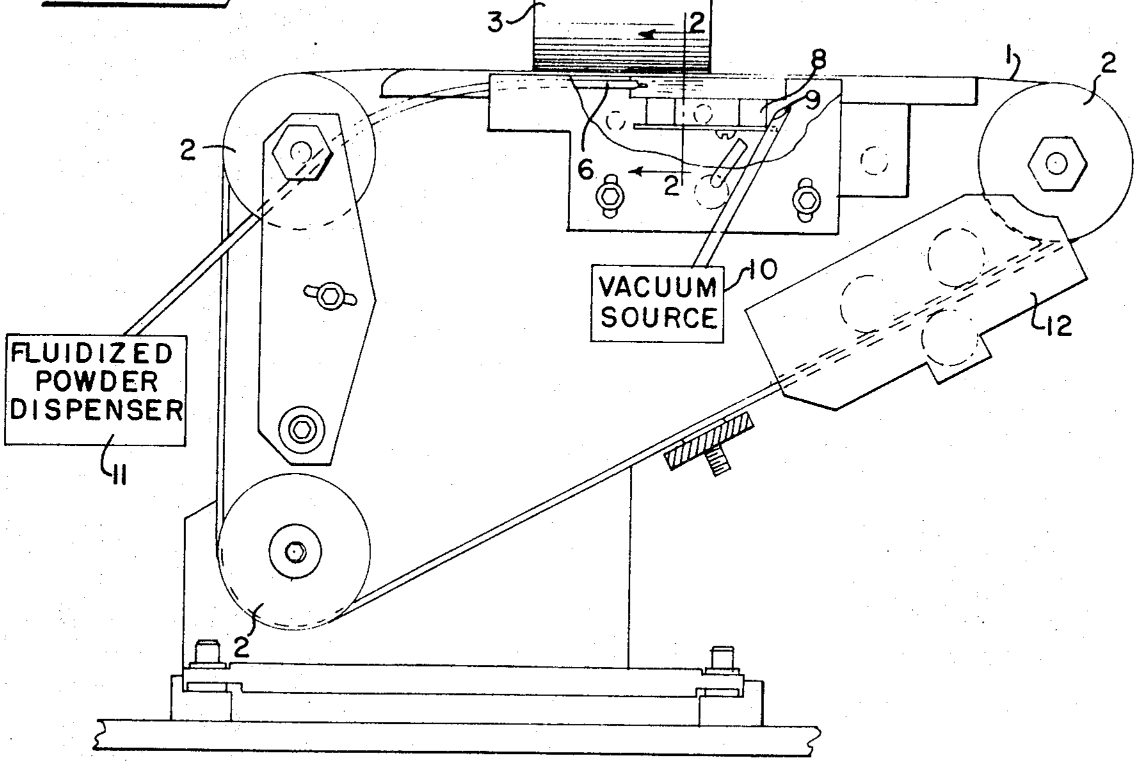
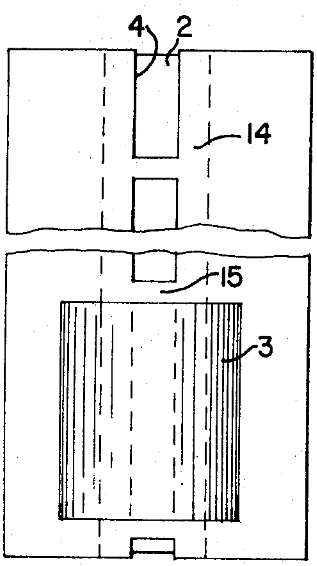


FIG. 3



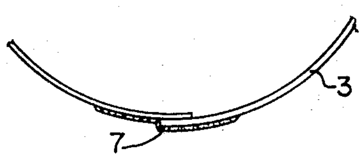


FIG. 5

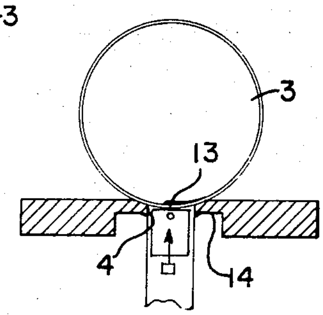


FIG. 2

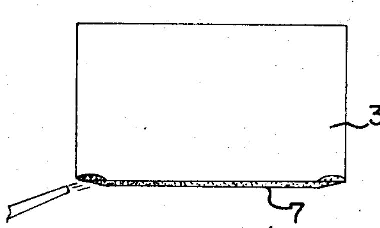


FIG. 4

INVENTOR.
ROBERT A. WINKLESS
BY
Anderson Mitchell
ATT'Y.

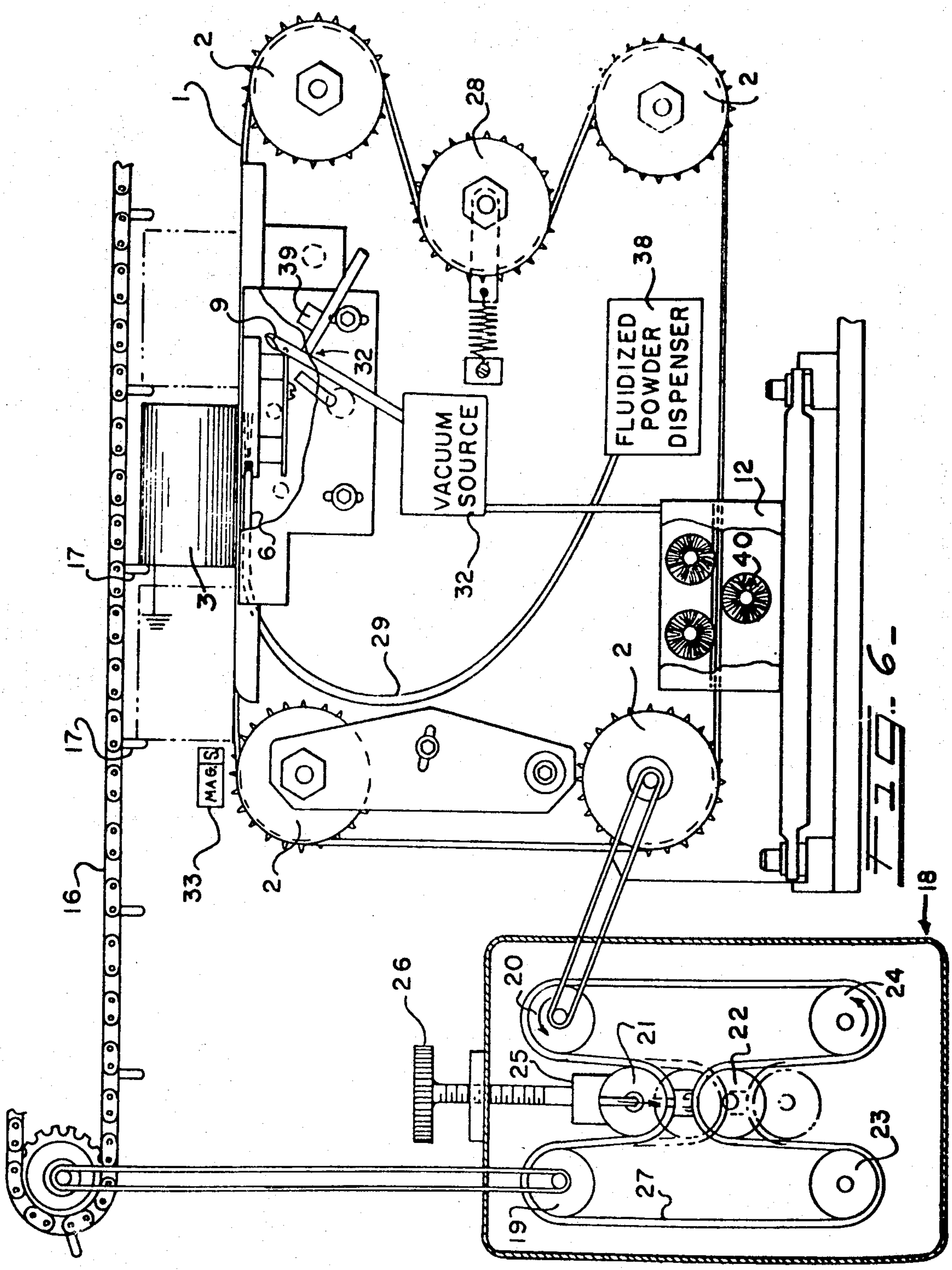


FIG. 6

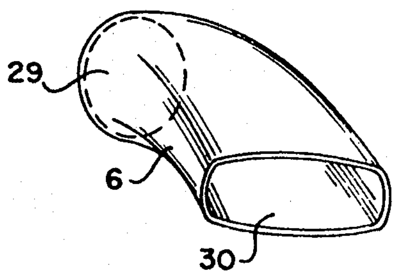


FIG. 7

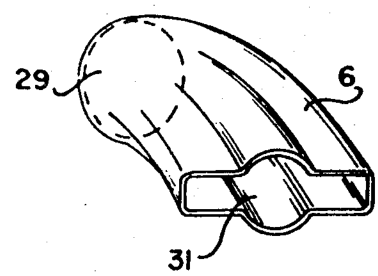


FIG. 8

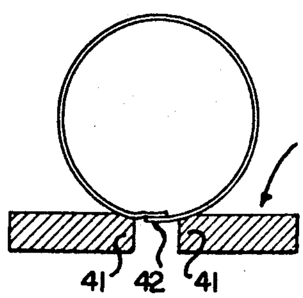


FIG. 10

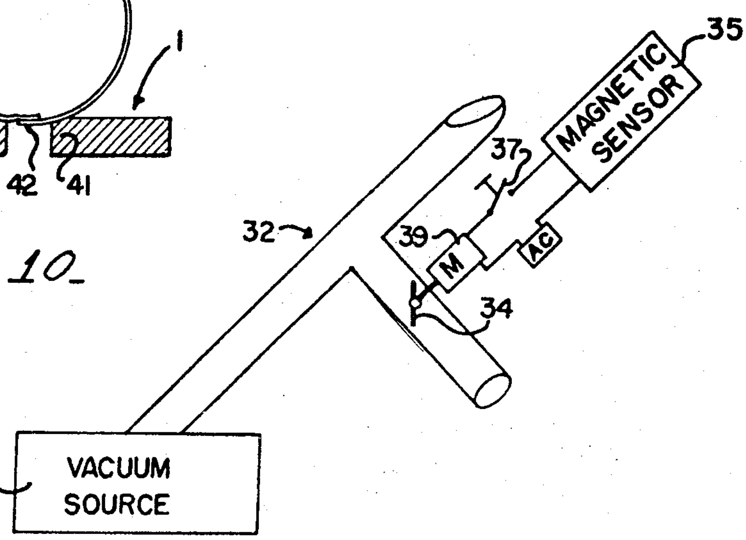


FIG. 9

METHOD FOR PIGMENTED SIDE STRIPING OF CAN BODIES

This application is a continuation-in-part of my application titled "Pigmented Outside Side Striper", by Robert A. Winkless, Ser. No. 767,582, now abandoned, and assigned to Continental Can Company, Inc., assignor of this invention.

My invention relates to a method for coating the side seams of cans, and more particularly, to a method for feeding the cans in spaced relationship along an assembly line while providing for a uniform application of side striping material to the can seam.

In the manufacture of cans, the blank stock is ordinarily coated while the material is flat. Since the cans are usually welded after this operation, the edges of the blank stock are cleaned so that the welding process forms an impervious joint. After welding, it is necessary to apply side striping or coating to the side seam of the can to protect the seam from corrosion and for esthetic appeal. This operation is performed many times a minute. Cans are placed onto the conveyor chain and after welding, the cans enter a striper unit and after striping are removed from the chain. The handling of cans is facilitated if they are spaced from each other by some distance.

The edges of can bodies may be fastened to each other by any means. The side striping is applied to protect the can seam where necessary against corrosion and for esthetic appeal.

It is an object of this invention to provide a method for side striping cans which are spaced apart a definite distance without allowing any of the striping material to pass into the can.

It is another object of this invention to provide a method for side striping without spraying objectionable pigmented matter into the interior of the can.

It is a further object of this invention to provide a feed line wherein the cans are striped by a fluidized powder to cover sharp edges.

It is a final object of this invention to provide a high speed coating method for cans.

Other objects and advantages of the present apparatus become apparent in the following discussion of the drawing wherein:

FIG. 1 is a side view of a moving belt striper.

FIG. 2 is an end view of the can mounted on a belt.

FIG. 3 shows the top view of a can mounted on the belt.

FIG. 4 shows a longitudinal cross-section of a welded can with uneven application of coating material.

FIG. 5 shows a cross-section of a welded can with a stripe applied.

FIG. 6 shows a side view of another embodiment of my moving belt striper.

FIG. 7 shows a configuration of the exit nozzle.

FIG. 8 shows a special configuration of the exit nozzle.

FIG. 9 shows a schematic of the high-low vacuum system of FIG. 6.

FIG. 10 shows an end view of a can mounted on an improved belt.

In brief, my invention is a moving belt striper in which the center of the endless belt has longitudinal slots spaced along its length. The belt is disposed over rollers and the can is placed in one of the slots with the can seam down. The endless belt passes over a nozzle from which a pigmented coating powder flows. The powder coats only the outside seam with a band of uniform width, and no powder passes into the interior of the can.

The belt **1** of this invention is supported by three pulleys **2** in FIG. **1**. The power drives of the preceding welding operation and of the striping operation are synchronized and in phase so that each can **3** is introduced onto the belt and falls exactly in the slot **4** of the belt (FIGS. **2** and **3**) with the seam down, and each can is spaced from each other can a distance equal to the bridge or covered space **15** between the cans. The can seam is hot and may heat the edges of the slot **4**. An electrically neutral material which is electrically neutral or of high resistivity or an insulator which does not wet and melts at a temperature higher than the wetting point of the pigmented or non pigmented powder is used for the belt. The belt may be made, for example, of fiberglass impregnated with Teflon or nylon. By using this type of belt, any powder falling onto the belt may be readily separated from the belt at a later stage, even if the powder has fused on the belt.

The can travels from left to right and at about midpoint of its traverse, the can passes over a nozzle **6**. As the can and belt slot pass over the nozzle, the coating material or striping powder **7** jets out from the nozzle and strikes against can **3**. The nozzle is placed near to the can to avoid material loss and inclines toward the can at a small angle to avoid particles bouncing off the can. The nozzle exit is rectangular in cross-section for even distribution of coating material on the can. If shading of coating material is desired, an appropriate nozzle exit configuration is used to control the thickness of the material at different points across the stripe. The width of the nozzle is about the same width as the slot to give maximum transmission of powder to stripe the can.

The striping powder must be attracted to the can side and must adhere to the can side. This is accomplished by charging the powder electrostatically and keeping the can at ground potential. Any charging means, such as corona discharge, sparks, arcs or radiation, may be used. In the embodiment shown, the striping powder **7** is charged negatively by the corona charging pins **8** which are maintained at a sufficiently high voltage to produce corona. The highly charged pins taken in conjunction with the can body give rise to an electric field that directs the electronegatively charged particles to the can and away from the pins. This function may be effected by a charged plate if corona pins are not used. The pins may be vertical or horizontal and are in a well through which air is drawn to clean the area. The use of corona discharge gives greater stability and higher operating voltages and currents are possible than in the other mentioned means.

When the charged particle hits the hot weld area, it gives up part of its charge to the can. The powder becomes somewhat conductive as it is heated by the hot weld area. The powder charge partly flows to the can, and the remaining electrostatic charge holds the powder to the can. Since most of the charge leaks off the powder, the surface does not present a repelling charged surface to particles subsequently arriving.

The negatively charged striping powder **7** is attracted to and adheres to the can **3** which is at ground potential. The bridge elements **15** of the belt block the pigmented powder from entering the interior of the can. As no pigmented or colorless powder flows into the interior of the can, a more attractive appearance is presented than would be the case if pigmented powder were found sprayed at spots inside the can. Further, the composition of the inside and outside powders may be different and the powders may be incompatible. One powder may not stick to the other or may even react chemically with the other powder to produce a chemical compound which is not suitable for coating. For these and other reasons it is desirable to keep the inside striping powder separated from the outside striping powder. The use of bridge **15** eliminates these problems. The can proceeds to the right and passes off the conveyor to the next operation where the powder may be heat-fused to the can.

Some of the sprayed powder contacts the endless belt and adheres to the belt mask. The pigmented powder must be cleaned from the belt to avoid transmitting a smudge to subsequent cans. This powder is carried around on the belt to the belt cleaning station and is swept off by rotating low density nylon brushes inside housing **12**.

Mounted to the right of the charging pins **8** is a port **9** connected to a vacuum source **10** which removes excess powder from the area of the nozzle charging pins **8**. The degree of vacuum is low to avoid pulling powder from the can and to allow the charged powder to move onto the can, but the degree of vacuum is sufficient to remove excess or uncharged powder from the area. This excess powder may be conducted from the vacuum source to a dust collector.

The powdered spray material is electrostatically charged, and after being charged, proceeds in a more or less straight line toward the can body under the influence of the electric field and the pneumatic force from the nozzle stream. The material is intercepted by the edges of the belt, i.e., the powder falls onto either the can or onto the belt to provide a sharp edge for the can stripe. For sharpest definition, the belt is mounted close to the can but need not touch the can.

The top plan view of FIG. **3** shows a belt in section and a can fitted into one of the slots in the belt.

Another effect of using a segmented belt is that unevenness of coating is avoided. A belt having a slot all the way down its center allows some of the coating material to tail over its end and into the interior of the can (FIG. **4**). An uneven outside coating is produced and if some specific thickness is desired, a large excess of coating material must be applied to the center so that the ends are coated to the desired thickness. When a segmented belt is used, no material tails over into the interior of the can, and an even coat is applied along the length of the stripe. Thus, if a certain thickness is desired, it can be applied evenly with considerable savings of material by using a segmented belt, compared to the amount of material used without the segmented belt.

If a pigmented powder is placed into suspension in a liquid carrier and then applied to a weld having a sharp edge, such as shown in FIG. **5**, the liquid then flows under the influence of surface tension and is either thin at the sharp edge or exposes the sharp edge. Fluidized powder applied from a rectangular nozzle exit lies evenly across the strip and coats each part of the area to about the same depth. The powder does not flow in the manner of a liquid, but coats the sharp edge as shown in FIG. **5**. By using fluidized powder, a savings of pigmented material is effected.

Another embodiment of my invention is shown in FIG. **6**. For consistency, the same numbers are applied to FIG. **6** as are applied to like items in FIG. **1**. The belt **1** of FIG. **6** is supported by four pulleys **2**. The power drive of the preceding welding operation drives both the chain **16** with dogs **17** and the belt **1** of the striping operation. The belt and chain are synchronized and in a phase relationship so that each can **3** is introduced onto the belt **1** at a point where it falls exactly in the slot **4** of the belt, (FIGS. **2** and **3**) with the seam down. The operation of the belt, can and nozzle **6** are the same as explained in reference to FIG. **1** in preceding paragraphs.

Cleaning air passes along the length of corona pins **8** and keeps the pins free of powder particles. The tip of each corona pin must be especially clean because powder adhering to the tip may substantially prevent electrons from discharging from the tip of the pin. Further, absence of an electron field around the pin causes an abrupt voltage gradient near the pin tip thus lowering the voltage which may be applied to the pin before electrical arcing takes place. One pin or preferably a plurality of corona pins may be used for greatest efficiency. Pins are placed about one half inch apart to avoid corona overlap.

Alternatively, cleaning air may be passed across the pins and pin tips. The corona discharge is not effectively altered by the direction of travel or the cleaning air and powder particles deposit onto the can side seam no matter which way the cleaning air is directed.

The cans **3** are moved along the belt **1** in synchronism with the belt. The cans are actually pushed along by dogs **17** attached to the overhead chain **16**. As the chain wears because of long usage the synchronism between the chain and the belt drive varies slightly. For this reason a variator **18** is put in the drive of the belt. Thus, when the chain wears or for any other reason a variance is found between the chain positioning of cans on the belt as to the belt slot, the variator **18** can be adjusted to bring about a correspondence between the can body and the can slot.

The variator sprockets **19** and **20** are keyed to input shafts and output shafts of the variator respectively. The other four sprockets **21**, **22**, **23** and **24** are essentially idler sprockets having no power function. The idler sprockets **21** and **22** are mounted in or on a housing **25** which is slidable and is adjustable by screw **26**. The adjustment is shown outside the variator. This adjustment may be made automatically in response to sensing means mounted near the belt and chain for sensing a phase difference if so desired. An endless roller chain **27** is wound around all of the sprockets as shown in variator **18**. The variator operation is readily understood by assuming that input sprocket **19** is stationary while the slidable housing **25** is lowered. As the slidable housing is lowered the output sprocket **20** rotates in a counterclockwise direction and the belt **1** will move backward a small amount. This variator can be operated while the sprockets are rotating or while the sprockets are still. The sole purpose of describing the output sprocket rotation when the sprockets position is fixed is for more easy understanding of the operation. By use of this variator between the chain and belt drive, a fine adjustment is possible to allow the cans to fall exactly into the slots **4** of belt **1**.

The nozzle exit or orifice of the nylon tube **29** may be rectangular, or may be an elliptical exit **30** as shown in FIG. 7 or may be given a special shape exit **31** as shown in FIG. **8**. In any case, the cross-sectional area of the nozzle exits **30, 31** must be very close to the cross-sectional area of the tube **29** which brings the suspended powder up to the nozzle. In this way, the velocity of the gas and suspended powder is very nearly the same throughout the extent of the tube **29** and nozzle. This is true so long as the nozzle is the same cross-sectional area as the area of the tube through which the suspended powder passes. As long as the powder velocity stays above the critical velocity, the powder has little or no tendency to adhere to the sides of the exit **30** or exit **31**. Thus, there is little or no clogging and the powder comes out of the shaped nozzle in the desired cross-section. The cross-sectional density of the powder coming out remains at about the same cross-sectional density as the powder suspension which is found in the tube. Also, the fluid density through the nozzle **6** remains above the critical transport velocity.

The transport tube **29** is made of a non-wetting material such as nylon to lessen the tendency for powder to clog in the tube. The powder transport velocity through the tube must be kept above the critical transport velocity to avoid powder adhering to the sides of the tube. It has been found that the critical transport velocity depends upon diameter of the powder, the diameter of the tube, the kind of gaseous transport material pressure and the material of the powder. The powder velocity in the production model is about 20 foot per second. Critical powder velocity is about 5 foot per second for a tube having an inside diameter of 90 thousanths of an inch. A very fine powder on the order of 5 microns in diameter tends to adhere to the sides of the tube at any transport speed because Vander Walls forces take over for this size particle. For particles larger than this, up to and on the order of 100 microns, the factors noted above determine the critical transport velocity and tube diameter. The diameter of the tube must be uniform throughout. In the event that the diameter of the tube is too great, powder deposits around on the walls of the tube and builds up into the tube thus decreasing the effective tube diameter until such time as the critical transport velocity for this powder in its mass is achieved. When the critical transport velocity of this powder is achieved, the powder stays in suspension in the gas which is used for transport purposes. Allowing this to happen might be one solution to the problem of achieving critical transport velocity. However, it has been found that if the tube is jiggled, tapped or disturbed in any way, segments of the deposited powder fall into the gaseous transport material and a slug comes out of the nozzle. This lug is quite undesirable from the standpoint of coating the side seams because of powder loss and great variance in side seam coating. Slugs must be avoided. Avoidance of a possible slug or plug of powder is achieved by reducing tube size until the critical transport velocity for this size powder in the gaseous transport medium is achieved. In short, by selecting the appropriate tube size a critical transport velocity for a given powder is achieved. As the gas and powder flows through the tube at a speed above the critical transport velocity turbulence, Brownian motion and other factors keep the powder uniformly dispersed across the cross-section of the tube.

Whatever the shape of the nozzle, it is necessary to maintain a uniform cross-sectional density of the powder in the transport gas. In order for the powder to come to a uniform cross-sectional density, which is its natural situation as it travels in a straight line through a tube, the powder must not be subjected to sharp accelerations such as are caused by sharp bends. In order to allow the powder time to come to a uniform cross-sectional density, the last foot and a half of tubing **29** is in the shape of a gentle smooth curve and lies in a plane defined by the centerline of the belt. The radius of this curve must be on the order of three inches or more. The radius of the curve is influenced by the transport velocity since the higher the transport velocity the greater the radius of the curve must be to avoid compacting of the powder against the outer wall of the tube. However, so long as the smooth curve lies in the plane of the belt there will be no lateral variance i.e., the powder density will be the same at any point in or out of the plane of the paper. Thus, if the cross-sectional density is a little denser at the outside radius of the tube than it is at the inside radius then the rate of deposit onto the can side seam will be the same for each interval of time. While it is essential that the rate of deposit be the same across the can side seam, a vertical sectional density variance can be tolerated. It has been found experimentally that a gentle smooth curve in the plane of the belt is very effective in giving an exit cross-sectional density that is acceptable for the purposes of depositing uniform powder density onto a can side seam.

The nozzle cross-sections shown in FIGS. **7** and **8** are designed to accomplish specific purposes. The cross-section of the exit nozzle should be rectangular for optimum even deposit. Fluidized powder applied from a rectangular nozzle lies evenly across the can seam and coats each part of the area to about the same depth. However, it has been found in practice that many times the corners of a rectangular nozzle fill in to give an elliptical nozzle. For this reason the elliptical nozzle shape **30** found in FIG. **7** is a very practical shape. This nozzle shape rather than a round shape gives an apparently uniform color gloss across the pigmented outside seam. This nozzle also avoids excessive thickness of the material on the seam to give a better use of the material and a controlled side seam stripe.

A special shape **31** to an exit nozzle may be utilized such as shown in FIG. **8**. The particular shape of FIG. **8** is designed for covering a can cut edge. Taking note of the outside edge of the can shown in FIG. **5** it is seen that the edge opposite the area designated **7** may have a burr along its length. When one handles a can this burr, if it exists, may produce cuts and scratches on the hands and may even snag clothing. The burr may be removed by mechanical means prior to the can blank being formed if one so desires. If it is desired to leave the cut edge without cleaning, an orifice shape such as shown in FIG. **8** may be used to coat the cut edge with an extra thickness of powder. In this case, when the powder is deposited a greater thickness of powder is found at the point 7 shown in FIG. 5. This bead or thick spot is sufficient to cover the cut edge and avoid damage to the can user.

During the operation of the can production line there are occasional work stoppages. At times, the can side seam forming machine may not form cans for extended periods of time. Powder is being injected from the nozzle at a more-or-less constant rate and this powder should not be allowed to deposit on the belt or other equipment. To avoid this contigency a high-low vacuum source 32 is used. Port 9 is mounted in about the same place in the embodiment of FIG. 6 as is shown in the embodiment of FIG. 1. However, in the embodiment of FIG. 6, this port is connected to a high-low vacuum source 31, FIG. 9 rather than to a single intensity vacuum. In the embodiment of FIG. 6 the vacuum source 33 is connected to port 9 at all times so that a stream of air flows through the port 9 towards the vacuum source 33. When can bodies are on the belt, valve 34 (FIG. 9) is open allowing air to come through it into vacuum source 33 and the high volume, low vacuum stream through port 9 is sufficient to collect those few particles of powder which are not deposited on the can side seam in normal operation. These particles of powder then do not adhere to the belt, to the corona pins, or to the housing where their presence might cause less efficient operation. When no cans are passing the sensor head 35, the butterfly valve 34 is closed and port 9 is connected to the vacuum source 33. Thus, when no can body is on the belt 1 to attract the ionized particles of powder, the port 9 aspirates many times more air than when port 9 is connected to the vacuum source 33 and valve 34 is open allowing ambient air to proceed through conduit 36. Most, if not all of the fluidized powder which jets from the nozzle is aspirated into the port 9 and is later recovered. The sensing means 35 for sensing a can body, FIGS. 6 and 9, may be a magnetic sensor, capacitive sensor, photoelectric eye or any other of a variety of sensors. The switch 37 may be manual or may be mounted to be operated with the switch starting the can body forming machine.

If the switch 37 is mounted to close with the switch starting the can body forming machine, then the vacuum source 33 is placed in the circuit only during the time the can forming machine is operating. The fluidized powder system is started at the same time.

When the switch is closed the powder dispensing system starts operation and relatively high vacuum is connected to port 9. In this way the apparatus is kept clean during the few seconds that it takes for the powder dispensing system 38 to come into equilibrium. After the powder dispensing system 38 has come into equilibrium, a can body comes from the can forming machine and approaches the can sensing means. When the can body comes opposite the can sensing means 33 then the sensing means causes the motor 39 to open butterfly valve 34 and only low vacuum is connected to the nozzle 9. The powder now deposits on the can body as it passes the nozzle.

When the can body forming machine (not shown) is stopped then can bodies are not fed to the side striping apparatus and when the last can body passes the sensing means then the high vacuum is connected to the nozzle and fluidized powder is swept through the apparatus leaving it clean. This has the advantage that it is necessary for a few seconds to elapse before the fluidized powder reaches equilibrium in the powder transport system. During this time, the high vacuum should be operating to avoid unwanted coating and loss of fluidized powder. A fluid transport system such as that shown in "Fluidizer and Dispenser" Ser. No. 772,988 now U.S. Pat. No. 3,570,716 by Boris J. Kirsanoff et al. and assigned to the assignee of the present invention may be used.

The nylon brushes 40 shown in the cleansing housing 12 rub against the belt 1 and remove all powder from this belt before the belt is again used to shield can body 3. Air is aspirated through housing 12 to draw the powder particles from the area. In actual operation any powder coming from nozzle 6 is directed to the can 3 and almost none adheres to belt 1 since the belt is of a non-wetting compound. The belt must be thoroughly clean by the time it comes to the fluidized powder deposit station. Since the belt is thoroughly clean each time that it approaches the powder deposit station there is no big accumulation of powder onto the belt to affect the powder coating of the can.

The angle of the nozzle to the direction of travel of the surface of the can side seam is less than 30°. This avoids bounce and allows an even deposit of material on the can side seam.

It is an advantage of this invention that a continuous supply of coating material may be used.

Another advantage is that cans are spaced from each other, thus preserving essentially their normal relationship in a body maker line. This spacing makes easier further processing and handling of the can.

Another advantage is that by the use of a segmented belt, pigmented material is prevented from passing into the interior of the can to spoil its esthetic appearance. Further, a much thinner coat of pigmented material can be applied from end to end of the can, since all of the powdered material goes onto the can without loss of powder into the can at the can end.

Another advantage of this invention is that in normal usage, no pigmented material will find its way into the interior of the cans to spoil the esthetic appeal of the can and prevent possible chemical reaction with other internal coatings.

Other advantages of my embodiment are that a powder of uniform cross-sectional density is deposited on the can, a shaped nozzle allows selective deposition of powder from the seam and a high-low vacuum system prevents unwanted deposit of powder in places other than the can seam.

Finally, a variator allows exact correspondence between the can and slot in the belt.

The foregoing is a description of an illustrative embodiment, and it is applicant's intention in the appended claims to cover all forms which fall within the scope of the invention.

What is claimed is:

1. A method of coating the side seam of a can comprising the steps of:

fluidizing a polymeric powder;

jetting a shaped stream of fluidized polymeric powder at an angle of less than 30° toward the hot side seam of a can;

moving said can side seam at a constant rate past said point of jetting said stream;
charging said polymeric powder electrostatically;
grounding said can; and
electrically shielding all of said can body except said side seam from said charged fluidized polymeric powder whereby said polymeric powder is deposited upon said hot side seam and not upon any other part of said can.

2. A method of coating the side seam of a can as set forth in claim 1 in which said step of jetting said fluidized powder comprises the steps of:
shaping said stream of fluidized powder as it is jetted toward said hot side seam; and
allowing said fluidized powder to settle onto said side seam.

3. A method of coating the side seam of a can as set forth in claim 2 in which said step of shaping said stream further comprises the step of:
forming the cross-section of said stream of fluidized powder into the general shape of a rectangle.

4. A method of coating the side seam of a can as set forth in claim 1 in which said step of grounding said can comprises the step of:
electrically connecting said can wall to an electrical ground.

5. A method of coating the side seam of a can as set forth in claim 1 further comprising the additional step of:
aspirating all excess powder which does not deposit on the side seam into an excess powder collector.

6. A method of coating the side seam of a can as set forth in claim 5 comprising the additional step of:
intensifying said aspirating when no can and no can side seam is present to be covered whereby all powder is removed from the area where it has been blown.

7. A method of coating the side seam of a series of cans coming directly from a can body maker comprising the steps of:
moving a hot can side seam at a constant rate past a powder nozzle for blowing powder onto said side seam;
blowing a shaped stream of polymeric powder at an angle of less than 30° toward the hot side seam of a can body as it moves past the powder nozzle;
electrostatically charging the polymeric powder;
electrically shielding all of said can body except said side seam from said charged polymeric powder;
electrically connecting said can body to an electrical ground; and
aspirating all the powder which does not deposit on said side seam into an excess powder collector through a conduit having an orifice located near the side seam of said can.

8. A method of coating the side seam of a series of cans coming directly from a can body maker as set forth in claim 7 further comprising the step of:
intensifying said aspirating of the powder when no can bodies come from said can body maker to be coated by said powder whereby all of said blown powder is drawn from the area where it was blown.

9. A method of coating the side seam of a series of cans coming directly from a can body maker as set forth in claim 8 further comprising the steps of:
cleaning said aspirated powder,
mixing said cleaned, aspirated powder with said polymeric powder, and
blowing said stream of mixed polymeric powder toward the hot side seam of a can body.

* * * * *