

May 28, 1940.

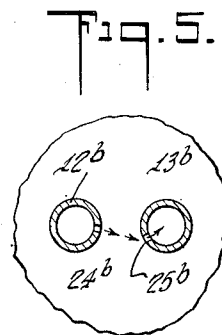
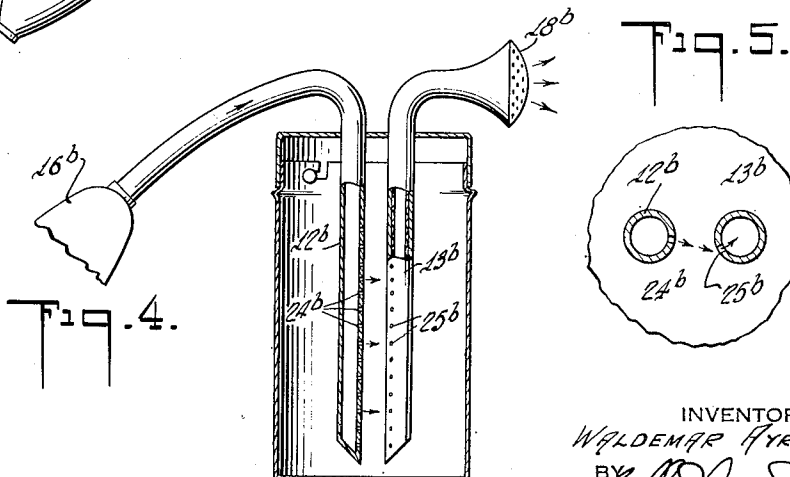
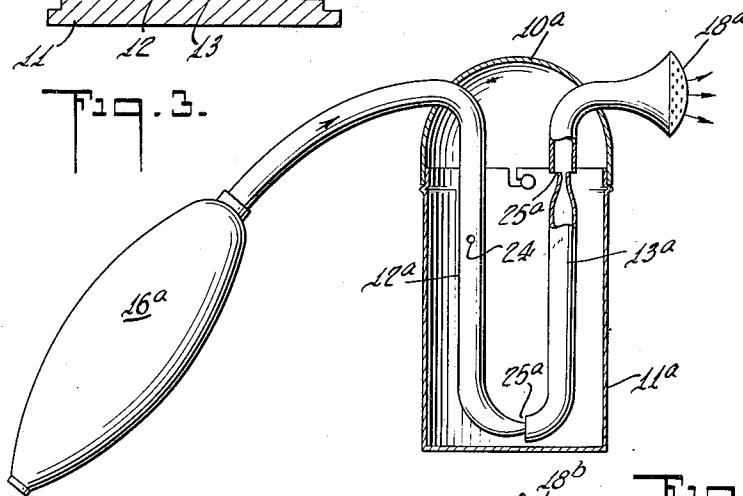
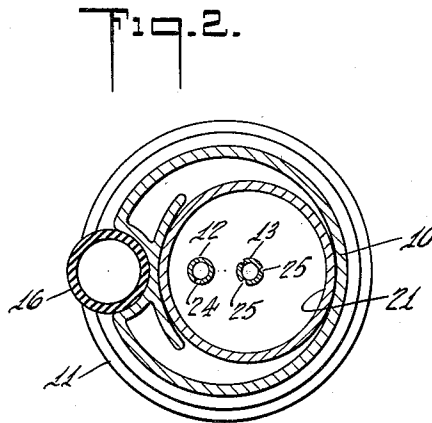
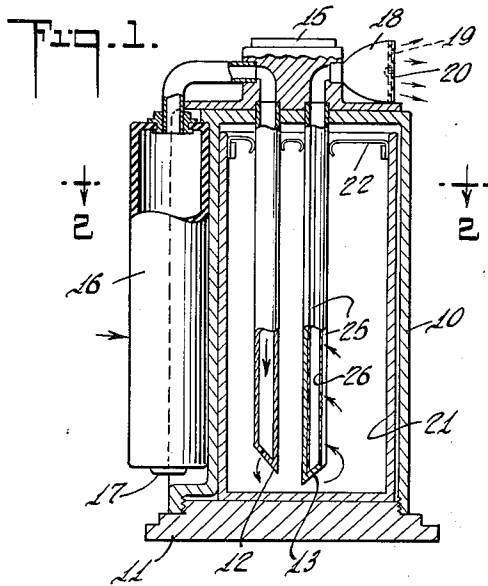
W. AYRES

2,202,079

DISPENSER

Filed March 13, 1939

2 Sheets-Sheet 1



INVENTOR
WALDEMAR HYRES
BY *[Signature]*
ATTORNEY

May 28, 1940.

W. AYRES

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2 Sheets-Sheet 2

Fig. 6.

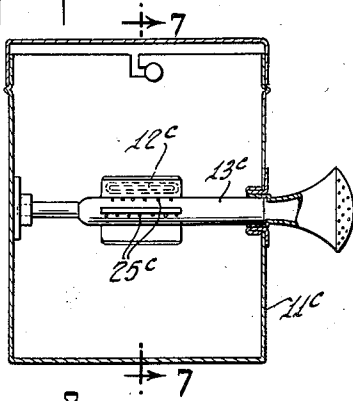


Fig. 7.

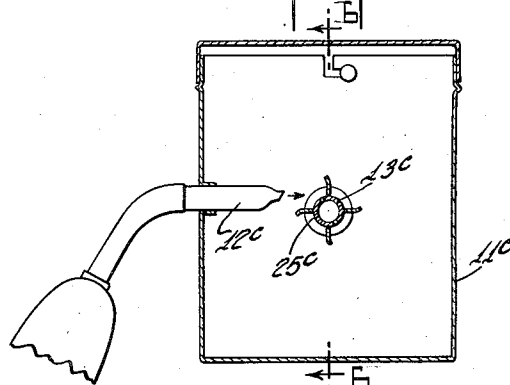


Fig. 8.

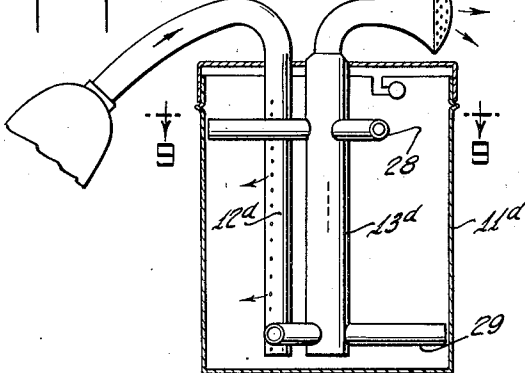


Fig. 9.

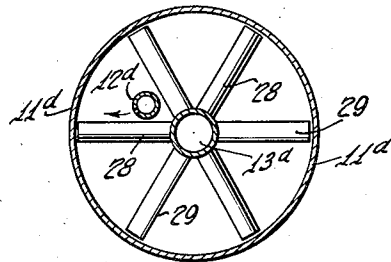


Fig. 12.

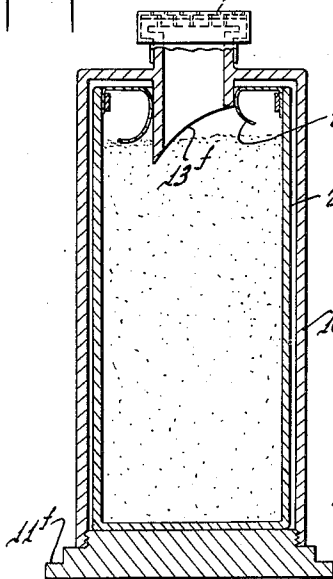


Fig. 10.

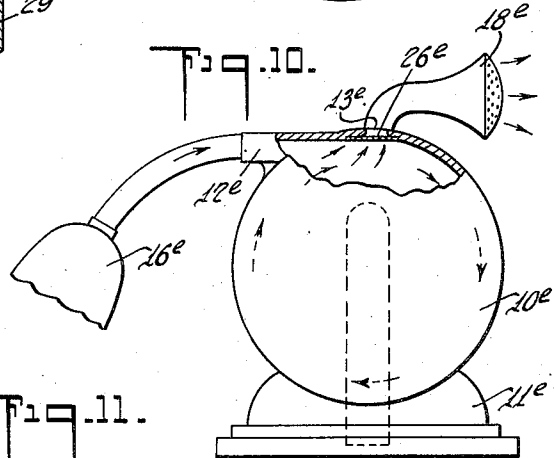
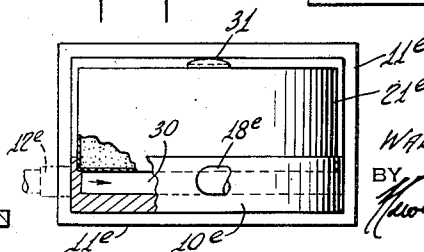


Fig. 11.



INVENTOR
WALDEMAR AYRES
BY *[Signature]*
ATTORNEY

UNITED STATES PATENT OFFICE

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DISPENSER

Waldemar Ayres, New York, N. Y.

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10 Claims. (Cl. 221-61)

This invention relates to a device for applying toilet powder and more particularly to such a device in which a flow of gas is used to entrain the powder to carry it to the surfaces on which it is to be applied.

Prior to my invention it has been customary in applying toilet or bath powder to use a "puff" ordinarily made of down or other similar soft material or to apply the powder directly onto the surface which is to be dusted and then to distribute it with the hand or a soft cloth or in any other suitable manner. The latter method of direct application is objectionable because, ordinarily, more powder than is desired remains at the point where it is directly applied; whereas, the use of the powder puff, although satisfactory as a method of distribution involves the use of a puff which is difficult if not impossible to clean and relatively expensive to replace.

It is an object of my invention to provide a device which is not much larger than the powder container itself, which may be a part of the powder container, but which unlike the ordinary powder container is capable of giving a uniform distribution of the powder with any desired density of application.

Another object of the invention is to provide a device which can be readily combined with and applied to an ordinary and inexpensive shipping container and conversely to provide an inexpensive shipping container which is specifically adapted for requirements of storage, shipment and selling.

With these objects in view I have shown in the accompanying drawings described below a preferred embodiment of my invention and a number of modifications thereof. It should be understood that these are not intended to be exhaustive nor limiting of the invention, but on the contrary are chosen with a view to illustrating the principles of the invention and the manner of embodying the same in practical use in order that others skilled in the art may be enabled to embody the invention in numerous forms and with numerous modifications, each as may be best adapted to the requirements of any particular use.

In these drawings:

Fig. 1 is a view in vertical section of a preferred embodiment of my invention;

Fig. 2 is a view in horizontal section taken on line 2-2 of Fig. 1;

Fig. 3 is a view in vertical section similar to that of Fig. 1, showing a modified embodiment of the invention;

Figs. 4 and 5 are views in vertical section and

in fragmentary horizontal section showing another embodiment of the invention;

Figs. 6 and 7 are views respectively in vertical and horizontal section of another embodiment of the invention;

Figs. 8 and 9 are similar views in vertical and horizontal section of another embodiment of the invention;

Fig. 10 is a view partly in elevation and partly in vertical section of another embodiment of my invention;

Fig. 11 is a view in horizontal section of a modification similar to that shown in Fig. 10; and

Fig. 12 is a view in vertical section of a refillable sifter container embodying my invention.

Referring first to Figs. 1 and 2, the device there shown comprises a container 10, having a removable closure 11 which in this case also serves as the base. Into this container project an air-inlet tube 12 and an outlet tube 13. The former connects through the head 15 of the container with a rubber bulb 16, which is provided with a one-way inlet valve 17 and thus serves as a source of gas pressure. The outlet tube 13 is connected with the distributor head or mouth 18 which is provided with a perforate face 19 adapted to hold back any lumps of powder which might collect within the tube 13 or the head 18. In the embodiment shown a rotating valve 20 is provided with perforations adapted in one position to register with the holes of the face 19 and in another position to be moved so as to close off the openings. This, of course, is not necessary to my invention, but is merely a precautionary measure to assure that no powder will sift out of the device if, for example, it should be packed with dark clothing while traveling.

It is important that these perforations 19 be distributed over the entire area of the face and especially close to the edges, and in general that the passages for the flow of the powder cloud should be so designed that there will be no back-washes in which powder can settle out and collect.

Within the container 10 is inserted a powder package 21. As shown in this figure the package is an ordinary cylindrical cardboard box, which is adapted to meet the requirements of shipment and distribution, and this is sealed at the top by a transparent film 22, e. g., of Cellophane, through which powder may be viewed by the purchaser.

Powder supplied in such container is received by the customer in a sealed air-tight condition. When it is to be used in the device of my inven-

tion, the base 11 is removed from the container and the powder package 21 is merely pushed into the receptacle 10. The pointed ends of the tube 12 and 13 puncture the thin transparent film 22 and thus extend down into the powder within the package. The base 11 is screwed back into place and the device is ready for use.

The inlet tube 12 near its bottom or advantageously throughout its length is provided with perforations through which air flowing from the bulb 16 is injected into the mass of powder. The tube 13 is provided with perforations both near its top and its bottom, and preferably throughout its length, into which the air flows with entrained powder. In order to prevent lumps of powder from passing into the tube 13 the openings are made so small that only such powder may pass as is capable of being entrained in the flow; and these openings likewise serve as a valve against any masses of powder by reason of the fact that the powder in a mass forms a self-sustaining arch over the opening.

In the case illustrated this result is attained by cutting longitudinal grooves substantially the full length of the tube which are sufficiently narrow so that the powder can form a self-supporting arch and will not flow into the slot 25 of its own weight or under the pressure applied by the bulb 16. As a further precaution to the same end, the interior of the tube is lined with a fine mesh screen 26. This screen may advantageously be fine mesh tube, e. g., a wire braid of about 25-50 mesh, supporting a cambric or other fine textile layer between it and the tube 13.

In the use of this device the container 10 can be grasped in the palm of the hand with the thumb on the bulb 16. Repeated pressing of the bulb will pump a stream of air under pressure through the tube 12 and out through the perforations 24 into the mass of powder within the package 21. This flow of air will stir up and entrain some of the powder, which will thus be carried up into the space above the solid mass of powder, from thence it will pass through the slots 25 and the screen 26 into the interior of the tube 13 and so out into the delivery head 18 and through the perforated face 19 and 20 from which it will pass as a cloud of powder in directed flow.

As this cloud strikes the skin or other surface to be dusted with the powder, the powder adheres and thus a uniform distribution may be achieved without excess.

It is an advantage of this arrangement that the device can be operated in any position. In the upright position the operation is as already described. In the inverted position, if the perforations are distributed along the full length of the tube 12 and sufficiently small so that the flow is distributed through them all, the operation will be identical. If not, the operation will still be effective because the device will not ordinarily be used for long in the inverted position and, by the very act of turning it over, a suitable amount of the powder will be stirred up by the air which passes from one end to the other when the container is inverted; and this entrained powder will be blown by the flow of air into the tube 13 and out through the delivery head 18. The action in various positions can be improved if the outlets 24 from the tube 12 are positioned at an angle to the radius so that the air jets from them produce a swirling of the air within the container which will tend to pick up additional powder by a cyclone action even though the tube

12 may be entirely above the level of the powder mass, as for example, with the container 10 nearly empty and held on its side.

In Fig. 3, I have shown a device which is similar, excepting that in this case I have illustrated a simple powder can having a simple cup or container section 11a directly filled with powder instead of carrying a package inside, and the cover section 10a is made in simple form without the head or dome 15 and with the tubes 12a, 13a, formed of a single continuous tube perforated at 24 to provide an outlet and cut and flattened at 25a to form a venturi with narrow openings into which the air and entrained powder are sucked. The end of this tube connects with the distributing head or outlet 18a provided with perforations not shown in this figure.

In the operation of this device, a flow of air is produced by repeated pressing of the bulb 16a. This flow passes in part through the tube 12a and the venturi 25a into the tube 13a and eventually out through the distributing head 18a and in part escapes through the opening 24. Each venturi produces a suction, whereby the air and entrained powder are sucked into the tube 13a. In this case it is less important that the size of the openings 25a should be sufficient to prevent the flow of powder into the tube, since the continuous flow of the narrow air jet at the venturi, compared to the size of the tube, will result in producing a turbulence which would entrain such powder even if it should flow through the relatively small opening 25a in a substantially solid stream.

In Figs. 4 and 5, I have shown another embodiment of my invention which is similar to that of Figs. 1 and 2, excepting that in this case the outlet from the tube 12b is through a slot or a line of perforations directed approximately tangentially across the tube 13b and the inlets into the tube 13b are approximately at the point of tangency and transverse to the direction of the flow from the tube 12b. The purpose of this arrangement is that the air from the tube 12b flowing across the openings 25b clears them from any powder which may be massed against them, while the turbulent back-wash in the space between the tubes entrains some of the powder blown away from the openings 25b and carries it on through those openings into 13b. With this exception, the operation and principle of the device shown in Figs. 4 and 5 is substantially the same as those shown in Figs. 1 to 3 inclusive and discussed above.

In Figs. 6 and 7, a device is shown which is provided with a rotor 13c while the tube 12c is designed to form an air jet for driving the rotor 13c. As the air drives against the vanes of the rotor 13c the powder is first blown away from the vane and the rotor is then rotated so that its vanes throw any powder which tends to blow into contact with it and keeps the openings 25c thereof free from any mass of powder, at the same time creating a turbulence which assists in entraining the powder in the air flow.

In the device of Figs. 8 and 9, the inlet tube 12d may be as in any of the other constructions already described. The outlet tube 13d in this case is provided with crow-foot extensions 28 and 29 which, as clearly shown in Fig. 9, extend so close to the sides of the container lid that any mass of powder will arch across the opening, whereas, any flow of air with powder entrained therein readily passes through the gap and into the branch tubes 28 or 29 and through them into

the outlet tube 13d. With the staggered crow-foot arrangement of the branch tubes 28 and 29, there will always be at least one of these tubes above the mass of powder even though the container 11d is almost full of powder. Thus, this device will operate equally well in any possible position. If desired, gravity valves may be used to shut off the outlets 28 and 29 which are lowermost and, therefore, would tend to be submerged in the mass of powder, leaving open only those which are uppermost. As already described, however, this is not necessary, since the powder itself will effectively close off the submerged branches if the spacing from the side of the container 11d is properly chosen.

In Fig. 10, I have shown a modified device which, however, uses the same principle as that of the device shown in Figs. 4 and 5. In this case the air or other gas flows through a tangential inlet 12e into the container 10e, and the outlet is through an opening 13e covered by a screen 26e. The powder in this case may either be contained in the container 10e without restriction, or it may be in a separate chamber separated from the air circulating chamber by a screen having openings just small enough to assure arching of the powder over the openings and thereby to prevent a simple flow of the powder through the screen. The latter modification is shown in Fig. 11.

Assuming first that the container 10e is without partition and simply carries the mass of powder in its interior below the opening 12e the operation is as follows: The flow of air is driven from the bulb 16e through the inlet opening 12e, and is deflected by the upper wall of the container 10e into a circular or elliptical path. A portion may pass out directly through the opening 26e but most of it will be deflected along the wall and against the mass of powder. As it strikes the mass of powder it will tend to produce turbulence which will pick up some of the powder and with this powder entrained the flow will continue its circular path until it escapes through the outlet 26e and the distribution head 13e. This action continues with an enlargement of the circular path by attrition as long as any powder remains in the container 10e.

In the case illustrated in Fig. 11, the portion 10e is designed to receive a simple cylindrical powder box 21e, which is held against the screen 30 by the spring clip 31 on the base 11e. The powder in the box 21e is packed by gravity against the screen 30, but does not flow through the screen because each opening in the mesh of the screen is so small that the powder effectively forms a self-supporting arch. Nevertheless, these openings are large enough to allow air passing over the base of the screen in a circular flow, as already described in connection with Fig. 10, to produce a turbulence at each opening of the mesh and this gradually carries away the powder by attrition, undermining the arch and allowing the powder mass repeatedly to fall back against the screen. Although I have shown a bulb in these examples as the source of gas flow, it should be understood that any source of gas under pressure or in flow may be used, as for example, electric blowers, cartridges or "bottles" of compressed gas. Electric blowers may be controlled by switches or contacts conveniently located to be operated much as the bulb 16 is operated or the flow of gas may be controlled by valves under finger or some control in much the same way. A small electrical motor with centrifugal blower can

be made of a compact size and embodied in the device quite similar to the motors now commonly used in electric shaving devices.

Although I have described above the use of commercial distribution packages 21 and 21e in connection with the particular distribution device of my invention, it should be understood that this feature of my invention is more broadly applicable. This I have illustrated, by way of example, in Fig. 12, in which a commercial package 21f similar to that illustrated in Fig. 1 is used with a sifter top can 10f which is provided with a tube 13f terminating in a pointed end adapted to rupture the sealing film or sheet 22. Such a device may be used for talcum powder or for numerous other powdered or granular articles, as for example, bathroom cleansers, in which latter case the base 11f may be made of molded plastic, wood or non-corroding metal so as to avoid producing rust stains on bathroom fixtures, as so often happens in the use of existing commercial packages for such cleansers. It is also within the scope of my invention to use such a device in connection with the existing packages, in which case the top of the package is ordinarily of thin sheet metal or heavy paper. In this case the threaded portion which engages between the base 11f and the container 10f may be made sufficiently long so that it may be used as a means for securing the necessary mechanical advantage to drive the pointed end of the tube 13f into the top (e. g., the thin metal top of an ordinary cleanser can) and thereby to produce a simple device for opening a commercial package. When the device is intended for use with commercial cleanser cans, the pointed end of the tube 13f should advantageously be positioned so as to strike one of the pre-weakened points which are provided in the commercial can for making it into a sifter top. This weakened point is easily penetrated and beyond that the metal may be easily torn by the square or sharp edge of the tube end.

It will be understood, of course, that other forms than the simple pointed tube may be used in order to facilitate puncturing and cutting of the opening in the top of the commercial package through which the contents flow into the outlet and it will be understood also that instead of the outlet tube 13f it will also be practicable simply to puncture the top of the tube with sufficiently large openings and to provide an ordinary sifter top or any other desired outlet from the container 10f.

What I claim is:

1. A toilet powder duster which comprises a substantially air-tight container for the powder, means for supplying gas under pressure to the vicinity of the powder in the interior of the container, and a delivery conduit extending from one extremity to the other of said container and having openings thereinto near each extremity whereby in either of inverted positions at least one of said openings will be exposed above the powder for receiving gas with entrained powder which flows from the gas supplying means.

2. A device as defined in claim 1, which includes means for closing a part of the delivery conduit when it is below the level of the powder against influx of the powder.

3. A device as defined in claim 1, in which the openings into the delivery conduit within said container are of dimensions adapted to permit passage of particles of the powder when entrained

in the gas but sufficiently small to support a mass of powder thereover without influx.

4. A device as defined in claim 1, in which the container comprises a shell composed of separable parts in one of which are fixed the projecting ends of the gas supplying means and the delivery conduit and a replaceable package containing the powder and having one end thereof pierced by said projecting ends; and said projecting ends are pointed to facilitate piercing such package.

5. A powder dispensing device which comprises a head including cover means, powder distributing means on the outside of the cover and a powder feeding tube extending therethrough and from the opposite side and having a pointed end; and a powder container having a readily perforable portion sealed therein adapted to be pierced by said pointed end and means for securing said container in substantially powder-tight relation to said cover.

6. A powder dispensing device which comprises a powder can having one open end, a transparent rupturable film across said open end closing it for shipment and delivery, closure means adapted to engage said can and seal it against leakage of powder, a tube extending through said closure whereby to feed powder to the outside thereof and having a pointed end adapted to pierce the rupturable film, and means for dispensing powder fed by said tube.

7. A toilet powder duster which comprises a powder container adapted to be closed substantially powder-tight, a gas inlet tube extending from top to bottom of the container and having outlets therefrom so narrow as to prevent substantial inflow of powder into said tube and to restrict the flow of gas pressure therefrom so that the flow will be distributed throughout said openings without short circuiting through any part of them, a powder outlet tube having a header extending from top to bottom and at least three branch tubes at each end thereof extending close to the sides of the container and having openings at the ends thereof so narrow as to

support a mass of powder without substantial inflow, said header extending through the top of the container and terminating in a mouth, and a screen over said mouth to restrain or break up any masses of powder which may be blown into said header.

8. A toilet powder duster which comprises a substantially air tight container for a mass of the powder, means for conducting gas from said pressure supply means in a flow substantially over the surface of the mass of powder whereby powder therefrom may be entrained in the flow, and means for conducting the flow from the vicinity of said powder mass to the exterior of said container and discharging it therefrom, said last-named means communicating with at least one space within the container which will be respectively above the mass of powder in any position of normal use, but being partitioned from the mass of powder below its surface in every position of the container whereby the powder is prevented from flowing therein en masse.

9. A toilet powder duster as defined in claim 8, in which the means for conducting the flow from the powder mass to the exterior of the container is provided with a chamber adjacent the powder mass and extending into each space which in a given normal position of use may be above the powder mass and partitioned throughout from the powder mass by a screen having openings sufficiently large to pass the powder particles when entrained in the flow of gas but too small to permit the flow of the powder en masse.

10. A toilet powder duster as defined in claim 8, in which the means for conducting the flow from the powder mass to the exterior of the container is provided with a chamber adjacent the powder mass and extending into each space which in a given normal position of use may be above the powder mass, and valve means adapted to partition off from the powder mass each part of said chamber when it is below the level of the powder mass.

WALDEMAR AYRES. 45