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SPRINKLING DEVICE

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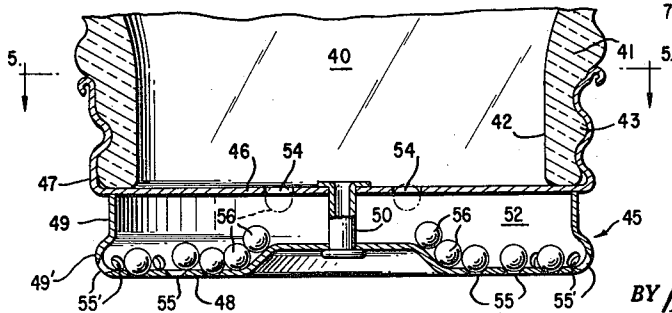
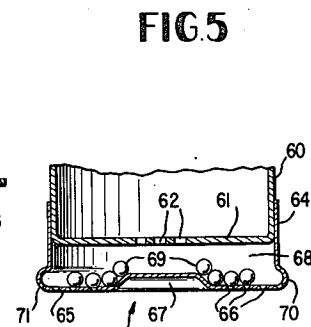
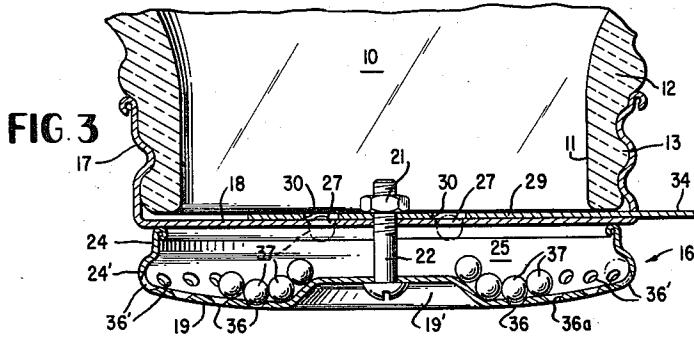
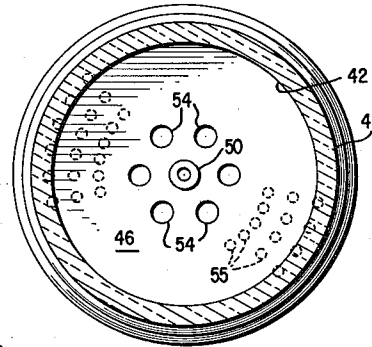
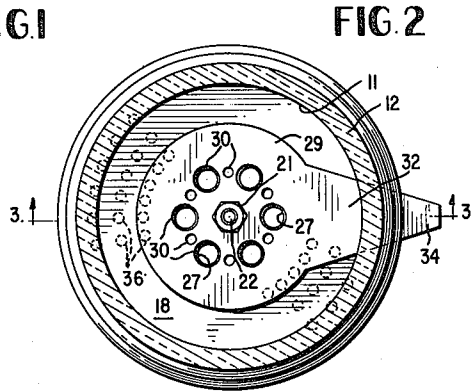
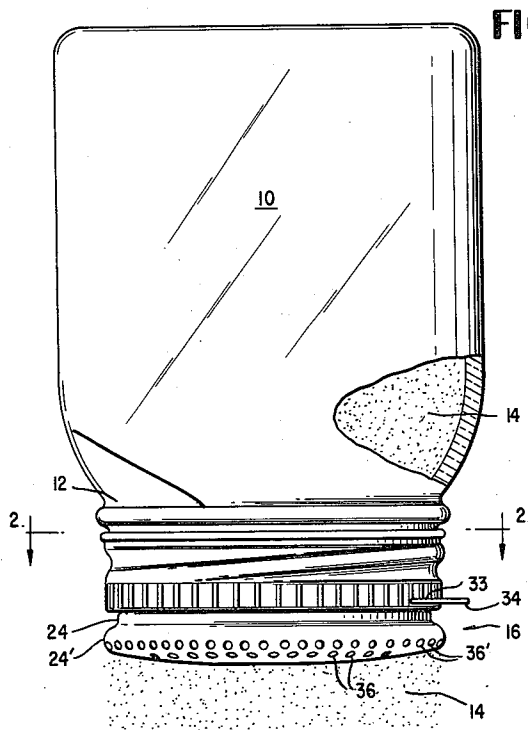


FIG. 4

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SPRINKLING DEVICE

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This invention relates to devices for sprinkling pourable liquids or powders. More particularly, it relates to an improved sprinkling device for use with a container of pourable material wherein individual charges of the material are metered into a separate chamber which is free from the pressure of the material in the container and from there are distributed uniformly over and easily discharged through a multiplicity of perforations.

There are many pourable materials in liquid and powdered form which when put to use may be manually sprinkled over the articles to which they are applied. Hence, various types of sprinkling devices find wide use in agriculture, industry, in the home, and in many other areas of activity. Manual sprinkling devices of the type contemplated by this invention are employed, for example, in dusting powdered insecticides and bactericides over vegetation, in distributing finely comminuted fertilizers over the ground, in dusting molds with releasing agents, in powdering confections with sugar or other trimmings, in dampening clothes prior to ironing, and in applying cleansing agents in washing.

The typical sprinkling device used in most of these applications is simply a container of some sort having a perforated closure member through which the material may be distributed. These have the disadvantage, however, that when finely comminuted powders are to be sprinkled, and particularly when a relatively large supply of the powder is to be held in the container (say one pint or more), the perforations in the closure member often become clogged under the weight of the powder in the container. Ordinarily the operator can prevent such clogging, if at all, only by shaking the container quite violently. Of course, the perforations in the closure member can always be enlarged so that such clogging does not occur, but that definitely diminishes the uniformity with which the powder can be applied.

It also has been proposed, as in German Patent No. 206,845, to provide a dusting device in which the material in the container is discharged through a partitioning plate into a separate chamber from which it is dusted through a perforated cap. However, such proposals, with which I am familiar, have not been entirely satisfactory, due in part, to a failure to provide a proper sprinkled from the charge. The apertures in the partitioning plate and those in the cap and to properly locate the apertures in the partitioning plate relative to those in the cap.

One of the primary purposes of the present invention, therefore, is to provide a dusting or sprinkling device of simple construction which is not subject to the above objections and which also embodies means for preventing clogging which do not entail the enlarging of the perforations. These objects have been achieved by working many improvements upon dusting or sprinkling devices of the type which are adapted to form a section of the wall of the container with which they are used and in which a pourable material is contained.

The contemplated device includes an inner partitioning plate adapted to extend completely across a section of the container wall and an outer foraminous member adapted to completely cover the partitioning plate. The partitioning plate and foraminous member define between them a substantially enclosed chamber. The partitioning plate has apertures which are adapted to permit a charge of pourable material to be metered from the container into the enclosed chamber and a multiplicity of

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perforations are formed in the foraminous member to permit the charge of pourable material to be dusted or sprinkled from the charge. The apertures in the partitioning plate are individually of larger area than the perforations in the outer foraminous member. Located in the chamber are a plurality of freely displaceable balls which are adapted to be agitated over the inside surface of the foraminous member in the charge of pourable material to distribute the material substantially uniformly over the inner surface of the foraminous member and to cause it to pass through all of the perforations.

When a pourable material in powdered form is being dispensed by means of this device, a measured charge of the material can be metered into the chamber simply by turning the container with the dusting or sprinkling device directed downwardly. This charge of material can then be distributed over and sprinkled through the perforations by very slightly oscillating the container back and forth so that the displaceable balls in the chamber roll over the inside surface of the foraminous member. By this method, the balls evenly spread the charge of material to all of the perforations in the foraminous member and the discharge therethrough is particularly uniform.

Since only a controlled amount of the powder is metered into the chamber at a time, the weight of the remainder of the material in the container cannot act upon the material in the chamber to cause clogging of the perforations. At the same time, the apertures in the partitioning plate are sufficiently large to prevent the weight of the material in the container from clogging in and around the apertures. It will also be noted that the contemplated dusting or sprinkling device permits the pourable material to be evenly dusted or sprinkled without shaking the container up and down since only a slight agitation of the balls over the inside of the foraminous member is needed to discharge the material from the chamber. The charging of the chamber is, of course, continuous when a liquid is being sprinkled.

Preferred embodiments of the contemplated dusting or sprinkling device are described hereinbelow with reference to the accompanying drawing, wherein:

FIG. 1 is an elevation partly broken away of one embodiment of a contemplated dusting or sprinkling device threaded onto the neck portion of a container of pourable material;

FIG. 2 is a horizontal section taken along the line 2—2 of FIG. 1;

FIG. 3 is a fragmentary vertical section, on an enlarged scale, taken along the line 3—3 of FIG. 2;

FIG. 4 is a fragmentary vertical section taken through the neck portion of a container similar to that shown in FIG. 1 with a second embodiment of the contemplated dusting or sprinkling device threaded thereto.

FIG. 5 is a horizontal section taken along the line 5—5 of FIG. 4; and

FIG. 6 is a cross-sectional view showing a further embodiment of the invention.

Referring first to the embodiment illustrated in FIGS. 1—3, a container 10 is shown which is substantially enclosed except for an opening 11 defined by a neck portion 12 at one end thereof. The container 10 may advantageously be a glass bottle of the Mason jar type having integral external threads 13 formed about its neck portion 12. The container 10 is adapted to hold a pourable material 14 (such as any of those previously-mentioned liquids or fine powders) which is to be manually sprinkled, dusted, or otherwise scattered from the container by means of the contemplated dusting or sprinkling device.

The dusting or sprinkling device itself, indicated generally by the numeral 16, is fitted onto the open end of the

container 10. It includes an annular internally threaded rim 17 which is adapted to be threaded onto the external threads 13 formed about the neck portion 12 of the container. The rim 17 extends longitudinally from the periphery of an integral, flat, circular, inner partitioning plate 18 which is adapted to extend over the opening 11 of the container 10 when the rim 17 is threaded in place on the neck portion 12. Concentrically located on the inner partitioning plate 18 is an outer circular foraminous member 19 which is attached thereto by means of a fastener such as a nut 21 and metal bolt 22 extending through central holes in the partitioning plate 18 and the foraminous member. The hole in the foraminous member 19 through which the bolt 22 passes is located in the center of an inwardly-extending, centrally-located, circular, depressed portion 19'. Included in the foraminous member 19 is an annular, peripheral flange portion 24, the edge of which abuts the outer face of the partitioning plate 18 such that a chamber 25 is defined between the partitioning plate 18 and the foraminous member 19. The lower edge portion of the flange portion 24 is bellied out to form an arcuate peripheral channel 24' where it joins the foraminous member 19.

To provide communication between the inside of the container 10 and the chamber 25, a plurality of apertures 27 are formed in the inner partitioning plate 18. The apertures 27 are substantially centrally located in the partitioning plate 18 so that when the pourable material 14 passes therethrough, it enters at the center of the chamber 25. The positioning of the apertures centrally in the partitioning plate 18 further is desirable in that there is less weakening of the partitioning plate than if they extended to adjacent its outer periphery. However, the apertures should be spaced a sufficient distance from the opening through which the bolt 22 passes that the partitioning plate is not unduly weakened in that area. Since the apertures 27 are located in the central portion of the partitioning plate, these apertures are confined to a more compact area than the total area of the foraminous member having the perforations 36. The apertures 27 may be circular or of oblong shape, and are each substantially the same distance from the center of the plate 18. The size of the apertures 27 depends primarily upon the type of pourable material 14 being dusted or sprinkled since they must be sufficiently large to preclude the possibility of clogging and yet must be small enough to permit only the desired amount of material 14 to be metered therethrough into the chamber 25 below.

In view of the fact that the size of the apertures 27 is a variable, appropriate adjustment means are provided so that the dusting or sprinkling device 16 may be used with various types of pourable material 14. The contemplated adjustment means includes an adjustment disc 29 which is rotatably mounted about the bolt 22 on the center of the inside surface of the partitioning plate 18. The disc 29 is held flat against the partitioning plate 18 by means of the nut 21. It has formed therein an arrangement of holes 30 of two sizes positioned such that they can be registered with the apertures 27 in the adjoining partitioning plate 18. However, when the larger of the holes 30 are in registry with the apertures 27 (as seen in FIG. 2), the smaller of the holes 30 are not, and vice versa. When the larger of the holes 30 are in registry with the apertures 27, the entire area of the apertures 27 is exposed; and when the smaller of the holes 30 are in registry, only a portion of the area of the apertures 27 is exposed. By these means, the operating size of the apertures can be varied merely by rotating the disc 29 to one of two positions. To further facilitate this manual adjustment, the disc 29 includes an arm portion 32 adapted to extend radially through an arcuate slot 33 in the rim 17 so that it exposes an actuating handle 34 on the outside of the sprinkling device.

As seen in FIG. 3, the foraminous member 19 has a multiplicity of perforations 36 formed therein. These

perforations are located outwardly of the depressed portion 19' of the foraminous member which is imperforate and, when the dusting or sprinkling device is in the position shown in FIGS. 1 and 3, underlies the area of the partitioning plate having the apertures 27 therein, the perforations 36 in the foraminous member extend outwardly to the periphery thereof and upwardly into the channel 24' connecting the flange 24 to the foraminous member. This outer ring of corner perforations 36' is also important. These perforations are of sufficient size to discharge all powder which reaches them. If it were not for these holes, the powder would start collecting and packing in the corner where the flange 24 joins the periphery of the foraminous member 19 and the sides of the chamber eventually would become completely filled with the material. As shown in FIG. 3, the radius of the curvature of the channel 24' is slightly greater than the radius of the balls 37 so that the balls 37 can work in close and keep the powder forced out of the perforations, thereby keeping the perforations free from clogging. Also, a plurality of freely displaceable balls 37 are arranged at random within the chamber 25 which are of sufficient size to be prevented from escaping through either the perforations 36 or the apertures 27. However, as shown in FIG. 3, the balls 37 are of such size that when the dusting or sprinkling device is shaken up and down or oscillated back and forth, they will partially enter the apertures in the partitioning plate 18 and the perforations 36 in the foraminous member, respectively. This will effectively keep the apertures 27 from clogging and will also keep the perforations 36 free from clogging and act to force the material through them to facilitate deeper penetration of the balls into the perforations 36. The perforations are punched from the inside of the foraminous member and leave the dimple-like depressions 36a around each perforation in the inside. The outer portion of the depressions is ground off flush with the outer face of the foraminous member. The dimple-like depressions around the inside of each of the perforations permit the balls to go deeper into the perforations and makes it almost impossible for the perforations to clog up, without increasing the size of the perforations. The clogging of the apertures 27 and the perforations 36 further is prevented, and uniform metering of the material into the chamber 25, and uniform distribution of the material through the perforations of the foraminous member is facilitated by vibrations which are set up in the partitioning plate 18 and the foraminous member 19 resulting from the balls striking against the metal bolt 22. This sets up vibrations in the bolt which are transmitted by the bolt to the partitioning plate and the foraminous member. The balls 37 also function to distribute the material falling through the apertures 27 into the chamber 25 since it requires but slight oscillation of the entire container 10 by the operator to roll the balls 37 over the perforations 36 in the foraminous member 19 to cause the balls 37 to distribute the pourable material 14 metered through the partitioning plate 18 to all of the perforations. Since the tendency of the material is to collect at the periphery of the chamber 25 as the container is oscillated, the apertures 27 are centrally located and the foraminous member 19 is given a slightly outwardly convex shape. Both these features retard the normal radial outward displacement of the charge of pourable material 14 and insure that the distribution is as uniform as possible over the perforations. The uniform distribution of the material over the perforations is also facilitated by the fact that the material falling through the apertures 27 falls upon the imperforate central section of the foraminous member 19 and is acted upon and distributed by the balls 37 before it can pass through the perforations 36.

In order to obtain optimum results, the apertures in the partitioning plate 18 and the perforations in the foraminous member 19 should be of the proper size for the material to be dusted or sprinkled and in the proper ratio

to one another; the balls should be of the proper size; and the total area of the perforations 36 to the total area of the space surrounding the perforations should be of the proper ratio. While these factors will vary with respect to the dusting or sprinkling of different materials, it has been found that for many powdery materials to be dusted, the apertures in the partitioning plate should be about $\frac{1}{8}$ inch in diameter, or of equivalent area if other than round, and the perforations in the foraminous member should be about $\frac{1}{16}$ inch in diameter, that is, the ratio of the diameter of the apertures to the diameter of the perforations is about 2.5 to 1, and the ratio of the area of the apertures to the area of the perforations is about 6.4 to 1. This latter ratio might be somewhat less, but should not be less than 3 to 1 and preferably not less than 4 to 1. This ratio may be increased to some extent but should not be decreased materially. The purpose of providing such a ratio is to assure a concentrated feed of material from the container 10 to the chamber 25 and a scattered feed-out of the material through the perforations 36. The size of the perforations 36 in the foraminous member should not vary materially from about $\frac{1}{16}$ inch. If the size of the perforations is materially increased, they will feed too much powder per hole when used for dusting powders to give a proper dusting effect. If the size of the perforations is less to any material extent, the balls cannot roll deep enough into them during a dusting operation to maintain them free from clogging. About the maximum range of the diameter of the perforations, depending upon the material being dusted, is from $\frac{1}{32}$ to $\frac{3}{32}$ inch.

The ratio of the total area of the perforations 36 to the total area of the space of the foraminous member surrounding the perforations should be between 1 to 9 and 1 to 36, depending upon the characteristics of the material being dusted or sprinkled and to some extent upon the volume of material fed to the chamber 25. For most powdery material a ratio of about 1 to 18 will give the best results. If the ratio is appreciably less than 1 to 9, the material tends to fall straight down during a dusting operation and the desired dusting effect is not obtained.

The diameter of the balls 37 should be about $\frac{1}{8}$ inch and slightly greater than the diameter of the apertures 27 in order that a substantial portion of the balls will protrude through the apertures when the dusting or sprinkling device is agitated or shaken to dislodge material which may tend to clog them. They may be somewhat larger, but should not be so large that they will not extend down into the dimpled-like depressions surrounding the perforations in the foraminous member.

The perforations of the ring of perforations 36' in the channel 24' should have a diameter slightly larger than the diameter of the perforations 36 in the main portion of the foraminous member and preferably a diameter about 25 percent greater. Thus, when the perforations 36 are $\frac{1}{16}$ inch in diameter, the perforations 36' should be about $\frac{3}{64}$ inch in diameter. Under such conditions, the ratio of the diameter of the balls 37 to the diameter of the perforations 36' is about 2.2 to 1, while the ratio of the diameter of the balls to the diameter of the perforations 36 is about 2.75 to 1. Balls of smaller diameter would not work as satisfactorily as they would lessen the width of the aperture or else fall back into the space 25. The ideal size of the balls is one which is just large enough not to fall back through the apertures and yet is small enough to dislodge powder which otherwise might clog the perforations.

In use, the container is simply turned upside down so that a limited charge of the pourable material 14 drops through the apertures 27 into chamber 25. If the characteristic of the material 14 is such that the apertures 27 provide for too great a flow of material, the size of the apertures may be adjusted by means of the handle 34 to permit a lesser quantity of the material to pass upon

each over-turning of the container, or the disc 29 may be turned to bring the smaller holes 30 therein into alignment with the apertures 37 in the partitioning plate. In the case of extremely fine powders or liquids, the size of the apertures should be adjusted to permit a limited continuous charge to enter the chamber 25.

After the container is over-turned in this manner and the chamber 25 is charged, the entire container is simply oscillated back and forth slightly. During such movement of the container the rolling, bouncing balls strike the inwardly depressed portion 19' and bounce against the overlying partitioning plate 18 with some of the balls actually extending into the apertures 27 as shown in dot-and-dash lines and dislodging material from them. This same action causes the balls to strike against the metal bolt 22 setting up vibrations in it which are transmitted both to the partitioning plate 18 and the foraminous member 19, thereby further assisting in the dislodgment of material from the apertures 27 as well as from the perforations 36. As the balls roll and bounce around in the chamber, the material which has fallen through the apertures 27 onto the central imperforate section of the foraminous member is distributed by them over the inner face of the foraminous member to the ring of perforations 36' in the channel 24', thus distributing the material uniformly over the perforations 36 and causing a uniform dusting of the material from the container. If the charge of material entering the chamber 25 is not continuous, the chamber may be recharged merely by turning the container upright and then again turning it upside down so that another quantity of material drops into the chamber.

Turning now to the embodiment illustrated in FIGS. 4 and 5, a container 40 which is identical to that shown in FIG. 1 has a neck portion 41 at one end defining an opening 42. External threads 43 are formed about the circumference of the neck portion 41. Again, the container 40 is adapted to hold a pourable material such as any of those previously described. Covering the mouth of the container 40 is a sprinkling device indicated generally by the numeral 45 which is of simpler construction than that shown in FIGS. 1-3 and is more suited for the sprinkling of liquids and particularly fine powders.

Included in the sprinkling device 45 is an inner partitioning plate 46 having a peripheral rim portion 47 which is internally threaded so that it can be threaded onto the neck portion 41 of the container 40. An outer circular foraminous member 48 is concentrically attached to the partitioning plate 46 by means of a centrally located rivet 50. The foraminous member 48 has an annular circumferential flange portion 49, the edge of which abuts the outer face of the partitioning plate 46 such that a chamber 52 is defined between the partitioning plate 46 and the foraminous member 48.

Communication between the inside of the container 40 and the chamber 52 is provided by a plurality of apertures 54 which in this embodiment are all of equal size. Again, the apertures 54 are centrally arranged in the partitioning plate 46 to insure that the pourable material is delivered to the imperforate center of the chamber 52 to offset the tendency of the material to collect at the periphery of the chamber 52. In the foraminous member 48, a multiplicity of perforations 55 are formed, each of which is smaller in area than the individual apertures 54. In this embodiment also, a plurality of freely displaceable balls 56 are randomly positioned in the chamber 52 in such a manner that they can be agitated over the perforations 55.

In this embodiment the size of the apertures 54, the size of the perforations 55, and the size of the balls 56 may be the same as the size of the apertures 27 of the embodiment of FIGS. 1 to 3. In like manner, the ratio of the diameters of the apertures 54 to the diameters of the perforations 55, and the ratio of the diameter of the balls 56 to the diameters of the apertures 54 and the perforations 55 may be the same as the ratio of the diameter

of the balls 37 to the diameters of the apertures 27 and the perforations 36 of the embodiment of FIGS. 1 to 3. Like the flange 24 of the foraminous member 19 of FIGS. 1 to 3, the flange portion 49 of the foraminous member 48 is provided with a channel 49' where it joins the periphery of the foraminous member 48. Such channel is provided with a ring of perforations 55' of a size corresponding to the perforations 36' of the channel 24'. When liquid is being sprinkled from the container, the perforations 55' permit the liquid to be discharged radially, under the pressure of the head of the overlying liquid, outwardly from the sprinkling device in addition to the normal downward discharge. This feature is also an advantage when dusting fine powdered insecticides or the like onto plants since it permits the powder to be more easily dusted onto the leaves of the plant.

In some instances it may be desirable to embody the invention in a disposable plastic or paperboard tube. Such an embodiment is disclosed in FIG. 6 in which 60 represents a disposable container of a suitable plastic or paperboard having a closed end 61 provided with apertures 62. A cap member 63 is secured to the container 20 by the flanges 64 thereof, which may be adhesively or otherwise secured to the end portion of the side wall of the container.

The base 65 of the cap is provided with a plurality of perforations 66. The center portion of the base of the cap has an inwardly-extending, centrally-located, imperforate, circular, depressed portion 67 similar to the depressed portion 19' of FIG. 3.

The end wall 61 of the container forms a partition and with the cap member provides a chamber 68 in which a plurality of roller members, preferably balls 69, are located.

The lower edge portion of the flange 64, where it is connected to the base of the cap member, is bellied out to form arcuate peripheral channel 70 having an annular ring of perforations 71.

The size of the apertures 62, the size of the perforations 65 and 71, and the size of the balls 69 are all as described above with respect to the previous modifications, as is also the ratio of the size of the apertures 62 to the size of the perforations 65 and the ratio of the total area of the apertures 62 to the total area of the central portion of the end member surrounding the perforations and the ratio of the total area of the perforations 66 to the total area of the end of the cap surrounding the perforations.

As in FIG. 3, the apertures 62 are located in the central area of the end of the container and above the imperforate depressed portion 67, so that pulverulent material passing through the perforation 62 into the chamber 68 will fall upon the imperforate, centrally depressed portion 67 and be spread by the balls 69 over the base of the cap to pass through the perforations therein as the container is shaken back and forth.

Since liquids or particularly fine powders are advantageously sprinkled by means of this embodiment of the invention, no adjustment means are included for varying the size of the apertures 54 because the flow characteristics of such materials are relatively uniform.

In general, however, the operation of the sprinkling device 45 is the same as that previously discussed, particularly in that a charge of the pourable material in the container can be metered either intermittently or continuously into the chamber 52 where it is free from the pressure of the remainder of the pourable material in the container. In the chamber 52 it is spread evenly over the perforations 55 by simply a slight agitation of the balls 56, as described in connection with dusting and sprinkling device of FIGS. 1 to 3, and it emerges uniformly from all of the perforations 55.

There are, of course, many variations which can be made in the two embodiments described herein without departing from the scope of this invention. For example,

either of the sprinkling devices 16 or 45 can be incorporated integrally into their associated containers. The pourable material could, therefore, be marketed in a container which includes the sprinkling device. Also, such structural features as the attachment of the rims and flanges to the partitioning plates and foraminous members can be varied in several different ways to define the chamber therebetween. Modifications can also be made in the fastening means and aperture adjustment means shown without departing from the scope of the invention.

This application is a continuation-in-part of my application Serial No. 778,877, filed December 8, 1958, now abandoned.

I claim:

1. A dusting or sprinkling device for attachment to a container holding pourable material and adapted to form a section of the container wall comprising means for attaching the device to a container, an inner partitioning plate, an outer foraminous member having perforations therein, means spacing said partitioning plate from said foraminous member and forming between them a chamber, said partitioning plate having at least one aperture therein through which material in an attached container may flow into said chamber, said aperture being solely in the central area of said partitioning plate, and said perforations being spaced radially outwardly from the projection of the central area of the partitioning plate, leaving an imperforate central portion in the foraminous member axially opposite said aperture whereby when the device is positioned with the foraminous member beneath said partitioning plate, material falling through said aperture will fall upon said imperforate central area.
2. A dusting or sprinkling device as set forth in claim 1 including rolling members in said chamber.
3. A dusting or sprinkling device as set forth in claim 2 in which at least a portion of said central area of the foraminous member extends inwardly from the general plane of the foraminous member into said chamber, whereby, when the device is in dusting or sprinkling position and is shaken, the roller members will strike against said inwardly-extending portion and be caused to bounce around.
4. A dusting or sprinkling device for attachment to a container holding pourable material and adapted to form a section of the container wall comprising means for attaching the device to a container, an inner partitioning plate, an outer foraminous member having perforations therein, means spacing said partitioning plate from said foraminous member and forming between them a chamber, said partitioning plate having at least one aperture therein through which material in an attached container may flow into said chamber, roller members in said chamber, said foraminous member having at least one portion extending inwardly into said chamber against which said roller members are adapted to strike when the device is in dusting or sprinkling position and is shaken.
5. A dusting or sprinkling device for attachment to a container holding pourable material and adapted to form a section of the container wall comprising means for attaching the device to a container, an inner partitioning plate, an outer foraminous member having perforations therein, said foraminous member having a peripheral flange portion extending between its periphery and said partitioning plate, said flange portion spacing said foraminous member from said partitioning plate and forming a chamber between them, said flange portion having an inwardly concave channel adjacent where it joins said foraminous member, said channel having a ring of perforations therein, said partitioning plate having at least one aperture therein through which material in an attached container may flow into said chamber, and roller members in said chamber.
6. A dusting or sprinkling device as set forth in claim 5 in which the area of the individual perforations in said

channel is greater than the area of the individual perforations in said foraminous member.

7. A dusting or sprinkling device as set forth in claim 6 in which said roller members are balls, said channel is substantially arcuate and the radius of curvature of said channel is greater than the radius of said balls so that said balls can readily enter said channel and force material from the perforations therein.

8. A dusting or sprinkling device as set forth in claim 6 in which said roller members are balls, the perforations in the foraminous member and in said channel are circular and the ratio of the diameter of the balls to the diameter of the perforations in said channels is about 2.2 to 1.

9. A dusting or sprinkling device for attachment to a container holding pourable material adapted to form a section of the container wall comprising means for attaching the device to a container, an inner partitioning plate, an outer foraminous member having perforations therein through which material in an attached container foraminous member and forming a chamber between them, said partitioning plate having at least one aperture therein through which material is an attached container may flow into said chamber, roller members in said chamber, a member extending across said chamber and connected at its respective ends to said partitioning plate and said foraminous member and in a position to be struck by said roller members when said device is in dusting or sprinkling position and is shaken and thereby impart vibrations to said partitioning plate and said foraminous member.

10. A dusting or sprinkling device as set forth in claim 9 in which said partitioning plate has a plurality of apertures therein, said apertures are positioned solely in the central area of said partitioning plate, said perforations are spaced radially outwardly of the projection of the central area of the partitioning plate, leaving an imperforate central portion in the foraminous member axially opposite said apertures, whereby, when the device is positioned with the foraminous member beneath said partitioning plate, material falling through said apertures will fall upon said imperforate central portion, at least a portion of said central area of the foraminous member extends inwardly from the general plane of the foraminous member, and the member which extends across said chamber extends from said inwardly-extending portion.

11. A dusting or sprinkling device for attachment to a container holding pourable material and adapted to form a section of the container wall comprising means for attaching the device to a container, an inner partitioning plate, an outer foraminous member having circular perforations therein, means spacing said partitioning plate from said foraminous member and forming a chamber between them, said partitioning plate having at least one aperture therein through which material in an attached container may flow into said chamber, and balls in said chamber, the inner surface of the foraminous member having dimple-like depressions surrounding the perforations thereof.

12. A dusting or sprinkling device as set forth in claim 11 in which the ratio of the diameter of the roller members to the diameter of the perforations in the foraminous member is from about 2 to 1 to 6 to 1.

13. A dusting or sprinkling device for attachment to a container holding pourable material and adapted to form a section of the container wall comprising means for attaching the device to a container, an inner partitioning plate, an outer foraminous member having perforations therein, means spacing said partitioning plate from said foraminous member and forming a chamber between them, said partitioning plate having at least one aperture therein through which material in an attached container may flow into said chamber, the ratio of the total area of the perforations in the foraminous member to the total

area of the foraminous member surrounding the perforations being from about 1 to 9 to 1 to 36.

14. A dusting or sprinkling device comprising an inner partitioning plate forming a wall of a container for the material to be dusted or sprinkled, an outer foraminous member having perforations therein, means spacing said partitioning plate from said foraminous member and forming between them a chamber, said partitioning plate having at least one aperture therein through which material in an attached container may flow into said chamber, said aperture being in the central area of said partitioning plate, and said perforations being spaced radially outwardly from the projection of the central area of the partitioning plate, leaving an imperforate central portion in the foraminous member axially opposite said aperture, whereby, when the device is positioned with the foraminous member beneath said partitioning plate, material falling through said aperture will fall upon said imperforate portion.

15. In a dusting or sprinkling device for use with a container holding pourable material and adapted to form a section of the container wall, an inner partitioning plate, an outer foraminous member having perforations therein, means spacing said partitioning plate from said foraminous member and forming between them a chamber, said partitioning plate having at least one aperture therein through which material in an adjacent container may flow into said chamber, the ratio of the area of the individual apertures to the area of the individual perforations being at least 3 to 1.

16. A dusting or sprinkling device for attachment to a container holding pourable material and adapted to form a section of the container wall, an inner partitioning plate, an outer foraminous member having perforations therein, means spacing said partitioning plate from said foraminous member and forming a chamber between them, said partitioning plate having a plurality of closely spaced apertures therein through which material in an attached container may flow into said chamber, the ratio of the total area of said apertures to the total area of the partitioning plate immediately surrounding said apertures being greater than the ratio of the total area of said perforations to the total area of the foraminous member surrounding said perforations.

17. A dusting or sprinkling device for distributing pourable material from a container comprising an inner partitioning plate, an outer foraminous member having perforations therein, and means spacing said partitioning plate from said member and forming between them a chamber, said partitioning plate having at least one aperture therein through which material in an associated container may flow into said chamber, said aperture being positioned solely in the central area of said partitioning plate, and said perforations being spaced radially outwardly from the projection of the central portion of the partitioning plate, leaving an imperforate central portion in the foraminous member axially opposite said aperture, whereby, when the device is positioned with the foraminous member beneath said partitioning plate, material falling through said aperture will fall upon said imperforate central portion.

18. A dusting or sprinkling device for distributing pourable material from a container comprising an inner partitioning plate, an outer foraminous member having perforations therein, means spacing said partitioning plate from said foraminous member and forming between them a chamber, said partitioning plate having at least one aperture therein through which material in an associated container may flow into said chamber, rolling members in said chamber, and means attached to one of said partitioning, plates and the foraminous member and extending into said chamber and in the path of movement of said rolling members as they roll in said chamber.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,145,880

August 25, 1964

Louis B. Whatley

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 29, for "in" read -- is --; line 50, for "sprinkled from the charge. The" read -- relation between the size of the --; column 9, line 20, for "therein through which material in an attached container" read -- therein, means spacing said partitioning plate from said --.

Signed and sealed this 29th day of December 1964.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents

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