April 19, 1932. A. M. DE QUINCY ET AL 1,854,458

POWDER SPRAY

Filed April 6, 1931

Fig. 4.

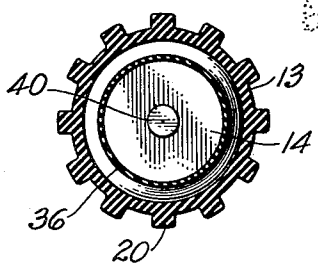


Fig. 1.

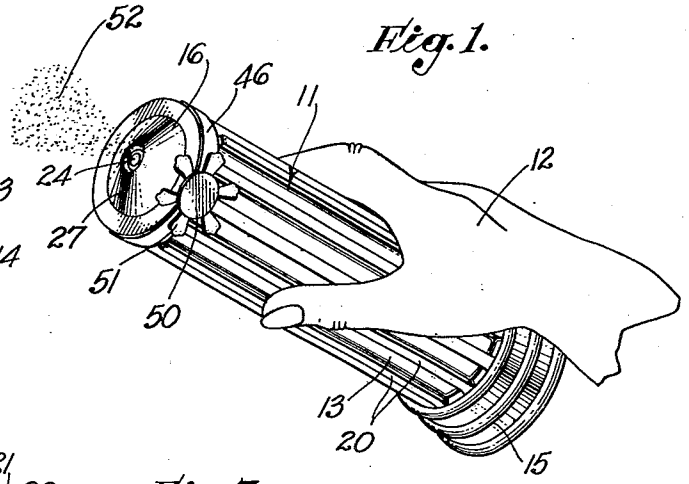


Fig. 3.

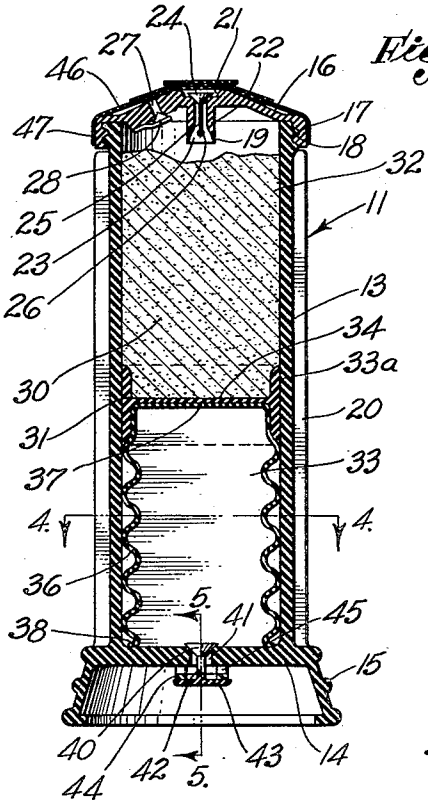


Fig. 2.

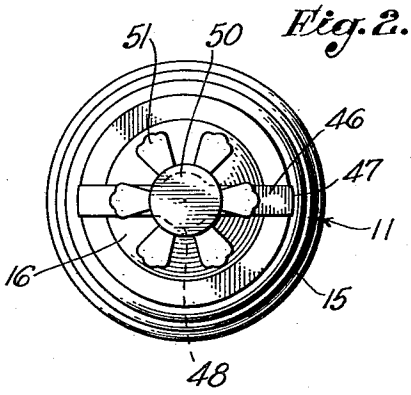
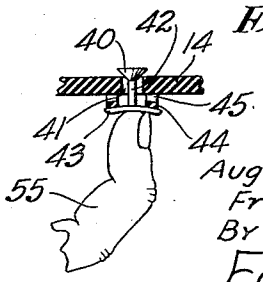


Fig. 5.



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UNITED STATES PATENT OFFICE

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POWDER SPRAY

Application filed April 6, 1931. Serial No. 528,036.

Our invention relates to a powder spray, and relates particularly to a powder spray which may be used for toilet powders, such as talcum powder.

It is an object of the invention to provide a powder spraying device consisting of a container having a flexible side wall structure adapted to be manually flexed, a discharge outlet, and means for holding a body of powder in proper position relative to the discharge outlet so that the quauntity of powder sprayed at each operation of the spray device will not be greatly changed as the quantity of powder within the container diminishes.

A further object of the invention is to provide a simple automatic means for holding a body of powder in proper position relative to the discharge outlet, this automatic means consisting preferably of a movable wall adapted to move toward the discharge outlet as the powder is used.

A further object of the invention is to provide a movable wall for supporting a body of powder in a container of the above character, this movable wall being automatically actuated toward the discharge outlet by air pressure produced in the manipulation of the device.

A further object of the invention is to provide a simple means for sealing the discharge outlet of the device.

Further objects and advantages of the invention will be made evident throughout the following part of the specification.

Referring to the drawings, which is for illustrative purposes only,

Fig. 1 is a perspective view showing the manner in which the device is used.

Fig. 2 is a view of the front end of the powder spray device with the closure means in a position to seal the spray outlet of the device.

Fig. 3 is a vertical section through the spray device, this section being taken on a diametral plane.

Fig. 4 is a cross section on a plane represented by the line 4—4 of Fig. 3.

Fig. 5 is a cross section on a plane represented by the line 5—5 of Fig. 3, showing the manner of manipulating the valve in the rear or lower end of the powder spray.

Referring to the several views of the drawings, our device includes a container 11 adapted to be held by a hand 12 of the user. The container 11 preferably includes a cylindrical wall 13 of flexible material which may be integrally formed with a bottom wall 14 and a base 15. To the outer end of the wall 13 a front or top wall 16 is secured, this top wall being part of a cap having a threaded portion 17 adapted to engage the threads 18 formed at the front or upper end of the cylindrical wall 13. The cylindrical wall 13, the bottom wall 14, and the base 15 are preferably made of rubber, and vertical ribs 20 may be molded thereon for the purpose of stiffening the wall and also for providing a simple means of decoration.

Extending inwardly from a shallow depression 21, preferably formed centrally in the outer wall 16, is an inwardly extending tube 22 having a discharge or spray passage 23 extending therethrough. This passage 23 flares at its inner end so as to provide an annular lip 19 at the inner end of the tube 22, this sharp lip 19 serving to reduce agitation of the air flow so that clouds of powder are not readily formed by the spray. Cooperating with the passage 23 is a check valve 24 adapted to prevent an inward flow of air through the passage 23, this check valve 24 being shown in the form of a conical part held inwardly against the mouth of the passage 23 by a resilient thread or string of rubber 25, the inner end 26 of which is secured at the inner end of the tube 22. The top wall 16 is also provided with an inlet opening 27 having a check valve 28 for preventing an outward flow through the passage 27, this check valve being simply shown as a flap valve, but it is evident that both the valve 28 and the valve 24 may be made in various other forms.

For supporting a body of powder in the upper portion of the container, we provide a movable wall member 31 which divides the interior of the container into a front or upper chamber 32 and a rear or bottom chamber 33. The wall member 31 has a cylindrical

wall 33*a* of flexible material, such as rubber, this cylindrical wall 33*a* having an external diameter substantially equal to the internal diameter of the wall 13 and being slidable therein. The wall 33*a* frictionally engages the wall 13 in such a manner that its sliding movement is thereby retarded. The cylindrical wall 33*a* also has sufficient width or dimension in the direction of its axis to hold the member 31 in transverse position across the interior of the container, as shown in Fig. 3. The member 31 is also shown as including a thin transverse wall 34 which is preferably positioned intermediate the ends of the cylindrical wall 33*a*. As a means for sealing the lower chamber 33 from the upper chamber 32, we provide a thin rubber inner tube 36 having an upper end wall 37 cemented to the transverse wall 34 and having its lower end 38 cemented to the upper surface of the bottom wall 14 adjacent the lower end of the cylindrical wall 13. In the practice of the invention the transverse wall 34 may be omitted, and the upper end wall 37 of the tube 36 may be employed as the transverse wall of the movable wall member 31. The lower chamber 33 is provided with an inlet check valve consisting of a valve part 40 adapted to seat in the inner end of an axial opening 41 through the bottom wall 14. Extending downwardly from the valve member 40 is a stem 42 connecting to the center of a rubber diaphragm 43, the edges of which diaphragm are joined to a downwardly projecting annular wall 44 having air passages 45 therein.

As a simple closure means for the discharge opening 23 we provide a rubber strip 46 having ends 47 cemented to the periphery of the cover member of which the wall 16 forms a part. The central portion of the rubber strip 46 is preferably circularly enlarged, as indicated by dotted lines 48 of Fig. 2, and to the exterior surface of the circularly enlarged central portion of the strip 46 we secure a disc 50, preferably of rubber, having radially projecting leaves 51 which may be readily engaged by the fingers of the user in a manner to pull the closure means from the centralized position shown in Fig. 2 to the offset position shown in Fig. 1. These leaves may be given the configuration of flower petals and may be formed from rubber colored differently from the disc 50 so as to give a pleasing decorative effect.

The operation of the device is substantially as follows: A body 30 of powder is placed in the upper chamber 32, and the top wall 16 is secured in place. By gripping the container, as shown in Fig. 1 and moving the fingers and thumb toward each other, the flexible wall 13 may be moved inwardly so as to reduce the volume of the interior of the container and force air outwardly through the passage or opening 23. The air in the lower chamber 33 is compressed, and a pressure is exerted against the lower face of the movable wall 31, flexing the transverse wall 34 thereof upwardly and tending to move the entire member 31 in upward direction as the air content of the upper chamber 32 is discharged through the outlet passage 23, carrying therewith particles of powder and ejecting such powder with the air in the form of a spray 52, as shown in Fig. 1. On release of the pressure of the hand 12 so as to permit the cylindrical wall 13 to assume its normal position, air is drawn in through the inlet 27, and also a small quantity of air is drawn in through the lower air passage 41, thus slightly increasing the volume of air contained within the tube 36 and the lower chamber 33. The result of entrapping a body of air in the lower chamber 33 and the gradual increase of the volume of such body of air as above indicated has the effect of moving the movable wall member 31 upwardly so as to support the body 30 of powder in a position proximate to the discharge outlet 23 as the volume of the body 30 decreases due to the removal of powder therefrom in response to the spraying action of the powder spray device.

When it is desired to lower the movable wall member 31 within the container, as for the purpose of placing more powder in the upper chamber 32, the check valve 40 is moved into open position, as shown in Fig. 5, by placing a finger 55 against the flexible wall 43 and forcing upwardly thereagainst. This permits air to escape from the lower chamber 33 as the movable wall member 31 is moved downwardly.

A feature of our invention is that it may be made entirely from rubber if desired and may be made in a form corresponding to that at the present time employed for toilet powder containers. The rubber materials employed may be given various color combinations so as to provide a product of an appearance pleasing to the character of trade for which a device of this character would be used.

Although we have herein shown and described our invention in simple and practical form, it is recognized that certain parts or elements thereof are representative of other parts, elements, or mechanisms which may be used in substantially the same manner to accomplish substantially the same results; therefore, it is to be understood that the invention is not to be limited to the details disclosed herein but is to be accorded the full scope of the following claims.

We claim as our invention:

1. A powder spray device of the character described, including: a container having a discharge outlet in the front end thereof and flexible side walls adapted to be manually flexed; and movable means within said con-

tainer for holding a body of powder in proximity to said discharge outlet.

2. A powder spray device of the character described, including: a container having a discharge outlet in the front end thereof and flexible side walls adapted to be manually flexed; a movable wall for holding a body of powder; and means for moving said wall toward said discharge outlet.

3. A powder spray device of the character described, including: a container having a discharge outlet in the front end thereof and flexible side walls adapted to be manually flexed; a movable wall for holding a body of powder; and means for automatically moving said wall toward said discharge outlet.

4. A powder spray device of the character described, including: a container having a discharge outlet in the front end thereof and flexible side walls adapted to be manually flexed; and movable means within said container for holding a body of powder in proximity to said discharge outlet, said movable means being adapted to move automatically toward said discharge outlet in response to actuation of said powder spray device.

5. A powder spray device of the character described, including: a container having a discharge outlet in the front end thereof and flexible side walls adapted to be manually flexed; a movable wall dividing said container into a front chamber and a rear chamber; and an inlet check-valve means leading into said rear chamber.

6. A powder spray device of the character described, including: a container having a discharge outlet in the front end thereof and flexible side walls adapted to be manually flexed; a movable wall dividing said container into a front chamber and a rear chamber; an inlet check-valve means leading into said rear chamber; and an inlet check-valve means leading into said front chamber.

7. A powder spray device of the character described, including: a container having a discharge outlet in the front end thereof and flexible side walls adapted to be manually flexed; a movable wall dividing said container into a front chamber and a rear chamber; an inlet check-valve means leading into said rear chamber; and means for releasing said inlet check-valve means.

8. A powder spray device of the character described, including: a container having a removable cover on the front end thereof and flexible side walls adapted to be manually flexed, there being a discharge outlet in said cover having a check valve therein; and movable means within said container for holding a body of powder in proximity to said discharge outlet.

9. A powder spray device of the character described, including: a container having a removable cover on the front end thereof and flexible side walls adapted to be manually flexed, there being a discharge outlet in said cover having a check valve therein; and movable means within said container for holding a body of powder in proximity to said discharge outlet, said movable means being adapted to move automatically toward said discharge outlet in response to actuation of said powder spray device.

10. A powder spray device of the character described, including: a container having a removable cover on the front end thereof and flexible side walls adapted to be manually flexed, there being a discharge outlet in said cover having a check valve therein; a movable wall dividing said container into a front chamber and a rear chamber; and an inlet check-valve means leading into said rear chamber.

11. A powder spray device of the character described, including: a container having a removable cover on the front end thereof and flexible side walls adapted to be manually flexed, there being a discharge outlet in said cover having a check valve therein; a movable wall dividing said container into a front chamber and a rear chamber; an inlet check-valve means leading into said rear chamber; and an inlet check-valve means leading into said front chamber.

12. A powder spray device of the character described, including: a container having a removable cover on the front end thereof and flexible side walls adapted to be manually flexed, there being a discharge outlet in said cover having a check valve therein; a movable wall dividing said container into a front chamber and a rear chamber; an inlet check-valve means leading into said rear chamber; and means for releasing said inlet check-valve means.

13. A powder spray device of the character described, including: a container having a removable cover on the front end thereof and flexible side walls adapted to be manually flexed, there being a discharge outlet in said cover having a check valve therein; a movable wall dividing said container into a front chamber and a rear chamber; an inlet check-valve means leading into said rear chamber; means for releasing said inlet check-valve means; and sealing means for said discharge outlet comprising a member adapted to cooperate with the outer end of said discharge outlet, and an elastic member for holding said member in cooperation with said discharge outlet.

14. A powder spray device of the character described, including: a container having a removable cover on the front end thereof and flexible side walls adapted to be manually flexed, there being a discharge outlet in said cover having a check valve therein; a movable wall dividing said container into a front chamber and a rear chamber; an inlet check-valve means leading into said rear

chamber; means for releasing said inlet check-valve means; and sealing means for said discharge outlet comprising a member adapted to cooperate with the outer end of said discharge outlet, and an elastic member for holding said member in cooperation with said discharge outlet consisting of a resilient strap extending over said member and having its ends secured to said powder spray device.

15. A powder spray device of the character described, including: a container having an outlet passage and being adapted to hold powder, there being means for producing a discharge flow of air through said outlet passage; and sealing means for said outlet passage comprising a substantially flat member adapted to fit against the outer end of said outlet passage, and an elastic member for holding said member in cooperation with said outlet passage.

16. A powder spray device of the character described, including: a container having an outlet passage and being adapted to hold powder, there being means for producing a discharge flow of air through said outlet passage; and sealing means for said outlet passage comprising a member adapted to cooperate with the outer end of said outlet passage, and a resilient member for holding said member in cooperation with said outlet passage consisting of an elastic strap extending over said member and having its ends secured to said powder spray device.

17. A powder spray device of the character described, including: a container having an outlet passage and being adapted to hold powder, there being means for producing a discharge flow of air through said outlet passage; and sealing means for said outlet passage comprising a member adapted to cooperate with the outer end of said outlet passage, and elastic straps extending outwardly from said member with their ends connected to said container for holding said member in cooperation with said outlet passage.

18. A powder spray device of the character described, including: a container having a discharge outlet in the front end thereof and flexible side walls adapted to be manually flexed; a movable wall for holding a body of powder, said movable wall being of yieldable material and extending between said side walls within said container; and means for automatically moving said wall toward said discharge outlet.

19. A powder spray device of the character described, including: a container having a discharge outlet in the front end thereof and flexible side walls adapted to be manually flexed; a movable wall dividing said container into a front chamber and a rear chamber; means for forming a seal between said movable wall and said container whereby to seal said rear chamber from said front chamber; and an inlet check-valve means leading into said rear chamber.

In testimony whereof, we have hereunto set our hands at Los Angeles, California, this 1st day of April, 1931.

AUGUSTA M. DE QUINCY.
FRANK JOHNSON.