April 19, 1955 H. I. KEITH 2,706,580

VALVE MEANS FOR POWDER DISPENSERS

Filed Feb. 12, 1952

Fig. 1.

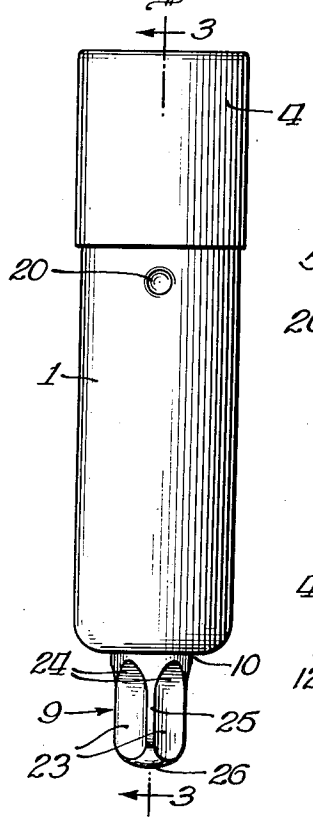


Fig. 3.

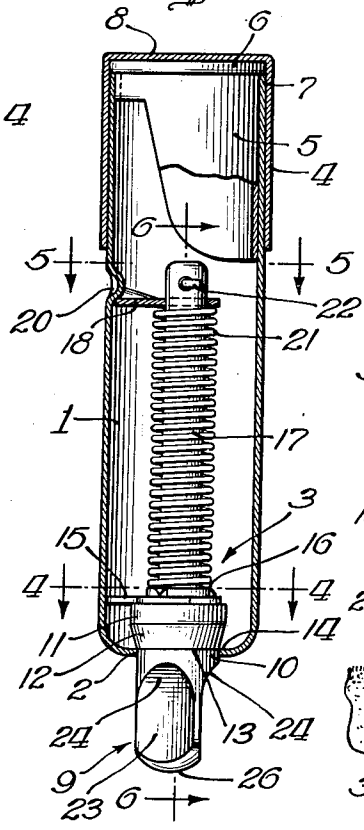


Fig. 6.

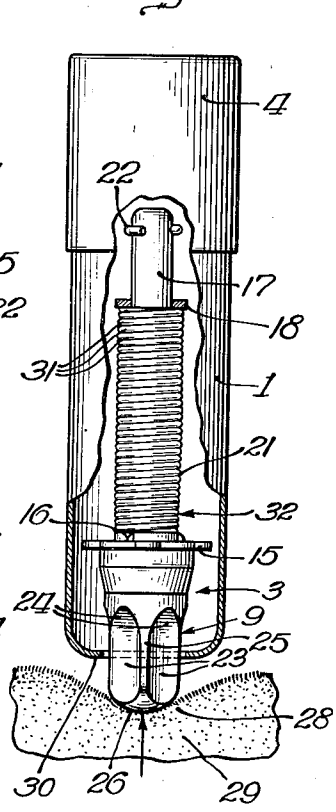


Fig. 2.

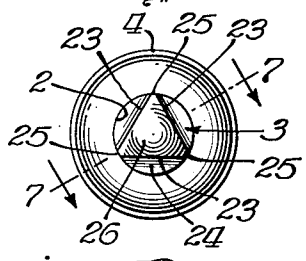


Fig. 4.

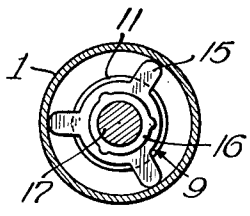


Fig. 5.

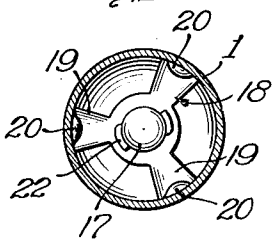
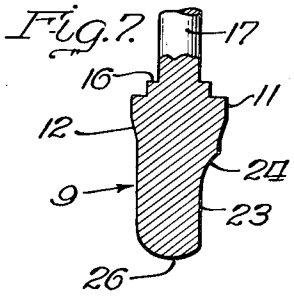


Fig. 7.



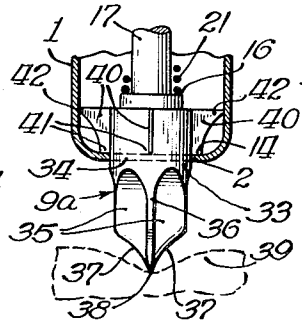


Fig. 8.

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VALVE MEANS FOR POWDER DISPENSERS

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Application February 12, 1952, Serial No. 271,189

5 Claims. (Cl. 222—117)

This invention relates to powder dispensers and is more specifically directed to certain improvements relating to a device for dispensing face powder of the type and character shown and described in my co-pending application Serial No. 252,163, filed October 19, 1951.

One of the main objects of the present invention is to provide a valving means for a face powder dispenser to eliminate packing of powder and/or the retention of the powder upon the valving means during the use of such a dispenser. It has been found that a dispenser of this type when used for face powder presents a number of difficulties which are particularly objectionable by reason of the character of the face powder due to its inherent tendencies to cling to surfaces and especially so when such powder is subjected to any slight amount of packing pressure. Furthermore, the fineness of the face powder and its adherent constituency all contribute to the difficulty of providing an efficient and effective means for cleanly dispensing such material.

It is another object of the present dispensing unit to include a valve member with a projecting portion comprising the actuating means for the valve that has limited motion relatively to the power dispensing container over a given distance of operation and wherein such valve unit is thus stopped to prevent the powder receiving object from engaging the outer end of the powder dispensing container itself to prevent powder from being packed against such end. By engaging a powder puff surface with the valve end exposed for that purpose, it is extremely advantageous to present as small a contact surface to the puff as possible to prevent packing of the powder against such surface. This feature and the fact that the dispensing valve unit is held away from contact with the container all contribute to the efficient operation of the dispenser of the present invention.

Another object of the present invention is to provide the valve member of the dispenser with a multiple face area which is normally disposed outside of the dispenser and which is movable into the powder container to provide a powder feed means therefor. With this multiple face arrangement the dividing edges between the faces are coincident with the powder cut-off portion of the head which seals the discharge port so that the dispensing end of the head is divided into a number of powder feed areas. Upon endwise movement of the dispensing end of the head into the container, the powder is fed in distinct and segregated quantities as determined by the number of faces on the dispensing head of the valve.

It is still a further feature of the present invention to provide a multi-faced dispensing head of the character defined in the paragraph above wherein each of the faces are curved upwardly and outwardly for blending into the peripheral wall of the head which comprises the powder cut-off portion thereof. By so blending the upper ends of the faces with the peripheral body portion of the dispensing head, the powder will not be compressed or packed during the movement of the head when the powder is being dispensed.

Other advantages and features relating to the powder dispenser of the present invention and more particularly to the valving means therefor shall hereinafter appear in the following detail description having reference to the accompanying drawings forming a part of the specification.

In the drawings:

Fig. 1 is a side elevational view of the dispenser of

the present invention incorporating the new type of powder feed and valving means;

Fig. 2 is a bottom end view of the dispenser illustrated in Fig. 1;

Fig. 3 is a vertical cross sectional view taken substantially along the line 3—3 in Fig. 1;

Fig. 4 is a plan sectional view taken substantially along the line 4—4 in Fig. 3;

Fig. 5 is another plan sectional view taken substantially along the line 5—5 in Fig. 3;

Fig. 6 is another side elevational view of the powder dispenser with a portion thereof broken away and in section substantially as seen along the line 6—6 in Fig. 3;

Fig. 7 is a fragmentary view of the valving head of the present invention shown in section and substantially as viewed along the line 7—7 in Fig. 2; and

Fig. 8 is a fragmentary sectional view of the dispensing end of the powder feeding device illustrating a modified construction of valving means therefor.

As best shown in Figs. 1, 2 and 3, the dispenser of the present invention comprises a powder container **1** having a circular port **2** in the bottom end thereof for powder discharge from within the container **1**, and this port **2** is normally closed by a valving means generally illustrated at **3**. The upper end of the container **1** is closed by a cap **4** and this end of the container also houses a powder filling scoop **5** which has an annular overhanging lip **6** that seats upon the upper end **7** of the container to be held in place by the upper wall **8** of the cap **4**.

The valving structure **3** comprises a head **9** which includes a powder cut-off portion **10** having the same external configuration as the discharge port **2** of the container **1**. Immediately above the cut-off portion **10** and within the container **1** the head is enlarged as at **11** which is connected by a conical portion **12** with the cut-off portion **10**. At the annular meeting edge of the conical portion **12** and the cut-off portion **10** the head presents a feather edge **13** which provides a slight shoulder that rests upon the annular wall **14** of the container, which wall surrounds the port **2** as best shown in Figs. 2 and 3. The feather edge **13**, therefore, provides a stop which limits the outward movement of the head **9** with respect to the container **1**.

As best shown in Figs. 3 and 4, a powder agitating spider **15** is suitably secured to a shoulder portion **16** of the head **9** so that this spider may move vertically with the head as the latter is manipulated to discharge powder from the container **1**. A stem **17** projects upwardly from the head and from the shoulder portion **16** as best shown in Fig. 3 and carries at the upper end thereof another spider **18** which is best illustrated in Figs. 3 and 5 as having a plurality of radially disposed projections **19** which engage underneath suitable retaining projections **20** formed into the surface of the container **1**. An expansion spring **21** is interposed between the spider **18** and the upper face of the shoulder portion **16** which is normally maintained under compression as determined by the position of the feather edge **13** and the location of the spider **18** under the projections **20**. A suitable pin such as **22** is carried by the end of the stem **17** to prevent the spider **18** and spring **21** from moving off of the stem **17** when the entire valve assembly is removed from within the container.

It is to be noted as best seen in Figs. 1, 2, 3 and 7, that the dispensing end of the head **9** comprises a predetermined configuration for the sole purpose of preventing powder from packing or adhering to the head under the operation of the latter in dispensing the powder from the container **1**. It is preferable, therefore, to provide a head of this character with a dispensing arrangement which includes a plurality of flat faces **23** formed radially outwardly with respect to the vertical axis of the head and valving means, and which faces each include an upwardly and outwardly flaring terminal end **24** that blends into the outer contour of the cut-off portion **10** of the head **9**. The edge portions of the faces **23** are joined by ridges **25** which are coincident with the external contour of the cut-off portion **10** of the head and extend outwardly and downwardly with respect to the dispenser container **1**. These three ridges **25** provide guide means

which hold the valve centrally with respect to the opening 2 during the vertical operation of the dispensing valve. Furthermore, the ridges 25 provide a divisional means for segregating the powder in specific amounts about the dispensing end of the valve head 9 to prevent the formation of any adhering powder about the dispensing end which might have a tendency to stay with the end as the latter is moved outwardly of the dispenser. In other words, the remaining powder definitely drops off of the end of the dispenser as the same is allowed to move outwardly of the container 1 under the action of the spring 21 when the dispenser is lifted upwardly out of contact with the object receiving the powder. The outwardly and upwardly curved portions 24 counteract retention and adherence of the powder which drops off of the end of the dispenser while in use. Furthermore, the outwardly flaring portions 24 of the faces 23 will not cause any radial packing of the powder within the dispenser container 1, so that after each operation the powder within the dispenser surrounding the valve will be free to drop off or into the opening 2 and therethrough upon the surface adjacent the dispenser.

The outer terminal end of the dispenser is made in the form of an abutment member or crown 26 having its exterior peripheral contour limits normally defined by the faces 23 of the head 9 and which abutment member or crown is preferably a hemispherical construction having a relatively smaller diameter end which curves upwardly to blend into the crown defining faces 23 and coincidently into the narrow edges 25 of the outer extended peripheral portions of the cut-off portion 10 of the dispenser head 9. By reducing the contact area of the bottom of the dispenser, the tendency for powder packing is also reduced during the engagement of a powder puff such as illustrated at 28 in Fig. 6.

It should also be noted that the annular wall portion 14 of the container 1 which surrounds the port 2 is located in a plane substatnially at right angles to the axis of the valve means 3. With this arrangement, the return of the valve into seated position will bring the feather edge 13 down upon this annular wall, and the conical portion 12 adjacent the feather edge 13 will act to radially displace the powder laterally outwardly over the wall 14 at this point to prevent packing and clogging at the exit portion of the port.

It has also been found extremely advantageous to terminate the motion of the valving means into the dispenser in a position substantially as illustrated in Fig. 6. By preventing the actuation of the end of the valve means of the dispenser by a puff to the extent that the puff 29 contacts the outer peripheral portion 30 of the dispenser, this construction eliminates the possible packing of face powder against the bottom edge 30 of the dispenser during the operation thereof while the puff functions to readily clean off the end of the plunger or dispensing portion of the head 9 when constructed as shown in Fig. 6. To provide a means for stopping the valve means 3 as shown in Fig. 6, spring 21 is made of a predetermined length with a predetermined number of coils 31 which will function as a stop means when all of such coils are seated upon the other with one end of the spring engaging the spider 18. With this relationship the end 32 of the spring will prevent further inward movement of the head 9 since the spring has then reached its maximum movement under the resiliency thereof. This will hold the outer puff engaging end of the head 9 substantially as shown in Fig. 6, preventing the puff from touching the bottom portion or surface 30 to pack powder thereagainst.

By making the valving structure with a head that eliminates all possible sharp corners which would readily retain powder material such as face powder, it is possible to obtain a clean discharge of powder from within the container 1 with very little powder clinging to the entire head under the conditions of operation explained. Furthermore, the little powder that may be still adhering to the end of the head 9 can be cleaned up by the puff during the use of this device.

In Fig. 8, the construction is substantially similar to the form previously described, but the head 9*a* presents certain modifications in the exact structure thereof. This modification comprises a cylindrical body 33 having the same external contour as the opening 2 in the powder container 1. A portion 34 of the body 33 obviously forms the cut-off portion for the powder by closing the port 2. The outer end of the head 9*a* again presents a plurality

of faces such as 35 which are connected by ridges 36 that remain in line with the same outer contour of the head 9*a*. The ridges 36 are curved inwardly and downwardly at their terminal ends as shown at 37 to meet at a rounded portion 38 which is used for directly contacting the surface of a powder puff 39 which is there illustrated in broken lines.

The head 9*a* may move inwardly to a stop position by the spring 21 in the same manner as illustrated in Fig. 6. This construction, however, contemplates the use of a plurality of wing-like fins 40 which terminate in feather edges 41 for contact engagement with the inner peripheral portion of the wall 14 that surrounds the discharge opening 2. These feather edges of the wings, therefore, prevent outward movement of the dispensing head beyond the position illustrated in Fig. 8.

Although the ridges 36 joining the faces of the dispensing end of the head 9*a* will act to guide the adjacent end of the valve means axially of the container 1, the wing-like fins 40 may be extended radially outwardly as at 42 for point contact with the internal peripheral wall portions of the container 1 if that is desirable.

In operation, this dispenser is, therefore, supplied with a head having a plurality of inwardly disposed faces taken with respect to the axial center thereof which will permit the powder from within the container 1 to fall and move in the direction of the axis of the valve as the latter is actuated inwardly of the container 1 to bring the faces into the position shown in Fig. 6. This action, together with the general fluffing and agitating action of the spider 15, will prevent the powder within the container 1 from packing at the discharge opening 2 thereof. Thus, when the device is arranged as shown in Fig. 6, the powder will drop through the openings created by the faces 23 in relation to the cylindrical opening of the port 2, this powder falling upon the top surface of the puff 29 for supplying this powder thereto.

When the dispensing valve is again closed under the action of the spring 21, the fluffing spider will tend to move powder generally in the direction of the opening 2 to again fill up the area surrounding this valving means.

It is contemplated that changes and modifications may be made in the exact form shown and described heretofore. However, any changes or modifications in the various parts or combination thereof shall be governed by the breadth and scope of the language in the claims appended hereto.

What I claim is:

1. In a powder dispenser, a powder container, said container having a port to discharge powder therefrom, and valve means for said port including a movable head having one portion thereof provided with an external contour to fit said container port to close the latter to cut off powder flow, said container and head having cooperative stop means to normally maintain said one head portion in powder cut-off relation with respect to said container, and said head including a powder dispensing end positioned outside said container and beyond the cut-off portion of the head, said end having multiple faces thereon each terminating in positions away from the dispenser port with each face having arcuate origins beginning adjacent the port and at the full port closing contour of said one portion of the head, said head having an outwardly rounded abutment crown at its outwardly positioned terminal end for contact with a powder receiving object to actuate said head relatively with respect to said container port, and said faces of said dispensing end of said head each blending into said abutment crown and defining the exterior peripheral contour limits of said crown.

2. In a powder dispenser, a powder container, said container having a port to discharge powder therefrom, and valve means for said port including a movable head having one portion thereof provided with an external contour to fit said container port to close the latter to cut off powder flow, said container and head having cooperative stop means to normally maintain said one head portion in powder cut-off relation with respect to said container, and said head including a powder dispensing end positoined outside said container and beyond the cut-off portion of the head, said end having multiple faces thereon each terminating in positions away from the dispenser port with each face having arcuate origins beginning adjacent the port and at the full port closing contour of said one portion of the head, said faces having

their adjacent terminal edge portions joined at dividing ridges comprising extended surfaces of said one cut-off portion of the head to provide segregated powder dispensing areas and to form guide ridges to remain in contact with the port edges when said head is actuated inwardly of the port and toward the powder container, said ridges following in continuing coincident relation with said surface contour of said powder cut-off portion of said head to a predetermined position externally of the container, and said ridges thereafter curving radially inwardly of the head to meet in a rounded point.

3. A valve unit for opening and closing a discharge port of a powder dispenser comprising a generally cylindrical head having a powder cut-off portion to fit said port, and a powder dispensing portion extending beyond the cut-off portion comprising a plurality of flat faces extending generally parallel to the axis of said head and terminating in edges continuously depending from the cut-off portion of the head to form guide edges at the port and to segregate the powder feed of the head into individual batches about the periphery of the head, said faces each having radially outwardly curved ends to blend into the powder cut-off portion of the head and to prevent powder retention on said faces, and said edges and faces having their outer terminal end portions curved to converge radially inwardly into a reduced area abutment tip for said dispensing portion of the head to provide a small contact surface area adapted for direct engagement wtih a powder receiving object whereby to actuate said head relatively to said port and to permit free powder flow discharge and to prevent powder retention by said head, said abutment tip functioning to counteract powder packing upon the reduced area abutment tip of said powder dispensing portion of the head by said powder receiving object.

4. A valve unit for opening and closing a discharge port of a powder dispenser comprising a generally cylindrical head having a powder cut-off portion to fit said port, and a powder dispensing portion extending beyond the cut-off portion of said head, said head being arranged for bodily movement toward the dispenser to discharge powder out of the port past the dispensing portion of the head, and stop means to limit outward movement of the head at the port comprising wing-like members arranged about said head and having feather edge contact with portions of the interior of said dispenser.

5. A powder dispenser comprising a powder container having a powder discharge port therein, and a valve to close said port, said valve having a cut-off portion to fit said port and arranged for motion into and out of registry with said port, said container having a wall portion encircling said port and disposed in a plane positioned at right angles to the path of motion of said cut-off portion of said valve to counteract packing of the powder about said valve at the point of discharge, said cut-off portion of said valve being straight sided and arranged for motion at right angles with respect to the port encircling wall portion of the container, said valve having wing-like guides to contact portions of the container to guide said valve, said wing-like guides having feather edge contact with said right angled wall portion of the container at said port to limit outward movement of the valve and to hold the same in port sealing relation.

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