

Aug. 17, 1965

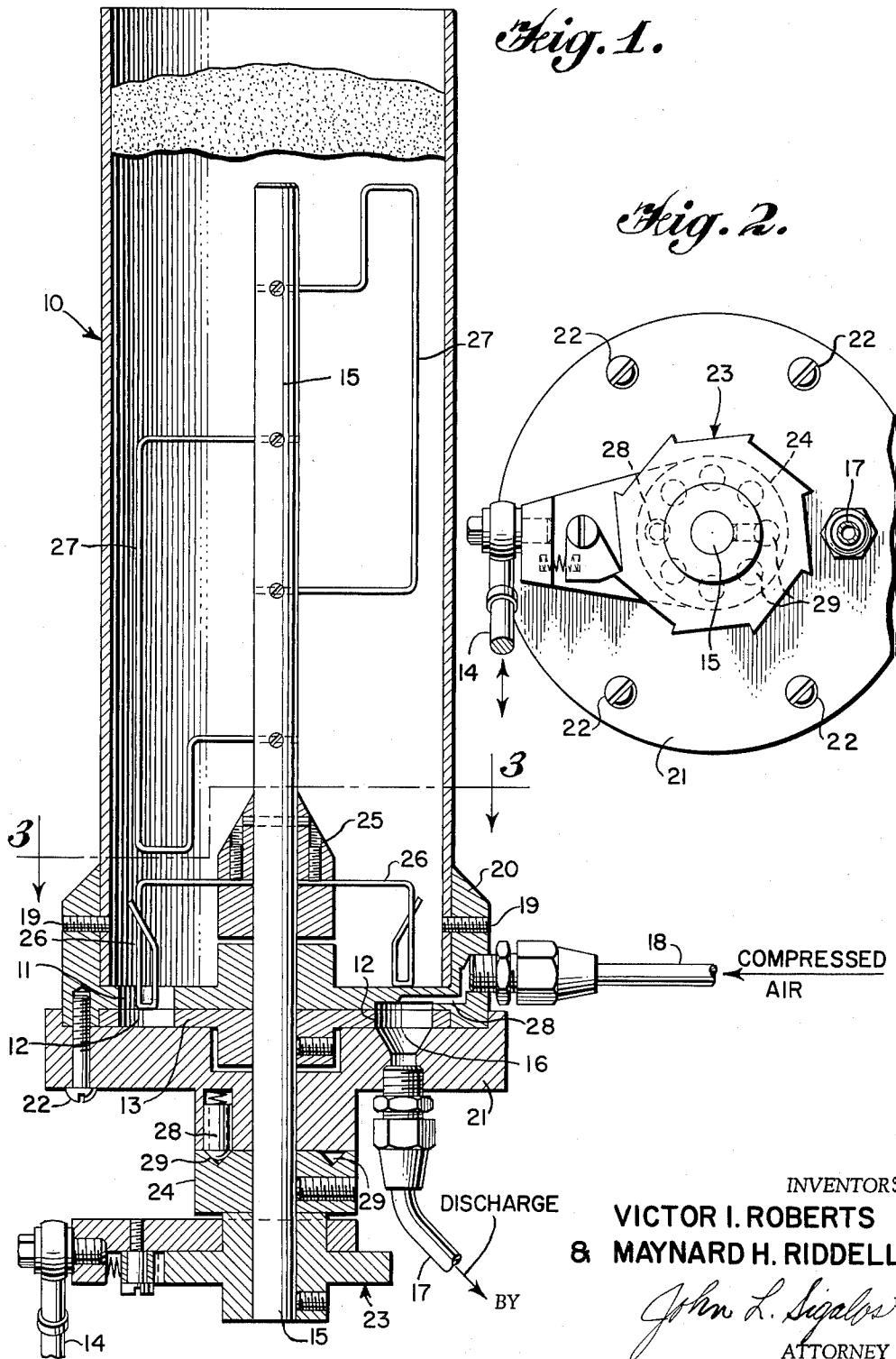
V. I. ROBERTS ETAL

3,201,001

PULVERULENT MATERIALS DISPENSER

Filed Oct. 12, 1962

2 Sheets-Sheet 1



Aug. 17, 1965

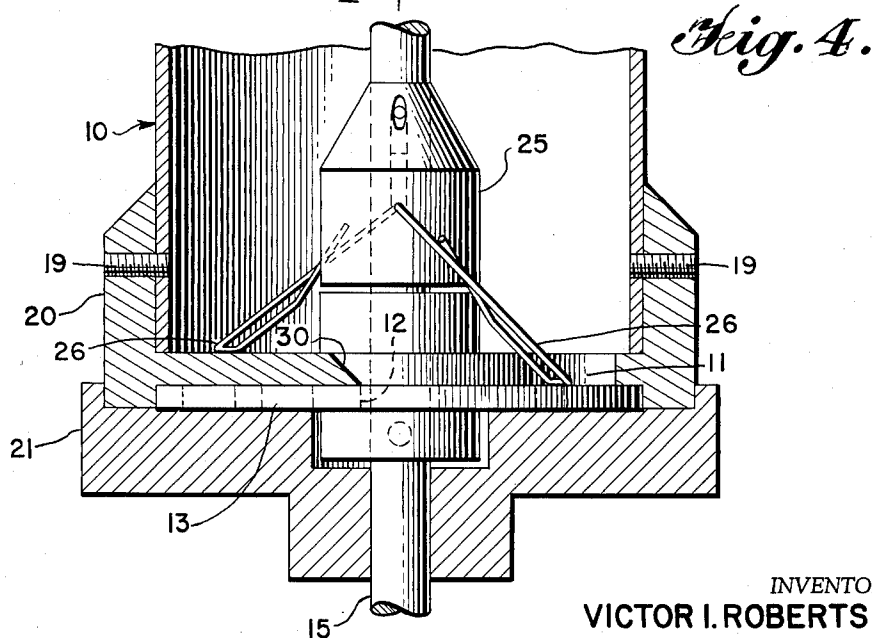
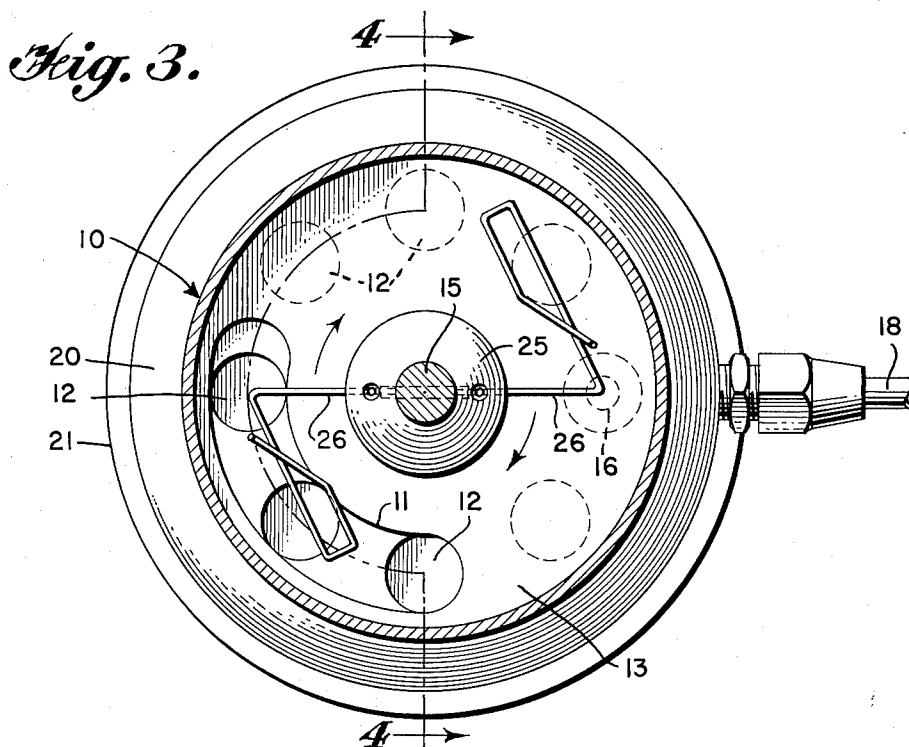
V. I. ROBERTS ET AL

3,201,001

PULVERULENT MATERIALS DISPENSER

Filed Oct. 12, 1962

2 Sheets-Sheet 2



INVENTORS
VICTOR I. ROBERTS
& MAYNARD H. RIDDELL

BY

John L. Sigalov
ATTORNEY

3,201,001

PULVERULENT MATERIALS DISPENSER

Victor I. Roberts and Maynard H. Riddell, Randolph, N.Y., assignors to The Borden Company, New York, N.Y., a corporation of New Jersey

Filed Oct. 12, 1962, Ser. No. 230,294

2 Claims. (Cl. 222-194)

This invention relates to a new and improved device for dispensing powdery or pulverulent material in predetermined quantities with a high degree of accuracy.

Accurate dispensing of powdery materials has become increasingly important in many manufacturing processes to insure that potent and expensive chemicals are dispensed in a manner to minimize waste. It is also desirable to hold the pulverulent material in a storage container where it will be agitated as it is dispensed to prevent lumping or clinging to the walls of the container.

It is an object of this invention therefore to provide an apparatus to dispense pulverulent materials in reliably controlled quantities from a dispenser which is totally enclosed, simple to operate and easy to maintain.

Other objects and advantages of this invention will be apparent upon consideration of the following description of a preferred embodiment thereof in conjunction with the annexed drawings wherein:

FIGURE 1 is a vertical sectional view of the entire device;

FIGURE 2 is a bottom view of the device showing the ratchet and pawl mechanism;

FIGURE 3 is a top view in partial section along line 3-3 in FIGURE 1 in the direction of the direction of the arrows;

FIGURE 4 is a partial section view of the lower part of the device along line 4-4 of FIGURE 3 in the direction of the arrows.

Referring now to the drawings in greater detail, a preferred embodiment of the device may be described as follows:

A supply of the powder to be dispensed is stored in a hopper 10. A portion of this supply drops through an arcuate hole 11 in bottom of the hopper directly into one of a group of cavities 12 in a rotatable member 13. Each cavity 12 is open at its bottom so that when the rotatable member 13 is turned through an arc by actuating the operating lever 14 and through it the shaft 15, the charge of powder in the cavity 12 is brought into registry with an exhaust aperture 16 in the stationary base. A charge of compressed air may then be caused to enter air line 18 to blow the charge of powder out of the cavity and through the discharge tube 17.

In FIGURE 1 the hopper 10 which acts as a reservoir for storage of the powdery or pulverulent material to be dispensed is shown as held to the hopper base member 20 by a plurality of setscrews 19. Removal of these setscrews will facilitate easy cleaning of the hopper and interior parts. The hopper base member is in turn held to the stationary base 21 by a plurality of screws 22. These screws 22 may also be removed for dismantling and cleaning of the device.

Between the hopper base member 20 and the stationary base 21 lies the rotatable member 13 which has the plurality of holes or cavities 12 therein equally circumferentially spaced around the member as is shown more clearly in FIGURE 3 and all lying the same radial distance from its center. This rotatable member acts as a metering disc and the amount of powder dispensed at one time is controlled by the size of the cavity. Suitable interchangeable discs with larger or smaller holes may be designed easily to change the amount dispensed or by having varying sizes of holes in the same disc the amount to be dispensed at any one time may be scheduled in a

predetermined fashion to correlate with a given manufacturing process.

The agitator 27 and the agitating fingers 26 are both securely fastened to the shaft 15 and upper hub 25 thereof respectively, so that when the shaft 15 is rotated, the supply of pulverulent material in the hopper 10 is stirred to prevent lumping or sticking to the sides or bottom of the container. The agitating fingers 25 are made of a springy resilient material and so mounted on the upper hub 25 that the bottom edges scrape across the bottom of the hopper 10 as more clearly shown in FIGURE 4. The spring tension on the agitating fingers is such that when one of the fingers 26 is rotated above the arcuate hole 11, as more clearly shown in FIGURE 3, the finger 26 springs down into the arcuate hole 11, helping to force the powdery material into one of the cavities 12. Thus, the edge 30 (FIG. 4) of the arcuate hole 11 is slanted so that the finger 26 will ride up out of arcuate hole 11 as the hub 25 and the finger 26 are rotated further along their circular path.

The loading and movement of the member 13 is brought about by pulling the lever 14 through a short arc. This movement causes a ratchet and pawl arrangement 23, more clearly shown in FIG. 2 to rotate the shaft 15, the lower hub 24, the upper hub 25, the agitator 27, and the rotatable member 13, all of which are keyed together for movement in unison.

Thus, in one movement of the lever 14 the entire reservoir is agitated to prevent lumping, the bottom of the hopper is scraped by fingers 26, one cavity 12 is brought under the arcuate hole 11 to be filled and another cavity 12 is moved into registry with the discharge aperture 16 to be emptied through the discharge tube 17.

The magnitude of the angular displacement of the disc 13 per actuation of the mechanism 23 is controlled within precise limits by a spring loaded pin 28 which drops into one of a number of latching cavities 29 as the hub 24 is rotated. The number of latching holes 29 and the number of teeth on the ratchet and pawl 23 are each equal to the number of holes or cavities 12 in the rotatable member 13 so that each single movement of the lever 14 will cause one complete cycle in correct stepwise fashion. The arcuate hole 11 and the discharge aperture are so spaced circumferentially that at any time one cavity 12 is in registry with the discharge aperture 16, at least two of the other cavities will be in registry with the arcuate hole 11 to be filled by gravity and the action of the agitating fingers 26.

Compressed air can be admitted through line 18 from an external air supply (not shown) and passed through the air passage 28 and through the cavity 12 entraining with it any powder therein. The air propelled powder leaves the instrument through the discharge tube 17 to any prescribed receiving container. Control means (not shown) such as a valve and pressure regulator is used to control the volume and timing of the air charge.

What is claimed is:

1. A device for dispensing predetermined volumes of a pulverulent material comprising a stationary base having an exhaust aperture extending therethrough, a hopper affixed to said stationary base and having an arcuate hole for discharge in the bottom thereof, a rotatable shaft extending vertically through said stationary base and into said hopper, a rotatable member with circumferentially spaced cavities each of predetermined volume mounted on said shaft between said stationary base and said hopper, said rotatable member being moved by said shaft through a circular path in stepwise fashion sequentially to register each cavity first with said arcuate hole and later with said exhaust aperture, detent means resiliently to latch said rotatable member at the end of each stepwise movement, and agitator means for agitating pulverulent

3

material in said hopper, said agitator means comprising at least one resilient rod affixed to said shaft and having a portion thereof extending downwardly with the lower end bent upwardly to form a U-shaped loop whose bottom edge rides into and out of said arcuate hole to help force the pulverulent material into said cavities.

2. A device for dispensing predetermined volumes of a pulverulent material comprising a stationary base having an exhaust aperture extending therethrough, a hopper affixed to said stationary base and having an arcuate hole for discharge in the bottom thereof, a rotatable shaft extending vertically through said stationary base and into said hopper, a rotatable member with circumferentially spaced cavities each of predetermined volume mounted on said shaft between said stationary base and said hopper, said rotatable member being moved by said shaft through a circular path in stepwise fashion sequentially to register each cavity first with said arcuate hole and later with said exhaust aperture, detent means resiliently to latch said rotatable member at the end of each stepwise movement, pneumatic means to evacuate the contents of a

4

cavity in registry with said exhaust aperture, and agitator means for agitating pulverulent material in said hopper, said agitator means comprising at least one resilient rod affixed to said shaft and having a portion thereof extending downwardly with the lower end bent upwardly to form a U-shaped loop whose bottom edge rides into and out of said arcuate hole to help force the pulverulent material into said cavities.

References Cited by the Examiner

UNITED STATES PATENTS

1,252,121	1/18	Jacobs	222—360 X
1,416,156	5/22	Anderson et al.	222—194 X
1,566,187	12/25	Fifer	222—225
1,939,703	12/33	Hunt	222—239
2,314,031	3/43	Colburn	222—194 X
2,685,390	8/54	Milton	222—216 X

LOUIS J. DEMBO, *Primary Examiner.*

RAPHAEL M. LUPO, *Examiner.*