Dec. 13, 1927. 1,652,732

R. R. ROOT

FINE POWDER DISTRIBUTING DEVICE

Filed Jan. 7, 1924

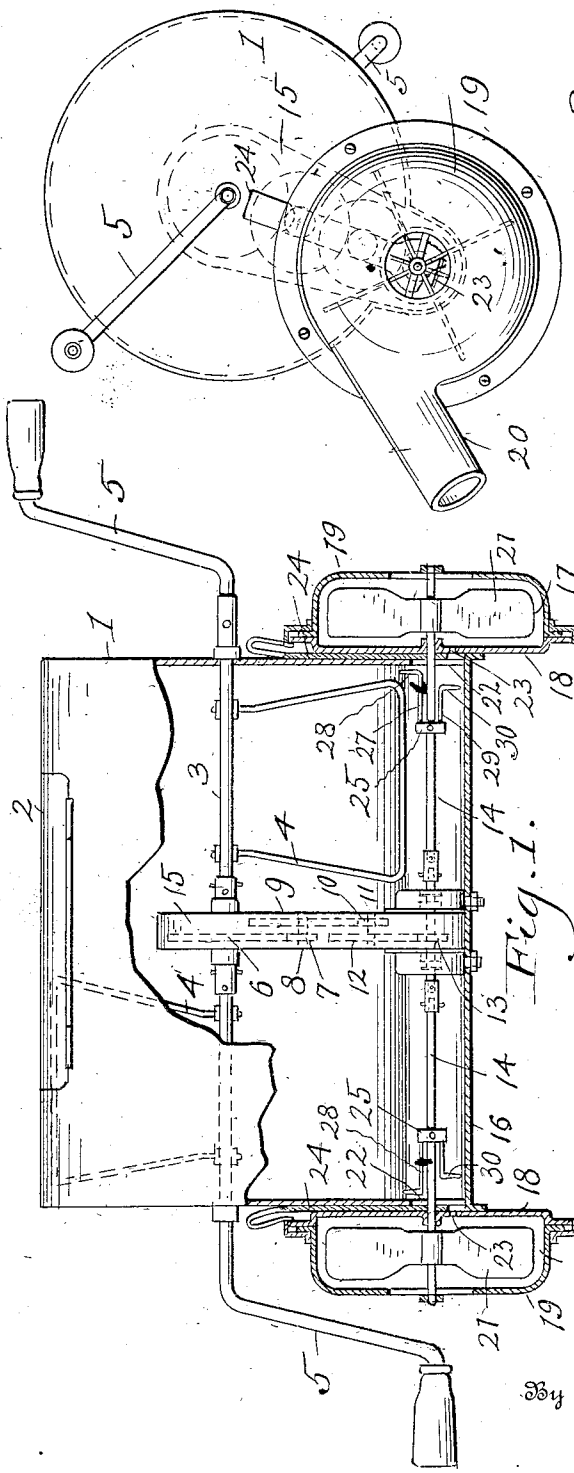


Fig. 1.

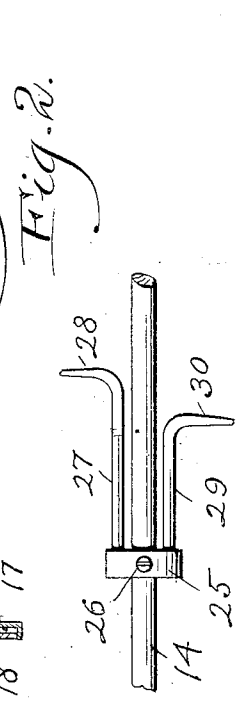


Fig. 2.

Fig. 4.

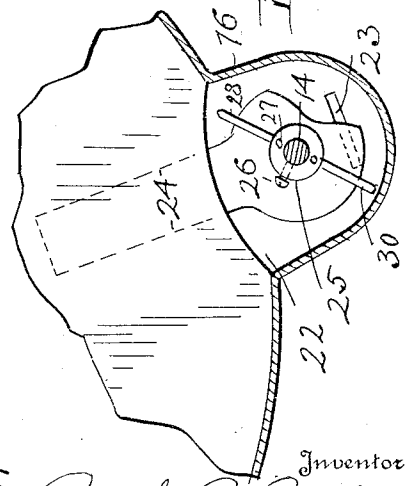


Fig. 3.

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UNITED STATES PATENT OFFICE.

RALPH R. ROOT, OF LAKEWOOD, OHIO, ASSIGNOR TO THE ROOT MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

FINE-POWDER-DISTRIBUTING DEVICE.

Application filed January 7, 1924. Serial No. 684,722.

This invention relates to fine powder distributing devices, and more particularly to devices for feeding the fine powder continuously and at a uniform rate from a container. As shown herein, the invention is employed to feed powder from a container into the fan casing of a powder distributor of the type disclosed in my co-pending application Serial No. 590,210, filed Sept. 23, 1922.

An object of the present invention is to provide a simple, durable, inexpensive and efficient device for feeding the powder from the container in a continuous stream and at a uniform rate.

A further object is to provide a powder stirring and feeding device which will prevent clogging, lumping or bridging the material in the container regardless of weather conditions.

The following description and accompanying drawings set forth in detail certain means embodying the invention, the disclosed means, however, constituting but one of the various mechanical forms in which the principle of the invention may be employed.

Reference should be had to the accompanying drawings forming a part of this specification, in which Fig. 1 is a longitudinal section through the powder container and distributing fan casing of a powder distributor showing the improved powder feeding device. Fig. 2 is an end view of the distributing apparatus; Fig. 3 is a fragmentary transverse section taken through the delivery trough at the bottom of the container. Fig. 4 is a side elevation of the powder agitating and feeding arms mounted on the fan shaft.

Referring to the accompanying drawings, the distributor is provided with a cylindrical powder container 1 which has a suitable hinge cover 2 by means of which the container may be filled with powder and access may be had to the mechanism within the container. Journaled in the end walls of the container and disposed axially thereof is a stirrer shaft 3 which is provided with U-shaped stirrer arms 4 which upon rotation of the shaft 3 sweep around the interior of the cylinder and serve to prevent bridging or clogging of the powder within the body of the cylinder. The shaft 3 projects beyond the ends of the cylinder 1 and to the projecting ends of the shaft are attached cranks 5 by means of which the shaft 3 may be manually operated.

Adjacent the center of the container a large gear 6 is fixed to the shaft 3, and this gear meshes with a small gear 7 on a countershaft 8 to which is fixed a large gear 9 which meshes with a smaller gear 10 on a second countershaft 11, the countershaft 11 carrying a large gear 12 which meshes with a small gear 13 fixed to the fan shaft 14, which extends longitudinally along the bottom portion of the cylinder. The gearing connecting the stirrer shaft 3 to the fan shaft 14 is housed within a gear casing 15 which is secured to the bottom portion of the container. The fan-shaft 14 extends lengthwise of a trough 16 which is formed along the bottom portion of the container. The shaft 14 projects through the end walls of the container into fan casings 17 which are secured to the opposite ends of the container. Each fan casing consists of a back plate 18 rigidly secured to an end wall of the container 1, and a cover member 19 which is adjustably secured to the back plate 18, a delivery spout 20 being formed integrally with the cover portion 19, and the cover portion 19 being adjustable angularly upon the back plate 18 to vary the inclination of the discharge spout 20. Fixed on the shaft 14 within each of the fan casings 17 is a fan 21 which serves to discharge the powder fed to the fan casing from the container 1 through the discharge spout 20. The powder is fed to the fan casing through openings 22 in the end walls of the container at the ends of the trough 16, and through angularly disposed slots 23 in the back plates 18 of the fan casings, the slots 23 being controlled by means of pivoted valve members 24 which are adjustable across the slots to vary the area of the passageway for the powder.

The mechanism so far described is substantially that disclosed in my co-pending application Serial No. 590,210, above referred to, the present invention residing in the specific means herein disclosed for feeding the powder to the fan casings.

The powder feeding device of the present invention consists of agitating and feeding devices adjustably mounted upon the fan shaft 14 adjacent the opposite ends of the container. The agitating and feeding de-

vices at each end of the container are attached to a collar 25 which is adjustable along the fan shaft 14 and is adapted to be fixed in adjusted position by means of a set screw 26. The agitating and feeding means consists of a long arm 27 which extends longitudinally of the shaft and has an outturned outer end portion 28, and a short arm 29 which extends longitudinally of the shaft 14 and has an outturned end portion 30. The collar 25 will be so adjusted upon the shaft 14 that the outer outturned end of the long arm 27 lies closely adjacent the end wall of the container. When the agitating and feeding device is so mounted upon the shaft 14, the outturned end 30 of the shaft arm 29 serves as an agitating device which will prevent any bridging or clogging adjacent the end of the delivery trough 16, and the arm 28 rotating in the trough closely adjacent the discharge opening 20 maintains a regular flow of powder to the feed slot 23 of the fan casing. In the operation of the distributor, shaft 3 is rotated by means of the hand cranks 5 causing the U-shaped arms 4 to rotate within the container and prevent any clogging of the material in the body of the container. At the same time the shaft 3 drives the fan shaft 13 at a relatively high rate of speed, and the rapidly rotating agitating and feeding arms 27 and 29 maintain a continuous flow of powdered material to the fan casing. The stirrer arms 4 maintain a free flow of powder at all times to the delivery trough 16 and the rapidly rotating stirrer arms 27 and 29 maintain a free and continuous flow of powder from the trough to the fan casing.

Having described my invention, I claim:—

1. In a fine powder distributing device, the combination with a container, of a shaft extending through a wall of the container into the lower portion of the container, there being a relatively small opening in said container wall at one side of the shaft and spaced therefrom, a feeding arm carried by the shaft within the container in proximity to the wall and movable across the opening, and an agitating arm carried by the shaft.

2. In a fine powder distributing device, the combination with a container, of a shaft extending through a side wall of the container into the lower portion of the container, there being a relatively small discharge opening in the side wall of the container at one side of the shaft and spaced therefrom, and a radial feeding arm carried by the shaft within the container and movable across the opening in proximity to the wall.

3. In a fine powder distributing device, the combination with a container, of a shaft extending into the container there being a discharge opening in the wall of the container adjacent the shaft, a collar secured to the shaft within the container, an arm extending from said collar toward the opening, said arm having an end portion extending outwardly and located adjacent the opening, a second arm extending from the collar parallel to the first arm, said second arm having an out-turned end portion spaced inwardly from the outwardly extending portion of the first arm, and means for driving said shaft.

4. In a fine powder distributing device, the combination with a container, having a discharge trough formed across the bottom portion thereof, agitating means within the container above the trough, said agitating means having a portion movable across the top of said trough to maintain a free flow of powder to the trough, means for driving said agitator, a valve controlled discharge opening in a wall of the container at an end of the trough, and an agitating and feeding member in the trough at the end thereof adjacent the opening, said member being mounted to turn about an axis offset laterally from the opening and having a part movable across the opening in close proximity thereto.

5. In a fine powder distributing device, the combination with a container of sustantially cylindrical form, said container having a discharge trough formed in the cylindrical wall lengthwise thereof along the bottom portion of the container, an agitator shaft extending axially through the container, arms carried by the shaft, said arms having portions extending parallel to the axis and located adjacent the inner side of the cylindrical wall, a shaft extending longitudinally within the trough, there being a discharge opening in an end wall of the container adjacent said last mentioned shaft, agitating and feeding arms on said last mentioned shaft adjacent the discharge end of the trough, and means for driving said shafts.

In testimony whereof, I hereunto affix my signature,

RALPH R. ROOT.