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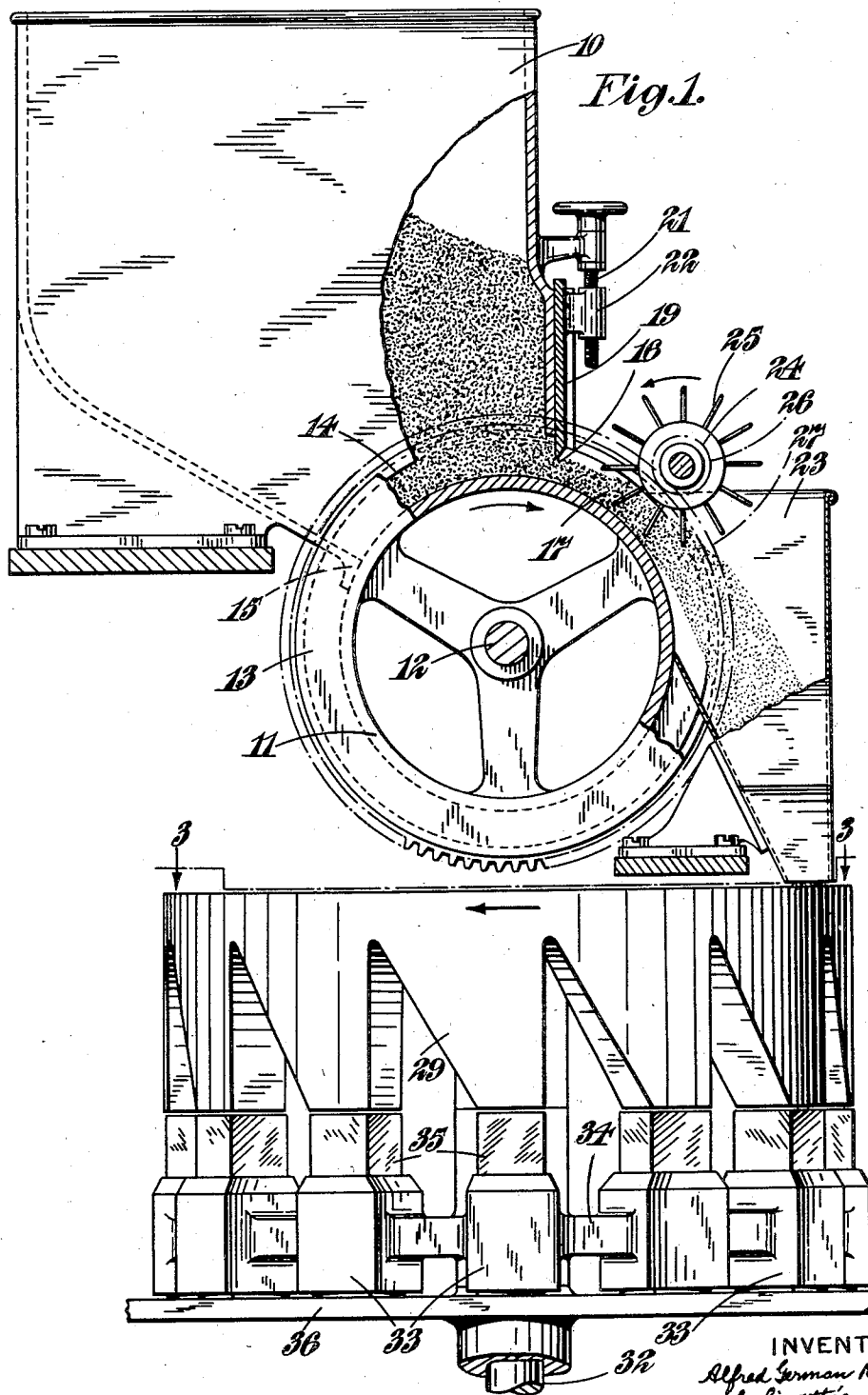
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2,030,541

APPARATUS FOR DELIVERING POWDERY MATERIAL

Filed March 19, 1935

3 Sheets-Sheet 1



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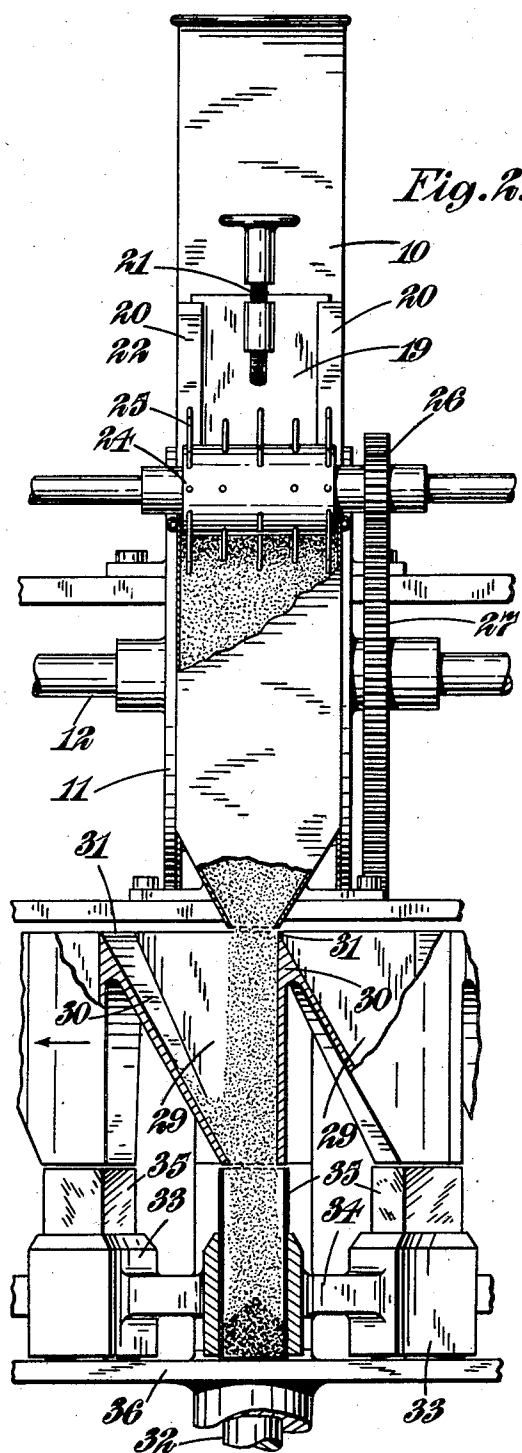
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APPARATUS FOR DELIVERING POWDERY MATERIAL

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3 Sheets-Sheet 2



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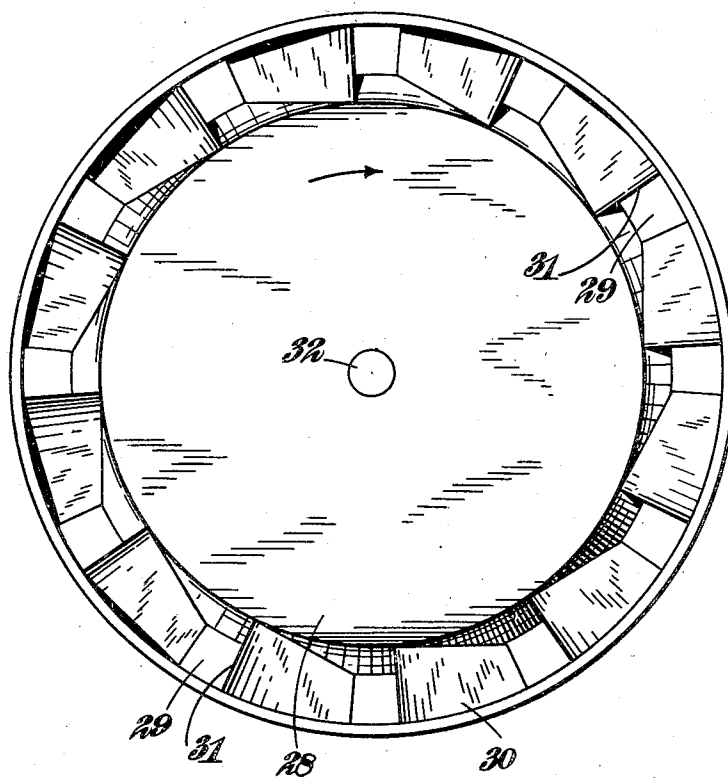
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APPARATUS FOR DELIVERING POWDERY MATERIAL

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3 Sheets-Sheet 3

Fig. 3.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR DELIVERING POWDERY MATERIAL

Alfred German Rose, Gainsborough, England, assignor to Rose Brothers (Gainsborough) Limited, Gainsborough, England, a British company

Application March 19, 1935, Serial No. 11,818
In Great Britain January 22, 1934

2 Claims. (Cl. 221—130)

This application corresponds to the application of Alfred German Rose and Rose Bros., (Gainsborough) Ltd., Serial No. 2,111/34, which was filed in Great Britain on January 22, 1934.

This invention relates to apparatus for delivering measured quantities of granular, pulverulent or like fluent solid materials (hereinafter referred to as "powder") into containers, for example into bags, cartons and the like.

According to the present invention the apparatus for delivering measured quantities of powder into containers comprises the combination with a hopper, means for feeding a stream of powder from the hopper continuously at a regulated rate, and separating means operable to direct the stream of powder into each of a succession of containers in turn for the same predetermined period without interrupting the flow of the powder.

According to a feature of this invention the separating means comprises a series of delivery funnels, means for moving them in succession through the stream of powder and container feeding means operable to move a container, in register with the lower end of each funnel, with the funnel while it moves through the stream of powder. It is a feature of this invention that the upper opening of each funnel is separated from the opening of the two adjacent funnels by a part whose upper edge is so thin that no powder can lodge thereon.

Preferably the container feeding means comprises a series of pockets each arranged below a separate funnel and means for moving the pockets in step with the funnels.

Conveniently the funnels are arranged in a circle on a wheel which is rotated continuously or intermittently to carry each funnel in turn through the stream of powder. The pockets may also be arranged in a circle on a wheel which is rotated in step with the wheel carrying the funnels.

According to a further feature of this invention the means for feeding the powder from the hopper comprises a wheel mounted in an opening in the bottom of the hopper and rotatable to feed a stream of powder from the hopper. Preferably means is provided for loosening the layer of powder on the feeding wheel in order to prevent it adhering thereto.

A preferred embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:—

Figure 1 is an elevation, partly in section, of the apparatus,

Figure 2 shows the apparatus, partly in section, as seen from the right of Figure 1, and

Figure 3 is a section on the line 3—3 of Figure 1.

The apparatus comprises a hopper 10 in which the powder or other material to be measured is placed. The powder is fed from the hopper by means of a feeding wheel or drum 11 which is secured to a continuously rotating shaft 12. The drum is provided with two flanges 13 which fit against the lower edges 14 of the side walls of the hopper. An extension 15 of the bottom of the hopper fits snugly between the flanges 13 and against the annular surface of the feed wheel 11.

The feed wheel 11 thus closes an opening in the bottom of the hopper except at 16 where an opening is formed through which a stream of powder 17 is fed by the wheel 11. The size of the opening 16 can be varied by means of a sluice-gate 19 which is mounted for vertical movement in guides 20. The gate 19 can be adjusted by means of a screw 21 which is engaged with a nut 22 secured on the gate. The thickness of the stream 17 of powder can be adjusted by varying the height of the gate 19.

The weight of the powder in hopper 10 compresses the powder at the bottom of the hopper so that the stream of powder lying between flanges 13 of the drum is packed and tends to adhere to the surfaces of the drum. Accordingly means is provided for loosening the stream of powder so that it may fall freely into a feed chute 23. The loosening means is arranged as follows. A drum 24 is mounted to rotate parallel to the drum 11 and is provided with a plurality of radial spikes 25. The drum 24 is spaced a sufficient distance from the sluice-gate 19, so there will be a stream of the packed powder on the feed wheel 11, between the gate 19 and the point of contact of the spikes, whereby all danger of the powder being drawn from the hopper by the spikes is avoided. A gear wheel 26 is secured to the drum 24 and meshes with a gear wheel 27 which rotates with the feeding drum 11. The gear ratio is such that the spiked drum 24 rotates at a higher speed than the feeding drum 11. The spikes 25 are thus moved through the stream of powder at the feeding drum and loosen it directly into the feed chute 23.

The powder is delivered by the chute 23 on to a separating device which comprises a wheel 28 mounted to turn about a vertical axis and formed with a plurality of delivery funnels 29 arranged

in a circle at its periphery (see Figure 3). The upper openings of the funnels 29 are separated by a partition 30 (Figure 2), the upper edge 31 of which is so sharp that no powder can rest on it. A wheel 28 is secured to a shaft 32 which is rotated, continuously or intermittently, so that each funnel 29 registers with the chute 23 in turn for a predetermined constant period. Since the powder is being fed from the hopper at a constant rate, a constant quantity of powder will pass down through each funnel.

A rectangular pocket 33 is arranged immediately below each of the funnels 29. The pockets 33 are arranged in a circle around the periphery of a wheel 34 which is also secured to the shaft 32. A bag or carton 35 is inserted, by suitable mechanism not shown, to each pocket. Each bag is thus carried round by its pocket and lies immediately below one of the funnels 29. The bags are supported by means of a table 36.

As each funnel 29 passes beneath the chute 23 a measured quantity of powder is delivered into it. This powder passes down through it into its bag so that each bag receives a predetermined quantity of powder. After the bag has been filled it is removed from its pocket in any suitable manner not shown.

I claim:—

1. In an apparatus for delivering solid material, a hopper for containing bulk material having an opening in the bottom thereof, a feed wheel ro-

tatable in said opening to feed a uniform stream of material from the hopper continuously and at a constant rate, means for varying the depth of said stream, means for receiving the fed stream, and rotary means having projections thereon between the hopper and the means for receiving the stream for continuously breaking up the stream after the stream has left the hopper, there being an unbroken portion of the stream on the feed wheel between the hopper and the breaking up means.

2. In an apparatus for delivering solid material, a hopper for containing bulk material having an opening in the bottom thereof, a feed wheel rotatable in said opening to feed a uniform stream of material from the hopper continuously and at a constant rate, means for varying the depth of said stream, means for receiving the fed stream, and a material-loosening means between the hopper and the means for receiving the stream comprising a drum spaced from the hopper and mounted to rotate parallel to the feed wheel, projections on the drum for loosening the material on the feed wheel, and means for rotating the drum at a higher speed than the feed wheel, there being an unbroken portion of the stream on the feed wheel between the hopper and the portion on the stream engaged by projections on the drum.

ALFRED GERMAN ROSE.