Feb. 7, 1956 D. H. FENSKE 2,733,800

NONCLOGGING DEVICE FOR DISTRIBUTING GRANULAR MATERIAL

Filed March 29, 1951

Fig. 1

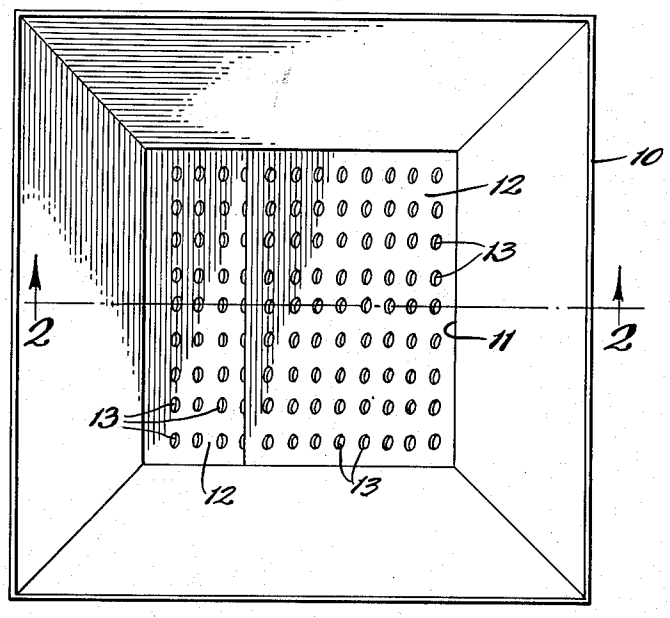


Fig. 3

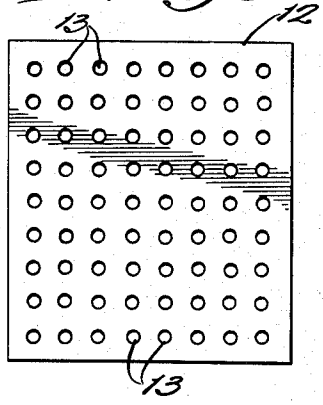
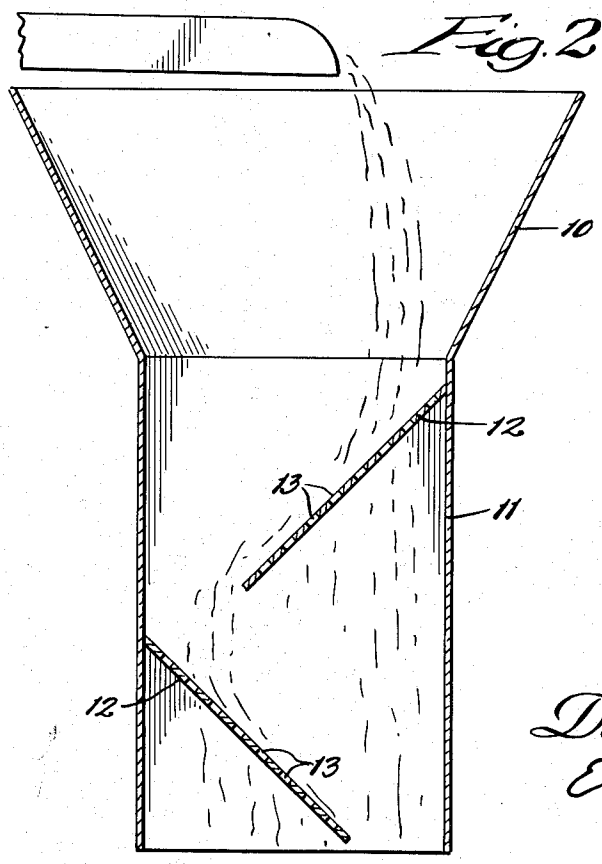


Fig. 2



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United States Patent Office

2,733,800

Patented Feb. 7, 1956

2,733,800

NONCLOGGING DEVICE FOR DISTRIBUTING GRANULAR MATERIAL

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Application March 29, 1951, Serial No. 218,227

1 Claim. (Cl. 193—27)

This invention relates to apparatus for distributing powdered material. More particularly, it relates to a nonclogging diffusing chute for dispersing and breaking up streams of closely packed particles into free-moving spaced particles.

When making an electrostatic separation of ore by contact with a roll which is one of a pair of electrodes, the material is delivered as a thin layer in order that all particles will have a chance to contact the roll. Under these conditions there is no need for dispersion of the particles. On the other hand, when ore is separated by passage between plate electrodes as particles usually travelling in a path not in contact with the plates, good separations require that the particles be free to move and not be in such close proximity one to another as to mutually interfere with particle movement.

In order to accomplish the dispersion of the particles, feeders have been introduced which spread out the powdered ore by causing the material to travel through a multiplicity of spaced perforations, as through screens or perforated plates. While such dispersing units effectively distribute particles, the chutes have a narrow range of particle-size material for which they are useful, and these chutes are readily clogged by material having dimensions not readily passed by said perforations.

It is a primary object of this invention to provide a dispersing unit for powdered ore which will overcome the disadvantages and shortcomings of apparatus heretofore in use.

It is a further object to provide a dispersing chute for powdered ore which will shunt material of such nature as to clog the feeder to one side, and thus prevent the cutting off of the supply to the electrostatic field.

It is a further object to so improve the detailed structure of a device of this character that the latter shall be simple and efficient in operation.

These and other objects will appear from the following description in which one embodiment of the invention has been set forth in detail in conjunction with the accompanying drawings in which:

Figure 1 is a top plan view of a chute.

Figure 2 is a sectional view along the line 2—2 of Figure 1.

Figure 3 is a top plan view of the perforated plate.

Referring to the drawings, the numeral **10** indicates a hopper, preferably square and tapered, and having an outlet duct portion or tubular member **11**. Duct portion **11** has positioned in the interior thereof plates **12** provided with perforations **13**. Perforate plates **12** are

angled downwardly from the point of junction with the duct wall, usually at an angle of 30° to 60° and preferably at an angle of about 45°, and extend from opposite sides of the duct alternately, if more than one plate is inserted in duct portion **11**. The distance that the plates extend across the duct must be such that material falling vertically will have no straight unobstructed vertical path through the disperser, i. e., if one plate is utilized, then the feeder should be positioned to deliver a stream of powdered material so as to hit the plate. If more than one plate is utilized, the plates should be positioned in spaced vertical relationship so that the combination presents no straight unobstructed vertical path through the distributor. Thus, for example, if two plates are utilized, the plates should be positioned so that they both intersect a common vertical plane through the disperser with the plates extending from opposite sides of the duct portion **11**.

By such an arrangement, a large proportion of the material of particle size capable of passage through perforations falls directly through the plate as scattered individual particles. Material of such size as not to pass through the perforations readily follows a circuitous path down the face of one plate, from which it drops to the face of a succeeding plate and eventually works downward out of the feeder.

Having thus fully described and illustrated the character of the invention, what is desired to be secured and claimed by Letters Patent is:

A nonclogging apparatus for continuous dispersing of closely packed particles into free moving spaced particles over a limited cross-sectional area, which comprises a tubular member having the longitudinal axis thereof substantially vertical, a plurality of plates mounted within said tubular member and having perforations of substantially the same size in each plate such that a substantial portion of the particles ultimately will pass through said perforations, said plates being vertically and alternately spaced, and secured to opposite walls as a base and downwardly inclined from the juncture of said base with the wall so that there is a portion of unobstructed tubular member between the end of each plate and the opposite tube wall; the ends of the plates being positioned in overlapping arrangement so as to eliminate any straight vertical path downward for particles which are not passed by the perforations of the plate above, while the space between plates forms a continuous circuitous unobstructed path for material not passing through perforations in the plates, discharge from the circuitous path being in the same direction as the dispersed particles and within the limited cross-sectional area of the tubular member.

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