

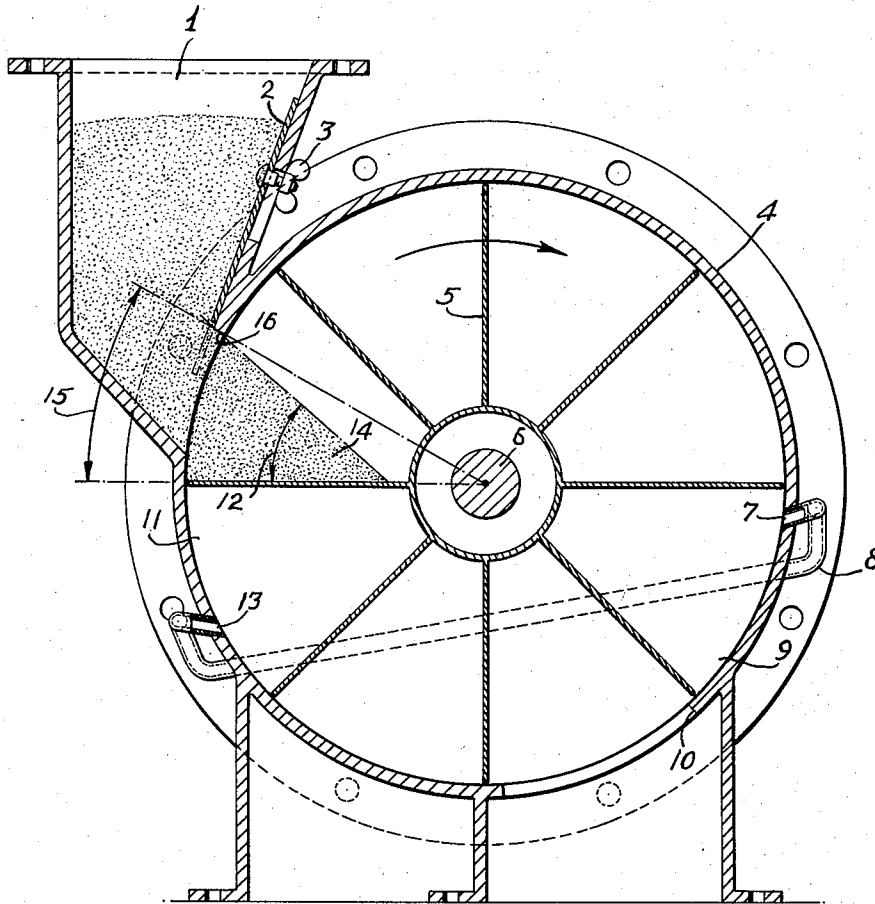
May 12, 1959

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2,886,216

APPARATUS FOR METERED FEEDING OF GRANULAR MATERIALS

Filed Aug. 23, 1955



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APPARATUS FOR METERED FEEDING OF GRANULAR MATERIALS

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Application August 23, 1955, Serial No. 530,135

Claims priority, application Sweden August 26, 1954

2 Claims. (Cl. 222—282)

The present invention refers to an apparatus for metered feeding of granular materials, said apparatus consisting of a winged wheel rotatable around a horizontal shaft, the winged wheel being positioned in a cylindrical casing, provided with inlet and outlet openings. A drawback of previously known winged wheels of this type is that during the rotation of the wheel the material often is damaged, owing to the fact that the outer layer near casing is crushed. Particularly when feeding grain and the like this causes a considerable decrease in quality. The object of the present invention is to eliminate this drawback and to operate the wheel with the sections or pockets not entirely filled.

The apparatus according to the invention is characterized in that the inlet opening is arranged in the upper quadrant at one side of the cylindrical surface of the casing—when rotating clockwise arranged in the left quadrant and vice versa—in such way, that a line drawn from the centre of the winged wheel through the upper edge of the inlet opening forms an angle with the horizontal plane smaller than the angle of repose of the material to be fed. The position of the upper edge of the opening may according to a suitable embodiment of the invention be adjustable by means of a movable damper blade. The outlet opening of the apparatus may suitably be positioned in the cylindrical surface of the casing in a quadrant which is situated diametrically opposite to the inlet opening whereby more complete sealing is obtained between the inlet and outlet openings. For the purpose of equalizing the pressure difference, if any, the apparatus advantageously may be provided with a pipe equalizing the pressure between two openings positioned on each side of the outlet opening at such relative angular distance, that said pipe connects the sector or pocket about to be filled with the sector or pocket about to be emptied.

The invention will now be described more in detail with reference to the accompanying drawing. The figure shows a section of a suitable embodiment of an apparatus for metered feeding of granular material according to the invention.

In the drawing 5 is a winged wheel rotatable around a horizontal shaft 6. 4 indicates a cylindrical casing around the winged wheel 5. This casing is provided with an inlet opening 1 and an outlet opening 10. In the illustrated embodiment it is intended to cause the winged wheel to rotate clockwise as indicated by the arrow. According to the drawing the inlet opening is placed in the left quadrant of the casing in such a manner that a line drawn from the centre of the winged wheel through the upper edge line 16 of the opening forms an angle 15 with the horizontal plane, smaller than the angle of repose 12 of the material 14 to be fed. With reference to the drawing, it is noted that the difference between the angle 15 and the angle 12 causes a triangular space to be left empty in the pocket. As the wheel 5 rotates clockwise, the material in the pocket shifts so that the empty space appears at the top of the

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pocket to free the outer edges of the wings of the wheel 5 from the granular material and thereby prevents crushing of the material between the wings and the cylindrical wall of the casing 4. Thus, this construction effectively prevents crushing of the material as it travels with the winged wheel about the casing.

According to a suitable embodiment the position of said edge line 16 may be adjusted by means of a movable damper blade 2, which by means of the locking device 3 can be adjusted in the desired position.

Thus, by adjusting the damper blade 2, the upper edge of the inlet opening may be adjusted to accommodate different angles of repose. For example, when the material has a smaller angle of repose, the blade 2 may be adjusted to the dotted line position to insure that the pocket is not completely filled as the wheel rotates past it.

8 indicates a pipe for the equalizing of pressure between two openings 7 and 13 on each side of the outlet opening and connecting the sector 11, which in turn is to be filled, with the sector 9 in turn to be emptied. Thus, if there is a substantial pressure difference between the inlet and outlet openings, the pipe 8 cuts the pressure difference between the sectors and the openings by approximately one half. For example, if the inlet opening is at three atmospheres of pressure and the outlet opening is at one atmosphere of pressure, the filled sectors traveling from the inlet opening to the opening 7 will be at three atmospheres. Likewise, the empty sectors or pockets traveling from the outlet opening to the opening 13 will be at one atmosphere. The pipe 8 will equalize the pressures in the sectors as they pass the openings 7 and 13 respectively to approximately two atmospheres so that the pressure difference between the inlet opening and the sector registering with the inlet opening, is reduced to one atmosphere difference, and the pressure difference between the outlet and the filled sector approaching the outlet opening is likewise reduced to one atmosphere. This greatly reduces the ill effect of a substantial pressure difference at the inlet and outlet openings.

Modifications of the present invention certainly are possible within the scope of the invention.

What I claim:

1. For metered feeding of granular material having a given angle of repose, apparatus comprising a casing having a cylindrical wall disposed about a horizontal axis and generally radial wall means in said cylindrical wall defining inlet and outlet openings for the material, said inlet opening being contained within one upper quadrant of said casing defined between horizontal and vertical planes through its axis, a winged wheel having radial wings slidably engaging the cylindrical wall of said casing and mounted for rotation coaxially within said casing in a generally upward direction in said one upper quadrant, the wings of said winged wheel forming closed pockets by engaging said cylindrical wall continuously between said inlet and outlet openings to preclude substantial air-leakage between said inlet and outlet openings, said inlet opening being positioned so that a straight line perpendicular to the axis of said casing passing through the uppermost point in said opening forms an angle with said horizontal plane smaller than the said given angle of repose, whereby when each pocket registers with the inlet opening, the difference in angles causes an open space at the top of the pocket which frees the upper edge of the pocket from the granular material and prevents crushing of the same between the wheel and the cylindrical wall as the wheel rotates, and an adjustable damper blade to adjust the uppermost point in said opening to accommodate materials having different angles of repose.

2. For metered feeding of granular materials having a given angle of repose, apparatus comprising a casing having a cylindrical wall disposed about a horizontal axis and generally radial wall means in said casing defining inlet and outlet openings, said inlet and outlet openings being at different pressures and contained within opposite quadrants of said casing defined between horizontal and vertical planes through its axis, said inlet opening being positioned so that a straight line perpendicular to the axis of said casing passing through the uppermost point in said opening forms an angle with said horizontal plane smaller than the said given angle of repose, a winged wheel having generally radial wings slidably engaging the cylindrical wall of said casing and mounted for rotation co-axially within said casing, the wings of said winged wheel forming a plurality of closed pockets

by engaging said cylindrical wall continuously between said inlet and outlet openings to preclude substantial air-leakage between said inlet and outlet openings, and conduit means opening into said casing to interconnect a filled pocket passing from said inlet toward said outlet opening with an emptied pocket passing from said outlet toward said inlet opening to equalize the pressure in said pockets.

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