Fully jacketed screw centrifuge

The invention relates to a solid bowl screw centrifuge according to the preamble of claim 1.

Solid bowl screw centrifuges are known in the most diverse possible versions, thus, for example, from DE 43 20 265 A1 and WO 2004/058409 A1.

DE 42 38 568 A1 illustrates in fig. 1 that and how dirt can accumulate in a solids capture chamber when a solid bowl screw centrifuge is in operation. This necessitates repeated cleaning of the solids capture chamber in order to avoid operating impairments caused by blockages or even damage to the rotating system.

To solve this problem, it is known from US 3,399,828 to form at the solids discharge of a solid bowl screw centrifuge, at its tapering end, a solids capture chamber in which is arranged, tension-mounted, an elastic air-impermeable diaphragm covering an air duct which is closed off, air-tight, with respect to the surroundings and with respect to the actual solids capture chamber. By the action of compressed air, pressure fluctuations can be generated at the diaphragm which set the latter in oscillation, thus serving to release dirt from the walls of the capture chamber, here the diaphragm.

Although the problem of dirt is reduced in this way, the problem still appears to be the relatively high outlay in terms of apparatus and structure for generating pressure fluctuations at the elastic diaphragm. Furthermore, it is relatively difficult to change the diaphragms, since the diaphragms repeatedly have to be mounted, pressure-tight, in the solids capture chamber.

~~The object~~Embodiments of the invention ~~is~~ seek to eliminate this problem.

~~The invention achieves this object by means of the subject matter of claim 1.~~

According to an aspect, there is provided a solid bowl screw centrifuge which has the following: a rotatable drum with an axis of rotation oriented, in particular, horizontally; a rotatable screw arranged in the drum; at least one discharge port, oriented at an angle to the axis of rotation of the solid bowl screw centrifuge, for the discharge of solids from the drum in the bowl of the drum, with the at least one discharge port being assigned a solids capture chamber which partially surrounds the drum rotating during operation and which does not rotate during operation, wherein, at least one hose segment not circumferentially closed in cross section is arranged in the capture chamber.

~~According to the invention, a~~Advantageously, in spite of dispensing with a chamber which is closed by an elastomer and in which a pressure gradient can be generated by the action of compressed air, movements in the elastomeric element in the solids capture chamber are sufficiently generated, solely by the impact of the solid, in order to release dirt. The number of cleanings of the solids capture chamber can consequently be reduced, compared with solids capture chambers without an elastomeric element. Moreover, maintenance work is simplified as compared with solutions with a pressure chamber in which a pressure gradient can be generated, since the elastomer no longer has to be arranged so as to be pressure-tight. Moreover, as compared with such solutions, there is no need for the means required for generating the pressure gradient (for example, a controllable pump).

A further advantage is the noise reduction achieved, since the impingement momentum of the solids is effectively decoupled vibrationally from the stand or the noise-radiating surface of the centrifuge, and

since the hose segment implements a dual-shell structure which has a noise-insulating effect. This is also advantageous especially in the case of harder and coarse solids and when there is a high discharge of solids for a unit time (or high solids performance).

Advantageous refinements will be gathered from the subclaims.

The invention is explained in more detail below by means of exemplary embodiments, with reference to the drawing in which:

Claims

1. A solid bowl screw centrifuge which has the following:

- a rotatable drum ~~(3)~~ with an axis of rotation oriented, in particular, horizontally,
- a rotatable screw ~~(5)~~ arranged in the drum ~~(3)~~,
- at least one discharge port ~~(19)~~, oriented at an angle to the axis of rotation of the solid bowl screw centrifuge, for the discharge of solids from the drum ~~(3)~~ in the bowl of the drum ~~(3)~~,
- with the at least one discharge port ~~(19)~~ being assigned a solids capture chamber ~~(25)~~ which partially surrounds the drum ~~(3)~~ rotating during operation and which does not rotate during operation,

~~characterized in that~~wherein

- at least one hose segment ~~(29)~~ not circumferentially closed in cross section is arranged in the capture chamber ~~(25)~~.

2. The solid bowl screw centrifuge as claimed in claim 1, ~~characterized in that~~wherein the hose segment ~~(29)~~ is composed of an elastomeric material.

3. The solid bowl screw centrifuge as claimed in claim 1 or 2, ~~characterized in that~~wherein the hose segment ~~(29)~~ is in such a way designed and arranged in the solids discharge chamber (~~25~~11) that it is excited to oscillatory movements upon the impingement of solids.

4. The solid bowl screw centrifuge as claimed in one of the preceding claims, ~~characterized in that~~wherein the non-circumferentially closed hose segment ~~(29)~~ is arranged virtually in the form of a ring in the solids

capture chamber, so that said hose segment surrounds the drum in the region of the solids discharge port ~~(19)~~ virtually completely, with the exception of an outlet port into a diversion or a capture container.

5. The solid bowl screw centrifuge as claimed in one of the preceding claims, ~~characterized in that~~wherein the non-circumferentially closed region of the hose segment ~~(29)~~ is C-shaped, U-shaped or Ω-shaped in cross section.

6. The solid bowl screw centrifuge as claimed in one of the preceding claims, ~~characterized in that~~wherein the region ~~(35)~~ of the hose segment ~~(29)~~ which is not circumferentially closed in cross section faces the discharge port ~~(19)~~.

7. The solid bowl screw centrifuge as claimed in one of the preceding claims, ~~characterized in that~~wherein the hose segment ~~(29)~~ bears, spaced apart from regions of direct or indirect fastening in the solids discharge chamber ~~(25)~~, in at least one region, on its outside facing away from the discharge port ~~(19)~~, against an inside ~~(38)~~ of a wall ~~(39)~~ of the solids discharge chamber.

8. The solid bowl screw centrifuge as claimed in one of the preceding claims, ~~characterized in that~~wherein the hose segment ~~(29)~~ has a spacing with respect to all the insides ~~(38)~~ of the solids discharge chamber, except in regions of direct or indirect fastening in the solids discharge chamber ~~(25)~~.

9. The solid bowl screw centrifuge as claimed in one of the preceding claims, ~~characterized in that~~wherein the hose segment ~~(29)~~ is composed completely of an elastomeric material.

10. The solid bowl screw centrifuge as claimed in one of the preceding claims, ~~characterized in that~~wherein the hose segment ~~(29)~~ is designed as a hybrid part which is composed partially of an elastomeric material and partially of a rigid material.

11. The solid bowl screw centrifuge as claimed in one of the preceding claims, ~~characterized in that~~wherein a space not closed off so as to be pressure-tight is formed between the hose segment ~~(29)~~ and the solids discharge chamber.