CLAIMS:

1. Solid bowl centrifuge, in particular two-phase or three-phase solid bowl centrifuge, which has the following:
   a. a rotor with a bowl rotating about an axis of rotation during operation, which has an inlet for a suspension to be processed in the centrifugal field and a separation chamber in which a screw rotating during operation is arranged,
   b. a solid material discharge for discharging a solids phase and at least one liquid outlet for letting out the at least one liquid phase,
   c. wherein the at least one liquid outlet has a device for influencing a pond depth in the separation chamber or the diameter of a separation zone in the separation chamber,
   d. wherein this device has at least one or more pressure chambers, into each of which a fluid supply line opens, via which a gas pressure in the respective pressure chamber can be influenced in order to apply the gas pressure in the respective pressure chamber to at least one liquid surface of the draining liquid phase in order to influence the diameter of the pond depth and/or the diameter of the separation zone in the bowl during operation, in particular to adjust it in a controlled or regulated manner,

   characterized in that

   e. the respective pressure chamber is formed in the rotor, and in that one or more functional discs are arranged in the region of the respective pressure chamber, wherein all of these functional discs rotate with the rotor during operation.

2. Solid bowl centrifuge according to claim 1, characterized in that the one or more functional discs are connected in a rotationally fixed manner either to the bowl or to the screw, so that they rotate with the bowl or with the screw during operation.

3. Solid bowl centrifuge according to claim 1 or 2, characterized in that the one or more functional discs are designed as ring segments or as circumferentially closed rings.

4. Solid bowl centrifuge according to one of the preceding claims, characterized in that the respective pressure chamber is bounded on all sides only by elements rotating with the rotor during operation.

5. Solid bowl centrifuge according to one of the preceding claims, characterized in that it is designed as a two-phase solid bowl centrifuge having a single type of

liquid outlet for a single liquid phase.

6. Solid bowl centrifuge according to one of the preceding claims, characterized in that it is designed as a three-phase solid bowl centrifuge having at least two different types of liquid outlets for two liquid phases of different densities - a lighter liquid phase and a heavier liquid phase.

7. Solid bowl centrifuge according to one of the preceding claims, characterized in that the at least one liquid outlet has a weir with one or more weir openings and in that the one or more pressure chambers are associated with the weir.

8. Solid bowl centrifuge according to one of the preceding claims, characterized in that a plurality of the weir openings are provided in the bowl cover, and in that a first siphon disc extending from radially inwards to outwards into the region of the weir openings is connected upstream of the one or more weir openings as one of the functional discs.

9. Solid bowl centrifuge according to one of the preceding claims, characterized in that the fluid supply line has at least two line sections, wherein one of these line sections is formed in a non-rotating region and wherein the at least one other of these line sections is formed in the rotor - in the bowl or the screw - and opens into the respective pressure chamber in the rotor.

10. Solid bowl centrifuge according to one of the preceding claims, characterized in that the at least two line sections of the fluid supply line in the non-rotating region of the solid bowl centrifuge and in the rotor are connected to one another via a rotary feedthrough.

11. Solid bowl centrifuge according to one of the preceding claims, characterized in that the rotary feedthrough is formed in an annular gap between the rotor and the frame.

12. Solid bowl centrifuge according to one of the preceding claims, characterized in that the rotary feedthrough is designed in the form of an annular chamber and has one or more seals, in particular mechanical seal(s).

13. Solid bowl centrifuge according to one of the preceding claims, characterized in that
    a. the one or more liquid outlets for the lighter liquid phase are each assigned one of the pressure chambers into which the respective fluid supply line

opens in the rotor,

b. and/or in that the one or more liquid outlets for the heavier liquid phases are each assigned one of the pressure chambers into which the respective fluid supply line opens in the rotor.

14. Solid bowl centrifuge according to one of the preceding claims, characterized in that

a. the one or more liquid outlets for the lighter liquid phase are each assigned one of the pressure chambers into which the respective fluid supply line opens in the rotor,

b. and/or in that the one or more liquid outlets for the heavier liquid phases are each assigned a discharge pipe with which the heavier phase can be discharged from the bowl.

15. Solid bowl centrifuge according to one of the preceding claims, characterized in that

a. one of the pressure chambers into which the respective fluid supply line in the rotor opens is assigned to the one or more fluid outlets for the heavier liquid phases,

b. and in that the one or more liquid outlets for the lighter liquid phases are each assigned one of the discharge pipes with which the heavier phase can be discharged from the bowl.

16. Solid bowl centrifuge according to one of the preceding claims, characterized in that one of the pressure chambers and a ring siphon, which is provided in sections or revolves, is assigned to one or more weir openings in each case and has a ring cup which is open radially inwards, and an outer siphon disc, the radially outer section of which dips into the ring cup.

17. Solid bowl centrifuge according to claim 15, characterized in that the outer siphon disc is designed as a functional disc rotating with the bowl or screw during operation.

18. Solid bowl centrifuge according to claim 15 or 16, characterized in that the radially inwardly open ring cup of the ring siphon is bounded in the axial direction by two weir discs which extend radially from the outside to the inside and which rotate with the bowl or the screw during operation.

19. Solid bowl centrifuge according to one of the preceding claims, characterized in that a plurality of the weir openings are provided in the bowl cover, and in that the

pressure chamber has first pressure chamber sections inside the respective weir openings and a circumferential annular pressure chamber section which adjoins them axially outwards, which connects the first pressure chamber sections and which is formed circumferentially on the inside on the side of the outer siphon disc directed towards the weir openings and radially on the outside towards the ring cup.

20. Solid bowl centrifuge according to claim 19, characterized in that the fluid supply line opens into the circumferential annular pressure chamber section, so that a single fluid supply line can be supplied with gas under pressure to the entire pressure chamber.

21. Solid bowl centrifuge according to one of the preceding claims, characterized in that a plurality of the weir openings are provided in the bowl cover, wherein a part of the weir openings is closed at one axial end in the manner of a blind hole and is designed as a discharge chamber, wherein a discharge pipe for discharging liquid from the bowl opens into each of these discharge chamber(s).

22. Solid bowl centrifuge according to claim 18, characterized in that one of the pressure chambers is assigned to each of the discharge chambers in the blind hole-like weir openings.

23. Solid bowl centrifuge according to claim 18 or 19, characterized in that another part of the weir openings is designed as passage openings.

24. Solid bowl centrifuge according to one of the preceding claims, characterized by an arrangement of a respective separating weir in such a way that the lighter liquid phase can be conducted into the respective discharge chamber into which the discharge pipe for discharging liquid from the bowl opens.

25. Solid bowl centrifuge according to one of the preceding claims, characterized by an arrangement of a respective separating weir such that the heavier liquid phase can be conducted into the discharge chamber into which the discharge pipe for discharging liquid from the bowl opens.

26. Solid bowl centrifuge according to one of the preceding claims, characterized in that a plurality, in particular four to eight, of first and second weir openings are arranged circumferentially distributed on an imaginary circle in the bowl cover, wherein one of the separating weirs is assigned to each second or third opening.

27. Method for operating a solid bowl centrifuge according to one of the preceding claims, characterized in that, during the regulation of the separation process in the bowl, the gas pressure is adjusted in the respective pressure chamber, into which a gas is introduced, which is fed through a rotary feedthrough into the rotor of the bowl and there into the respective pressure chamber.