container further has at its vertically upper end an overflow for a second phase, so that this flows during operation into the surrounding non-rotating housing, so that the latter fills during operation until the liquid phase also flows out of the stationary housing again through an overflow to the outside. This design has the disadvantage that higher speeds are hardly feasible, since the inner - rotating - container rotates in the liquid collecting in the housing.

It is the object of the invention to solve this problem.

The invention solves this object by the subject matter of claim 1, providing a separator for separating a flowable suspension in a centrifugal field into at least two flowable phases of different density, said separator designed as a separating device with which a suspension can be separated into two phases, wherein both of these phases are dischargeable from the drum, said separator comprising at least the following:

a) a housing which is stationary in operation, designed in the manner of a container, which has at least two openings,

b) a drum being arranged within the housing and having an axis of rotation and being rotatable about said axis of rotation, and having at least one opening,

c) wherein a gap is formed at least in sections or continuously between the drum and the housing,

d) a support and drive device comprising at least two support and/or drive units, by means of which the drum can be suspended, supported and/or rotated within the housing,

e) wherein a first one of the support and/or drive units comprises a magnetic bearing which is at least adapted to axially support and levitate the drum,

f) wherein at least one further of the support and/or drive units is designed to axially support the drum

g) wherein one and/or both of the support and/or drive units is/are designed and usable to set the drum in rotation within the housing, and

h) wherein a distributor and a separating means, in particular a disk pack, are arranged in the drum.

This separator is also very well suited for operation at higher speeds. In addition, it can also be used well for one-off processing - for example for centrifugal separation of a product batch of a flowable suspension into different phases - and then disposed of.

There is a particular advantage here in that, in addition to a lower axial bearing in the first vertical alignment of the axis of rotation, a further axial bearing is provided - for example, at an opposite end of the drum or, optionally, also in the drum. This is because this allows the axis of rotation of the drum to be arranged vertically, but alternatively also advantageously inclined from the vertical. Any arrangement of the

CLAIMS:

1. Separator for separating a flowable suspension in a centrifugal field into at least two flowable phases of different density, said separator designed as a separating device with which a suspension can be separated into two phases, wherein both of these phases are dischargeable from the drum, said separator comprising:

   a) a housing which is stationary in operation and is designed in the manner of a container having at least two openings,

   b) a drum being arranged within the housing and having an axis of rotation and being rotatable about said axis of rotation, and having at least one opening,

   c) wherein a gap is formed at least in sections or continuously between the drum and the housing,

   d) a support and drive device comprising at least two support and/or drive units by means of which the drum can be suspended, supported and/or rotated within the housing,

   e) wherein a first one of said support and/or drive units comprises a magnetic bearing which is at least adapted to axially support and levitate said drum;

   f) wherein at least one further of the support and/or drive units is designed to axially support the drum,

   g) wherein one and/or both of the support and/or drive units is/are designed and usable to set the drum in rotation within the housing, and

   h) wherein a distributor and a separating means, in particular a disk pack, are arranged in the drum.

2. Separator according to claim 1, characterized in that the two support and/or drive units are arranged axially offset from one another in the direction of the axis of rotation, and in that, in a first vertical alignment of the axis of rotation, the lower and/or the upper of the two support and/or drive units is designed to support the drum axially and to keep it suspended.

3. Separator according to one of the preceding claims, characterized in that the first of the support and/or drive units is designed as a combined bearing device which, in addition to an axial bearing, also effects a radial bearing of the drum.

4. Separator according to one of the preceding claims, characterized in that the second or further of the support and/or drive units is designed as a combined bearing device which, in addition to an axial bearing, also effects a radial bearing of the drum.

5. Separator according to one of the preceding claims, characterized in that one or both of the support and/or drive units has/have a radial bearing and an axial bearing.

6. Separator according to one of the preceding claims, characterized in that at least one of the bearing devices, which in addition to a radial bearing also effects an axial bearing of the drum, has a bearing acting obliquely to the axis of rotation.

7. Separator according to one of the preceding claims, characterized in that the second of the bearing devices is arranged above the first magnetic bearing in the first vertical alignment of the axis of rotation.

8. Separator according to one of the preceding claims, characterized in that it is designed as a clarifying device with which a suspension of solids can be clarified, wherein preferably only the clarified suspension is dischargeable from the drum.

9. Separator according to one of the preceding claims, characterized in that the housing has at least two openings, one of which is for a feed of a suspension to be processed in the centrifugal field and at least one of which is for a discharge of a phase of the suspension processed in the centrifugal field.

10. Separator according to one of the preceding claims, characterized in that the housing has at least three openings.

11. Separator according to one of the preceding claims 9 or 10, characterized in that the housing further comprises at least one functional opening, in particular for connecting a device generating a vacuum.

12. Separator according to one of the preceding claims, characterized in that the drum comprises at least one inlet and only one outlet or a plurality of outlets.

13. Separator according to one of the preceding claims, characterized in that the inlet is formed as an inlet pipe which, in a first vertical alignment of the axis of rotation, extends vertically from above through one of the openings of the housing into the drum.

14. Separator according to one of the preceding claims, characterized in that, in a first vertical alignment of the axis of rotation on the drum, a first liquid outlet is formed in the upper axial region and a second liquid outlet is formed in the lower axial region of the drum.

15. Separator according to claim 12, characterized in that the maximum two outlets are radially aligned, wherein both outlets are formed at the upper axial region of the drum at a first vertical alignment of the axis of rotation.

16. Separator according to claim 12, characterized in that at least one of the outlets from the drum comprises solids outlet openings, in particular solids outlet nozzles, in the drum shell.

17. Separator according to one of the preceding claims, characterized in that the at least one bearing device, which in addition to a radial bearing also effects an axial bearing of the drum, has at least one or more permanently and/or electromagnetically acting bearings.

18. Separator according to one of the preceding claims, characterized in that the at least one bearing device, which in addition to a radial bearing also effects an axial bearing of the drum, has at least one or more bearings acting in the manner of plain bearings.

19. Separator according to claim 18, characterized in that the plain bearing is formed by a mandrel-like inlet pipe which is supported with a centering tip in a corresponding recess in the distributor base.

20. Separator according to claim 14, characterized in that at least one of the two liquid outlets is assigned a device for adjusting the separation zone within the drum.

21. Separator according to claim 12, characterized in that one or more seals are arranged between the drum and the housing - in particular in the region of one or more of the outlets and/or one or more annular spaces.

22. Separator according to one of the preceding claims, characterized in that the housing has exclusively two or three openings and is otherwise designed in a hermetically closed manner.

23. Separator according to one of the preceding claims, characterized in that the drum has one or more solids outlet nozzles.

24. Separator according to one of the preceding claims, characterized in that the gap is an air gap.

25. Separator according to one of the preceding claims, characterized in that the drum and the housing are designed as a disposable separator which can be disposed of after a single use, wherein the at least two support and/or drive units are designed to be removably reusable from the outside of the housing.

26. Use of a separator according to claim 25 as a disposable separator which is disposed of after a single use, wherein the at least two support and/or drive units are previously removed from the housing.