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The invention relates to a separator arrangement according to the preamble of claim 1.

5 Such separator arrangements are generally known. The general prior art is shown by WO 02/096 566 A1.

DE 43 42 471 C1 and DE 103 11 997 A1 relate to filter centrifuges and are further away from the subject matter of the invention. US 5,343,282 also shows a laboratory centrifuge which is also further away from the subject matter of the invention.
10 tion.

It is necessary for different applications of separators, especially in the field of medical or food technology, to operate generic separators in such a way that especially high demands are fulfilled with respect to sanitation and hygiene.
15

It is the object of the invention to provide a separator arrangement which especially meets this requirement with constructively simple means.

This object is achieved by the invention by the subject matter of claim 1.
20

The invention realises a separator arrangement, comprising a separator having a drum with a vertical rotational axis, which is placed onto a rotatable drive spindle and is surrounded by a hood, and which is rotatable in operation by a drive device having a speed of more than 1000 rpm, preferably more than 2500 rpm, and preferably less than 8500 rpm, and which comprises a dividing wall which divides
25 the separator arrangement into a sanitary chamber with the drum and the hood and into a drive chamber with the drive device, wherein the separator with a machine frame having the hood and the drum and the drive device is decoupled as a unit in vibration terms from the dividing wall and optionally from a foundation attachment. In this case, the sanitary chamber is arranged above the dividing
30 wall and the drive chamber beneath the dividing wall.

In particular, the arrangement of the components is chosen in such a way that work on the components of the drive device, especially work on the motor, coupling, spindle, bearing and other maintenance and repair work, can be carried out
35 in the drive chamber region without any connection to the sanitary chamber region.

As a result, a change in the lubricant or a change in the motor can be carried out for example in a simple way. It is conversely possible to work on the hood or the drum in the sanitary chamber without producing any connection to the drive chamber region.

5

In contrast to DE 36 22 886 A1 and JP 08-024714 A, which disclose centrifuges which are formed for removing fission products from dissolved nuclear fuel and in which the drive and the drum are separated from each other by a concrete ceiling in order to shield the drive region against radiation, a decoupling in terms of vibration of the entire separator plus the machine frame from the dividing wall is advantageously also realised in accordance with the invention. In addition, the drum can advantageously be decoupled from the machine frame in terms of vibration.

15 The concept of the invention can be realised in a simple manner in such a way that the sanitary chamber and the drive chamber are two rooms of a building which are surrounded or separated from each other by the dividing wall in the manner of a ceiling.

20 The sanitary chamber is preferably subdivided into a first sanitary region outside of the hood and a second sanitary region within the hood, wherein it is usually adequate if the first sanitary region outside of the hood meets lower cleanliness requirements than the second sanitary region within the hood, which can even be formed as a sterile region. In order to meet such high cleanliness requirements it is advantageous if the region around the hood is also formed in a sanitary way and no contaminations from the drive region can reach the region around the hood.

25 A decoupling of the dividing wall from the machine frame with its walls in terms of vibration is especially advantageous, which can be reached via sealing, flexible connecting elements such as a membrane.

30 Further advantageous embodiments are provided in the dependent claims.

35 The invention will be explained below in closer detail by reference to an embodiment shown in the drawing, wherein:

Fig. 1 shows a schematic view of a separator arrangement.

Fig. 1 shows a separator arrangement 1 with a separator with a vertical rotational axis D, which comprises a drum 2 which is placed on a rotatable drive spindle 3. The product feed preferably occurs from above (not shown in closer detail).

5 The drive spindle 3 is rotatably mounted by means of at least one or several bearings 4 in a bearing housing 5, which is supported on an upper flange section 5a via elastic elements 6 on a machine frame 7.

10 The drive spindle 3 is rotatable by means of a motor 8 whose output shaft 9 is arranged in axial extension of the drive spindle 3, wherein a coupling device 10 is arranged between the drive spindle 3 and the output shaft 9 of the motor 8. The invention can be realised especially advantageously in this compact configuration, as shown by Fig. 1. The motor 8 is arranged entirely or in sections beneath the machine frame. It could also be considered and would also provide a very compact configuration if the motor 8 were arranged within the machine frame 7 and if
15 the motor 8 and the drum 2 would comprise a common bearing (both are not shown).

20 The drum 2 is surrounded by a hood 11, which is connected in its bottom region 13 to the machine frame 7 in a rigid and gas-tight manner. A solid scavenger can also be interposed between the hood 11 and the machine frame 7.

25 The region within the hood 11 is sealed in a gas-tight manner in its entirety against the ambient environment of the hood 11 and the drive chamber, which allows forming this region in a sanitary manner. Furthermore, the region outside of the Hood 11 is also formed in a gas-tight manner in relation to the drive chamber, beneath a dividing wall 16, for which purpose respective precautions need to be taken.

30 A drive cover 23 is formed between the region 13, in which the hood is fixed to the machine frame, and the drive spindle 3, said drive cover being sealed in relation to the drive spindle 3 with a sealing device 12. Said sealing device 12 can be formed as a mechanical face seal or barrier chamber, especially as a barrier chamber which comprises two seals which are spaced from each other and between
35 which a fluid such as a gas can be introduced, which is preferably a sterile gas. The gas pressure is then preferably kept at a higher level in the different operating states in the barrier chamber than in the adjacent spaces.

A membrane arrangement 21 is formed on the drive cover 23 between the sealing device 12 and the region 13 in which the hood 11 is arranged on the machine frame 7, which membrane arrangement decouples the machine frame 7 from the spindle or the sealing device 12 in terms of vibration.

5

The entire separator, i.e. the machine frame 7 with the hood 11 and the drum 2 in addition to the drive device 22, is supported via at least one or several elastic support elements 14 on a bottom foundation attachment 15 of a dividing wall 16, said support elements preferably having damping properties and said dividing wall
10 being formed in this case as a flat wall which divides the building space in which the separator is arranged into a sanitary chamber 19, which meets high sanitary requirements, above the dividing wall 16 and into a drive chamber 20 beneath the dividing wall 16.

15 The sanitary chamber 19 and the drive chamber 20 are preferably two chambers which are surrounded or separated from each other by a dividing wall 16 in the manner of a ceiling.

Since the machine frame 7 is supported by elastic elements 14 on the bottom
20 foundation attachment 15 of the dividing wall 16, it is advantageously decoupled in terms of vibration from the dividing wall 16.

In this respect, the sanitary chamber 19 is subdivided into a first sanitary region
25 24 above the dividing wall or ceiling 16 and outside the hood 11 and into a second sanitary region 25 within the hood 11 and above the drive cover 23. A sterile configuration of the second sanitary region 25 can be considered, wherein the entire interior space of the hood can preferably be formed to be sterilised by steam. The temperatures preferably lie above 120°C, which corresponds to a pressure of 1 bar (superatmospheric pressure). It is also possible to realise higher temperatures
30 and pressures, e.g. 134°C/2 bar, so that the configuration of the components is chosen accordingly. Sterile regions, clean rooms or ultraclean rooms can be realised, according to the current use of these terms among professionals.

A gap 17 is formed between the dividing wall 16 and the machine frame, which
35 gap is sealed by a preferably elastic sealing element 18 in the manner of a membrane, so that relative movements between the dividing wall 16 and the machine frame 7 are possible. The sealing element 18 seals the drive chamber 20 in an

air-tight manner against the sanitary chamber 19, so that no germs are allowed to pass or contaminations can reach the sanitary chamber.

5 The entire power and oil supply of the drive (motor) occurs in the drive chamber 20 beneath the dividing wall 16, which apart from that is also formed in such a way that no connection needs to be produced between the sanitary chamber 19 and the drive chamber 20 during maintenance work. As a result, the dismounting of the drum and hood is possible from the sanitary chamber 19 alone, because according to the preferred embodiment all elements for fixing said components
10 are accessible from the sanitary chamber 19.

The drive device 22 especially comprises the motor 8, the coupling 10, the bearing device 4 and the bottom region of the drive spindle 3 beneath the sealing device 12. The region beneath the machine frame can form the actual drive region,
15 via which lubrication of the bearing 4 also occurs in particular.

The separator arrangement of the type according to Fig. 1 also meets the highest sanitary requirements in the field of medical technology for example, since clean room or even ultraclean room conditions can be realised in the region 24.
20

List of reference numerals

	Separator arrangement	1
	Drum	2
5	Drive spindle	3
	Bearing device(s)	4
	Flange section	5
	Flange section	5a
	Elastic elements	6
10	Machine frame	7
	Motor	8
	Output shaft	9
	Coupling device	10
	Hood	11
15	Sealing device	12
	Region	13
	Elastic support element	14
	Foundation attachment	15
	Dividing wall	16
20	Gap	17
	Elastic element	18
	Sanitary chamber	19
	Drive chamber	20
	Membrane arrangement	21
25	Drive device	22
	Drive cover	23
	Sanitary regions	24, 25
	Rotational axis	D

PATENTKRAV

1. Separator-arrangement, omfattende en separator med en tromle (1), med
5 en lodret rotationsakse (1), og som er anbragt på en roterbar drivspindel
(3) og er omgivet af en hætte (11), og som under drift kan rotere ved
hjælp af en drivindretning (25) med en hastighed på mere end 1000
omdr./min. Og fortrinsvis mindre end 8500 omdr./min,
k e n d e t e g n e t v e d en delevæg (16), der opdeler separator-
arrangementet i et sanitetskammer (19) med tromlen (1) og hætten (11)
10 og i et drivkammer (20) med drivindretningen (22), hvorved separatoren
med et maskinstativ (7), med hætten (11) og tromlen (2) samt drivindret-
ningen (22), udtrykt med vibrationstermer, som en enhed bliver afkoblet
fra delevæggen (16) og eventuelt fra en funderingsfastgørelse (15), hvor-
ved det sanitære kammer (19) er anbragt oven over delevæggen (16) og
15 drivkammeret (20) neden under skillevæggen (16).
2. Separator-arrangement ifølge krav 1,
k e n d e t e g n e t v e d , at sanitetskammeret (19) og drivkammeret
(20) er to rum i en bygning, og som er adskilt fra hinanden ved hjælp af
20 en skillevæg på samme måde som et loft.
3. Separator-arrangement ifølge krav 1 eller 2,
k e n d e t e g n e t v e d , at sanitetskammeret (19) er opdelt i en første
sanitetsregion (24) uden for hætten (11) og en anden sanitetsregion (25)
25 inden for hætten (11).
4. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at separatoren med dens maskinstativ (7),
med hætten (11) og tromlen (2) samt drivenheden understøttes på dele-
30 væggen (16) eller på delevæggens (16) fremspring (15) med et eller flere
elastiske elementer (14).
5. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at motorens (8) udgangsaksel (9) er anbragt
35 i aksial forlængelse af drivspindlen (3).
6. Separator-arrangement ifølge et hvilket som helst af de foregående krav,

k e n d e t e g n e t v e d , at den første sanitetsregion (24) uden for hættens (11) fordrer mindre arbejde til rengøring end den anden sanitetsregion (25) inden i hættens (11).

- 5 7. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at den anden sanitetsregion (25) er dannet
som en steril region, navnlig i en damp-steriliserbar udformning.
- 10 8. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at drivenheden (22) omfatter en motor (8),
en kobling (10), i det mindste en lejeindretning (4) og et afsnit omkring
drivspindlen (13) neden under et drevdæksel (23), og en tætningsindret-
ning (12).
- 15 9. Separator-arrangement ifølge krav 8,
k e n d e t e g n e t v e d , at hættens (11) for drivspindlen (3) er tætnet
ved hjælp af tætningsindretningen (12), der fortrinsvis er dannet som en
glideringstætning eller som spærrekammer.
- 20 10. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at drivspindlen (3) er monteret drejeligt i et
lejehus (5) ved hjælp af den i det mindste ene lejeindretning (4), hvilket
lejehus understøttes af elastiske elementer (6) på et maskinstativ (7).
- 25 11. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at en koblingsindretning (10) er anbragt mel-
lem drivspindlen (3) og motorens (8) udgangsaksel (9).
- 30 12. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at hættens (11) i sin nedre region (13) stift og
gastæt er forbundet til et maskinstativ (7).
- 35 13. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at der i regionen ved drevdækslet (23) er
dannet et membran-arrangement (21), hvilket membran-arrangement,
udtrykt med vibrationstermer, afkobler drevdækslet (23) i regionen om-
kring drivspindlen (3).

14. Separator-arrangement ifølge krav 12 eller krav 13,
k e n d e t e g n e t v e d , at der mellem delevæggen (16) og maskin-
stativet (7) er dannet en spalte (17), hvilken spalte er tætnet og danner
bro ved hjælp af et elastisk tætningselement (18), navnlig et membran-
arrangement.
5
15. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at hele strømforsyningen til motoren, smø-
remiddelforsyningen og fastgørelsen af drivindretningens (25) elementer
realiseres i drivkammeret (20).
10
16. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at tromlen (2) og hættten (11) kan afmonte-
res og/eller udskiftes fra sanitetskammeret uden åbning af en forbindelse
mellem sanitetskammeret (19) og drivkammeret (20).
15
17. Separator-arrangement ifølge et hvilket som helst af de foregående krav,
k e n d e t e g n e t v e d , at motoren (8) er anbragt neden under ma-
skinstativet (7).
20
18. Separator-arrangement ifølge et hvilket som helst af de foregående krav 1
til 16,
k e n d e t e g n e t v e d , at motoren (8) er anbragt inden i maskinsta-
tivet (7).
25
19. Separator-arrangement ifølge et hvilket som helst af de foregående krav 1
til 18,
k e n d e t e g n e t v e d , at motoren (8) og tromlen (2) har et fælles
leje.
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