

IN THE CLAIMS

1. (Currently Amended) A bearing system for a rotor in rotating machines, such as compressors, pumps, turbines and expanders, the rotor being provided with at least two bearings and associated seals, ~~e-h-a-r-a-e-t-e-r-i-s-e-d-i-n-t-h-a-t~~ wherein each bearing and sealing point for the rotor (16) is in the form of a bearing and seal combination (17) which is formed of a stator (18) located within a rotating machine housing (15) and surrounding the rotor (16), ~~that~~ wherein the stator (18) is formed with a bore (19), whereby an annular clearance is formed between the stator and rotor, and ~~that~~ wherein the bore (19) has a gradually increasing sectional area in the direction of higher pressure (P2) within the rotating machine, wherein the stator is provided with means adapted for damping of gas rotation in the annular clearance, wherein the rotating damping means includes at least one of an axial rib, a brush, an inclined hole-pattern, and a guide apparatus, such as guide blades.

2. (Currently Amended) A bearing system according to claim 1, ~~e-h-a-r-a-e-t-e-r-i-s-e-d-i-n-t-h-a-t~~ wherein the bearing and seal combination (17) is an axial bearing formed as a cylindrical disc on the rotor (16) which bears against an associated portion of the stator(18), whereby a gas film may be formed with rigidity and damping according to the same principle as in a radial bearing having desired dynamic rigidity and damping.

3. (Currently Amended) A bearing system according to claim 1, ~~e-h-a-r-a-e-t-e-r-i-s-e-d-i-n-t-h-a-t~~ wherein the axial bearing is formed according to the hydrostatic principle which entails a flow restriction before and after its bearing surface as to obtain rigidity with accompanying damping.

Applicants: Harald UNDERBAKKE
Application No.: Not Yet Known

4. (Currently Amended) A bearing system according to claim 2 ~~or 3, characterise~~
~~d in that~~ wherein the axial bearing is formed as a combination of the
radial bearing with gas film and the hydrostatic principle with flow restriction
before and after the bearing surface.

5-6. (Canceled)

7. (Currently Amended) A bearing system according to ~~any one of the preceding~~
~~claims, characterise d in that~~ claim 1, wherein the bore (19) is formed
having an uneven surface structure.

8. (Currently Amended) A bearing system according to ~~any one of the preceding~~
~~claims, characterise d in that~~ claim 1, wherein the bore (19) is formed
having a honeycomb structure or pattern of holes (20).

9. (Currently Amended) A bearing system according to ~~any one of the preceding~~
~~claims, characterise d in that~~ claim 1, wherein the surface structure (21)
of the bore (19) has an outer zone consisting of an external radial pattern of holes
and an internal pattern of channels, but so positioned relative to each other as to
allow gas exchange to take place in the direction of the higher pressure (P2).

10. (Currently Amended) A bearing system according to ~~any one of the preceding~~
~~claims, characterise d in that~~ claim 1, wherein at the start-up or the run-
down of the rotating machine the higher pressure (P2) is provided by means of an
accumulator (6) which contains gas at such a pressure, and which is in
communication with each individual bearing and seal combination (17).

Applicants: Harald UNDERBAKKE
Application No.: Not Yet Known

11. (Currently Amended) A bearing system according to ~~any one of the preceding claims, characterised in that~~ claim 1, wherein the system comprises at least two support bearings (7) arranged in connection with the respective bearing and seal combination (17), and which are of a type suitable for withstanding contact for a brief period during start-up or run-down.

12. (Currently Amended) A bearing system according to ~~any one of the preceding claims, characterised in that~~ claim 1, wherein the system ~~comprises~~ includes a control means (7) such as a regulating valve, so as to adjust the geometry of the respective bearing and seal combination (17) by means of applied pressure forces.

13. (Currently Amended) A bearing system according to ~~any one of the preceding claims, characterised in that~~ claim 1, wherein the motor (22) and the compressor (23) are located in the same housing (24).

14. (Currently Amended) A bearing system according to ~~any one of the preceding claims, characterised in that~~ claim 1, wherein a passive permanent magnetic bearing for support of the rotor (16) at start-up or shut-down is arranged integrated in the bearing and seal combination (17) or separately adjacent thereto.

15. (New) A bearing system according to claim 1, wherein the guide apparatus (d) gives the gas a start rotation in a direction opposite a rotating direction of the rotor.

Applicants: Harald UNDERBAKKE
Application No.: Not Yet Known

16. (New) A rotating machine, such as a compressor, pump, turbine, or expander, including a bearing system according to claim 1.