CLAIMS

1. A piston-chamber combination comprising a chamber (2,2') which is bounded by an inner chamber wall (4), and comprising a piston (1) in said chamber (2,2') to be engagingly movable relative to said chamber wall (4) at least between a first position and a second position of the chamber (2,2'),

said chamber (2,2') having cross-sections of different cross-sectional areas and differing circumferential lengths at the first and second longitudinal positions, and at least substantially continuously different cross-sectional areas and circumferential lengths at intermediate longitudinal positions between the first and second longitudinal positions, the cross-sectional area and circumferential length at said second longitudinal position being smaller than the cross-sectional area and circumferential length at said first longitudinal position,

said piston (1) is comprising an member (12) for suspension of the sealing (7); said member (12) is rotatable, and said sealing (7) is comprising a separate part (6,6') engaging the wall (4) of said chamber (2,2') and a sealing (7) made of elastically deformable impervious material, and mounted on the piston rod (5),

characterized by the fact that

the piston (1) is produced to have a production-size of said separate part (6') and said sealing (7) in the stress-free and undeformed state thereof in which the circumferential length of the piston (1) is approximately equivalent to the circumferential length of said chamber wall (4) at said second longitudinal position, the piston (1) being expandable from its production size in a direction transversally with respect to the longitudinal / circular direction of the chamber (2,2') thereby providing for an expansion of sealing (7) of the piston (1) from the production size thereof during the relative movements of the piston from said second longitudinal position to said first longitudinal / circular position,

at one end, closest to a second longitudinal / circular position of said chamber (2'), the sealing (7) is embedded in said separate part (6'), said sealing (7) of the piston (1) is comprising sealing sections (19,20; 51) in a direction along the piston rod (5), said sealing (7) is updivided in said sections over the circumference of said sealing (7), and, the angle (δ;ξ) in-between two adjacent sealing sections is much less than 180°,

at one other end, closest to a first longitudinal / circular position of said chamber, said sealing (7') is updivided in said sections (19,20;51') over the circumference of said sealing (7'), and, the

angle (ε;ψ) in-between two adjacent sealing sections is bigger than said angle (δ;ξ).

2. A piston-chamber combination according to claim 1, wherein closest to a first longitudinal / circular position of the chamber (2') is the cross-sectional diameter (k,y) of said separate part (6') is biggest, and closest to a first longitudinal/circular position of said chamber (2) the cross-sectional diameter (j,x) of the separate part (6) is smaller the cross-sectional diameter (k,y) of the separate part (6') at a second longitudinal/ circular position of the chamber (2').

3. A piston-chamber combination according to claim 1, wherein said sealing sections (8) are plane sections (19,20), having transitions (21,22) in-between said sections, said sections and said transitions are comprising reinforcements (23,24), said reinforcements are communicating with each other.

4. A piston-chamber combination according to claim 1, wherein said sealing sections are curved sections (51,53,54; 51',59), and are comprising in turning centres reinforcements which are positioned in a direction along the piston rod (5), said sections are comprising reinforcements, said reinforcements are communicating with each other.

5. A piston-chamber combination according to claim 1, wherein said angles are between two adjacently positioned section planes.

6. A piston-chamber combination according to claim 4, wherein said angles are between two adjacently positioned reinforcement ends of turning centres in a transversal cross-section.

7. A piston-chamber combination according to claim 1, further comprising turning points for the sealing and for a member (12), wherein said turning points of are closely positioned to each other.

8. A piston-chamber combination according to claim 1, further comprising a coil spring (34,34') for suspending said separate part, said coil spring is comprising a part (44) which can turn over an angle ζ.

9. A piston-chamber combination according to claim 1, of which member (12) is further comprising a shaped holder (38), wherein said holder has a similar circle round shape as the outside shape of said coil spring (34,34').

10. A piston-chamber combination according to claims 1 or 9, wherein said shaped holder is part of a portion (37) of said member (12), wherein said portion is retractable, by a stop (39) which is mounted on the piston rod (5).

11. A piston-chamber combination according to claim 1, wherein the member 12 is having an angle α, preferably approximately 60°, with the centre axis 3 of the piston rod 5.

12. A piston-chamber combination according to claim 1, wherein the turning point, spot 10 of the sealing 7, is positioned very nearly the centre 11 of the axle 13 of the member 12.

13. A pump for pumping a fluid, the pump comprising:

- a combination according to any of the preceeding claims,
- means for engaging the piston means from a position outside the chamber,
- a fluid entrance connected to the chamber and comprising a valve means, and
- a fluid exit connected to the chamber.
- said separate part (6,6') is sealingly engaging the wall (4) of said chamber (2, 2'), at least from a first to a second longitudinal / circular position of the chamber.

14. A pump according to claim 13 wherein the engaging means have an outer position where the piston means is at the first longitudinal / circular position of the chamber, and an inner position where the piston means is at the second longitudinal / circular position of the chamber.

15. A pump according to claim 14 wherein the engaging means have an outer position where the piston means is at the second longitudinal / circular position of the chamber, and an inner position where the piston means is at the first longitudinal / circular position of the chamber.

16. A shock absorber comprising:

- a combination according to any of claims 1 to 12,
- means for engaging the piston means from a position outside the chamber, wherein the engaging means have an outer position where the piston means is at the first longitudinal position of the chamber, and an inner position where the piston means is at the second longitudinal position,
- said separate part (6,6') is sealingly engaging the wall (4) of said chamber (2,2'), at least from a first and a second longitudinal / circular position of the chamber.

17. A shock absorber according to claim 16, further comprising a fluid entrance connected to the chamber and comprising a valve means.

18. A shock absorber according to claim 14 or 15 further comprising a fluid exit connected to the chamber and comprising a valve means.

19. A shock absorber according to any of claims 16 to 18 wherein the chamber and the piston means form an at least substantially sealed cavity comprising a fluid, the fluid being compressed when the piston means moves from the first to the second longitudinal / circular position of the chamber.

20. A shock absorber according to any of claims 16 to 18 further comprising means for biasing the piston means toward the first longitudinal / circular position of the chamber.

21. An actuator comprising:

- a combination according to any of claims 1 to 12,
- means for engaging the piston means from a position outside the chamber,
- means for introducing fluid into the chamber in order to displace the piston means between the first and the second longitudinal / circular positions of the chamber,
- said separate part (6,6') is sealingly engaging the wall (4) of said chamber (2,2'), from a second to a first longitudinal / circular position of the chamber or from a first to a second longitudinal / circular position of the chamber.

22. An actuator according to claim 21, further comprising a fluid entrance connected to the chamber and comprising a valve means.

23. An actuator according to claim 21 or 22, further comprising a fluid exit connected to the chamber and comprising a valve means.

24. An actuator according to any of claims 21 to 23 further comprising means for biasing the piston means toward the first or second longitudinal / circular position of the chamber.

25. An actuator according to any of claims 21 to 24, wherein the introducing means comprise means for introducing pressurised fluid into the chamber.

26. An actuator according to any of claims 21 to 24 wherein the introducing means are adapted to introduce a combustible fluid, such as gasoline or diesel, into the chamber, and wherein the actuator further comprises means for combusting the combustible fluid.

27. An actuator according to any of claims 21 to 24 further comprising a crank adapted to translate the translation of the piston means into a rotation of the crank.