CLAIMS

1. A rotor support configured to rotatably mount a rotor shaft in a vacuum pump, said rotor support comprising:

a rolling bearing for rotatably supporting said shaft;

an insert and at least one resilient damping member, said insert and said at least one resilient damping member surrounding said rolling bearing; wherein

said insert comprises inner and outer annular portions connected by a plurality of flexible members, said plurality of flexible members being configured to flex in a radial plane and resist movement in an axial plane, thereby absorbing radial movement of said shaft; and

said at least one resilient damping member is formed of an elastomeric material configured to flex in both a radial and axial direction; wherein

said at least one resilient damping member is configured to support said insert and is arranged in series with said insert.

2. A rotor support according to claim 1, wherein said at least one resilient damping member is arranged in series with said insert in at least one of the following configurations:

at least one of said at least one resilient damping member is located between said inner annular portion of said insert and said rolling bearing; and

said outer annular portion of said insert is located between at least one of said at least one resilient damping member and said rolling bearing.

3. A rotor support according to claim 1, wherein said insert is formed of a metallic material or a plastic material and said flexible members are longer axially than they are wide, thereby providing axial stiffness and radial flexibility.

4. A rotor support according to any preceding claim, wherein each of the flexible members comprises an elongate, arcuate member substantially concentric with the inner and outer annular portions.

5. A rotor support according to any preceding claim, wherein the flexible members provide a plurality of integral leaf springs providing radial flexibility.

6. A rotor support according to any preceding claim, wherein said rolling bearing comprises an inner race, an outer race and a plurality of rolling elements located between the races, said outer race being bonded to said insert.

7. A rotor support according to any one of claims 1 to 5, wherein at least one of said at least one resilient damping member is located between said insert and said rolling bearing.

8. A rotor support according to any preceding claim, wherein said insert is located between said rolling bearing and at least one of said at least one resilient damping member.

9. A rotor support according to any preceding claim, further comprising at least one resilient axial damping member formed of an elastomeric material and mounted such that axial movement of said rolling bearing changes a compression of said at least one resilient axial damping member.

10. A rotor support according to claims 7 and 9, wherein at least one of said at least one resilient axial damping member is mounted on a surface that lies in a radial plane.

11. A rotor support according to claims 8 and 9, wherein said insert comprises an extension extending radially inwardly from an end of said inner annular portion, said extension extending over said rolling bearing, at least one of said at least one resilient axial damping member being mounted between a surface of said rolling bearing facing said extension and a surface of said extension facing said rolling bearing.

12. A rotor support according to claim 9 or 10, wherein said at least one resilient axial damping member is axially more flexible than said resilient axial damping member.

13. A rotor support according to any one of claims 9 to 11, wherein said resilient axial damping member and said resilient damping member comprise a single member.

14. A rotor support according to claim 13, wherein said single member comprises an L-shaped member.

15. A rotor support according to any one of claims 1 to 12, wherein said at least one resilient damping member comprises at least one O-ring.

16. A vacuum pump comprising:

a rotor comprising a shaft rotatably mounted within a pump body on a rotor support, said rotor support comprising a rotor support according to any preceding claim.

17. A vacuum pump according to claim 16, wherein an outer one of said at least one resilient damping member or said insert are bonded to said pump body.

18. A vacuum pump according to claim 16 when dependent from claim 15, wherein said at least one O-ring is mounted in at least one recess in said pump body.

19. A vacuum pump according to any one of claims 16 to 18, wherein said vacuum pump comprises a turbomolecular pump.