Claims

1. An omnidirectional antenna intended to equip a sonar, the antenna being centered around a longitudinal axis, the antenna comprising: an assembly of emission rings stacked along said longitudinal axis, said emission rings being directly immersed in a dielectric fluid, each emission ring being formed around said longitudinal axis, wherein each ring constitutes a vibrating ring in said dielectric fluid and comprises an internal cavity including an internal fluid, each ring presenting at least two resonance frequencies acoustically coupled to said fluid, said resonance frequencies comprising a cavity frequency corresponding to a cavity mode and a radial frequency corresponding to a radial mode, wherein the emission rings are assembled in groups of rings, the groups of rings comprising at least two groups of rings, each group of rings, of the groups of rings, comprising at least two rings, and an inter-ring spacing between the rings of one and the same group of rings are a function of the cavity frequency of the group of rings while an inter-group spacing between two successive groups of rings are a function of a frequency of operational use of the emission rings, wherein the inter-ring spacing between the rings of one and the same group of rings is furthermore chosen as a function of the radial frequency of the group of rings.

2. The omnidirectional antenna as claimed in claim 1, wherein the rings are made of piezoelectric material.

3. The omnidirectional antenna as claimed in claim 1, wherein the sum of the inter-group spacing between two groups of rings p, of the inter-ring spacing d between two of rings and of twice the height of a ring is substantially equal to half the wavelength of the frequency of operational use of the emission rings.

4. The omnidirectional antenna as claimed in claim 1, wherein the inter-ring spacing between two rings of one and the same group of rings is chosen so as

to position the cavity frequency of the group of rings with respect to the radial frequency of the rings of the group of rings.

5. The omnidirectional antenna as claimed in claim 1, wherein the cavity frequency of each ring is coupled with the radial frequency of said ring.

6. The omnidirectional antenna as claimed in claim 1, wherein the internal cavity of each emission ring is in contact with said dielectric fluid.

7. The omnidirectional antenna as claimed in claim 1, wherein the antenna is housed in a leaktight enclosure filled with said dielectric fluid.

8. The omnidirectional antenna as claimed in claim 7, wherein the enclosure is over-pressurized.

9. The omnidirectional antenna as claimed in claim 7, wherein the enclosure is placed in hydrostatic equilibrium with the exterior medium.

10. The omnidirectional antenna as claimed in claim 1, wherein the rings are fed group-wise in parallel.

11. The omnidirectional antenna as claimed in claim 1, wherein a group of rings comprising more than two rings and the inter-ring spacing between two rings of said group varies within the group.

12. The omnidirectional antenna as claimed in claim 1, wherein the inter-group spacing between two groups of rings of the antenna varies for the assembly of groups of rings of the antenna.

13. The omnidirectional antenna as claimed in claim 1, wherein in the radial mode for a ring is obtained by alternate extension/compression of the material

constituting the ring, and the cavity mode for a ring is obtained by causing the internal fluid included in the internal cavity to resonate.

14. The omnidirectional antenna as claimed in claim 13, wherein the cavity mode depends on the height of the ring.