Claims

1. An omnidirectional antenna ~~(100)~~ intended to equip a sonar, the antenna being centered around a longitudinal axis ~~(10) and~~ , the antenna comprising: an assembly of emission rings ~~(20)~~ stacked along said longitudinal axis, ~~each emission ring (20) being formed around said longitudinal axis, characterized in that the~~ said emission rings ~~(20)~~ 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 ~~(200)~~, the ~~antenna (100) comprising at least two groups of rings (200) and each~~ groups of rings comprising at least two groups of rings, each group of rings, of the groups of rings, comprising at least two rings ~~(20)~~, and an inter-ring spacing between the rings of one and the same group of rings are a function of ~~in that the inter-ring spacings between the rings of one and the same group are a function of~~ the cavity frequency of the group of rings ~~(200)~~ while ~~the~~ an inter-group spacing~~s~~ between two successive groups of rings are a function of ~~the~~ a frequency of operational use of the emission rings ~~(20)~~, 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 ~~(100)~~ as claimed in claim 1, ~~characterized in that~~ wherein the rings ~~(20)~~ are made of piezoelectric material.

3. The omnidirectional antenna ~~(100)~~ as claimed in ~~one of the preceding claims~~claim 1, ~~characterized in that~~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 ~~(20)~~.

~~4. The omnidirectional antenna (100) as claimed in one of the preceding claims, characterized in that the inter-ring spacing between the rings of one and the same group is furthermore chosen as a function of the radial frequency of the group of rings.~~

~~5~~4. The omnidirectional antenna ~~(100)~~ as claimed in claim ~~4~~1, ~~characterized in that~~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 ~~below~~ with respect to the radial frequency of ~~said ring~~the rings of the group of rings.

~~6~~5. The omnidirectional antenna ~~(100)~~ as claimed in ~~one of claims 4 and 5~~claim 1, ~~characterized in that~~wherein the cavity frequency of each ring is coupled with the radial frequency of said ring.

~~7. The omnidirectional antenna (100) as claimed in one of the preceding claims, characterized in that the emission rings (20) are immersed directly in a dielectric fluid.~~

~~8~~6. The omnidirectional antenna ~~(100)~~ as claimed in claim ~~7~~1, ~~characterized in that~~wherein the internal cavity of each emission ring ~~(20)~~ is in contact with said dielectric fluid.

~~9~~7. The omnidirectional antenna ~~(100)~~ as claimed in ~~one of claims 7 and 8~~claim 1, ~~characterized in that~~ wherein the antenna ~~(100)~~ is housed in a leaktight enclosure ~~(208)~~ filled with said dielectric fluid.

~~10~~8. The omnidirectional antenna ~~(100)~~ as claimed in claim ~~9~~7, ~~characterized in that~~ wherein the enclosure ~~(208)~~ is over-pressurized.

~~11~~9. The omnidirectional antenna ~~(100)~~ as claimed in ~~one of claims 9 and 10~~claim 7, ~~characterized in that~~ wherein the enclosure ~~(208)~~ is placed in hydrostatic equilibrium with the exterior medium.

~~12~~10. The omnidirectional antenna ~~(100)~~ as claimed in ~~one of the preceding claims~~claim 1, ~~characterized in that~~wherein the rings ~~(20)~~ are fed group-wise in parallel.

~~13~~11. The omnidirectional antenna ~~(100)~~ as claimed in ~~one of the preceding claims~~claim 1, ~~characterized in that~~wherein a group of rings comprising more than two rings and the inter-ring spacing between two rings ~~(20)~~ of said group varies within ~~one and~~ the ~~same~~ group.

~~14~~12. The omnidirectional antenna ~~(100)~~ as claimed in ~~one of the preceding claims~~claim 1, ~~characterized in that~~wherein the inter-group spacing between two groups of rings of the antenna varies for the assembly of groups of rings of the antenna ~~(200)~~.

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.