CLAIMS

1. An omnidirectional antenna intended to be equipped by a dipping sonar, the antenna comprising multiple elementary transmission rings that are formed around a longitudinal axis of the antenna and multiple hydrophones that are distributed around the longitudinal axis, the antenna being intended to be dipped in water, the hydrophones being separate from the elementary transmission rings, the hydrophones and the elementary transmission rings being fixed to one another in the antenna, wherein the elementary transmission rings and the hydrophones are interlinked along one and the same height measured along the longitudinal axis, wherein the elementary transmission rings and the hydrophones operate at a working frequency of less than 8 kHz, wherein a first minimum cylindrical volume around the longitudinal axis occupied by the elementary transmission rings has a diameter D1, a second minimum cylindrical volume around the longitudinal axis occupied by the hydrophones has a diameter D2 and the difference in absolute value between the two diameters D1 and D2 remains less than 30%, of the smallest of the two diameters D1 and D2, wherein the diameter ratio of the two volumes is constant regardless of whether the antenna is in operation or in a storage position and wherein the projections from the phase centers of the hydrophones in a horizontal plane (P) that is perpendicular to the longitudinal axis, or in a vertical plane (V) containing the longitudinal axis, are spaced apart by a spacing of less than λ/3, λ being the wavelength at the working frequency, the hydrophones being distributed in rings formed around the longitudinal axis in the horizontal plane (P), the spacing (p2), referred to as the horizontal spacing, between two hydrophones is the length of the chord between two neighboring hydrophones over the diameter in question.

2. The antenna as claimed in claim 1, wherein the hydrophones are arranged on bars that are fixed to the transmission rings.

3. The antenna as claimed in claim 1, wherein the hydrophones are distributed in rings that are formed around the longitudinal axis.

4. The antenna as claimed in claim 3, wherein the elementary transmission rings and the hydrophone rings are arranged alternately along the height.

5. The antenna as claimed in claim 1, wherein the hydrophones are superposed over the elementary transmission rings.

6. The antenna as claimed in claim 3, wherein the elementary transmission rings and the hydrophone rings form a tube that extends along the longitudinal axis between two ends, wherein the antenna comprises two structures that close the tube, each at one of the ends of the tube.

7. The antenna as claimed in claim 1, wherein the inner walls of the elementary transmission rings are in contact with a fluid in the liquid state.

8. The antenna as claimed in claim 7, comprising openings that allow the water into which the antenna is dipped to flow along inner walls of the elementary transmission rings.

9. The antenna as claimed in claim 8, wherein the openings are arranged between the transmission rings.

10. A dipping sonar comprising a cable and an antenna as claimed in claim 1, the antenna being suspended from the cable.

11. The dipping sonar as claimed in claim 10, further comprising a winch that allows the cable to be wound in and wound out.

12. The dipping sonar comprising a computer and an antenna as claimed in

claim 1, the computer being configured to carry out sonar beamforming, beamforming parameters being calculated on the basis of the covariance of a spatially correlated noise according to an adaptive processing formalism that is robust with respect to antenna calibration errors.