Patent Application

A method for acoustic antenna

Claims

1. A method for generating large-scale acoustic vibration in air or liquid medium such as oil or water or gels wherein the first acoustic transducer generates a longitudinal motion and at the end of this transducer a metallic wire, tube or rod of various designs, which is fixed perpendicular to the direction of movement of the first transducer, generates a transverse or bending movement in the direction of longitudinal movement of the first transducer and propagates acoustic vibration radially into the surrounding medium, with a predominant propagation direction in the longitudinal movement of the first transducer, characterized in that the first acoustic transducer is firmly bound with a second acoustic transducer (e.g. a wire) and the simple longitudinal movement is transferred into a transverse movement in the second acoustic transducer (Figure 1) or (according to Figure 2) longitudinal and transverse movement of the transducer (2) are simultaneously transferred into the transducer (1), (Figure 2), so that the transducer (1) produces an acoustic vibration in the surrounding medium throughout its complete length and throughout a large volume or area of the medium.

2. A method according to claim 1, characterized in that the second transducer (1) is firmly bound by a fixed physical contact at 90 degrees to the first transducer (2) and the longitudinal motion of this first transducer is transferred into transverse motion within the second transducer, and an overall new transducer, as a combination of transducers (2) and transducers (1), is acting as the vibrational source, specifically along the entire length of the transducer (1) which is considered to be the main source of vibration for the surrounding medium (Figure 1), or the transducer (1), outlined in Figure 2, absorbs all modes of vibration from the transducer (2) both longitudinally and transversely (Figure 2) and the linear transducer (1) radiates all of these modes of vibration into the environment.

3. Method according to one of the preceding claims 1 or 2, characterized in that the second transducer (1) of a line-formed wire, tube or rod with the entire length (L), preferably cylindrical with a diameter of a few millimeters to a few centimeters, vibrates transversely and with negligible absorption and further vibrates transversely, and together with transducer (2) to form a new line-shaped vibration source.

4. A method according to claim 3, characterized in that each point on the line-shaped wire, tube or rod acts as a new point source of the vibration radiating acoustic energy radially into the surrounding medium such that along the wire, tube or rod there forms a cylindrical acoustic zone of activation with a cross-section S. (Figure 1) or R. (Figure 2).

5. A method according to claim 4, characterized in that a medium is vibrated within the acoustic zone, which is propagated by the action of the acoustic line-shaped vibration source, and vibrates at a similar vibration frequency, and the radial range of the acoustic zone depends on the vibration intensity of the line-shaped vibration source, and the absorption of the acoustic energy along the radial direction limits the size of the real and overall active zone.

6. A method according to claim 5, characterized in that the surrounding medium (such as air, gas, water or any liquid) can be applied by the linear acoustic transducers with homogeneous distributed acoustic energy and well-defined oscillation frequency in a given space or volume.

7. A method according to claim 6, characterized in that the shape of the acoustic zone is given by the deformation (bending) of the line-shaped vibration source, the effective acoustic zone can be produced as one-dimensional (6), two-dimensional (7) or three-dimensional (8) forms (Figure 3).

8. A method according to claim 6, characterized in that the shape of the acoustic zone is given through a combination of 2 or more straight line-shaped vibrational sources producing two-dimensional (9) or three-dimensional (10) forms (Figure 4).