CONDENSER MICROPHONE WITH IMPROVED ACOUSTICAL CIRCUIT

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DIGITAL
CONDENSER MICROPHONE WITH IMPROVED ACOUSTICAL CIRCUIT

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4 Claims

ABSTRACT OF THE DISCLOSURE

In a condenser microphone each radial aperture in a casing of the microphone, out of a plurality of such apertures, communicates with a radial groove in an insulating plate within the microphone casing, with each groove of a plurality of grooves leading to an annular space, and axial perforations in the insulating plate and in an electrode fixed within the casing lead from said annular space toward a diaphragm which spacedly faces said fixed electrode.

The present invention is concerned with a condenser microphone the diaphragm of which is fastened to the front of a microphone casing, and which is provided with a fixed electrode located behind the diaphragm. The fixed electrode has a plurality of openings which communicate acoustically with radial apertures in the microphone casing. Condenser microphones of this type, have been known. The radial openings of these known condenser microphones lead into a ring-formed space inside the microphone, and axial grooves communicate on the one hand with said space and on the other hand with axial openings in a disk. The latter openings open into another ring-formed chamber which communicates with axial openings in the fixed electrode.

The acoustic circuit between the rear input on the microphone and the diaphragm of the known system is very complicated, especially because the ring-formed chamber between the inside disk and the fixed electrode forms a parasitic space which displaces the phase in an undesirable manner and results in frequency-dependent direction-characteristics of the microphone. Another disadvantage of the known system is its mechanical complexity, which prevents the use of a fixed electrode made of ceramic materials, as for instance of Electret.

The above mentioned drawbacks are overcome according to this invention by an arrangement of a condenser microphone, hereinafter described with reference to the accompanying drawing. The problem is solved in such a manner that each radial openings or aperture in the casing of the microphone, out of a plurality of such apertures, communicates directly with a radial groove in an insulating plate within the microphone casing, each groove leading to a ring-formed space. The latter, in turn, communicates with axial openings as perforations in the insulating plate. Each of these axial openings communicates directly with an axial opening or perforation in the fixed electrode. Such an arrangement removes all the parasitic cavities which otherwise impair the properties of a microphone. The novel construction of the present microphone is very simple and permits the use of a fixed electrode made of ceramic material with permanent charge.

The drawing illustrates an embodiment of the condenser microphone according to this invention, shown in a schematic illustration to make clear the essence of the invention. Any details not absolutely necessary for the understanding of the matter are omitted.

A diaphragm 1 of the condenser microphone shown is fastened in a known manner to the front side of a microphone casing 2. Behind the diaphragm 1 there is a fixed electrode 3 of the microphone. In the microphone casing 2 there are several radial apertures 4 arranged so as to be in acoustic connection with axial perforations 5 and 8 in an insulating plate 9 and in the fixed electrode 3, respectively.

According to this invention, each of the radial apertures 4 communicates with a radial groove 6, the latter leading to a ring-shaped space 7. The latter communicates with axial perforations 8 provided in the insulating plate 9. Further each of the axial perforations 8 communicates directly with an axial perforation 5 in the fixed electrode 3.

The microphone as a whole is kept together by a rear wall 10 and a screw 11.

What we claim is:

1. A condenser microphone comprising
(1) a casing having an open end and an axis and being provided with radial apertures,
(2) a diaphragm mounted on said casing at said open end,
(3) an electrode fixed within said casing, provided with axially extending perforations,
(4) an insulating plate fixed within said casing, provided with axially extending perforations and radially extending grooves, and
(5) a wall of said casing, provided so as to define together with said insulating plate a chamber, said first and second named perforations communicating with each other and extending from said chamber toward said diaphragm, each of said radial apertures communicating with one of said radially extending grooves, said grooves opening into said said chamber.

2. The microphone according to claim 1, wherein said insulating plate has a rear face, and said casing wall has a front face, said rear and front faces being in actual contact except for the area of said chamber.

3. In the microphone according to claim 2, said chamber being ring-shaped and forming a recess in said front face, said radial grooves extending in inward directions to points short of the center of said insulating plate and being open toward said chamber.

4. In the microphone according to claim 1, said electrode being arranged so as to define a space between said electrode and said diaphragm, said second named perforations bypassing said grooves, said first and second named perforations being aligned and connecting said space and said chamber.

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