

METHOD AND APPARATUS FOR SIMULATING A SOUND IN VIRTUAL SPACE TO
HAVE A LISTENER ENJOY ARTIFICIAL EXPERIENCE OF THE SOUND

ABSTRACT OF THE DISCLOSURE

Sound simulation of the present invention enables a
5 listener in a real space to enjoy a sound of an arbitrarily set
virtual space as if he were in the virtual space. In the
simulation, a transient signal generated in a sound source located
in an arbitrary position in the virtual space is propagated in a
wave motion mode in the virtual space, so that a transient
10 response signal affecting a predetermined observation point is
determined as follows.

In the simulation: the transient signal is represented by
a plurality of sound ray vectors radiating in all directions from
the sound source in the virtual space; a potential is determined
15 with respect to each of the plurality of sound ray vectors each
time each of the sound ray vectors is reflected from a portion of
boundaries and further advances, the potential reaching the
observation point from the portion of the boundaries defining the
virtual space; and, the transient response signal is determined by
20 summing up the potential on a delay time base. Further, in the
simulation: the observation point in the virtual space is
superimposed over a listening point in the real space; a potential
is determined, the potential affecting the observation point after
the elapse of a delay time corresponding to a transient signal



which is generated at a sound source in said virtual space and propagated therein; the potential looking toward said observation point is divided into a plurality of pieces allocated to the individual loud speakers disposed in the real space; and, a
5 transient response signal for each of the loud speakers is determined by adding the pieces of the potential so as to correspond to the delay time.

(See Fig. 5)

This Sheet Has Been Replaced

