

# PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

### Improvements in and relating to Loudspeaker Control Systems

I, CHOO-NG ANG OH, of 13 Siang Kwang Avenue, Sennett Estate, Singapore 13, a British subject, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to loudspeaker control systems.

Present day electro-acoustic methods of reproduction of sound commonly fail to produce results close enough to the original in that they produce sound simulating magnified or amplified sound as heard through a telephone receiver. Boosting of the upper and lower regions of the sound band does not appear to improve the result very much and whilst so-called stereophonic sound reproduction gives the effect of objects in motion as seen on the cinema screen, there is not very much fidelity in the different sounds produced.

The present invention accordingly has for its object to reproduce sounds approaching more closely to the original in that the clarity and range may be such that the impression of the actual presence of the source of the original sound, for example, a singer or an orchestra, is produced. This result is obtainable without special records or recordings and only good standard equipment is required.

In a loudspeaker control system embodying the present invention the output from an electrical sound amplifier is applied by way of a low resistance potentiometer to two loudspeakers one being capable of producing sound mainly in the treble range and the other being capable of producing sound mainly in the bass range, the arrangement being such that as the position of the movable member of the potentiometer is changed the proportional output supplied to one speaker varies inversely as that supplied to the other speaker, with the output to the bass speaker passing through a low efficiency low frequency choke

and that to the treble speaker through a fixed condenser.

Preferably the treble speaker is disposed so as directly to face a listener or listeners whilst the bass speaker is disposed in a position at right angles thereto.

One convenient mode of carrying the present invention into effect is illustrated in the accompanying diagrammatic drawings in which:—

Figure 1 is a circuit diagram and

Figure 2 shows diagrammatically the disposition of the loudspeakers when in use.

As shown in figure 1 a control system according to the present invention comprises a potentiometer *c* having an ohmic value equal to that of the speaker with the higher impedance and this potentiometer is connected at one end *d* with a low efficiency choke *e* consisting of about forty turns of closely coiled enamelled copper wire, the diameter of the coil being about 1". This unit is capable of carrying the maximum output of an amplifier supplying the system.

One lead *f* from an amplifier is connected to the movable arm *g* of the potentiometer whilst the other lead *h* is connected to one terminal *i* of each speaker. The other terminal of the treble speaker *a* is connected to the other end of the potentiometer through its own feed condenser, whilst the other terminal *j* of the bass speaker *b* is connected to the free end *k* of the choke coil *e*. The connections to one speaker may be reversed after trial for best results. The actual travel of movable arm *g* of the potentiometer will be small having regard to the optimum load of the amplifier.

As shown in figure 2 the low frequency or bass speaker *b* is placed about two feet above the floor to one side of the room or hall *m* for occupation by an audience *n* and a short distance in front of the audience. Its opening is at about right angles to the audience. The high frequency or treble speaker *a* is placed

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at a higher level facing the audience at a distance a little farther away than the bass speaker. It is also tilted towards the floor at about an angle of  $45^\circ$  being conveniently mounted. It is on a microphone stand. There should be no obstruction between the speakers. The distance between the speakers may be varied directly as the volume of sound required, the minimum distance being about two feet.

In operation the tone and volume controls of the amplifier and the movable arm of the potentiometer are all adjusted until a correct tonal balance is reached.

WHAT I CLAIM IS:—

1. A loudspeaker control system in which the output from an electrical sound amplifier is applied by way of a low resistance potentiometer to two loudspeakers one being capable of producing sound mainly in the treble range and the other being capable of producing sound mainly in the bass range, the arrangement being such that as the position of the movable member of the potentiometer is changed the proportional output supplied to one speaker varies inversely as that supplied to the other speaker, with the output to the bass speaker passing through a low efficiency low frequency choke and that to the treble speaker through a fixed condenser.

2. A loudspeaker control system substantially as hereinbefore described with reference to the accompanying diagrammatic drawings.

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In operation the tone and volume controls of the amplifier and the movable arm of the potentiometer are all adjusted until a correct tonal balance is reached.

15 WHAT I CLAIM IS:—

1. A loudspeaker control system in which the output from an electrical sound amplifier is applied by way of a low resistance potentio-

meter to two loudspeakers one being capable of producing sound mainly in the treble range and the other being capable of producing sound mainly in the bass range, the arrangement being such that as the position of the movable member of the potentiometer is changed the proportional output supplied to one speaker varies inversely as that supplied to the other speaker, with the output to the bass speaker passing through a low efficiency low frequency choke and that to the treble speaker through a fixed condenser.

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