

CLAIMS

1. A multi-transducer earpiece for an audio reproduction apparatus, the earpiece including:
- 5 a sound delivery member with an acoustic delivery channel, a first end of the sound delivery member being for placement of a ear bud, the ear bud being locatable at an entrance of a ear canal of a user;
- a sound damper for mounting the sound delivery member, the sound damper having a perpendicular flange for partitioning a cross sectional area of
- 10 the acoustic delivery channel when the sound delivery member is mounted onto the sound damper;
- an enclosure encasing the sound damper;
- a high frequency transducer located within the enclosure, with a first output of the high frequency transducer being co-axial with a first sound
- 15 delivery tube located in the sound damper; and
- a mid/low frequency transducer located within the enclosure, with a second output of the mid/low frequency transducer being co-axial with a second sound delivery tube located in the sound damper;
- wherein the perpendicular flange partitions the cross sectional area of
- 20 the acoustic delivery channel in a manner where mixing of signals from both the high frequency transducer and the mid/low frequency transducer is carried out in the ear canal of a user during reproduction of audio signals.
2. The multi-transducer earpiece of claim 1, wherein the acoustic delivery
- 25 channel includes slots for fitment of the perpendicular flange.
3. The multi-transducer earpiece of claim 1, wherein a cross-sectional area of an ear bud end of the acoustic delivery channel is at least equal to a cross-sectional area of a sound damper end of the acoustic delivery channel
- 30 such that acoustic pressure is consistent in the acoustic delivery channel.
4. The multi-transducer earpiece of claim 1, wherein the perpendicular flange is an integrated part of the sound damper.

5. The multi-transducer earpiece of claim 1, wherein the perpendicular flange has a rectangular cross sectional profile.
- 5 6. The multi-transducer earpiece of claim 1, wherein the perpendicular flange partitions the cross sectional area of the acoustic delivery channel into extensions of the first sound delivery tube and the second sound delivery tube.
- 10 7. The multi-transducer earpiece of claim 6, wherein the extensions of the first sound delivery tube and the second sound delivery tube are both more durable and take up less space compared to discrete sound delivery tubes.
- 15 8. The multi-transducer earpiece of claim 1, wherein both the high frequency transducer and the mid/low frequency transducer receive signals from a source of audio signals subsequent to passing through an electrical crossover circuit incorporated within the multi-transducer earpiece.
- 20 9. The multi-transducer earpiece of claim 1, wherein both the first sound delivery tube and the second sound delivery tube enable transmission of signals from the high frequency transducer and the mid/low frequency transducer respectively to the acoustic delivery channel.
- 25 10. The multi-transducer earpiece of claim 1, wherein the cross sectional area of the acoustic delivery channel is either circular or elliptical.
11. A method for optimizing performance of a multi-transducer earpiece, the method including:
- positioning a high frequency transducer in an enclosure such that an output of the high frequency transducer is co-axial with a first sound delivery tube located in a sound damper;
- 30 positioning a mid/low frequency transducer in the enclosure such that an output of the mid/low frequency transducer is co-axial with a second sound delivery tube located in the sound damper;

mounting a sound delivery member onto the sound damper, the sound damper having a perpendicular flange for partitioning a cross sectional area of an acoustic delivery channel of the sound delivery member;

placing a ear bud onto a first end of the sound delivery member; and

5 locating the ear bud at an entrance of a ear canal of a user;

wherein the perpendicular flange partitions the cross sectional area of the acoustic delivery channel in a manner where mixing of signals from both the high frequency transducer and the mid/low frequency transducer is carried out in the ear canal of a user during reproduction of audio signals.

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12. The method of claim 11, wherein the enclosure encases the sound damper.

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13. The method of claim 11, wherein the acoustic delivery channel includes slots for fitment of the perpendicular flange.

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14. The method of claim 11, wherein a cross-sectional area of an ear bud end of the acoustic delivery channel is at least equal to a cross-sectional area of a sound damper end of the acoustic delivery channel such that acoustic pressure is consistent in the acoustic delivery channel.

15. The method of claim 11, wherein the perpendicular flange has a rectangular cross sectional profile.

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16. The method of claim 11, wherein the perpendicular flange partitions the cross sectional area of the acoustic delivery channel into extensions of the first sound delivery tube and the second sound delivery tube.

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17. The method of claim 16, wherein the extensions of the first sound delivery tube and the second sound delivery tube are both more durable and take up less space compared to discrete sound delivery tubes.

18. The method of claim 11, wherein both the first sound delivery tube and the second sound delivery tube enable transmission of signals from the high frequency transducer and the mid/low frequency transducer respectively to the acoustic delivery channel.

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19. The method of claim 11, wherein the cross sectional area of the acoustic delivery channel is either circular or elliptical.

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1. A multi-transducer earpiece for an audio reproduction apparatus, the earpiece including:

a sound delivery member with an acoustic delivery channel having a cross section area, a first end of the sound delivery member being for placement of an ear bud, the ear bud being locatable at an entrance of an ear canal of a user;

a sound damper for mounting the sound delivery member;

a first single sound delivery tube and a second single sound delivery tube located in the sound damper,

a perpendicular flange which is integral to the sound damper, the flange for partitioning the cross sectional area of the acoustic delivery channel into an extension of the first single sound delivery tube and an extension of the second single sound delivery tube when the sound delivery member is mounted onto the sound damper, the extension of the first single sound delivery tube being separated from the extension of the second single sound delivery tube by only the flange, and the breadth of the perpendicular flange is at least as lengthy as the diameter of each of the first and second sound delivery tube;

a high frequency transducer having a first output positionable to be co-axial with the first single sound delivery tube; and

a mid or low frequency transducer having a second output positionable to be co-axial with the second single sound delivery tube;

wherein mixing of signals from the first and second outputs is carried out in the ear canal of a user during reproduction of audio signals.

2. The multi-transducer earpiece of claim 1, wherein the acoustic delivery channel includes slots for fitment of the perpendicular flange.

3. The multi-transducer earpiece of claim 1, wherein a cross-sectional area of an ear bud end of the acoustic delivery channel is at least equal to a cross-sectional area of a sound damper end of the acoustic delivery channel such that acoustic pressure is consistent in the acoustic delivery channel.

4. The multi-transducer earpiece of claim 1, wherein the perpendicular flange has a rectangular cross sectional profile.

5. The multi-transducer earpiece of claim 1, wherein both the high frequency transducer and the mid or low frequency transducer receive signals from a source of audio signals subsequent to passing through an electrical crossover circuit incorporated within the multi-transducer earpiece.

6. The multi-transducer earpiece of claim 1, wherein both the first sound delivery tube and the second sound delivery tube enable transmission of signals from the high frequency transducer and the mid or low frequency transducer respectively to the acoustic delivery channel.

7. The multi-transducer earpiece of claim 1, wherein the cross sectional area of the acoustic delivery channel is either circular or elliptical.