Claims

1. A sound-suppressing duct suitable for use in a loudspeaker housing or incorporated within an acoustic device for use with a movable loudspeaker element, the sound-suppressing duct incorporating at least one vortex chamber to absorb sound waves propagating through the duct and so suppress sound waves.

2. A sound-suppressing duct as claimed in claim 1 incorporating at least two vortex chambers in series.

3. A sound-suppressing duct as claimed in claim 2 wherein the vortex chambers that are in series are arranged such that successive vortices are in opposite directions.

4. A sound-suppressing module which defines a multiplicity of sound-suppressing ducts as claimed in claim 1 arranged in parallel.

5. An acoustic device for use with a movable loudspeaker element, the acoustic device defining an enclosure with an aperture to locate the movable loudspeaker element, and with a port communicating with the outside of the enclosure, wherein the acoustic device includes at least one sound-suppressing duct as claimed in claim 1 to suppress sound waves from the port.

6. An acoustic device as claimed in claim 5 wherein the or each sound-suppressing duct incorporates at least two vortex chambers in series.

7. An acoustic device as claimed in claim 6 wherein the vortex chambers that are in series are arranged such that successive vortices are in opposite directions.

8. An acoustic device as claimed in claim 5 comprising a plurality of sound-suppressing ducts arranged in parallel for any air flow.

9. An acoustic device as claimed in any one of claims 5 to 8 which is of laminated construction.

10. An acoustic device as claimed in claim 9 comprising a plurality of layers held together under compressive force.

11. An acoustic device as claimed in any one of the preceding claims which is a housing for a movable loudspeaker element.

12. An acoustic device as claimed in any one of claims 5 to 10 which is a frame for an acoustic driver.

13. A driver comprising an acoustic device as claimed in claim 12 in combination with a movable loudspeaker element.

14. A loudspeaker comprising a housing as claimed in claim 11 in combination with a movable loudspeaker element.

15. A loudspeaker as claimed in claim 14 which incorporates a driver as claimed in claim 13.

AMENDED CLAIMS
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Claims

1. A sound-suppressing duct suitable for use in a loudspeaker housing or incorporated within an acoustic device for use with a movable loudspeaker element, the sound-suppressing duct incorporating at least one vortex chamber, the vortex chamber being part of the duct and being arranged such that any airflow in the duct will create a vortex in the vortex chamber to absorb sound waves propagating through the duct and so suppress sound waves.

2. A sound-suppressing duct as claimed in claim 1 incorporating at least two vortex chambers in series.

3. A sound-suppressing duct as claimed in claim 2 wherein the vortex chambers that are in series are arranged such that successive vortices are in opposite directions.

4. A sound-suppressing module which defines a multiplicity of sound-suppressing ducts as claimed in claim 1 arranged in parallel.

5. An acoustic device for use with a movable loudspeaker element, the acoustic device defining an enclosure with an aperture to locate the movable loudspeaker element, and with a port communicating with the outside of the enclosure, wherein the acoustic device includes at least one sound-suppressing duct as claimed in claim 1 to suppress sound waves from the port.

6. An acoustic device as claimed in claim 5 wherein the or each sound-suppressing duct incorporates at least two vortex chambers in series.

7. An acoustic device as claimed in claim 6 wherein the vortex chambers that are in series are arranged such that successive vortices are in opposite directions.

8. An acoustic device as claimed in claim 5 comprising a plurality of sound-suppressing ducts arranged in parallel for any air flow.

9. An acoustic device as claimed in any one of claims 5 to 8 which is of laminated construction.

10. An acoustic device as claimed in claim 9 comprising a plurality of layers held together under compressive force.

11. An acoustic device as claimed in any one of the preceding claims which is a housing for a movable loudspeaker element.

12. An acoustic device as claimed in any one of claims 5 to 10 which is a frame for an acoustic driver.

13. A driver comprising an acoustic device as claimed in claim 12 in combination with a movable loudspeaker element.

14. A loudspeaker comprising a housing as claimed in claim 11 in combination with a movable loudspeaker element.

15. A loudspeaker as claimed in claim 14 which incorporates a driver as claimed in claim 13.

Claims

1. A sound-suppressing duct suitable for use in a loudspeaker housing or incorporated within an acoustic device for use with a movable loudspeaker element, the sound-suppressing duct incorporating at least one vortex chamber, the vortex chamber being a generally circular cavity with which a first channel and a second channel communicate at its periphery; the vortex chamber, the first channel and the second channel being part of the duct and being arranged such that any airflow in the duct would create a vortex in the vortex chamber that would inhibit through flow of air; thereby to absorb sound waves propagating through the duct and so suppress sound waves.

2. A sound-suppressing duct as claimed in claim 1 incorporating at least two vortex chambers in series.

3. A sound-suppressing duct as claimed in claim 2 wherein the vortex chambers that are in series are arranged such that successive vortices are in opposite directions.

4. A sound-suppressing module which defines a multiplicity of sound-suppressing ducts as claimed in claim 1 arranged in parallel.

5. An acoustic device for use with a movable loudspeaker element, the acoustic device defining an enclosure with an aperture to locate the movable loudspeaker element, and with a port communicating with the outside of the enclosure, wherein the acoustic device includes at least one sound-suppressing duct as claimed in claim 1 to suppress sound waves from the port.

6. An acoustic device as claimed in claim 5 wherein the or each sound-suppressing duct incorporates at least two vortex chambers in series.

7. An acoustic device as claimed in claim 6 wherein the vortex chambers that are in series are arranged such that successive vortices are in opposite directions.

8. An acoustic device as claimed in claim 5 comprising a plurality of sound-suppressing ducts arranged in parallel for any air flow.

9. An acoustic device as claimed in any one of claims 5 to 8 which is of laminated construction.

10. An acoustic device as claimed in claim 9 comprising a plurality of layers held together under compressive force.

11. An acoustic device as claimed in any one of the preceding claims which is a housing for a movable loudspeaker element.

12. An acoustic device as claimed in any one of claims 5 to 10 which is a frame for an acoustic driver.

13. A driver comprising an acoustic device as claimed in claim 12 in combination with a movable loudspeaker element.

14. A loudspeaker comprising a housing as claimed in claim 11 in combination with a movable loudspeaker element.

15. A loudspeaker as claimed in claim 14 which incorporates a driver as claimed in claim 13.