

CLAIMS

1. A head wearable air purifier comprising:
 - 5 a first speaker assembly arranged to be worn over a first ear of a user and a second speaker assembly arranged to be worn over a second ear of the user, wherein the first speaker assembly comprises a filter assembly, an impeller for creating an airflow through the filter assembly, a motor arranged to drive the impeller, and an air outlet downstream from the filter assembly for emitting the filtered airflow from the speaker assembly; and
 - 10 a nozzle arranged to receive the filtered airflow from the first speaker assembly, the nozzle comprising an air outlet arranged to emit the received filtered airflow from the head wearable air purifier;
wherein the filter assembly is provided upstream of the impeller and comprises one or more generally frusto-conical filter elements.
- 15 2. The head wearable air purifier of claim 1, wherein both the impeller and the motor are disposed within an impeller casing that is generally frusto-conical in shape, and wherein the impeller casing is at least partially disposed within a volume defined by a back of the one or more generally frusto-conical filter elements.
- 20 3. The head wearable air purifier of claim 2, wherein the impeller casing is at least partially disposed within a central opening of the one or more filter elements.
4. The head wearable air purifier of any one of claims 1 to 3, wherein the filter assembly
25 comprises any of a particulate filter element and a chemical filter element.
5. The head wearable air purifier of claim 4, wherein the particulate filter element comprises a pleated particulate filter media that is arranged to be frustoconical in shape.
- 30 6. The head wearable air purifier of claim 5, wherein folds of the pleated filter media are at an acute angle relative to a central axis of the particulate filter element and both inner and outer edges of the pleated filter media are parallel to a central axis of the filter.
- 35 7. The head wearable air purifier of claim 6, wherein the entirety of the inner edge of the pleated filter media is disposed within a seal of resilient material, and the entirety of the outer edge of the pleated filter media is disposed within another seal of resilient material..

8. The head wearable air purifier of any one of claims 1 to 7, wherein the filter assembly further comprises a filter seat supporting the one or more filter elements.

5 9. The head wearable air purifier of claim 8, wherein the filter seat is provided with a plurality of apertures that allow air to pass from a front surface of the filter seat to a back surface of the filter seat, the front surface of the filter seat being arranged to support one or more filter elements over the plurality of apertures.

10 10. The head wearable air purifier of claim 9, wherein the filter seat comprises a generally frusto-conical portion and the plurality of apertures are provided in the frusto-conical portion.

11. The head wearable air purifier of any one claims 1 to 10, wherein the first speaker assembly and the second speaker assembly are substantially the same.

15 12. The head wearable air purifier of any one of claims 1 to 11, wherein the second speaker assembly comprises a filter assembly, an impeller for creating an airflow through the filter assembly, a motor arranged to drive the impeller, and an air outlet downstream from the filter assembly for emitting the filtered airflow from the speaker assembly, wherein the filter assembly is provided upstream of the impeller and comprises one or more generally frusto-conical filter
20 elements; and wherein the nozzle is further arranged to receive the filtered airflow from the second speaker assembly and to emit both of the received filtered airflows from the head wearable air purifier.

25 13. The head wearable air purifier of any one claims 1 to 12, wherein the first speaker assembly is mounted on a first end of a headband and the second speaker assembly mounted on an opposite, second end of the headband, the headband being arranged to be worn on the head of a user.

30 14. A head wearable air purifier comprising:
a headgear;
an air purifier assembly supported by the headgear, the air purifier assembly comprising a filter assembly, an impeller for creating an airflow through the filter assembly, a motor arranged to drive the impeller, and a nozzle arranged to receive the airflow from the filter assembly, the nozzle comprising an air outlet arranged to emit the received airflow from the
35 head wearable air purifier;
wherein the filter assembly is provided upstream of the impeller and comprises one or more generally frusto-conical filter elements.

15. The head wearable air purifier of claim 14, wherein the air purifier assembly further comprises a housing having an air inlet and an air outlet, and both the filter assembly and the impeller are disposed within the housing

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16. The head wearable air purifier of claim 15, wherein the air outlet of the housing is arranged to emit the airflow from the housing and is connected to an air inlet of the nozzle.

17. The head wearable air purifier of any one of claims 14 to 16, wherein the air purifier assembly further comprises a speaker driver unit and the air purifier assembly is arranged to be worn over a first ear of a user.

18. A filter assembly comprising:
a particulate filter element, the particulate filter element comprising a pleated particulate filter media that is arranged to be frustoconical in shape with folds of the pleated filter media at an acute angle relative to a central axis of the particulate filter element and both inner and outer edges of the pleated filter media parallel to a central axis of the particulate filter element;

wherein the entirety of the inner edge of the pleated filter media is disposed within a seal of resilient material, and the entirety of the outer edge of the pleated filter media is disposed within another seal of resilient material.

19. The filter assembly of claim 18, and further comprising a chemical filter element that is arranged to be frustoconical in shape.

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