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Amended Claims for the purpose of International Preliminary Examination
2nd amendment (Clean version)

1. A motorized vehicle, comprising a gas purification system configured to purify an exhaust gas of the motorized vehicle, wherein the gas purification system (10) comprises a corona discharge system (300), the corona discharge system (300) comprising:
   a. a conductive strip (310) with longitudinal edges (313,314), wherein one or more of the longitudinal edges (313,314) comprise tooth structures (150), wherein the tooth structures (150) at the one or more longitudinal edges (313,314) have tooth tops (151) with shortest distances (dt) selected from the range of 2-200 mm;
   b. a counter electrode (340) comprising a conductive plate, wherein the counter electrode (340) is grounded; and
   c. a voltage generator (330) configured to apply a DC voltage of at least 10 kV to the conductive strip (310);
   wherein the gas purification system comprises a plurality of said conductive strips, further comprising a gas channel comprising said plurality of conductive strips and said counter electrode, wherein the conductive strips are arranged in a zigzag like structure, and wherein the motorized vehicle is configured to allow an exhaust gas flow through the gas channel for purification of said exhaust gas, wherein the motorized vehicle comprises a street sweeper comprising the gas purification system configured to purify the exhaust gas of a vacuum system of the street sweeper.
2. A method for purifying an exhaust gas of a motorized vehicle, the motorized vehicle comprising a gas purification system configured to purify the exhaust gas of the motorized vehicle, wherein the gas purification system (10) comprises a corona discharge system (300), the corona discharge system (300) comprising:
   a. a conductive strip (310) with longitudinal edges (313,314), wherein one or more of the longitudinal edges (313,314) comprise tooth structures (150), wherein the tooth structures (150) at the one or more longitudinal edges (313,314) have tooth tops (151) with shortest distances (dt) selected from the range of 2-200 mm;

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b. a counter electrode (340) comprising a conductive plate, wherein the counter electrode (340) is grounded; and

c. a voltage generator (330) configured to apply a DC voltage of at least 10 kV to the conductive strip (310);

wherein the gas purification system comprises a plurality of said conductive strips, further comprising a gas channel comprising said plurality of conductive strips and said counter electrode, wherein the conductive strips are arranged in a zigzag like structure, and wherein the motorized vehicle is configured to allow an exhaust gas flow through the gas channel for purification of said exhaust gas, the method further comprising transporting the gas through the gas channel with a flow speed in the range of 2.5-25 m/s.

3. The method according to claim 2, comprising applying a DC voltage of at least 20 kV to the conductive strips (310).

4. The method according to any one of claims 2-3, further comprising applying an electric current of at least 0.2 μA per tooth structure.

5. The method according to any one of claims 2-4, comprising applying a stationary electric field between the conductive strip (310) and the counter electrode (340) in the range of 2-100 kV/m.

6. The method according to claim 5, wherein the motorized vehicle is selected from the group consisting of a moped, a motor, a car, a truck, a coach, a train, a craft, a ship and a boat.

7. The method according to any one of claims 2-6, wherein the motorized vehicle comprises a street sweeper comprising the gas purification system configured to purify the exhaust gas of a vacuum system of the street sweeper.

Claims

1. A gas purification system comprising a corona discharge system, the corona discharge system comprising:
    a. a conductive strip with longitudinal edges, wherein one or more of the longitudinal edges comprise tooth structures, wherein the tooth structures at the one or more longitudinal edges have tooth tops with shortest distances selected from the range of 2-200 mm;
    b. a counter electrode; and
    c. a voltage generator configured to apply a DC voltage of at least 10 kV to the conductive strip.
2. The gas purification system according to claim 1, wherein the tooth structures have tooth structure heights, defined by the difference in height between the tooth tops and valleys between adjacent tooth structures, selected from the range of 0.5-500 mm, wherein the tooth structures have a ratio between the shortest distances and tooth structure height selected from the range of 0.5-1000, wherein the counter electrode is grounded, and wherein the conductive strip is attached to one or more isolators, wherein each isolator has a creeping length, wherein the creeping length is configured to be at least 5 mm creeping length per kV DC voltage; wherein the conductive strip has a thickness in the range of 0.1-10 mm, especially in the range of 0.1-5 mm.
3. The gas purification system according to any one of claims 1-2, wherein the tooth structures of one of the longitudinal edges point in a direction of the counter electrode; wherein the counter electrode comprises a concave part; and wherein the counter electrode is grounded.
4. The gas purification system according to any one of the claims 1-2, wherein the counter electrode is negatively charged.
5. The gas purification system according to any one of claims 1-4, wherein the conductive strip is attached to one or more isolators, wherein each isolator has a creeping length, wherein the creeping length is configured to be at least 5 mm creeping length per kV DC voltage, especially at least 10 mm creeping length per kV DC voltage.

6. The gas purification system according to any of claims 1-5, comprising an elongated gas channel, the elongated gas channel comprising the counter electrode and the conductive strip, wherein the elongated gas channel has a first face, a second face opposite of the first face, and edges, wherein the elongated gas channel further has a rectangular cross-section, a channel height, and a longitudinal axis; wherein the counter electrode within the elongated gas channel has a counter electrode distance to the first face, with $\frac{1}{2}h1 < d3 \leq h1$; wherein the conductive strip within the elongated gas channel has a first distance to the first face and a second distance, measured from the tooth tops of one of the longitudinal edges to the counter electrode, with $\frac{1}{2}h1 < d1 < h1$ and $d1/d2 > 1$; wherein the conductive strip is configured parallel to the edges; wherein the distances from the conductive strip to each of the first face and the edges are larger than the second distance to the counter electrode.
7. The gas purification system according to any one of claims 1-6, wherein the counter electrode is part of a belt of a conveyor belt, wherein the conveyor belt is configured to run the belt through the elongated gas channel.
8. The gas purification system according to any one of the claims 1-7, further comprising a gas return system, configured to recirculate at least part of the gas through the elongated gas channel; wherein the gas transport unit is configured to transport the exhaust gas with a flow speed in the range of 2.5-25 m/s.
9. The gas purification system according to any one claims 1-8, comprising an arrangement of a plate like counter electrode and the conductive strip attached to the plate like counter electrode with one or more isolators in between.
10. A motorized vehicle, comprising a gas purification system according to any one of the preceding claims, configured to purify an exhaust gas of the motorized vehicle.
11. The motorized vehicle according to claim 10, wherein the motorized vehicle is selected from the group consisting of a moped, a motor, a car, a truck, a coach, a train, a craft, a ship, a boat, and a street sweeper comprising the gas purification system configured to purify the exhaust gas of a vacuum system of the street sweeper.
12. The motorized vehicle according to any one of claims 10-11, further comprising a gas transport unit configured to transport the exhaust gas through the a gas channel comprising said conductive strip and said counter electrode, wherein the gas

transport unit is configured to transport the exhaust gas with a flow speed in the range of 2.5-25 m/s.

13. The motorized vehicle according to any one of claims 10-12, comprising a plurality of said conductive strips, further comprising a gas channel comprising said plurality of conductive strips and said counter electrode, wherein the conductive strips are arranged in a zigzag like structure, and wherein the motorized vehicle is configured to allow an exhaust gas flow through the gas channel for purification of said exhaust gas.

14. An accommodation, selected from the group consisting of a shed, a stable, a sty, a fold and a poultry farm, further comprising the gas purification system according to any one of claims 1-9 for purifying the air of the accommodation.

15. A particle catch arrangement for the removal of one or more of fine dust bacteria, viruses, spores, fungi and parasites, especially bacteria, viruses and fungi, from a gas, the particle catch arrangement comprising the gas purification system according to any one of the claims 1-9, wherein at least part of the gas purification system is part of, or integrated with, an object comprising street furniture, for instance a sound barrier, a crash barrier, a tunnel wall, a road sign, a traffic information system, a street lamp or a traffic light.

16. A method for purifying a gas comprising leading said gas through the gas purification system according to any one of claims 1-15 while applying a DC voltage of at least 10 kV to the conductive strip.

17. The method according to claim 16, wherein the gas comprises an exhaust gas of a motorized vehicle; wherein the motorized vehicle is selected from the group consisting of a moped, a motor, a car, a truck, a coach, a train, a craft, a ship, a boat, and a street sweeper.

18. The method according to any one of claims 16-17 for purifying air of an accommodation, selected from the group consisting of a shed, a stable, a sty, a fold and a poultry farm, comprising leading gas of the accommodation through the gas purification system while applying a DC voltage of at least 10 kV to the conductive strip.

19. The method according to any one of claims 16-18, comprising applying a DC voltage of at least 20 kV to the conductive strip; wherein the conductive strip is configured as positive electrode and wherein the counter electrode is earthed; the

method further comprising applying an electric current of at least 0.2 μA per tooth structure and applying a stationary electric field between the conductive strip and the counter electrode in the range of 2-100 kV/m.

20. The method according to any one of claims 16-19, further comprising transporting the gas through a gas channel comprising said conductive strip and said counter electrode with a flow speed in the range of 2.5-25 m/s.