Claims

1. A filter candle (10; 50) for gaseous fluids, in particular for hot gas filtration, comprising
   - one or more filter elements (12; 52) in the shape of hollow cylinders made of a porous material, wherein the filter elements (12; 52) have substantially identical inner and outer diameters and are disposed coaxially in line with each other;
   - a support element (16) comprising a metal tube which is disposed within the one or more filter elements (12; 52), wherein said metal tube (16) has an outer diameter which is smaller than the inner diameter of the filter element(s) (12; 52), and wherein said metal tube (16) has a wall (24) with a plurality of perforations (26); and
   - at least two annular sealing disks (34, 36; 54) having an outer diameter equal to or larger than that of the filter element(s) (12; 52) and an inner diameter smaller than that of the filter element(s) (12; 52), wherein first and second terminal sealing disks (34, 36) are disposed at opposite axial end faces of a single filter element (12) or of a plurality of filter elements (52) disposed in line, and wherein optionally further internal sealing disks (54) are disposed between two adjacent filter elements (52) of a plurality of filter elements (52),

   wherein the one or more filter elements (12; 52), and optionally the internal sealing disks (54), are compressed between the first and second terminal sealing disks (34, 36~~).~~),

   characterized in that each sealing disk (34, 36; 54) comprises an annular metal disk (46), preferably a steel disk, and a gasket (48) provided on one or both sides of the metal disk (46) in contact with a filter element (12; 52), so as to provide a substantially gastight seal between the filter element(s) (12; 52) and the sealing disks (34, 36; 54), and to allow a radial movement of the filter element(s) (12; 52) relative to the sealing disk (34, 36; 54).

2. The filter candle (10) according to claim 1, wherein the filter candle (10) comprises only one filter element (12), preferably having an axial length of about 0.5 to about 3.0 m, more preferably from about 1.0 to about 2.5 m.

3. The filter candle (50) according to claim 1, wherein the filter candle (50) comprises a plurality of filter elements (52) disposed in line, preferably having a total axial length of about 0.5 to about 6.0 m, preferably from about 1.5 to about 5.0 m.

4. The filter candle (50) according to claim 3, wherein the filter candle (50) comprises two to eight filter elements (52), preferably three to five filter elements (52).

5. The filter candle (10; 50) according to any one of claims 1 to 4, wherein the one or more filter elements (12; 52) have an outer diameter of about 30 to about 150 mm, preferably from about 60 to about 70 mm, and an inner diameter of about 15 to about 120 mm, preferably from about 40 to about 50 mm.

6. The filter candle (10; 50) according to any one of claims 1 to 5, wherein the radial distance between the filter element(s) (12; 52) and the metal tube is from about 1 to about 5 mm, preferably from about 3 to about 4 mm.

7. The filter candle (10; 50) according to any one of claims 1 to 6, wherein ~~each sealing disk (34, 36; 54) comprises an annular metal disk (46), preferably a steel disk, and a gasket (48) provided on one or both sides of the metal disk (46) in contact with a filter element (12; 52), so as to provide a substantially gastight seal between the filter element(s) (12; 52) and the sealing disks (34, 36; 54), and to allow a radial movement of the filter element(s) (12; 52) relative to the sealing disk (34, 36; 54).~~

8. ~~The filter candle (10; 50) according to claim 7, wherein~~ the gasket (48) comprises graphite, metal fibers, a metal mesh, a polymeric material or a combination thereof.

~~9~~8. The filter candle (10; 50) according to any one of claims 1 to ~~8~~7, wherein one or more of the sealing disks (34, 36; 54), in particular one of the terminal sealing disks (34, 36) and/or the internal sealing disks (54), comprise a resilient compensating element (56).

~~10~~9. The filter candle (10; 50) according to any one of claims 1 to ~~9~~8, wherein the one or more filter elements (12; 52) are made of a ceramic material, preferably of a material comprising sintered silicon carbide.

~~11~~10. The filter candle (10; 50) according to any one of claims 1 to ~~10~~9, wherein the metal tube (16) is a steel tube, preferably having a wall thickness of about 2 to about 10 mm, in particular of about 3 to about 6 mm.

~~12~~11. The filter candle (10; 50) according to any one of claims 1 to ~~11~~10, wherein the metal tube (16) has an axial length larger than the total axial length of the filter element(s) (12; 52), and wherein the perforations (26) are distributed uniformly over a middle section (18) of the metal tube (16) which extends within the filter element(s) (12; 52).

~~13~~12. The filter candle (10; 50) according to claim ~~12~~11, wherein a first end section (20) of the metal tube (16), which preferably comprises an axial discharge opening (30) for the gaseous fluid, extends outside of the filter element(s) (12; 52) and through the first terminal sealing disk (34), and wherein the first terminal sealing disk (34) is fixed to said first end section (20), preferably by welding or screwing.

~~14~~13. The filter candle (10; 50) according to claim ~~13~~12, wherein a second end section (22) of the metal tube (16), which is preferably closed at its axial end (32), extends outside of the filter element(s) (12; 52) and through the second terminal sealing disk (36), and wherein the second terminal sealing disk (36) is axially movable relative to the metal tube (16).

~~15~~14. The filter candle (10; 50) according to claim ~~14~~13, wherein the one or more filter elements (12; 52) are compressed between the first and second terminal sealing disks (34, 36) by an axial force exerted onto the

second terminal sealing disk (36) through a spring element (38), preferably a high temperature spring, which abuts against the second terminal sealing disk (22) and a flange element (40) fixed to the second end portion (22) of the metal tube.

~~16~~15. The filter candle (10; 50) according to claim ~~15~~14, wherein the compression of the one or more filter elements (12; 52) is such that it allows for a radial movement between a filter element (12; 52) and an adjacent sealing disk (34, 36; 54), until the filter element (12; 52) comes into contact with the metal tube (16).

* * *