textile filter bag and an outer textile, chemically active filter sleeve or filter bag which is slid over the inner bag. The flue gas stream enters the inner particulate textile filter bag. The gas stream passing the particulate textile filter bag in the radial direction contacts the chemically active component of the textile filter sleeve or filter bag where the contaminants such as NOx or NH_3 react on the surface of the catalytic component.

It is an object of the present invention to provide a textile filter system for a pulse jet filtration device which is faster and easier to handle in regeneration cycles.

It is a further object of the present invention to provide a method for regenerating a textile filter, in particular a textile filter sleeve for NOx and/or NH_3 removal wherein the textile filter has a filter carrier of a textile material and a chemically active component on the filter carrier, in particular a catalytic component, for removing substances from a flue gas stream.

It is also an object of the present invention to provide a regeneration apparatus for textile filters, in particular textile filter sleeves for NOx and/or NH_3 removal, each textile filter having a filter carrier of a textile material and a catalytic component on the filter carrier for removing substances from a flue gas stream.

In one aspect of the present invention, the above first object is achieved by a textile filter system ~~of~~ suitable for a pulse jet filtration device, the system comprising a particulate textile filter bag to restrain particles in a gas stream, the filter bag having a radially outer, upstream surface and a radially inner, downstream surface and being provided with a textile carrier bag, the radially inner, downstream surface of the particulate filter bag being provided as a low-friction, preferably a smooth surface. The textile filter system further comprises a textile, chemically active filter sleeve having a filter carrier sleeve of textile material and a chemically active~~, i.e. catalytic~~ component on the filter carrier sleeve comprising catalytic particles to remove ~~substances~~ NO_x and/or NH_3 from the gas stream. The filter sleeve is insertable into the filter bag to be arranged within the filter bag and is removable from the filter bag, and the low-friction surface being implemented by one of: providing a textile carrier bag made of a PTFE textile, wherein the radially inner, downstream surface of the particulate filter bag is defined by the PTFE

textile defining the carrier bag; providing a coating material at the radial inner side of the textile carrier bag; and providing a textile carrier bag with a flattened, calendared radial inner surface. The term "radially inward outer surfaces" is not limited to circular cylindrical or generally cylindrical filter sleeves. Rather, it expresses surfaces which are faced towards the interior and exterior of the filter bag.

Claims

1. A textile filter system of a pulse jet filtration device, the system comprising:

a particulate textile filter bag to restrain particles in a gas stream, the filter bag having a radially outer, upstream surface and a radially inner, downstream surface, and being provided with a textile carrier bag, the radially inner, downstream surface of the filter bag being provided as a low-friction surface, and

a textile, chemically active filter sleeve having a filter carrier sleeve of textile material and a catalytic component on the filter carrier sleeve to remove substances from the gas stream,

the filter sleeve being insertable into the filter bag to be arranged within the filter bag and being removable from the filter bag.

2. The textile filter system of claim 1, wherein the textile carrier bag is of PTFE.

3. The textile filter system of claim 2, wherein the radially inner, downstream surface of the particulate filter bag is defined by the PTFE textile defining the carrier bag.

4. The textile filter system of claim 1 or 2, wherein the upstream surface of the filter bag is defined by a microporous membrane.

5. The textile filter system of any of the preceding claims, wherein the filter bag has an inner dimension, seen in cross-section, which is at least 2% larger than the outer dimension of the filter sleeve.

6. A method for regenerating a textile filter, the textile filter having a filter carrier of a textile material and a catalytic component on the filter carrier for removing substances from a flue gas stream, the regeneration recovering the activity of the catalytic component of the textile filter after use within a filtration device,

the method comprising the steps of

a) removing the textile filter from the filtration device,

b) washing the textile filter with tap water together with a mechanical treatment of the textile filter, and

c) drying the textile filter.

7. The method according to claim 6, wherein the washing step b) is performed according to the following steps:

b1) bringing the textile filter in contact with tap water, and

b2) applying mechanical pressure to the textile filter,

wherein steps b1) and b2) are performed successively and/or simultaneously.

8. The method according to claim 6 or 7, wherein at least one of the washing step b) and the drying step c) comprises the step of:

applying mechanical pressure to the textile filter to squeeze water out of the wet textile filter.

9. The method according to any of claims 7 to 8, wherein the washing step b) comprises the step:

b3) rinsing the textile filter with fresh tap water.

10. The method according to claim 9, wherein rinsing of the textile filter with fresh tap water is performed by spraying the textile filter with fresh tap water.

11. The method according to any of claims 6 to 10, wherein the washing step b) is performed more than once per recovery cycle of the textile filter.

12. The method according to any of claims 6 to 11, wherein the mechanical treatment comprises applying mechanical pressure to the textile filter, the mechanical pressure being applied by at least one nip roller.

13. The method according to any of claims 6 to 12, wherein the tap water is at least one of free of additives and untreated.

14. A textile filter regeneration apparatus, each textile filter having a filter carrier of a textile material and a catalytic component on the filter carrier for removing substances from a flue gas stream, the regeneration in the regeneration apparatus recovering the activity of the textile filter after use within a filtration device, the apparatus comprising:

a tap water bath to wet the textile filters with tap water,

a device to mechanically treat the textile filters, and

a device to dry the textile filters after washing.

15. The regeneration apparatus according to claim 14, further comprising a supply of fresh water to rinse the textile filters with fresh tap water.

16. The regeneration apparatus according to claim 14 or 15, wherein the device to mechanically treat the textile filters and/or the device to dry the textile filters after washing is at least one set of nip rollers between which the textile filters are moved.

17. The regeneration apparatus according to claim 16, wherein at least one set of nip rollers is arranged within the tap water bath.

18. The regeneration apparatus according to any of claims 14 to 16, wherein the device to mechanically treat the textile filters is arranged vertically underneath the device to dry the textile filters and wherein both devices are arranged above the tap water bath.

19. The regeneration apparatus according to any of claims 14 to 18, wherein a tap water sprayer is arranged between the device to mechanically treat the textile filters, and the device to dry the textile filters after washing.

20. The regeneration apparatus according to any of claims 14 to 19, further comprising a device to control the pH value of the water bath.

Claims

1. A textile filter system suitable for a pulse jet filtration device, the system comprising:

a particulate textile filter bag to restrain particles in a gas stream, the filter bag having a radially outer, upstream surface and a radially inner, downstream surface, and being provided with a textile carrier bag, the radially inner, downstream surface of the filter bag being provided as a low-friction surface, and

a textile, chemically active filter sleeve having a filter carrier sleeve of textile material and a chemically active component on the filter carrier sleeve comprising catalytic particles to remove NO_x and/or NH_3 from the gas stream,

the filter sleeve being insertable into the filter bag to be arranged within the filter bag and being removable from the filter bag, and

the low-friction surface being implemented by one of:

providing a textile carrier bag made of a PTFE textile, wherein the radially inner, downstream surface of the particulate filter bag is defined by the PTFE textile defining the carrier bag;

providing a coating material at the radial inner side of the textile carrier bag; and

providing a textile carrier bag with a flattened, calendared radial inner surface.

2. The textile filter system of claim 1, wherein the textile carrier bag is comprised of PTFE.

3. The textile filter system of claim 2, wherein the radially inner, downstream surface of the particulate filter bag is defined by the PTFE textile defining the carrier bag.

4. The textile filter system of claim 1 or 2, wherein the upstream surface of the filter bag is defined by a microporous membrane.

5. The textile filter system of any of the preceding claims, wherein the filter bag has an inner dimension, seen in cross-section, which is at least 2% larger than the outer dimension of the filter sleeve.

6. The textile filter system of any of the preceding claims, wherein a support cage is arranged inwardly of the filter sleeve.