This is why it is known practice to arrange a device to suction particles resulting from braking in the braking system. The suction device is intended to suction the brake particles shortly after their emission. These devices are generally relatively efficient. However, they are not able to make disc brake systems completely non-polluting.

Object of the invention

An object of the invention is to provide a friction assembly for a disc brake system that is even less polluting.

Brief summary

To do this, according to an ~~first~~ aspect, a friction assembly for a disc brake system is provided, comprising:

- a lining made of friction material, comprising a friction face, an attachment face opposite the friction face, and a collection groove that is open on the friction face,
- a sole plate, supporting the lining, comprising a hole in pneumatic communication with the collection groove,
- a negative pressure source configured to create negative pressure in the collection groove and the hole,

characterized in that the friction assembly comprises a gas filtration device, in pneumatic communication with the collection groove and the hole, capable of capturing gases resulting from the friction of the lining and coming from the collection groove, and a particulate filter in pneumatic communication with the collection groove and the hole configured to filter gas coming from the collection groove, wherein the particulate filter and the gas filtration device are in the form of a thin layer of material positioned one on top of the other and on a support layer, the gas filtration device being positioned between the support layer and the particulate filter, wherein the friction assembly further comprises means for condensing gases resulting from friction of the lining which comprise a plate heat exchanger which is adapted to be supplied with a refrigerant fluid, wherein the means

for condensing gases are pneumatically positioned between the collection groove and the particulate filter.

Thus, the gas filtration device makes it possible to filter a gaseous phase produced during friction of the lining on the disc. The gas filtration device makes it possible in effect to capture gases comprised in this gaseous phase.

The inventors have observed that during braking, the temperature at the interface between the friction lining and the disc is often at least equal to 300°C, and that the atmosphere around this zone is oxidizing. Thus, in addition to the solid particles emitted, a gaseous phase is also produced during braking. Part of this gaseous phase remains in gas form and can pollute the environment of the vehicle. Another part of this gaseous phase condenses in the environment of the vehicle, which can foul portions of the vehicle, or

CLAIMS

1. Friction assembly (19A) for a brake system (19), comprising:
   - a lining made of friction material (22A, 22B), comprising a friction face (30A, 30B), an attachment face (32A, 32B) opposite the friction face (30A, 30B), and a collection groove (3A, 3B) that is open on the friction face (30A, 30B),
   - a sole plate (20A, 20B), supporting the lining (22A, 22B), comprising a hole (17A, 17B) in pneumatic communication with the collection groove (3A, 3B),
   - a negative pressure source (66) configured to create negative pressure in the collection groove (3A, 3B) and the hole (17A, 17B),

   characterized in that the friction assembly (19A) comprises a gas filtration device (64), in pneumatic communication with the collection groove (3A, 3B) and the hole (17A, 17B), capable of capturing gases resulting from the friction of the lining (22A, 22B) and coming from the collection groove (3A, 3B), and a particulate filter (62) in pneumatic communication with the collection groove (3A, 3B) and the hole (17A, 17B) configured to filter gas coming from the collection groove (3A, 3B), wherein the particulate filter (62) and the gas filtration device (64) are in the form of a thin layer of material positioned one on top of the other and on a support layer (100), the gas filtration device (64) being positioned between the support layer (100) and the particulate filter (62), wherein the friction assembly (19A) further comprises means for condensing gases resulting from friction of the lining (22A, 22B) which comprise a plate heat exchanger which is adapted to be supplied with a refrigerant fluid, wherein the means for condensing gases are pneumatically positioned between the collection groove (3A, 3B) and the particulate filter (62).

2. Friction assembly (19A) according to the preceding claim, wherein the gas filtration device (64) comprises activated carbon and/or a mass of zeolite and/or a mass of silica and/or a mass of alumina.

3. Friction assembly (19A) according to any one of the preceding claims, wherein the gas filtration device (64) comprises a canister.

4. Friction assembly (19A) according to any one of the preceding claims, wherein the gas filtration device (64) is capable of capturing gases of carbon dioxide and/or methane and/or nitrogen oxide and/or nitrogen dioxide and/or ethane and/or phenol and/or hexanol and/or heptane and/or cyclopentanone and/or an alkene.

~~5. Friction assembly (19A) according to any one of the preceding claims, comprising a particulate filter (62) in pneumatic communication with the collection groove (3A, 3B) and the hole (17A, 17B), configured to filter air coming from the collection groove (3A, 3B).~~

~~6. Friction assembly (19A) according to the preceding claim, wherein the particulate filter (62) is pneumatically positioned between the collection groove (3A, 3B) and the filtration device (64).~~

~~7. Friction assembly (19A) according to any one of the preceding claims, comprising means for condensing gases resulting from friction of the lining (22A, 22B), the means for condensing gases resulting from friction of the lining (22A, 22B) preferably comprising a plate heat exchanger.~~

~~8. Friction assembly (19A) according to the preceding claim, wherein the plate heat exchanger is adapted to be supplied with a refrigerant fluid.~~

~~9. Friction assembly (19A) according to claim 6 and any one of claims 7 to 9, wherein the means for condensing gases resulting from friction of the lining (22A, 22B) are pneumatically positioned between the collection groove (3A, 3B) and the particulate filter (62).~~