**[21]** Advantageously, when the sealing chamber is installed in the space between the lining carrier and the mounting face of the lining, the at least one orifice provided in the lining carrier to allow the passage of the pin is not obstructed by the sealing chamber. It is thus still possible to connect the pad to the brake head by inserting the pin into the at least one orifice in the lining carrier. The presence of the sealing chamber therefore does not change the maintenance operations for the pad, which can be replaced when the pin is removed from the at least one orifice in the lining carrier and the communication means disconnected from the suction duct. Moreover, as explained above, the chamber can be installed in prior art pads without altering their geometry or dimensions.

**[22]** The sealing chamber may be an additional component inserted into the space between the lining carrier and the mounting face of the lining. This configuration has the advantage of not requiring any modification to the method for assembling the lining to the lining carrier. Alternatively, the sealing chamber may be integrated into the lining carrier and/or into the lining itself. This avoids having to provide means to hold the sealing chamber in position within the space between the lining carrier and the mounting face of the lining.

**[23]** The sealing chamber is advantageously connected in a sealed manner to the lining of the pad, and thus to each collection groove of the pad. The seal between the chamber and the lining (and between each collection groove) may be established, for example, using a layer of rubber or putty, by molding the lining onto the chamber, or by an O-ring fitted between the suction hole and the chamber.

**[24]** According to one example, the sealing chamber is welded to the lining carrier and/or to the lining.

**[25]** This configuration allows the chamber to be installed in the space between the lining carrier and the mounting face without modifying the structure of the lining carrier or of the lining. Thus, the sealing chamber can be installed on existing pads which comprise a space between the lining carrier and the mounting face of the lining. Furthermore, there is no need to use additional parts to hold the sealing chamber in position inside the space between the lining carrier and the mounting face of the lining.

**[26]** To perform the welding, the sealing body may comprise a shell, for example made of metal. The shell may define a recess in the sealing body. The shell may be welded to a face of the lining carrier that is positioned facing the mounting face of the lining. A weld bead therefore appears between the lining carrier and the sealing chamber.

**[27]** If the sealing chamber is welded to the lining, the lining may advantageously comprise a metal area for performing the welding.

**[28]** According to one example, the pad may further comprise a connecting means which connects the sealing chamber to the lining carrier and/or to the lining. Thus, the sealing block is reliably connected to the lining carrier and/or to the lining.

**[29]** The connecting means may be non-removable or removable. The connecting means may be a screw, for example. In order to connect the chamber to the lining carrier by the connecting means, the sealing body may comprise a cavity comprising an internal thread complementary to an external

thread of the connecting means. Furthermore, the lining carrier may comprise a bore aligned with the cavity of the sealing body and shaped to receive the connecting means. The sealing chamber can thus be connected to the lining carrier by the connecting means, holding it in position within the space provided between the lining carrier and the mounting face of the lining.

**[30]** It should be noted that the sealing chamber designed to be connected to the lining carrier by connecting means may otherwise comprise the same elements as the sealing chamber designed to be welded to the lining carrier and/or to the lining. It should be noted, however, that to avoid increasing the dimensions of the sealing chamber, the recess of the shell described above may be smaller than when the sealing chamber is welded.

**[31]** According to one example, the sealing chamber is press-fitted into the space provided between the lining carrier and the mounting face of the lining. This configuration also allows the chamber to be installed in the space between the lining carrier and the mounting face without modifying the structure of the lining carrier or of the lining. The sealing chamber can thus be installed in existing pads that comprise a space between the lining carrier and the mounting face of the lining. Furthermore, there is no need to use additional parts to hold the sealing chamber in position in the space between the lining carrier and the mounting face of the lining.

**[32]** In particular, the sealing chamber may be shrink-fitted into the space between the lining carrier and the mounting face of the lining. For this purpose, the chamber is initially sized to have dimensions preventing its insertion into the space. The chamber, or at least its sealing body, is then cooled. This cooling process causes the sealing chamber to contract, allowing it to be easily inserted into the space between the lining carrier and the mounting face of the lining. The temperature of the sealing chamber then gradually increases until it reaches thermal equilibrium with its environment (in particular with the lining carrier and the mounting face). This increase in the temperature of the sealing chamber causes the chamber to gradually regain its original shape and dimensions. The sealing chamber is then held tightly between the lining carrier and the lining, creating a seal.

**[33]** According to one example, the sealing chamber may comprise a nut welded to the lining carrier and/or to the lining. The nut comprises an inner annular face provided with an internal threading that is complementary to an external threading on an outer surface of the suction duct. The suction duct may thus be connected to the nut by the cooperation between the external thread on the outer surface of the suction duct and the internal thread in the nut.

**[34]** To weld the nut to the lining carrier, a wall substantially perpendicular to the suction duct may be obtained by bending the plate of the lining carrier or by welding such a wall to the lining carrier.

**[35]** In some cases, to improve the seal between the sealing body and the suction duct, a sealing member, for example an O-ring, may be arranged at the end of the suction duct that is received in the sealing body.

**[36]** According to one example, the sealing chamber may include a filler block comprising a cavity fluidly connecting the suction hole of the at least one collection groove to the suction duct.

**[37]** The filler block may be installed in the recess of the shell described above. The filler block may occupy the entire recess delimited by the shell. The cavity of the filler block extends, for example, between the suction hole and the suction duct, making it possible to establish a fluid connection between the suction hole and the suction duct.

**[38]** The filler block may also be obtained after overmolding the lining onto the lining carrier.

**[39]** According to one example, the filler block may be made of silicone and/or in the friction material of the lining.

**[40]** When the filler block is made in the friction material of the lining, it is possible to obtain the filler block at the same time that the lining is overmolded onto the lining carrier.

**[41]** According to one example, the sealing chamber may be made as a single unit with the lining carrier. In this manner, there is no need for additional parts or steps to connect the sealing chamber to the lining carrier during pad assembly.

**[42]** According to one example, the plate used to form the lining carrier may be designed so that it can be bent to form the sealing body of the sealing chamber.

**[43]** According to another example, at least one wall may be welded to the lining carrier, this wall extending substantially perpendicularly to the suction duct. For example, two walls substantially perpendicular to the suction duct may be welded to the lining carrier to form a single unit. A cavity formed between these walls and the lining carrier can be filled with the friction material of the lining when the lining is overmolded onto the lining carrier.

**[44]** According to another example, a method for assembling a brake pad as described above is proposed, the method comprising:

- supplying the lining, the lining carrier, and the sealing chamber;
- connecting the lining carrier to the mounting face of the lining;
- arranging the sealing chamber in the space provided between the lining carrier and the mounting face of the lining, such that the suction hole of the at least one particle collection groove leads into the sealing chamber and is fluidly connected to the suction duct.

**[45]** The method for assembling the brake pad is therefore simple. In particular, by means of this method, it is possible to install the sealing chamber without having to modify the brake head, the latter operation being very complex in the case of brake systems for rail vehicles. A seal established between the suction hole, the suction duct, and the negative-pressure source is thus easily achieved.

**[46]** According to one example, the sealing chamber may be arranged in the space by at least one of the following techniques:

- welding the sealing chamber to the lining carrier and/or to the lining; and/or
- attaching the sealing chamber to the lining carrier and/or to the lining via a connecting means; and/or
- shrink-fitting the sealing chamber between the lining carrier and the lining; and/or
- overmolding the lining onto an assembly comprising the lining carrier and the suction duct.

**[47]** It should be noted that it is possible to combine several of these techniques in the same brake pad in order to arrange the sealing chamber in the space between the lining carrier and the mounting face of the lining. For example, a same chamber may be both welded to the lining carrier and attached to the lining carrier by connecting means. This helps to better ensure that the sealing chamber remains in position within the space between the lining carrier and the mounting face of the lining.

**[48]** Advantageously, when the chamber comprises a shell enclosing a recess occupied by the sealing block, and the chamber is welded or attached via connecting means to the lining carrier and/or to the lining, the filler block is installed in the recess before the sealing block is connected to the lining and/or to the lining carrier. In the case of the examples in which the chamber is welded or connected via connecting means to the lining carrier and/or to the lining, it is possible to first connect the lining carrier to the mounting face of the lining, and then install the sealing chamber in the space between the lining carrier and the mounting face. In these examples, it is also possible to first connect the chamber to the lining carrier and/or to the lining (by welding or by connecting means), and then connect the lining carrier to the mounting face of the lining. In this case, the step of connecting the lining carrier to the mounting face and the step that includes arranging the chamber in the space between the lining carrier and the mounting face are carried out concurrently.

**[49]** In examples in which the lining is overmolded onto the assembly comprising the lining carrier and the suction duct, the step of arranging the chamber in the space is also carried out concurrently with the step that includes connecting the lining carrier and the lining.

[49a] In an aspect, the present disclosure refers to a brake pad (18), the brake pad (18) comprising a lining (20) and a lining carrier (24), the lining (20) being made of friction material and having at least one particle collection groove (30, 32, 38, 40, 42), the lining carrier (24) being connected to a face (22B) of the lining (20), called the mounting face, wherein a space (29) is provided between the lining carrier (24) and the mounting face (22B) of the lining (20), wherein a sealing chamber (50) is arranged in the space (29), the sealing chamber (50) comprising a suction duct (52) intended to be fluidly connected to a negative-pressure source, wherein the at least one particle collection groove (30, 32, 38, 40, 42) comprises a suction hole (44) that leads into the sealing chamber (50) and is fluidly connected to the suction duct.

[49b] In an aspect, the present disclosure refers to a method for assembling a brake pad (18), the brake pad (18) comprising a lining (20) and a lining carrier (24), the lining (20) being made of friction material and having at least one particle collection groove (30, 32, 38, 40, 42), the lining carrier (24) being connected to a face (22B) of the lining (20), called the mounting face, wherein a space (29) is provided between the lining carrier (24) and the mounting face (22B) of the lining (20), wherein a sealing chamber (50) is arranged in the space (29), the sealing chamber (50) comprising a suction duct (52) intended to be fluidly connected to a negative-pressure source, wherein the at least one particle collection groove (30, 32, 38, 40, 42) comprises a suction hole (44) that leads into the sealing

chamber (50) and is fluidly connected to the suction duct, the method comprising:

- supplying the lining (20), the lining carrier (24), and the sealing chamber (50);
- connecting the lining carrier (24) to the mounting face (22B) of the lining (20);
- arranging the sealing chamber (50) in the space (29) provided between the lining carrier (24) and the mounting face (22B) of the lining (20), such that the suction hole (44) of the at least one particle collection groove (30, 32, 38, 40, 42) leads into the sealing chamber (50) and is fluidly connected to the suction duct (52).

**Brief description of drawings**

**[50]** Other features, details, and advantages will become apparent from the detailed description below, and from an analysis of the accompanying drawings, in which:

**Fig. 1**

**[51]** [Fig. 1] shows a schematic perspective view of a braking system according to one exemplary embodiment.

**Fig. 2**

**[52]** [Fig. 2] shows a schematic side view of a brake assembly of the braking system of FIG. 1.

**Fig. 3**

**[53]** [Fig. 3] shows a schematic perspective view of a brake pad of the braking system of FIG. 1 according to one exemplary embodiment.

**Fig. 4**

**[54]** [Fig. 4] shows a schematic perspective view of the pad of FIG. 3 from a first angle, with the pad equipped with a sealing chamber.

**Fig. 5**