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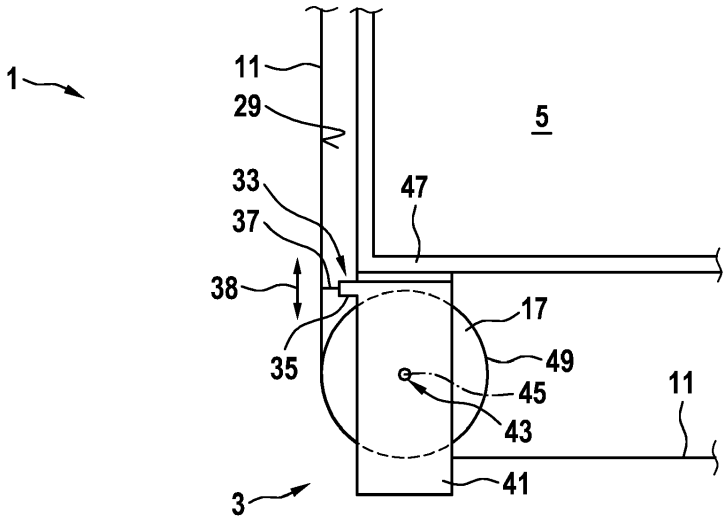
(54) ELEVATOR ARRANGEMENT COMPRISING A BRUSH FOR CLEANING A SUSPENSION TRACTION MEMBER

(57) An elevator arrangement (1) is proposed. The elevator arrangement comprises a displaceable component such as a cabin (5), at least one pulley arrangement (3), a drive engine and an elongate suspension traction member (11). The pulley arrangement (3) comprises a pulley (17) and is attached to the displaceable component (5). The drive engine drives a traction sheave. The elongate suspension traction member (11) is wound along the at least one pulley (17) thereby suspending the displaceable component (5). Additionally, the elongate suspension traction member (11) is wound along the traction sheave of the drive engine. Furthermore, the elevator arrangement comprises a brush (33). This brush (33) is arranged upwards of the at least one pulley (17) and is adapted such as to contact a contact surface (29) of the suspension traction member (11) contacting the pulley (17) when the suspension traction member (11) being wound along the pulley (17). The brush (33) may clean the suspension traction member (11) from dust and dirt which otherwise might induce wear or even damage to the suspension traction member (11) or the pulley (17).

Fig. 3



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Description

[0001] Elevator arrangements typically comprise displaceable components such as a cabin and, in most cases, a counterweight which may be displaced for example within an elevator hoistway to different levels in order to transport persons or items for example to various levels within a building.

[0002] In a common type of elevator, the cabin and/or the counterweight are supported by a suspension traction member arrangement comprising one or generally more suspension traction members (STM). The suspension traction member is typically an elongate member such as a rope or a belt. The suspension traction member may suspend loads of the cabin and/or the counterweight. Furthermore, the cabin and/or the counterweight may generally be displaced throughout the elevator hoistway by displacing the suspension traction member suspending these movable components. For such purpose, in most cases, the suspension traction members are wound around a traction sheave being driven into rotation by a drive engine such that due to traction between the traction sheave and the suspension traction member, the latter may be displaced. The movable component is then suspended by the suspension traction member via at least one pulley arrangement being attached to the movable component. Therein, the pulley arrangement typically comprises a pulley around which the suspension traction member may be wound and an attachment structure for attaching the pulley to the movable component.

[0003] It has been observed that the suspension traction member(s) and/or the pulley arrangement(s) of an elevator may be subject to substantial wear and/or even damaging upon operating the elevator. Thereby, for example lifetimes of such elevator components may be limited whereby maintenance or replacement costs for operating the elevator arrangement may be increased. In worst cases, reliability or even security of the elevator arrangement may be reduced.

[0004] There may be a need for an elevator arrangement with reduced maintenance or replacement costs during operating same and/or with improved reliability or security. Particularly, there may be a need for an elevator arrangement showing a reduced risk for substantial wear or damaging of its components during operating same. Furthermore, there may be a need for a pulley arrangement for such elevator arrangement.

[0005] Such needs may be met with the subject-matter of the independent claims. Advantageous embodiments are defined in the dependent claims and in the following specification.

[0006] According to a first aspect of the present invention, an elevator arrangement is proposed. The elevator arrangement comprises a displaceable component, at least one pulley arrangement, a drive engine and an elongate suspension traction member. The displaceable component may be a cabin (sometimes also referred to as a car) or a counterweight. The pulley arrangement comprises a pulley and is attached to the displaceable component. The drive engine drives a traction sheave. The elongate suspension traction member may be e.g. a belt and is wound along the at least one pulley thereby suspending the displaceable component. Additionally, the elongate suspension traction member is wound along the traction sheave of the drive engine. Furthermore, the elevator arrangement comprises a brush. This brush is arranged upwards of the at least one pulley and is adapted such as to contact a contact surface of the suspension traction member contacting the pulley when the suspension traction member being wound along the pulley.

[0007] According to a second aspect of the present invention, a pulley arrangement for an elevator arrangement is proposed. The pulley arrangement comprises a pulley and is adapted for being attached to a displaceable component of the elevator arrangement and for suspending the displaceable component upon a suspension traction member being wound along the pulley. Therein, the pulley arrangement comprises a brush being arranged such as to be positioned upwards of the pulley when the pulley arrangement is attached to the displaceable component and being adapted such as to contact a contact surface of the suspension traction member contacting the pulley when the suspension traction member being wound along the pulley.

[0008] Ideas underlying embodiments of the present invention may be interpreted as being based, inter alia, on the following observations and recognitions.

[0009] As indicated above, cases have been observed in which the suspension traction member(s) and/or the pulley arrangement(s) of an elevator were subject to substantial wear and/or even damaging upon operating the elevator.

[0010] Upon analysis of such cases, it has been found that such wear or damaging may result from dust or even dirt being present on surfaces of the STM and/or of the pulley. For example, especially during construction phases, dust and dirt may be produced within the elevator hoistway and may deposit on surfaces of the STM and/or of the pulley. Such dusts or dirt may be for example microscopic particles floating in the air, construction cement flakes or stones, rust particles, oil contamination, or similar. Particularly when such dust or dirt comes between the contact surface of the STM and an opposing contact surface of the pulley, it may harm an integrity of one or both of these components due to for example abrasion effects. In worst cases, dirt such as for example little stones or peeled-off pieces of concrete may be clamped between the STM and the pulley and may damage these components or even result in jumping-off of the STM from its correct positioning on the pulley.

[0011] As a lesson learned from such analysis, it is proposed to provide the elevator arrangement with a brush which may serve for cleaning a surface of the STM. Therein, the term "brush" may be interpreted broadly. Generally, a brush may refer to a means which may be brought into contact with a surface of an item to be

cleaned and which may flexibly adapt to a contour of such surface upon moving the brush with respect to the surface such as to substantially clean the surface from dust or dirt. Therein, portions of the brush coming into contact with the surface to be cleaned should have a certain elasticity such that, upon pushing the brush into contact with the surface to be cleaned, these portions contact the surface to be cleaned with a contact pressure which, on the one hand, is sufficiently strong such as to wipe away the dust or dirt from the surface but which, on the other hand, is sufficiently weak such as not to harm or even damage the surface to be cleaned. Various implementations of brushes such as brushes comprising bristles, brushes comprising elastic structures such as foam structures, etc. are applicable.

[0012] In order to allow the brush to effectively clean the contact surface of the STM in order to thereby avoid any dust or dirt remaining on such contact surface upon portions of the STM coming into contact with an opposing surface of a pulley around which the STM is wound, the brush should be arranged upwards of the pulley. Generally, the STM extends from an upward location such as the traction sheave of the drive engine or a fixation structure at the top of the hoistway down to the pulley arrangement attached to the elevator cabin or counterweight. Accordingly, upon moving the STM, dirt or dust deposited onto the STM may fall down onto the pulley due to gravity and/or may adhere to the contact surface of the STM until it comes into contact with the surface of the pulley upon displacement of the STM. In order to avoid this, the brush should be arranged at a higher position than the pulley, i.e. upwards of the pulley, such that any dust or dirt falling off from the STM may be hindered from reaching the pulley and/or any dust or dirt adhering to the STM may be wiped away before the underlying portion of the STM contacting the pulley upon displacement of the STM. Generally, the brush may be arranged at various locations upwards of the pulley, i.e. at any location between the pulley and a highest suspended location of the STM. Preferred arrangements of the brush will be discussed further below.

[0013] According to an embodiment, the brush is adapted such as to be elastically bendable in both of opposite directions parallel to an extension direction of the suspension traction member.

[0014] In other words, the brush with its portions contacting the surface of the STM to be cleaned shall preferably be elastically bendable not only in a single direction but in both antiparallel directions corresponding to the extension direction of the STM. Such bending capability in opposite directions may be beneficial as the STM may generally be moved during operation of the elevator in opposite directions. A brush being bendable in both of these opposite directions may adapt its bending configuration to the actual displacement direction of the STM.

[0015] According to an embodiment, the brush comprises bendable bristles.

[0016] The bendable bristles of the brush may be elongate fibres, filaments, strands or similar. Such bristles may be easily bent in directions transverse to their longitudinal direction. Particularly, the bristles may be bent in both of opposite directions such that for example when the STM is moved downwards the bristles are bent downwards and when the STM is moved upwards the bristles are bent upwards. The bristles may have diameters in a range of for example between 30 μm to 3 mm, preferably between 50 μm and 1 mm, more preferably between 100 μm and 500 μm. The bristles may have lengths which are adapted to, on the one hand, provide for a suitable bending capability of the bristles and which, on the other hand, allow for a sufficient contact pressure to be established between the bristles and a surface to be cleaned. For example, the bristles may have lengths between 1 cm and 20 cm, preferably between 2 cm and 10 cm. The bristles may be made with various materials such as natural or artificial fibres, plastic filaments, etc.

[0017] According to an embodiment, the suspension traction member is profiled at its contact surface.

[0018] STMs have been developed and applied in elevator arrangements wherein the contact surface of the STM contacting the pulleys and/or the traction sheave is profiled. The profiled contact surface may help guiding the STM for example upon being wound around the pulley, the pulley preferably having a contact surface having a profile complementary to the profile of the STM. For example, the profile at the STM may include elongate grooves extending parallel to the extension direction of the STM. Such grooves may have for example a V-shape, a U-shape or similar cross-sectional shapes. It has been observed that dust or dirt may preferably adhere to such profiled surfaces and that, therefore, it may be particularly beneficial to provide the elevator arrangement with a brush for cleaning such profiled surfaces of a STM.

[0019] Particularly in such configuration, according to an embodiment, a cantilever end of the brush has a geometry which is substantially complementary to the profile of the contact surface of the suspension traction member.

[0020] In other words, while, generally, the cantilever end of the brush may have any geometry or contour and may, in a simplest configuration, form a linear edge, it may be beneficial to adapt the geometry or contour of the cantilever end of the brush to a geometry or contour of the profile of the contact surface of the STM. For example, if the STM comprises V-shaped grooves at its profiled contact surface, it may be beneficial to provide the brush with a configuration in which its flexible cantilever end has a geometry or contour being substantially complementary to the contact surface profile of the STM. Accordingly, the cantilever end of the brush may engage into the profile of the STM. Thereby, effective cleaning capability may be enabled while avoiding excessive local contact pressures between the brush and the STM.

[0021] According to an embodiment, the STM is a belt. Such belt may be used in modern elevators as a replacement for conventional ropes. Particularly, the belt may

have a rectangular and relatively flat cross section and may be profiled at least at one of its lateral contact surfaces.

[0022] According to an embodiment, the brush contacts the contact surface of the STM along an entire width of the contact surface.

[0023] Expressed differently, the brush should preferably cross the entire contact surface of the STM such that its cantilever end may come into contact with the contact surface of the STM from one lateral side thereof to the opposing lateral side thereof. Accordingly, the brush may clean the contact surface of the STM along its entire width.

[0024] According to an embodiment, the brush is arranged at an inclined angle relative to a horizontal direction.

[0025] In other words, it may be preferable to arrange the brush not in a horizontal configuration but in a configuration in which it is inclined or slanted with respect to the horizontal direction. In such inclined configuration, dust or dirt wiped away from the contact surface of the STM may not easily accumulate on top of the brush but may glide or move along the inclined brush towards a lateral end of the brush. As such lateral end of the brush is typically spaced apart from a lateral edge of the STM, the dust or dirt may then for example fall-off from the brush without any danger to again being deposited onto the STM. For example, an inclination of the brush with respect to the horizontal direction may be between 3° and 70°, preferably between 10° and 50°.

[0026] According to an embodiment, the brush comprises a biasing arrangement for elastically biasing the brush in a direction towards the contact surface of the suspension traction member.

[0027] Accordingly, the biasing arrangement may be configured to push the brush towards the contact surface of the STM. Preferably, such pushing or biasing action is established in an elastic manner. Thereby, a contact pressure between the cantilever end of the brush and the contact surface of the STM may be selectively configured such as to enable effective cleaning while avoiding damaging or wear resulting from excessive contact pressures. For example, the biasing arrangement may comprise one or more elastic elements such as a spring, an elastomer element, etc. for biasing the brush.

[0028] According to an embodiment, the brush comprises a position adjustment arrangement for adjusting a position of the brush relative to the contact surface of the suspension traction member.

[0029] The adjustment arrangement may for example be configured to fixing the brush at selectable locations relative to the STM. Particularly, a lateral distance between the contact surface of the STM and the brush may be selectable and the brush may then be fixed at a selected location. The position adjustment arrangement may be adapted to enable for example fixing the brush at various locations at different lateral distances with respect to the contact surface of the STM. Such various locations may be within a displacement range of for example at least up to 1 cm (i.e. using the position adjustment arrangement, the brush may be displaced 1 cm closer to or further away from the contact surface of the STM in a lateral direction), preferably at least up to 5 cm or more preferably at least up to 10 cm.

[0030] Such option for adjusting the position of the brush with respect to the STM may be beneficial during installation of the elevator arrangement as well as during subsequent operation of the elevator arrangement. For example, during installation, the STM and the brush may provisionally be roughly position with respect to each other and only after all components of the elevator arrangement are finally installed at their final positions, the brush may be brought to and/or fixed at a final suitable location using the position adjustment arrangement.

[0031] According to an embodiment, the at least one pulley is attached to a beam of a load carrying structure of the displaceable component via an attachment structure and the brush is attached to one of the beam and the attachment structure.

[0032] In other words, the pulley arrangement comprises the pulley and the attachment structure wherein the attachment structure is adapted for attaching the pulley at the elevator cabin or counterweight. For example, the attachment structure may be a frame or a housing which, on the one hand, may bear an axis of the pulley such that the pulley is rotatable and which, on the other hand, is configured to be fixedly attached to the beam of the load carrying structure of the cabin or counterweight. In such configuration, it may be beneficial to attach the brush either to the beam of the load carrying structure of the cabin/counterweight or to the attachment structure of the pulley arrangement. In both cases, the brush may be located such as to be upwards with respect to the pulley and may be kept preferably in a defined position relative to the pulley and therefore relative to the STM suspending the pulley and being guided by the pulley.

[0033] Specifically, according to an embodiment of the pulley arrangement, the pulley arrangement further comprises the attachment structure via which the pulley is to be attached to a load carrying structure of the displaceable component, and the brush is attached to this attachment structure.

In other words, it may be preferable to integrate the brush to be a part of the pulley arrangement. Accordingly, the pulley and its attachment structure as well as the brush being all parts of the pulley arrangement may for example be handled as a single unit during installation. In this case, the pulley arrangement may for example be installed by attaching it to the cabin/counterweight and, at the same time, the brush included in the pulley arrangement is installed at a correct position.

[0034] According to an embodiment, the brush is provided with an electrically conductive path reaching from a cantilever end of the brush to a base body of the brush.

[0035] In other words, the brush or at least portions of the brush may be made with an electrically conductive

material such that the electrically conductive path is generated. Such electrically conductive path should preferable connect the cantilever end of the brush which comes into contact with the surface of the STM with the base body of the brush. The base body may then be electrically connected to a ground potential. Accordingly, the brush may serve for electrically discharging the STM.

[0036] It shall be noted that possible features and advantages of embodiments of the invention are described herein partly with respect to an elevator arrangement and partly with respect to a pulley arrangement to be included in an elevator arrangement. One skilled in the art will recognize that the features may be suitably transferred from one embodiment to another and features may be modified, adapted, combined and/or replaced, etc. in order to come to further embodiments of the invention.

[0037] In the following, advantageous embodiments of the invention will be described with reference to the enclosed drawings. However, neither the drawings nor the description shall be interpreted as limiting the invention.

Fig. 1 shows a side view of an elevator arrangement which may be implemented in accordance with an embodiment of the present invention.

Fig. 2 shows a perspective view of a suspension traction member and a brush for an elevator arrangement in accordance with an embodiment of the present invention.

Fig. 3 shows an enlarged side view of a pulley arrangement and a brush of an elevator arrangement in accordance with an embodiment of the present invention.

Fig. 4 shows an enlarged side view of a pulley arrangement and a brush of an elevator arrangement in accordance with another embodiment of the present invention.

Fig. 5 shows a top view onto details of a brush for an elevator arrangement in accordance with an embodiment of the present invention.

[0038] The figures are only schematic and not to scale. Same reference signs refer to same or similar features.

[0039] Fig. 1 shows a traction-type elevator arrangement 1 comprising pulley arrangements 3 in accordance with an embodiment of the present invention.

[0040] The elevator 1 comprises movable components such as a cabin 5 and a counterweight 7 which may be displaced vertically within an elevator shaft 9. The cabin 5 and the counterweight 7 are suspended by a suspension traction member 11. This suspension traction member 11 typically comprises one or more belts or ropes. In the arrangement shown in Fig. 1, end portions of the suspension traction member 11 are fixed to supporting structures 12 of the elevator 1 at a top of the elevator shaft 9. The suspension traction member 11 may be displaced using a drive engine 13 driving a traction sheave 15. Therein, the STM 11 may be wound around a traction surface of the traction sheave 15 and may furthermore be wound around pulleys 17 of the pulley arrangements 3 attached to the cabin 5 and to the counterweight 7, respectively. An operation of the drive engine 13 may be controlled by a control device 19.

[0041] It may be noted that the elevator 1 and particularly its suspension traction member(s) 11 may be configured and arranged in various other ways than those shown in Fig. 1.

[0042] Fig. 2 shows an example of an STM 11 which is embodied with a belt 21. The belt 21 comprises a plurality of cords 23 which are arranged parallel to and spaced from each other. The cords 23 are enclosed in a jacket material 25 such as Polyurethane (PU) forming a jacket 27. On a contact surface 29, the jacket 25 is profiled and comprises longitudinal guiding grooves 31.

[0043] In order to clean the STM 11 from dust or dirt, a brush 33 may be provided within the elevator arrangement 1. Such brush 33 is schematically illustrated in Fig. 2. The brush 33 comprises a base body 35 from which bundles of bristles 37 extend in a direction towards the contact surface 29 of the STM 11.

[0044] In the example shown, a cantilever end 39 of the brittles 37 of the brush 33 has a geometry or contour which substantially corresponds in a complementary manner to the contour of the profiled contact surface 29 of the STM 11. For such purpose, the bristles 37 attached to the linear base body 35 are provided with different lengths dependent on their position at the base body 35. Due to such geometry or contour, the bristles 37 of the brush 33 may, on the one hand, engage into the grooves 31 of the profiled contact surface 29 of the STM 11 while, on the other hand, not generating excessive local pressures onto the STM 11.

[0045] The brush 33 may be arranged within the elevator arrangement 1 at various locations. Generally, the brush 33 should be arranged at a higher position than the pulley 17, i.e. upwards in relation to the pulley 17, such that dirt or dust may be brushed-off from the STM 11 before a respective portion of the STM 11 reaches the pulley 17 when the suspension traction member 11 being displaced during elevator operation.

[0046] Fig. 3 shows an enlarged view of the section "A" indicated in Fig. 1 including the pulley arrangement 3. In this exemplary embodiment, the pulley arrangement 3 is attached to a lower side of the cabin 5. Particularly, the pulley arrangement 3 comprises an attachment structure 41 formed by a frame or a housing. This attachment structure 41 may be made for example with metal sheets. The carrying structure 41 comprises a bearing 43 in which an axis 45 of the pulley 17 may engage. On an upper side, the attachment structure 41 is attached to a beam 47 of a load carrying structure of the cabin 5. The STM 11 is wound around a cylindrical generated surface 49 of the pulley 17 such that its contact surface 29 contacts

the generated surface 49.

[0047] In the configuration shown in Fig. 3, the brush 33 is fixedly attached to the attachment structure 41 of the pulley arrangement 3. Alternatively or additionally, the brush 33 could also be fixed to the cabin 5, for example to the beam 47 of the load carrying structure of the cabin 5. Therein, the brush 33 is arranged such that its bristles 37 extend in a substantially horizontal direction towards the contact surface 29 of the STM 11.

[0048] In an alternative embodiment as shown in Fig. 4, the pulley arrangement 3 could be attached to a movable component of the elevator arrangement 1 at an upper side thereof. Such configuration is shown for example in the section "B" of Fig. 1. In such embodiment, the attachment structure 41 may be fixed for example to an upper beam 47 of a load carrying structure of for example the counterweight 7. The brush 33 may be attached to the attachment structure 41 upwards of the pulley 17. In the example shown, bristles 37 laterally extend in a horizontal direction at both opposing sides of a base body 35 such as to contact and thereby clean the contact surface 29 of the STM 11.

[0049] In the examples shown in Figs. 3 and 4, the brush 33 with its bristles 37 should be elastically bendable in both of opposite bending directions 38 parallel to an extension direction of the STM 11. Accordingly, independent on in which direction the STM 11 is currently displaced, the brush 33 may bend in a suitable direction such as to optimized its cleaning function without compromising an integrity of the STM 11 due to excessive local forces applied thereto.

[0050] In figures 3 and 4 two possible configurations for providing the brush 33 within the elevator arrangement 1 are shown in which configurations the brush 33 is attached to the pulley arrangement 3, particularly to its attachment structure 41, such that the entirety of the pulley arrangement 3 including the brush 33 may be fabricated, handled and finally installed in the elevator arrangement 1 as a single unit. However, various other configurations are possible and the brush 33 may be provided and fixed within the elevator arrangement 1 at various other locations.

[0051] While, in Figs. 2, 3 and 4, the brush 33 is shown in a horizontal configuration (i.e. rectangular with respect to a vertical direction 52 crossing the suspension traction member 11) for ease of representation, it may be beneficial to arrange the brush 33 at an inclined angle α with respect to the horizontal direction 50. Such configuration is shown in dotted lines in Fig. 2. In such inclined configuration, dust or dirt wiped away from the contact surface 29 of the STM 11 may slide along the inclined brush 33 and may therefore be transferred laterally away from the STM 11.

[0052] Finally, possible details of a brush 33 will be explained with reference to Fig. 5. In fact, the brush 33 may be implemented with a more complex structure than the simple structure shown in the preceding figures. It shall be emphasised that details of the brush 33 are visualised only schematically and functionalities realised by such details may be implemented in various other ways than those shown in the figure.

[0053] The brush 33 includes a base body 35 from which bristles 37 extend. Furthermore, the brush 33 comprises a biasing arrangement 51. This biasing arrangement may serve for mechanically biasing, i.e. pushing, the base body 35 of the brush 33 in a direction towards the contact surface 29 of the STM 11. For example, the biasing arrangement 51 may comprise one or more springs 53 or other elastic members.

[0054] Furthermore, the brush 33 comprises a position adjustment arrangement 55. With this position adjustment arrangement 55, the position of the base body 35 of the brush 33 may be adjusted relative to the contact surface 29 of the STM 11. For example, a displacement plate 63 may comprise elongate through holes 57 and may be fixed with screws 59 to a base plate 61. Accordingly, upon releasing the screws 59, the displacement plate 63 may be displaced relative to the base plate 61 and may then fixed in a final desired position upon tightening the screws 59.

[0055] Finally, it should be noted that the term "comprising" does not exclude other elements or steps and the "a" or "an" does not exclude a plurality. Also elements described in association with different embodiments may be combined. It should also be noted that reference signs in the claims should not be construed as limiting the scope of the claims.

List of reference signs

[0056]

1	elevator arrangement
3	pulley arrangement
5	cabin
7	counterweight
9	hoistway
11	suspension traction member
12	supporting structures
13	drive engine
15	traction sheave
17	pulley
19	control device
21	belt
23	cords
25	jacket material
27	jacket
29	contact surface of STM
31	grooves
33	brush
35	base body
37	bristles
38	bending directions
39	cantilever end
41	attachment structure
43	bearing

45 axis
47 beam
49 generated surface of pulley
50 horizontal direction
51 biasing arrangement
52 vertical direction
53 spring
55 position adjustment arrangement
57 elongate through-hole
59 screw
61 base plate
63 displacement plate

Claims

1. Elevator arrangement (1), comprising:

a displaceable component (5, 7);
at least one pulley arrangement (3) comprising a pulley (17) and being attached to the displaceable component (5, 7);
a drive engine (13) driving a traction sheave (15);
an elongate suspension traction member (11) wound along the at least one pulley (17) thereby suspending the displaceable component (5, 7) and wound along the traction sheave (15) of the drive engine (13); and
a brush (33) being arranged upwards of the at least one pulley (17) and being adapted such as to contact a contact surface (29) of the suspension traction member (11) contacting the pulley (17) when the suspension traction member (11) being wound along the pulley (17).

2. Elevator arrangement of claim 1, wherein the brush (33) is adapted such as to be elastically bendable in both of opposite bending directions (38) parallel to an extension direction of the suspension traction member (11).

3. Elevator arrangement of one of the preceding claims, wherein the brush (33) comprises bendable bristles (37).

4. Elevator arrangement of one of the preceding claims, wherein the suspension traction member (11) is profiled at its contact surface (29).

5. Elevator arrangement of claim 4, wherein a cantilever end (39) of the brush (33) has a geometry which is substantially complementary to the profile of the contact surface (29) of the suspension traction member (11).

6. Elevator arrangement of one of the preceding claims, wherein the suspension traction member (11) is a belt.

7. Elevator arrangement of one of the preceding claims, wherein the brush (33) contacts the contact surface (29) along an entire width of the contact surface (29).

8. Elevator arrangement of one of the preceding claims, wherein the brush (33) is arranged at an inclined angle (α) relative to a horizontal direction (50).

9. Elevator arrangement of one of the preceding claims, wherein the brush (33) comprises a biasing arrangement (51) for elastically biasing the brush (33) in a direction towards the contact surface (29) of the suspension traction member (11).

10. Elevator arrangement of one of the preceding claims, wherein the brush (33) comprises a position adjustment arrangement (55) for adjusting a position of the brush (33) relative to the contact surface (29) of the suspension traction member (11).

11. Elevator arrangement of one of the preceding claims, wherein the at least one pulley (17) is attached to a beam (47) of a load carrying structure of the displaceable component (5, 7) via an attachment structure (41) and wherein the brush (33) is attached to one of the beam (47) and the attachment structure (41).

12. Elevator arrangement of one of the preceding claims, wherein the brush (33) is provided with an electrically conductive path reaching from a cantilever end (39) of the brush (33) to a base body (35) of the brush (33).

13. Pulley arrangement (3) for an elevator arrangement (1), wherein the pulley arrangement (3) comprises a pulley (17) and is adapted for being attached to a displaceable component (5, 7) of the elevator arrangement (1) and for suspending the displaceable component (5, 7) upon a suspension traction member (11) being wound along the pulley (17);
wherein the pulley arrangement (3) comprises a brush (33) being arranged such as to be positioned upwards of the pulley (17) when the pulley arrangement (3) is attached to the displaceable component (5, 7) and being adapted such as to contact a contact surface (29) of the suspension traction member (11) contacting the pulley (17) when the suspension traction member (11) being wound along the pulley (17).

14. Pulley arrangement of claim 11, further comprising an attachment structure (41) via which the pulley (17) is to be attached to a load carrying structure of the displaceable component (5, 7),
wherein the brush (33) is attached to the attachment structure (41).

15. Elevator arrangement of claim 1,

wherein the brush (33) comprises bendable bristles (37) being elastically bendable in both of opposite bending directions (38) parallel to an extension direction of the suspension traction member (11);
wherein the suspension traction member (11) is a belt which is profiled at its contact surface (29);
wherein the brush (33) comprises a position adjustment arrangement (55) for adjusting a position of the brush (33) relative to the contact surface (29) of the suspension traction member (33); and
wherein the at least one pulley (17) is attached to a beam (47) of a load carrying structure of the displaceable component (5, 7) via an attachment structure (41) and wherein the brush (33) is attached to one of the beam (47) and the attachment structure (41).

Fig. 1

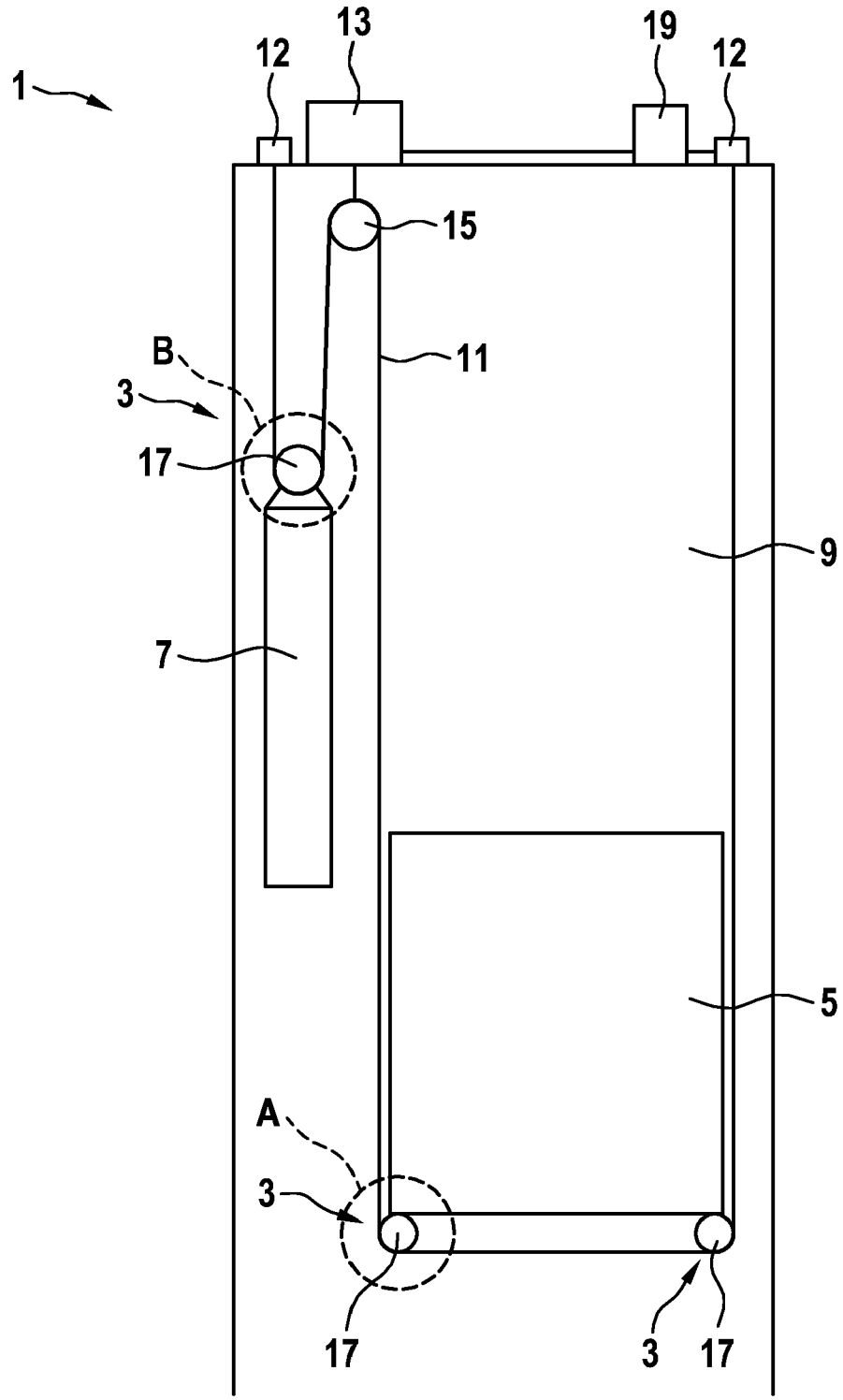

Fig. 2

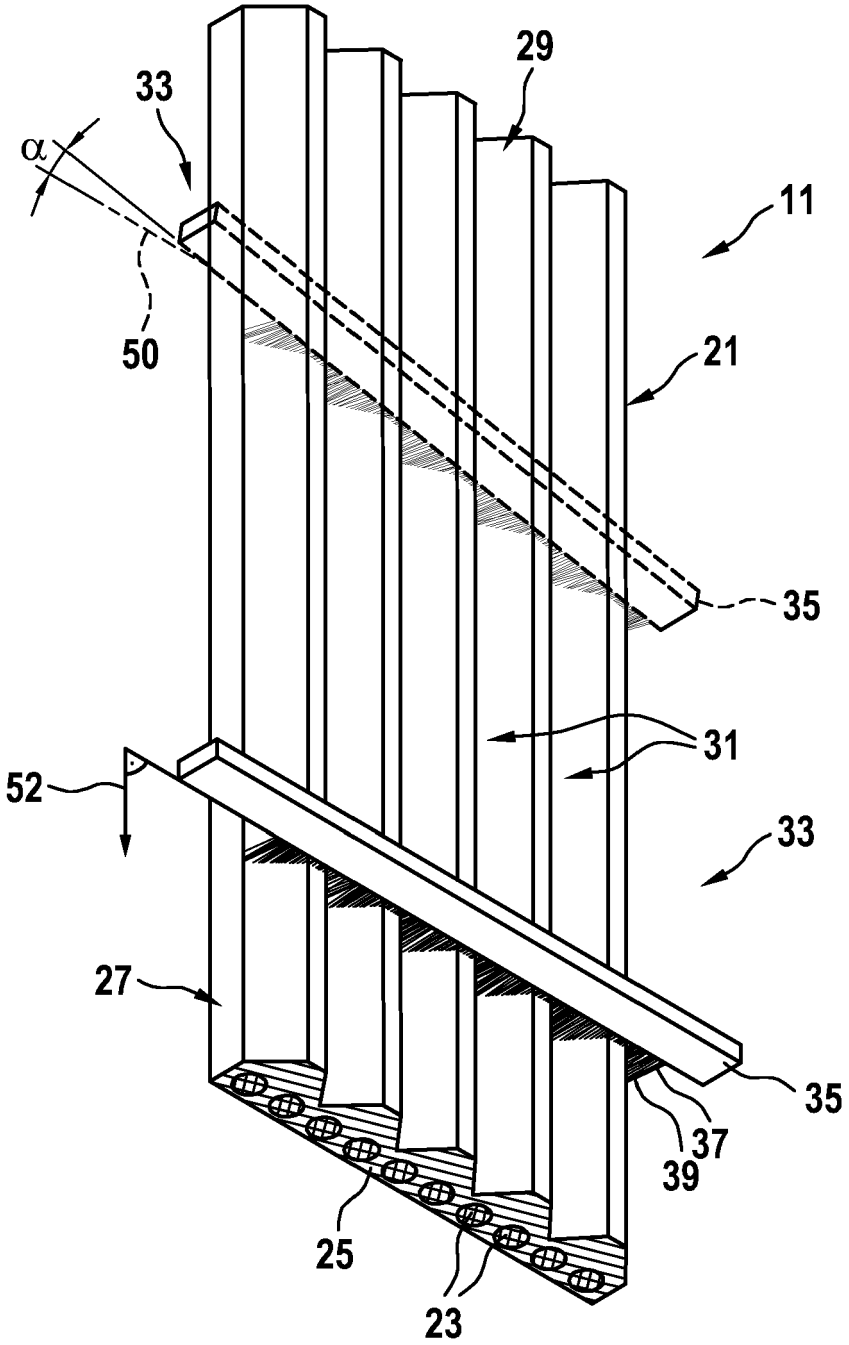

Fig. 3

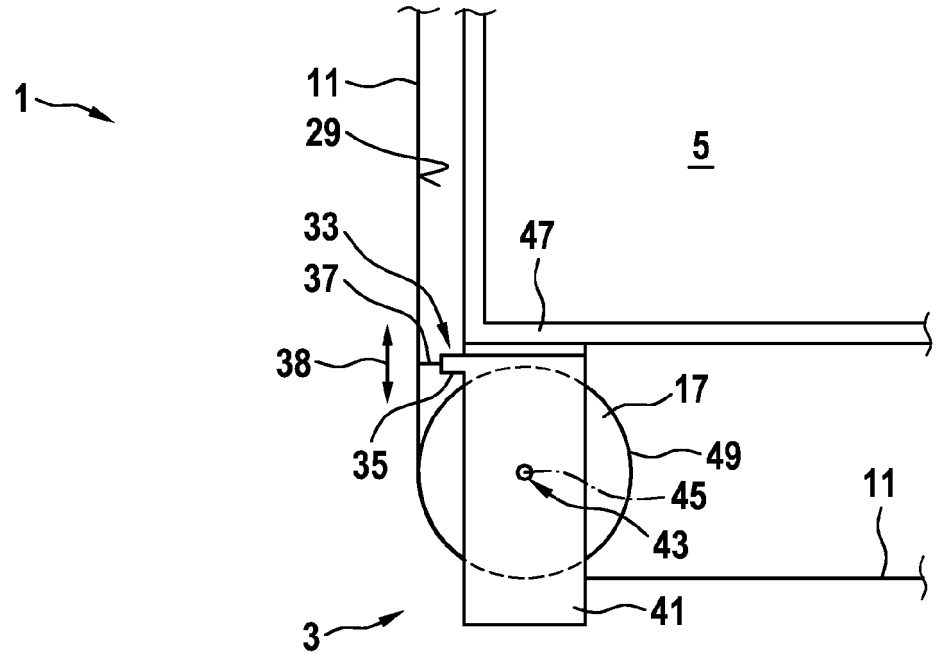
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Fig. 4

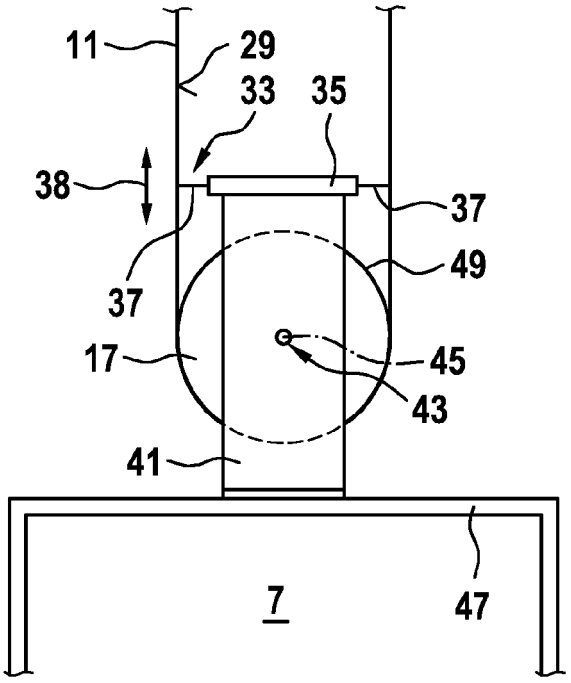
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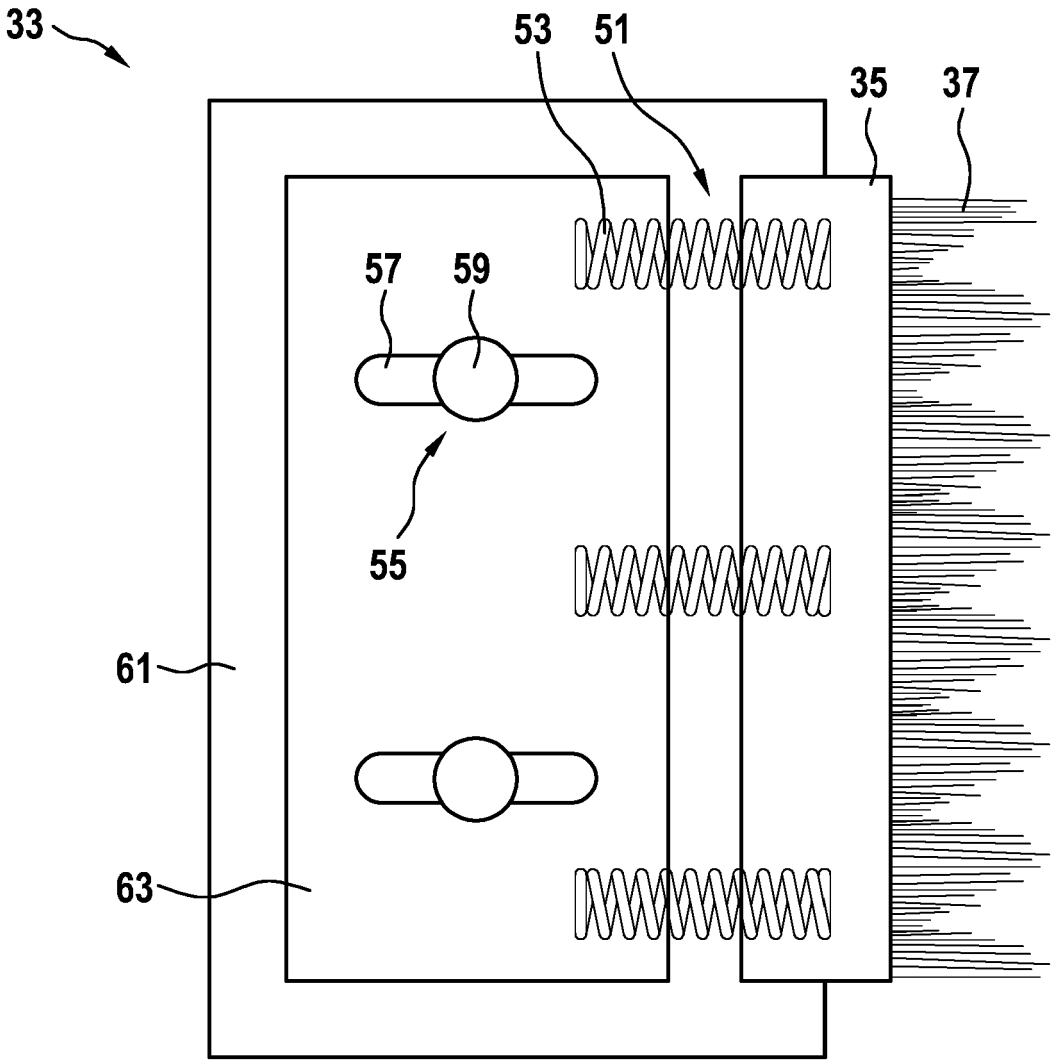
Fig. 5



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Application Number
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 February 2017	Szován, Levente

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