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(54) **SLIDING GUIDE FOR AN ELEVATOR**

GLEITFÜHRUNGSSCHUH FÜR EINEN AUFZUG

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(56) References cited:

DE-U1- 7 607 776	**DE-U1- 7 607 776**
FI-C- 99 203	**FI-C- 99 203**
US-A- 4 271 932	**US-A- 4 271 932**
US-A- 4 598 798	**US-A- 4 598 798**

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Description

[0001] The object of the invention is a guide shoe arrangement of an elevator as defined in the preamble of claim 1.

[0002] Normally elevators comprise essentially vertical guide rails disposed in an elevator hoistway, guided by which guide rails the elevator car is fitted to travel up and down in the elevator hoistway. Guide shoes are fitted onto the top edges and bottom edges of the elevator car or of the car sling, which guide shoes are arranged to guide the passage of the elevator car on the guide rails. The most commonly used types of guide shoes are a sliding guide shoe and a roller guide shoe. The current invention relates more particularly to a sliding guide shoe arrangement of an elevator car.

[0003] The guide rails are not brought into the elevator hoistway as full-length in the installation phase, but instead they are assembled in the elevator hoistway from guide rail elements of a certain length, which elements are connected in the installation phase end-on-end one after the other. Guide rails of essentially the height of the elevator hoistway, are in practice, impossible to install in a fully straight line, owing to which lateral forces from the guide rails are exerted on the sliding guide shoes when the elevator car moves, which forces cause vibrations, from which noise is also produced. If there is no sort of damping or insulation between a sliding guide shoe and the elevator car, vibrations and noises are transmitted via the sliding guide shoes to the elevator car, which disturbs the passengers.

[0004] Solutions according to prior art have used various damping solutions in order to eliminate this problem. Rubber insulators, for example, are used between the sliding guide shoe pad and the frame of the guide shoe as this is for example to be seen in document FI 99 203 C from 1995 of the same applicant as for the present invention. However, a problem in these solutions is that in order to get the rubber insulator to stay in its place, it has had to be glued to e.g. the frame of the guide shoe. This is an extra work phase and raises the price of a guide shoe unit. In contrast to this, document US 4,598,798 shows a possibility to click the single parts of elastomeric pad, guide retainer and slide shoe components to one another without needing a gluing.

[0005] In addition, the rubber pieces of uniform thickness that are used yield elastically only according to their material properties, which is relatively little, because the rubber material is not able to move freely in the compression phase. When the flexibility margin is relatively little, one problem is poor drive comfort and also the precision required in installation in order for the sliding guide shoes to be brought into their correct points as accurately as possible. Often it is necessary to use various washers as an aid and to fit the guide shoes by means of them a little at a time into their correct points with respect to the guide rails.

[0006] To this end, above mentioned document US 4,598,798 aims to solve this problem by providing holes in the elastomeric pad, in which stiffener pins can be inserted to change the damping characteristics of the pad.

[0007] In prior art, it has been further known according to document DE 76 07 776 U1 of the year 1976 to form a U-shaped housing for the guide shoe in which an circular elastic pad is accommodated which at its outer edges leaves a distance to the housing rim, so that the pad can be deformed into these spaces for letting a polyamide-sliding shoe turn a bit.

According to document US 4,271,932 a guide shoe is elucidated being from 1981, having the sliding body provided with protrusions which penetrate through apertures of an intermediate elastic pad.

The purpose of this invention is to eliminate the aforementioned drawbacks and to achieve a guide shoe arrangement of an elevator that prevents the vibrations and noise produced by a guide rail to a guide shoe from being transmitted to the elevator car. Another aim is to achieve a guide shoe arrangement of an elevator, wherein the guide shoes are structurally simple and also inexpensive, and their structure is such that they are easy to install into position.

The solution of the present invention is defined by the features of claim 1. Preferred embodiments are disclosed in the subordinate claims.

One advantage of the solution according to the invention is that by means of it the transmission to the elevator car of vibrations and noise produced in the contact of the guide shoes of the car and the guide rail can be reduced. Another advantage is that the arrangement is simple and inexpensive to implement, because the parts are inexpensive and assembly is easy and fast, and e.g. gluing does not slow down the manufacturing. Yet another advantage is that the installation of sliding guide shoes according to the invention is easy and quick, because washers are not needed in the installation for determining the exact position of a sliding guide shoe in relation to the front surface of a guide rail.

[0008] The invention is based on the concept that an elastic insulating part is used to insulate the elevator car from the guide rail. One advantage is the simplicity, efficiency and easy formability of the structure to produce advantageous behavior from the viewpoint of vibration damping and insulation.

[0009] In one basic embodiment of the concept according to the invention in the guide shoe arrangement of an elevator the elevator comprises at least an elevator car, which is fitted to travel in an elevator hoistway essentially vertically guided by at least one guide rail, and also at least one sliding guide shoe per guide rail, which sliding guide shoe comprises at least a frame part and a sliding part disposed to be supported by the frame part. For insulating the elevator car from the guide rail the frame part is insulated from the guide rail with an elastic, i.e. of an elastic material, insulating part in the sliding guide shoe. This can assist in ensuring that there is not a problematic route for vibration to travel to the elevator car. Elasticity

also enables movement between the sliding part and the frame part. (The frame part is preferably arranged to be fixed, preferably rigidly, to its mounting base, such as to the elevator car or to the car sling).

[0010] In a more refined embodiment of the concept according to the invention between the frame part of the sliding guide shoe and the sliding part the elastic insulating part is fitted to be movable in relation to the frame part. Since the insulating part is able to move slightly in relation to the frame part, the pivoting and other slight movement of the sliding part of the insulating part supported inside it is facilitated.

[0011] In a more refined embodiment of the concept according to the invention the elastic insulating part is of rubber. Rubber insulates parts from each other such that it allows relative movement of the parts to be insulated. It is advantageous as a vibration-damping material.

[0012] According to the invention the sliding guide shoe comprises a sliding part, the inner surfaces of which function as sliding surfaces resting directly against the guide rail, and that the sliding part is insulated from the frame part with an elastic insulating part such that the sliding part and/or a support part supporting the sliding part is supported on the frame part only via the aforementioned elastic insulating part. Thus the insulation is comprehensive and effective. Thus ensuring that there is not a route for vibration to travel to the elevator car can be assisted.

[0013] In a more refined embodiment of the concept according to the invention the elastic insulating part is fitted into its position in the frame part by means of precompression and shape-locking. Extensive clearances and the formation of transitory noise can thus be prevented.

[0014] In a more refined embodiment of the concept according to the invention the external cross-section of the elastic insulating part is greater than the cross-section of its essentially trough-shaped location site in the frame part. Extensive clearances and the formation of transitory noise can thus be prevented.

[0015] In a more refined embodiment of the concept according to the invention the sliding part is disposed inside the support part (see mentioning above) that is essentially trough-shaped in its cross-section, and that the combined cross-section of the sliding part and the support part is greater than the essentially trough-shaped internal cross-section of the elastic insulating part. Thus the insulating part precompresses the parts inside it ensuring there is no clearance in a loading situation, because the precompression is released, filling the spaces in which a clearance would otherwise form. It is advantageous to prevent the transitory formation of extensive clearances because the extensive free surfaces of the sliding part and/or of the support part would without insulating support produce noise.

[0016] As said above, between the frame part and each side wall of the elastic insulating part is an air pocket, at the point of which the insulating part is not in contact with the frame part. The elastic insulating part is thus molded also in its shape in addition to its material properties to produce advantageous elastically yielding behavior. An air pocket guarantees a space into which the material of the elastic insulating part can flow as a consequence of compression exerted on it. Thus the material does not need to be selected to be very flexible.

[0017] According to the invention the side walls of the elastic insulating part comprise a plurality of compression protrusions, which rest on the inner walls of the frame part, and that between the aforementioned compression protrusions are recesses, and that at the point of the aforementioned recesses is (when the sliding guide shoe is in an unloaded static state) an air pocket between the frame part and the insulating part, at the point of which air pocket the insulating part is not in contact with the frame part. The elastic insulating part is thus molded also in its shape in addition to its material properties to produce advantageous elastically yielding behavior. By changing the size and shape of the air pocket it is easy to adjust the behavior to be advantageous. An air pocket guarantees a space into which the material of the elastic insulating part can flow as a consequence of compression exerted on it. Thus the material does not need to be selected to be very flexible.

[0018] In a more refined embodiment of the concept according to the invention the elastic insulating part rests on the inner walls of the frame part via the compression protrusions that are in the center area in the longitudinal direction of the elastic insulating part such that there is not an air pocket in the longitudinal direction in the center of the insulating part, and that in the longitudinal direction there is an air pocket between the insulating part and the frame part on both sides of the center area of the insulating part, preferably symmetrically, at the point of which air pocket the insulating part is not in contact with the frame part. The elastic insulating part is thus molded also in its shape in addition to its material properties to produce advantageous elastically yielding behavior. This support enables pivoting of the insulating part around the central area, because the central area has more rigid support than around it. Thus the sliding part can advantageously adapt to variations in the direction of a guide rail.

[0019] In a more refined embodiment of the concept according to the invention the side walls of the elastic insulating part each comprise an elasticity means, which rests on the outer wall of the sliding part, and that the elasticity means preferably comprises compression protrusions, between which are recesses, at the point of which recesses is (when the sliding guide shoe is in an unloaded static state) an air pocket between the sliding part and the insulating part, at the point of which air pocket the insulating part is not in contact with the sliding part. The elastic insulating part is thus molded also in its shape in addition to its material properties to produce advantageous elastically yielding behavior in the sliding part. With the structure described the insulating part is in direct con-

tact with the sliding part and its support can comprise an air pocket between the insulating part and the frame part and between the insulating part and the sliding part.

[0020] In a more refined embodiment of the concept according to the invention between the rear wall of the frame part and the rear wall of the insulating part is an air pocket, at the point of which the insulating part is not in contact with the frame part. This enables an advantageous pivoting movement of the insulating part in relation to the frame part such that the bottom edge of the rear wall of the insulating part approaches the rear wall of the frame part and the top edge recedes from it (and *vice versa*). Thus the sliding part can advantageously adapt to variations in the direction of a guide rail.

[0021] In a more refined embodiment of the concept according to the invention the side wall of the elastic insulating part comprises a plurality of compression protrusions, at the point of which the wall thickness of the side wall is greater than the other part of the side wall, and that between the compression protrusions in the longitudinal direction of the side wall are recesses, in which the wall thickness of the side wall is smaller than, or as large as, the other part of the side wall. The elastic insulating part is thus molded also in its shape in addition to its material properties to produce advantageous elastically yielding behavior.

[0022] In a more refined embodiment of the concept according to the invention the internal compression protrusions of the side wall of the elastic insulating part are fitted through the apertures that are in the side walls of the support part into contact with the outer surface of the side wall of the sliding part. Thus a large support is achieved for the sliding part despite the presence of the support part. This, among other things, decreases the susceptibility to the formation of clearances between the sliding part and the support part, thus reducing noise problems.

[0023] In a more refined embodiment of the concept according to the invention the inner surface of the side wall of the frame part comprises recesses essentially at the point of the elasticity means of the outer surface of the side wall of the elastic insulating part and the compression protrusions of it, and that the wall thickness of the side wall of the elastic insulating part at the point of the compression protrusions is greater than the distance between the base of the recesses on the inner surface of the side wall of the frame part and the outer wall of the sliding part. The elastic insulating part is thus molded also in its shape in addition to its material properties to produce advantageous elastically yielding behavior.

[0024] In a more refined embodiment of the concept according to the invention the depth of the compression protrusions of the outer surface of the side wall of the elastic insulating part from their front edge to their rear edge is smaller than the depth of the recesses in the same direction such that when the insulating part is in its position inside the frame part the rear edges of the compression protrusions are detached from the rear edge of the recesses. In this way an advantageous air pocket forms.

[0025] In a more refined embodiment of the concept according to the invention the rear surface of the rear wall of the insulating part comprises essentially rectangular protrusions, which are fitted to extend into the apertures in the rear wall of the frame part, and that the front surface of the rear wall of the insulating part comprises essentially rectangular protrusions, which are fitted to extend into the apertures in the rear wall of the support part. In this way advantageous shape-locking forms.

[0026] Some inventive embodiments are also presented in the descriptive section and in the drawings of the present application. The features of the various embodiments of the invention can be applied within the framework of the basic inventive concept in conjunction with other embodiments. Each embodiment can also singly and separately from the other embodiments form a separate invention.

[0027] In the following, the invention will be described in detail by the aid of an example of its embodiment with reference to the attached drawings, wherein

- Fig. 1 presents as an explosion drawing an oblique top view of a sliding guide shoe unit according to the invention,
- Fig. 2 presents a front view of a sliding guide shoe unit according to the invention,
- Fig. 3 presents a top view of a sliding guide shoe unit according to the invention, sectioned according to the III-III section line of Fig. 2.
- Fig. 4 presents a side view of a sliding guide shoe unit according to the invention in the free position, sectioned according to the IV-IV section line of Fig. 2,
- Fig. 5 presents a side view of a sliding guide shoe unit according to the invention in the compressed position, sectioned according to the IV-IV section line of Fig. 2,
- Fig. 6 presents a magnified and simplified view of a part of one side edge of an insulating part of a sliding guide shoe unit according to the invention, sectioned according to the VI-VI section line of Fig. 3,
- Fig. 7 presents a front view of a sliding guide shoe unit according to the invention, sectioned according to the VI-VI section line of Fig. 3, and
- Fig. 8 presents a front view of a sliding guide shoe unit according to the invention, sectioned according to the VI-VI section line of Fig. 3, but with the second side edge of the insulating part removed.

[0028] Fig. 1 presents as an explosion drawing one sliding guide shoe unit 1 according to the invention. The sliding guide shoe unit 1 comprises a frame part 2, an insulating part 3, a support part 4 and a sliding part 5 that

are detached from each other and nested, the cross-sectional shape of all of which is an essentially trough-like U-shape that opens towards the front.

[0029] The frame part 2 is e.g. bent from metal plate into such a shape that the rear edges of the frame part 2 have fixing lugs 2a extending outwards to the sides, from the fixing holes 2b in which lugs the frame part 2 is arranged to be fixed to its mounting base, such as to the elevator car or to the car sling. Between the fixing lugs 2a is a trough-shaped space that opens towards the front, which is formed by side walls 2c that in cross-section are at essentially right angles in relation to the fixing lugs 2a as well as by a rear wall 2d that is between the side walls and is in essentially the direction of the fixing lugs 2a.

[0030] The side walls 2c, which are bent from metal plate, of the frame part 2 are twice the thickness of the plate material up to the rear wall 2d except for the recesses 2f on the inner surfaces of the side walls 2c, at the point of which recesses the thickness of the side wall is the same as the thickness of the whole plate material. The inner surface of both side walls 2c comprises in the longitudinal direction, i.e. in the direction of movement of the elevator car, two consecutive flat-bottomed recesses 2f that are essentially rectangular in shape and open towards the front, which recesses are at a vertical distance from each other separated by a neck 2g. The rear wall 2d comprises in a line in the longitudinal direction at regular intervals a plurality of essentially rectangular apertures 2e for the insulating part 3 to be fitted inside the frame part 2.

[0031] In the assembled sliding guide shoe unit 1 the front-opening, trough-shaped insulating part 3 is fitted inside the frame part 2, which insulating part is made of an elastic material such as e.g. of rubber. The insulating part 3 comprises two side walls 3a and a rear wall 3b that is between the side walls and is at a right angle with respect to the side walls. The outer surfaces of the side walls 3a of the insulating part 3 comprise elasticity means 3e, which are fitted into the recesses 2f of the side walls 2c of the frame part 2. In the longitudinal direction there are e.g. two consecutive elasticity means 3e on both outer surfaces of the side wall 3a and they are disposed at essentially the same distance from each other as the recesses 2f. The depth of the elasticity means 3e from their front edge to their rear edge is smaller than the depth of the recesses 2f in the same direction, so that when the insulating part 3 is in its position inside the frame part 2 the rear edges of the elasticity means 3e are detached from the rear edge of the recesses 2f. This structure allows a small pivoting movement of the parts 3-5 that are inside the frame part 2 at least towards the rear wall of the frame part 2 and back as a result of the forces produced by errors in the straightness of the guide rails. The result is good following capability of the guide shoe, which in the elevator car is experienced as good ride comfort.

[0032] The rear surface of the rear wall 3b of the insulating part 3 additionally comprises essentially rectangular protrusions 3i, which are fitted to extend into the apertures 2e in the rear wall 2d of the frame part 2. The protrusions 3i are not visible in Fig. 1 but they are visible in Figs. 3-5. The inner surface of the rear wall 3b comprises corresponding protrusions 3f to those on the outer surface of the rear wall. In addition, the end edges of the inner surface of both side walls 3a of the insulating part 3 comprise elasticity means 3d and in the center of the inner surface in the longitudinal direction is an elasticity means 3c. The end edges, i.e. the top edges and the bottom edges 3g, of the rear wall 3b of the insulating part 3 are bent backwards such that they turn over the end edges, i.e. the top edges and the bottom edges, of the rear wall 2d of the frame part 2 when the sliding guide shoe unit 1 is assembled. In addition, the front edges 3h of the side walls 3a of the insulating part turn over the front edges of the side walls 2c of the frame part 2.

[0033] The insulating part 3 is in cross-section suitably larger in its external dimensions than the frame part 2 in its internal dimensions. Owing to this the insulating part 3 precompresses against the frame part 2 when it is fitted inside the frame part 2, in which case the insulating part 3 remains firmly inside the frame part 2 without glue. In addition, the protrusions 3f and 3i as well as the bends 3g are fitted to improve the staying of the insulating part 3 in its position.

[0034] The protrusions 3f and 3i of the rear wall 3b of the insulating part 3 as well as the elasticity means 3c, 3d and 3e of the side walls are described in more detail in connection with the descriptions of Figs. 3-8.

[0035] In the assembled sliding guide shoe unit 1 a support part 4 is further fitted inside the insulating part 3, which support part is e.g. a trough-shaped piece bent from metal plate into a U-shaped cross-sectional profile and opening towards the front. The support part 4 comprises side walls 4a that extend towards the front and a rear wall 4d between these. The side walls 4a comprise apertures 4b for the elasticity means 3c of the insulating part and apertures 4g for the elasticity means 3d of the insulating part. The rear wall 4d of the support part 3 correspondingly comprises apertures 4e for the protrusions 3f of the inner surface of the rear wall of the insulating part 3. In addition, the end edges, i.e. the top edges and the bottom edges 4f, of the rear wall 4d are bent backwards and also turn over the top edges and the bottom edges of the rear wall 2d of the frame part 2 on top of the top edges and the bottom edges 3g of the rear wall 3b of the insulating part 3 when the sliding guide shoe unit 1 is assembled.

[0036] The support part 4 is in cross-section suitably larger in its external dimensions than the insulating part 3 in its internal dimensions. In this case when the support part 4 is fitted inside the insulating part 3, the support part 4 precompresses the insulating part 3 against the frame part 2, in which case the frame part 2, the insulating part 3 and also the support part 4 remain firmly together.

[0037] The sliding part 5 is fitted inside the support part 4. The sliding part 5 comprises side walls 5a that extend towards the front and a rear wall 5b between these. The

inner surfaces of the sliding part 5 function as sliding surfaces that follow the guide rail. The sliding part 5 is manufactured from some very slippery material, such as from a plastic. The top edges and the bottom edges of the side walls 4a of the support part 4 are bent inwards such that they turn over the ends of the side walls 5a of the sliding part, in which case the sliding part 5 stays inside the support part 4 well.

[0038] The insulating part 3 presses, owing to the precompression, firmly around the support part 4 and the sliding part 5, in which case not even large lateral forces are able in any phase to detach the insulating part 3 from the inner surfaces of the side walls 2c of the frame part 2 nor from the outer surfaces of the support part 4 and of the sliding part 5.

[0039] When the elevator car moves the sliding part 5 of the sliding guide shoe 1 hits the guide rail, in which case forces of different directions are exerted on it owing to, among other things, the points of connection of the guide rails and from the fact that the guide rails are not generally exactly straight. One purpose of the insulating part 3 is to insulate the sliding part 5 from the frame part 2 and thereby to damp the transmission to the elevator car of vibrations produced by forces exerted on the sliding guide shoe. The insulating part 3 damps the vibrations owing to its elastic material and owing to its shaping being suitable for the purpose.

[0040] Fig. 2 presents a sliding guide shoe unit 1 according to the invention as seen from the front, i.e. as viewed from the direction of the guide rail. For the sake of clarity the elastic insulating part 3 is presented in the figure as black.

[0041] Figs. 3-5 present a sliding guide shoe unit 1 according to the invention as different cross-sectional views, as viewed both from the front and from the side. Fig. 3 has sectioned the sliding guide shoe 1 at the center in the longitudinal direction. In this case the frame part 2 is sectioned at the point of the necks 2g, in which case the elasticity elements 3e of the outer surfaces of the side walls of the insulating part 3 are not visible in the figure. Instead the elasticity elements 3c of the inner surfaces of the side walls of the insulating part 3 are visible in Fig. 3, sectioned at their thinnest point and disposed in the holes 4b of the side walls 4a of the support part 4. Fig. 3 also visibly presents the internal protrusions 3f of the rear wall 3b of the insulating part 3 when they are disposed in the apertures 4e in the rear wall 4d of the support part 4 as well as the external protrusions 3i when they are disposed in the apertures 2e in the rear wall 2d of the frame part 2.

[0042] In Fig. 3 and also in Figs. 4 and 5 it is clearly seen that there is a clearance between the rear surface of the rear wall 3b of the insulating part 3 and the front surface of the rear wall 2d of the frame part 2 when the sliding guide shoe unit 1 is assembled into its operating position. In the situation presented by Fig. 4 this clearance is greater than in the situation presented by Fig. 5. In the situation of Fig. 4 the sliding guide shoe unit 1 is free from the compression of the guide rails, e.g. in the installation phase, and the protrusions 3i are only slightly sunk into the apertures 2e. In the situation of Fig. 5, however, the protrusions 3i have pressed deeper into the apertures 2e. In this case e.g. the guide rail presses the sliding part 5 towards the elevator car.

[0043] In elevator installations the distance of the mounting base of the sliding guide shoe and the sliding surface 5c of the sliding part 5 that is against the guide rail is precisely defined. In a normal installation the aforementioned distance is marked in Fig. 5 with the reference L2. Since long guide rails are not straight, this defined distance L2 is extremely difficult to implement and in connection with installation it is necessary to use different washers between the frame of the sliding guide shoe and the mounting base in order to achieve the required accuracy. In the solution according to the invention this problem has been eliminated as a result of the construction and shape of the sliding guide shoe unit 1 and of its parts. The structure now permits placement of the sliding surface 5c of the sliding guide shoe in connection with installation suitably farther, i.e. to the distance L1 instead of the defined distance L2, which distance L1 is presented in Fig. 4. The distance L1 is e.g. between 0-3 mm greater than the distance L2, suitably e.g. approx. 2 mm greater. In this case in connection with installation the sliding surface 5c of the sliding guide shoe can be left to be greater to the extent of the aforementioned difference, in which case the distance L1 settles by itself to be correct, owing to the precompression of the insulating part 3 and the shape construction, when the elevator has been installed.

[0044] Figs. 6-8 present in more detail the shapes of the side walls 3a of the insulating part 3 as cross-sectional views. Figs. 7 and 8 present the insulating part 3 as black and for the sake of clarity in Fig. 8 the second side wall of the insulating part 3 is omitted. The shape of the side wall 3a of the insulating part 3 presented in Fig. 6 at the sectioning point of the wall is precisely optimized with a special calculation method to suit its task in exactly this environment. The outer surface of the side wall 3a comprises two elasticity means 3e that are consecutive in the longitudinal direction, between which means in the center of the side wall 3a in the longitudinal direction is a groove 3m in the height direction of the side wall, which groove is dimensioned such that it fits at its sides tightly on top of the neck 2g in the side wall of the frame part 2.

[0045] In the longitudinal direction both ends of the elasticity means 3e comprise compression protrusions 3k and 31 that extend outwards from the outer surface of the side wall 3a and between the compression protrusions is a recess 3j with a curved base. In the height direction, i.e. in the depth direction, of the side wall 3a the compression protrusions 3k and 31 do not extend to the rear edge of the side wall 3a, as stated already earlier, and the depth of said protrusions is smaller than the depth in the same direction of the recesses 2f in the inner surface of the side walls 2c of the frame part 2.

[0046] Correspondingly the inner surface of the side wall 3a comprises three elasticity means 3d and 3c that are consecutive in the longitudinal direction. Both ends of the side wall 3a comprise one elasticity means 3d and in the center in the longitudinal direction is an elasticity means 3c. The elasticity means 3d at the ends extend for their whole distance essentially evenly outwards from the inner surface, whereas the elasticity means 3c is reminiscent of the elasticity means 3e of the outer surface, and it comprises in the longitudinal direction at both ends of the elasticity means 3c compression protrusions 3n and 3p that extend outwards from the inner surface of the side wall 3a and between the compression protrusions a recess 3o with a curved base. In the height direction, i.e. in the depth direction, of the side wall 3a, the compression protrusions 3d, 3n, 3p are in the center of the side wall 3a, in which case they are at a distance from both the front edge and the rear edge of the side wall 3a.

[0047] The thickness L3 of the side wall 3a of the insulating part 3 is at its greatest at the point of the compression protrusions and is at its thinnest between them such that when the side wall 3a is compressed under the effect of lateral forces, material flows from the compression protrusions 3k, 31, 3d, 3n and 3p into the thinnest points, i.e., into the recesses 3j and 3o, of the elasticity means 3c and 3e. At these points there is an air pocket P in the unloaded structure. Compression occurs when assembling the sliding guide shoe unit 1 and during a run of the elevator owing to the lateral forces produced by the guide rail. Compression causes, among other things, the wall thickness L3 of the side wall 3a at the point of the compression protrusions to be greater than the distance L4 between the base of the recesses 2f on the inner surface of the side wall 2c of the frame part 2 and the outer wall of the sliding part 5 in a finally assembled sliding guide shoe unit. In this case precompression is involved. The distance L4 is easily visible in Fig. 8, in which the second side wall of the insulating part 3 has been removed. In Figs. 7 and 8 it is seen how the side walls 3a of the insulating part 3 are compressed at the point of the compression protrusions between the side walls of the frame part 2 and the sliding part 5.

[0048] The recesses 2f still contain space at the point of the recesses of the elasticity means 3e and correspondingly the apertures 4b still contain space at the point of the recesses of the elasticity means 3c for the compressive effect of additional lateral forces. If this type of lateral force caused by the guide rail pushes the sliding part 5 in the lateral direction, e.g. in Figs. 7 and 8 to the left, the side wall 3a on the left-hand side compresses even more and simultaneously the compression of the side wall on the right-hand side decreases, but owing to the precompression the compression protrusions do not detach from the inner wall of the frame part 2 nor from the outer wall of the sliding part 5, but instead contract in the longitudinal direction of the sliding guide shoe towards their free shape. In this case the thickness of the inner wall at the point of the compression protrusions increases with the widened dimension L4, but owing to the precompression always remains smaller than L3. Thus, owing to the precompression, the insulating part 3 remains firmly compressed around the support part 4 and the sliding part 5, in which case they do not produce excessive noise.

[0049] In the guide shoe arrangement according to the invention the elevator car is preferably insulated from the guide rails via an insulating part 3 that is in a sliding guide shoe and fitted to be movable. For example, shape-locking (e.g. 3i, 2e) allows the insulating part to move at least in the lateral direction in relation to the frame part. Despite the movement the precompression keeps both sides of the insulating part and the frame part in continuous contact with each other, thus preventing the "resonating" of the structure. The compression behavior resulting from the shaping of the insulating part resists the aforementioned movement according to a preferred progression curve. The movement is also able to originate preferably by pivoting in the manner described.

[0050] It is obvious to the person skilled in the art that different embodiments of the invention are not only limited to the examples described above, but that they may be varied within the scope of the claims presented below. Thus, for example, the structure of the sliding guide shoe unit can be different to what is presented above.

[0051] It is also obvious to the person skilled in the art that the number and shape of the elasticity means and of the compression protrusions can be different to what is presented above. It is also obvious that the support part is not necessary in the invention. The elastic insulating part can be in some advantageous point between the sliding part and the frame part, e.g. directly between the frame part and the sliding part, because the sliding part can be made sufficiently rigid to rest directly on the elastic insulating part without a support part.

Claims

1. Sliding guide shoe for guiding an elevator car in an elevator hoistway essentially vertically by at least one guide rail,
   which sliding guide shoe (1) comprises at least a frame part (2) and a sliding part (5) disposed to be supported by the frame part (2), wherein for insulating the elevator car from the guide rail the frame part (2) is insulated with an elastic insulating part (3) in the sliding guide shoe (1), **characterized in that** side walls (3a) of the elastic insulating part (3) comprise a plurality of compression protrusions (3k, 31, 3d, 3n, 3p), which rest on inner walls of the frame part (2), and **in that** between the aforementioned compression protrusions are recesses (3j, 3o), and **in that** at the point of the aforementioned recesses is an air pocket (P1) between the frame part (2) and the insulating part (3), at the point of which air pocket the insulating part (3) is not in contact with the frame

part (2).

2. Sliding guide shoe (1) according to claim 1, **characterized in that** between the frame part (2) of the sliding guide shoe (1) and the sliding part (5) the elastic insulating part (3) is fitted to be movable in relation to the frame part (2).

3. Sliding guide shoe (1) according to claim 1 or 2, **characterized in that** inner surfaces of the sliding part (5) function as sliding surfaces resting directly against the guide rail, and **in that** the sliding part (5) is insulated from the frame part (2) by means of the elastic insulating part (3) such that the sliding part (5) and/or a support part (4) supporting the sliding part (5) is supported on the frame part (2) only via the aforementioned elastic insulating part (3).

4. Sliding guide shoe (1) according to claim 1, 2 or 3, **characterized in that** the elastic insulating part (3) is fitted into its position in the frame part (2) by means of precompression and shape-locking.

5. Sliding guide shoe (1) according to claim 1, 2, 3 or 4, **characterized in that** the external cross-section of the elastic insulating part (3) is greater than the cross-section of its essentially trough-shaped location site in the frame part (2).

6. Sliding guide shoe (1) according to any of the preceding claims, **characterized in that** the sliding part (5) is disposed inside a support part (4) that is essentially trough-shaped in its cross-section, and **in that** the combined cross-section of the sliding part (5) and the support part (4) is greater than the essentially trough-shaped internal cross-section of the elastic insulating part (3).

7. Sliding guide shoe (1) according to any of the preceding claims, **characterized in that** the elastic insulating part (3) rests on the inner walls of the frame part (2) via the compression protrusions (3k) that are in the center area in the longitudinal direction of the elastic insulating part such that there is not an air pocket in the longitudinal direction in the center of the insulating part, and **in that** in the longitudinal direction there is an air pocket (P1) between the insulating part and the frame part on both sides of the center area of the insulating part (3), preferably symmetrically, at the point of which air pocket the insulating part (3) is not in contact with the frame part (2).

8. Sliding guide shoe (1) according to any of the preceding claims, **characterized in that** the side walls (3a) of the elastic insulating part (3) each comprise an elasticity means (3c, 3d), which rests on the outer wall of the sliding part (5), and **in that** the elasticity means (3c, 3d) preferably comprises compression protrusions, between which are recesses, at the point of which recesses is an air pocket (P3) between the sliding part (5) and the insulating part (3), at the point of which air pocket the insulating part (3) is not in contact with the sliding part (5).

9. Sliding guide shoe (1) according to any of the preceding claims, **characterized in that** between the rear wall (2d) of the frame part (2) and the rear wall (3b) of the insulating part (3) is an air pocket (P2), at the point of which the insulating part (3) is not in contact with the frame part (2).

10. Sliding guide shoe (1) according to any of the preceding claims, **characterized in that** the side wall (3a) of the elastic insulating part (3) comprises a plurality of compression protrusions (3k, 31, 3d, 3n, 3p), at the point of which the wall thickness (L3) of the side wall (3a) is greater than the other part of the side wall, and **in that** between the compression protrusions in the longitudinal direction of the side wall are recesses (3j, 3o), in which the wall thickness of the side wall (3a) is smaller than, or as large as, the other part of the side wall.

11. Sliding guide shoe (1) according to any of the preceding claims, **characterized in that** the inner compression protrusions (3d, 3n, 3p) of the side wall (3a) of the elastic insulating part (3) are fitted through apertures (4b, 4g) in the side walls (4a) of the support part (4) into contact with the outer surface of the side wall (5a) of the sliding part (5).

12. Sliding guide shoe (1) according to any of the preceding claims, **characterized in that** the inner surface of the side wall (2c) of the frame part (2) comprises recesses (2f) essentially at the point of elasticity means (3e) of the outer surface of the side wall (3a) of the elastic insulating part (3) and the compression protrusions (3k, 3l) of it, and **in that** the wall thickness (L3) of the side wall (3a) of the elastic insulating part (3) at the point of the compression protrusions (3k, 31, 3d, 3n, 3p) is greater than a distance (L4) between the base of the recesses (2f) on the inner surface of the side wall (2c) of the frame part (2) and the outer wall of the sliding part (5).

13. Sliding guide shoe (1) according to any of the preceding claims, **characterized in that** the depth of the compression protrusions (3k, 3l) of the outer surface of the side wall (3a) of the elastic insulating part (3) from their front edge to their rear edge is smaller than the depth of the recesses (2f) in the same direction such that when the insulating part (3) is in its position inside the frame part (2) the rear edges of the compression protrusions (3k, 3l) are detached from the rear edge of the recesses (2f).

14. Sliding guide shoe (1) according to any of the preceding claims, **characterized in that** the rear surface of the rear wall (3b) of the insulating part (3) comprises essentially rectangular protrusions (3i), which are fitted to extend into the apertures (2e) in the rear wall (2d) of the frame part (2), and **in that** the front surface of the rear wall (3b) of the insulating part (3) comprises essentially rectangular protrusions (3f), which are fitted to extend into the apertures (4e) in the rear wall (4d) of the support part (4).

15. Sliding guide shoe (1) according to any of the preceding claims, **characterized in that** the elastic insulating part (3) is of rubber.

Patentansprüche

1. Gleitführungsschuh zum im Wesentlichen vertikalen Führen einer Aufzugskabine in einem Aufzugsschacht durch mindestens eine Führungsschiene, welcher Gleitführungsschuh (1) mindestens ein Rahmenteil (2) sowie ein Gleitteil (5) aufweist, das angeordnet ist, um durch das Rahmenteil (2) unterstützt zu werden, wobei zum Abschirmen der Aufzugskabine von der Führungsschiene das Rahmenteil (2) mit einem elastischen Abschirmteil (3) in dem Gleitführungsschuh (1) abgeschirmt ist, **dadurch gekennzeichnet, dass** Seitenwände (3a) des elastischen Abschirmteils (3) eine Mehrzahl an Kompressionsvorsprüngen (3k, 3l, 3d, 3n, 3p) aufweisen, die auf Innenwänden des Rahmenteils (2) ruhen, und dass zwischen den besagten Kompressionsvorsprüngen Vertiefungen (3j, 3o) sind, und dass an dem Punkt der besagten Vertiefungen eine Luft-Tasche (P1) zwischen dem Rahmenteil (2) und dem Abschirmteil (3) ist, wobei an dem Punkt der Luft-Tasche das Abschirmteil (3) nicht mit dem Rahmenteil (2) in Kontakt steht.

2. Gleitführungsschuh (1) gemäß Anspruch 1, **dadurch gekennzeichnet, dass** zwischen dem Rahmenteil (2) des Gleitführungsschuhs (1) und dem Gleitteil (5) das elastische Abschirmteil (3) eingepasst ist, um relativ zu dem Rahmenteil (2) bewegbar zu sein.

3. Gleitführungsschuh (1) gemäß Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** innere Flächen des Gleitteils (5) als Gleitflächen fungieren, die direkt gegen die Führungsschiene ruhen, und dass das Gleitteil (5) von dem Rahmenteil (2) mittels des elastischen Abschirmteils (3) abgeschirmt ist, derart, dass das Gleitteil (5) und/oder ein Stützteil (4), das das Gleitteil (5) unterstützt, auf dem Rahmenteil (2) nur über das besagte elastische Abschirmteil (3) unterstützt ist.

4. Gleitführungsschuh (1) gemäß Anspruch 1, 2 oder 3, **dadurch gekennzeichnet, dass** das elastische Abschirmteil (3) an seiner Stelle in dem Rahmenteil (2) mittels Vorkompression und Formschluss-Fixierung eingepasst ist.

5. Gleitführungsschuh (1) gemäß Anspruch 1, 2, 3 oder 4, **dadurch gekennzeichnet, dass** der externe Querschnitt des elastischen Abschirmteils (3) größer ist als der Querschnitt seiner im Wesentlichen wannenförmigen Platzierungsstelle in dem Rahmenteil (2).

6. Gleitführungsschuh (1) gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das Gleitteil (5) innerhalb eines Stützteiles (4) angeordnet ist, das im Wesentlichen wannenförmig in seinem Querschnitt ist, und dass der kombinierte Querschnitt aus Gleitteil (5) und dem Stützteil (4) größer ist als der im Wesentlichen wannenförmige interne Querschnitt des elastischen Abschirmteils (3).

7. Gleitführungsschuh (1) gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das elastische Abschirmteil (3) auf den Innenwänden des Rahmenteils (2) über die Druckvorsprünge (3k) ruht, die in dem Zentrumsbereich in der Längsrichtung des elastischen Abschirmteils vorliegen, derart, dass es hier keine Luft-Tasche in der Längsrichtung in dem Zentrum des Abschirmteils gibt, und dass es in der Längsrichtung eine Luft-Tasche (P1) zwischen dem Abschirmteil und dem Rahmenteil auf beiden Seiten des Zentrumsbereiches des Abschirmteiles (3) gibt, vorzugsweise symmetrisch, und zwar an dem Punkt, an dem die Luft-Tasche des Abschirmteils (3) nicht mit dem Rahmenteil (2) in Kontakt ist.

8. Gleitführungsschuh (1) gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Seitenwände (3a) des elastischen Abschirmteils (3) jeweils ein Elastizitätsmittel (3c, 3d) aufweisen, die auf der Außenwand des Gleitteils (5) ruhen, und dass die Elastizitätsmittel (3c, 3d) vorzugsweise Kompressionsvorsprünge aufweisen, zwischen denen Vertiefungen vorliegen, wobei an dem Punkt der Vertiefungen sich eine Luft-Tasche (P3) zwischen dem Gleitteil (5) und dem Abschirmteil (3) befindet, wobei an dem Punkt der Luft-Tasche der Abschirmteil (3) nicht mit dem Gleitteil (5) in Kontakt ist.

9. Gleitführungsschuh (1) gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** zwischen der Rückwand (2d) des Rahmenteils (2) und der Rückwand (3b) des Abschirmteils (3) eine Luft-Tasche (P2) ist, an deren Punkt der Ab-

schirmteil (3) nicht mit dem Rahmenteil (2) in Kontakt ist.

10. Gleitführungsschuh (1) gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Seitenwand (3a) des elastischen Abschirmteils (3) eine Mehrzahl an Kompressionsvorsprüngen (3k, 3l, 3d, 3n, 3p) aufweist, an deren Punkt die Wanddicke (L3) der Seitenwand (3a) größer ist als der andere Teil der Seitenwand, und dass zwischen den Kompressionsvorsprüngen in der Längsrichtung der Seitenwand Vertiefungen (3j, 3o) vorliegen, in denen die Wanddicke der Seitenwand (3a) kleiner oder gleich groß gegenüber dem anderen Teil der Seitenwand ist.

11. Gleitführungsschuh (1) gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Innen-Kompressionsvorsprünge (3d, 3n, 3p) der Seitenwand (3a) des elastischen Abschirmteils (3) durch Öffnungen (4b, 4g) in den Seitenwänden (4a) des Stützteiles (4) in Kontakt mit der Außenfläche der Seitenwand (5a) des Gleitteils (5) implementiert sind.

12. Gleitführungsschuh (1) gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Innenfläche der Seitenwand (2c) des Rahmenteils (2) Vertiefungen (2f) aufweist, im Wesentlichen an dem Punkt der Elastizitätsmittel (3e) der Außenfläche der Seitenwand (3a) des elastischen Abschirmteils (3) und der Kompressionsvorsprünge (3k, 3l) hiervon, und dass die Wanddicke (L3) der Seitenwand (3a) des elastischen Abschirmteils (3) an dem Punkt der Kompressionsvorsprünge (3k, 3l, 3d, 3n, 3p) größer ist als ein Abstand (L4) zwischen der Basis der Vertiefungen (2f) auf der Innenfläche der Seitenwand (2c) des Rahmenteils (2) und der Außenwand des Gleitteils (5).

13. Gleitführungsschuh (1) gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Tiefe der Kompressionsvorsprünge (3k, 3l) der Außenfläche der Seitenwand (3a) des elastischen Abschirmteils (3) von deren Frontrand zu ihrem rückwärtigen Rand kleiner ist als die Tiefe der Vertiefungen (2f) in derselben Richtung, derart, dass wenn sich das Abschirmteil (3) in seiner Position innerhalb des Rahmenteils (2) befindet, die rückwärtigen Ränder der Kompressionsvorsprünge (3k, 3l) von dem rückwärtigen Rand der Vertiefungen (2f) abgelöst sind.

14. Gleitführungsschuh (1) gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die rückwärtige Fläche der Rückwand (3b) des Abschirmteils (3) im Wesentlichen rechteckige Vorsprünge (3i) aufweist, die so implementiert sind, dass sie sich in die Öffnungen (2e) in der Rückwand (2d) des Rahmenteils (2) erstrecken, und dass die Frontfläche der Rückwand (3b) des Abschirmteils (3) im Wesentlichen rechteckige Vorsprünge (3f) aufweist, die implementiert sind, um sich in die Öffnungen (4e) in der Rückwand (4d) des Stützteiles (4) zu erstrecken.

15. Gleitführungsschuh (1) gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das elastische Abschirmteil (3) aus Gummi ist.

Revendications

1. Patin de guidage coulissant pour guider une cabine d'ascenseur dans une gaine d'ascenseur sensiblement verticalement par au moins un rail de guidage, ledit patin de guidage coulissant (1) comprenant au moins une partie de cadre (2) et une partie coulissante (5) disposée pour être supportée par la partie de cadre (2), dans lequel pour isoler la cabine d'ascenseur du rail de guidage la partie de cadre (2) est isolée avec une partie isolante élastique (3) dans le patin de guidage coulissant (1), **caractérisé en ce que** les parois latérales (3a) de la partie isolante élastique (3) comprennent une pluralité de protubérances de compression (3k, 3l, 3d, 3n, 3p), qui reposent sur des parois intérieures de la partie de cadre (2) et **en ce que**, entre lesdites protubérances de compression, se trouvent des évidements (3j, 3o), et **en ce que**, au niveau desdits évidements se trouve une poche d'air (P1) entre la partie de cadre (2) et la partie isolante (3), au niveau de ladite poche d'air la partie isolante (3) n'étant pas en contact avec la partie de cadre (2).

2. Patin de guidage coulissant (1) selon la revendication 1, **caractérisé en ce que**, entre la partie de cadre (2) du patin de guidage coulissant (1) et la partie coulissante (5), la partie isolante élastique (3) est installée pour être mobile par rapport à la partie de cadre (2).

3. Patin de guidage coulissant (1) selon la revendication 1 ou 2, **caractérisé en ce que** les surfaces intérieures de la partie coulissante (5) fonctionnent comme des surfaces coulissantes qui reposent directement contre le rail de guidage, et **en ce que** la partie coulissante (5) est isolée de la partie de cadre (2) au moyen de la partie isolante électrique (3) de telle sorte que la partie coulissante (5) et/ou une partie de support (4) qui supporte la partie coulissante (5) est supportée sur la partie de cadre (2) uniquement par le biais de ladite partie isolante élastique (3).

4. Patin de guidage coulissant (1) selon la revendica-

tion 1, 2 ou 3, **caractérisé en ce que** la partie isolante élastique (3) est installée dans sa position dans la partie de cadre (2) au moyen d'une précompression et d'un verrouillage de forme.

5. Patin de guidage coulissant (1) selon la revendication 1, 2, 3 ou 4, **caractérisé en ce que** la coupe transversale externe de la partie isolante élastique (3) est supérieure à la coupe transversale de son site d'emplacement sensiblement en forme de creux dans la partie de cadre (2).

6. Patin de guidage coulissant (1) selon une quelconque des revendications précédentes, **caractérisé en ce que** la partie coulissante (5) est disposée à l'intérieur d'une partie de support (4) qui est sensiblement en forme de creux dans sa coupe transversale, et **en ce que** la coupe transversale combinée de la partie coulissante (5) et de la partie de support (4) est supérieure à la coupe transversale interne sensiblement en forme de creux de la partie isolante élastique (3).

7. Patin de guidage coulissant (1) selon une quelconque des revendications précédentes, **caractérisé en ce que** la partie isolante élastique (3) repose sur les parois intérieures de la partie de cadre (2) par le biais des protubérances de compression (3k) qui sont dans la zone centrale dans la direction longitudinale de la partie isolante élastique de telle sorte qu'il n'y a pas de poche d'air dans la direction longitudinale dans le centre de la partie isolante, et **en ce que**, dans la direction longitudinale, il y a une poche d'air (PI) entre la partie isolante et la partie de cadre des deux côtés de la zone centrale de la partie isolante (3), de préférence symétriquement, au niveau de ladite poche d'air la partie isolante (3) n'étant pas en contact avec la partie de cadre (2).

8. Patin de guidage coulissant (1) selon une quelconque des revendications précédentes, **caractérisé en ce que** les parois latérales (3a) de la partie isolante élastique (3) comprennent chacune un moyen d'élasticité (3c, 3d), qui repose sur la paroi extérieure de la partie coulissante (5), et **en ce que** le moyen d'élasticité (3c, 3d) comprend de préférence des protubérances de compression, entre lesquelles se trouvent des évidements, au niveau desdits évidements se trouvant une poche d'air (P3) entre la partie coulissante (5) et la partie isolante (3), au niveau de ladite poche d'air la partie isolante (3) n'étant pas en contact avec la partie coulissante (5).

9. Patin de guidage coulissant (1) selon une quelconque des revendications précédentes, **caractérisé en ce que**, entre la paroi arrière (2d) de la partie de cadre (2) et la paroi arrière (3b) de la partie isolante (3) se trouve une poche d'air (P2), au niveau de laquelle la partie isolante (3) n'est pas en contact avec la partie de cadre (2).

10. Patin de guidage coulissant (1) selon une quelconque des revendications précédentes, **caractérisé en ce que** la paroi latérale (3a) de la partie isolante élastique (3) comprend une pluralité de protubérances de compression (3k, 3l, 3d, 3n, 3p), au niveau desquelles l'épaisseur de paroi (L3) de la paroi latérale (3a) est supérieure à l'autre partie de la paroi latérale, et **en ce que**, entre les protubérances de compression dans la direction longitudinale de la paroi latérale, se trouvent des évidements (3j, 3o), dans lesquels l'épaisseur de paroi de la paroi latérale (3a) est infiérieure à l'autre partie de la paroi latérale, ou aussi grande que celle-ci.

11. Patin de guidage coulissant (1) selon une quelconque des revendications précédentes, **caractérisé en ce que** les protubérances de compression intérieures (3d, 3n, 3p) de la paroi latérale (3a) de la partie isolante élastique (3) sont installées à travers des ouvertures (4b, 4g) dans les parois latérales (4a) de la partie de support (4) en contact avec la surface extérieure de la paroi latérale (5a) de la partie coulissante (5).

12. Patin de guidage coulissant (1) selon une quelconque des revendications précédentes, **caractérisé en ce que** la surface intérieure de la paroi latérale (2c) de la partie de cadre (2) comprend des évidements (2f) sensiblement au niveau du moyen d'élasticité (3e) de la surface extérieure de la paroi latérale (3a) de la partie isolante élastique (3) et des protubérances de compression (3k, 3l) de celle-ci, et **en ce que** l'épaisseur de paroi (L3) de la paroi latérale (3a) de la partie isolante élastique (3) au niveau des protubérances de compression (3k, 3l, 3d, 3n, 3p) est supérieure à une distance (L4) entre la base des évidements (2f) sur la surface intérieure de la paroi latérale (2c) de la partie de cadre (2) et la paroi extérieure de la partie coulissante (5).

13. Patin de guidage coulissant (1) selon une quelconque des revendications précédentes, **caractérisé en ce que** la profondeur des protubérances de compression (3k, 3l) de la surface extérieure de la paroi latérale (3a) de la partie isolante élastique (3) depuis leur bord avant jusqu'à leur bord arrière est infiérieure à la profiondeur des évidements (2f) dans la même direction de telle sorte que, lorsque la partie isolante (3) est dans sa position à l'intérieur de la partie de cadre (2), les bords arrières des protubérances de compression (3k, 3l) sont détachés du bord arrière des évidements (2f).

14. Patin de guidage coulissant (1) selon une quelconque des revendications précédentes, **caractérisé**

en ce que la surface arrière de la paroi arrière (3b) de la partie isolante (3) comprend des protubérances sensiblement rectangulaires (3i), qui sont installées pour s'étendre jusque dans les ouvertures (2e) dans la paroi arrière (2d) de la partie de cadre (2), et **en ce que** la surface frontale de la paroi arrière (3b) de la partie isolante (3) comprend des protubérances sensiblement rectangulaires (3f), qui sont installées pour s'étendre jusque dans les ouvertures (4e) dans la paroi arrière (4d) de la partie de support (4).

15. Patin de guidage coulissant (1) selon une quelconque des revendications précédentes, **caractérisé en ce que** la partie isolante élastique (3) est en caoutchouc.

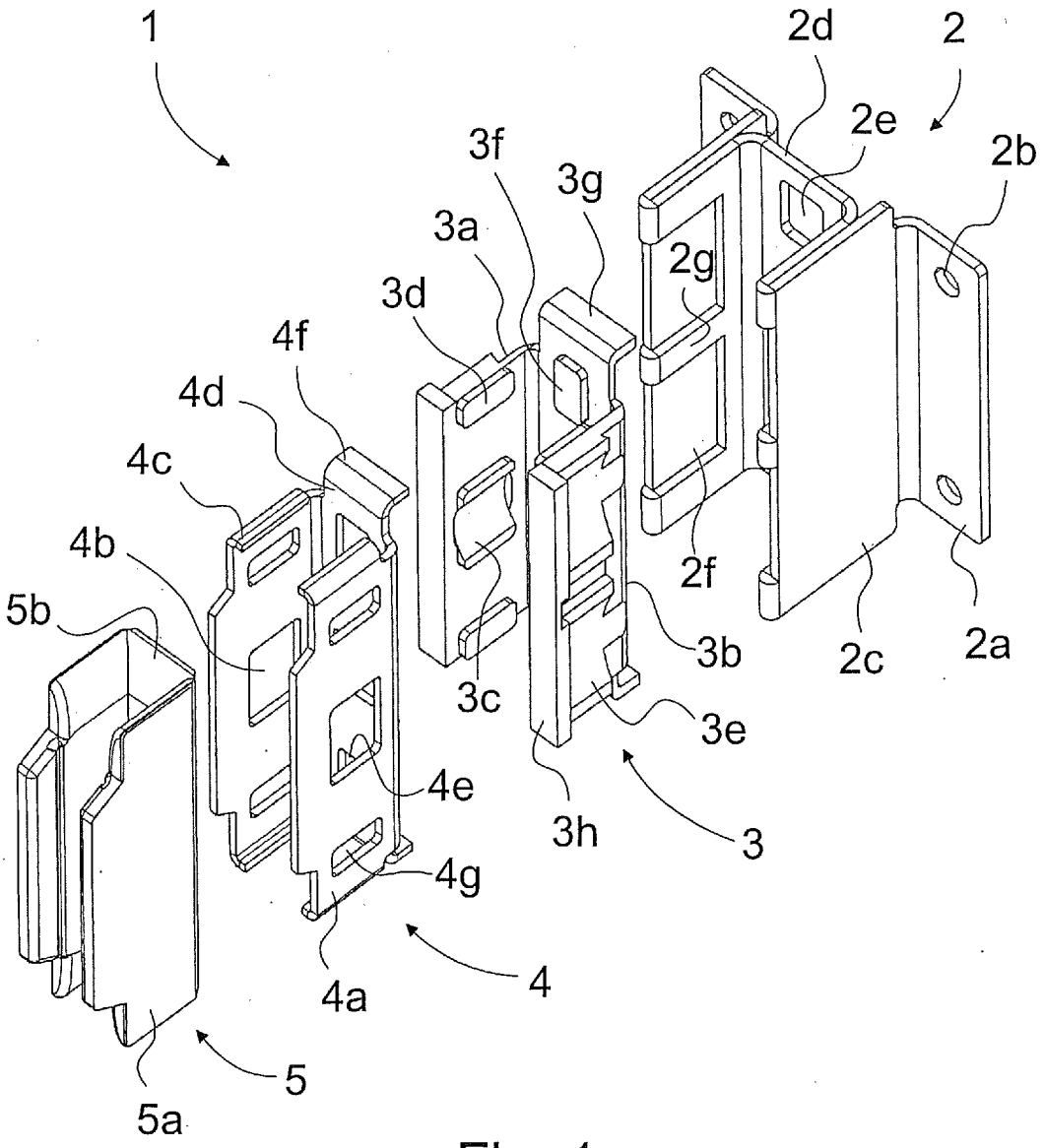

1
2d
2
2e
2b
3f
3g
3a
2g
3d
4f
4d
4c
4b
5b
2f
3b
2c
2a
3c
3e
4e
3h
3
4g
4a
4
5
5a

Fig. 1

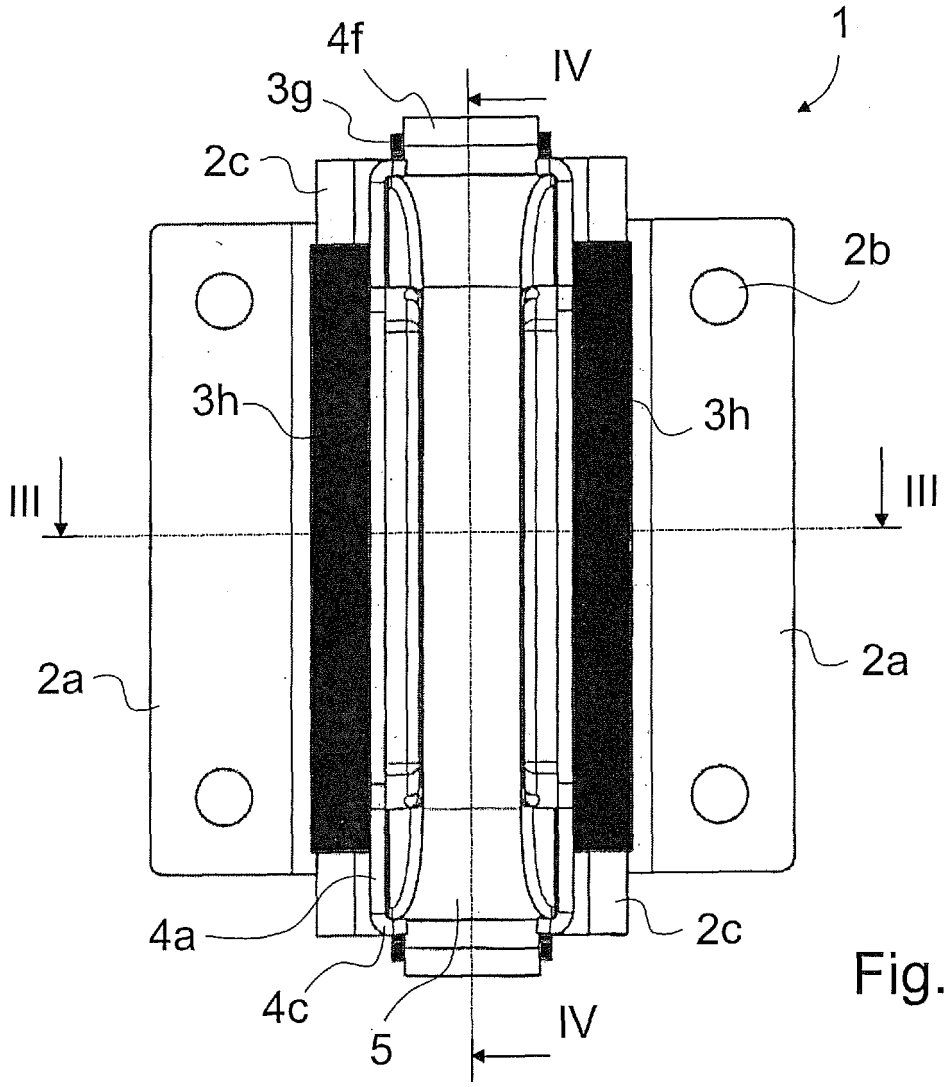

1
4f
IV
3g
2c
2b
3h
3h
III
III
2a
2a
4a
2c
4c
5
IV

Fig. 2

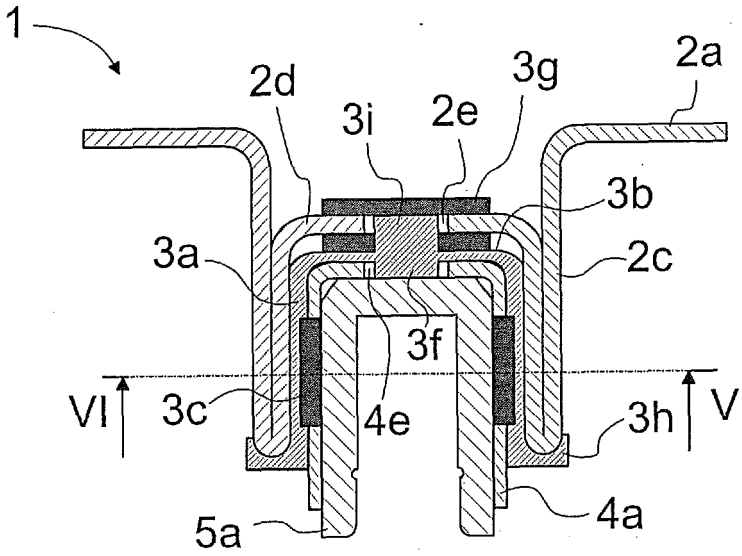

1
2d
3i
2e
3g
2a
3b
3a
2c
3f
VI
3c
4e
3h
VI
5a
4a

Fig. 3

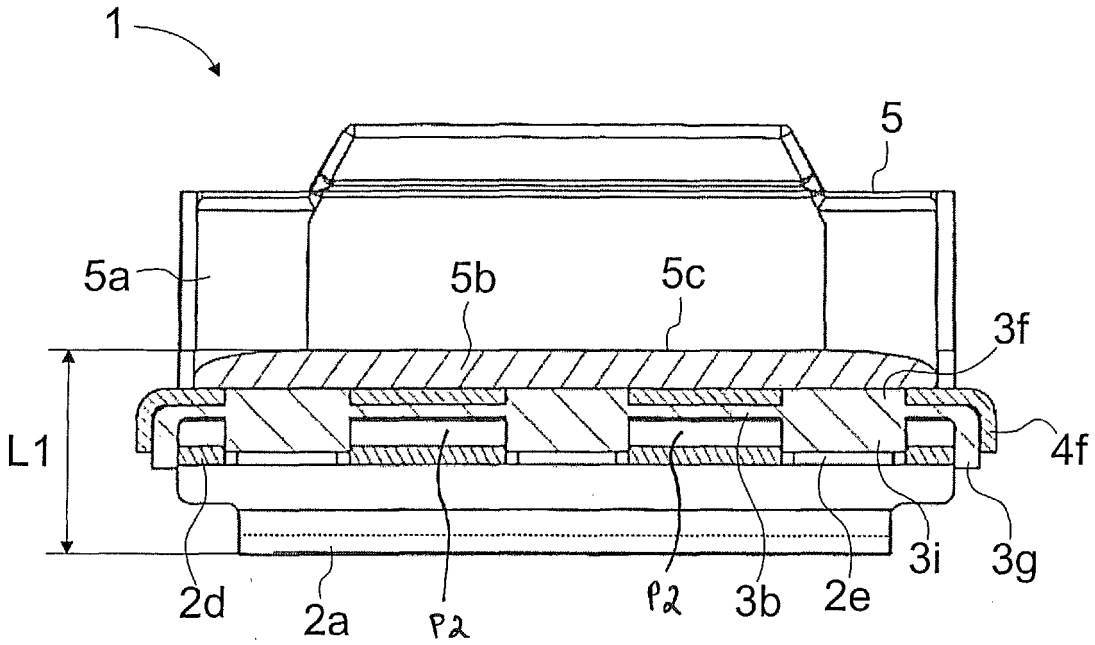

1
5
5a
5b
5c
3f
4f
L1
2d
2a
P2
P2
3b
2e
3i
3g

Fig. 4

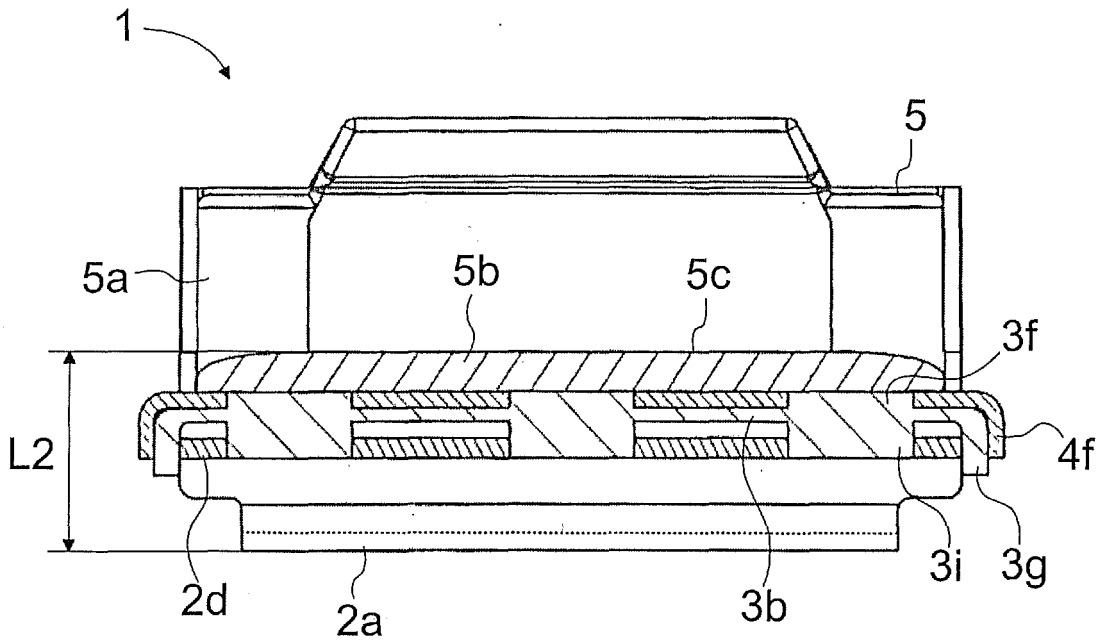

1
5
5a
5b
5c
3f
4f
L2
2d
2a
3b
3i
3g

Fig. 5

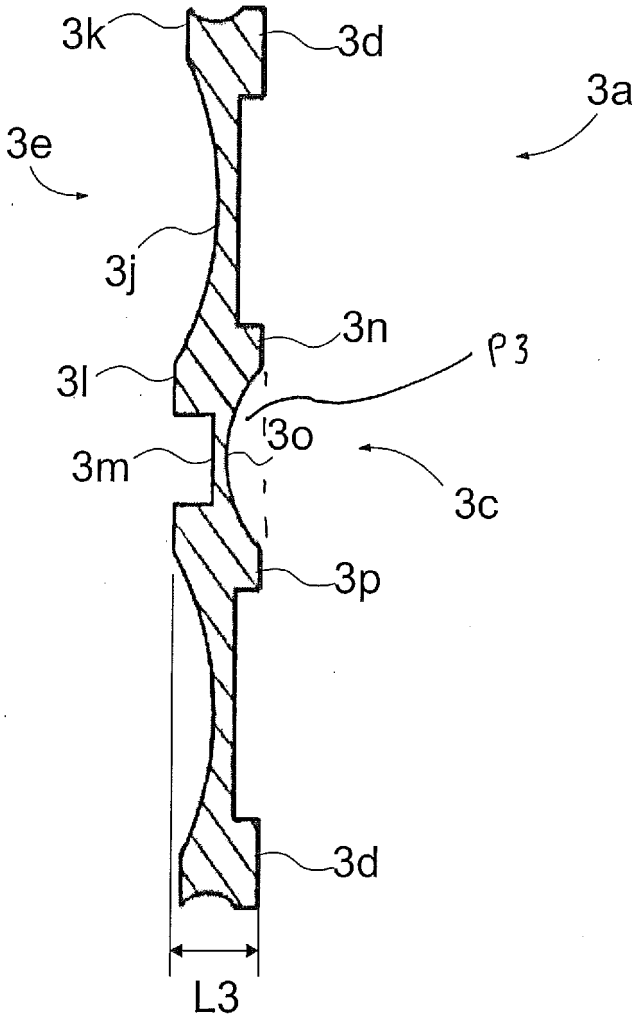


Fig. 6

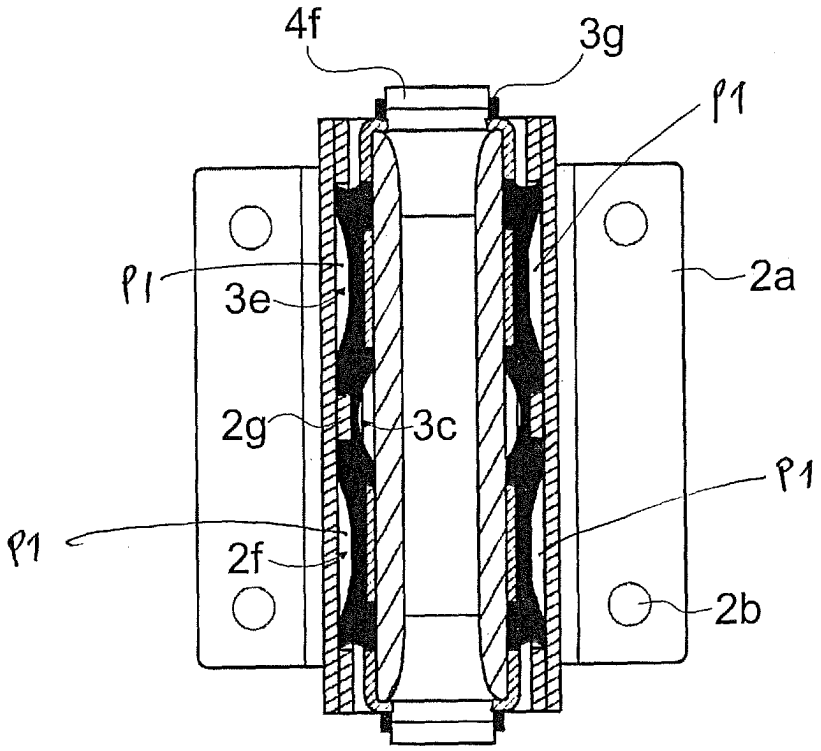

4f
3g
P1
P1
3e
2a
2g
3c
P1
P1
2f
2b

Fig. 7

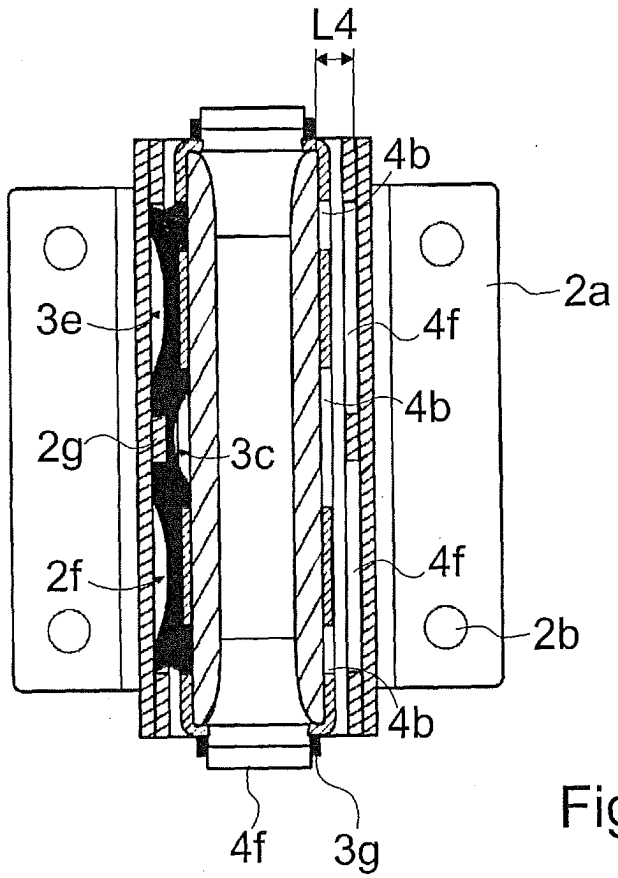

L4
4b
2a
3e
4f
4b
2g
3c
2f
4f
2b
4b
4f
3g

Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 4598798 A **[0004] [0006]**
- DE 7607776 U1 **[0007]**
- US 4271932 A **[0007]**