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(54) DAMPENING SPACER

DÄMPFUNGSABSTANDSHALTER

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Description

Technical field

[0001] The present invention relates to a spacer arranged for supporting and positioning a construction element at a distance from a support surface. This type of solution often is called "floating floor", where the floor is arranged on spacers positioned on a support structure like a floor joist.

Technical background

[0002] Spacers used at floorboards or floor joists are known and so-called floating floors are used for example when installations like ventilation, water pipes, electrical cables and the like must be positioned below the floor, or if the supporting floor is uneven or sloping and needs to be adjusted. Other applications may also be applicable for spacers arranged for supporting and positioning of the construction element relative a support surface. One aspect of this type of floor may be sound attenuation, for example the possibility of dampening sound from steps or other noise caused by an object hitting the floor. For this purpose, the spacers may be equipped with elastic dampers at their lowermost end or foot, which faces the support structure. These dampers may be of different kinds, where for example one is small enough to pass a through a hole in the construction element (floorboard). This type has problems which are associated with the small dimension of the damper. If the resilient material is too hard, vibrations will propagate through it, and the damping effect will be insufficient. If a softer material is used as resilient material, it might be too easily deformed, since the pressure on the damper is too great, due to the small dimension. To solve the latter problem, another type of damper which is considerably larger, is used to reduce the pressure on the damper and to make it possible to use a softer material. But such a damper cannot pass through the hole in the construction element, which means that the spacer and damper must be mounted on the underside of the building element, which can be difficult. This solution is used in SE 525 035 C2, where a spacer comprises a support foot with a resilient material positioned under the foot and which spacer has a first engaging means, by means of which it is attachable in a construction element, and that a spacer screw and the support foot have corresponding engaging means by which the spacer screw is fastened on the support foot. This solution provides a way of easy positioning of a dampening support foot to the spacer, wherein the spacer enables support for the construction element as well a fairly good sound attenuation.

[0003] Another solution is presented in DE 38 18 895 A1, which discloses a spacer which has a positioning means for engagement with a through hole in a floorboard, an elongate spacer screw with an external thread and a support foot. The spacer further has support means for supporting an underside of the floorboard and further a plate or a bushing of some kind arranged between the support and the floorboard. This solution further comprises a lot of details which are to be arranged in/at the hole of the floorboard and by that is rather complicated and expensive. Another solution is presented in EP 2 113 619 A2, which discloses a similar solution like the German document, but which also comprises a planar vibration-absorbing panel located on top of the support means and around an exterior of the hollow spacer screw. This solution is not arranged into a through hole of the floorboard and has the drawback of being bulky and not so flexible.

[0004] There is still a problem with today solutions regarding sound attenuation, since either the sound dampening material is not large enough depending on the solution, or that there still is a possibility that unwanted noise, from for example persons walking on the construction element (floor), is transferred to another location, like a lower floor or an adjacent premises, via the connection between the spacer screw and the construction element.

Summary of the invention

[0005] One object of the present invention is to provide a spacer which solves the above-described problems, which are solved by a spacer according to the independent claim 1.

[0006] According to an aspect a spacer for supporting and positioning a construction element, like a floorboard, a floor joist, or the like, at a distance from a support surface is disclosed. Relating to a using position of the spacer as a support of the construction element on the support surface, the spacer has an axial extension in a vertical direction. The spacer comprises a positioning means, arranged for positioning of the spacer relative a hole in the construction element, wherein the positioning means comprises first engagement means which are arranged to engage with a side of the hole of the construction element. The spacer further comprises an elongate spacer screw which extends in the vertical direction, wherein the spacer screw comprises an upper end and an opposite lower end, and an external first thread, which extends at least a part of a distance between the upper end and the lower end. Further, the spacer comprises a support foot which is intended for abutment against the support surface. The support foot is arranged at the second end of the spacer screw, preferably by that the support foot and the spacer screw comprises mutually corresponding engagement means by means of which the spacer screw is fixable in or on the support foot. Of course, the support foot can be a part of the spacer screw and it may also be arranged as an end of the spacer screw which may be arranged as to abut the support surface. The spacer further comprises a support means, which comprises an internal second thread, which is in threaded connection with the external first thread of

the spacer screw, wherein the distance between the construction element and the support foot is adjustable by rotation of the spacer screw in/relative the support means. By that, the support means is positioned/may be positioned relative the positioning means in the using position of the spacer. Further, at least one first resilient bushing is arranged between at least one of the construction element or the positioning means and the support means. This means that the resilient bushing is arranged between the construction element and the support means, or between the positioning means and the support means or between both the construction element and the positioning means and the support means. Further this means that the weight of the construction element as well as forces subjected to the construction element are transferred from the construction element to the positioning means and further via the resilient bushing to the support means, since the resilient bushing is in contact with the support means and at least one of the construction element or the positioning means.

[0007] Such a solution provides a sound attenuation at the "source", i.e. at the location where the sound/noise is transferred from the construction element/the floor to the spacer. Thereby, the "sound bridge" is broken by means of the resilient bushing, which is positioned either directly between the construction element and the support means of the spacer or between the positioning means and the support means of the spacer. The positioning means is engaged with the construction element and the support means is positioned relative the positioning means either directly or via the spacer screw, wherein the support means takes care of forces from the construction element and transfers them to the spacer screw after being dampened by the first resilient bushing. This solution thereby dampens (isolates) the spacer screw from the construction element already at the level of the construction element which eliminates sound transfer better than existing solutions.

[0008] According to the invention, the positioning means comprises a second flange arranged to abut an underside of the construction element, wherein the second flange extends transverse the vertical direction (i.e. outwards in direction away from the engagement means of the positioning means). This second flange supports the construction element, which rest on top of the second flange and the weight of the construction element and forces subjected the same are transferred to the second flange of the positioning means and further to the support means via the resilient bushing. By the second flange, a specified and larger area is available for the force to be transferred and a larger bushing may be used, which is positive for the resilient bushing concerning choice of material (softer and more dampening) and also concerning lifetime of the same.

[0009] The second flange of the positioning means further comprises a first side part which projects away from the construction element towards the support foot, in the using position, and the support means further comprises a bottom part, wherein the internal second thread of the support means extends through the bottom part, perpendicular relative the bottom part, wherein the at least one first resilient bushing is arranged between the bottom part of the support means and the second flange of the positioning means. Such a solution provides a safe keeping of the resilient bushing between the bottom part of the support means and the second flange of the positioning means wherein the first side part of the positioning means contributes to the "keeping" of the bushing. Further, such solution transfers the force and the weight of the construction element via the second flange of the positioning means and further via the resilient bushing to the bottom part of the support means. The force is further transferred via the second internal thread arranged in the bottom part of the support means, to the external first thread of the spacer screw and further via the foot to the support surface

[0010] According to an embodiment, the positioning means and the support means are of stiffer material than the at least one first resilient bushing. The support means and the positioning means have the function of providing a robust enough connection between the spacer screw and the construction element, why the must be sufficiently stiff, while the function of the resilient bushing is to take care of (dampening) the sound which otherwise could be transferred between the positioning means connected to the construction element and the support means connected to the spacer screw.

[0011] According to an embodiment, the positioning means and the support means are made of some kind of plastic material and the at least one first resilient bushing is made of rubber. Other more or less resilient materials may also be used.

[0012] According to an embodiment, the first engagement means of the positioning means has at least one upper first flange arranged to grip around edges of the hole of the construction element. This solution provides a grip such as the positioning means "stays in place" in and relative the hole in the construction element and the flange may rest on the upper surface of the construction element or more preferred be integrated in the construction element by a shallow or semi-shallow cut-out of the uppermost top surface around the hole in the construction element. By that, the flange does not protrude above the top surface of the construction element.

[0013] An alternative compared to the latter might be to skip an upper flange and instead only introduce the positioning means into the hole of the construction element where it is kept in place by its form or by other engagement means which engages with sides of the hole. For example, the hole as well as the positioning means may have corresponding shape, for example be circular, square, hexagon-shaped etc. and the positioning means be very tight fit into the hole.

[0014] According to an embodiment, the bottom part of the support means comprises a second side part which projects away from the bottom part, towards the con-

struction element, in the using position, wherein the first side part of the positioning means comprises first connecting means and the second side part of the support means comprises second connecting means. The second side part of the support means is thereby connectable to the first side part of the positioning means, by means of the first and second connecting means. Preferably, the support means may move a distance relative the positioning means in the vertical direction (relating to the using position of the spacer) by that the second connecting means of the support means is movable along and above the first connecting means of the positioning means. For example, the first and second connecting means are mutually corresponding snap connections where one snaps relative the other, for example as two projections, where the first connections means may be a groove or a thinner part of the first side part of the positioning means. This enables a possible sliding motion of the support means relative the positioning means in their connected state wherein a certain movement is allowed due to the fact that the bushing is resilient.

[0015] According to an embodiment, the spacer further comprising at least one second resilient bushing arranged between the first engagement means of the positioning means and the spacer screw for guiding of the spacer screw when the spacer screw extends into the hole of the construction element. When the construction element is adjusted, the upper end of the spacer screw might extend into the hole of the construction element, wherein the second resilient bushing guides (centers) the spacer screw in the hole as well as taking care of (dampening) eventual contact noise occurred by contact between spacer screw and positioning means, or airborne noise which otherwise might be transferred via a gap around the spacer screw.

[0016] According to an embodiment, the positioning means, the support means and the at least one first resilient bushing are vulcanized to one unit. This is a simple and cost-efficient solution where the dampening function is achieved at the level of the construction element.

[0017] According to an embodiment, the support foot of the spacer comprises at least one third resilient bushing, arranged at a side of the support foot which faces the support surface and which at least one third resilient bushing is intended for abutment against the support surface. This third resilient bushing may of course be used with all other embodiments presented above and a solution with this third resilient bushing together with the first resilient bushing gives a double sound attenuation and vibration isolation, both between the construction element and the support means/the spacer screw and between the support foot and the support surface (floor joist or the like). This is a far better dampening spacer than prior art spacer arranged for "floating floors".

Short description of the figures

[0018] The invention will now be described, by way of example, with reference to the accompanying figures in which:

Fig. 1a shows a principal side view of a spacer according to the invention, when mounted in a construction element and where a support foot is to be mounted to a spacer screw of the spacer.

Fig. 1b shows the spacer of Fig. 1a when the support foot is mounted to the spacer screw and where the spacer is in a using position as a support for a construction element positioned on a support surface.

Fig. 1c is a zoomed view of the upper part of Fig. 1a.

Fig. 2 shows a zoomed view of the upper part of the spacer with an alternative solution of a connection between a support means and a positioning means of the spacer.

Fig. 3 shows a zoomed view of an upper part of an alternative spacer according to the invention.

Description of embodiments

[0019] In the following, a detailed description of a preferred embodiment of a spacer 1 according to the invention is described with reference to the accompanying figures. The invention is not limited to the figures.

[0020] Fig. 1 shows a principal side view of a spacer 1 according to the invention, when mounted in a construction element 2 and where a support foot 25 is to be mounted to a spacer screw 20 of the spacer 1. Fig. 1b shows the spacer 1 of Fig. 1a when the support foot 25 is mounted to the spacer screw 20 and where the spacer 1 is in a using position as a support for the construction element 2 and where the spacer 1 is positioned on a support surface 3. Fig. 1c shows a zoomed view of the marked area A of Fig. 1b.

[0021] The spacer 1 is arranged to support and position a construction element 2 at a distance from a support surface 3. The construction element 2 typically may be a floorboard, a floor joist, or the like and the support surface 3 may typically be a concrete joist or other kind of joists, which serves as a floor or floor joist in a building for example. Relating to a using position of the spacer 1 as a support of the construction element 2 on the support surface 3, the spacer 1 has an axial extension X which normally is a vertical direction X. The spacer 1 comprises four important main parts, a positioning means 10, a support means 15, a spacer screw 20 (to which a support foot 25 may be attached) and a first resilient bushing 30.

[0022] The positioning means 10 is arranged both for positioning of the spacer 1 relative a hole 4 in the con-

struction element 2 and for attaching or at least keeping the position means 10 in a mounted position in the hole 4 of the construction element 2. Thus, the positioning means 10 comprises first engagement means 11 which are arranged to engage with a side of the hole 4 of the construction element 2. In the embodiments of Figs. 1a-c, Fig. 2 and Fig. 3, the positioning means 10 comprises at least an upper first flange 12, which is arranged to grip around edges 4a of the hole 4 of the construction element 2. Preferably, the upper first flange 12 is recessed in the construction element 2, wherein the construction element 2 comprises a recess around the hole 4. The hole 4 preferably is a circular bore hole. The recess provides an even upper surface of the construction element 2 where the upper first flange 12 of the positioning means 10 doesn't protrude above the upper surface of the construction element 2. Of course, this upper first flange 12 may be excluded such as only the first engagement means 11 of the positioning means 10 has contact (engages) with sides of the hole 4. For example, the engagement means 11 may comprise a thread which is arranged to engage with sides of the hole 4. The positioning means 10 as well as the corresponding hole 4 in the construction element 2 preferably have a circular cross-section, but other forms like square, quadratic, hexagon, octagon, or any other form is of course possible within the inventive concept.

[0023] The positioning means 10 further comprises a second flange 13 arranged to abut an underside of the construction element 2, wherein the second flange 13 extends transverse the vertical direction X, outwards in direction away from the engagement means 11 of the positioning means 10. By that, the second flange 13 supports the construction element 2, which rest on top of the second flange 13 and the weight of the construction element 2 and forces subjected the same are transferred to the second flange 13 of the positioning means 10 and further to the support means 15 via the first resilient bushing 30. The second flange 13 of the positioning means 10 further comprises a first side part 14, which projects away from second flange 13/ the construction element 2, in direction towards the support foot 25, in the using position of the spacer 1. The first side part 14 may be arranged as a circumferential wall, which extends all the way around outer edge/edges of the second flange 13, such as an inverted, cup-like space is achieved, which is open downwards. This downwardly open cup-like space is arranged to receive the first resilient bushing 30, which will be explained further below.

[0024] The spacer 1 further comprises the elongate spacer screw 20 which extends in the vertical direction X and comprises an upper end 21 and an opposite lower end 22, and an external first thread 23. The latter preferably extends along the whole length of the spacer screw, but may of course be shorter, such as at least a part of a distance between the upper end 21 and the lower end 22 of the spacer screw 20 comprises the first thread 23. The spacer screw 20 may in the using position extend into the hole 4 of the construction element 2.

[0025] Further, the spacer 1 comprises the support foot 25 which is intended for abutment against the support surface 3. The support foot 25 is arranged at the second end 22 of the spacer screw 20 and is "hat-shaped" with an upper circumferential wall 29 arranged around an open top and extending in the vertical direction X. At the bottom of the wall 29 a top flange 28a extends perpendicularly away from the wall 29 and the top flange 28a comprises a circumferential side part 28b which protrudes vertically downwards from the top flange 28a, in the vertical direction X. This forms a cup-like space which is open downwards wherein a third resilient bushing 32 is arranged in this space. The third resilient bushing 32 is arranged to abut the support surface 3 to dampen vibrations and noise which otherwise are transferred to the support surface 3 from the construction element 2.

[0026] In the preferred embodiment, the support foot 25 is arranged for snap-connection to the spacer screw 20 by mutually corresponding engagement means 24, 26. The spacer screw 20 comprises first engagement means 24 which are arranged as flexible tongues which protrudes from the second end 22 of the spacer screw 20, in direction away from first end 21. The support foot 25 comprises corresponding second engagement means 26, which is arranged as a chamfered inner edge 26 arranged at the intersection between the top flange 28a and the circumferential wall 29 of the support foot 25. By means of the first and second engagement means 24, 26, the support foot 25 is releasably fixable to the spacer screw 20. Of course, the support foot 25 can be a part of the spacer screw 20 as one unit, and it may also be arranged as a simple end of the spacer screw 20 which may be arranged as to abut the support surface 3. The support foot may comprise an outer thread 27, with the same function as the first outer thread 23 of the spacer screw 20.

[0027] The spacer 1 further comprises the support means 15, which comprises a bottom part 18, through which an internal second thread 16 extends, perpendicular relative the bottom part 18, which means that the second thread extends in the vertical direction X. The internal second thread 16 is in threaded connection with the external first thread 23 of the spacer screw 20, in the using position of the spacer 1 as a support to the construction element 20. By rotating the spacer screw 20 in/relative the support means 15, the distance between the construction element 2 and the support foot 25 (and by that the distance to the support surface 3) is adjustable. The support means 15 is thereby positioned relative the positioning means 10 and relative the construction element 2, in the using position of the spacer 1. According to the preferred embodiment, the bottom part 18 of the support means 15 comprises a second side part 17, which projects away from the bottom part 18, in direction towards the construction element 2, in the using position. This second side part 17 preferably is arranged as a circumferentially wall around outer edge/edges of

the bottom part 18.

[0028] The first resilient bushing 30 is as mentioned above arranged between the second flange 13 of the positioning means 10 and the bottom part 18 of the support means 15. This means that the weight of the construction element 2 as well as forces subjected to the construction element 2 are transferred from the construction element 2 to the positioning means 10 and further via the resilient bushing 30 to the support means 15, since the resilient bushing 30 is in contact with the support means 15 and the positioning means 10. The force is further transferred further from the internal flange 16 of the support means 15, to the external thread 23 of the spacer screw 20, and to the support surface 3 via the dampening foot 25 and its third resilient bushing 32. The first resilient bushing 30 is preferably arranged with a central opening which provides a passage for the spacer screw 20.

[0029] The first side part 14 of the positioning means 10 comprises first connecting means 14a, which preferably is arranged either as a groove in the first side part 14, which groove may extend around the complete second side part 14, or as local recesses, or arranged as a protruding heel 14a which extends away from the first side part 14 locally or along the whole circumference of the first side part 14. Further, the second side part 17 of the support means 15 comprises second connecting means 17a, which preferably is arranged as a protrusion, protruding in direction towards the spacer screw 20 (relating to the using position of the spacer). The second side part 17 of the support means 15 is thereby connectable to the first side part 14 of the positioning means 10, by means of the first and second connecting means 14a, 17a, which are arranged to engage with each other. Preferably, the support means 15 may be able to slide relative the positioning means 10 in the vertical direction X, by that the second connecting means 17a of the support means 15 is movable along the first side part 14 and above the first connecting means 14a of the positioning means 10. For example, the first and second connecting means 14a, 17a are mutually corresponding snap connections where one snaps relative the other, for example as two cooperating projections. This enables a possible sliding motion of the support means 15 relative the positioning means 10 in their connected state, which is good since the first resilient bushing 30 flexes when subjected to compression.

[0030] As an option, a second resilient bushing 31 may be arranged between the first engagement means 11 of the positioning means 10 and the spacer screw 20, for guiding of the spacer screw 20 when the spacer screw 20 extends into the hole 4 of the construction element 2. When the construction element 2 is adjusted relative the support surface 3, via the spacer screw 20, the upper end 21 of the spacer screw 20 might extend into the hole 4 of the construction element 2. The second resilient bushing 31 guides / centers the spacer screw 20 in the hole 4 as well as taking care of / dampening eventual vibrations and "contact noise" occurred by contact between spacer screw 20 and the positioning means 10, and/or eliminates airborne noise which otherwise might be transferred via a gap around the spacer screw 20 and the first engagement means 11 of positioning means 10.

[0031] The material of positioning means 10 and the support means 15 are made of stiffer material than the at least one first resilient bushing 30, preferably they are made from some kind of plastic material and the at least one first resilient bushing 30 as well as the second and third resilient bushings 31, 32 are preferably made of rubber, or any other resilient material. Other types of design of the resilient bushings which provides a dampening effect may also be used, for example springs or spring-like bushings.

[0032] Fig. 2 shows a zoomed view of the upper part of the spacer 1 with an alternative solution of the connection between the support means 15 and the positioning means 10 of the spacer 1. The only difference compared to the above-described embodiment of Figs. 1a-c is that there is no snap-connection in this alternative solution. Instead, there is at least one upwardly open groove arranged in the second side part 17 of the support means 15, in which the first side part 14 of the positioning means 10 is insertable. In this way, a "closed" space for the first resilient bushing 30 is achieved, wherein the first resilient bushing 30 is safely kept and protected inside the space. Of course, a snap-connection is possible also in this alternative if wanted, for example by have corresponding protrusions arranged both on at least one of the walls of the groove in the second side part 17 of the support means 15 and on the first side part 14 of the positioning means 10, which protrusions may engage to cause a snap-connection. The groove may for example be a circumferentially extending groove or two or more shorter grooves arranged in the second side part 17 of the support means 15 and corresponding tongues or the like, arranged at the first side part 14 of the positioning means 10. Since the threaded engagement between the external thread 23 of the spacer screw 20 and the internal thread 16 of the support means 15, it is possible to exclude the connection between the positioning means 10 and the support means 15, but the connection provides an extra security of keeping the support means 15 in position.

[0033] Fig. 3 shows a zoomed view of an upper part of a spacer 1 according to an alternative embodiment of the invention. According to this embodiment, the positioning means 10, the support means 15 and the at least one first resilient bushing 30 are vulcanized to one unit, which provides a simple and cost-efficient solution for providing a dampening effect at the level of the construction element 2. The lower part of the spacer 1 including the support foot etc. is similar with the earlier presented embodiments. This vulcanized unit may have an upper first flange 12, eventually a second flange 13 and preferably some slits (not visible), which makes it insertable into the hole 4 of the construction element 2. Another

option might be that the engaging means 11 of the positioning means 10 comprises a thread which may engage with sides of the hole 4.

Claims

1. Spacer (1) for supporting and positioning a construction element (2) at a distance from a support surface (3); relating to the using position of the spacer (1) as a support of the construction element (2) on the support surface (3), the spacer (1) has an axial extension in a vertical direction (X), the spacer (1) comprising:

   a positioning means (10) arranged for positioning of the spacer (1) relative a hole (4) in the construction element (2), wherein the positioning means (10) comprises first engagement means (11) which are arranged to engage with a side of the hole (4) of the construction element (2),
   an elongate spacer screw (20) extending in the vertical direction (X) with an upper end (21) and an opposite lower end (22), wherein the spacer screw (20) comprises an external first thread (23) extending at least a part of a distance between the upper end (21) and the lower end (22),
   a support foot (25) intended for abutment against the support surface (3), wherein the support foot (25) is arranged at the second end (22) of the spacer screw (20), ,
   a support means (15) which comprises an internal second thread (16) which is in threaded connection with the external first thread (23) of the spacer screw (20), wherein the distance between the construction element (2) and the support foot (25) being adjustable by rotation of the spacer screw (20) in the support means (15), wherein the support means (15) is positioned relative the positioning means (10) in the using position of the spacer (1),
   at least one first bushing (30), arranged between at least one of the construction element (2) or the positioning means (10) and the support means (15),

   wherein the positioning means (10) comprises a second flange (13) arranged to abut an underside of the construction element (2) wherein the second flange (13) extends transverse the vertical direction (X), **characterized in that** said at least first bushing (30) is resilient, and **in that** the second flange (13) of the positioning means (10) comprises a first side part (14) which projects away from the construction element (2) towards the support foot (25), in the using position, and the support means (15) further comprises a bottom part (18), wherein the internal second thread (16) of the support means (15) extends through the bottom part (18), perpendicular relative the bottom part (18), wherein the at least one first resilient bushing (30) is arranged between the bottom part (18) of the support means (15) and the second flange (13) of the positioning means (10).

2. Spacer (1) according to claim 1, wherein the positioning means (10) and the support means (15) are of stiffer material than the at least one first resilient bushing (30).

3. Spacer (1) according to claim 2, wherein the positioning means (10) and the support means (15) are made of plastic and the at least one first resilient bushing (30) is made of rubber.

4. Spacer (1) according to any of the preceding claims, wherein the first engagement means (11) of the positioning means (10) has at least one upper first flange (12) arranged to grip around edges (4a) of the hole (4) of the construction element (2).

5. Spacer (1) according to any of the preceding claims, wherein the bottom part (18) of the support means (15) comprises a second side part (17) which projects away from the bottom part (18) towards the construction element (2), in the using position, wherein the first side part (14) of the positioning means (10) comprises first connecting means (14a) and the second side part (17) of the support means (15) comprises second connecting means (17a), wherein the second side part (17) of the support means (15) is connectable to the first side part (14) of the positioning means (10).

6. Spacer (1) according to any of the preceding claims, further comprising at least one second resilient bushing (31) arranged between the first engagement means (11) of the positioning means (10) and the spacer screw (20) for guiding of the spacer screw (20) when the spacer screw (20) extends into the hole (4) of the construction element (2).

7. Spacer (1) according to any of the preceding claims, wherein the support foot (25) of the spacer (1) comprises at least one third resilient bushing (32), arranged at an underside of the support foot (25) which faces the support surface (3) and which at least one third resilient bushing (32) is intended for abutment against the support surface (3).

Patentansprüche

1. Abstandshalter (1) zum Abstützen und Positionieren eines Konstruktionselements (2) in einem Abstand von einer Auflagefläche (3); wobei in Bezug auf die

Gebrauchsstellung des Abstandshalters (1) als Abstützung des Konstruktionselements (2) auf der Auflagefläche (3) der Abstandshalter (1) eine axiale Erstreckung in einer vertikalen Richtung (X) aufweist, wobei der Abstandshalter (1) umfasst:

ein Positioniermittel (10), angeordnet zum Positionieren des Abstandshalters (1) relativ zu einer Öffnung (4) in dem Konstruktionselement (2), wobei das Positioniermittel (10) erste Eingriffsmittel (11) umfasst, die dazu angeordnet sind, mit einer Seite der Öffnung (4) des Konstruktionselements (2) in Eingriff zu treten,
eine längliche Abstandsschraube (20), die sich in vertikaler Richtung (X) mit einem oberen Ende (21) und einem gegenüberliegenden unteren Ende (22) erstreckt, wobei die Abstandsschraube (20) ein äußeres erstes Gewinde (23) umfasst, das sich mindestens über einen Teil des Abstands zwischen dem oberen Ende (21) und dem unteren Ende (22) erstreckt,
einen Auflagefuß (25), vorgesehen zum Anliegen an der Auflagefläche (3), wobei der Auflagefuß (25) am zweiten Ende (22) der Abstandsschraube (20) angeordnet ist,
ein Stützmittel (15), das ein inneres zweites Gewinde (16) umfasst, das mit dem äußeren ersten Gewinde (23) der Abstandsschraube (20) in Gewindeverbindung steht, wobei der Abstand zwischen dem Konstruktionselement (2) und dem Auflagefuß (25) durch Drehen der Abstandsschraube (20) in dem Stützmittel (15) einstellbar ist, wobei das Stützmittel (15) in der Gebrauchsstellung des Abstandshalters (1) relativ zum Positioniermittel (10) positioniert ist,
mindestens eine erste Buchse (30), angeordnet zwischen mindestens einem des Konstruktionselements (2) oder des Positioniermittels (10) und dem Stützmittel (15), wobei das Positioniermittel (10) einen zweiten Flansch (13) umfasst, der zum Anliegen an einer Unterseite des Konstruktionselements (2) angeordnet ist, wobei sich der zweite Flansch (13) quer zur vertikalen Richtung (X) erstreckt, **dadurch gekennzeichnet, dass** die mindestens eine erste Buchse (30) elastisch ist und dass der zweite Flansch (13) des Positioniermittels (10) einen ersten Seitenteil (14) umfasst, der in der Gebrauchsstellung vom Konstruktionselement (2) in Richtung des Auflagefußes (25) wegragt, und das Stützmittel (15) ferner einen Bodenteil (18) umfasst, wobei sich das innere zweite Gewinde (16) des Stützmittels (15) rechtwinklig zu dem Bodenteil (18) durch den Bodenteil (18) hindurch erstreckt, wobei die mindestens eine erste elastische Buchse (30) zwischen dem Bodenteil (18) des Stützmittels (15) und dem zweiten Flansch (13) des Positioniermittels (10) angeordnet ist.

2. Abstandshalter (1) nach Anspruch 1, wobei das Positioniermittel (10) und das Stützmittel (15) aus einem steiferen Material als die mindestens eine erste elastische Buchse (30) bestehen.

3. Abstandshalter (1) nach Anspruch 2, wobei das Positioniermittel (10) und das Stützmittel (15) aus Kunststoff hergestellt sind und die mindestens eine erste elastische Buchse (30) aus Gummi hergestellt ist.

4. Abstandshalter (1) nach einem der vorhergehenden Ansprüche, wobei das erste Eingriffsmittel (11) des Positioniermittels (10) mindestens einen oberen ersten Flansch (12) aufweist, der dazu angeordnet ist, die Ränder (4a) der Öffnung (4) des Konstruktionselements (2) zu umfassen.

5. Abstandshalter (1) nach einem der vorhergehenden Ansprüche, wobei der Bodenteil (18) des Stützmittels (15) einen zweiten Seitenteil (17) umfasst, der in der Gebrauchsstellung von dem Bodenteil (18) in Richtung des Konstruktionselements (2) wegragt, wobei der erste Seitenteil (14) des Positioniermittels (10) erste Verbindungsmittel (14a) und der zweite Seitenteil (17) des Stützmittels (15) zweite Verbindungsmittel (17a) umfasst, wobei der zweite Seitenteil (17) des Stützmittels (15) mit dem ersten Seitenteil (14) des Positioniermittels (10) verbindbar ist.

6. Abstandshalter (1) nach einem der vorhergehenden Ansprüche, ferner umfassend mindestens eine zweite elastische Buchse (31), die zwischen dem ersten Eingriffsmittel (11) des Positioniermittels (10) und der Abstandsschraube (20) angeordnet ist, zur Führung der Abstandsschraube (20), wenn sich die Abstandsschraube (20) in die Öffnung (4) des Konstruktionselements (2) erstreckt.

7. Abstandshalter (1) nach einem der vorhergehenden Ansprüche, wobei der Auflagefuß (25) des Abstandshalters (1) mindestens eine dritte elastische Buchse (32) umfasst, die an einer Unterseite des Auflagefußes (25), die der Auflagefläche (3) zugewandt ist, angeordnet ist und die mindestens eine dritte elastische Buchse (32) zur Anlage an der Auflagefläche (3) vorgesehen ist.

Revendications

1. Entretoise (1) pour supporter et positionner un élément de construction (2) à distance d'une surface de support (3) ; concernant la position d'utilisation de l'entretoise (1) comme support de l'élément de cons-

truction (2) sur la surface de support (3), l'entretoise (1) étant pourvue d'une extension axiale dans une direction verticale (X), l'entretoise (1) comprenant :

un moyen de positionnement (10) agencé pour positionner l'entretoise (1) par rapport à un trou (4) dans l'élément de construction (2), le moyen de positionnement (10) comprenant un premier moyen de prise (11) agencé de manière à entrer en prise avec un côté du trou (4) de l'élément de construction (2),
une vis d'entretoise allongée (20), s'étendant dans la direction verticale (X), pourvue d'une extrémité supérieure (21) et d'une extrémité inférieure (22) opposée, la vis d'entretoise (20) comprenant un premier filetage extérieur (23) s'étendant au moins sur une partie d'une distance entre l'extrémité supérieure (21) et l'extrémité inférieure (22),
un pied de support (25) destiné à venir en butée contre la surface de support (3), le pied de support (25) étant agencé au niveau de la deuxième extrémité (22) de la vis d'entretoise (20),
un moyen de support (15) comprenant un deuxième filetage intérieur (16) qui se visse sur le premier filetage extérieur (23) de la vis d'entretoise (20), la distance entre l'élément de construction (2) et le pied de support (25) étant réglable par rotation de la vis d'entretoise (20) dans le moyen de support (15), le moyen de support (15) étant positionné par rapport au moyen de positionnement (10) dans la position d'utilisation de l'entretoise (1),
au moins une première bague (30), agencée entre l'élément de construction (2) et/ou le moyen de positionnement (10) et le moyen de support (15), le moyen de positionnement (10) comprenant une deuxième bride (13) agencée de manière à venir en butée contre un dessous de l'élément de construction (2), la deuxième bride (13) s'étendant transversalement à la direction verticale (X), **caractérisée en ce que** ladite au moins une première bague (30) est élastique, et **en ce que** la deuxième bride (13) du moyen de positionnement (10) comprend une première partie latérale (14) qui fait saillie à l'opposé de l'élément de construction (2) en direction du pied de support (25), dans la position d'utilisation, et le moyen de support (15) comprend en outre une partie basse (18), le deuxième filetage intérieur (16) du moyen de support (15) s'étendant à travers la partie basse (18), perpendiculairement à la partie basse (18), l'au moins une première bague élastique (30) étant agencée entre la partie basse (18) du moyen de support (15) et la deuxième bride (13) du moyen de positionnement (10).

2. Entretoise (1) selon la revendication 1, le moyen de positionnement (10) et le moyen de support (15) étant constitués d'un matériau plus rigide que l'au moins une première bague élastique (30).

3. Entretoise (1) selon la revendication 2, le moyen de positionnement (10) et le moyen de support (15) étant en plastique et l'au moins une première bague élastique (30) est en caoutchouc.

4. Entretoise (1) selon l'une quelconque des revendications précédentes, le premier moyen de prise (11) du moyen de positionnement (10) étant pourvu d'au moins une première bride supérieure (12) agencée de manière à s'accrocher autour de bords (4a) du trou (4) de l'élément de construction (2).

5. Entretoise (1) selon l'une quelconque des revendications précédentes, la partie basse (18) du moyen de support (15) comprenant une deuxième partie latérale (17) qui fait saillie à l'opposé de la partie basse (18) en direction de l'élément de construction (2), dans la position d'utilisation, la première partie latérale (14) du moyen de positionnement (10) comprenant un premier moyen de connexion (14a) et la deuxième partie latérale (17) du moyen de support (15) comprenant un deuxième moyen de connexion (17a), la deuxième partie latérale (17) du moyen de support (15) étant connectable à la première partie latérale (14) du moyen de positionnement (10).

6. Entretoise (1) selon l'une quelconque des revendications précédentes, comprenant en outre au moins une deuxième bague élastique (31) agencée entre le premier moyen de prise (11) du moyen de positionnement (10) et la vis d'entretoise (20) pour guider la vis d'entretoise (20) lorsque la vis d'entretoise (20) s'étend dans le trou (4) de l'élément de construction (2).

7. Entretoise (1) selon l'une quelconque des revendications précédentes, le pied de support (25) de l'entretoise (1) comprenant au moins une troisième bague élastique (32), agencée au niveau d'un dessous du pied de support (25) qui fait face à la surface de support (3), et l'au moins une troisième bague élastique (32) étant destinée à venir en butée contre la surface de support (3).

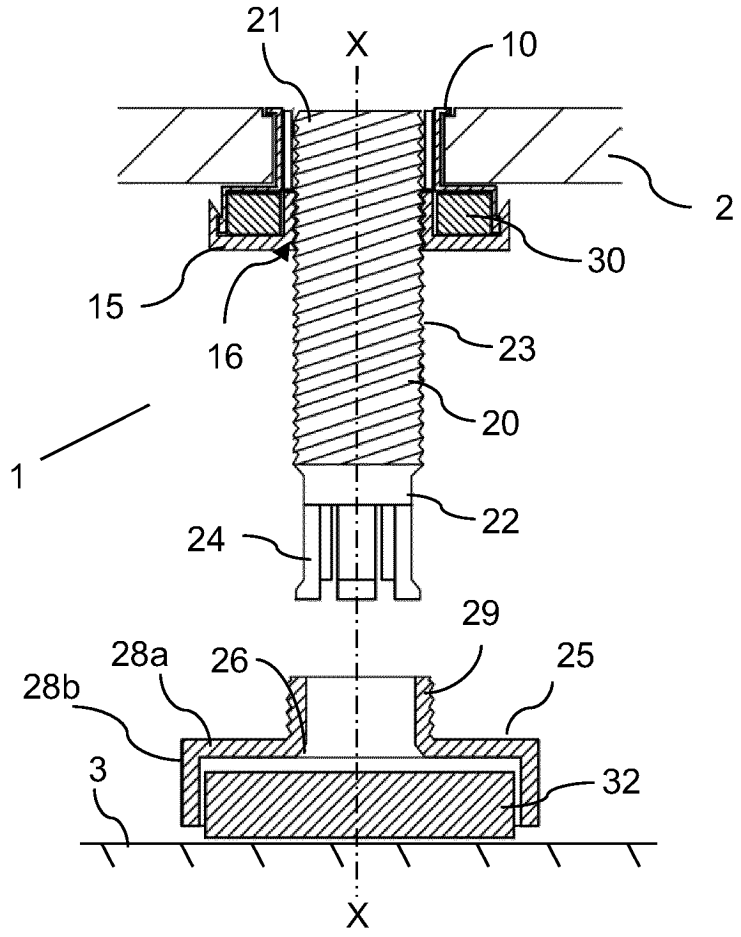
21
X
10
2
30
15
16
23
20
1
22
24
29
28a
26
25
28b
3
32
X

Fig. 1a

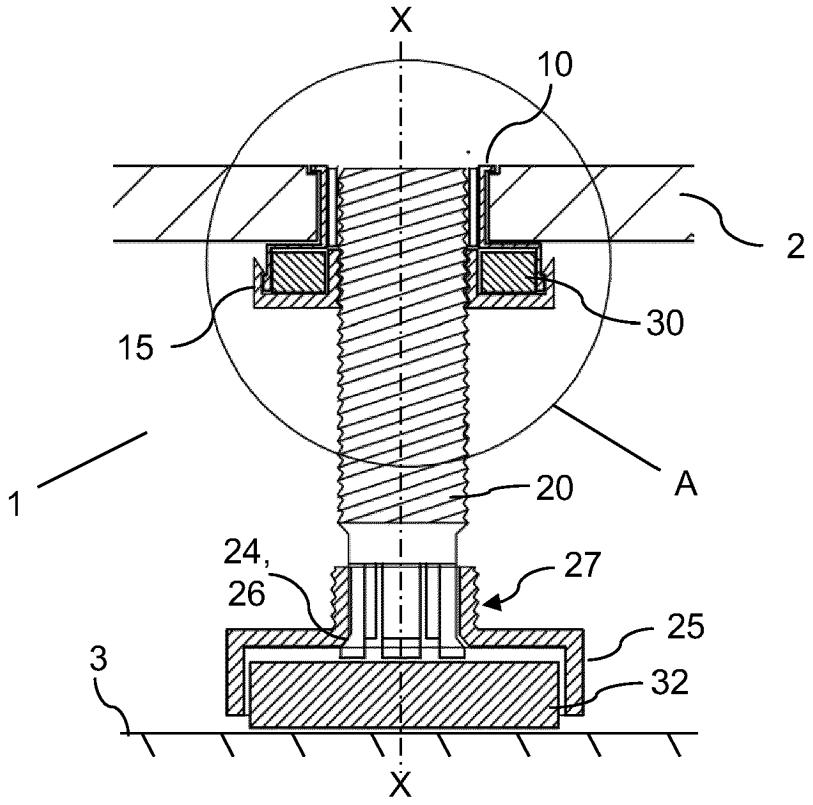
X
10
2
15
30
A
1
20
24,
26
27
25
3
32
X

Fig. 1b

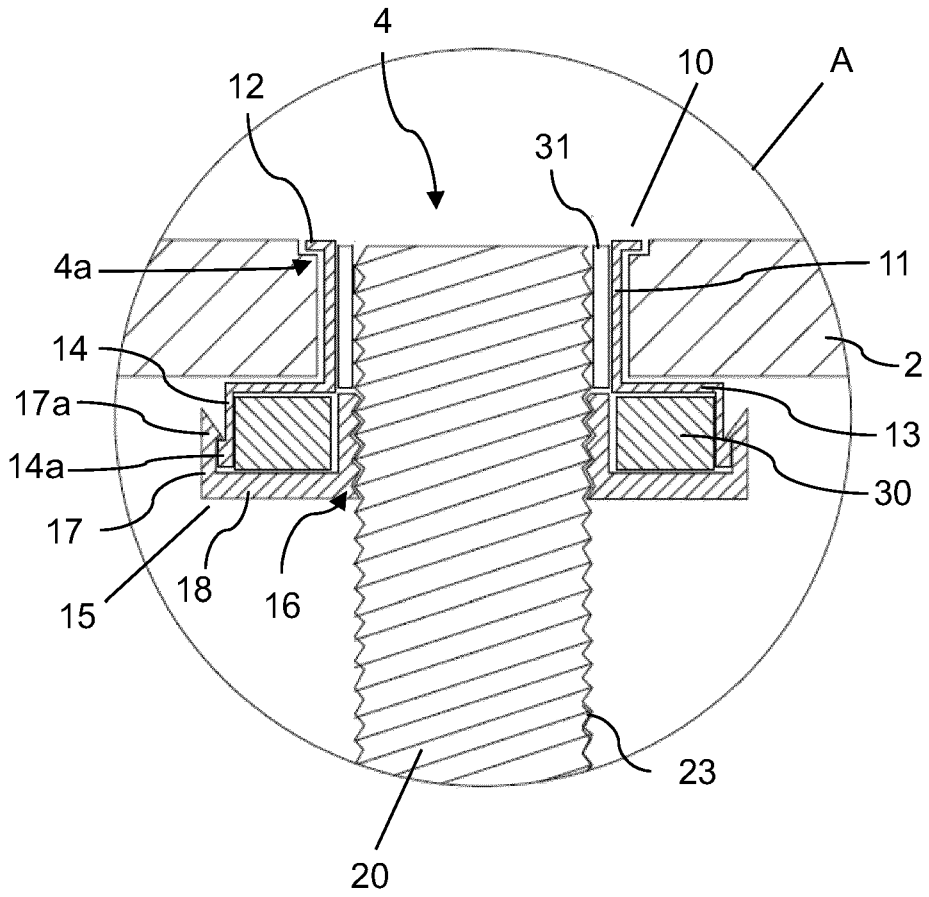
4
12
10
A
31
4a
11
14
2
17a
13
14a
30
17
18
16
15
23
20

Fig. 1c

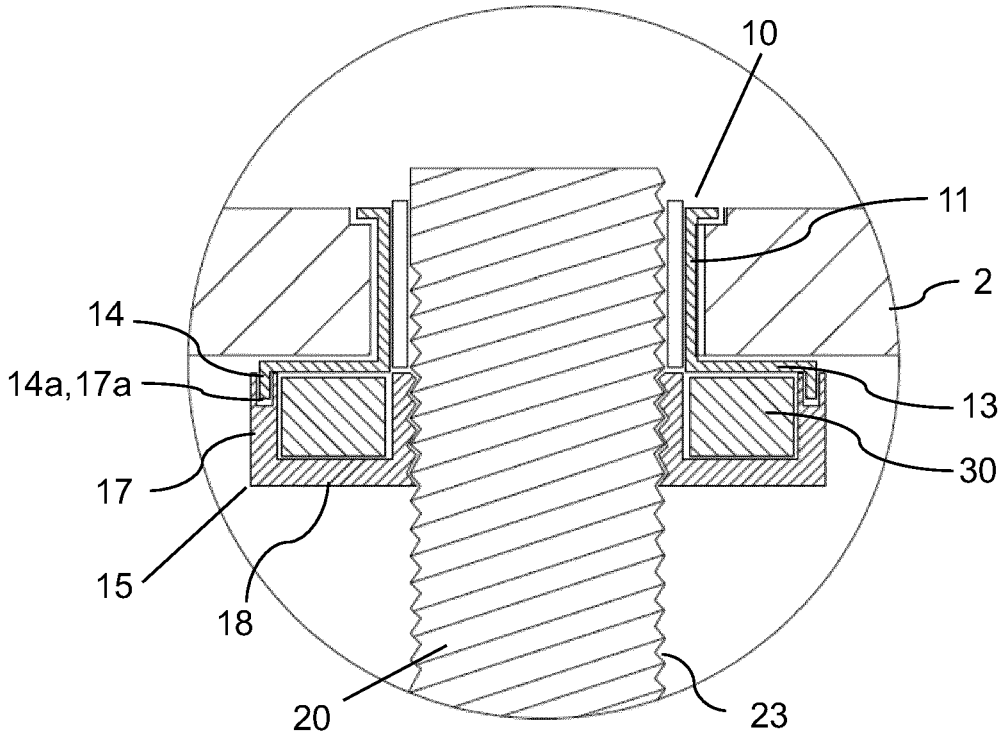
10
11
2
14
14a,17a
13
30
17
15
18
20
23

Fig. 2

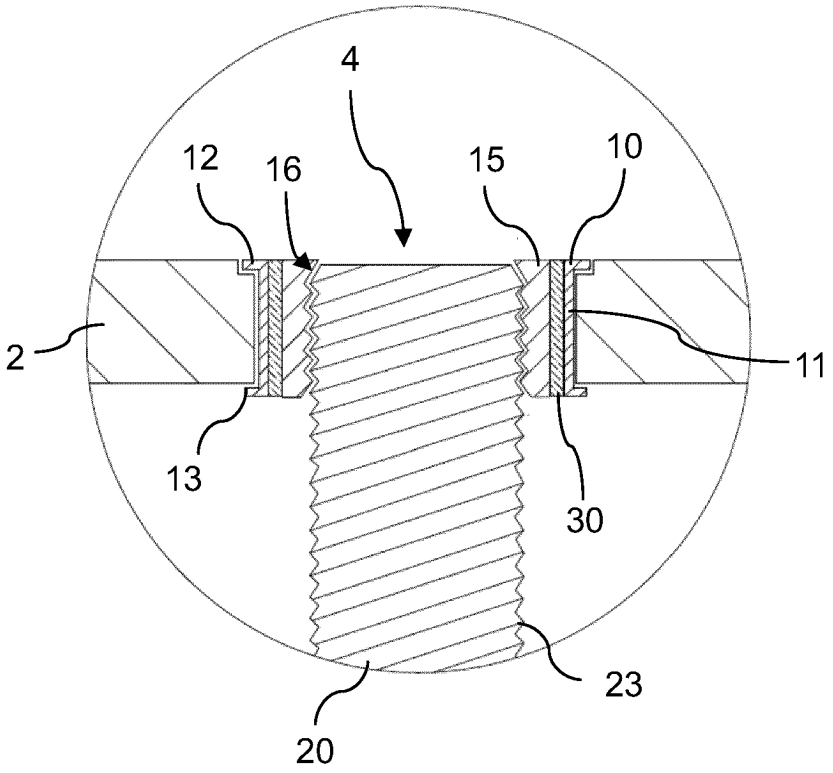

Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- EP 2113619 A2 **[0003]**