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(54) **SELF-ADJUSTING WIGGLE SUPPORT**

(57) Wiggle support (1) comprising a base plate (11), a front wall (12), side walls (13, 14) and a stop (15), wherein the front wall (12) and the stop (15) are arranged to abut sides (a, b) of a furniture leg. A wedge (20) is pivotally attached to one side wall (13) and comprises a stepped wedge-area (21) and an arm (22). A pedal (30) is pivotally attached between the sidewalls (13, 14) and is arranged to pivot the wedge (20) around a vertical first pivot axis (z) in a first pivoting direction (B) by an engagement means (31) which is arranged to engage with the arm (22) of the wedge (20). A spring (40) is arranged to impact the arm (22) of the wedge (20) such as the wedge (20) pivots around the vertical first pivot axis (z) in an opposite second pivot direction (D) relative the first pivoting direction (B).

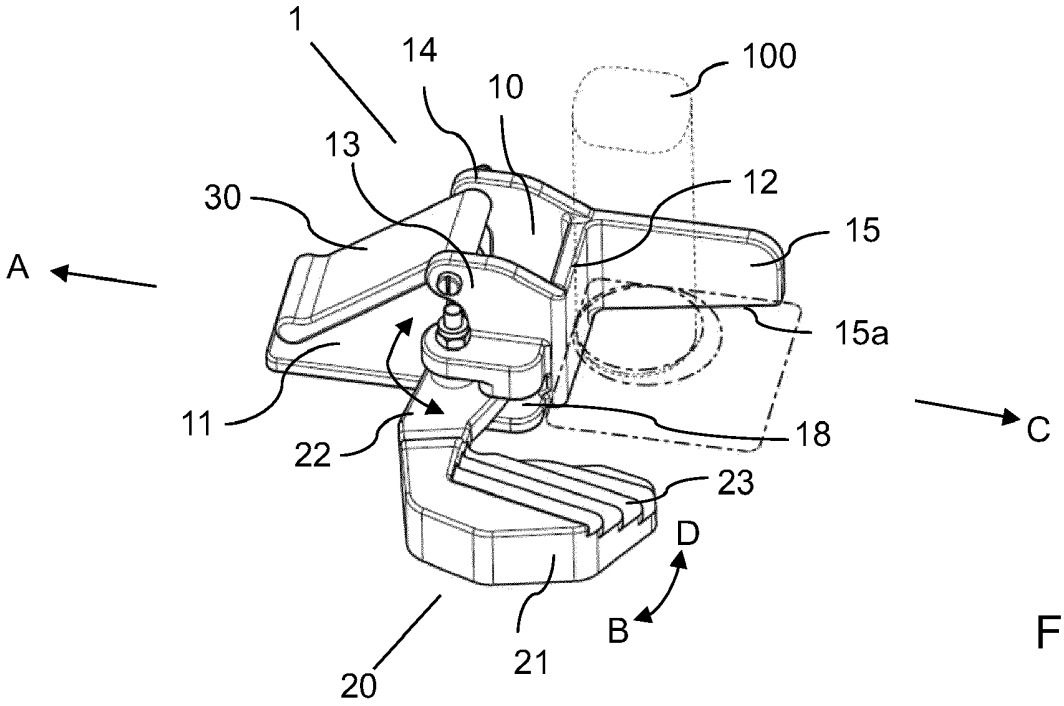

Fig. 1

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Description

Technical field

[0001] The invention considers a wiggle support to be used for stabilizing a piece of furniture. The wiggle support is to be arranged between a leg of a furniture and a substrate on which the furniture is standing and is arranged to more or less automatically fill a gap between the leg of a furniture and the substrate, when the wiggle support is operated.

Background

[0002] A common problem when positioning a piece of furniture on a substrate such a floor or on the ground, is that either one of the legs or the substrate is uneven. This results in an unstable furniture which tends to rock back and forth. Especially tables with more than three legs/feet and chairs with four legs/feet, this problem is particularly annoying. To solve the problem, the first and easy solution is normally to just put a piece of paper like a napkin or the like underneath one of the legs of for example the table.

[0003] An alternative and more serious solution compared to the above described "paper-solution" is described in US 10,130,174 B2, which discloses an interlocking wiggle support which comprises two identical pieces to be used individually as stabilizing shims, or which may be used in pairs and interlocked with one another such that it creates an adjustable stabilizer that can be reused again. One problem with this solution is that it is not self-adjusting.

[0004] Other more long-lasting solutions are to provide adjustable legs or feet, for example a threaded foot or leg, which may be screwed to shorten or lengthen one or more legs/feet. This solution may work for a single piece of furniture which is not moved very often, but a common problem at for example restaurants and cafes is that the tables are moved very often, and since the floor or the ground at an outdoor seating often is uneven, the problem occurs repeatedly. To solve this problem, automatic levelling/self-levelling/self-adjusted feet are developed. The problems with these solutions are that they are quite complicated and therefore expensive, and these kind of feet are arranged to be fixedly attached to the legs of the furniture, why the feet must be adopted to fit the particular table (furniture) or vice versa. It might be tricky to know which type of foot and fixation, for example which threaded connection, fits the particular piece of furniture, which for example the cafe owner possesses, and the cafe might also have a number of different tables, chair etc.

[0005] One example of such type of advanced self-adjusting stabilizing foot is disclosed in US 2013/112821 A1. This invention relates to a self-adjusting wiggle support which is connectable to the bottom surface of a foot of a table. The device comprises a first body, connectable to the foot and a second body for resting on a surface. The first body includes first ramp formations with a plurality of first engaging surfaces and the second body includes second ramp formations, which have a plurality of complementary second engaging surfaces. The first and second bodies are coupled to one another with the plurality of first and second engaging surfaces engaging one another to permit rotational movement of the second body relative to the first body, so that the wiggle support self-adjusts in the event of a rotational force applied thereto, in order to stabilize the table. This solution is complicated and expensive and must be adopted with correct thread connection to the foot of the table, which drawbacks are discussed above.

Summary

[0006] It is an object of the invention to address at least some of the problems and issues outlined above. It is possible to achieve these objects and others by using an automatic wiggle support as defined in the attached independent claims.

[0007] According to an aspect of the invention, an automatic/self-adjusting wiggle support/wiggle stop, arranged to stabilize a piece of furniture is disclosed. The wiggle support is in a using position arranged to fill a gap between a leg of a furniture and a substrate on which the furniture is standing. Referring to the using position of the wiggle support, the wiggle support comprises a body, which comprises a base plate which is to be arranged on the substrate. The body further comprises a front wall and two side walls of which at least one of the walls is fixedly attached to the base plate, wherein the front wall is fixedly attached to at least one of the base plate or at least one of the side walls and the side walls are fixedly attached to at least one of the base plate or the front wall. This means that the walls may be arranged as separate walls extending from the base plate or that at least one of them is attached to the base plate and the other walls are attached to that wall and to each other, or other combinations. It is also possible that one or more of the walls may be a column or other types of supports. The walls have an extension in a vertical direction relative the base plate, and the front wall is arranged to abut a first side of a leg of a furniture and the sidewalls face away from the front wall in a first direction. The body further comprises a stop which protrudes from the front wall in an opposite direction relative the first direction (and thus the sidewalls), wherein the stop is arranged to abut a second side of a leg of a furniture. The expression "side of a leg" may also be interpreted as a "point of a leg" if for example the leg is round or has a convex surface, wherein the support of the front wall and the stop abuts the surface of the leg in two different positions.

[0008] The wiggle support further comprises a wedge which comprises a stepped wedge-area and an arm, wherein the arm is pivotally attached to one of the side walls of the body, and is pivotable around a vertical first

pivot axis, wherein the wedge upon pivoting around the first pivot axis, the stepped wedge-area may enter or leave a gap between a leg of a furniture and a substrate in direction towards or away from at least the stop of the body. The vertical first pivot axis is vertical relative the base plate of the body. The wiggle support further comprises a maneuvering device which either is a pedal which is pivotally attached between the sidewalls of the body, and which is pivotable around a horizontal second pivot axis. The pedal is arranged to pivot the wedge around the vertical first pivot axis in at least a first pivoting direction, by an engagement means which protrudes from the pedal in the vertical direction and which engagement means is arranged to engage with the arm of the wedge, to pivot the wedge. Alternatively, the maneuvering device is a lever which is fixedly attached to the arm of the wedge at a position where the arm is pivotally attached to one of the side walls of the body, wherein the lever is arranged to pivot the wedge around the vertical first pivot axis in at least a first pivoting direction. Further, the wiggle support comprises a spring which is arranged to impact the arm of the wedge with its spring force such as the wedge pivots around the vertical first pivot axis in at least a second pivot direction which is opposite the first pivoting direction.

[0009] By such a solution, an automatic and cheap wiggle support is achieved which fits any leg of a furniture, independently of the form of the leg or foot and which is easy to apply and remove. By maneuvering the maneuvering device (the pedal/the lever), the wiggle support is opened and thereby possible to push towards a furniture leg, where a gap between the end of the leg and the substrate such as a floor is at hand. The wiggle support is pushed until the front wall abuts leg (or the foot). By releasing the pedal/the lever, the spring-force of the spring causes the wedge to rotate in direction towards the stop and/or the front wall (depending on the size and shape of the leg), and the stepped wedge-area of the wedge fills the gap under the leg. If needed the furniture is rocked a bit up and down wherein the stepped wedge-area fills the gap to the correct distance since the spring force causes the motion to proceed until the gap is filled. To release the wiggle support from the leg, the pedal/the lever is again maneuvered such as the wiggle support opens and thus the wedge leaves the gap in direction away from the stop, and the wiggle support may be pulled away from the leg. This solution fits any form of the leg or foot of the furniture and may easily be moved to another leg or piece of furniture if needed. No such solution is known in prior art.

[0010] According to an embodiment, the stepped wedge-area of the wedge comprises a plurality of steps, each arranged with a riser, which riser is arranged to abut at least a third side of a leg of a furniture. By the riser, the leg of the furniture is also clamped in the supported position, wherein the third side (or point, see discussion above) is arranged on an opposite (or partly opposite) side of the leg, with one or several steps positioned in the gap underneath the leg. The step which, depending on the size of the gap, supports the underside of the leg thus supports the leg from beneath and the next, higher step clamps the leg by its riser and the opposite stop/front wall. Depending on the size and/or shape of the leg, this third side or position is opposite at least one of the first or second sides of the leg, which sides are supported (abutted) by the front wall and the stop. For example, for a thin leg with small diameter, the riser which clamps the leg on the third side, may be opposite the front wall only, but for a thick leg, the riser which clamps the leg on the third side may be opposite only the stop. Intermediate dimensions of the leg may be clamped such as the riser of a step clamps the leg in intermediate opposite positions of the stop and the front wall.

[0011] According to an embodiment, the stop of the body has a chamfered lower edge such as a first gap is achieved between the lower edge of the stop and a substate on which the wiggle support is arranged, which first gap allows at least a part of the wedge-area of the wedge to pass below the stop. Such a solution provides a larger flexibility regarding the size and shape of the leg of the furniture which is to be levelled (supported). If a large gap is to be "filled" by the stepped wedge-area it is positive to let the wedge pass underneath the stop, wherein the steps may have a large enough support area, but still may provide a plurality of steps instead of a few steps. Without this feature, the number of steps must be less and with higher step height, to be able to provide the same functionality.

[0012] According to an embodiment, the uppermost step of the wedge-area of the wedge comprises a stop edge. The stop edge of the uppermost step has the same functionality as the riser of the steps, as described above. This means that a leg of a furniture may be clamped between the stop (and/or the front wall) of the body and the stop edge of the wedge also when the uppermost step is used.

[0013] According to an embodiment, when the maneuvering device is the pedal, the body comprises a second gap between the base plate and the one of the side walls to which the arm of the wedge is pivotally attached, and the arm of the wedge comprises a free end which extends into the second gap past the side wall and ends between the side walls, such as the engagement means of the pedal may engage with the free end of the arm for pivoting the wedge around its vertical first pivot axis.

[0014] According to an embodiment, the spring is a coil-spring which is arranged around the first pivot axis. This is an easy and cheap solution for providing the self-adjusting pivoting motion of the wedge around the first pivot axis. The spring is arranged to cause a "closing motion" of the wedge wherein the wedge pivots such as the wedge moves towards the stop.

[0015] According to an embodiment, when the maneuvering device is the pedal, the horizontal second pivot axis, around which the pedal pivots, is arranged at a first distance from the base plate of the body and the engage-

ment means of the pedal protrudes a second distance downwards from the pedal in direction towards the base plate of the body. The second distance is shorter than the first distance, wherein a pressing of the pedal downwards towards the base plate causes the wedge to move in direction away from the stop, in the first pivoting direction, to an open position. This, by that the engagement means of the pedal is arranged to press the free end of the arm of the wedge in direction towards the front wall of the body. It is preferred that the first distance up to the horizontal second pivot axis and the second distance which determines the length of the engagement means, is adapted such as a pressing of the pedal downwards to an end position, in which the outer free end of the pedal abuts the base plate, corresponds to a fully open position of the wedge relative the stop. This adaption of the distances allows that the wiggle support may be used to level a furniture leg of with a diameter up to at least 50 mm.

[0016] According to an embodiment, when the maneuvering device is the pedal, the spring is arranged such as the spring force of the spring is subjected to the wedge such as the free end of the arm of the wedge tends to move in direction away from front wall of the body.

[0017] According to an embodiment, when the maneuvering device is the pedal, the body comprises a pedal stop which is arranged to prevent the pedal from passing the stop while pivoting around the second pivot axis in an opposite direction relative the spring force direction. This means that when a user has operated the wiggle support for stabilizing a piece of furniture, and then release the pedal, the pedal is pushed in the opposite direction by that the spring-force of the spring impact the engagement means of the pedal via the arm of the wedge. The stop prevents this motion to proceed further, such as the pedal will not flip over, i.e., the point of gravity of the pedal does not pass an imaginary vertical line above the pivot point of the pedal. By that, the pedal is ready to be pressed downwards towards the base plate to open the wiggle support again.

[0018] According to an embodiment, the front wall is fixedly attached to at least one of the sidewalls and is further arranged in front of a front edge of the base plate, such as a third gap is arranged below the front wall and a substate on which the wiggle support is arranged, which third gap allows at least a part of the wedge-area of the wedge to pass below the front wall. An alternative could also be that the front wall is attached to the base plate but protrudes in front of the base plate to provide the gap. This provides an even higher flexibility of which diameter and/or form of the leg that could be levelled by the wiggle support and the also a higher flexibility of the design of the wedge and the wedge-shaped area.

[0019] According to an embodiment, when the maneuvering device is the lever, the spring is arranged such as the spring force of the spring is subjected to the wedge such as the lever tends to move in direction away from front wall of the body.

[0020] According to an embodiment, when the maneuvering device is the lever, the lever is attached to arm of the wedge as an extension of the arm on the opposite side of the vertical first pivot axis. Such a solution provides an easy-handled wiggle support, since the lever enables easy access and the use of low force to open the wiggle support.

[0021] According to an embodiment, when the maneuvering device is the lever, the lever comprises an angled end.

[0022] Further possible features and benefits of this solution will become apparent from the detailed description below.

Brief description of drawings

[0023] The solution will now be described in more detail by means of exemplary embodiments and with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a wiggle support / stop according to the invention, which in the figure is in an open position ready to be applied to a leg of a furniture.

Fig. 2 is an exploded view of the wiggle support of Fig. 1.

Fig. 3a is a front view, Fig. 3b is a side view and Fig. 3c is a top view of the wiggle support of Fig. 1 in its open position.

Fig. 4a is a perspective view of the wiggle support according to the invention, which in the figure is in a supporting (stabilizing) position underneath a leg of a furniture.

Fig. 4b is a cross-sectional view of the wiggle support of Fig. 4c, seen from a front side (section B-B of Fig. 4c).

Fig. 4c is a side view and Fig. 4d is a top view of the wiggle support of Fig. 4a in it supporting (stabilizing) position.

Fig. 5a is a perspective view of the wiggle support according to an alternative solution of the invention, which in the figure is in a supporting (stabilizing) position underneath a leg of a furniture.

Fig. 5b is a top view of the wiggle support of Fig. 5a, but in an open position, ready to be arranged in its supporting (stabilizing) position underneath a leg of a furniture.

Fig. 5c is a section through a lower part of the wiggle support of Fig. 5a (at a height of a third step of a stepped wedge-area), in a supporting (stabilizing) position underneath a leg of a furniture.

Detailed description

[0024] Briefly described, an automatic wiggle support for arrangement to a leg of a furniture is disclosed. The wiggle support is easy to use and fits most type of shapes and many different dimensions of furniture legs. This is achieved by a spring-loaded and stepped wedge automatically enters to a correct support height to support a leg of an unstable furniture.

[0025] Fig. 1 shows a perspective view of a self-adjusting wiggle support 1 / wiggle stop 1 according to the invention, when ready to be applied to a leg 100 of a piece of furniture, wherein the leg 100 in the figure is visible as a dotted line. A number of different shapes of furniture legs may be seen as dot-dashed lines in the figure. Fig. 2 shows an exploded view of the wiggle support 1 from another angle, compared to Fig. 1.

[0026] The automatic wiggle support 1 is as mentioned arranged to stabilize a piece of furniture and is in a using position arranged to automatically fill a gap between an end of a leg 100 of a furniture and a substrate, for example a floor, on which the furniture is standing, when arranged to the leg of the furniture. This to make a rocky piece of furniture stable. In the following description, the orientation referred to as "up" and "down" refers to a using position of the wiggle support 1 when positioned on a substrate. Further, expressions like "front", "back", "left", "right" and "side" refers to the positioning of the wiggle support 1 relative the leg 100, where for example "front" refers to the side of the wiggle support 1 which first approaches the leg 100 of the furniture when the wiggle support 1 is positioned to the leg 100.

[0027] The automatic wiggle support 1 comprises a body 10 arranged with a base plate 11 which is to be arranged on the substrate. The body 10 further comprises a front wall 12 and two side walls 13, 14, wherein the front wall 12 is to be directed towards the leg 100 when positioning the wiggle support 1 on/to the leg 100. At least one of the walls 12, 13, 14 is fixedly attached to the base plate 11, and in the preferred embodiment the front wall 12 and the left sidewall 14 and a short part of the right sidewall 13 are fixedly attached to the base plate 11. Other options of how the walls 12, 13, 14 are attached to the base plate 11 are of course possible. For example may, the front wall 12 be fixedly attached to only the base plate 11 or only to one or more of the side walls 13, 14, and the side walls 13, 14 may be fixedly attached only the base plate 11 or only to the front wall 12. Of course, at least one of the walls 12, 13, 14 must be attached to the base plate 11. The walls 12, 13, 14 have an extension in a vertical direction z, upwards relative the base plate 11 (i.e. perpendicular relative the base plate), and the front wall 12 is arranged to abut the leg 100 on a first side a in the using position (see Figs. 3c and 4c). The sidewalls 13, 14 face away from the front wall 12 in a first direction A and the body 10 further comprises a stop 15 which protrudes from the front wall 12 in an opposite direction C relative the first direction A. The stop 15 is thereby arranged to abut a second side b of the leg 100 in the using position (see Figs. 3c and 4c).

[0028] The wiggle support 1 further comprises a wedge 20 which comprises a stepped wedge-area 21 and an arm 22, where the arm 22 is pivotally attached to the right-side wall 13, by a shaft or the like. In the preferred embodiment, a first shaft 25 is fixed to the base plate 11 from an underside and protrudes upwards through the base plate 11. The other end of the first shaft 25 is attached to a heel 13a of the right sidewall 13 and the arm 22 of the wedge 20 is pivotally attached between the base plate 11 and the heel 13a and to the first shaft 25 via a through-hole through which the first shaft 25 extends. The wedge 20 thereby is pivotable around a vertical first pivot axis z (the shaft 25), such as the stepped wedge-area 21 of the wedge 20 may enter or leave a gap between the leg 100 of a furniture and a substrate, in direction D towards the stop 15 or direction B away from the stop 15. This to stabilize the furniture when needed and to disengage the wiggle support 1 when wanted. The stepped wedge-are 21 comprises a plurality of steps 23, arranged from the bottom to a top of the wedge-area 21 such as the wedge 20 provides a number of different support heights, wherein the steps 23 are arranged to fill/enter the gap underneath the leg 100. The function will be explained further below.

[0029] The stop 15 of the body 10 has a chamfered lower edge 15a such as a first gap 16 is achieved between the lower edge 15a and a substate on which the wiggle support 1 is arranged (see also the description in relation to Fig. 3b below). The first gap 16 allows at least a part of the wedge-area 21 of the wedge 20 to pass below the stop 15. This function will also be explained further below.

[0030] The wiggle support 1 further comprises a maneuvering device, which in this embodiment is a pedal 30 which is pivotally attached between the sidewalls 13, 14 and pivotable around a horizontal second pivot axis y, which in the preferred embodiment is a second shaft 35. The pedal 30 is a control pedal which is used for opening the wiggle support 1 when applying it to the leg 100, wherein the pedal 30 is arranged to pivot the wedge 20 around the vertical first pivot axis z in the first pivoting direction B, in which the wedge 20 moves away from the stop 15. The impact by the pedal 30 on the wedge 20 is performed by an engagement means 31, which protrudes from the pedal 30 in the vertical direction z downwards. The engagement means 31 is arranged to engage with the arm 22 of the wedge 20, by engaging with a free end 22a of the arm 22 for pivoting the wedge 20 around its vertical first pivot axis z. The body 10 further comprises a second gap 18, which is arranged between the base plate 11 and the right sidewall 13 (to which the arm 22 of the wedge 20 is pivotally attached). The free end 22a of the arm 22 extends into the second gap 18, past the side wall 13 and ends between the side walls 13, 14, and by that the engagement means 31 of the pedal 30 may engage with the free end 22a such as the free end 22a moves in direction towards the front wall 12. Further, a

spring 40 in the form of a coil-spring 40 is arranged around the first pivot axis z, i.e., the shaft 25. The spring 40 is arranged to impact the free end 22a of the arm 22 of the wedge 20 with its spring force, such as the wedge 20 pivots around the vertical first pivot axis z in the second pivot direction D wherein the free end 22a moves in direction away from the front wall 12.

[0031] Fig. 3a-c shows the wiggle support 1 in the open position and ready to level/support the leg 100 of a furniture. Fig. 3a is a front view, Fig. 3b is a side view and Fig. 3c is a top view of the wiggle support 1. Fig. 4a-d shows the wiggle support 1 in its supporting (stabilizing) position when stabilizing/supporting the leg 100 of a furniture. Fig. 4a is a perspective view of the wiggle support 1, Fig. 4b is a cross-sectional view of Fig. 4c, seen from a front side (section B-B of Fig. 4c), Fig. 4c is a side view and Fig. 4d is a top view. Below the functionality of the wiggle support 1 will be explained referring to Figs. 3a-c and Figs. 4a-d.

[0032] By pressing the free end of the pedal 30 downwards towards the base plate 11, the engagement means 31 presses the free end 22a of the arm 22 in direction towards the front wall 12 of the body 10 and the spring-loaded wedge 20 moves away from the stop (first pivoting direction B in Fig. 1). The user may press the pedal 30 by hand or more convenient by the foot. And when this is done, the wiggle support 1 is ready to be pushed towards the leg 100 (direction indicated by C in Fig. 3c), which leg is to be supported. When the front wall 12 abuts a first side a of the leg 100 as illustrated in Figs. 3a-c, the user releases the pedal 30 wherein the wedge 20 automatically, by the spring-force of the coil-spring 40, pivots in the second pivot direction D, which is in direction towards the stop 15.

[0033] The levelled/supported position of the wiggle support 1 underneath the leg 100 is illustrated in Figs. 4a-d. Depending on how large the gap is between the substrate (floor) and the bottom of the leg 100, the stepped wedge-are 21 enters underneath the leg 100 with that step 23 of the wedge 20 which may enter "without difficulties". This is decided by the gap and the form of the leg 100. Each step 23 comprises a riser 24, which will abut a third side c, d of the leg 100 and thereby the leg 100 also gets clamped between the stop 15 and/or the front wall 12 (depending on the diameter and form of the leg). The user may shake or rock the furniture, for example the table, to ensure that a proper support is achieved by the wiggle support 1. If there still is a gap to fill, the wedge 20 will "snap" further inwards in the second pivot direction D, yet another step, until the gap is properly filled and the leg 100 is sufficiently supported by the step 23 of the wedge 20. Depending on the form and diameter of the leg 100, the clamping force may be directed only towards the stop 15, towards the front wall 12 or positions in between these. If a large gap is to be "filled" or the leg 100 has a small diameter the chamfered edge 15a of the stop 15 allows at least a part of the wedge-area 21 to pass below the stop, such as a proper support and clamping is achieved, which may be seen especially in Figs. 4b and 4d. It is also possible that the wedge-area 21 of the wedge 20 may pass below the front wall 12 if needed. This is not shown in the figures, but in that case, the front wall 12 may protrude outside a front edge of the base plate 11, to allow the wedge-area 21 to enter. This may be a wanted function depending on the range of which heights should be possible to "fill" under a leg 100 of a piece of furniture.

[0034] The body 10 may comprise a pedal stop (not visible) which is arranged to prevent the pedal 30 from passing the stop while pivoting around the second pivot axis y in an opposite direction relative the spring force direction. This means that when a user has operated the wiggle support 1 for stabilizing a piece of furniture, and then release the pedal 30, the pedal is pushed in the opposite direction (upwards in the Figs. 3b and 4c) by that the spring-force of the spring impact the engagement means 31 of the pedal 30 via the free end 22a of the arm 22 of the wedge 20. The stop prevents this motion to proceed further, such as the pedal will not flip over, past an imaginary vertical line z above the pivot point y of the pedal 30. By that, the pedal 30 is ready to be pressed downwards towards the base plate 11 to open the wiggle support 1 again.

[0035] The automatic wiggle support 1 according to the preferred embodiment is robust, provides good support to a furniture leg and provides great flexibility since it fits any leg of a furniture, independently of the form of the leg or foot and which also is easy to apply and remove. Further, it is possible to produce at low cost and a cafe-owner or restaurant-owner or the like may print a logo on the stop 15 and may also use it for example as a give-away.

[0036] The wiggle support described above in Figs. 1 - 4d is as mentioned arranged according to a first design, in which a maneuvering device 30, 50 is in the form of a pedal 30. An alternative second design of the maneuvering device 30, 50 is presented in Figs. 5a - c, where the maneuvering device 30, 50 is in the form of a lever 50.

[0037] Fig. 5a shows a perspective view of the wiggle support 1 in a supporting (stabilizing) position underneath a leg of a furniture and Fig. 5b shows a top view of the wiggle support 1, but in an open position, ready to be arranged in its supporting position underneath a leg of a furniture. Fig. 5c shows a section through a lower part of the wiggle support 1 (at a height of a third step 23 of a stepped wedge-area 21 of the wedge 20, in a supporting position underneath a leg of a furniture. The function is similar with the wiggle support according to the first design/embodiment, where the maneuvering device 30, 50 is in the form of a pedal 30, and the main design of the second embodiment is regarding main parts of the body 10 and the wedge-shaped area 21 and arm 22 of the wedge 20, very similar or similar with the first design/embodiment.

[0038] The biggest difference between the first design (pedal) and the second design (lever) is that the second

design comprise comprises less parts and that the first design is intended to be maneuvered with the user's foot and thereby operated in a vertical pressing of the pedal 30 (relative the base plate 11), while the second design is intended to be maneuvered with the user's hand, by operating the lever 50 in a horizontal pressing (along the base plate 11). The second design comprises more or less three parts, the body 10, the wedge 20 (including the lever 50) and the spring 40. According the second design, the body 10 comprises the base plate 11 (to be arranged on the substrate), the front wall 12 and walls 13, 14, as well as the stop 15, but where for example one of the walls 13 (to which the wedge 20 is attached, see below) may have a short extension in the first vertical direction z, or instead be arranged as a top cover 17 of the body 10, see Fig. 5a. The function and arrangement of the base plate 11, the walls 12, 13, 14, as well as the stop 15 are quite similar with the first design and is not further described here.

[0039] The wedge 20 is pivotally attached to the body 10 by that a holding part of the arm 22 of the wedge 20 is pivotally attached to a shaft 26 which extends between the cover part 17 (closed top of the body 10) and the base plate 11 (or short wall 13). The lever 50 is fixedly attached to the arm 22 of the wedge 20 at the position of the holding part of the arm 22, and preferably is as an extension of the arm 22 on the opposite side of the vertical first pivot axis z (the shaft 26), wherein the lever 50 upon maneuvering is arranged to pivot the wedge 20 around the vertical first pivot axis z (the shaft 26) in at least the first pivoting direction B. The spring 40 is arranged around the shaft 26 and is arranged such as the spring force of the spring 40 is subjected to the wedge 20, wherein the lever 50 tends to move in direction away from front wall 12 of the body 10, wherein the wedge 20 tends to move in the second pivoting direction D, to fill a possible gap between the leg 100, which is to be supported, and the substrate. To open the wiggle support 1, the lever 50 is pressed in direction towards the side wall 14. All functionality of the wiggle support 1 according to this second design (lever) is similar with the first design (pedal). Preferably, the lever comprises an angled end to provide a simpler and fast opening grip of the wiggle support 1.

[0040] Although the description above contains a plurality of specificities, these should not be construed as limiting the scope of the concept described herein but as merely providing illustrations of some exemplifying embodiments of the described concept. It will be appreciated that the scope of the presently described concept fully encompasses other embodiments which may become obvious to those skilled in the art, and that the scope of the presently described concept is accordingly not to be limited. Reference to an element in the singular is not intended to mean "one and only one" unless explicitly so stated, but rather "one or more." All structural and functional equivalents to the elements of the above-described embodiments that are known to those of ordinary skill in the art are expressly incorporated herein and are intended to be encompassed hereby.

Claims

1. Wiggle support (1) to stabilize a piece of furniture, which wiggle support (1) in a using position is to be arranged to fill a gap between a leg of a furniture and a substrate on which the furniture is standing, referring to the using position of the wiggle support (1) the wiggle support (1) comprising:

   a body (10) which comprises a base plate (11) which is to be arranged on the substrate, the body (10) further comprises a front wall (12) and two side walls (13, 14) of which at least one of the walls (12, 13, 14) is fixedly attached to the base plate (11), wherein the front wall (12) is fixedly attached to at least one of the base plate (11) or at least one of the side walls (13, 14), and the side walls (13, 14) are fixedly attached to at least one of the base plate (11) or the front wall (12), and the walls (12, 13, 14) have an extension in a vertical direction (z) relative the base plate (11), wherein the front wall (12) is arranged to abut a first side (a) of a leg of a furniture, wherein the sidewalls (13, 14) face away from the front wall (12) in a first direction (A), wherein the body (10) further comprises a stop (15) which protrudes from the front wall (12) in an opposite direction (C) relative the first direction (A), wherein the stop (15) is arranged to abut a second side (b) of a leg of a furniture,
   a wedge (20) which comprises a stepped wedge-area (21) and an arm (22), wherein the arm (22) is pivotally attached to one of the side walls (13) of the body (10), and pivotable around a vertical first pivot axis (z), wherein the wedge (20) upon pivoting around the first pivot axis (z), the stepped wedge-area (21) may enter or leave a gap between a leg of a furniture and a substrate in direction towards or away from at least the stop (15) of the body (10),
   a maneuvering device (30, 50) which either is a pedal (30) pivotally attached between the sidewalls (13, 14) of the body (10) and pivotable around a horizontal second pivot axis (y), wherein the pedal (30) is arranged to pivot the wedge (20) around the vertical first pivot axis (z) in at least a first pivoting direction (B) by an engagement means (31) which protrudes from the pedal (30) in the vertical direction (z) and which engagement means (31) is arranged to engage with the arm (22) of the wedge (20), or a lever (50) which is fixedly attached to the arm (22) of the wedge (20) at a position where the arm (22) is pivotally attached to one of the side walls (13) of the body (10), wherein the lever (50) is ar-

ranged to pivot the wedge (20) around the vertical first pivot axis (z) in at least a first pivoting direction (B),
a spring (40) arranged to impact the arm (22) of the wedge (20) with its spring force such as the wedge (20) pivots around the vertical first pivot axis (z) in at least a second pivot direction (D) which is opposite the first pivoting direction (B).

2. Wiggle support (1) according to claim 1, wherein the stepped wedge-area (21) of the wedge (20) comprises a plurality of steps (23), each arranged with a riser (24), which riser (24) is arranged to abut at least a third side (c, d) of a leg of a furniture.

3. Wiggle support (1) according to claim 1 or 2, wherein the stop (15) of the body (10) has a chamfered lower edge (15a) such as a first gap (16) is achieved between the lower edge (15a) of the stop (15) and a substate on which the wiggle support (1) is arranged, which first gap (16) allows at least a part of the wedge-area (21) of the wedge (20) to pass below the stop (15).

4. Wiggle support (1) according to any of the preceding claims, wherein the uppermost step (23) of the wedge-area (21) of the wedge (20) comprises a stop edge.

5. Wiggle support (1) according to any of the preceding claims, wherein, when the maneuvering device (30, 50) is the pedal (30), the body (10) comprises a second gap (18) between the base plate (11) and the one of the side walls (13) to which the arm (22) of the wedge (20) is pivotally attached, and the arm (22) of the wedge (20) comprises a free end (22a) which extends into the second gap (18) past the side wall (13) and ends between the side walls (13, 14), such as the engagement means (31) of the pedal (30) may engage with the free end (22a) of the arm (22) for pivoting the wedge (20) around its vertical first pivot axis (z).

6. Wiggle support (1) according to any of the preceding claims, wherein the spring (40) is a coil-spring which is arranged around the first pivot axis (z).

7. Wiggle support (1) according to any of claims 5 - 6, wherein, when the maneuvering device (30, 50) is the pedal (30),, the horizontal second pivot axis (y), around which the pedal (30) pivots, is arranged at a first distance (zi) from the base plate (11) of the body (10) and the engagement means (31) of the pedal (30) protrudes a second distance (z_2) downwards from the pedal (30) in direction towards the base plate (11) of the body (10), wherein the second distance (z_2) is shorter than the first distance (zi), wherein a pressing of the pedal (30) downwards towards the plate (11) causes the wedge (20) to move in direction away from the stop (15), in the first pivoting direction (B), to an open position, in which the wiggle support (1) is arrangeable towards a leg of a furniture which is to be levelled, by that the engagement means (31) of the pedal (30) is arranged to press the free end (22a) of the arm (22) of the wedge (20) in direction towards the front wall (12) of the body (10).

8. Wiggle support (1) according to any of claims 5 - 7, wherein, when the maneuvering device (30, 50) is the pedal (30),, the spring (40) is arranged such as the spring force of the spring (40) is subjected to the wedge (20) such as the free end (22a) of the arm (22) of the wedge (20) tends to move in direction away from front wall (12) of the body (10).

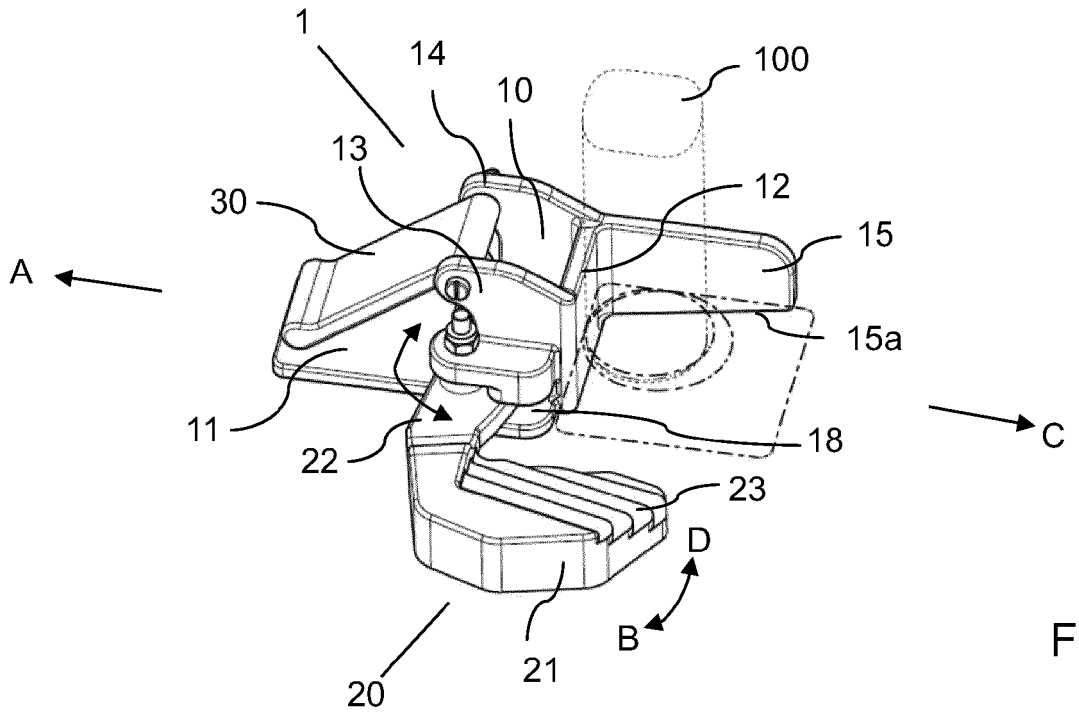
9. Wiggle support (1) according to any of the preceding claims, wherein, when the maneuvering device (30, 50) is the pedal (30), the body (10) comprises a pedal stop which is arranged to prevent the pedal (30) from passing the stop while pivoting around the second pivot axis (y) in an opposite direction relative the spring force direction.

10. Wiggle support (1) according to any of the preceding claims, wherein the front wall (12) is fixedly attached to at least one of the sidewalls (13, 14) and further is arranged in front of a front edge of the base plate (11), such as a third gap is arranged below the front wall (12) and a substate on which the wiggle support (1) is arranged, which third gap allows at least a part of the wedge-area (21) of the wedge (20) to pass below the front wall (12).

11. Wiggle support (1) according to any of claims 1 - 4 or 6, wherein, when the maneuvering device (30, 50) is the lever (50), the spring (40) is arranged such as the spring force of the spring (40) is subjected to the wedge (20) such as the lever (50) tends to move in direction away from front wall (12) of the body (10).

12. Wiggle support (1) according (1) according to any of claims 1 - 4 or 6, wherein, when the maneuvering device (30, 50) is the lever (50), the lever (50) is attached to arm (22) of the wedge (20) as an extension of the arm (22) on the opposite side of the vertical first pivot axis (z).

13. Wiggle support (1) according (1) according to any of claims 1 - 4 or 6, wherein, when the maneuvering device (30, 50) is the lever (50), the lever (50) comprises an angled end.


1
14
10
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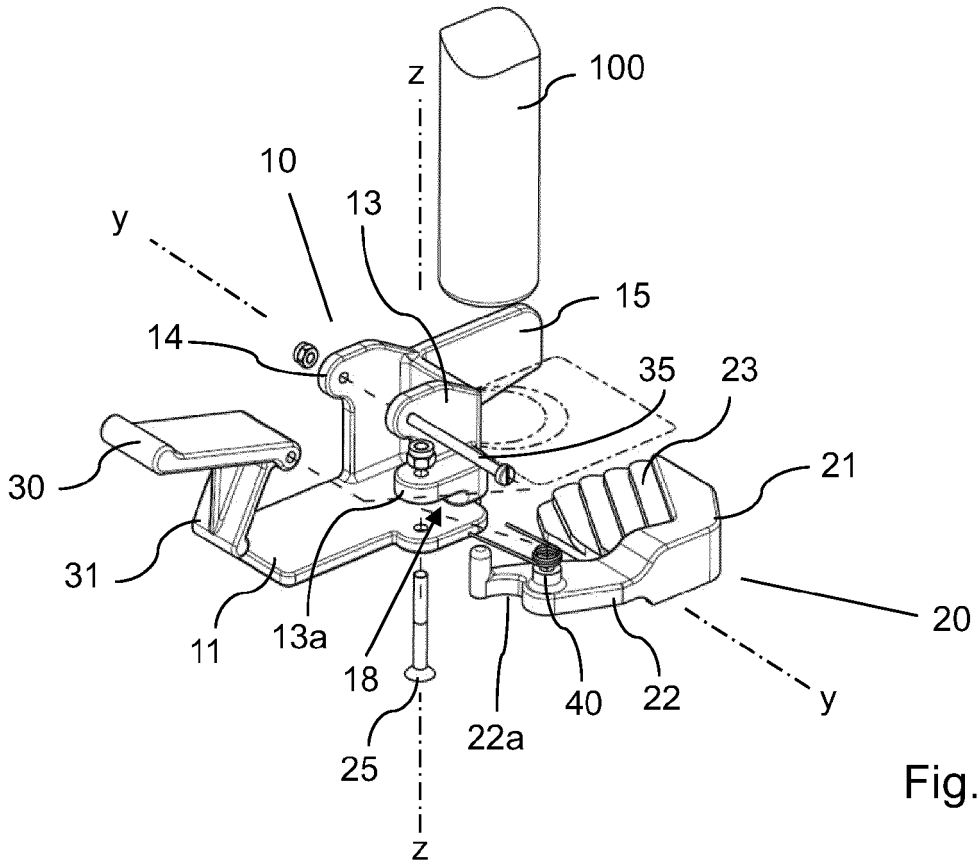
13
12
30
15
A
15a
C
11
22
18
23
D
B
21
20

Fig. 1


z
100
10
y
13
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14
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21
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40
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y
22a
25
z

Fig. 2

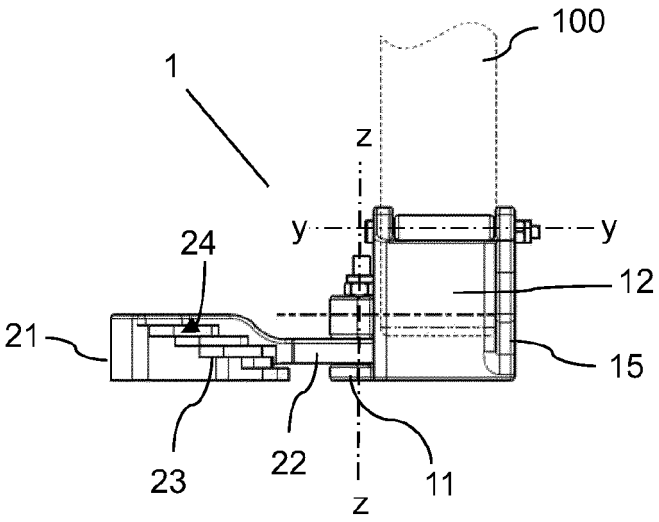

Fig. 3a

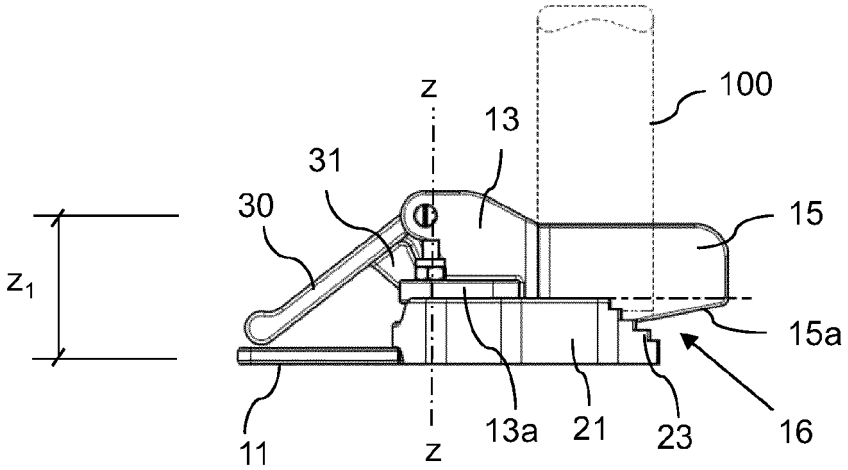

Fig. 3b

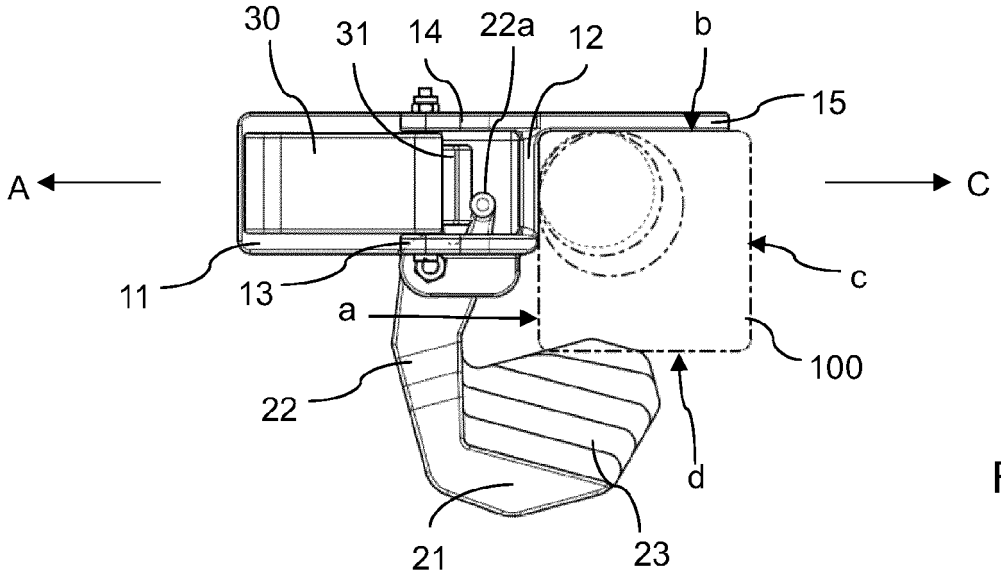

Fig. 3c

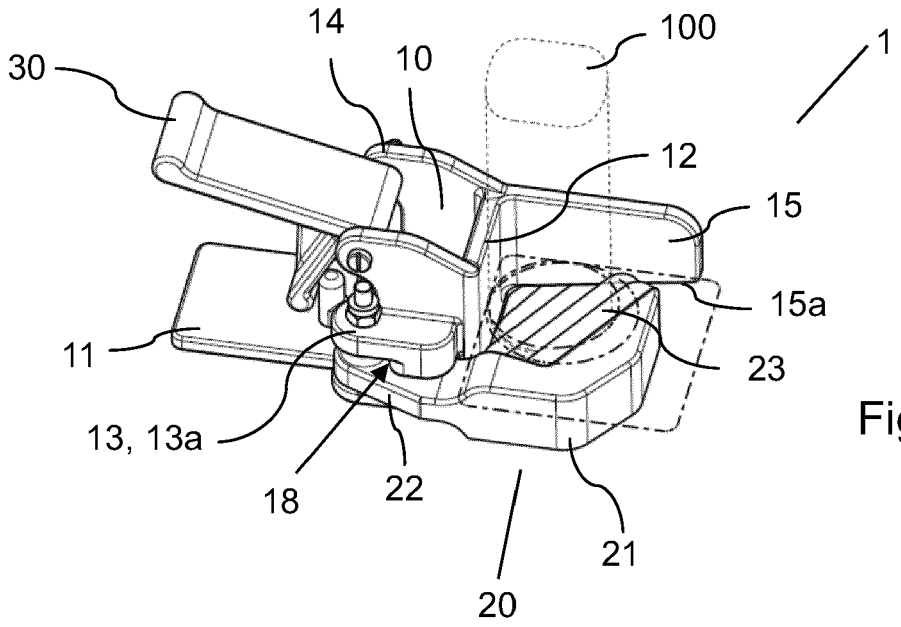

Fig. 4a

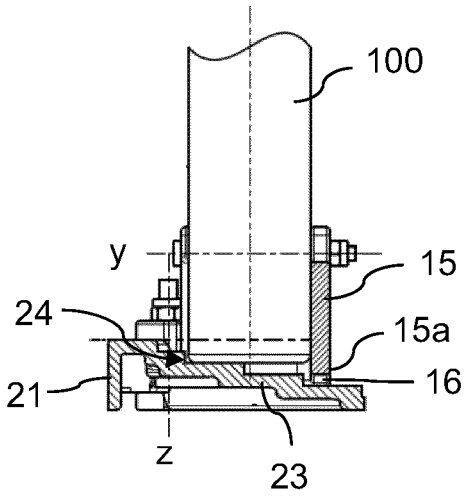

Fig. 4b
(Section B-B)

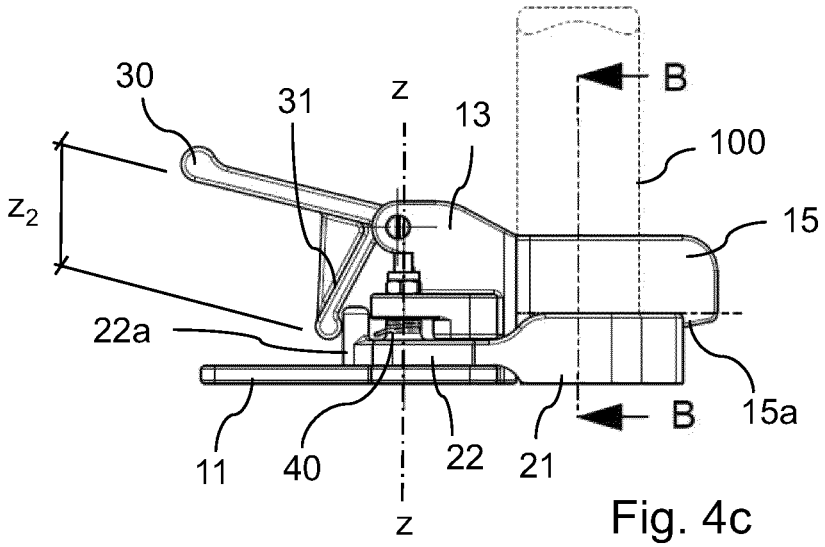

Fig. 4c

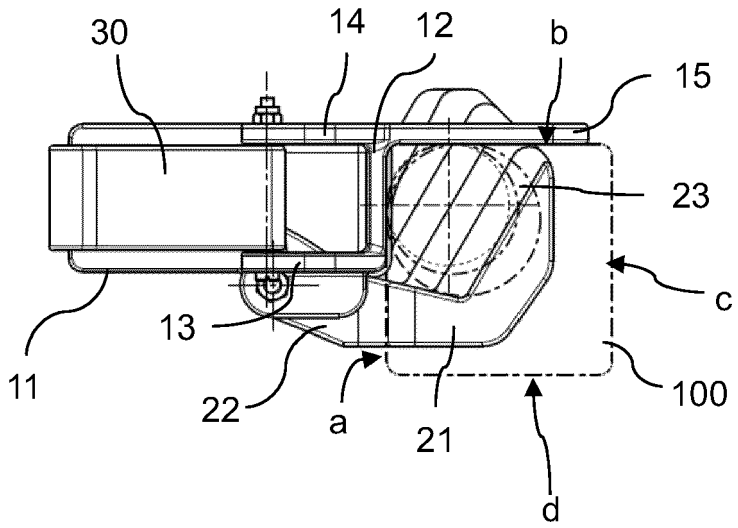

Fig. 4d

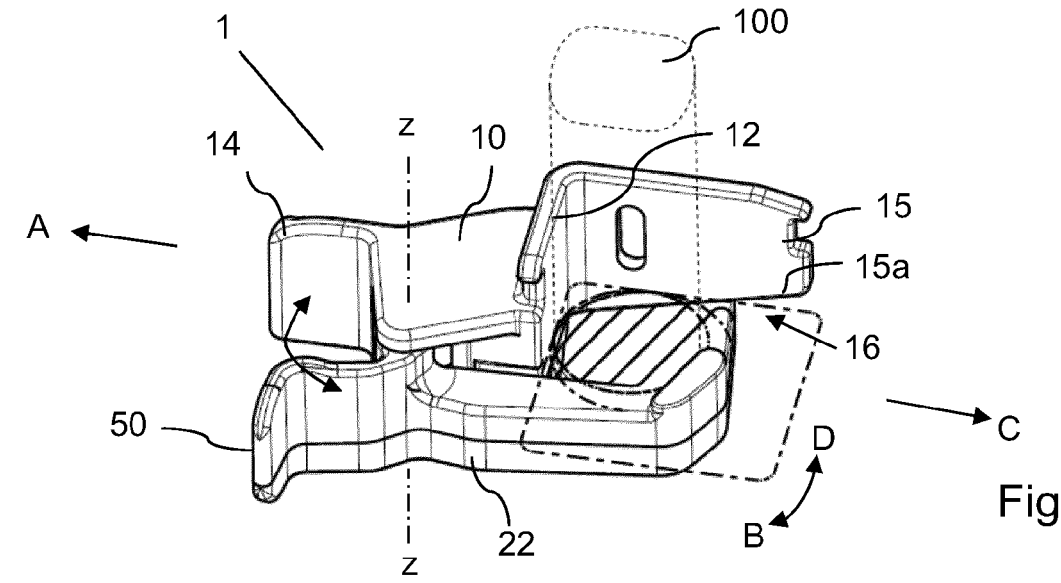

Fig. 5a

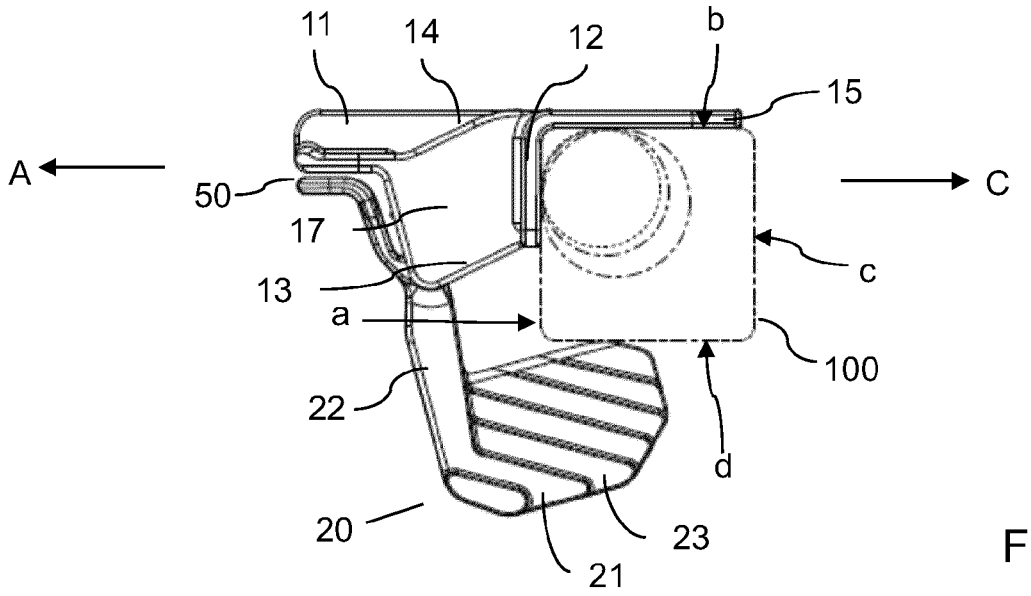

Fig. 5b

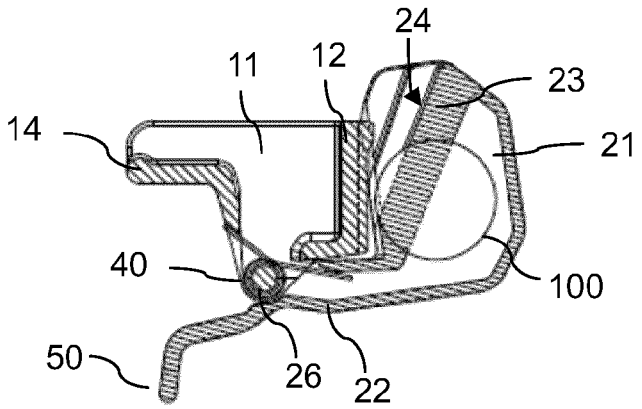

Fig. 5c

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EUROPEAN SEARCH REPORT

Application Number
EP 22 16 3348

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2 850 117 A (GERSMEHL SR VERN R) 2 September 1958 (1958-09-02) * figure 7 *	1,2,4,6, 11-13	INV. A47B91/12 B25B5/04 B25B5/06 B25B5/16
A	DE 20 2020 004179 U1 (FUERBETH ALFRED [DE]) 3 November 2020 (2020-11-03) * the whole document *	1	
A	WO 2020/120814 A1 (PASTOR ARENAL DAVID [ES]) 18 June 2020 (2020-06-18) * figures 1-3 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

A47B
F16M
E06C
B60T
B62B
B25B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	29 July 2022	Martinez Valero, J

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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29-07-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2850117 A	02-09-1958	NONE	
DE 202020004179 U1	03-11-2020	NONE	
WO 2020120814 A1	18-06-2020	ES 1223096 U	16-01-2019
		WO 2020120814 A1	18-06-2020

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

- US 10130174 B2 **[0003]**
- US 2013112821 A1 **[0005]**