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(54) **FASTENING DEVICE FOR INSTALLING A WINDOW OR A DOOR AND INSTALLING SYSTEM AND METHOD FOR WINDOWS AND DOORS**

(57) Fastening device 1 for installing a window or a door, which fastening device comprises an outer part 3 and an inner part 6, which is movably arranged to the cavity 4 of the outer part, as well as an adjusting screw 8, with which the inner part 6 is moved in the cavity 4 in the lateral direction of the cavity. The object of the invention is also an installation method and system, in which

the installation of the window or the door to be installed is performed from the outer surface of the frame so that fastening pins are arranged on the outer surface of the frame to the vertical sides of the frame and fastening devices are arranged to the vertical walls of the opening provided for the window or the door.

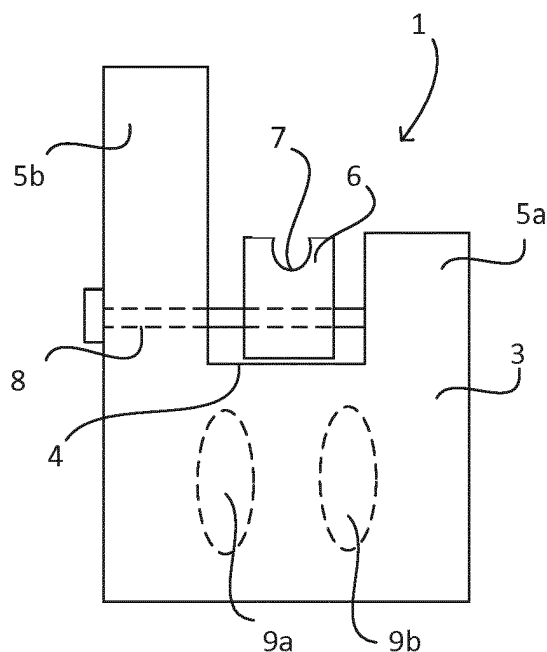


Fig. 1

DescriptionField of the invention

[0001] The invention relates to a fastening device according to the enclosed independent claims for installing a window or a door and to an installing system and an installing method for windows or doors.

Background of the invention

[0002] In the currently used way of installing a window in its place, the window framework is removed from the window frame before installing the window to the opening provided for it. In some smaller windows, the outer framework can be left in its place, but the inner framework is removed. The window frame is put in its place to the opening with different installation wedges and the like. After this, the frame is fastened to the opening from inside the frame through the frame, typically the frame is fastened with screws through the frame to the structures of the side walls of the opening. Due to this, there are openings induced by the fasteners through the frame, which openings must be covered later by individual sealer plugs. After this the window framework is reinstalled in its place. The gap between the frame and the opening is typically sealed by sealing compound and/or mineral wool. When using wool, a closed-cell foam plastic ribbon having a thickness of the gap is typically also installed to the inner edge of the window and furthermore a silicone or an acrylic puttying to the inner surface.

[0003] The above-described installation of the frame in its place to a correct point is troublesome and time-consuming. Removing the window frameworks and re-installing them also easily cause damages to the window structures. The same working phases and problems also exist when installing doors.

Object and description of the invention

[0004] An object of the present invention is to reduce or even eliminate the above-mentioned problems appearing in prior art.

[0005] An object of the present invention is to provide a fastening device for installing a window or a door and an installing system and an installing method for windows and doors, which system and method do not require removing the window frameworks or the doors from their frame structure before installation. An object of the invention is thus to disclose a simple and a quick method for installing windows and doors to the openings provided for them.

[0006] To achieve this object, the fastening device, the system and the method according to the invention are primarily characterised in what is presented in the characterising parts of the independent claims.

[0007] Some preferred embodiments of the invention are disclosed in the other, dependent claims.

[0008] A typical fastening device according to the invention for installing a window or a door to the opening provided for it comprises

- an outer part having a cavity, which is formed so that in the vertical direction of the fastening device the first edge of the cavity is lower than the second edge of the cavity, the space between the edges of the cavity defines the lateral direction of the cavity,
- an inner part, which is movably arranged to the cavity of the outer part so that the upper part of the inner part is substantially in the same plane with the first edge of the outer part, and the upper part of the inner part of which comprises a cavity deviating from the plane, and
- an adjusting screw, which is arranged through the outer part and the inner part so that the inner part is moved with the aid of the adjusting screw in the lateral direction of the cavity of the outer part.

[0009] A typical system according to the invention for installing a window or a door to the opening provided for it comprises

- a fastening pin, which can be installed on the outer surface of the window frame or the door frame to the vertical sides of the frame, and
- a fastening device according to the invention, which can be installed to the wall of the opening and to which fastening device the fastening pin can be arranged so that the fastening pin sets to the cavity of the inner part of the fastening device.

[0010] In a typical method according to the invention for installing a window or a door to the opening provided for it

- fastening pins are arranged on the outer surface of the frame of the window or the door to be installed to the vertical sides of the frame,
- fastening devices according to the invention are provided to the vertical walls of the opening provided for the window or the door,
- a window or a door to be installed is provided to the opening so that the fastening pins arranged on the outer surface of the frame set to the cavities of the inner part of the fastening devices arranged to the walls of the opening.

[0011] The fastening device and the installation method and system according to the invention are based on the fact that the window frameworks or the door do not need to be removed from their frame structure before the

installation, but the windows and the doors can be installed to the opening provided for them so that all window frameworks or the door are in their places in the frame. In the installation method and the system according to the invention the fastening of the window or the door to the wall of the opening is performed from the outer surface of the frame. In a preferred embodiment of the invention the fastening from the outer surface of the frame is performed so that the inner surface of the frame remains unbroken. This way, the frame remains untouched and separate sealing plugs are no longer needed to cover the holes induced by the fastening of the frame. Since the window frameworks or the door do not need to be removed from the frame before the installation, the installation work will also become remarkably quicker and simpler. When the window or the door is fastened to the opening with the system according to the invention, on the installation site, only the sealing foam or another insulation material needs to be added to the insulation gap between the window and the wall of the opening and install the trims surrounding the window in their places.

[0012] The fastening device according to the invention and the installation method and system are suitable for the installation of both windows and doors, although it is not always separately mentioned. Thus, the frame refers either the frame structure of the window or the door, to which frame structure the window framework or the door is fastened, typically hinged. The frame comprises vertical sides and horizontal upper and lower sides. The vertical sides of the frame refer to sides, which, when the window or the door are installed in its place, are substantially vertical and set opposite to each other in relation to the vertical walls of the opening. An insulation gap remains typically between the frame and the wall of the opening, in which insulation gap the fastening devices according to the invention are located. The fastening device and the installation method and system according to the invention enable the installation with a very small insulation gap. Typically, the insulation gap can be only 10 - 25 mm, 10 - 20 mm or 15 - 20 mm. The frames are typically manufactured of wood, but the fastening device according to the invention and the installation method are suitable to be used also with other materials. With the installation system according to the invention, an easy and a quick mechanical fastening of the window or the door to the structures of the opening can be guaranteed.

[0013] The fastening device according to the invention is formed of two parts inserted within each other: of the outer part and the inner part. Furthermore, the fastening device comprises an adjusting screw connecting the parts. The outer part of the fastening device comprises a cavity, which is formed so that in the vertical direction of the fastening device the first edge of the cavity is lower than the second edge of the cavity. Typically, the cavity of the outer part is in the vertical direction of the fastening device so that, the fastening device being fastened in its place, the cavity opens upwards. The space between the

edges of the cavity defines the lateral direction of the cavity. The inner part of the fastening device is movably arranged to the cavity of the outer part so that the upper part of the inner part is substantially in the same plane with the first edge of the outer part, i.e. with the lower edge. In a preferred embodiment of the invention, the height of the inner part is substantially the same as the height of the cavity of the outer part measured from the bottom of the cavity to the upper part of the first, i.e. the lower edge of the cavity. The upper part of the inner part of the fastening device comprises a cavity deviating from the plane, to which cavity the fastening pin can be inserted.

[0014] The fastening device comprises an adjusting screw, which is arranged through the outer part and the inner part so that the inner part is moved with the aid of the adjusting screw in the lateral direction of the cavity of the outer part. This enables the adjustment of the window or the door to a correct place in the depth direction of the frame after the window or the door has been installed in its place to the fastening device. The width of the inner part is thus smaller than the width of the cavity of the outer part in the lateral direction of the cavity, so that there is an adjustment tolerance in the fastening device. Typically, the adjustment tolerance of the cavity is about 10 to 20 mm or 5 to 10 mm depending on the dimensioning of the fastening device. In a preferred embodiment of the invention the width of the inner part in relation to the cavity of the outer part is dimensioned so that the fastening pin to be used with the fastening device has, due to the adjustment tolerance, no room to fall to the cavity of the outer part, but is always specifically guided to the cavity on the upper surface of the inner part.

[0015] In a preferred embodiment of the invention the cavity on the upper surface of the inner part comprises a grooving or a similar roughening on the bottom of the cavity, which grooving or roughening functions as a so-called non-slip device and thus the fastening pin setting to the cavity remains well in its place. The cavity of the inner part is preferably dimensioned to be suitable for the fastening pin to be inserted therein. The cavity is typically dimensioned so that its diameter is substantially the same as the diameter of the fastening pin. The depth of the cavity can vary.

[0016] The outer part and the inner part of the fastening device according to the invention comprise a first planar surface and a second planar surface. In a preferred embodiment of the invention the first and the second surfaces of the outer part and the inner part are substantially in the same plane. The distance between the first and the second planar surface from each other defines the thickness of the fastening device. The thickness of the fastening device can vary, but is typically about 10 mm. In a preferred embodiment of the invention the cavities of the outer and inner part of the fastening device extend in the thickness direction of the fastening device through the fastening device, i.e. from the first planar surface to the second planar surface.

[0017] In an embodiment according to the invention the outer part of the fastening device comprises two or more openings for fastening the fastening device in its place. In a preferred embodiment the openings are elongated in the vertical direction of the fastening device, whereby the installation point of the fastening device in the vertical direction can be adjusted when fastening the fastening device in its place. The vertical direction of the fastening device is the direction, in which the cavity of the outer part opens upwards.

[0018] In an embodiment according to the invention, the outer part of the fastening device comprises at least on one planar surface two or more pins or similar projections, with which the fastening device can be tightly fixed to the wall of the opening when fastening the fastening device.

[0019] The fastening device according to the invention can be made of any material suitable for the purpose. In an embodiment of the invention the fastening device, in particular its outer and inner part, are made of plastic or metal, for example of hot-dip galvanized steel. Also the adjusting screw can be made of any material suitable for the purpose, typically of metal. The advantage of the fastening devices made of plastic is that no heat bridges are formed to the structure. The form and the size of the fastening device can vary freely, however so that the fastening device has the above-described outer and inner part and a cavity, to which the fastening pin can be easily and firmly inserted, as well as an adjusting screw.

[0020] The fastening pins to be used in the installation system according to the invention can be for example of screwing bar, male screws, screws or similar fastening devices suitable for the purpose. When using the screwing bar, pins or similar means, they can be shortened to a suitable length on the installation site. In a preferred embodiment of the invention the fastening of the fastening pins to the frame structure of the window or the door is only performed from the outer surface of the frame. In a preferred embodiment the fastening device does not penetrate the inner surface of the frame. The fastening pins can be fastened either on the installation site or alternatively already in the factory based on the dimensioning information of the window or the door opening. If fastening pins which are ready-mounted in the factory are used, they can be fastening means extending through the frame from the inside to the outside, but preferably the fastening means are arranged to the structure so that the inner surface of the frame remains unbroken.

[0021] In a preferred embodiment of the invention, two or more fastening pins are installed on the outer surface of the window or the door frame, to the vertical sides of the frame. Respectively, a respective number of fastening devices according to the invention are installed to the vertical sides of the opening. In a typical embodiment, if the wall of the opening is not aligned with the inner wall, a plate or the like can be installed to the wall of the window opening before installing the fastening devices. A fastening device according to the invention opening upwards

is formed so that one end of the cavity is lower than the other end. The fastening device according to the invention is installed to the wall of the opening so that the edge of the cavity which is first in the installation direction is lower than the second edge of the cavity, since the fastening pins can thus be easily inserted to the fastening device and the installation is carried out easily. Respectively, the higher edge which is latter in the installation direction eases the installation on its part and the setting of the fastening pin to the cavity. The fastening pins set on the bottom of the cavity of the inner part of the fastening device and thus the window or the door remains firmly in its place. Typically, the number of fastening pins or the like is 2-4 on the vertical side of the frame depending on the size of the window or the door to be installed, so that the window and the door can be firmly and exactly installed in its place.

[0022] In the installation method according to the invention the fastening device is installed in its place to the window opening so that the middle point of the fastening device is aligned and corresponds thus the middle point of the fastening pin fastened to the window frame. The middle point of the fastening device refers to the vertical line of the fastening device, which runs through the middle point (the middle point of the cavity in the lateral direction of the cavity) of the cavity of the outer part. The adjustment tolerance of the inner part of the fastening device enables the fastening pin in the window or the door frame to be installed so as to set securely in the correct point and the window or the door can be fitted to a correct plane in the depth direction of the opening. In a preferred embodiment the fastening device is fastened in the vertical direction of the opening to a correct point through the elongated openings in the fastening device, for example with screws. Elongated openings enable the installation of the fastener to a correct point exactly in the vertical direction of the opening.

[0023] In an embodiment according to the invention, a seal has furthermore been arranged on the outer surface of the window or the door frame, which seal sets tightly against the walls of the opening when installing the window or the door in its place. Typically, the seal has been arranged around the frame, to all sides of the frame. The seal can be continuous along the entire circumference of the frame or it is composed of several individual pieces. The seal can be made of rubber or similar material having a sufficient stiffness. The seal can be a strip-like seal, which is fastened from its one end to the window frame and the second end extends to the edge of the opening so that the seal bends slightly in the insulation gap and is tightly pressed against the walls of the opening. The seal is typically fastened to the groove located in the middle part of the frame or to another point in the lateral direction of the frame so that the seal is set to the insulation gap between the frame and the wall of the opening. With such seal to be fastened to the frame, an air lock is provided to the insulation gap, but also the sound insulation can be improved with it. The insulation gap between

the frame and the walls of the opening can additionally be conventionally sealed with sealing compound and/or mineral wool on both sides of the seal. This seal combined with the fastening device according to the invention accelerates remarkably the installation work of the window.

[0024] In an installation method according to the invention the windows are hoisted to the window opening and after this the windows can be installed in their places to the fastening devices according to the invention either from the inside or the outside of the building. The windows can be hoisted to the window opening with any hoisting apparatus or hoisting arrangement suitable for the purpose. With the installation system according to the invention, a hoisting arrangement can be utilized for hoisting the windows to the window openings of the building, which hoisting arrangement comprises a support structure to be arranged to the window opening and hoisting means for hoisting the window. Thus, especially the windows of the blocks of flats can be installed one window line at a time, in which window line there are two or more windows on top of each other in the vertical direction of the building. The windows are hoisted to the window openings with a hoisting arrangement, which is typically arranged to the opening of the uppermost window in the window line. This way, the hoisting arrangement is arranged to one window opening when installing the windows of one window line. The installation work of the windows can be remarkably accelerated, when the window is hoisted with a hoisting arrangement at the place of the window opening outside the building, inside through the opening and thus the window can be easily installed in its place to the opening from inside the building when using the fastening devices and the fastening system according to the invention. Simultaneously, with the hoisting arrangement arranged to the uppermost window opening of the window line, all windows of the same window line can be hoisted in their places.

[0025] The support structure of the hoisting arrangement is formed so that it is supported by both edges of the window opening in the lateral direction of the window opening, whereby the hoisting apparatus does not need to be separately mechanically fastened to the structures of the building. The support structure runs through the window opening, so that the hoisting apparatus does not fall when hoisting the windows due to the weight of the windows. The structure of the support structure can vary, but typically the support structure comprises

- a horizontal supporting bar supported by the upper edge of the opening and a horizontal supporting bar supported by the lower edge of the opening in both edges of the window opening in the lateral direction of the opening, which supporting bars have a first end and a second end, and which supporting bars are substantially perpendicular to the window opening, and

- a vertical supporting beam, to which the first ends of the supporting bars of the upper edge and the lower edge are fastened.

[0026] Hoisting means for hoisting the windows have been arranged to the supporting bar of the upper edge of the support structure. Typically, the hoisting arrangement comprises two separate hoisting means, both support structures in the edges of the window opening having their own hoisting means, with which the window can be hoisted by fastening to the opposite edges of the window.

[0027] In the support structure of the hoisting arrangement the horizontal supporting bar of the upper edge of the window opening can be formed of one or more parts so that at least one part is supported against the upper edge of the window opening. One end of the supporting bar formed of one or more parts extends out from the opening substantially perpendicular to the window opening and to which end hoisting means have been arranged for hoisting the window. The second end of the supporting bar is fastened to the vertical supporting beam located inside the building. The horizontal supporting bar supported by the lower edge of the window opening of the support structure is also arranged substantially perpendicular to the window opening. The horizontal supporting bar of the lower edge comprises a first end a second end, the first end of which is fastened to the same supporting beam structure located inside of the building as the supporting bar of the upper edge and its second end extends typically to the outer edge of the window opening (to the edge of the outer wall) or to the edge of the window opening in the depth direction of the window opening so that the structure is well supported by the lower edge of the window opening. The horizontal supporting bars of the upper edge and the lower edge of the support structure can comprise a projection or the like substantially perpendicular to the bar, which projection or the like sets to the edge of the window opening. Thus, the supporting bar can be set in its place and kept in its place.

[0028] The supporting bars of the upper edge and the lower edge of the support structure of the hoisting arrangement are clamped so as to be supported by the window opening, whereby no separate mechanical fastening is needed for fastening the supporting bars to the window opening. In a preferred embodiment the supporting bars of the upper edge and the lower edge are connected to each other by a separate vertical clamping bar, which can be adjusted so as to extend from the supporting bar supported by the upper edge to the supporting bar supported by the lower edge. The clamping bar has typically adjusting means, such as a threaded sleeve or a clamping sleeve, which enables the adjustment of the length of the clamping bar. With the aid of the clamping bar the distance of the supporting bars of the upper edge and the lower edge is adjusted to correspond to the height of the window opening and thus the supporting bars of the upper edge and the lower edge can be clamped between the upper and the lower edge of the window opening.

ing.

[0029] The support structure of the hoisting arrangement further comprises a supporting beam structure inside of the building, to which supporting beam structure the horizontal supporting bars of the upper edge and the lower edge are fastened from their first ends. The supporting beam structure can be formed of one beam or several beams connected to each other, either of horizontal and/or of vertical supporting beams. Typically, the supporting beam structure inside of the building comprises in both edges of the window opening a vertical supporting beam structure, which is formed of one or more parts connected to each other. The horizontal supporting bars are typically adjustably fastened from their first ends to the supporting beam, whereby the fastening point can be adjusted depending on the depth of the window opening and on the space needed inside the building between the inner wall and the supporting beam structure. The first end of the supporting bar of the upper edge and the lower edge refers to the end or the point of the supporting bar extending inside the building, from which end or point the supporting bar is fastened to the supporting beam structure. The height of the supporting beam structure can vary, but however so that it is possible to assemble the supporting beam structure inside the building. The supporting beam structure of the hoisting arrangement does not, however, require any mechanical fastenings inside the building, but the hoisting arrangement is arranged in its place between the upper edge and the lower edge of the opening by horizontal supporting bars. Typically, the support structure of the hoisting arrangement is dimensioned so that it is as close as possible to the wall having a window opening inside the building, but however so that e.g. a heating battery or the like possibly located under the window opening remain between the support structure and the wall.

[0030] Typically, the vertical supporting beam structures of the hoisting arrangement have been arranged to both edges of the window opening like the horizontal supporting bars. At least one horizontal supporting bar is typically arranged between the vertical supporting beam structures of the support structure arranged to both edges of the window opening for supporting and stiffening the support structure inside the building. The horizontal supporting bar is preferably also adjustable so that the distance of the supporting bars from each other can be adjusted depending on the width of the window opening. Furthermore, actuators of the hoisting means, such as a motor and other necessary actuators and controlling elements, have been arranged to the lower end of the vertical supporting beam structure of the support structure arranged to both edges of the window opening. The centre of gravity of the support structure can thus be located inside the building to the lower part of the support structure, which prevents the hoisting arrangement from falling or bending when hoisting the windows. Typically, the support structures located in both edges of the window opening have their own actuators of the hoisting

means.

[0031] With the above-described hoisting arrangement and the fastening device according to the invention it is possible to accelerate the installation work remarkably, since the windows can be easily hoisted in their places to the opening and the fastening device enables a quick and an easy fastening directly in their place.

[0032] The installation method and the installation system according to the invention are suitable for installing windows or doors on all kinds of sites, in new buildings as well as on renovation sites. The installation method and system are also suitable for windows or doors of all sizes. Particularly, when installing windows of blocks of flats, a quick and a simple way of installation according to the invention is preferred. The installation system according to the invention enables the windows to be installed for example so that the windows are hoisted from the window opening inside the apartment and from inside the apartment the window is installed in its place to the opening as a whole package. Thus, there is no need to have a person outside the window for installation and thus there is no need for a personnel hoist on the installation site.

Short description of the drawings

[0033] In the following, the invention will be described in more detail with reference to the appended drawings, in which

- Figure 1 shows a fastening device according to the invention as a diagram,
- Figure 2 shows an opening, to which the window is installed, and fastening devices according to an embodiment of the invention fastened to the wall of the opening,
- Figure 3 shows a window to be installed and fastening pins according to an embodiment of the invention fastened on the outer surface of its frame,
- Figure 4 shows an embodiment according to the invention, in which a seal has been installed on the outer surface of the window frame, and
- Figure 5 shows schematically a hoisting arrangement to be used in the installation of windows pictured from the side.

Detailed description of the invention

[0034] In Figure 1, a fastening device 1 according to the invention is shown as an illustrated diagram pictured directly from the side. The form and the size of the fastening device can, however, vary, and the invention is

not limited to the embodiment shown in the figure. Typically, the fastening device 1 comprises two parts inserted within each other: an outer part 3 and an inner part 6. Furthermore, the fastening device comprises an adjusting screw 8.

[0035] The outer part 3 of the fastening device 1 comprises a cavity 4, which is formed so that in the vertical direction of the fastening device the first edge 5a of the cavity is lower than the second edge 5b of the cavity. In the vertical direction of the fastening device the cavity 4 opens upwards. The space between the edges of the cavity defines the lateral direction of the cavity 4. The lateral direction of the cavity is the same as the lateral direction of the fastening device. The cavity 4 extends through the fastening device in the thickness direction of the fastening device. The inner part 6 of the fastening device 1 is movably arranged to the cavity 4 of the outer part 3, so that the upper part of the inner part 6 is substantially in the same plane with the first edge 5a of the outer part, and the upper part of the inner part 6 of which comprises a cavity 7 deviating from the plane. The width of the inner part 6 is smaller than the width of the cavity 4 of the outer part 3 in the lateral direction of the cavity, so that the adjustment, i.e. movement, of the inner part in the lateral direction of the cavity is possible.

[0036] The adjusting screw 8 of the fastening device which is arranged through the outer part 3 and the inner part 6, so that the inner part 6 is moved with the aid of the adjusting screw in the lateral direction of the cavity 4 of the outer part 3. The adjustment screw 8 is thus arranged at the place of the cavity 4 to the fastening device and it typically extends in the lateral direction of the fastening device from the one outer edge of the fastening device at least over the cavity and through the inner part to the second edge of the cavity. The adjusting screw 8 is typically fastened from its one end to the edge of the cavity 4. The end of the adjusting screw 8 located on the outer edge of the fastening device 1 enables respectively the movement of the adjusting screw by rotating it and thus the movement of the inner part 6 of the fastening device in the cavity 4.

[0037] The outer part 3 of the fastening device 1 can comprise two or more openings 9a, 9b for fastening the fastening device in its place. The openings 9a, 9b are typically elongated in the vertical direction of the fastening device, whereby they enable adjusting the place of the fastening device in the vertical direction of the fastening device exactly to its correct point.

[0038] A wall 10 of the window or the door opening and the fastening devices 1 a, 1 b according to the invention fastened to it are shown in Figure 2, to which fastening devices the fastening pins 2a, 2b (shown in Figure 3) fastened to the window or the door frame 11 can be installed. The fastening devices 1 a, 1 b shown in the Figure do not comprise all details according to the invention, the Figure only illustrates the fastening of the fastening devices from their planar surface to the wall of the opening. Figure 3 illustrates the fastening of the fastening pins to

the vertical side of the window frame 11. The fastening devices 1 a, 1 b and the fastening pins 2a, 2b are arranged to points corresponding to each other and their number and location depend on the site. The fastening system according to the invention comprising the above-mentioned fastening devices 1, 1 a, 1 b and the fastening pins 2a, 2b is only used on the vertical sides of the frame and the opening of the window or the door. The fastening pins 2a, 2b set to the cavity 7 of the smaller part 6 of the fastening device 1. In the embodiment shown in Figure 2, the fastening device 1 a, 1 b is arranged in its place to the wall of the opening so that the edge 5a of the cavity which is first in the installation direction of the window or the door is lower than the second edge 5b of the cavity. The fastening pins 2a, 2b can be easily set to the cavity 7 of the smaller part 6.

[0039] In Figure 3 is shown a window 13, which comprises a window framework 14 and a frame 11, to which the window framework is typically fastened by hinges. The frame structure 11 surrounds the window and comprises substantially vertical sides and a horizontal upper and lower side. In the installation method and system according to the invention, fastening pins 2a, 2b are arranged on the outer surface of the vertical sides of the frame 11. The fastening pins 2a, 2b shown in Figure 3 are made of threaded bar or are screws, which are arranged to a distance from each other in the vertical direction of the frame. The fastening bars are arranged on the outer surface of the frame 11. Typically, the fastening pins 2a, 2b are fastened from outside the frame so that the inner surface of the frame 11 remains unbroken.

[0040] In Figure 4, an embodiment according to the invention is illustrated as seen from the side, in which embodiment a separate seal 12, which sets tightly against the walls 10 of the opening when installing the window in its place, is arranged on the outer surface of the upper edge of the window frame 11. Typically, the seal 12 is fastened from its one edge to the frame 11, for example to the groove in the frame, and the second edge is pressed against the wall 10 of the opening. The seal 12 is made of flexible material, so it bends easily to its place, however so that it seals the gap between the frame and the wall of the opening. The seal 12 is typically arranged to all sides of the frame.

[0041] In Figure 5, the hoisting arrangement 15 is schematically illustrated as shown from the side, which hoisting arrangement can be utilized in the installation method according to the invention, so that the installation work of the windows can be further accelerated. Figure 5 shows a support structure with hoisting means located in one end of the window opening, corresponding support structures are arranged to both edges of the window opening in the lateral direction of the window opening. In Figure 5, the window opening is a space between the upper edge 24 and the lower edge 25 of the opening, to which space the hoisting arrangement 15 is arranged. The hoisting arrangement 15 shown in the Figure comprises a horizontal supporting bar 17 arranged to the up-

per edge 24 of the window opening, which supporting bar is formed of two parts fastened to each other: of a supporting bar 17a supported by the upper edge 24 of the window opening and of an additional bar 17b fastened to it. The supporting bar 17 can also be formed of one piece, which is supported against the upper edge 24 of the window opening. The first end of the supporting bar 17a supported by the upper edge of the window opening is fastened to the supporting beam structure 20 and the second end, in the case shown in the Figure the second end of the additional bar 17b, extends outside the window opening substantially perpendicular in relation to the window opening. The hoisting means 16 are arranged to the end of the additional bar 17b outside A the building.

[0042] A horizontal supporting bar 18 is arranged to the lower end 25 of the window opening, which supporting bar is supported against the lower edge of the window opening. The first end of the supporting bar 18 of the lower edge is fastened to the supporting beam structure 20, and the second end extends to the window opening so that the structure can be arranged firmly in its place. A vertical clamping bar 19 is arranged between the supporting bar 17 of the upper edge of the support structure and the supporting bar 18 of the lower edge, with which clamping bar the horizontal supporting bars 17, 18 of the upper edge and the lower edge are connected to each other and clamped between the upper edge 24 and the lower edge 25 of the window opening. The supporting bars 17, 18 of the upper edge and the lower edge can further comprise a projection 21 a, 21 b or the like, which is substantially perpendicular to the supporting bar and sets to the edge of the window opening to support the support structure so as to stay in its place.

[0043] The vertical supporting beam structure 20 of the hoisting arrangement 15 is arranged inside B the building. Furthermore, actuators 22 needed for the hoisting means 16 are arranged to the supporting beam structure 20. The hoisting means 16 further comprise means for fastening the window to be hoisted to the hoisting arrangement and a wire or a string 23 for hoisting the window. The structure and the actuators of the hoisting means can vary, but however so that a motor 22 or a similar actuator required by the hoisting means is typically arranged to the lower end of the supporting beam structures 20 inside B the building. The support structures located to both ends of the window opening have their own hoisting means 16 and their own actuators 22 for the hoisting means. With the hoisting means 16, the window can be hoisted to the window opening outside A the building. The vertical supporting beam structure 20 of the hoisting arrangement is typically arranged to a distance from the inner wall 26 of the building inside B the building. Thus, the horizontal supporting bars 17, 18 extend also from the window opening inside B the building.

Claims

1. A fastening device (1) for installing a window or a door, **characterized in that** the fastening device (1) comprises
 - an outer part (3) having a cavity (4), which is formed so that in the vertical direction of the fastening device the first edge (5a) of the cavity is lower than the second edge (5b) of the cavity, the space between the edges of the cavity defines the lateral direction of the cavity (4),
 - an inner part (6), which is movably arranged to the cavity (4) of the outer part (3) so that the upper part of the inner part (6) is substantially in the same plane with the first edge (5a) of the outer part, and the upper part of the inner part (6) of which comprises a cavity (7) deviating from the plane, and
 - an adjusting screw (8), which is arranged through the outer part (3) and the inner part (6) so that the inner part (6) is moved with the aid of the adjusting screw in the lateral direction of the cavity (4) of the outer part (3).
2. Fastening device according to claim 1, **characterized in that** the width of the inner part (6) is smaller than the width of the cavity (4) of the outer part (3) in the lateral direction of the cavity.
3. Fastening device according to claim 1 or 2, **characterized in that** the outer part (3) comprises two or more openings (9a, 9b) for fastening the fastening device in its place, which openings (9a, 9b) are elongated in the vertical direction of the fastening device.
4. Fastening device according to any of the preceding claims, **characterized in that** the cavity (7) of the inner part (6) comprises a grooving or a similar roughening on the bottom of the cavity
5. Fastening device according to any of the preceding claims, **characterized in that** the outer part (3) and the inner part (6) comprise a first planar surface and a second planar surface, which first and second planar surfaces of the outer part (3) and the inner part (6) are substantially in the same plane.
6. Fastening device according to any of the preceding claims, **characterized in that** the outer part (3) comprises on at least its second planar surface two or more pins or similar projections.
7. An installing system for installing a window or a door to an opening provided for it, **characterized in that** the system comprises
 - a fastening pin (2a, 2b), which can be installed

- on the outer surface of the window frame or the door frame (11) to the vertical side of the frame, and
 - a fastening device (1, 1a, 1b) according to any of the claims 1 to 6, which can be installed to the wall (10) of the opening and to which fastening device the fastening pin (2a, 2b) can be arranged so that the fastening pin (2a, 2b) sets to the cavity (7) of the inner part (6) of the fastening device (1, 1a, 1b).
8. Installing system according to claim 7, **characterized in that** the fastening pin (2a, 2b) is made of threaded bar, is a screw or the like.
9. Installing system according to claim 7 or 8, **characterized in that** the diameter of the fastening pin (2a, 2b) is substantially the same as the width of the cavity (7) of the inner part (6) of the fastening device.
10. A method for installing a window or a door, **characterized in that** in the method
- fastening pins (2a, 2b) are arranged on the outer surface of the frame (11) of the window (13) or the door to be installed to the vertical sides of the frame,
 - fastening devices (1, 1a, 1b) according to any of the claims 1 to 6 are arranged to the vertical walls (10) of the opening provided for the window or the door, and
 - the window (13) or the door to be installed is arranged to the opening so that the fastening pins (2a, 2b) arranged on the outer surface of the window or the door frame (11) set to the cavities (7) of the inner part (6) of the fastening devices (1, 1a, 1b) arranged to the walls (10) of the opening.
11. Method according to claim 10, **characterized in that** the fastening device (1, 1a, 1b) is arranged to the wall of the opening so that first in the installation direction of the window or the door is the first edge (5a) of the outer part (3) of the fastening device (1, 1a, 1b), which first edge is lower than the second edge (5b) of the fastening device.
12. Method according to claim 10 or 11, **characterized in that** the fastening pins (2a, 2b) do not penetrate the inner surface of the window or the door frame (11).
13. Method according to any of the preceding claims 10 to 12, **characterized in that** the window or the door is adjusted to the desired point by moving the inner part (6) of the fastening device (1, 1a, 1b) in the cavity (4) of the outer part (3) with an adjusting screw (8).
14. Method according to any of the preceding claims 10 to 13, **characterized in that** a seal (12) is arranged on the outer surface of the window or the door frame (11), which seal sets tightly against the walls (10) of the opening when installing the window or the door in its place.
15. Method according to any of the preceding claims 10 to 14, **characterized in that** the window (13) is hoisted to the opening provided for it with a hoisting arrangement (15), which comprises
- a support structure to be arranged to the window opening, which comprises
 - a horizontal supporting bar (17) supported by the upper edge (24) of the opening and a horizontal supporting bar (18) supported by the lower edge (25) of the opening in both edges of the window opening in the lateral direction of the opening, which supporting bars (17, 18) have a first end and a second end, and
 - a supporting beam structure (20), to which the first ends of the supporting bars (17, 18) of the upper edge and the lower edge are fastened,
- and
- hoisting means (16) arranged to the support structure for hoisting the window.

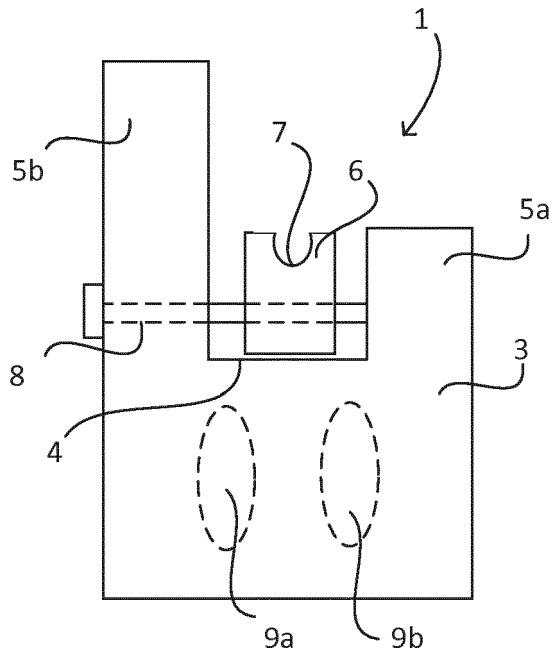


Fig. 1

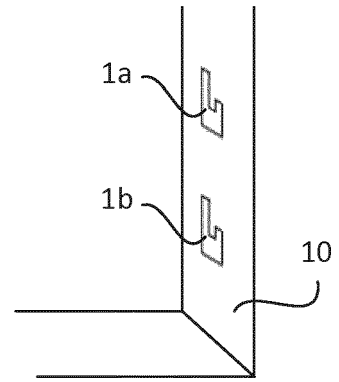


Fig. 2

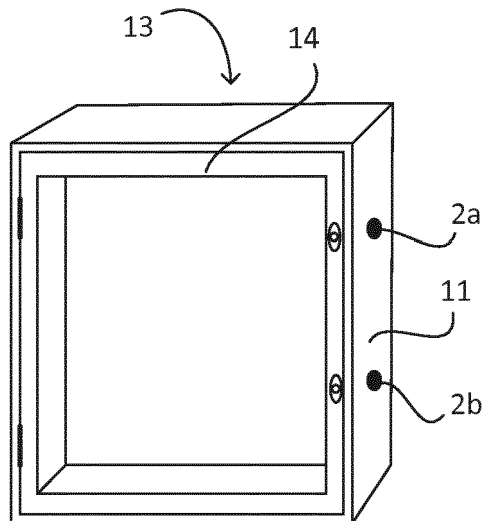


Fig. 3

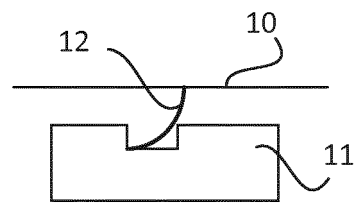


Fig. 4

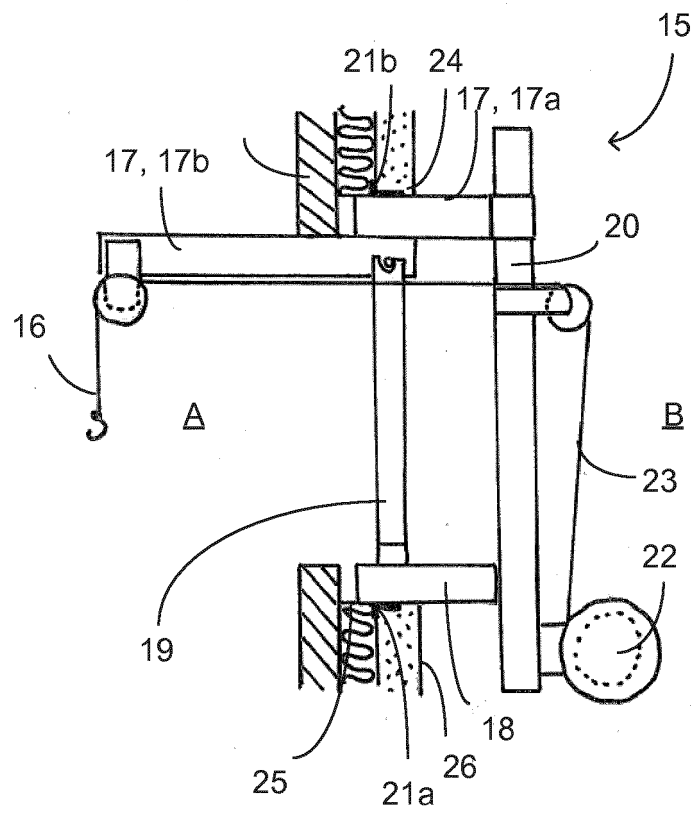


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 17 16 6765

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Y	* page 3, line 22 - page 4, line 39; figures 1-3 *	6-15	
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			TECHNICAL FIELDS SEARCHED (IPC)
			E04G E06B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 23 October 2017	Examiner Hellberg, Jan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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23-10-2017

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