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December 2020

Mounting device

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Mohr, Christian A., "Mounting device", Technical Disclosure Commons, (December 01, 2020)

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Description

Mounting device, assembly units for a household appliance, laterally fixable household appliance and method for performing its installation

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The present invention relates to a mounting device for a hanging installation of a household appliance, especially for a lateral fixation of a household appliance, in particular of an extractor hood. The present invention further relates to an assembly unit for an installation of a laterally fixable household appliance and to an assembly unit for a hanging installation of a household appliance, especially for a mounting in a suspended ceiling, in particular of an extractor hood. Moreover, the present invention also relates to a laterally fixable household appliance, in particular an extractor hood. Finally, the present invention relates to a method for installing a laterally fixable household appliance, in particular an extractor hood, in kitchen furniture.

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In the technical area of laterally fixable household appliances, particularly of built-in household appliances, such as extractor hoods, specifically built-in extractor hoods, the installation of said household appliances, especially their hanging mounting at walls or into kitchen furniture, is rather bothersome. The household appliance has to be correctly positioned and, while keeping it in its position, fixation means have to be fit for the fastening of the appliance. Keeping in place in a hanging position of such an appliance until its final fixation, however, is very exhausting due to its weight. Therefore, in many case a second installation worker is needed for this task, while the first worker is fitting the fixation means, which are usually screws.

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In order to overcome the need for a second installation worker, US 4,011,803(A) proposes a pre-assembling step to be performed prior to the final fixation of a range hood. During said pre-assembling step two snap-in bracketing devices are secured by
5 conventional screwing means onto the surface of a wall onto which fixation of the range hood is intended and are so spaced apart as to align with receiving slots on the upper rear portion of the range hood when it is mounted on the wall, and the rear top portion of the range hood when it is mounted to a soffit so
10 as to suspend down from such a soffit. Once these brackets have been installed the installation worker needs only align the slots of the entire range hood assembly with the mounted brackets and push this range hood assembly onto the brackets until both have been snapped in place. After both brackets have been
15 snapped into the related slots, the installation worker is released from holding the range hood and can fasten final mounting screws, thereby completing the mounting of the range hood assembly. However, the use of such snap-in brackets makes it nearly impossible to disassemble the range hood, which disassembling
20 may be necessary in case of potentially needed repair work.

It is an object of the present invention to provide a mounting device, an assembly unit for an installation of a laterally fixable household appliance, an assembly unit for a hanging installation of a household appliance, a laterally fixable household
25 appliance and a method for performing its installation, which allow a facilitated installation of the household appliance, which installation may be performed by solely one installation worker, and specifically allow an easy later disassembling if
30 repair work will have to be performed.

The object is achieved for a mounting device for a laterally fixable household appliance by the features of claim 1.

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A mounting device for a hanging installation of a household appliance, especially for a lateral fixation of the household appliance, in particular an extractor hood, comprises, according to a first aspect of the present invention, a first portion and
5 a second portion. The first portion is connectable or connected with a frame surface or a housing wall of the household appliance. The second portion is attachable or attached to a wall, in particular to a kitchen furniture wall, and comprises an engagement opening or a suspension edge or surface. The first portion
10 is connected or connectable with the frame surface or housing wall in such way that the engagement opening or the suspension edge or surface is or comprises a section, preferably a final section, directed to the rear side of the household appliance. Alternatively, according to a second aspect of the present in-
15 vention, instead of the first portion and the second portion, the household appliance comprises a first part and a second part. The first part is connectable or connected with a frame surface or a housing wall of the household appliance and comprises a fitting aperture, which is opened to the top, or a fit-
20 ting section, which is directed to the top, for an insertion or a reception of a lower end or a lower section of a suspension bracket and which includes at least one lateral support of said lower end or lower section. The second part comprises a latching element, which engages or is adapted to engage with said suspen-
25 sion bracket. Preferably, the latching element is elastic or spring-loaded.

By means of such kind of mounting device, not only a facilitated mounting can be executed by solely one installation worker, but
30 specifically also a later disassembling of the household appliance in an easy way may be performed for the purpose of potentially needed repair work.

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The second portion of the mounting device may be hook-shaped, or it may comprise a hook-shaped section or element.

5 According to a specific arrangement, the engagement opening or the suspension edge or surface comprises an initial section, which is upstream with the final section. The initial section is inclined rearwards or is vertically oriented when the first portion is connected with the frame surface or the housing wall and the household appliance is arranged in its destined orientation.

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Favourably, the engagement opening or the suspension edge or surface comprises a guiding groove or a guiding slot. With the help of said guiding means the mounting of the household appliance is further facilitated.

15

A preferred embodiment is characterized by an engagement opening or suspension edge or surface, which is allocatable to, particularly engageable with, an engagement means. The engagement means, which may be a pin or a bolt, is fixed or fixable to the wall, particularly to the kitchen furniture wall.

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According to a particularly preferred embodiment, the engagement means is adapted to be guided during a mounting process by a guiding groove or guiding slot comprised by the engagement opening or the suspension edge or surface. For a specifically easy and secure mounting, the engagement means is preferably screw-shaped or mushroom-shaped, or it comprises a screw-shaped or mushroom-shaped partition with a stem part and a head part. The stem part may be guided by the guiding groove or guiding slot and the head part may extend beyond the groove width or slot width.

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In particular, the first portion and the second portion define an angle of at least nearly 90 degrees.

The mounting device may be made of a metal. In that case, the first portion may be a bent part of the second portion. Alternatively, the mounting device may be produced using a reinforced plastic material. Then, the first portion is favourably integrally formed with the second portion, which solution is the most cost-saving one.

Particularly, the second portion is made of or comprises a flat sheet. In the case of a one-piece construction, the first and second portions are made of or comprise said flat sheet.

A further specific embodiment provides a mounting device with a first portion, which comprises at least one first fixation object for the fixation of the mounting device to the household appliance. The first fixation object is preferably at least one through hole and the fixation may be executed by a screw connection.

According to the present invention, the object is achieved for an assembly unit for an installation of a laterally fixable household appliance, in particular of an extractor hood, according to the features of claim 8.

An assembly unit for an installation of a laterally fixable household appliance, in particular of an extractor hood, comprises at least a pair of the mounting device as exemplified or defined by anyone of the afore-described embodiments. The assembly unit preferably further comprises a pair of related engagement means, which engagement means are fixable to a wall, which may be a kitchen furniture wall. Additionally or alternatively, the assembly unit may further comprise at least one second fixation object, particularly a screw, for the fixation of the mounting device to the household appliance.

According to the present invention, the object is achieved for a laterally fixable household appliance, in particular an extractor hood, according to the features of claim 9.

5

A laterally fixable household appliance, in particular an extractor hood, comprises and/or is mountable or pre-mountable at a wall by means of a mounting device or by means of an assembly unit as exemplified or defined by anyone of the afore-described
10 embodiments. The household appliance may comprise further fixation means for a final fixation of the household appliance. Preferably, the further fixation means is at least one laterally arranged through-hole. It may additionally or alternatively be preferred that the further fixation means is arranged on two
15 lateral walls or frame surfaces.

According to the present invention, the object is achieved for a laterally fixable household appliance, in particular an extractor hood, according to the features of claim 10.

20

A laterally fixable household appliance, in particular an extractor hood, is mountable or pre-mountable at a wall by means of a mounting arrangement, which may be fixed to or may be integrated in a side wall of the household appliance. Preferably, at
25 least one of said mounting arrangement is arranged on each one of a left and a right side of the household appliance. The mounting arrangement comprises a portion or a surface, which is attachable or attached to a wall, in particular to a kitchen furniture wall. The portion or surface comprises an engagement
30 opening or a suspension edge or surface arranged in such way that the engagement opening or the suspension edge or surface is or comprises a section, preferably a final section, which section is directed to the rear side of the household appliance.

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The portion or surface may be hook-shaped or may comprise a hook-shaped section or element.

According to an embodiment, the engagement opening or the suspension edge or surface comprises an initial section, which is arranged upstream with the final section. Said initial section is inclined rearwards or vertically oriented in the installation position of the household appliance. Additionally or alternatively, the engagement opening or the suspension edge or surface may comprise a guiding groove or a guiding slot.

Advantageously, the engagement opening or the suspension edge or surface is allocatable to, particularly engageable with, an engagement means, preferably a pin or a bolt. Said engagement means may be fixed or fixable to the wall, particularly to the kitchen furniture wall.

A specifically preferred embodiment provides for an engagement means, which is adapted to be guided during a mounting process by a guiding groove or guiding slot, which is comprised by the engagement opening or the suspension edge or surface.

According to the present invention, the object is achieved for method for installing a laterally fixable household appliance, in particular an extractor hood in kitchen furniture, according to the features of claim 13.

A method for performing a hanging installation of a laterally fixable household appliance, in particular an extractor hood, at a wall or in kitchen furniture, especially for performing a hanging installation of a household appliance according to an afore-described embodiment, comprises at least a first mounting process and preferably a second mounting process. The first mounting process is particularly a pre-mounting process. The op-

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tional second mounting process may be a final mounting process.

The first mounting process comprises the following steps:

- fixing a pin-shaped or screw-shaped or mushroom-shaped engagement means to a wall, particularly to a kitchen furniture wall,
- moving the engagement means within an at least approximately horizontally oriented section, particularly a final section, of a guiding groove or guiding slot of an engagement opening, thereby pushing the household appliance towards a rear wall, particularly a rear wall of kitchen furniture, and
- completing the first mounting process with the engagement means arriving at a final position of the guiding groove or guiding slot.

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Before moving the engagement means within the at least horizontally oriented section, i. e. before pushing the household appliance towards the rear wall, the following optional steps may be performed:

- moving the household appliance from below, preferably upwardly, towards a kitchen furniture which is open at the bottom, and/or
- inserting the engagement means into an initial section of a guiding groove or guiding slot of an engagement opening, which initial section is inclined rearwards or vertically oriented, and moving the engagement means along the initial section, thereby lifting the household appliance.

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After the above-mentioned second optional step a change of direction from a vertical to a horizontal one may be executed.

30

During the final mounting process the household appliance, preferably a side wall or a lateral frame surface or part thereof, is particularly fixed to the wall or the kitchen furniture by at least one fixation means on each side. For a more reliable fixa-

tion at least two fixation means are preferably used on each side. For the final fixation a screw may be used with particular preference.

5 A preferred embodiment of the mounting device according to the second aspect of the present invention comprising the above-mentioned first and second parts is characterized by the first part being a bracket, which is attachable or attached to a top side of the frame surface or of the housing wall. The latching
10 element, particularly the elastic or spring-loaded latching element, comprises a support surface or support edge. Said support surface or support edge acts or rests on or is adapted to act or to rest on a top surface at or of the lower end or of the lower section of the suspension bracket.

15 The first part, i. e. the bracket, is particularly a U-shaped bracket that includes a first vertical portion, a second vertical portion and a horizontal portion. The horizontal portion connects the lower ends of the first and second vertical por-
20 tions and is attachable or attached to the top side of the frame surface or of the housing wall.

At least the support surface or support edge, but preferably the whole second part, may be height-adjustable for performing a
25 height adjustment of the household appliance during or after its installation or during or after a pre-installation thereof.

According to embodiments, the height adjustment means for a height adjustment of the household appliance during or after its
30 installation or during or after a pre-installation comprises an adjuster element, which is supported against or which rests on the first part and acts on the second part for performing a dislocation of the second part in relation to the first part. Said dislocation is particularly a vertical dislocation in the mount-

ing condition of the household appliance. The adjuster element is particularly a screw having a first end section and a second end section. The first end section is helically moved in relation to the first part and a second end section is coupled, particularly rigidly coupled, with the second part.

A particularly preferred embodiment provides a second part, which is slidably guided at or by the first part. Also provided is a spring element, which is arranged between the first part and the second part in a way that the second part is pressed against the first part. The spring element may be a leaf spring. Preferably, the second part is pressed against the first part in a direction orthogonally to the sliding movement between first and second parts. The second part is adapted to perform a dislocation in relation to the first part, preferably a horizontal dislocation in the mounting condition of the household appliance, during the installation of the household appliance, in particular during the insertion of the suspension bracket. The latching element preferably includes a lead-in chamfer, which is adapted to support the dislocation of the second part during the insertion of the suspension bracket.

Finally, according to the present invention, the object is achieved for an assembly unit for a hanging installation of a household appliance according to the features of claim 19.

An assembly unit for a hanging installation of a household appliance, in particular of an extractor hood, comprises the mounting device, preferably at least a pair of the mounting device, and the suspension bracket, preferably at least a pair of the suspension bracket, according to anyone of the afore-described embodiments. The assembly unit is preferably adapted to enable a height adjustment of the household appliance from below.

Novel and inventive features of the present invention are set forth in the appended claims.

The present invention will be described in further detail with
5 reference to the drawings, in which

Fig. 1 is a perspective view of a first embodiment of an extractor hood comprising laterally arranged hook elements;

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Fig. 2 is a slightly perspective view of one of the hook elements of Fig. 1;

Fig. 3 is an exploded view of the extractor hood of Fig. 1 in an initial phase of its installation in a kitchen cabinet;

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Fig. 4 is a detail view of the hook element of Fig. 2 approaching a pre-mounting screw fixed to a kitchen cabinet wall;

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Fig. 5 is a detail view of the pre-mounting screw and the hook element during an intermediate mounting step following the configuration of Fig. 4;

25

Fig. 6 is a perspective view of the extractor hood according to Fig. 1 in its final position within the kitchen cabinet;

30 Fig. 7 is a perspective view of a section of the extractor hood according to Fig. 1 with extracted screen;

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Fig. 8 is a perspective view of a second embodiment of an extractor hood fixed on a ceiling by means of a pair of suspension brackets;

5 Fig. 9 is a perspective view of one bracket according to Fig. 8 with adjustment step for distance to the ceiling and step of mounting to the ceiling;

10 Figs.10a,b indicate the assembly of the extractor hood of Fig. 8 by two assembly steps;

Fig. 11 is an enlarged view of detail A indicated in Fig. 10b;

15 Fig. 12 indicates a height-adjustment step during the assembly of the extractor hood of Fig. 8; and

Fig. 13 is an enlarged view of detail B indicated in Fig. 12.

20 Fig. 1 illustrates an extractor hood 1 as commonly used in domestic kitchens, serving the purpose of exhausting or extracting kitchen vapours resulting from the performance of cooking processes. The extractor hood 1 comprises a hood screen part 3 and a chimney part 5, the latter including an exhaust fan or blower (not shown) for the extraction of the kitchen vapours. The illustrated extractor hood 1 is configured for being installed in a kitchen overhead cabinet 7 above a cooking hob used for cooking food, particularly during boiling processes.

30 The mounting of the extractor hood 1 in the kitchen overhead cabinet 7 is performed by an installation worker in a two-stage mounting process, as will be explained in more detail further down below. During a first stage of the mounting process a pre-

mounting of the extractor hood 1 takes place, while in a second stage the final fixation of the extractor hood 1 is executed.

The pre-mounting is a process in which the extractor hood 1 is hung up within the kitchen overhead cabinet 7 in a way that it is kept by itself in its final position, or in an at least approximate final position, without the need of special temporary support means and without the need of keeping hold of the extractor hood 1 by the installation worker or by a support person. In order to execute said pre-mounting the extractor hood 1 is equipped with two hook elements 9, one at each of the right and left sides of the extractor hood housing. The hook element 9 for the pre-mounting is illustrated with Fig. 1 in a first design and comprises a vertically oriented main part 11 for the pre-mounting of the extractor hood 1 to a side wall of the kitchen overhead cabinet 7. To this end, the main part 11 is slotted in horizontal direction from its centre point to its rear side edge, in that defining a hook-shaped mounting bracket.

The hook element 9 of the design according to Fig. 1 is shown in Fig. 2 in a detail illustration, however, from its reverse side. As can be best seen in this detail view, the hook element 9 comprises further a base part 13 for the fixation of the hook element 9 to an upper side of the hood screen 3, in fact at an upper lateral edge of the hood screen housing. The base part 13 is perpendicular to the main part 11 and comprises two through-holes 17 for the fixation to the upper side of the hood screen 3 by means of screws 19.

When fixed to the hood screen 3, the hook elements 9 at both sides of the extractor hood 1 are positioned within a vertical plane together with the balance point of the extractor hood 1 and the horizontal slots 15 in the main parts 11 of the hook el-

ements 9 are opened to the rear wall of the kitchen overhead cabinet 7.

As will be explained in more detail further down below with the
5 single steps of the mounting process, the horizontal slot 15 of
a hook element 9 is configured to receive a shaft of a bolt 21.
In its final position, said bolt 21 is placed in the centre
point of the main part 11, which is configured as an upturned
resting recess 23 at the final point of the horizontal slot in a
10 way that a self-contained movement of the shaft of the bolt 21
is avoided due to the weight of the extractor hood 1.

Fig. 3 illustrates an exploded view of a first step of the
mounting process of the extractor hood 1 within the kitchen
15 overhead cabinet 7. The bolts 21 for the pre-mounting (only the
left one shown) have been fixed to the side walls of the kitchen
overhead cabinet 7 in a defined position, which positioning may
have been supported by a mounting template. Additionally, two
pilot holes 25, which are needed for the final fixation of the
20 extractor hood 1 (see below), are also set in each of the kitchen
overhead cabinet side walls.

The installation worker moves the extractor hood 1 from below
towards the kitchen overhead cabinet 7, which is open from be-
25 low. During this movement an outlet tube 27 moves towards a re-
spective cutout 29 within the kitchen overhead cabinet 7. Fur-
ther, the hook elements 9 approach their dedicated bolts 21 in
order to be engaged with each other. The hook elements 9 of Fig.
3 are established with a second design slightly different to the
30 first design according to Figs. 1 and 2. In addition to the hor-
izontal slot 15, also comprised in the first design, the hook
element 9 according to the second design further comprises a
vertical slot 31, so that the total slot 15, 31 is curved at a
right angle, starting from the top edge of the main part 11,

offset from the central axis of the main part 11, and ending in the centre of the main part 11. The provision of said vertical slot 31 is configured to hold the bolt 21 in its final orientation and prevents the disassembling from the bolt 21 which could
5 cause the hood to fall down.

Fig. 4 illustrates a detail view, as indicated by "IV", of the hook element 9 approaching the bolt 21 from below. Said approaching, however, is not performed with a vertically aligned
10 but slightly inclined extractor hood 1, in order to enable the bolt 21 to enter the entry of the vertical slot 31, as indicated by motion arrow 33. In order to facilitate the insertion of the bolt 21, the entry of the vertical slot 31 is provided with a lead-in chamfer.

15

Fig. 5 illustrates a next status during the mounting process. The extractor hood 1 has been moved along the vertical slot 31 and has reached the bending of the curved total slot 15, 31. This status represents the finalization of the upward movement
20 of the extractor hood 1 and is the starting point for the horizontal movement of the bolt 21 along the horizontal slot 15 towards the centre of the main part 11 of the hook element 9, as indicated by motion arrow 35.

Fig. 6 shows the final placement of the extractor hood 1 within the kitchen overhead cabinet 7. The outlet tube 27 is implemented in the respective cutout 29 of the kitchen overhead cabinet 7 and the bolt 21 is positioned in the centre of the main part 11 of the hook element 9, more specifically in the resting recess
30 23. The extractor hood 1 is now kept in place in a hanging position unsupported by the installation worker or a supporting person. The pre-mounting of the extractor hood 1 is finalized.

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After the afore-described pre-mounting, the extractor hood 1 still has to be finally fixed. For that purpose, as illustrated with Fig. 7 being a perspective view of a section of the extractor hood 1 with extracted screen 3, two bores 37 are provided in the both side walls (only the left one shown) of the hood screen housing, which fit with the above-mentioned pilot holes 25, drilled into the side walls of the kitchen overhead cabinet 7 by the installation worker at the beginning of the mounting process. The installation worker just needs to finalize the whole mounting process by screwing in respective screws.

A slight variation of the afore-described embodiment, which is not explicitly depicted on images, provides an extractor hood, which comprises a hood screen and a chimney and which is in particular designed as illustrated by 1 in Fig. 3. In order to install this extractor hood, it includes, similarly to the arrangement of Fig. 3, hook-shaped support means laterally arranged at the hood screen. Contrary to the embodiment of Fig. 3, said hook-shaped support means are not designed as separate parts, which, as in Fig. 3, are hook elements 9 laterally fixed on a top side of the hood screen by screws. Rather, the hook-shaped support means are integral features of the left and right side walls of the hood screen. Nevertheless, the installation process of the extractor hood with such variation is similar to that one of the embodiment of Fig. 3. After installation in the kitchen furniture, the hook-shaped support means is invisible as being covered by the furniture walls, only an entrance opening of a vertical slot thereof may be visible from above.

Figs. 8 to 13 illustrate a different solution for an extractor hood 101, also being commonly used in domestic kitchens and serving the purpose of exhausting or extracting kitchen vapours resulting from the performance of cooking processes. Fig. 8 is a schematic visualization of the extractor hood 101 in a perspec-

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tive view. The extractor hood 101 is shown installed in a space 103 between a room ceiling 105 and a suspended ceiling 107, but may be implemented also in a kitchen cabinet, and in general it includes an extraction unit 109 and a flat hood screen 111. The
5 extraction unit 109 comprises a suction motor (not shown) included in a suction box 113 and an outlet tube 115 for a coupling of an extraction hose (not shown) in order to expel cooking vapours into the atmosphere. The flat hood screen 111 includes a support plate 117 and a cover plate 119 covering the
10 support plate 117 from below. The dimensions of length and width of the cover plate 119 are marginally larger than those ones of the support plate 117, so that a circumferential collar 121 is configured.

15 In order to install the extractor hood 101, the installation technician has to cut an opening or cut-out 123 into the suspended ceiling 107. The dimensions of length and width of the cut-out 123 are defined by the respective dimensions of the hood screen support plate 117 so that the support plate 117 may be
20 fit completely into the cut-out 123 and the circumferential collar 121 covers any potential gap between cut-out 123 and the perimeter of the support plate 117.

As also indicated in Fig. 8, the extractor hood 101 is suspended
25 from the room ceiling 105 by means of a pair of suspension brackets 127, each one has to be fixed to the room ceiling 105 by three screws 129, as is indicated in Fig. 9. In order to comply with the local conditions with regard to the distance between room ceiling 105 and suspended ceiling 107, the respective
30 width of the suspension brackets 127 has to be adapted. To this end, each one of the two identical suspension brackets 127 is of two-part type, with the two parts of each suspension bracket 127 being U-shaped frame elements 129, 131. The two parallel arms 133 of the upper frame element 129 are guided within the respec-

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tive parallel arms 135 of the lower frame element 131 in a rail-like way, and both pairs of arms 133, 135, which are assigned to each other, include perforated fields 137, 139 allowing connection of the two pairs of arms 133, 135 by means of screws 141
5 (see Fig. 9) after width adjustment of the suspension brackets 127 as locally determined by the installation technician.

Figs. 10a and 10b illustrate the installation step of integration of the extractor hood 101 into the cut-out 123 of the suspended ceiling 107. According to Fig. 10a, the extractor hood
10 101 approaches the cut-out 123 from below in vertical direction, with the flat hood screen 111 approaching the cut-out 123 to fit therein and fixing devices 143 arranged at the top side of the support plate 117 of the flat hood screen 111, which fixing de-
15 vices 143 will be explained in more detail further down below, approaching the suspension brackets 127 to connect thereto. As shown with Fig. 10b, the extractor hood 101 has arrived its installation destination, the flat hood screen 111 is inserted in the cut-out 123, and the fixing devices 143 are connected to the
20 suspension brackets 127. That way, the extractor hood 101 is fixed.

The extractor hood 101 is equipped with four fixing devices 143, which are connected to the top surface of the support plate 117,
25 and which are arranged as in the corners of a rectangle. Two fixing devices 143 are assigned to each one of the suspension brackets 127 to be connected thereto, so that the extractor hood 101 is hung up at four connection points.

30 Each fixing device 143 comprises a U-shaped bracket 145 having a horizontal portion, which is attached to the top side of the support plate 117, and having two vertical portions, which are distant from each other in a way to receive the lower horizontal strut 147 of the suspension bracket 127 in a way at least ap-

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proximately free of play. The fixing device 143 further comprises a latching element 149, which is designed to rest on a top surface of the lower horizontal strut 147 of the suspension bracket 127 after the connection of the fixing device 143 with the suspension bracket 127 has been established. Fig. 11 is an enlarged view of detail "A" as indicated in Fig. 10b and shows the way of connection between the lower horizontal strut 147 of one of the two suspension brackets 127 and one of the fixing devices 143. After establishment of the connection, the bottom of the horizontal strut 147 rests on the horizontal portion of the U-shaped bracket 145, which itself, as mentioned-above, is fixed to the top surface of the support plate 117. The side surfaces of the lower horizontal strut 147 are laterally supported by the two vertical portions of the U-shaped bracket 145 in a play-free way. A lower surface or lower edge, constituting a support surface or support edge, of a latching element 149 rests on the upper surface of the lower horizontal strut 147. That way, the lower horizontal strut 147 of the suspension bracket 127 is supported on all sides so that a stable connection between fixing device 143 and suspension bracket 127 is received, and hence also the extractor hood 101 is installed in a stable way.

The latching element 149 is designed as being part of a snap-in mounting system. To this end, the latching element 149 is configured to move away from the locking position as illustrated in Fig. 11. This is realized by means of a spring-loaded support of the latching element 149 at the fixing device 143. A spring element (not shown), particularly a leaf spring element, forces the latching element 149 to be kept in the locking position (see spring force indicated by arrow 151) as long as no "moving away force" is exerted that pushes the latching element 149 away from the locking position, in particular in horizontal direction, i.e. in opposite direction to spring force 151. Said "moving away force" is induced by the lower horizontal strut 147 during

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the assembly movement acting on a sloping surface 153 arranged at the latching element 149, as illustrated by Fig. 11. As soon as the lower horizontal strut 147 has fully passed the sloping surface 153 during the assembly movement, the latching element
5 149 snaps into the locking position due to spring force.

It is to be noted that the U-shaped bracket 145 may also be realized in that the horizontal portion thereof being constituted by the top surface of the support plate 117 and the two vertical
10 portions being two separate parts, which each individually are connected to the top side or top surface of the support plate 117, arranged in parallel in a defined distance to each other. This distance is determined by the width of the lower horizontal
15 strut 147 of the suspension bracket 127, which is supposed to be arranged between the two separate vertical portions for connection of the extractor hood 101 thereto.

Finally, after establishing the connection between all four connection points, i.e. at all fixing devices 143, and the two lower
20 horizontal struts 147, the extractor hood 101 is height-adjustable for a horizontal alignment (see Fig. 12) by a means of height adjustment means comprising a height adjuster, one thereof arranged at each one of the four fixing devices 143. Said height adjuster, which is illustrated in more detail specifically in Fig. 13, is an adjustment screw 155 comprising a
25 threaded shaft 157 and a circumferential slot arranged close to the screw head 159. The threaded shaft 157 is helically moved within a threaded sleeve 161 coupled to a stationary fixing plate 163. When turning the adjustment screw 155, the circumferential
30 slot at the screw head 159 is moving in vertical direction, which vertical movement is transmitted to the latching element 149, which is coupled, in particular rigidly coupled, to the circumferential slot. Consequently, the support surface or

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support edge is also moving in vertical direction, thus performing a height adjustment to the extractor hood 101.

As illustrated in Fig. 12, the height adjustment is performable
5 from a bottom side of the extractor hood 101 by means of a
screwdriver 163. The screw head 159 is accessible to the screw-
driver 163 after flipping open a bottom cover 167.

10 Additionally or alternatively, the latching element 149 may also
be used for clamping the lower horizontal strut 147 in a play-
free manner toward the horizontal portion of the U-shaped brack-
et 145, or toward the top surface of the support plate 117, re-
spectively, rather than to be a height adjustment means.

Although illustrative embodiments of the present invention have
been described herein with reference to the accompanying draw-
ing, it is to be understood that the present invention is not
limited to these precise embodiments, and that various other
changes and modifications may be affected therein by one skilled
in the art without departing from the scope or spirit of the in-
vention. All such changes and modifications are intended to be
included within the scope of the invention as defined by the ap-
pended claims. Particularly, features of the different above-
describe embodiments may be used in either of the embodiments
even though they might be described merely in connection with
one of the different embodiments. The skilled person may readily
execute such interchanges.

List of reference numerals

	1	extractor hood
	3	hood screen
	5	chimney
	7	kitchen overhead cabinet
	9	hook element
	11	main part
	13	base part
	15	horizontal slot
5	17	through-hole
	19	screw
	21	bolt
	23	resting recess
	25	pilot hole
10	27	outlet tube
	29	cutout
	31	vertical slot
	33,35	motion arrows
	37	bore
15	101	extractor hood
	103	space
	105	room ceiling
	107	suspended ceiling
	109	extraction unit
20	111	flat hood screen
	113	suction box
	115	outlet tube
	117	support plate
	119	cover plate
25	121	collar
	123	cut-out
	127	suspension bracket
	129	upper frame element

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	131	lower frame element
	133,135	arms
	137,139	perforated fields
	141	screws
5	143	fixing devices
	145	U-shaped bracket
	147	lower horizontal strut
	149	latching element
	151	spring force
10	153	sloping surface
	155	adjustment screw
	157	threaded shaft
	159	screw head
	161	threaded sleeve
15	163	fixing plate
	165	screwdriver
	167	bottom cover

Claims

1. A mounting device (9) for a hanging installation of a household appliance (1, 101), especially for a lateral fixation or for a mounting in a suspended ceiling (107) of a household appliance (1, 101), in particular of an extractor hood, comprising
- a first portion (13) or a first part, which is connectable or connected with a frame surface or a housing wall of the household appliance (1, 101), and
 - a second portion (11) or a second part,
- wherein
- the first portion (13) is connected or connectable with the frame surface or housing wall in such way that the engagement opening or the suspension edge or surface is or comprises a section, preferably a final section (15), directed to the rear side of the household appliance (1), and wherein the second portion (11) is attachable or attached to a wall, in particular to a kitchen furniture wall, and comprises an engagement opening or a suspension edge or surface, which preferably comprises a guiding groove or a guiding slot (15, 31), the second portion (11) particularly being hook-shaped or comprising a hook-shaped section or element;
- or wherein
- the first part comprises a fitting aperture, which is opened to the top, or a fitting section, which is directed to the top, for an insertion or a reception of a lower end or a lower section (147) of a suspension bracket (127) and which includes at least one lateral support surface for a lateral support of said lower end or lower section (147), and wherein the second part comprises a latching element (149), preferably an elastic or a spring-loaded latching

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element, the latching element (149) engaging or being adapted to engage with said suspension bracket (127).

2. The mounting device (9) according to claim 1, characterized in that the engagement opening or the suspension edge or surface comprises an initial section (31), upstream with the final section (15), which initial section (31) is inclined rearwards or vertically oriented when the first portion (13) is connected with the frame surface or the housing wall.
3. The mounting device (9) according to anyone of the preceding claims, characterized in that the engagement opening or the suspension edge or surface is allocatable to, particularly engageable with, an engagement means (21), preferably a pin or a bolt, which engagement means (21) is fixed or fixable to the wall, particularly to the kitchen furniture wall.
4. The mounting device (9) according to claim 3, characterized in that the engagement means (21) is adapted to be guided during a mounting process by a guiding groove or guiding slot (15, 31) comprised by the engagement opening or the suspension edge or surface, the engagement means (21) preferably being screw-shaped or mushroom-shaped or comprising a screw-shaped or mushroom-shaped partition having a stem part and a head part, with the stem part being guided by the guiding groove or guiding slot (15, 31) and the head part extending beyond the groove width or slot width.
5. The mounting device (9) according to anyone of the preceding claims, characterized in that the first portion (13)

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and the second portion (11) define an angle of at least approximately 90 degrees.

- 5 6. The mounting device (9) according to anyone of the preceding claims, characterized in that the mounting device is made of a metal, preferably with the first portion (13) being a bent part of the second portion (11), or of a reinforced plastic material, preferably with the first portion (13) being integrally formed with the second portion (11), and in that particularly that the second portion (11), preferably the first (13) and second (11) portions, is made of or comprises a flat sheet.
- 10
- 15 7. The mounting device (9) according to anyone of the preceding claims, characterized in that the first portion (13) comprises at least one first fixation object, particularly at least one through hole (17), for the fixation, particularly by a screw connection, of the mounting device (9) to the household appliance (1).
- 20
- 25 8. An assembly unit for an installation of a laterally fixable household appliance (1), in particular of an extractor hood, comprising at least a pair of the mounting device (9) according to anyone of the preceding claims, preferably further comprising a pair of related engagement means, which engagement means (21) are fixable to a wall, particularly to a kitchen furniture wall, and/or further comprising at least one second fixation object (19), particularly a screw, for the fixation of the mounting device (9)
- 30
9. A laterally fixable household appliance (1), in particular an extractor hood, comprising and/or being mountable or pre-mountable at a wall by means of a mounting device (9)

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according to anyone of the claims 1 to 7 or an assembly unit according to claim 8, the household appliance (1) particularly comprising further fixation means, in particular being at least one laterally arranged through-hole (37) and/or preferably being arranged on two lateral walls or frame surfaces, for a final fixation of the household appliance (1).

10. A laterally fixable household appliance, in particular an extractor hood, being mountable or pre-mountable at a wall by means of a mounting arrangement, which is particularly fixed to or integrated in a side wall of the household appliance, the mounting arrangement comprising a portion or a surface which is attachable or attached to a wall, in particular to a kitchen furniture wall, the portion or surface comprising an engagement opening or a suspension edge or surface arranged in such way that the engagement opening or the suspension edge or surface is or comprises a section, preferably a final section, directed to the rear side of the household appliance, wherein particularly the portion or surface is hook-shaped or comprises a hook-shaped section or element.

11. The household appliance according to claim 10, characterized in that the engagement opening or the suspension edge or surface comprises an initial section, upstream with the final section, which initial section is inclined rearwards or vertically oriented in the installation position of the household appliance, and/or in that the engagement opening or the suspension edge or surface comprises a guiding groove or a guiding slot.

12. The household appliance according to claim 10 or 11, characterized in that the engagement opening or the suspension

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edge or surface is allocatable to, particularly engageable with, an engagement means, preferably a pin or a bolt, which engagement means is fixed or fixable to the wall, particularly to the kitchen furniture wall, in particular
5 wherein the engagement means is adapted to be guided during a mounting process by a guiding groove or guiding slot comprised by the engagement opening or the suspension edge or surface.

- 10 13. A method for performing a hanging installation of a laterally fixable household appliance (1), in particular an extractor hood, at a wall or in kitchen furniture (7), especially for performing a hanging installation of a household appliance (1), according to anyone of the claims 9 to
15 12, the method comprising a first mounting process, which is particularly a pre-mounting process, and preferably a second mounting process, which is particularly a final mounting process, the first mounting process comprising the following steps:
- 20 - fixing a pin-shaped or screw-shaped or mushroom-shaped engagement means (21) to a wall, particularly to a kitchen furniture wall,
 - particularly moving the household appliance (1) from below towards a kitchen furniture (7) which is open at the
25 bottom,
 - particularly inserting the engagement means (21) into an initial section (31) of a guiding groove or guiding slot of an engagement opening, which initial section (31) is inclined rearwards or vertically oriented, and moving
30 the engagement means (21) along the initial section (31), thereby lifting the household appliance (1),
 - moving the engagement means (21) within an at least approximately horizontally oriented section, particularly a final section (15), of a guiding groove or guiding

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slot of an engagement opening, thereby pushing the household appliance (1) towards a rear wall, particularly a rear wall of kitchen furniture (7), and
- completing the first mounting process with the engagement means (21) arriving at a final position of the guiding groove or guiding slot.

14. The method according to claim 13, characterized in that during the second mounting process the household appliance (1), preferably a side wall or a lateral frame surface or part thereof, is fixed to the wall or the kitchen furniture (7) by at least one fixation means, preferably by at least two fixation means, on each side, the fixation means particularly being a screw.

15. The mounting device according to claim 1, characterized in that the first part is a bracket, particularly a U-shaped bracket (145) including a first vertical portion, a second vertical portion and a horizontal portion connecting the lower ends of the first and second vertical portions, wherein the bracket (145), particularly the horizontal portion thereof, is attachable or attached to a top side of the frame surface or of the housing wall, and wherein the latching element (149), particularly the elastic or spring-loaded latching element, comprises a support surface or support edge acting or resting on or being adapted to act on or to rest on a top surface at or of the lower end or of the lower section (147) of the suspension bracket (127).

16. The mounting device according to claim 15, characterized in that at least the support surface or support edge, preferably the whole second part, is height-adjustable for performing a height adjustment of the household appliance

(101) during or after its installation or during or after a pre-installation.

- 5 17. The mounting device according to claim 1 or 15 or 16, characterized by a height adjustment means for a height adjustment of the household appliance (101) during or after its installation or during or after a pre-installation, the height adjustment means comprising an adjuster element (155), which is supported against or rests on the first part and acts on the second part for performing a dislocation, particularly a vertical dislocation in the mounting condition of the household appliance (101), of the second part in relation to the first part, the adjuster element (155) particularly being a screw having a first end section (157), which is helically moved in relation to the first part, and a second end section (159), which is coupled, particularly rigidly coupled, with the second part.
- 10
- 15
- 20 18. The mounting device according to anyone of the claims 1 or 15 to 17, characterized in that the second part is slidably guided at or by the first part and a spring element, preferably a leaf spring, is arranged between the first part and the second part in a way that the second part is pressed against the first part, preferably in a direction orthogonally to the sliding movement between first part and second part, wherein the second part is adapted to perform a dislocation in relation to the first part, preferably a horizontal dislocation in the mounting condition of the household appliance (101), during the installation of the household appliance (101), in particular during the insertion of the suspension bracket (127), and wherein the latching element (149) preferably includes a lead-in chamfer, which is adapted to support the dislocation of the
- 25
- 30

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second part during the insertion of the suspension bracket (127).

- 5 19. An assembly unit for a hanging installation of a household appliance (101), in particular of an extractor hood, comprising the mounting device, preferably at least a pair of the mounting device, and the suspension bracket (127), preferably at least a pair of the suspension bracket (127), according to anyone of the claims 1 or 15 to 18,
- 10 the assembly unit preferably being adapted to enable a height adjustment of the household appliance (101) from below.

Abstract

The present invention relates to a mounting device (9) for a hanging installation of a household appliance (1, 101), specifically for a lateral fixation of a household appliance (1), in particular for an extractor hood. The mounting device (9) comprises a first portion (13) and a second portion (11). The first portion (13) is connectable or connected with a frame surface or a housing wall of the household appliance (1). The second portion (11) is attachable or attached to a wall, in particular to a kitchen furniture wall, and comprises an engagement opening or a suspension edge or surface. The first portion (13) is connected or connectable with the frame surface or housing wall in such way that the engagement opening or the suspension edge or surface is or comprises a section, preferably a final section (15), directed to the rear side of the household appliance (1).

Alternatively, instead of first and second portions (11, 13), the mounting device (1) comprises a first and a second part. The first part comprises a fitting aperture, which is opened to the top for an insertion of a lower end or a lower section (147) of a suspension bracket (127) and which includes at least one lateral support surface for a lateral support of said lower end or lower section (147). The second part comprises a latching element (149), which engages or is adapted to engage with said suspension bracket (127).

The invention further relates to an assembly unit for a laterally fixable household appliance (1), an assembly unit for a hanging installation of a household appliance (1), a laterally fixable household appliance (1) and a method for performing its installation.

FIG 3

Fig.1

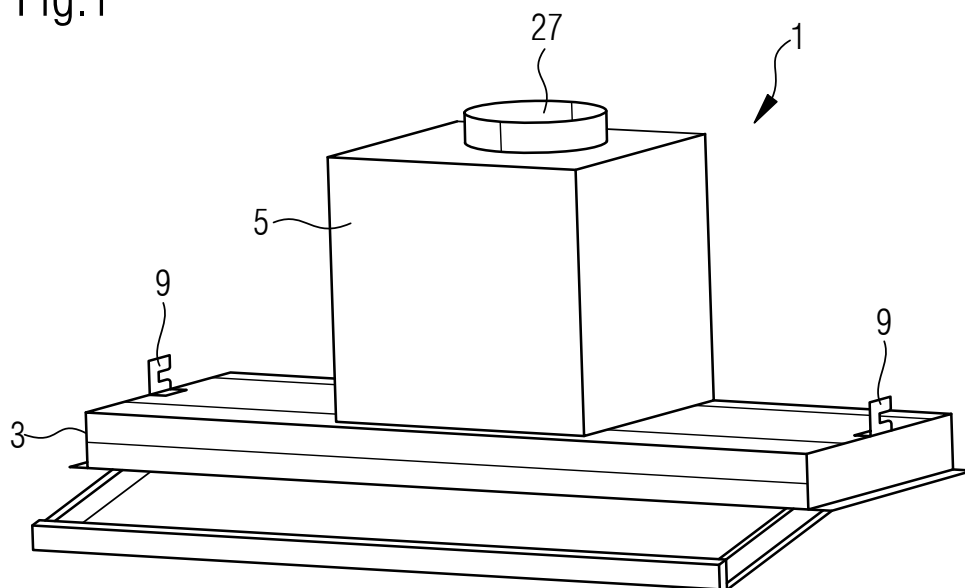


Fig.2

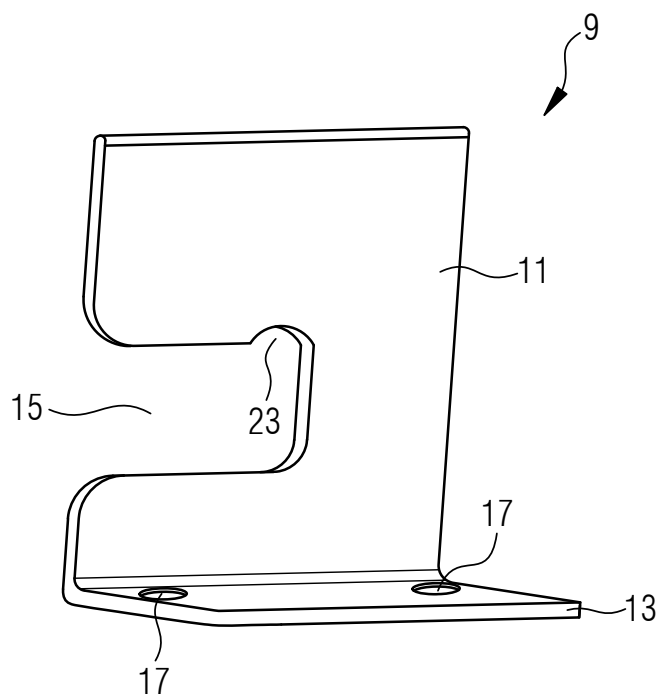


Fig.3

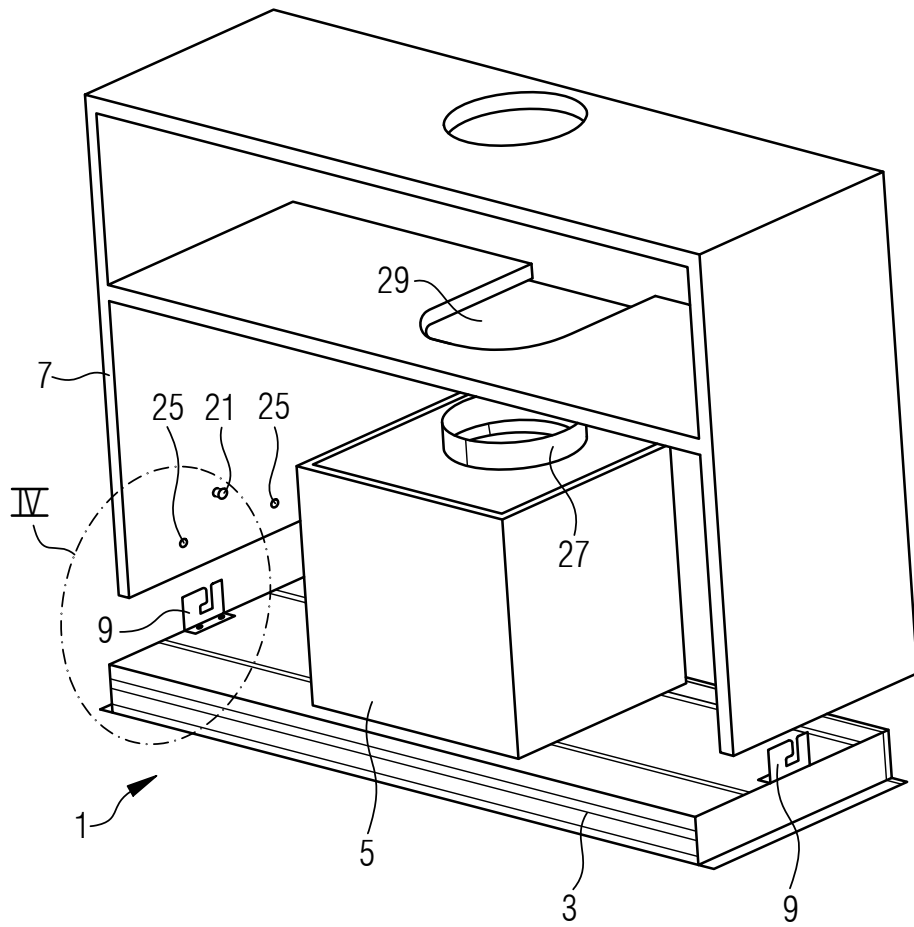


Fig.4

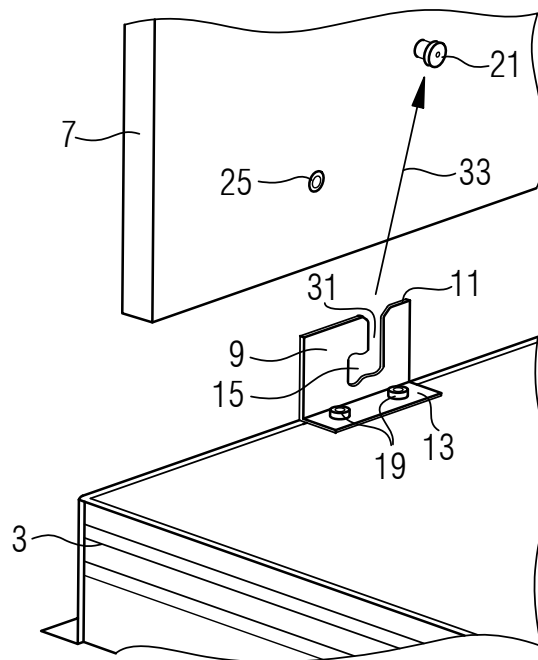


Fig.5

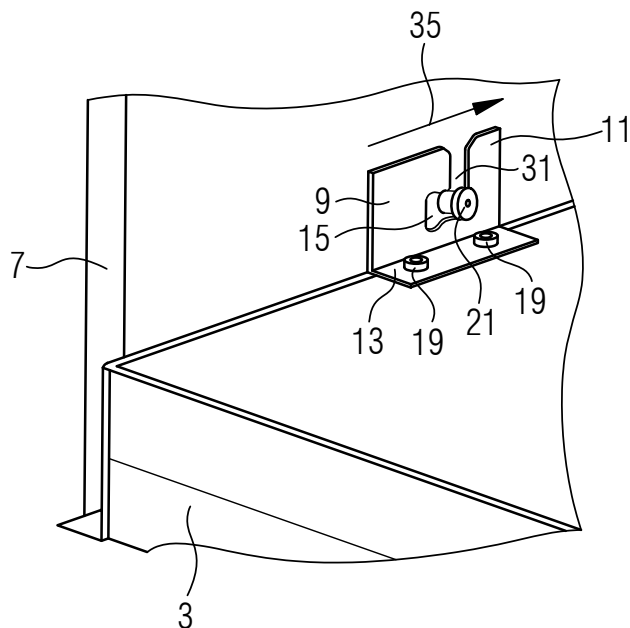


Fig.6

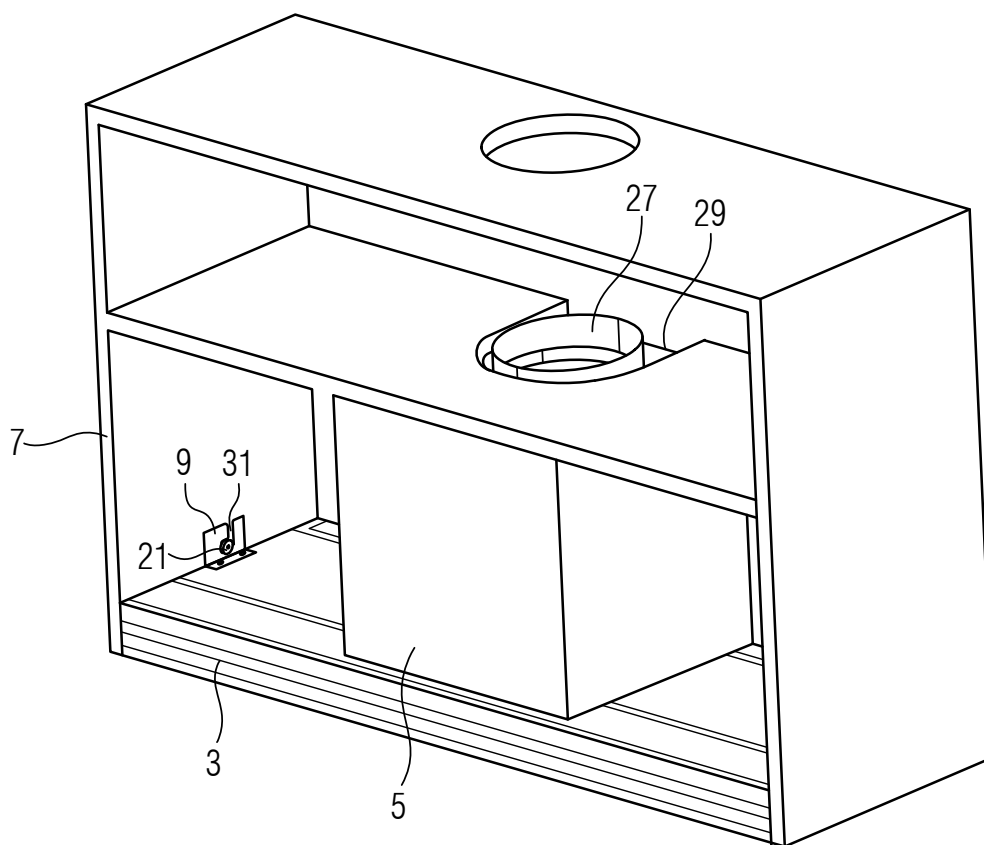


Fig.7

