



Closure sleeve for a clamping device
for the releasable connection of two profile pieces

5 The present invention relates to a closure sleeve for a clamping device for the releasable connection of two profile pieces.

A clamping device of the type mentioned above is known, for example, from the applicant's WO 97/25536. Such clamping devices are provided in
10 order to connect two profile pieces to one another. These are usually constituted by a profile rod on which a wall profile is positioned. Provided laterally in the wall profile for each clamping device is an inner milled relief into which the clamping device can be
15 pushed up to the projecting hook elements. Provided on one side of the wall surface, for a clamping device known from WO 97/25536, is a round bore through which the locking head extends once it has been sunken in the clamping device, counter to the action of a spring
20 force, and advanced through the milled relief up to the bore into which it latches.

Also known from the prior art, in addition to the clamping device of the type mentioned above, are a number of further clamping devices which all have in
25 common the two features that they are advanced in a milled relief of the wall panel, and that an operating knob projects - for the most part flush - out of the wall panel on one side of the latter.

Said operating knob, at the same time, absorbs
30 tensile forces which act on the wall panel and try to separate the latter from the profile strip.

It is also the case that, in addition to metal, other materials, for example wood, are being used more and more commonly as wall elements. It has been found
35 here that the operating knob, which projects into the wall surface in the case of the known clamping devices, is not suitable for absorbing relatively large tensile forces of the type described above. The same problems



arise with base panels or shelves, which are likewise being produced more and more from wood.

Taking the abovementioned prior art as departure point, the object of the invention is thus to
5 configure clamping devices of the type mentioned in the introduction such that they can also be used with non-metallic materials, e.g. wood.

This object is achieved according to the invention by a closure sleeve of a clamping device
10 having the features mentioned in Patent Claim 1.

Further advantageous configurations of the invention are specified in the dependent claims.

The invention is explained in more detail hereinbelow by way of example, using different
15 exemplary embodiments, with reference to the attached drawings, in which:

Figure 1 shows a plan view of a clamping device, introduced into a wall panel, with a sleeve according to the invention in a first exemplary
20 embodiment,

Figure 2 shows the wall panel, clamping device and sleeve according to Figure 1 in a cross section along line II-II,

Figure 3 shows the same elements according to
25 Figure 1 in a cross section along line III-III,

Figure 4 shows a plan view of a sleeve as is used in the first exemplary embodiment according to Figures 1 to 3,

Figure 5 shows a side view of the sleeve
30 according to Figure 4,

Figure 6 shows a cross section, corresponding to Figure 3, through a wall panel, clamping device and sleeve according to a second exemplary embodiment of the invention,

Figure 7 shows a plan view of a sleeve
35 according to the second exemplary embodiment,

Figure 8 shows a side view of the sleeve according to Figure 7,

Figure 9 shows a cross section, corresponding to Figure 3, through a wall panel, clamping device and sleeve according to a third exemplary embodiment of the invention,

5 Figure 10 shows a plan view of a sleeve according to the third exemplary embodiment,

Figure 11 shows a side view of the sleeve according to Figure 10,

10 Figure 12 shows a plan view of a sleeve according to a fourth exemplary embodiment of the invention,

Figure 13 shows a perspective view of a profile rod and a wall panel equipped with a sleeve according to the invention,

15 Figure 14 shows a perspective view of the clamping device with closure sleeve according to Figure 1,

Figure 15 shows an exploded view of the clamping device, closure sleeve and wall panel according to Figure 1,

20 Figure 16 shows a cross section, corresponding to Figure 3, through a wall panel, clamping device and sleeve according to a fifth exemplary embodiment of the invention,

25 Figure 17 shows a side view of a sleeve according to the fifth exemplary embodiment,

Figure 18 shows a plan view of the sleeve according to Figure 16,

30 Figure 19 shows a plan view, partially in section, of the clamping device with the sleeve according to the invention shown in Figure 16,

Figure 20 shows a cross section, corresponding to Figure 3, through a wall panel, clamping device and sleeve according to a sixth exemplary embodiment of the invention,

35 Figure 21 shows a side view of a sleeve according to the sixth exemplary embodiment,

Figure 22 shows a plan view of the sleeve according to Figure 20,

Figure 23 shows an exploded view of a clamping device with a closure housing, a thin wall panel and a closure sleeve according to a seventh exemplary embodiment, and

5 Figure 24 shows an exploded view of a clamping device with a closure housing, a thin wall panel and a closure sleeve according to an eighth exemplary embodiment.

Figure 1 shows a plan view of a clamping device
10 2 which is introduced into a wall panel 1 and of which merely the clamping hooks 3 project beyond the front wall-panel edge 24. 14 designates a profile rod in which the clamping hooks 3 can be hooked in a releasable manner. The clamping device 2 is positioned
15 in a milled relief in the wall panel 1, said milled relief being designated 5. The construction of the clamping device 2 can be gathered from WO 97/25536. An essential feature of the clamping device 2 is the head 6 which is sunken in the body of the clamping device 2,
20 counter to the action of a spring force, and is then introduced into the wall panel 1 through the milled relief 5. Said head 6 then projects, in a transverse bore, into the wall panel 1, and it advantageously terminates flush with the wall panel 1.

25 7 designates the sleeve, the functioning of which will be explained in conjunction with the rest of the drawings.

Figure 2 shows a cross section along line II-II of Figure 1, the same features having the same designations in each case. It can clearly be seen that
30 the clamping device 2 has been advanced into the milled relief 5 and that the head 6 of the clamping device 2 terminates flush with the surface 8 of the wall panel 1, there being provided, about the axis 9, a
35 cylindrical bore 10 into which the sleeve 7 can be inserted before the clamping device 2 is inserted.

It can clearly be seen that the sleeve 7, in the region of the wall panel 1, is fitted in a form-fitting manner in the latter and, in particular in the

regions designated 11, is capable of absorbing forces which act in one of the directions of the double arrow 12.

Figure 3 illustrates a cross section along line
5 III-III from Figure 1. Figure 4 shows the sleeve 7 in a plan view. This is associated with Figure 5, which shows the same sleeve 7 in the side view from the direction 15. It can clearly be seen that the cylindrical sleeve 7 has a bore 16, in this case
10 rectangular, which passes through it and leaves behind a circle section 17 of material on both sides in each case, as seen in plan view. The body of the clamping device 2 can be advanced through the bore 16. Provided concentrically with the axis of symmetry 18 of the
15 cylinder of the sleeve 7 is a receiving bore 19, of which the diameter is adapted such that the head 6 of the clamping device 2 fits in an essentially form-fitting manner therein.

The functioning of the sleeve 7 can clearly be
20 seen from the illustration thereof in conjunction with Figures 1 to 3. The task of absorbing forces in one of the directions of the double arrow 20 in Figure 1 or 3 is ensured by the large side surfaces of the clamping device 2. This action of force usually corresponds to
25 the weight of the wall panels 1, which are fastened on profile rods 14 via the clamping device 2. In addition to the wall panels 1, the sleeve according to the invention can be used for a clamping device likewise for shelves and base panels or other sheet-like
30 elements which are to be supported, in this case in particular in fair instruction.

Using the sleeve 7 vastly increases the surface area over which it is possible to absorb forces which act in one of the directions of the double arrow 12,
35 i.e. essentially tensile forces which could remove the wall panel 1 from the profile rod in which the clamping hooks 3 of the clamping device 2 engage. That surface area of the sleeve 7 which is subjected to tensile stressing corresponds, in the projection in Figure 4,

to the surface area which is arranged in the plane of the arrow 15. With the design selected in the exemplary embodiment, this has thus more than doubled. In addition to this surface area, which is designated 11 in Figure 14, there are also, and in particular, the surface areas of the circle-segment sections 17 in the lateral surface, said surface areas being designated 31. At the same time, the base surface 22 of the sleeve 7 forms an abutment which reliably prevents the head 6 tilting in the sleeve 7, or the sleeve 7 tilting in relation to the wall panel 1.

Of course, it is also possible to realize the action of the sleeve with differently configured clamping devices or sleeves. In particular, it may be desirable, as is illustrated for the second exemplary embodiment in Figure 6, for the wall panel 1 to retain a base section 21, with the result that the sleeve 27 can only be seen in the wall panel from the top side, i.e. only from one side. As can be seen from Figures 7 and 8, illustrating the sleeve 27, the latter, by way of its recess 26, does not have a base plate 22, but rather has two elongate undercuts 28 which engage in grooves 29 provided correspondingly in the clamping device 2.

Figure 9 shows a third exemplary embodiment of the invention, in the case of which the height of the sleeve 37 provided here has been reduced again, with the result that the undercuts 38 engage in a correspondingly provided groove 39 of the clamping device 2 approximately halfway up the latter. The bore has also been changed to a U-shape recess 26 here. It can be seen here, in Figures 10 and 11, that the increase in the operative surface area can also be ensured by a very low overall height of the sleeve.

In addition to the exemplary embodiments illustrated here, it is also, of course, possible for the sleeve 7, rather than being cylindrical, to have corners, in particular right angles. In addition to a rectangle, the sleeve may also have the outer form of

other polygons. Figure 12 represents a corresponding illustration in plan view. Corresponding to the first-mentioned exemplary embodiments, this sleeve 47 may be of different heights and pass through the panel 1 completely or have undercuts. The important factor in each case is that there is a front edge surface 48 of which the surface area located perpendicularly to the arrow direction 12 is greater than the diameter of the bore 49 through which the head 6 of the clamping device 2 projects. 50 designates the bore provided in the sleeve 47 for the clamping device 2. The use of the sleeve 47, of course, makes it necessary to drill a correspondingly right-angled opening in the wall panel 1. Advantageously present alongside the bore 50 are lateral beads, in this case the lateral regions 48, which absorb the tensile force originating from a profile piece 1 and direct this force, via the operating knob 6, into the clamping device 2 and then into the profile rod 14.

Of course, other forms of the head 6, for example a honeycomb structure or an octagon, are also possible. In particular, the bore 49 for the head 6 may be adapted to the requirements of this head 6, which may possibly have a different outer form, the circle form of the head 6 obviously being preferred in order to fix the clamping device 2 and the clamping hook 3 in a profile rod 1, since this form of head is thus easy to turn.

Figure 13 shows a perspective view of a clamping device 2 which is equipped with a sleeve 7 according to the invention and has been pushed into a wall panel 1 before a profile rod 14. In this case, following the assembly, the front side 24 of the panel 1 rests on the profile rod 14.

Figure 14 shows a perspective view of the clamping device 2 with a closure sleeve 7 according to Figures 1 and 13 in the assembled state. It is possible to see, in particular, the regions 11 and 31, which project laterally beyond the clamping device 2 and

thus, following the installation, rest in the material of the wall panel 1 and are suitable for absorbing forces.

Figure 15 shows an exploded view of the clamping device 2, closure sleeve 7 and wall panel 1 according to Figure 1 before assembly. In this case, it is possible to see the through-bore 10 and the milled relief 5, into which the closure sleeve 7 and the clamping device 2 are inserted in this order. It should be noted here that the invention can be used with any clamping device which is cuboidal like the clamping device 2. It is also possible, however, for the clamping device to have, for example, a cylindrical body.

Figure 16 shows a cross section, corresponding to Figure 3, through a wall panel 1, clamping device 2 and a sleeve 57 according to a fifth exemplary embodiment of the invention. In this case, the clamping device 2 has, laterally in each case, sections 58 which project beyond the outer border of the housing of the clamping device 2 and can better be seen in the plan view, partially in section, of the clamping device 2 according to Figure 19. These sections 58 form a constituent part of the longitudinally movable slide 59.

Figure 17 shows a side view of the sleeve 57 and Figure 18 shows a plan view of said sleeve 57. It can be seen here that longitudinal grooves 60, which fulfil the function of the undercuts 28 and 38, are provided laterally at a corresponding height, and in a complementary manner, to the sections 58. The height of the sleeve 57 is thus preferably exactly the same as the height of the clamping device 2 with head 6. In the side view of Figure 17, the surface directed in the drawing-in and drawing-out directions 12 is designated 51.

Figure 20 shows a cross section, corresponding to Figure 3, through a wall panel 1, clamping device 2 and sleeve 67 according to a sixth exemplary embodiment

of the invention, Figure 21 illustrating a side view, and Figure 22 illustrating a plan view, of the sleeve 67 according to Figure 20. In this case, the clamping device 2 has rounded side edges and, in particular, rounded bottom side edges 69. These interact with undercuts 68 of the sleeve 67, which have the same, complementary radius of curvature.

Figure 23 shows an exploded view of a clamping device 2 with a closure housing 92, a thin wall panel 91 and a closure sleeve 77 according to a seventh exemplary embodiment. Like the sleeve 57, the sleeve 77 is provided with a groove 60, which interacts with projecting elements 58 of the clamping device 2. In order also to be able to use the clamping device 2 for wall panels 91 which are thinner than the clamping device 2 itself, there is provided a closure housing 92 which has a through-cavity 93 with grooves 94 for the elements 58. Also provided is an opening 95 which is arranged transversely to the direction 12 and is intended for receiving the sleeve 77. In this case, cylinder sections 96 project beyond the outer walls of the closure housing 92. Provided on the opposite sides of the closure housing 92, for receiving the thin wall panel 91, in each case is a longitudinally running groove 98, of which the complementary form is made in the wall panel 91. In this case, it is also possible to select the mass of the closure housing 92, in another embodiment, such that the circle-section-shaped recess 99 in the wall panel 91 is dispensed with.

Finally, Figure 24 shows an exploded view of a clamping device 2 with a further closure housing 92, a thin wall panel 91 and a closure sleeve 87 according to an eighth exemplary embodiment. This exemplary embodiment is very similar to that of Figure 23. The differences are that the sleeve 87 has two sections 84 and 85 of different circle diameters. The rear or bottom section 84 is smaller and forms part of the surface of the groove 98. The top, larger section 85 occupies a space in the closure housing 92 which, in

the closure housing 92 according to Figure 23, was filled by said housing itself. This allows a space-saving construction of the clamping device 2 with the sleeve 87 for the thin wall panel 91.

5 Of course, it is also possible for the sleeves 77 and 87, which are provided for use with the closure housing 92, to be configured to correspond to other embodiments and, in particular, to correspond to the sleeves 7, 27, 37, 47, 57 and 67. In this case, it is
10 also possible, in particular, to dispense with the groove 94 if the clamping device 2 does not have any projecting sections 58.

 The sleeves 7, 27, 37, 47, 57, 67, 77 and 87 and the closure housings 92 preferably consist of a
15 light metal, e.g. aluminium. However, they may also be produced from any other material, in particular from plastic. To summarize, these sleeves have the advantage that clamping devices 2 equipped with such a closure sleeve 7, 27, 37, 47, 57, 67, 77 and 87 withstand to a
20 considerably improved extent tensile forces acting in the longitudinal direction 12 of the clamping device 2. This means that clamping devices 2 of said type may then also be used with other materials for the profile pieces 1, e.g. wood. By using a closure housing 92, it
25 is then also possible to use very thin profile elements 1, for example thin wooden panels 91.

Patent Claims

1. Closure sleeve for a clamping device (2) for the releasable connection of two profile pieces (1, 91 and 14), which (2) has an operating knob (6), securable in one profile piece (1, 91), and which can be introduced into a recess (5) provided in said profile piece (1, 91), it being the case that the closure sleeve (7, 27, 37, 47, 57, 67, 77, 87), for receiving the body of the clamping device (2) in a form-fitting manner, has a recess (16, 50) and also has a bore (19) which can receive the operating knob (6), it being the case that the surface-area parts (11, 31, 48, 51) directed in the introduction direction (12) of the clamping device (2) into the closure sleeve (7, 27, 37, 47, 57, 67, 77 and 87) are larger than the corresponding surface area of the operating knob (6).

2. Closure sleeve according to Claim 1, characterized in that the closure sleeve (7, 27, 37, 57, 67) has the outer form of a cylinder.

3. Closure sleeve according to Claim 1, characterized in that the closure sleeve (47) has the outer form of a polygon.

4. Closure sleeve according to one of Claims 1 to 3, characterized in that the recess (16, 50) is a bore, with the result that the closure sleeve (7) has a base (22) located opposite the bore (19).

5. Closure sleeve according to one of Claims 1 to 3, characterized in that the recess (26) is of U-shaped configuration, and in that the closure sleeve (27, 37, 67) has undercuts (28, 38, 68) which interact with complementary grooves (29, 39, 69) of the clamping device (2).

6. Closure sleeve according to one of Claims 1 to 3, characterized in that the closure sleeve (57, 77, 87) has grooves (60) which run laterally in the introduction direction (12) and interact with complementary sections (58) of the clamping device (2).

7. Closure housing for a closure sleeve according to one of the preceding claims, characterized in that the closure housing (92) has a cavity (93), for receiving the clamping device (2), an opening (95),
5 which is aligned transversely to the longitudinal direction of said clamping device and is intended for receiving the closure sleeve (77, 87), and grooves (98), which run in the longitudinal direction on the narrow sides of the closure housing and are intended
10 for receiving the profile piece (91).

8. Closure housing according to Claim 7, characterized in that, on its narrow sides, it has projecting cylinder sections (96) which interact with complementary recesses (99) of the profile piece (91).

15 9. Closure housing according to Claim 7, characterized in that, on the narrow sides, the cavity (93) has mutually opposite grooves (94) for receiving sections (58) which project laterally beyond the clamping device (2).



VERIFICATION OF TRANSLATION

I, Michael Liebetanz, Patent Attorney and Translator at Isler & Pedrazzini AG, of Gotthardstrasse 53, CH-8023 Zurich, Switzerland, do hereby declare that:

1. I am well acquainted with the English and German languages.
2. The annexed document is, to the best of my knowledge and belief, an accurate translation of the amended pages of the International Preliminary Examination Report of the International Patent Application No. PCT/CH98/00337 filed on 11.08.1998 in the name of SYMA INTERCONTINENTAL AG, of Rosenberg, CH-9533 Kirchberg SG, Switzerland.

Zurich, this 22nd day of December 1999



Michael Liebetanz

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Device for the releasable connection of two
profile pieces

5 The present invention relates to a device for
the releasable connection of two profile pieces, having
a clamping device which can be introduced into an
opening provided in a profile piece, having a closure
sleeve which, for receiving the body of the clamping
device in a form-fitting manner, has a recess, and
10 having an operating knob by means of which the clamping
device can be secured in the closure sleeve.

Such a device is known from DE 28 04 222, in
which a description is given of a connection fitting
which is intended for parts of furniture and can be
15 used to secure a clamping pin, positioned in a profile
piece, by a closure sleeve, turning of the closure
sleeve causing an engagement helix of the same to
engage in annular grooves of the clamping pin.

A further device for the releasable connection
20 of two or more wooden parts is known from DE 18 11 743,
in the case of which a metal pin is secured in a
releasable manner, as a connecting rod, in a profile
piece via a closure sleeve configured as a cam plate.

The abovementioned devices are not suitable for
25 repeated assembly and dismantling as is necessary for
fair construction.

A clamping device of the type mentioned above
for fair construction is known, for example, from the
applicant's WO 97/25536. Such clamping devices are
30 provided in order to connect two profile pieces to one
another. These are usually constituted by a profile rod
on which a wall profile is positioned. Provided
laterally in the wall profile for each clamping device
is an inner milled relief into which the clamping
35 device can be pushed up to the projecting hook
elements. Provided on one side of the wall surface, for
a clamping device known from WO 97/25536, is a round
bore through which the locking head extends once it has

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been sunken in the clamping device, counter to the action of a spring force, and advanced through the milled relief up to the bore into which it latches.

Also known from the prior art, in addition to the devices of the type mentioned above, are a number of further devices which all have in common the two features that they are advanced in a milled relief of the wall panel, and that an operating knob projects - for the most part flush - out of the wall panel on one side of the latter.

Said operating knob, at the same time, absorbs tensile forces which act on the wall panel and try to separate the latter from the profile strip.

It is also the case that, in addition to metal, other materials, for example wood, are being used more and more commonly as wall elements. It has been found here that the operating knob, which projects into the wall surface in the case of the known clamping devices, is not suitable for absorbing relatively large tensile forces of the type described above. The same problems arise with base panels or shelves, which are likewise being produced more and more from wood.

Taking the abovementioned prior art as departure point, the object of the invention is thus to configure devices of the type mentioned in the introduction such that they are suitable for frequent assembly and dismantling for fair construction and, at the same time, they can also be used with non-metallic materials, e.g. wood.

This object is achieved according to the invention, in the case of a device of the type mentioned in the introduction, in that the operating knob is provided in the clamping device, in that the closure sleeve has a bore which receives the operating knob, and in that the operating knob can be pushed into the body of the clamping device, counter to a spring force, in the transverse direction to the longitudinal axis of the clamping device.

Further advantageous configurations of the invention are specified in the dependent claims.

5 The invention is explained in more detail hereinbelow by way of example, using different exemplary embodiments, with reference to the attached drawings, in which:

10 Figure 1 shows a plan view of a clamping device, introduced into a wall panel, with a sleeve according to the invention in a first exemplary embodiment,

Figure 2 shows the wall panel, clamping device and sleeve according to Figure 1 in a cross section along line II-II,

15 Figure 3 shows the same elements according to Figure 1 in a cross section along line III-III,

Figure 4 shows a plan view of a sleeve as is used in the first exemplary embodiment according to Figures 1 to 3,

Patent Claims

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1. Device for the releasable connection of two profile pieces (1, 91 and 14), having a clamping device (2) which can be introduced into an opening (5) provided in a profile piece (1, 91), having a closure sleeve (7, 27, 37, 47, 57, 67, 77, 87) which, for receiving the body of the clamping device (2) in a form-fitting manner, has a recess (16, 50), and having an operating knob by means of which the clamping device (2) can be secured in the closure sleeve (7, 27, 37, 47, 57, 67, 77, 87), characterized in that the operating knob (6) is provided in the clamping device (2), in that the closure sleeve (7, 27, 37, 47, 57, 67, 77, 87) has a bore (19) which receives the operating knob (6), and in that the operating knob (6) can be pushed into the body of the clamping device (2), counter to a spring force, in the transverse direction to the longitudinal axis of the clamping device (2).

2. Device according to Claim 1, characterized in that the closure sleeve (7, 27, 37, 57, 67) has the outer form of a cylinder.

3. Device according to Claim 1, characterized in that the closure sleeve (47) has the outer form of a polygon.

4. Device according to one of Claims 1 to 3, characterized in that the recess (16, 50) is a bore, with the result that the closure sleeve (7) has a base (22) located opposite the bore (19).

5. Device according to one of Claims 1 to 3, characterized in that the recess (26) is configured such that, of the closure sleeve (27, 37, 67), a cross-sectionally U-shaped part remains, and in that the closure sleeve (27, 37, 67) has undercuts (28, 38, 68) which interact with complementary grooves (29, 39, 69) of the clamping device (2).

6. Device according to one of Claims 1 to 3, characterized in that the closure sleeve (57, 77, 87) has grooves (60) which run laterally in the introduction direction (12) and interact with complementary sections (58) of the clamping device (2).

7. Closure housing for a device according to one of the preceding claims, characterized in that the closure housing (92) has a cavity (93), for receiving the clamping device (2), an opening (95), which is aligned transversely to the longitudinal direction of said clamping device and is intended for receiving the closure sleeve (77, 87), and grooves (98), which run in the longitudinal direction on the narrow sides of the closure housing and are intended for receiving the profile piece (91).

8. Closure housing according to Claim 7, characterized in that, on its narrow sides, it has projecting cylinder sections (96) which interact with complementary recesses (99) of the profile piece (91).

9. Closure housing according to Claim 7, characterized in that, on the narrow sides, the cavity (93) has mutually opposite grooves (94) for receiving sections (58) which project laterally beyond the clamping device (2).

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