(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 760 809 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
06.01.2021 Bulletin 2021/01

(51) Int Cl.:
E04F 13/08 *(2006.01)* ***E04F 15/02*** *(2006.01)*

(21) Application number: **19183617.0**

(22) Date of filing: **01.07.2019**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **Deceuninck NV**
8830 Hooglede-Gits (BE)

(72) Inventor: **The designation of the inventor has not yet been filed**

(74) Representative: **BiiP cvba**
Lambroekstraat 5A
1831 Diegem (BE)

(54) **PROFILE FIXING ACCESSORY AND SUPPORT SYSTEM COMPRISING SUCH PROFILE FIXING ACCESSORY FOR CLADDING, ELEVATED FLOORS, LOWERED CEILINGS OR SUCH**

(57) A profile fixing accessory for mounting panels or covering elements of a cladding, elevated floor or lowered ceiling to elongated profiles, comprising a lock element and a key element, i) the lock element defining two parallel and spaced apart toothed sections extending in a Y-direction, both toothed sections joined to one another by a flexible link configured to allow relative movement of both toothed sections versus one another in the Y-direction and an X-direction perpendicular to said Y-direction; ii) the key element defining a wedge configure to cooperate with said lock for limiting the relative movement between the toothed sections in the X-direction.

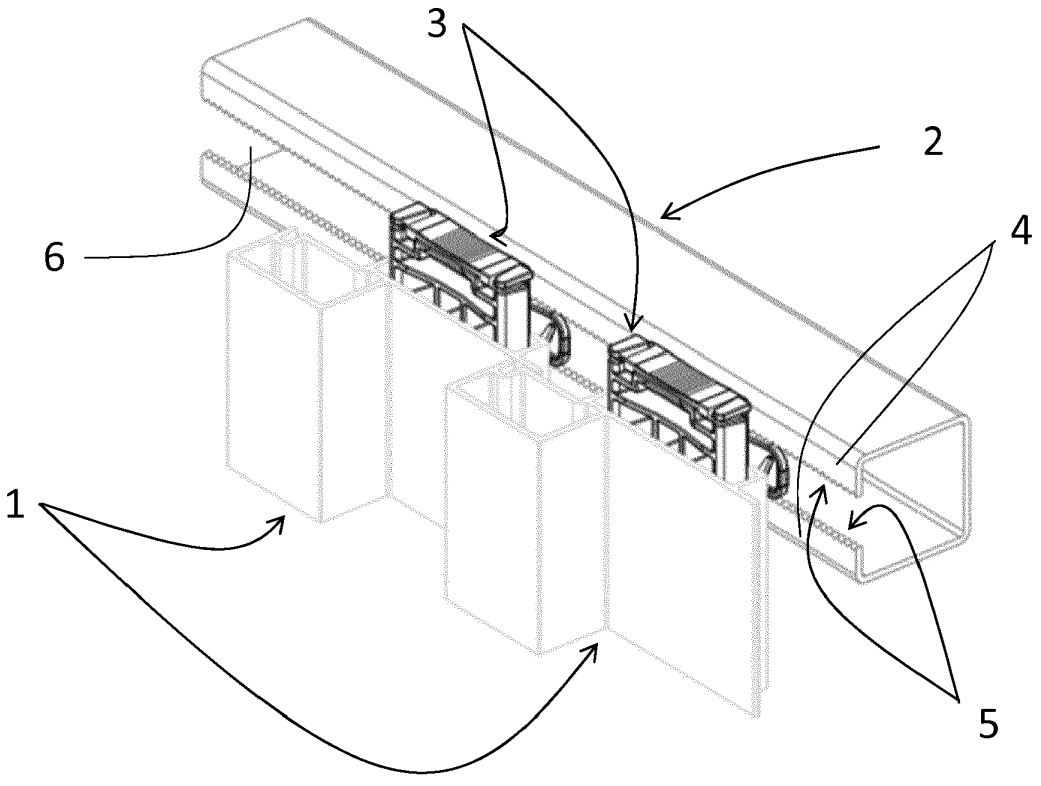

Fig. 1

EP 3 760 809 A1

Description

FIELD OF THE INVENTION

[0001] The present invention concerns a profile fixing accessory and to support system for cladding, elevated floors or lowered ceilings comprising such profile fixing accessory.

BACKGROUND TO THE INVENTION

[0002] Plenty of support systems for cladding or elevated floors are available on the market, a vast majority thereof is offered for sale together with cladding boards and most comprise elongated profiles configured to be permanently fixed on a wall in a horizontal or vertical direction to create a repetitive pattern of profiles over the entire wall to be covered by cladding.

[0003] The boards are to be fixed to the pattern of profiles, either directly or in more advanced systems by intermediate of a profile fixing accessory. Such support systems comprising profile fixing accessories are described in amongst others FR2928673, DE202013010345, WO2011/149371 and DE4224550.

[0004] In FR 2928673 and DE202013010345 the profile fixing accessories are to be fixed by either nails or screws, which has a substantial impact on the time for installing and or removing the cladding or elevated floor system. In WO2011/149371 a support system is disclosed wherein boards of a cladding, elevated floor or lowered ceiling are mounted on a pattern of elongated profiles by means of a profile fixing accessory and wherein no nails or screws are required for fixing either the profile fixing accessory or the boards to the elongated profiles. In this case, the elongated profiles define an elongated slot wherein a base of the profile fixing accessory is inserted and clamped by friction through rotation of the profile fixing accessory in the slot, thereby rotating the base - having a small and a large dimension oriented perpendicularly to one another - such that the large dimension turns to a position perpendicular to the slot, thereby clamping the base between sidewalls of the elongated profile. Once in clamping position, the profile fixing accessory is moved to a position wherein a head thereof cooperates with a board of the cladding. This movement of the clamped profile fixing accessory is done by hammering against the friction between the base of the profile fixing accessory and the elongated profiles. The movement of the profile fixing accessory is experienced in the field as cumbersome and time consuming and does in large amount nullify the time gained by not having to screw the profile fixing accessory in place. Additionally, as movement of the profile fixing accessory is possible with a limited amount of force, the profile fixing accessories do not provide a load bearing function in case of claddings.

[0005] DE4224550 discloses a support system comprising profile fixing accessories and one or more elongated profiles having sidewalls defining a longitudinal slot delimited by facing edges of the sidewalls, said facing edges defining asymmetric teeth configured to cooperate with toothed sections on the profile fixing accessory for locking the accessory in the elongated profiles. The asymmetric teeth are configured such as to allow movement of the profile fixing accessories in one direction but preventing movement in the opposite direction. Although the support system according to DE'550 in theory offers good load bearing functionality and is easy and fast in application, it suffers from a major drawback. Due to production tolerances, the asymmetric teeth on both sides of the slot in the elongated profile are not always perfectly aligned. Such misalignment has no or little influence in case the teeth are dimensioned wide enough in a longitudinal direction of the profile, but such wide dimensioning of the teeth limits fine regulation of the position of the profile fixing accessories and hence may jeopardize good immobilization of cladding boards and may give rise to vibration of the boards in cases of wind and as such to noise generation. Reducing the dimensions of the teeth to overcome the above drawback leads to higher material rejection as the misalignment prevents a straight positioning of the profile fixing accessories in the profiles and as such jeopardizes the load bearing functionalities of the system as a profile fixing accessory that is positioned askew in the elongated profiles may jump out of place as the teeth of the accessory and the elongated profiles have a reduced contact surface.

[0006] It follows from the above that there remains a market need for cladding support systems that are easy, fast and fail safe to install and optionally de-install.

SUMMARY OF THE INVENTION

[0007] The present invention is defined in the appended independent claims. Preferred embodiments are defined in the dependent claims. The present invention addresses the above market needs and provides for a profile fixing accessory for mounting panels or covering elements of a cladding, elevated floor or lowered ceiling to elongated profiles comprising a lock element and a key element, i) the lock element defining two parallel and spaced apart toothed sections extending in a Y-direction, both toothed sections joined to one another by a flexible link configured to allow relative movement of both toothed sections versus one another in the Y-direction and an X-direction perpendicular to said Y-direction; ii) the key element defining a wedge configure to cooperate with said lock for limiting the relative movement between the

toothed sections in the X-direction.

[0008] The support system according to the present invention comprises profile fixing accessories as described supra and one or more elongated profiles, preferably having sidewalls defining a longitudinal slot delimited by facing edges of the sidewalls, said facing edges defining teeth configured to cooperate with the toothed sections on the profile fixing accessory for locking the accessory in the elongated profiles upon insertion of the key in the lock.

DETAILED SUMMARY OF THE INVENTION

[0009] In a preferred embodiment of the present invention, the lock element and key element comprise two coupling means, a first coupling means for coupling the key element to the lock element in a non-locking position wherein the relative movement between both toothed sections of the lock element is possible over a distance A; and a second coupling means for coupling the key element to the lock element in a locking position, wherein the relative movement between both toothed sections of the lock element is possible over a distance B, B being smaller than A.

[0010] A preferred feature of the profile fixing accessory of the invention, is that said lock element comprises a guide for guiding a movement of the key element in view of the lock element from a non-locking position to a locking position.

[0011] Another preferred feature of the profile fixing accessory is that the lock element comprises a base wall that comprises at least two wall parts with a slot defined therebetween, said two wall parts connected to one another by said flexible link. More preferably, the lock element is configured as a basket comprising at least two side walls extending from two opposed edges of the base wall and at opposed sides of said slot defined between both wall parts of the base wall. Said slot defined in the base wall of the lock element is preferably delimited by at least two protrusions extending from the base wall at each side of said slot, each protrusion comprising one of said toothed sections and each toothed section is preferably delimited in the Z-direction - perpendicular to both the Y- and X-directions-, by on the one hand, the base wall and on the other hand, a shoulder portion. Each of said protrusion may comprise a bead extending in the Y-direction, both said beads defining a local narrowing in said slot.

[0012] In accordance with a preferred embodiment of the profile fixing feature of the present invention, the lock element manufactured in one piece, preferably in a polymeric material such as a polyolefin or polyamide.

[0013] The key element of the profile fixing accessory preferably comprises a base wall from which said wedge protrudes. The wedge may comprise wings having free edges, said free edges configured to cooperate with the beads of the locking profile for coupling the key element to the lock element in a locking position. The base wall may further be configured to cooperate with the side walls of the basket of the lock element for guiding the wedge into the slot.

[0014] The key element is preferably manufactured in one piece, preferably in a polymeric material such as a polyolefin or polyamide, most preferably the lock element and key element are manufactured in a same material.

[0015] The support system of the present invention preferably comprises elongated profiles that have sidewalls defining a longitudinal slot delimited by facing edges said edges defining a sawtooth or triangular toothed profile, the toothed sections of the profile fixing accessory configured to cooperate with said sawtooth or triangular toothed profile. The sawtooth or triangular toothed profile preferably have a period of between 0,5 and 1,5 mm; and said flexible link of the lock element is preferably configured to allow relative movement of both toothed sections versus one another in the Y over a distance of at least twice the period of the sawtooth or triangular toothed profile.

BRIEF DESCRIPTION OF THE APPENDED FIGURES

[0016]

Fig. 1 shows a system according to the present invention with a cladding mounted thereon.

Fig. 2 shows a profile fixing accessory and an elongated profile of a system according to the present invention;

Fig. 3 is a perspective view of a profile fixing accessory of the present invention;

Fig. 4 is an exploded view of a profile fixing accessory of the present invention;

Fig. 5 shows a side view of a profile fixing accessory of the present invention during introduction of a key element in a lock element.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0017] As illustrated in Fig. 1, the present invention concerns a system for mounting panels 1 or covering elements of a cladding and comprises one or more elongated profiles 2 intended to be fixed to a wall or ceiling that is to be covered

by the cladding and a plurality of profile fixing accessories 3 configured to mount the panels on the elongated profile(s) 2.

[0018] In the illustrated embodiment, the elongated profiles 2 are generally U-shaped with sidewalls 4 defining a longitudinal groove 5 delimited by facing edges said edges 6 defining a sawtooth or triangular toothed profile with a period of between 0,5 and 1,5mm.

[0019] The elongated profiles preferably have drill holes in the sidewall facing the slot, allowing easy fixation of the profiles on a wall or ceiling by screws.

[0020] The elongated profiles are preferably manufactured in a metal such as stainless steel, steel or aluminum; or in a preferably reinforced polymeric material.

[0021] Figs. 3, 4 and 5 illustrates a more detailed view of the profile fixing accessory of Fig. 1 & 2. This profile fixing accessory 3 comprises a lock element 7 and a key element 8. In the shown embodiment, the lock element 7 comprises a base wall 9 existing of two halves 9a & 9b with a slot 10 provided between both halves. Both halves 9a and 9b are in this case configured as one another's mirror image and each comprise upstanding walls 11 at a circumscribing edge of the base wall 9, such that the base wall and upstanding wall together define a basket. The upstanding walls in this case comprise local projections 12 at their free ends jutting out into the basket, these projections 12 having an increasing width from the free end of the upstanding walls towards the base wall of the basket such as to define a sloping top wall and each projection defining an undercut in the basket.

[0022] Extending in an opposite direction from the upstanding walls 11, are two protrusions 12, one at each side of the slot, and thus each halve of the base wall comprising one protrusion 12.

[0023] Each of the protrusions 13 comprises a toothed section 14, in this case at a surface thereof facing away from the slot 10 and extending of the entire length of the protrusion in a Y-direction. The teeth preferably have a sawtooth or triangular toothed profile with a period of between 0,5 and 1,5mm, corresponding to the sawtooth or triangular profile provided on the elongated profiles 2, thereby allowing cooperation between the toothed sections on the lock element and the toothed profiles on the elongated profiles.

[0024] The toothed section 14 on each of the protrusions 13, is delimited by a shoulder portion 15 that is part of an arrow like structure 16 defining the free end of each protrusion 13.

[0025] Further each of said protrusions 13 preferably comprises a bead 17 extending in the Y-direction and provided on a surface facing the slot 10, such that each slot is locally narrowed by two beads, one on each side of the slot 10.

[0026] Both halves 9a and 9b are coupled to one another by a flexible link 18 that in this case comprises two loops 18a and 18b, each coupling both halves 9a&b to one another, one at each side of the halves 9a&b. The flexible link allowing a relative movement between both halves in both the Y-direction and an X-direction perpendicular to the Y-direction and perpendicular to an imaginary plane wherein the toothed sections 1 extend. Preferably the flexible link allows a relative movement of both halves 9a&b over a distance of at least twice the period of the toothed profiles, in this case twice the distance of between 0,5 and 1,5mm in the Y direction.

[0027] The lock element 7 is preferably manufactured in one single piece of polymeric material such as a polyolefin or a polyamide such as PA6 and may be produced by example given injection molding.

[0028] As illustrated in Fig. 5, both halves 9a&b of the lock element are preferably slightly tilted versus one another over an angle of between 1 and 10° in a direction such that the basket opens up, i.e. the distance between opposed longitudinally (Y-direction) extending upstanding walls 11 are slightly widening from the base wall to the free end of these upstanding walls 11. This slight angle between both halves facilitates production in terms of removing the lock element 7 from a mold and allows easy introduction of the key element 8 in the basket.

[0029] The key element 8 comprises a base plate 19 from which on one side a wedge part 20 extends that is configured to translate into the slot 10 defined in the lock element 7. On an opposite surface of the base plate 19 than the wedge part 20, a mounting means 21 is provided that is configured to cooperate with the panels 1 or covering elements of the cladding. Such mounting means can have a wide variety of architectures, depending on the panels or covering elements of the cladding, are well-known in the art and will not be described in further detail in this document.

[0030] The base plate 19 in this case is dimensioned to neatly fit into the basket of the lock element, the upstanding walls parts 11 of the basket thereby serving as a guide for introducing the wedge part 20 into the slot 10 of the lock element.

[0031] The wedge part 20 that has a generally arrow like cross section and comprises wings 22 protruding sidewise from the wedge part in proximity to the free end thereof.

[0032] The key element 8 is preferably manufactured in one piece and in a polymeric material such as a polyolefin or a polyamide such as PA6 and may be produced by example given injection molding. Most preferably the key element is manufactured in a same material as the lock element 7.

[0033] Upon introduction of the base plate 19, this plate will first snap behind the projections 12 on the upstanding wall parts of the basket, thereby loosely coupling the key element 8 to the lock element 7. In this position, the wedge part is situated in the slot of the lock element but does not actively cooperate therewith in the sense that the halves 9a&b of the base wall of the lock and the corresponding toothed parts of the lock can still move rather unconstrained relative to one another in the X-direction, in this position the key element 8 is coupled to the lock element 7 in a non-locking position and the halves 9a&b can move in view of one another in the X-direction over a distance A.

[0034] Upon further translation of the wedge part 20 of the key element 8 in the slot 10, the halves 9a&b will be pushed apart to allow movement of the wings 22 of the wedge part over and beyond the beads 17 of the lock element, thereby creating a coupling of the key element 8 in the lock element 7 by snap-fit in a so-called locking position, wherein the halves 9a&b are constraint in movement in view of one another in the X-direction. The relative movement in the X-direction is limited to a distance B, B smaller than A, because the wedge part 20 of the key element prevents movement of the parts 9a&b towards another to a distance smaller than the width of the wedge part 20.

[0035] In order to install a cladding or covering with a system according to the present invention, it is preferred that elongated profiles 2 are first mounted to a wall or ceiling to be covered to create rows of parallel elongated profiles 2. Subsequently, profile fixing accessories 3 -with the lock element 7 and key element 8 coupled in a non-locking position - are introduced with their protrusions 13 of the lock element 7 in the longitudinal groove 5 of the elongated profiles 2. The toothed sections 14 of the lock element 7 herewith loosely interact with the toothed edges delimiting the groove 5 in the elongated profiles 2 and the profile fixing accessories can relatively easily be repositioned in the groove 5. Once in a desired position in the groove, the key element 8 is pushed further into the lock element 7 until the wings 22 of the wedge part snaps beyond the beads 17 in the slot 10 of the lock element 7. The toothed parts 14 of the lock element 7 are hereby spaced apart and snugly interact with the toothed edges of the elongated profiles, thereby readily locking the profile fixing accessories 3 in place. In this locked position, movement of the profile fixing accessories 3 in view of the elongated profiles is no longer possible or only by applying very high forces (the profile fixing accessories can now maintain panels or covering elements of the cladding in pace).

[0036] As the elongated profiles are preferably manufactured in metal and the toothed profiles at the opposed edges of the groove may, due to manufacturing tolerances not be perfectly aligned, a rigid fixation of the profile fixing accessories may be jeopardized were not that the flexible link 18 between the halves 9a&b allow relative movement of the halves 9a&b in view of one another when in the non-locking position of the key element and during part of the translation of the key element 8 from the non-locking to the locking position. As such, a correct alignment of the toothed sections 14 on each halve 9a, b with the corresponding toothed edge of the elongated profiles is guaranteed. Once a row of profile fixing accessories are locked in place, a panel or covering element of the cladding to be installed can be mounted.

[0037] In the depicted embodiment, the elongated profiles 2 are generally U-shaped with a groove 5 and the toothed sections 14 of the lock element 7 are to be moved apart to snap into the toothed edges of the elongated profiles. Clearly, it is also possible to make a similar system with elongated profiles having a generally T-shaped, I-shaped or L-shaped cross section, wherein a base of the elongated profiles is fixed to a wall and a leg protruding therefrom comprises a toothed profile at two opposed surfaces. The lock element in that case may comprises two halves with protrusions that have toothed sections at facing surfaces, while the key element limits movement in the locking position of the profile fixing accessory by pressing both halves towards another instead of moving them apart as in the embodiment of Figs 1-4. Also in this alternative embodiment, the key element, when in the locking position, will limit movement of the toothed sections of the lock element in the X-direction in view of the freedom of movement these toothed sections have in the non-locking position of the profile fixing accessory.

1. panels	9a&b halves of base wall	17 bead (snap fit for key)
2. elongated profiles	10 slot in base wall lock element	18 flexible link
3. profile fixing accessory		18a&b loops
4. sidewalls profiles	11 upstanding wall parts	19 base plate key
5. groove profiles	12 projections	element
6. side edges profiles	13 protrusions	20 wedge part
7 lock element	14 toothed sections	21 mounting means
8 key element	15 shoulder portion	22 wings
9 base wall lock element	16 arrow like structure	

Claims

1. A profile fixing accessory for mounting panels or covering elements of a cladding, elevated floor or lowered ceiling to elongated profiles, comprising a lock element and a key element, i) the lock element defining two parallel and spaced apart toothed sections extending in a Y-direction, both toothed sections joined to one another by a flexible link configured to allow relative movement of both toothed sections versus one another in the Y-direction and an X-direction perpendicular to said Y-direction; ii) the key element defining a wedge configure to cooperate with said lock for limiting the relative movement between the toothed sections in the X-direction.

2. The profile fixing accessory according to claim 1, the lock element and key element comprising two coupling means,

a first coupling means for coupling the key element to the lock element in a non-locking position wherein the relative movement between both toothed sections of the lock element in the X-direction is possible over a distance A; and a second coupling means for coupling the key element to the lock element in a locking position, wherein the relative movement between both toothed sections of the lock element is possible over a distance B, B being smaller than A.

3. The profile fixing accessory according to claim 1 or 2, said lock element comprising a guide for guiding a movement of the key element in view of the lock element from a non-locking position to a locking position.

4. The profile fixing accessory according to any of the preceding claims, the lock element comprising a base wall that comprises at least two wall parts with a slot defined therebetween, said two wall parts connected to one another by said flexible link.

5. The profile fixing accessory according to claim 4, the lock element configured as a basket comprising at least two upstanding walls extending from two opposed edges of the base wall and at opposed sides of said slot defined between both wall parts of the base wall.

6. The profile fixing accessory according to claim 4 or 5, said slot defined in the base wall of the lock element is delimited by at least two protrusions extending from the base wall at each side of said slot, each protrusion comprising one of said toothed sections.

7. The profile fixing accessory according to claim 6, each toothed section, delimited in the Z-direction perpendicular to both the Y- and X-directions, by on the one hand, the base wall and on the other hand, a shoulder portion.

8. The profile fixing accessory according to claim 6 or 7, each of said protrusion comprising a bead extending in the Y-direction, both said beads defining a local narrowing in said slot.

9. The profile fixing accessory according to any of claims 1 to 8, the key element comprising a base plate from which said wedge protrudes.

10. The profile fixing accessory according to claim 8 and 9, the wedge of the key element comprising wings having free edges, said free edges configured to cooperate with the beads of the locking profile for coupling the key element to the lock element in a locking position.

11. The profile fixing accessory according to claims 5 and 9 or 10, said base plate configured to cooperate with the side walls of the basket of the lock element for guiding the wedge into the slot.

12. A system for mounting panels or covering elements of a cladding, said system comprising:

- profile fixing accessories according to any of claims 1-11; and
- one or more elongated profiles.

13. The system according to claim 12, wherein said elongated profiles have sidewalls defining a longitudinal groove delimited by facing edges said edges defining a sawtooth or triangular toothed profile, the toothed sections of the profile fixing accessory configured to cooperate with said sawtooth or triangular toothed profile.

14. The system according to claim 13, said sawtooth or triangular toothed profile having a period of between 0,5 and 1,5 mm.

15. The system according to any of claims 12 to 14, said flexible link configured to allow relative movement of both toothed sections versus one another in the Y over a distance of at least twice the period of the sawtooth or triangular toothed profile.

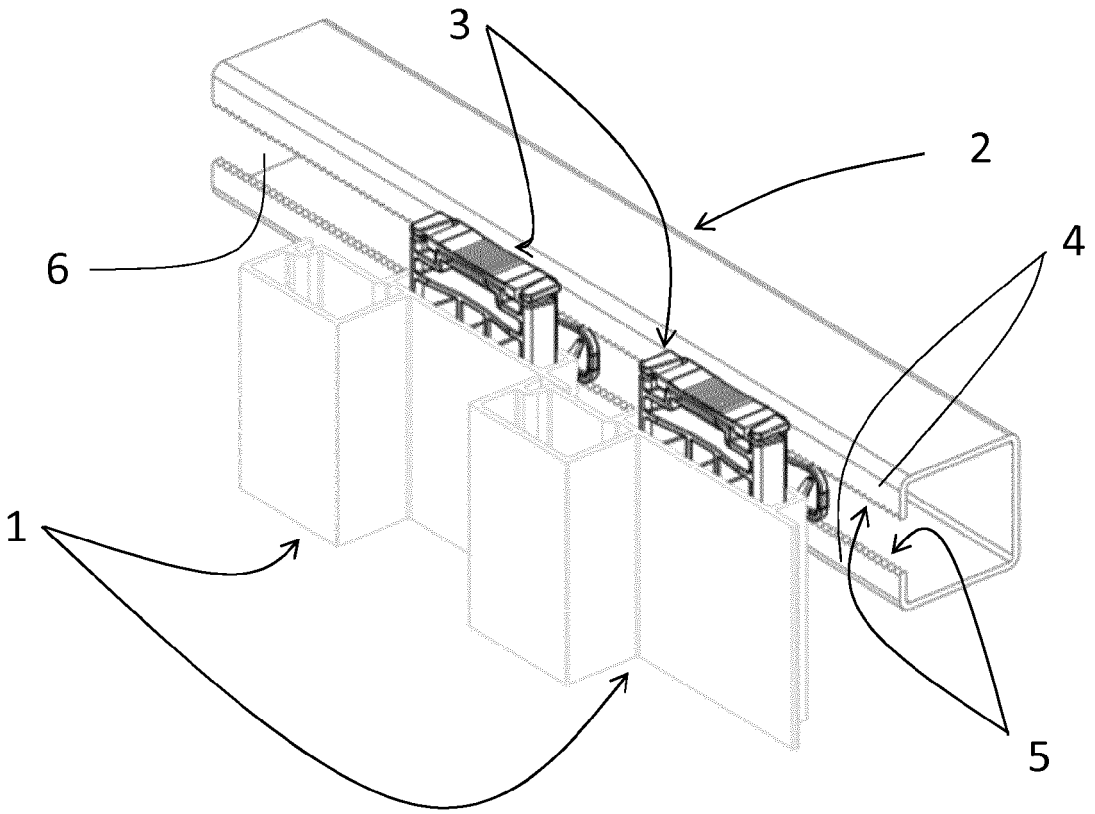

Fig. 1

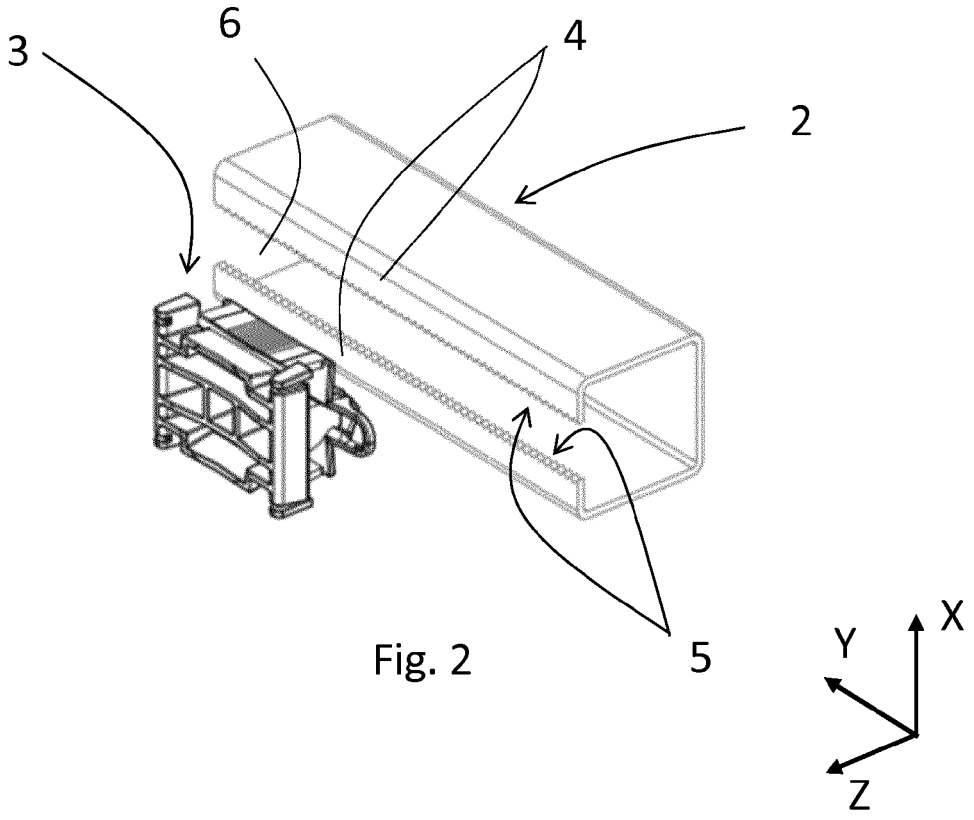

Fig. 2

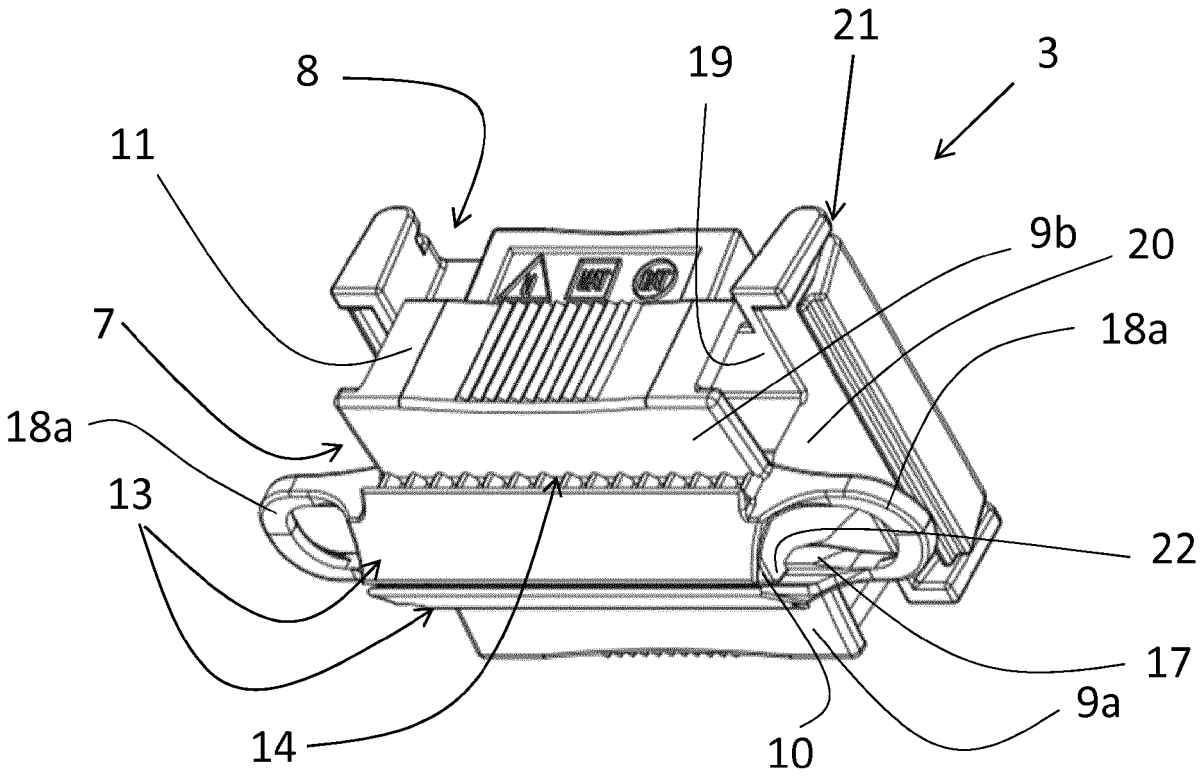
8
19
21
3
11
9b
20
7
18a
18a
13
22
17
9a
14
10

Fig. 3

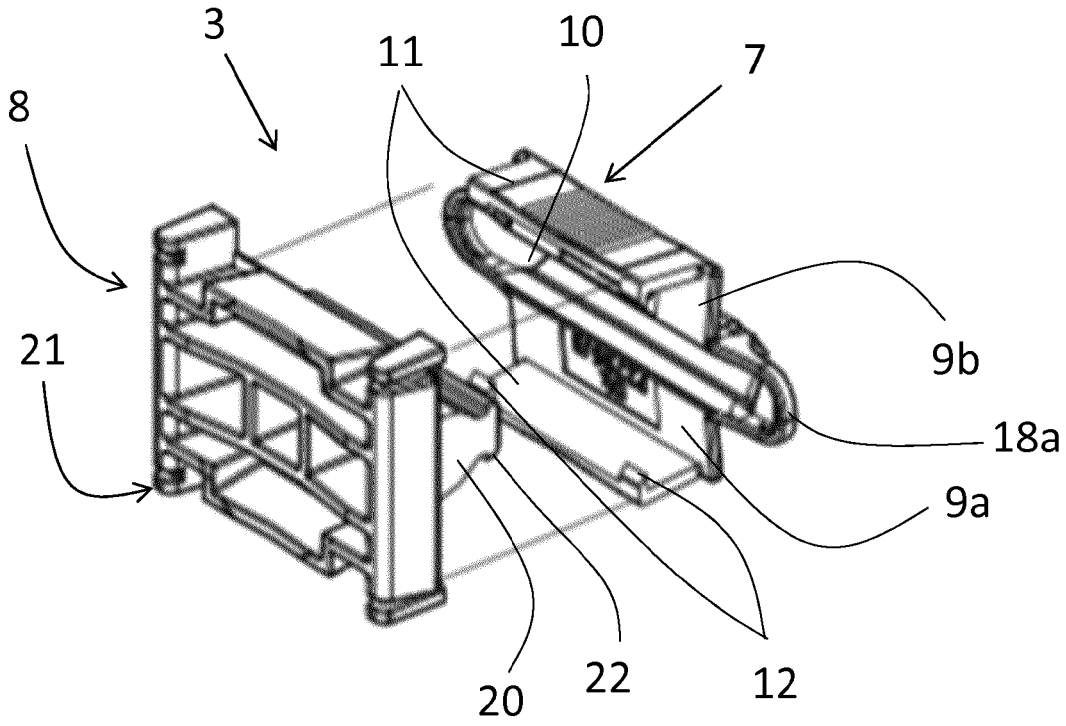
3
11
10
7
8
21
9b
18a
9a
20
22
12

Fig. 4

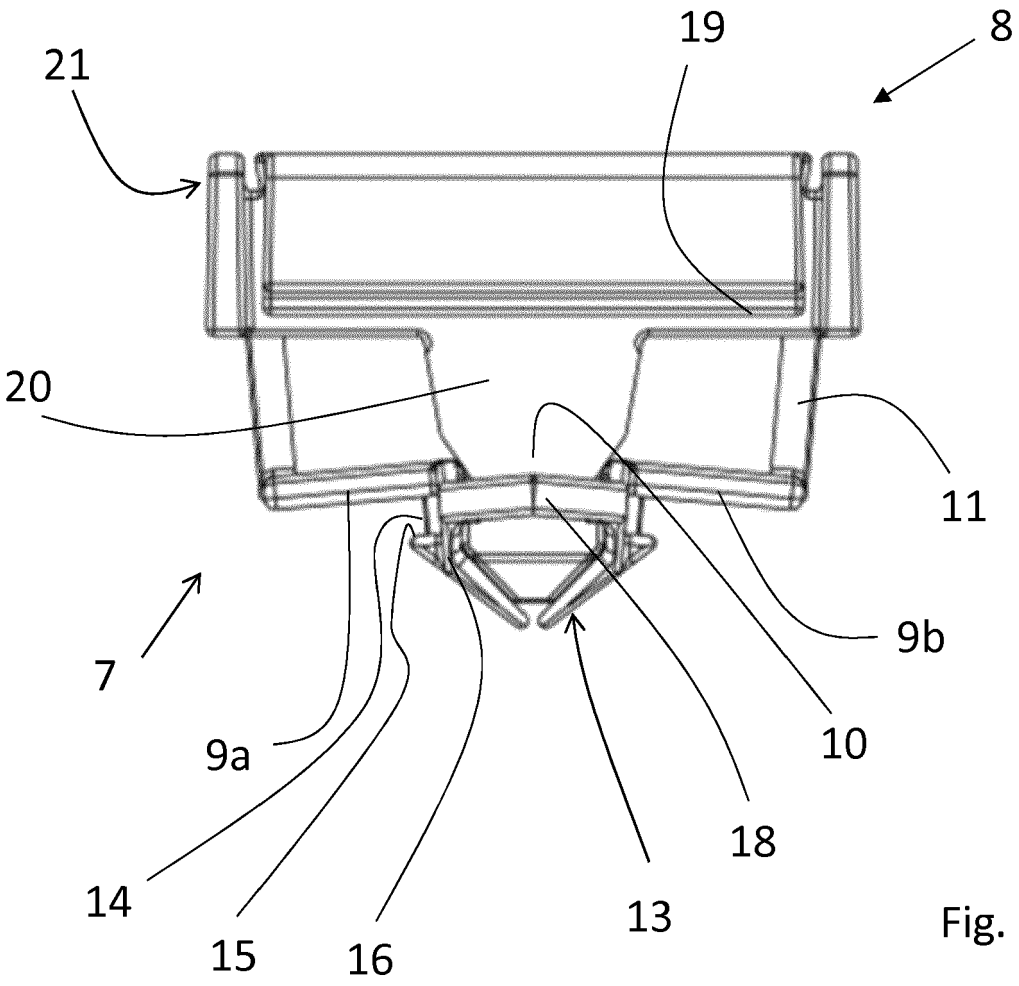

Fig. 5

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 19 18 3617

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 0 278 252 A2 (FRICKER SIEGFRIED) 17 August 1988 (1988-08-17) * figures 3-4, 7 * * column 1, line 3 - line 13 * * column 6, line 26 - line 58 *	1-15	INV. E04F13/08 E04F15/02
A,D	DE 42 24 550 A1 (RICHTER FERENCZI MICHAEL [DE]) 27 January 1994 (1994-01-27) * figures 1-4, 9-10 * * column 1, line 50 - column 2, line 21 *	1-15	

TECHNICAL FIELDS SEARCHED (IPC)
E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	17 December 2019	Estorgues, Marlène

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 18 3617

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-12-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0278252 A2	17-08-1988	AT 65275 T	15-08-1991
		AU 608801 B2	18-04-1991
		CA 1293713 C	31-12-1991
		DE 3701530 A1	04-08-1988
		EP 0278252 A2	17-08-1988
		ES 2022927 B3	16-12-1991
		JP 2610285 B2	14-05-1997
		JP S63266204 A	02-11-1988
		KR 880008894 A	13-09-1988
		NZ 223199 A	26-09-1990
		US 4878640 A	07-11-1989
DE 4224550 A1	27-01-1994	NONE	

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- FR 2928673 **[0003] [0004]**
- DE 202013010345 **[0003] [0004]**
- WO 2011149371 A **[0003] [0004]**
- DE 4224550 **[0003] [0005]**