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

(11) **EP 2 017 427 A2**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.01.2009 Bulletin 2009/04

(51) Int Cl.:
E06B 3/964 *(2006.01)*

(21) Application number: **08012572.7**

(22) Date of filing: **11.07.2008**

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

(30) Priority: **18.07.2007 IT TO20070533**

(71) Applicant: **Pronema S.r.l.**
28060 Comignago (NO) (IT)

(72) Inventor: **Martinotti, Gianmarco**
28060 Comignaco (NO) (IT)

(74) Representative: **Garavelli, Paolo**
A.BRE.MAR. S.R.L.,
Via Servais 27
10146 Torino (IT)

(54) Multi-function system for assembling profiles

(57) A multi-function system for assembling profiles is described, comprising at least one profile (1) equipped with at least one profile chamber (3) and a plurality of connection modules (10, 20, 30, 40, 50), each module being equipped with at least one insertion foot (7) adapted to be inserted and/or fixed insde at least one profile chamber (3) of the profile (1).

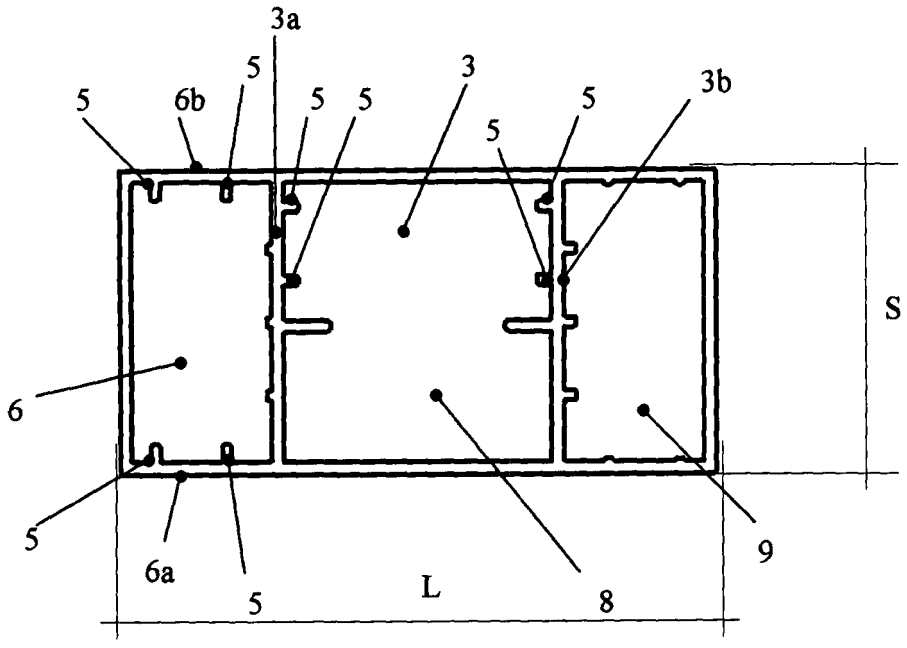

FIG. 1

EP 2 017 427 A2

Description

[0001] The present invention refers to a multi-function system for assembling profiles, in particular for making frames for openings such as doors or windows.

[0002] In the art profiles are known that are made of plastic material or metal alloy to make, in particular, the perimeter frame of door or window openings or more in general for building crosslinked structures. In the majority of cases, such profiles are directly fastened to the opening to be equipped. In other contexts, such profiles can be equipped with longitudinal grooves for the connection to other profiles by inserting therein sliding sliders or the use of a range of connection modules adapted to allow many assembling solutions of the profiles. Examples of such known solutions are disclosed in patents n. CN-A-1434240, DE-A-10016608, DE-A-19732972, DE-A-4323488 and DE-A-3624940.

[0003] In almost all these cases, however, the known systems for assembling profiles are substantially specifically made for the determined application for which they are provided, this not allowing to easily use the same profiles and the same connection modules for other applications that are different from the strictly provided ones. Moreover, it is difficult that the various profiles and their related connection modules, usually excessively complex from the mechanical and laying points of view, can be mutually interchanged, this making their assembly univocal and scarcely capable of being suited to different needs that can intervene in the building field.

[0004] The art therefore searches for systems for assembling profiles that are more and more practical, easy and quick in their laying and more and more versatile in their possible customisation.

[0005] Therefore, object of the present invention is solving the above prior art problems by providing a multi-function system for assembling profiles that allows being more easily and quickly laid than what is proposed by the prior art.

[0006] A further object of the present invention is providing a multi-function system for assembling profiles that is more versatile than what is proposed by the prior art.

[0007] The above and other objects and advantages of the invention, as will appear from the following description, are obtained with a multi-function system for assembling profiles as claimed in claim 1. Preferred embodiments and non-trivial variations of the present invention are the subject matter of the dependent claims.

[0008] It will be immediately obvious that many variations and modifications (for example related to shape, sizes, arrangements and parts with equivalent functionality) can be made to what is described, without departing from the scope of the invention as appears from the encosed claims.

[0009] The present invention will be better described by some preferred embodiments thereof, provided as a non-limiting example, with reference to the enclosed drawings, in which:

- FIG. 1 shows an orthogonally sectioned view of a preferred embodiment of a profile of the system according to the present invention;
- FIG. 2 shows a perspective view of a preferred embodiment of a first connection module of the system according to the present invention;
- FIG. 3 shows a perspective view of a preferred embodiment of a second connection module of the system according to the present invention;
- FIG. 4 shows a perspective view of a preferred embodiment of a third connection module of the system according to the present invention;
- FIG. 5 shows a perspective view of a preferred embodiment of a fourth connection module of the system according to the present invention;
- FIG. 6 shows a perspective view of a preferred embodiment of a fifth connection module of the system according to the present invention;
- FIG. 7a and 7b show exploded perspective views of examples of assembling a profile of FIG. 1 with some first connection modules of FIG. 2;
- FIG. 8a, 8b and 8c show exploded perspective views of some examples of assembling of two profiles of FIG. 1 with second and third connection modules of FIG. 3 and 4;
- FIG. 9a, 9b and 9c show exploded perspective views of some examples of assembling of two profiles of FIG. 1 with a fifth connection module of FIG. 6; and
- FIG. 10a and 10b show exploded perspective views of some examples of assembling of two profiles of FIG. 1 with a fourth connection module of FIG. 5.

[0010] The system for assembling profiles according to the present invention then comprises:

- at least one profile 1, preferably made as a box-like section bar with a quadrangular shape made of plastic material or of any metal alloy such as an aluminium alloy, equipped with at least one profile chamber 3 having two opposite side walls, respectively 3a, 3b equipped, inside the chamber 3 itself, with mutually parallel longitudinal ribs 5;
- a plurality of connection modules 10, 20, 30, 40, 50, each one equipped with at least one insertion foot 7 adapted to be inserted, and possibly fastened in the modes that will be described below, inside at least one profile chamber 3 of the profile 1.

[0011] With particular reference to FIG. 1, it is possible to note that a preferred embodiment of the profile 1 of the system according to the present invention, is composed, in addition to the first profile chamber 3, also of a second chamber 6 arranged orthogonally to this latter one, such second chamber 6 being dimensionally equal to the first chamber 3 and also equipped with mutually parallel longitudinal ribs 5 along two opposite side walls, respectively 6a, 6b. In this way, as will be seen afterwards, the system according to the present invention al-

lows mutually assembling various profiles 1, through the most appropriate connection modules 10, 20, 30, 40, 50, putting them side by side and connecting them both with respect to their thickness T and with respect to their width WL; in a preferred embodiment of the profile 1 of the system according to the present invention, T = 25 mm and W = 50 mm, but it is wholly clear that the same profile 1 can be made according to any other measure, though preferably keeping the same ratio T/W = 0,5. Obviously, profiles can be made with different sizes and ratios between them, such as for example with T = 30 mm and W = 70 mm, T = 100 mm and W = 25 mm, T = 100 mm and W = 50 mm, and with a different number and arrangement of profile chambers without departing from the scope of the present invention.

[0012] Preferably, in order to confer a more regular external shape to the profile 1, the profile 1 itself is equipped with a third profile chamber 8 mirroring the first chamber 3 and a fourth profile chamber 9 mirroring the second profile chamber 6.

[0013] With reference to FIG. 2, it is possible to note that a first connection module 10 of the system according to the present invention is a fastening plug equipped with the insertion foot 7, preferably equipped with grooves 7a corresponding to the longitudinal ribs 5 of the profile chambers, integral with at least one fastening plate 11 preferably orthogonal to the foot 7 itself, such plate 11 being preferably equipped with at least one through-hole 13 (preferably two) for inserting a fastening means 15 such as, for example, a screw, a small block or a nail.

[0014] With reference to FIG. 7a and 7b, it is possible to note that the first connection module 10 allows fastening at least one profile 1 to at least one plane surface. In particular, it is advantageously possible to fasten the profile 1 both oriented along its width L (as shown for example in FIG. 7a, in which the insertion foot 7 of at least one fastening plug is inserted inside a respective first profile chamber 3) and oriented along its thickness S (as shown, for example, in FIG. 7b, in which the insertion foot 7 of at least one fastening plug is inserted inside a respective second profile chamber 6). It is wholly clear that the number and/or arrangement of fastening plugs to be used is function of the specific application to be satisfied. In particular, as also clear from FIG. 7a and 7b, the profile 1 is rather versatile, allowing to use different and numerous combinations of positioning and number of fastening plugs to perform different orientations and fastening modes, possibly inserting the respective fastening feet 7 also inside the third and fourth profile chambers, respectively 8 and 9.

[0015] With reference to FIG. 3, it is possible to note that a second connection module 20 of the system according to the present invention is an angular junction square composed, in its simplest version, of the union of at least two insertion feet 7 mutually arranged along an angle α, being preferably $\alpha = 90°$. Such junction square is suitable to allow the angular joining along angle α of at least two profiles 1, possibly suitably shaped at their connection ends to allow a more accurate coupling. Advantageously, the connection module 20, next to an external surface with respect to angle α of each foot 7, can be equipped with respective fastening teeth 21 adapted to be inserted, due to elastic distortion or under the thrust of a possible spring (not shown), coaxial with a respective tooth 21 and housed inside the body of the related foot 7, in a corresponding seat 2 of one of the profile chambers 3, 6, 8, 9 inside which the foot 7 must be inserted. In particular, as for example shown in FIG. 8a and 8c, also in this case it is possible to note how two profiles 1 can be mutually joined in an angle α, both along their width (FIG. 8a) by inserting the feet 7 inside the respective first, more external profile chambers 3, and along their thickness (FIG. 8c) by inserting the feet 7 inside the respective second, more external profile chambers 6.

[0016] With reference to FIG. 4, it is possible to note that a third connection module 30 of the system according to the present invention is another junction square composed, in its simplest version, of the union of at least two insertion feet 7 mutually arranged along an angle α, being preferably $\alpha = 90°$. Also such junction square is suitable to allow the angular union along angle α of at least two profiles 1, possibly suitably shaped at their connection ends to allow a more accurate coupling. However, contrary to the connection module 20, the connection module 30 is equipped with fastening teeth 31 next to an internal surface with respect to angle α of each foot 7, also such teeth 31 adapted to be inserted due to elastic distortion or under the thrust of a possible spring (not shown) coaxial with a respective tooth 31 and housed inside the body of the related foot 7, in a corresponding seat 2 of one of the profile chambers 3, 6, 8, 9 inside which the foot 7 must be inserted. In particular, as for example shown in FIG. 8b, also in this case it is possible to note how two profiles 1 can be mutually joined in an angle α both along their width (FIG. 8b) by inserting the feet 7 inside the respective first, most internal profile chambers 3, and along their thickness (not shown) by inserting the feet 7 inside the respective second, most internal profile chambers 6.

[0017] With reference to FIG. 5, it is possible to note that a fourth connection module 40 of the system according to the present invention is a junction U-bolt composed, in an end thereof, of the insertion foot 7, possibly equipped with at least one fastening tooth 41 adapted to be inserted by elastic distortion or under the thrust of a possible spring (not shown) coaxial with a respective tooth 41 and housed inside the body of the related foot 7, in the corresponding seat 2 of one of the profile chambers 3, 6, 8, 9 inside which the foot 7 must be inserted, and in an opposite end thereof, of a "T"-shaped foot 43 on the surface of which at least one fastening hole 45 is arranged.

[0018] With reference to FIG. 10a and 10b, it is possible to note that in the system according to the present invention the fourth connection module 40 can be used to connect at least two profiles 1 in a mutually orthogonal

position. In particular, by obtaining at least one through-hole 47 along one of the two profiles 1 to be connected, it is possible to insert at least one fastening means, such as for example a screw 49, in order to grip the fastening hole 45 of the junction U-bolt, this one having its foot 7 inserted at least in the first profile chamber 3, to fasten a second profile 1 orthogonally along its width (FIG. 10a) or at least in the second profile chamber 6, to fasten a second profile 1 orthogonally along its thickness (FIG. 10b).

[0019] With reference to FIG. 6, it is possible to note that a fifth connection module 50 of the system according to the present invention is a junction square with variable angles along an angle β, such module 50 being composed of at least two insertion feet 7, each one of which is possibly equipped with at least one fastening tooth 51 adapted to be inserted, due to elastic distortion or under the thrust of a possible spring (not shown), coaxial with a respective tooth 51 and housed inside the body of the related foot 7, in the corresponding seat 2 of one of the profile chambers 3, 6, 8, 9 inside which the foot 7 must be inserted, such feet 7 being mutually connected by interposing at least one articulated junction 53, preferably made as a hinge-type kinematism (such as, for example, in the preferred embodiment shown in FIG. 6). Alternatively, the articulated junction 53 can obviously be made according to any other equivalent technical solution, such as for example an elastic joint. Such junction square with variable angles is adapted to allow the angular union along a variable and adjustable angle β of at least two profiles 1, possibly suitably shaped at their connection ends to allow a more accurate coupling. Between each foot 7 and the articulated junction 53, distance-adjusting means between feet 7 and junction 53 could be inserted.

[0020] In an alternative embodiment of the fifth connection module 50, each foot 7 could be fully replaced by a respective fourth connection module 40 like the previously described one, in which the distance-adjusting means are made as at least one adjusting screw 55 gripping inside each respective fastening hole 45, possibly cooperating with a respective axially-holding coaxial spring 57.

[0021] In particular, as shown for example in FIG. 9a, 9b and 9c, also in this case it is possible to note how two profiles 1 can be mutually joined in an adjustable angle β, both along their width by inserting the feet 7 inside the respective first, most external (FIG. 9a) or most external (FIG. 9b) profile chambers 3, and along their thickness, also in this case by inserting the feet 7 inside the respective second, most external (FIG. 9c) or most internal (not shown) profile chambers.

Claims

1. Multi-function system for assembling profiles, **characterised in that** it comprises:
   - at least one profile (1) equipped with at least one profile chamber (3);
   - a plurality of connection modules (10, 20, 30, 40, 50), each one of said modules being equipped with at least one insertion foot (7) adapted to be inserted and/or fixed inside at least one of said profile chambers (3) of said profile (1).

2. System according to claim 1, **characterised in that** said profile chamber (3) has two opposite side walls (3a, 3b) internally equipped with mutually parallel, longitudinal ribs (5).

3. System according to claim 1, **characterised in that** said profile (1) is further equipped with at least one second chamber (6) arranged orthogonally to said first profile chamber (3), said second chamber (6) being dimensionally equal to said first chamber (3) being internally equipped with said mutually parallel, longitudinal ribs (5) along two opposite side walls (6a, 6b) thereof and said insertion foot (7) being adapted to be inserted and/or fixed inside said second chamber (6).

4. System according to claim 1, **characterised in that** said profile (1) has such a thickness (T) and a width (W) that T/W = 0,5.

5. System according to claim 4, **characterised in that** said thickness (T) = 25 mm and said width (W) = 50 mm.

6. System according to any one of the previous claims, **characterised in that** said profile (1) is further equipped with a third profile chamber (8) mirroring said first chamber (3) and with a fourth profile chamber (9) mirroring said second profile chamber (6).

7. System according to claim 1, **characterised in that** one of said first connection modules (10) is a fastening plug equipped with said insertion foot (7) integral with at least one fastening plate (11), said insertion foot (7) being equipped with grooves (7a) corresponding to said longitudinal ribs (5).

8. System according to claim 7, **characterised in that** said fastening plate (11) is equipped with at least one through-hole (13) for inserting at least one fastening means (15).

9. System according to claim 1, **characterised in that** one of said second connection modules (20) is a junction square composed of the union of at least two of said insertion feet (7) mutually arranged along an angle (α) preferably equal to 90°.

10. System according to claim 1, **characterised in that**

said second connection module (20) is equipped, next to an external surface with respect to said angle (α) of each of said feet (7), with respective fastening teeth (21) adapted to be inserted in a corresponding seat (2) of said profile chambers (3, 6, 8, 9).

11. System according to claim 1, **characterised in that** one of said third connection modules (30) is a junction square composed of the union of at least two of said insertion feet (7) mutually arranged along an angle (α), preferably equal to 90°, equipped, next to an internal surface with respect to said angle (α) of each one of said feet (7), with respective fastening teeth (31) adapted to be inserted in a corresponding seat (2) of said profile chambers (3, 6, 8, 9).

12. System according to claim 1, **characterised in that** one of said fourth connection modules (40) is a junction U-bolt composed, at one end thereof, of said insertion foot (7) and, at an opposite end thereof, of a "T"-shaped foot (43) on the surface of which at least one fastening hole (45) is arranged.

13. System according to claim 1, **characterised in that** one of said fifth connection modules (50) is a junction square with variable angles along an angle (β), said module (50) being composed of at least two of said insertion feet (7) mutually connected by interposing at least one articulated junction (53).

14. System according to claim 1 or 13, **characterised in that** each one of said feet (7) is equipped with at least one fastening tooth (41, 51) adapted to be inserted in a corresponding seat (2) of said profile chambers (3, 6, 8, 9) and said angle (β) is variable.

15. System according to claim 13, **characterised in that** said articulated junction (53) is a hinge-type kinematism or an elastic joint.

16. System according to claim 13, **characterised in that** distance-adjusting means are inserted between said foot (7) and said articulated junction (53).

17. System according to claim 16, **characterised in that** said distance-adjusting means are at least one adjusting screw (55) cooperating with a respective axially-holding coaxial spring (57).

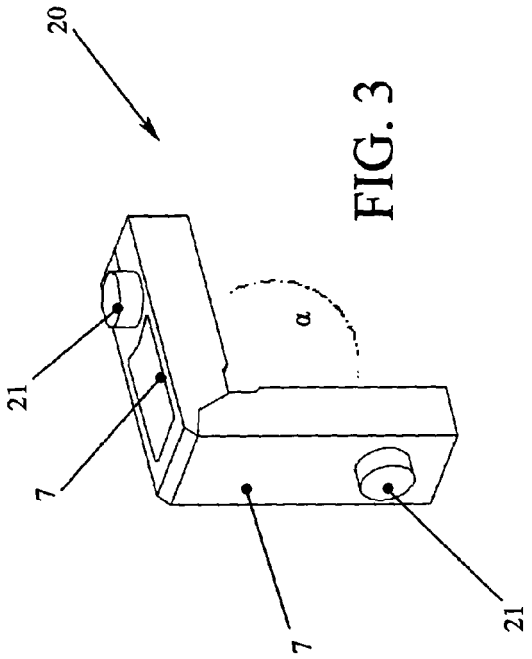

FIG. 3

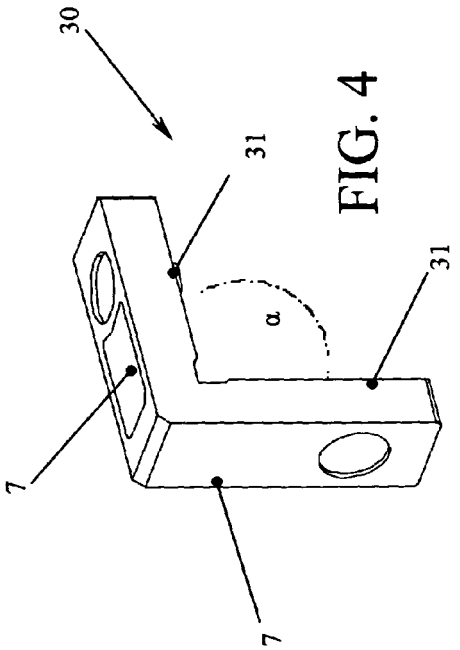

FIG. 4

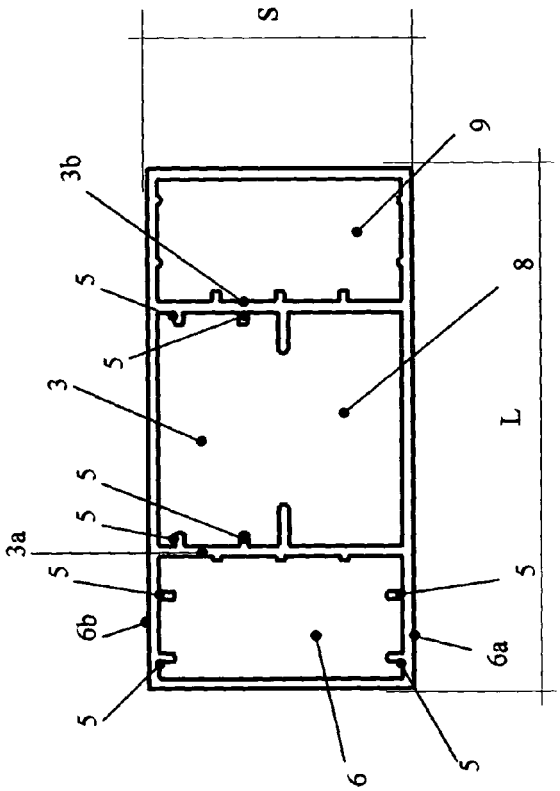

FIG. 1

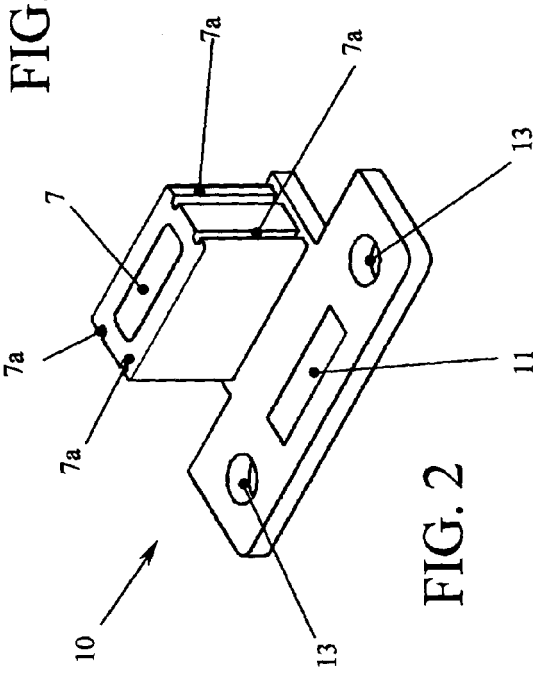

FIG. 2

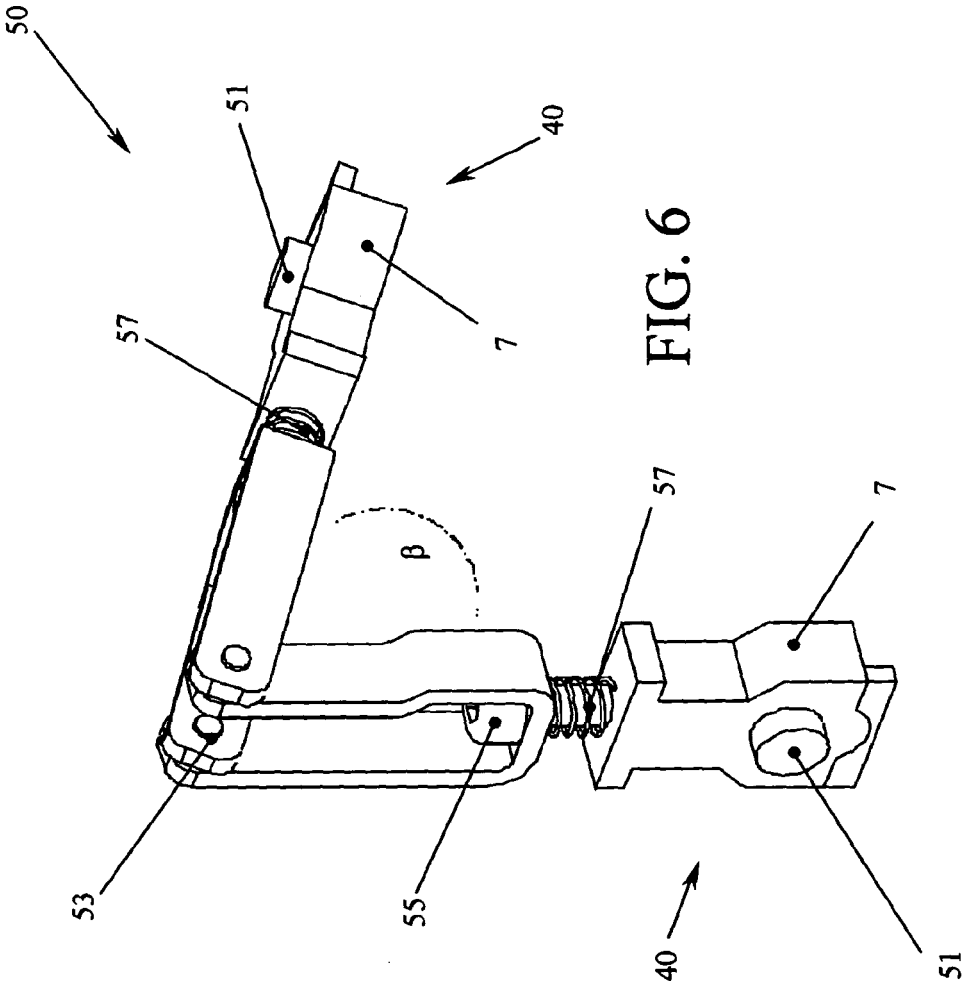

FIG. 6

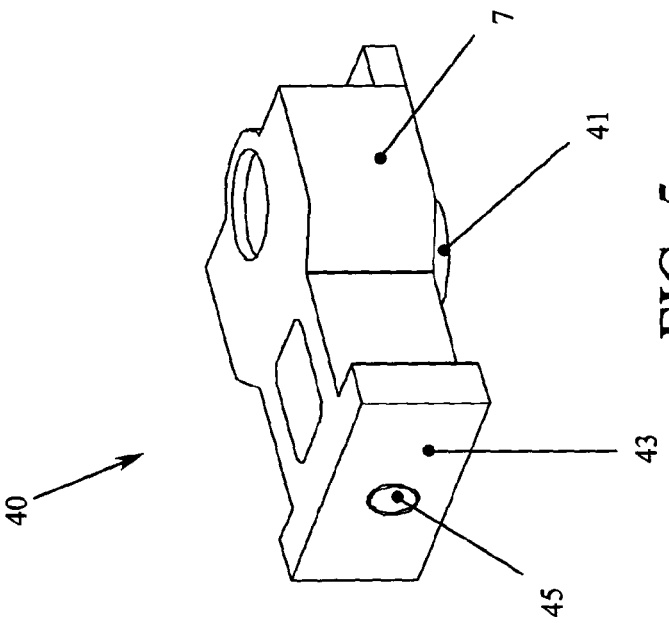

FIG. 5

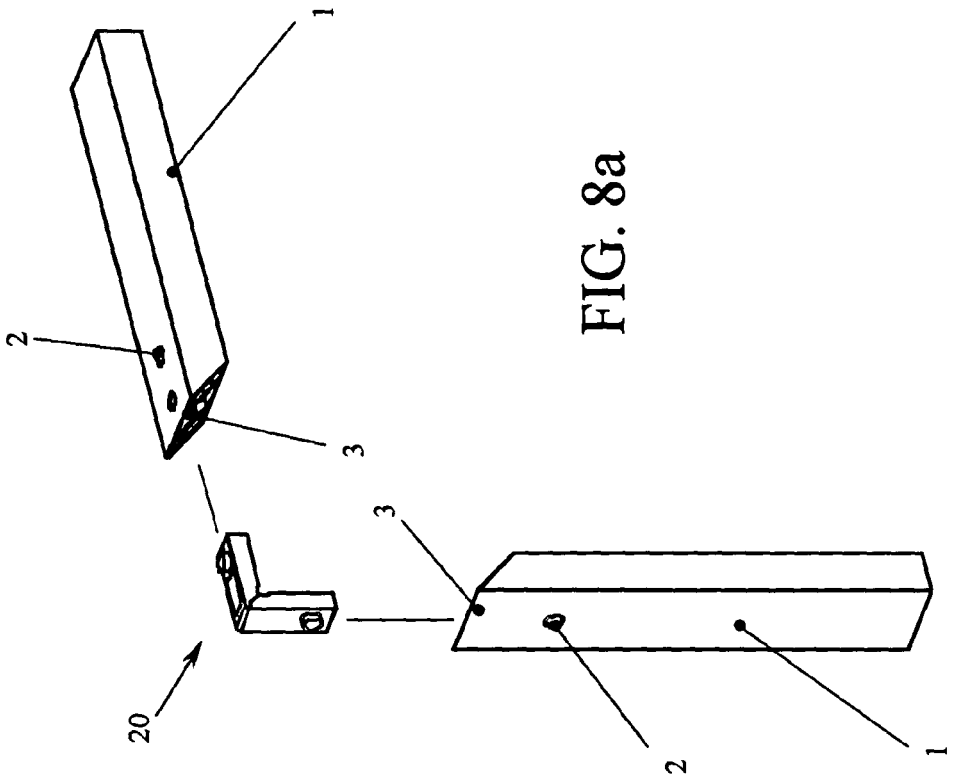

FIG. 8a

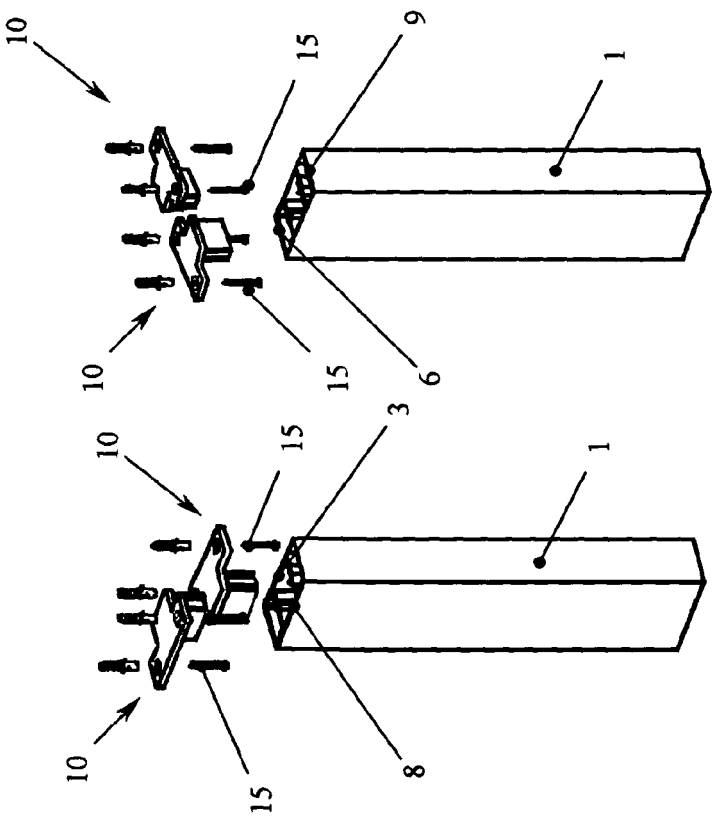

FIG. 7a

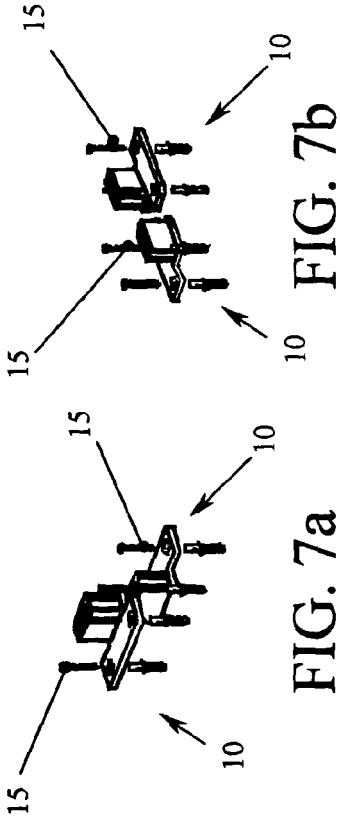

FIG. 7b

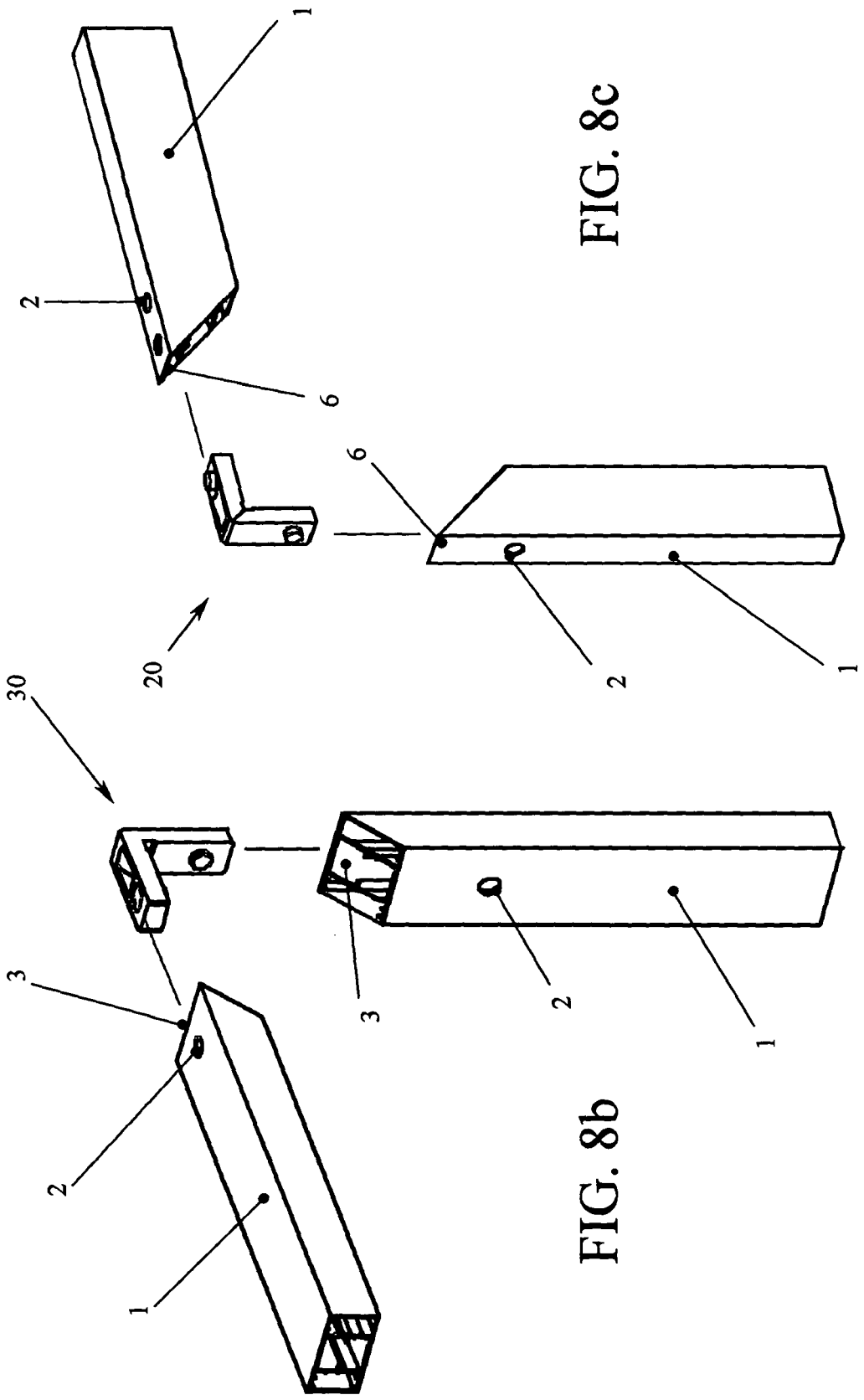

FIG. 8c

FIG. 8b

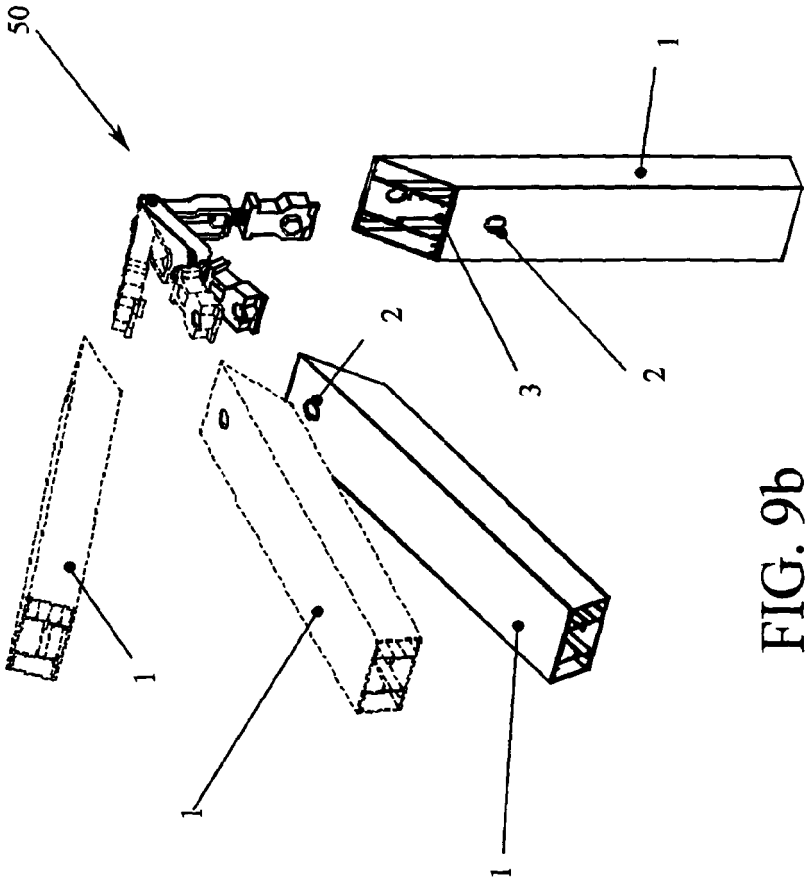

FIG. 9b

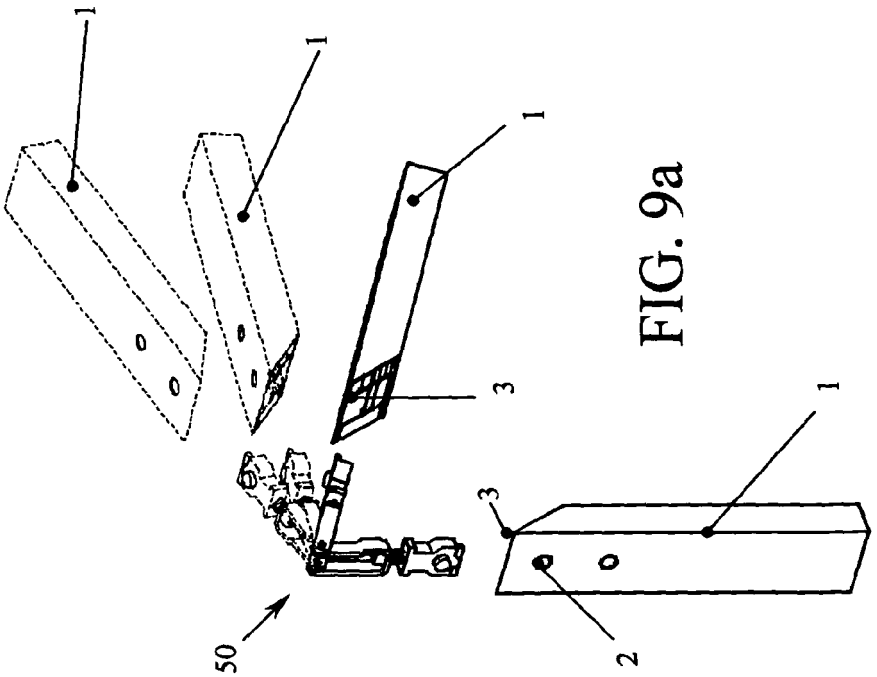

FIG. 9a

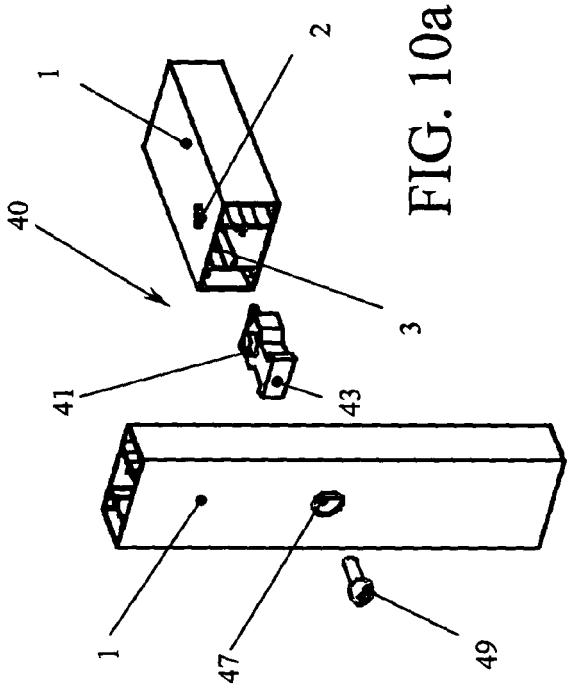

FIG. 10a

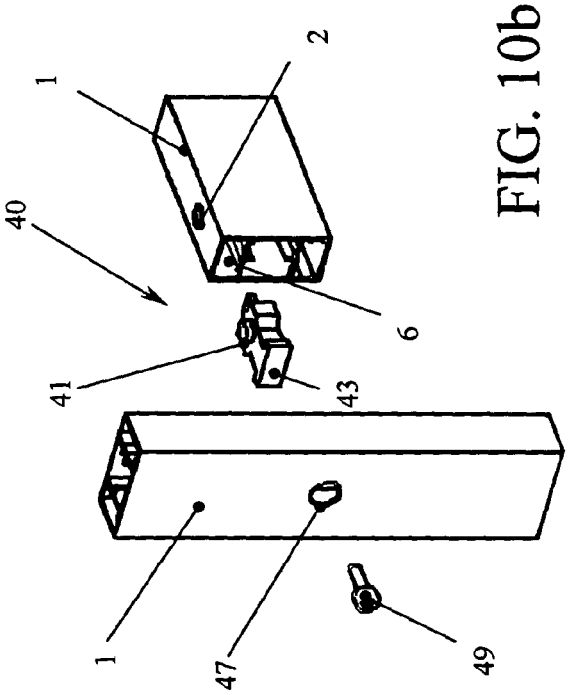

FIG. 10b

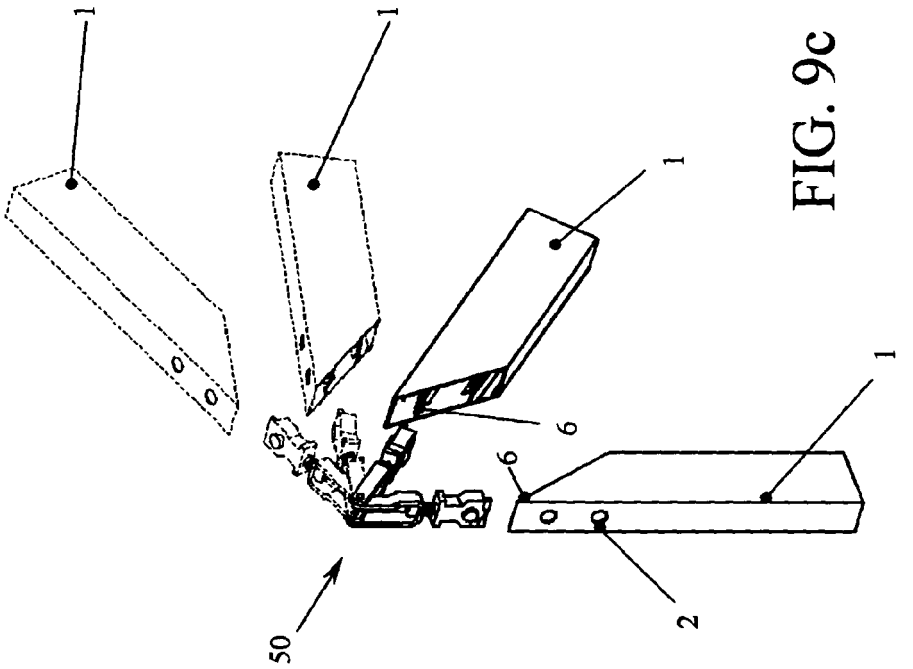

FIG. 9c

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

- CN 1434240 A **[0002]**
- DE 10016608 A **[0002]**
- DE 19732972 A **[0002]**
- DE 4323488 A **[0002]**
- DE 3624940 A **[0002]**