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(54) **Sarokösszekötő ajtó- és ablakkerethez**

CORNER CONNECTOR FOR DOOR AND WINDOW FRAMES

The invention relates to a corner connector for door and window frames, with a shaft with a rectangular cross-section to be inserted into a mitre-cut hollow frame profile and an inclined surface terminating the shaft, being weldable or bondable and being disposed according to the mitre of the hollow profile, and a spreading device spreading a spreading part from one of the rectangular faces of the shaft, for clamping the shaft within the hollow profile.

Corner connectors of this type are already known in various embodiments.

According to DE 89 10 401 U1 belonging to the Applicant, a spreading wedge is pulled over an inclined surface of the shaft by means of a screw screwed in from the inclined surface. As a result of moving over the wedge-shaped surface the spreading wedge is lifted so that it is tensioned inside the hollow profile. The wedge forms a spreading part which enlarges the cross-section of the corner connector, thereby achieving the tensioning. DE 91 13 235 U1 also shows a corner connector which also has a wedge as a spreading part, but this latter is inserted into the corner connector or pulled out of the latter not by means of a screw, but rather a tongue formed directly on the wedge.

In both cases the spreading part moves directly against the inner surface of the hollow profile. If the latter is made from plastic, a metallic reinforcing profile is inserted as a general rule. These reinforcing profiles, which are usually made of steel, do not always have smooth surfaces so that greatly differing friction coefficients may play a role making it impossible to ascertain, on the basis of the pulling or pushing force that is exerted, whether complete tensioning has been achieved.

Hence in EP 1 054 130 B1 the Applicant describes a solution in which a pressure plate is positioned between the spreading part contrived as a wedge and the inner surface of the hollow profile, this pressure plate being pushed outward by the spreading part, guaranteeing that the wedge, when moved longitudinally, is always moved along the same inner surface of the pressure plate so that the right pulling or pushing force with which the wedge is moved, always provides a measure of the degree of tensioning achieved.

EP 1 342 877 A2 discloses a corner connector of the above-mentioned type. The corner connector has, according to the usual construction, a shaft with a rectangular cross-section which can be inserted into a hollow profile for a window. Inside the shaft there is a spreading mechanism which enables, through longitudinal movement of a wedge connection, a spreading part to be spread from the shaft so that the shaft can be tensioned inside a hollow profile.

The cited publication also discloses a corner connector with a shaft from which spring arms on both sides of the shaft, which can be swung out on both sides.

The disadvantage of most prior art corner connectors is that they permit tensioning in one dimension only, but not in the dimension perpendicular thereto. Generally, however, it cannot be guaranteed that hollow profiles have absolutely precise measurements, so tensioning in a single dimension may not be sufficient.

The task of this invention is therefore to create a corner connector which allows tensioning in two dimensions perpendicular to each other without necessitating a complex construction to achieve this purpose.

For the purpose of solving this task a corner connector according to the invention is characterised in that the spreading part on both adjacent sides of the rectangular cross-section is connected with spreading plates which are pushed apart when the spreading part is spread by running onto spreading surfaces.

According to this solution, tensioning in one direction is achieved by means of the spreading part, but also in the direction perpendicular thereto by means of the spreading plates which are pushed apart laterally.

As mentioned above, the state of the art discloses several corner connectors which can be tensioned inside a hollow profile by means of a spreadable spreading part. As a general rule a metallic reinforcing profile such as an iron square profile is used inside plastic hollow profiles, this latter is also referred to here as a hollow profile, inside which the corner connectors are usually tensioned. Inside these hollow profiles tensioning is accomplished for example by ensuring that a spreading part is spread laterally by means of the corner connector. It should be of no importance whether the spreading part contacts the inside of the hollow profile directly or whether a pressure fitting is interposed, as is also disclosed in the state of the art.

In any event, tensioning inside the hollow profile is in one direction only in all the above-mentioned solutions.

According to this invention, tensioning is provided not only in one direction, but also in a second direction perpendicular thereto by providing spreading plates which are pushed apart by running onto burls or inclined surfaces, thereby generating additional tensioning. It is useful to provide tensioning in the second direction with substantial elasticity in order to overcome the difficulties associated with coordinating the dimensions in two different directions.

According to the invention, the spreading part and two lateral spreading plates form a structure with a U-shaped cross-section.

In this invention, the mechanism used to spread the spreading part in the first dimension of tensioning is of no importance. As already outlined, various solutions are already available for this purpose, in particular the use of interacting wedge surfaces or, for example, spreading burls, which can produce spreading of the spreading part.

Preferred examples of embodiments of the invention will be described in more detail below with reference to the attached drawings, in which

Fig. 1 is a perspective view of a corner connector according to the invention, without spreading device;

Fig. 2 is a spreading part according to the invention;

Fig. 3 is a perspective view of a corner connector with spreading part;

Fig. 4 is the corner connector of Fig. 3 in position inside a metallic reinforcing hollow profile;

Fig. 5 shows a perspective view of a spreading device according to the invention;

Fig. 6 is a longitudinal cross-section of a spreading part according to the invention;

Fig. 7 shows a longitudinal cross-section of the spreading device with the spreading part.

In the description and the claims, direction-related information is given with reference to the disposition of the corner connector shown in Figures 1 and 2.

Fig. 1 is a perspective view of a corner connector according to the invention without the associated spreading device and without spreading part. The corner connector as such comprises a shaft 10 with a rectangular cross-section and, closing the latter off at one end, an oblique surface 12 inclined at an angle of 45°, which can be welded with another oblique surface in the mitre section of a window frame. On the top side of shaft 10 in Fig. 1 there is a longitudinal chamber 14 for receiving a mobile spreading part which can be spread apart by shaft 10, thereby tensioning the shaft inside a hollow profile. This can be achieved, as per the state of the art, for example, by means of wedge elements or by means of burls as will be explained below.

Fig. 2 shows a corresponding perspective view of a possible spreading part 16 which can be inserted into chamber 14 as per Fig. 1 and, for example, pressed apart by means of a moving wedge which is not shown. According to this embodiment, spreading part 16 is connected with two lateral tensioning plates 18,20 in a globally U-shaped arrangement. These tensioning plates 18,20 abut

against the perpendicular side surfaces not shown in Fig. 1 which both contact the top surface in which chamber 14 is located. These two side surfaces of the shaft are provided with saddle-shaped ribs 22 extending in the longitudinal direction of shaft 10 and positioned parallel to one another on the corresponding side surface.

The spreading plates 18 and 20 connected with spreading part 16 are wave-shaped with a plurality of wave peaks and wave troughs running in the longitudinal direction of shaft 10 and are arranged to correspond with the ribs 22 of the shaft. This is achieved according to Fig. 3, which shows shaft 10 together with spreading part 16 and the two laterally suspended spreading plates 18 and 20. When spreading part 16 is lifted by a suitable spreading device, the two lateral spreading plates are pulled upward in Fig. 3. They run onto rib 22 and are spread apart as a result.

At the same time as tensioning in the first dimension, namely the vertical direction in Fig. 3, tensioning also takes place in the perpendicular direction, namely horizontally in Fig. 3.

Fig. 4 corresponds to Fig. 3, but shows the arrangement of corner connector and spreading part inside a hollow profile. Not a hollow plastic profile as used to produce window and door frames, but a metallic square profile as generally inserted inside the hollow plastic profile for reinforcement. The corner connector according to the invention is therefore equally suitable for use with a metallic reinforcing profile and for direct use inside a window and door frame profile. Note that the reinforcing profiles do not generally have a mitred perimeter, as shown in Fig. 4.

Fig. 5 shows a pull strap which can be used, for example, as a spreading element to spread spreading part 16. We refer in this context to Figs. 6 and 7. Whilst the pull strap shown in Fig. 5 forms a spreading device, spreading part 16 is shown together with this spreading device in Figs. 6 and 7. Whilst the pull strap serving as spreading device 24 is provided as per Fig. 5 with a row of burls 26,28,30, the underside of spreading part 16 is provided with a corresponding number of dome-shaped recesses 32,34,36 which engage with the burls. When the spreading device, namely the aforementioned pull strap, is pulled e.g. to the right in Fig. 7, burls 16,28,30 run to the right in Fig. 7 towards the edge area of the dome-shaped recess and lift spreading part 16 upward. The spreading part is tensioned together with shaft 10 inside the reinforcing profile designated at 38 in Fig. 4.

The tensioning of the corner connector by means of spreading part 16 and spreading device 24 are to be understood purely as examples, of course. Any other tensioning device as described in the aforementioned publications may also be used.

It should also be mentioned that the pairing of the surfaces between the lateral ribs and the waves of the spreading jacket should be self-inhibiting so that the lateral spreading surfaces cannot slip back once a position has been achieved.

It is not important what type of spreading part is used here. In any event, the operating principle to be adopted is one which ensures that the spreading part is lifted evenly along its entire length. This could be achieved using a wedge, for example, as mentioned in the above documents. Systems where the corner connector is pressed apart at its rear end, as is the case with some corner connectors, are less well suited. These corner connectors are then essentially supported only at their outermost rear end section.

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Sarokösszekötő ajtó- és ablakkerethez

Szabadalmi igénypontok

1. Sarokösszekötő ajtó- és ablakkeretekhez, amely sarokösszekötőnek van keresztmetszetében négyszögletes, sarokillesztésnek megfelelően vágott üreges keretprofilba történő betolásra alkalmas szára (10), és a szárat lezáró, hegeszthető vagy ragasztható, az üreges profil sarokillesztésének megfelelően elhelyezkedő ferde felülete (12), amely szár (10) mozgatható terpesztő rész (16) befogadására szolgáló kamrát (14) tartalmaz, amely sarokösszekötőnek továbbá terpesztő része (16), valamint a szárnak az üreges profilban történő megfeszítésére szolgáló, a terpesztő részt (16) a szár négyszögfelületeinek egyikéről kinyomó terpesztő szerkezete (24) van, **azzal jellemezve, hogy** a terpesztő rész (16) összességében U-alakú elrendezésben két oldalsó terpesz-pályával (18, 20) van összekötve, amelyek függőleges oldalfelületekre fekszenek fel, amelyek kétoldalról felső oldalfelületet – amelyben a kamra (14) található – határolnak, amely terpesz-pályák (18, 20) a terpesztő rész (16) kinyomásakor ezzel felemelkednek és felfelé vannak húzva, és nyereg alakú bordákra (22) ráfutnak és ezáltal kinyomódnak, a bordák (22) a szár (10) hosszirányában húzódnak és egymással párhuzamosan a megfelelő oldalfelületen fekszenek, a terpesz-pályák (18, 20) hullámos kialakításúak és több hullámhegyet és hullámvölgyet tartalmaznak, amelyek a szár (10) hosszirányában helyezkednek el és elrendezésükben a bordáknak (22) felelnek meg.

2. Az 1. igénypont szerinti sarokösszekötő, **azzal jellemezve, hogy** a bordák (22) és a terpesz-pályák (18, 20) hullámai közötti felületi párosítás önzáró oly módon, hogy az egyszer elért helyzet elérése után a visszacsúszás ki van zárva.

3. A 2. igénypont szerinti sarokösszekötő, **azzal jellemezve, hogy** az együttműködő felületek rasztert alkotnak.

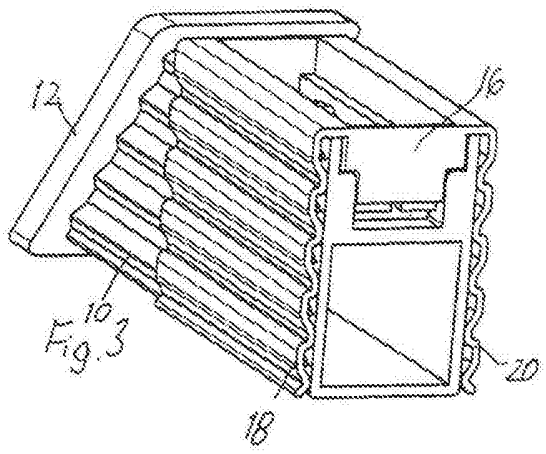

Fig. 3

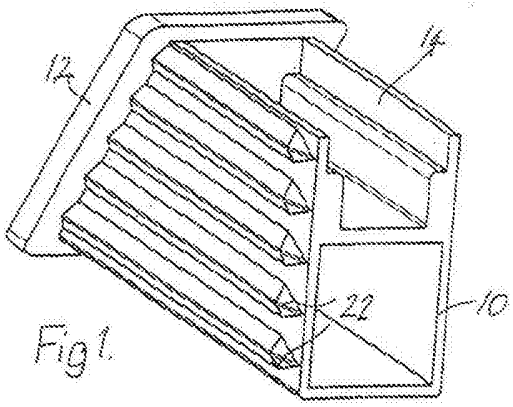

Fig 1.

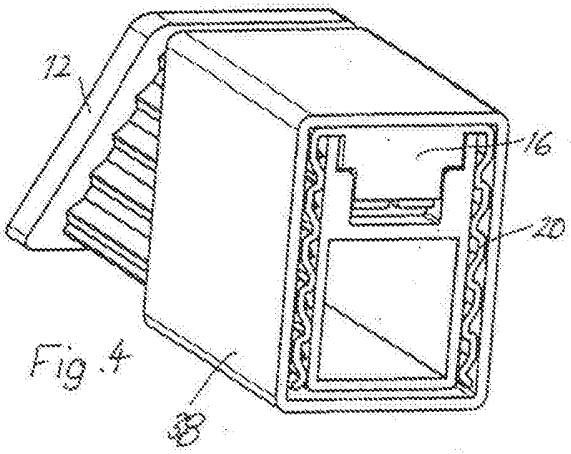

Fig. 4

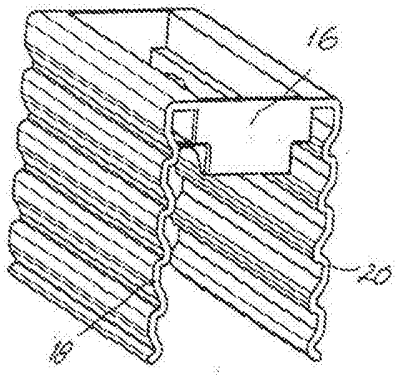

Fig. 2

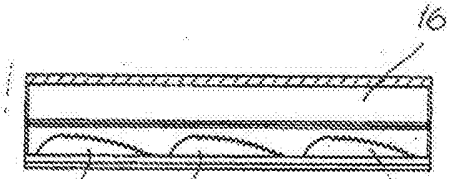

Fig. 6

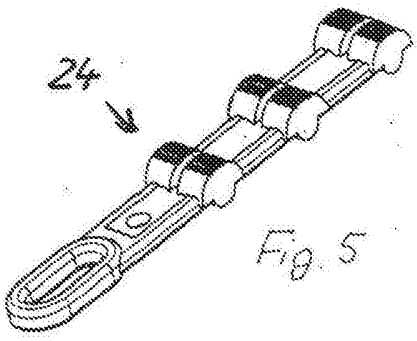

Fig. 5

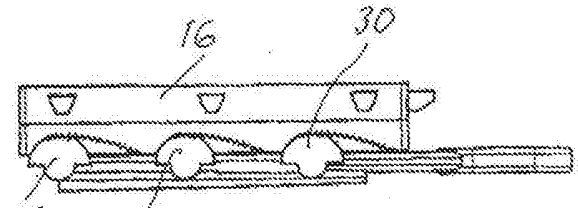

Fig. 7