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

(11) **EP 2 868 843 B2**

(12) **NEW EUROPEAN PATENT SPECIFICATION**
After opposition procedure

(45) Date of publication and mention of the opposition decision:
13.11.2019 Bulletin 2019/46

(45) Mention of the grant of the patent:
27.04.2016 Bulletin 2016/17

(21) Application number: **13193357.4**

(22) Date of filing: **18.11.2013**

(51) Int Cl.:
E04H 12/22 *(2006.01)*

(54) Baseboard post guard

Schutz für den Fussbereich eines Pfostens

Plinthe de protection d'un poteau

(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

(30) Priority: **23.10.2013 ES 201331216**

(43) Date of publication of application:
06.05.2015 Bulletin 2015/19

(73) Proprietor: **SAS Prefabricados de Hormigon, S.A.**
08030 Barcelona (ES)

(72) Inventor: **Sas Sanahuja, Joaquim**
08030 BARCELONA (ES)

(74) Representative: **Ponti & Partners, S.L.P**
C. de Consell de Cent 322
08007 Barcelona (ES)

(56) References cited:
DE-U1-202013 002 879
FR-A- 785 631
JP-A- 2001 065 202
JP-A- 2001 295 298
US-A- 4 019 301
US-A1- 2010 037 539

EP 2 868 843 B2

Description

Object of the Invention.

[0001] More specifically the invention refers to protective pieces especially for protecting the lower area of the posts that hold up, for instance, the overhead power cables of a railway against undesired actions that would erode its exterior surface. If these posts are made of metal, the aforementioned erosion may affect the layers of paint that protect against corrosion, as well as the outer layers that give them colour and cover them.

[0002] Another of the objects of the invention is the procedure for the placement of these pieces on the lower part of said posts in the ballast area, in the laying of railway lines, for which these pieces are designed, as well as other applications outside of the field of railways, for the simple protection of any type of post, whether placed inside or outside of urban areas.

State of the Art.

[0003] Until now, there has been no type of pieces specifically for the protection set out in the previous section, although there are currently baseboards of all kinds for the protection of pillars, made of wood, concrete, metal, and plastic materials. Such a baseboard for a post is disclosed in FR 785 631 A.

[0004] In one of the possible applications, the baseboards that are the subject matter of the present invention are applied to the posts of overhead power cables, generally made of metal, and of, for example but not limited to, HEB, HEA, UPN, UPE and L pieces, for protecting the same from the impact of the ballast of the railway platform, crushed stone that may fly up as a consequence of a difference of pressure created by the speed of trains. Remember that the ballast is a layer of gravel or crushed stone, which is laid on the graded area of railways to lay and hold the rails to the ground.

[0005] The passing of any type of train presupposes, from the point of view of physics, the creation of a difference in pressure in the environment of the train in movement, which acts as a sort of vacuum, producing a "suction" effect on the air, raising up the materials that are around the bottom of the post, and in function of their weight, the lightest ones may be lifted up.

[0006] This suction effect doesn't have negative consequences when the trains are low and medium-speed, but since the appearance of high-speed trains, this "suction" is of a greater magnitude, and it has resulted in consequences that hadn't existed until now, such as the flying of pieces of gravel that shoot off because of the speed of the train and hit the lower parts of the posts that hold up the railway's overhead power cables, which in turn hold the electrical conductors that provide power to the engines of the trains themselves. As the lower part of the post of the overhead power lines continually receive the impact of bits of gravel, the layer of anti-corrosive materials and paint come off, therefore causing structural damage to the lower part of the same, and the start of corrosion, including the appearance of fissures.

[0007] So far, railway maintenance companies have tried to solve this problem in various manners: initially by restoring the damaged surfaces, plastering and painting; and later they have made individual plank moulds around each post of the overhead power cables, piling mortar on until a coat is built up on the bottom part; this type of work could be classified as handcrafted, and it is expensive, with no guarantee of elasticity between the baseboard and the lower part of said post. There are no dilation joints made with the intention of absorbing the vibrations of the posts when the trains pass and the tensions produced on the overhead power cables due to dilation.

Object of the Invention.

[0008] The protective piece, which we will call a baseboard, is mainly made up of two pieces intended to be placed facing each other around a post, so that an interior cavity is created between the interior perimeter of the baseboard and the edge of the post; it is filled with an elastic filling material. Thus, this material joins the two pieces to the post, but at the same time it allows the absorption of thermal dilations, as well as the mechanical vibrations that the post is subjected to.

[0009] According to one of the preferred embodiments of the invention, the two pieces that make up the baseboard are the same and they have a noticeably "U"-shaped prismatic base and a certain height. This noticeably "U"-shaped base is made up of a central wing with arms that stick out perpendicularly to the ends, and the ends of the arms have their respective centring elements in order to be able to place the two pieces together facing each other, fitting together through the said centring elements. For instance, these centring elements can be made in the form of a ridge placed at the end of one arm, and the corresponding groove with a concave surface is placed at the end of the other arm, fitting perfectly together with the ridge, leaving a space between the groove and the ridge for a bit of play to facilitate the centring of the two pieces.

[0010] The central area of each piece has a central element that comes out of the central part of the base perpendicular to the same, which may or may not end in a concave groove.

[0011] These pieces are preferably made in industrial facilities, using moulds that are preferably metal, into which Portland or similar cement is poured, which is then compacted in the inside of these moulds, using vibratory compacters, mixing said cement with the corresponding dry materials.

[0012] A high-strength material is used for the manufacturing of the bodies of the two pieces that make up the baseboard, so that it will withstand the successive impact of the gravel; the concrete, for example, is compacted inside the corresponding metal moulds using vi-

bratory compactors, which allow measurements to be perfectly precise. It is preferable to use a type of high-strength concrete with very low water/cement ratios and quarried dry materials of different grain size, providing a very high-strength, compact concrete that is optimal for guaranteeing that the exterior surface of the pieces doesn't degrade from the degenerative action of gravel continually hitting the surface. The type of dry materials used are mainly, although not exclusively, recycled dry materials, in order to have more sustainable manufacturing; with these technical specifications, concrete densities of up to 2,250 kg/m3 are obtained for the recommended baseboards.

[0013] The elastic filling material is preferably liquid asphalt or a similar material, which is poured into the cavity until it solidifies, so that said asphalt forms a sort of elastic seal, giving the structure a certain flexibility so that it can absorb the dilations of the post, as well as the vibrations that the overhead power cables of the post experience when the train passes, especially when they are high-speed trains going faster than 300 km per hour.

[0014] The baseboard that is the subject matter of this invention is also stackable, one on top of the other, so that in function of the height necessary, one or more baseboard can be assembled, as is best for each case, and the stack of baseboards filled with the elastic filling material. Optionally, the pieces that make up the baseboard may have conventional means of fitting together in order to be stacked more accurately.

[0015] The present invention furthermore concerns the procedure of on-site placement, which unlike what is the state of the art, is different in that the pieces are manufactured industrially, without having planking around each post, but rather they are placed on the lower surface of the post going around it, once the adjacent area of the ballast has been cleaned, arranged with the two pieces facing each other, fitting the ridges with the grooves of the respective pieces, and then filling in the interior cavity formed by the inside faces of the pieces and the edge of the post with liquid asphalt or a similar material, letting it temper until a single piece is obtained.

[0016] The main advantages obtained by this invention with respect to the state of the art are: the great improvement in terms of the time of manufacturing, service and placement of the baseboard, which reduces the cost enormously in comparison with the traditional systems known to date; and on the other hand, they have standards of quality that are greatly superior, since they are manufactured industrially by mass-production. Another advantage of this baseboard is that it can be stacked.

[0017] The application of this invention is not exclusively for protecting posts for holding up overhead railway power cables; it may also be used for other types of posts, such as for any type of post or outdoor supporting element for urban planning of any kind: electrical posts, traffic lights, outdoor lighting, etc., which may need additional protection, even against vandalism.

[0018] Other details and characteristics shall be shown throughout the description below referring to drawings attached to this report which are shown for illustrative but not limiting purposes only in a drawing of the invention. Keep in mind that the embodiments of the invention may be of any material as far as composition goes, and its outside arrangement is also not critical.

Description of the drawings.

[0019] Below is a list of the different parts of the invention, that can be seen in the drawings, and are indicated with their respective numbers; (10, 10', 10") baseboard, (11, 11', 11") pieces, (12) central wing of the piece (11), (13) tab, (14a, 14b) arms, (15) groove, (16) squares, (17) ridge, (18) concave part, (19) filling material, (20) cavity, (21) upper base of the piece (11), (22) lower base of the piece (11), (23a, 23b) side bases of the piece (11), (24, 25) posts.

Figure 1 shows a bottom plan view of a piece (11), made up of a base (12) with ends that each have arms (14a, 14b).

Figure 2 illustrates a top plan view of the piece (11) shown in Figure 1.

Figure 3 illustrates a right side view of the piece (11) shown in Figure 1, with an upper base (21) and a lower base (22).

Figure 4 illustrates a left side view of the piece (11) shown in Figure 1, with an upper base (21) and a lower base (22).

Figure 5 is a top plan view of the mounting of two pieces (11) shown in Figures 1 to 4 facing each other, forming a baseboard (10).

Figures 6 to 7 are respective practical embodiments of the baseboard (10), set up around a post (24, 25) and with elastic filling in the interior cavity (19).

Figure 8 shows a plan view of a second embodiment of the piece (11').

Figure 9 illustrates a top plan view of the piece (11') shown in Figure 8.

Figure 10 illustrates a right side view of the piece (11') shown in Figure 8.

Figure 11 illustrates a left side view of the piece (11') shown in Figure 8.

Figure 12 is a practical embodiment of the baseboard (10'), set up around a post (24) and with elastic filling in the interior cavity (19).

Description of an embodiment of the invention.

[0020] In one of the preferred embodiments of the invention, and as may be seen in Figures 1 to 7, the baseboard (10) is made up of two pieces (11), which are set up facing each other and centred using a means of centring, in this case grooves (15) and corresponding ridges (17). As can be seen in Figures 6 and 7, this baseboard (10) may be applied to different shapes of posts.

[0021] The arrangement of said pieces (11) is repre-

sented in Figures 1 and 4, with a "U" shape, with a central wing (12) with ends that have perpendicular arms (14a, 14b), at the end of which are centring elements (15, 17). According to the invention, from the middle part of the central wing (12) comes a tab (13) with an end that may be shaped with a concave groove (18), marking the interior surfaces of the central wings (12) and arms (14a, 14b) of both pieces (11) and of the tabs (13), and an interior cavity (20), which allows for the placement of the post (24, 25), and in the space, or cavity that is left, the filling material (19) can be poured, as illustrated in, but not limited to Figures 6 and 7.

[0022] Figures 8 to 12 show different views of a second embodiment of the piece (11'), in which the tab (13') has another different shape, without the concave part (18).

[0023] Having sufficiently described this invention using the figures attached, it is easy to understand that any modification may be made to the detail which may be deemed to be appropriate, whenever these changes do not alter the essence of the invention summarised in the following claims.

Claims

1. Baseboard post guard which is made up of two pieces (11, 11') intended to be placed facing each other around a post, so that an interior cavity (20) is created between the interior perimeter of the baseboard and the edge of the post, wherein the interior cavity is filled with an elastic filling material that forms an elastic seal, such that this material joins the two pieces to the post, but at the same time allows the absorption of thermal dilations and mechanical vibrations the post is subjected to; **characterized in that** the two pieces (11, 11') have a noticeably "U"-shaped prismatic base and a certain height, the "U"-shaped base being made up of a central wing (12) with arms (14a, 14b) that stick out perpendicularly thereto to form the ends of the U-shaped pieces; the ends of the arms having respective centring elements (15, 17) in order to be able to place the two pieces (11, 11') together facing each other, fitting together through the said centring elements, and the central area of said central wing of each piece having a central element in form of a tab (13) that protrudes from the central part of the "U"-shaped base perpendicular to the central wing (12).

2. Baseboard post guard according to claim 1, **characterised in that** the tab (13) ends in a concave groove.

3. Baseboard post guard according to claim 1, **characterised in that** the centring elements (15, 17) are in form of a ridge (17) placed at the end of one arm, and a corresponding groove (15) with a concave surface is placed at the end of the other arm, fitting perfectly together with the ridge.

4. Baseboard post guard according to any of the preceding claims, **characterised in that** the material used for manufacturing the pieces is concrete, duly compacted with corresponding means inside respective metal moulds.

5. Baseboard post guard according to claim 4, **characterised in that** a high-strength concrete is used with very low water/cement ratios and quarried dry materials of different grain size.

6. Baseboard post guard according to claims 4 or 5, **characterised in that** the type of dry materials used in the concrete are recycled dry materials.

7. Baseboard post guard according to claim 1, **characterised in that** the elastic filling material is liquid asphalt or a similar material, which is poured into the cavity until it solidifies, such that said asphalt forms a sort of elastic seal.

Patentansprüche

1. "Mastsockelschutz", bestehend aus zwei Teilen (11, 11'), die dazu bestimmt sind, an einem Mast so einander zugewandt platziert zu werden, dass zwischen dem Innenumfang des Sockelschutzes und der Kante des Mastes ein innerer Hohlraum (20) entsteht, der mit einem elastischen Füllmaterial, das eine elastische Dichtung bildet, ausgefüllt wird, und zwar so, dass dieses Material die beiden Teile mit dem Mast verbindet, dabei aber gleichzeitig die Aufnahme der Wärmeausdehnungen und mechanischen Schwingungen, denen der Mast ausgesetzt ist, ermöglicht, **dadurch gekennzeichnet, dass** die beiden Teile (11, 11') eine erkennbar prismatische U-förmige Grundfläche und eine bestimmte Höhe haben, wobei die U-förmige Grundfläche aus einem zentralen Flügel (12) mit senkrecht zu diesem stehenden Schenkeln (14a, 14b) besteht, welche die Enden der U-förmigen Teile bilden; die Enden der Schenkel jeweils Zentrierelemente (15, 17) aufweisend, um die beiden Teile (11, 11') so einander zugewandt positionieren zu können, dass sie sich mittels der besagten Zentrierelemente ineinanderfügen, und wobei der mittlere Bereich des zentralen Flügels an jedem der Teile ein Mittelstück in Form einer Lasche (13) aufweisend, die aus dem mittleren Bereich der U-förmigen Grundfläche senkrecht zu dem zentralen Flügel (12) heraustritt.

2. "Mastsockelschutz" nach Anspruch 1, **dadurch gekennzeichnet, dass** die Lasche (13) in eine konkav geformte Nut ausläuft.

3. "Mastsockelschutz" nach Anspruch 1, **dadurch gekennzeichnet, dass** die Zentrierelemente (15, 17) am Ende des einen Schenkels die Form einer Auswölbung (17) besitzen und am Ende des anderen Schenkels eine entsprechende Nut (15) mit einer konkav geformten Fläche aufweisen, die perfekt in die Auswölbung passt.

4. "Mastsockelschutz" nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es sich bei dem Material, das für die Herstellung der Teile verwendet wird, um Beton handelt, der mit geeigneten Mitteln in entsprechenden Metallformen hinreichend verdichtet wird.

5. "Mastsockelschutz" nach Anspruch 4, **dadurch gekennzeichnet, dass** ein hochfester Beton mit sehr niedrigem Wasserzementwert und Trockenmaterial unterschiedlicher Körnungsgrößen verwendet wird.

6. "Mastsockelschutz" nach Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** es sich bei der Art des Trockenmaterials, das für den Beton verwendet wird, um Recyclingmaterial handelt.

7. "Mastsockelschutz" nach Anspruch 1, **dadurch gekennzeichnet, dass** es sich bei dem elastischen Füllmaterial um Flüssigasphalt oder um ein vergleichbares Material handelt, das in den Hohlraum hineingeschüttet wird, bis es erstarrt, wobei dieser Flüssigasphalt eine Art elastische Dichtung bildet.

Revendications

1. Protecteur de montant à plinthe qui se compose de deux pièces (11, 11') destinées à être placées en face l'une de l'autre autour d'un poteau, de sorte qu'une cavité intérieure (20) est créée entre le périmètre intérieur de la plinthe et le bord du poteau, où la cavité intérieure est remplie d'un matériau élastique de remplissage qui forme un joint élastique, de sorte que le matériau relie les deux pièces du poteau, mais en même temps, permet l'absorption des dilatations thermiques et des vibrations mécaniques auxquelles le poteau est soumis ; **caractérisé en ce que** les deux pièces (11, 11') ont une base prismatique en forme sensiblement de U et une certaine hauteur, la base en forme de U étant constituée d'une aile centrale (12) avec des bras (14a, 14b) qui ressortent perpendiculairement de celle-ci pour former les extrémités des pièces en forme de U; les extrémités des bras présentant des éléments de centrage respectifs (15, 17) afin de pouvoir placer les deux pièces (11, 11') ensemble face à face, s'emboîtant ensemble par lesdits éléments de centrage, et la zone centrale de ladite aile centrale de chaque pièce comportant un élément central en forme de languette (13) qui dépasse de la partie centrale de la base en forme de U perpendiculairement à l'aile centrale (12).

2. Protecteur de montant à plinthe conformément à la revendication 1, **caractérisé en ce que** la languette (13) se termine dans une rainure concave.

3. Protecteur de montant à plinthe conformément à la revendication 1, **caractérisé en ce que** les éléments de centrage (15, 17) ont la forme d'une nervure (17) placée à l'extrémité d'un bras, et une rainure correspondante (15) à surface concave est placée a l'extrémité de l'autre bras, s'emboîtant parfaitement avec la crête.

4. Protecteur de montant à plinthe conformément à n'importe laquelle des revendications précédentes, **caractérisé en ce que** le matériau utilisé pour la fabrication des pièces est du béton, dûment compacté avec des moyens correspondants à l'intérieur des moules métalliques respectifs.

5. Protecteur de montant à plinthe conformément à la revendication 4, **caractérisé en ce qu'**un béton à haute résistance est utilisé avec des rapports eau/ciment très faibles et des matériaux secs extraits de différentes granulométries.

6. Protecteur de montant à plinthe conformément à la revendication 4 ou 5, **caractérisé en ce que** le type de matériau sec utilisé dans le béton est des matériaux secs recyclés.

7. Protecteur de montant à plinthe conformément à la revendication 1, **caractérisé en ce que** le matériau de remplissage élastique est de l'asphalte liquide ou un matériau similaire, qui est versé dans la cavité jusqu'à sa solidification, de sorte que ledit asphalte forme une sorte de joint élastique.

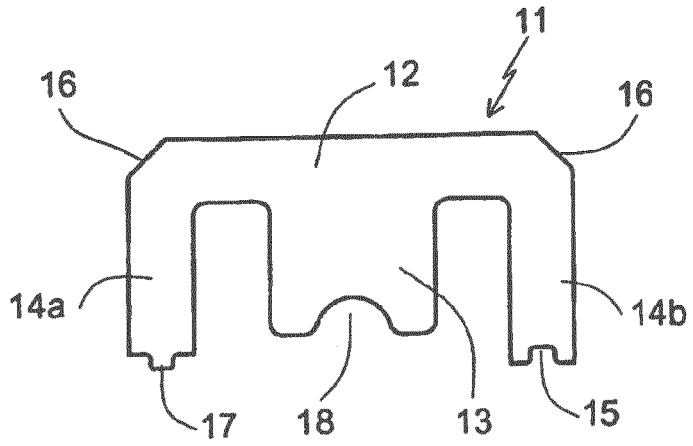

Fig. 1

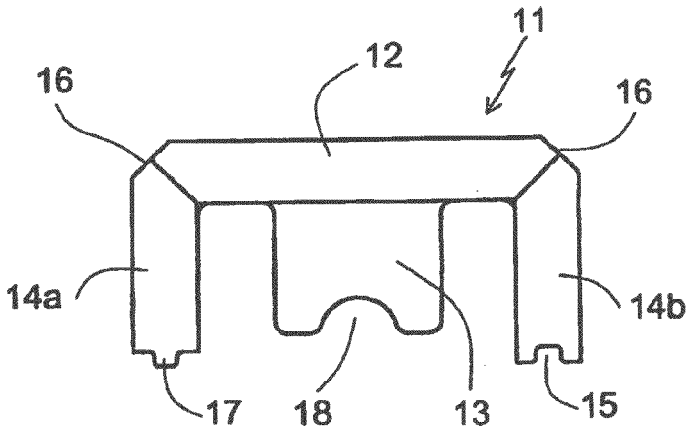

Fig. 2

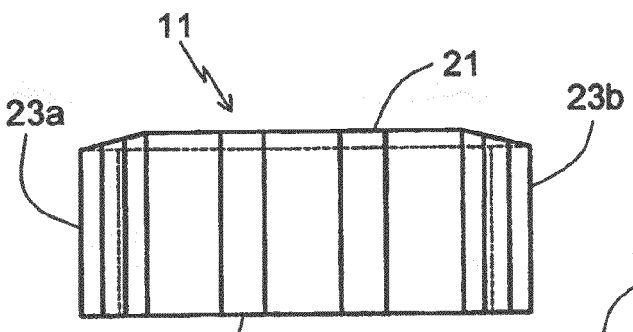

Fig. 3

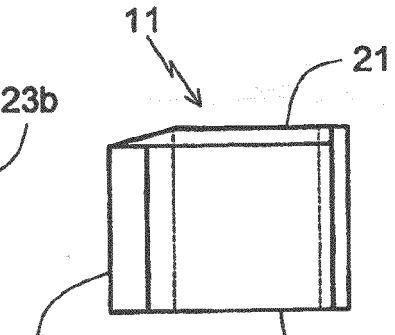

Fig. 4

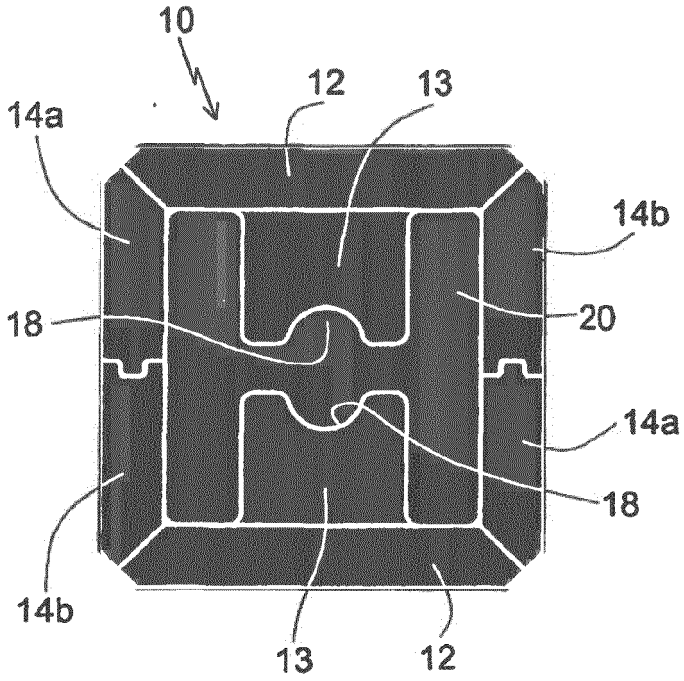

Fig.5

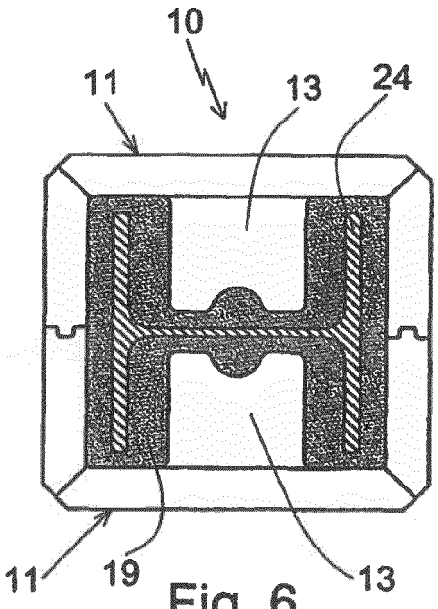

Fig. 6

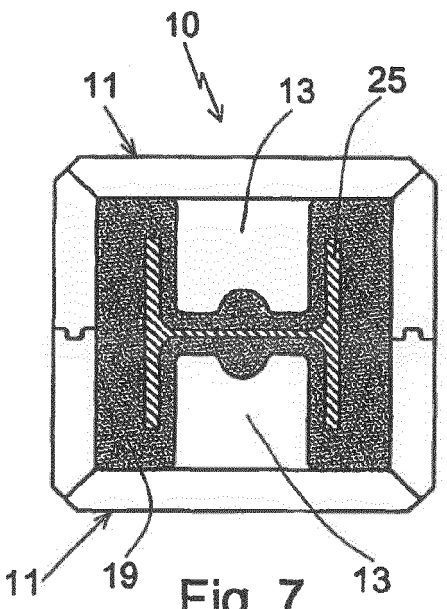

Fig. 7

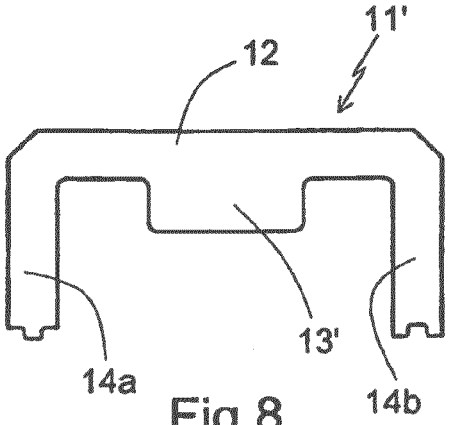

Fig.8

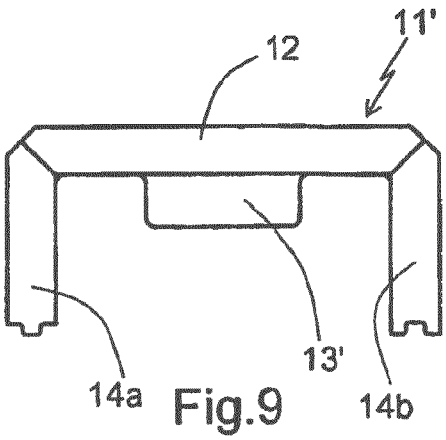

Fig.9

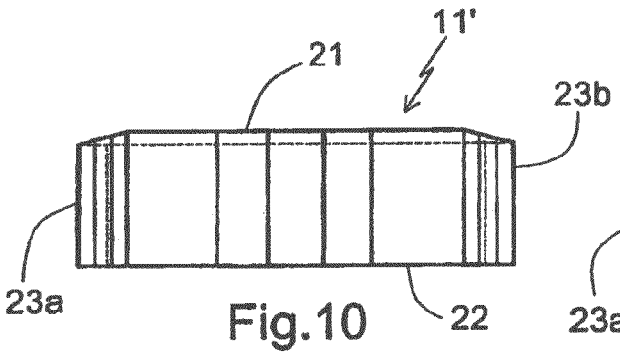

Fig.10

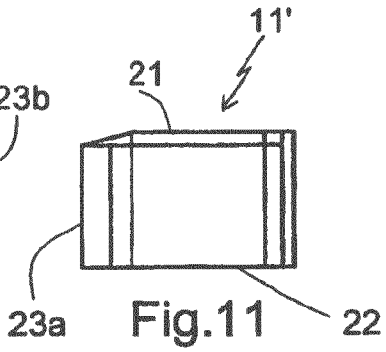

Fig.11

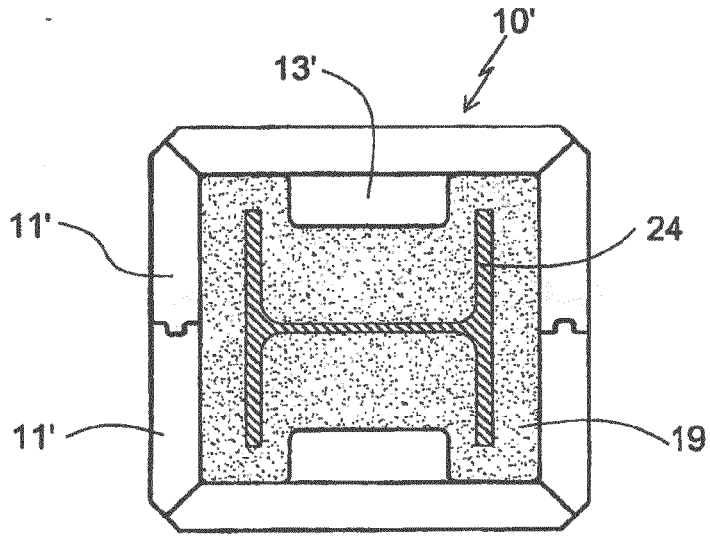

Fig.12

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 785631 A **[0003]**