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(54) **RETROREFLECTOR FOR SAFETY BARRIERS**

(57) A retroreflector for safety barriers, comprising a support (1) provided with two main faces (11, 12) forming a dihedral and with a base (13) that has a lateral inlet slot (14) for a screw (T) for fastening to a safety barrier (B); and reflectors (2) fastened to the main faces (11, 12) of the support. The support (1) is made up of a piece of folded sheet metal that extends along the lower end of the main faces (11, 12) in corresponding tabs (15, 16) that are facing each other and provided with a hook and a hole for the mutual coupling thereof in an assembly position wherein they make up the base of the support (13), the main faces of the support (11, 12) and the rear surfaces of the reflectors (2) comprising windows (17) and complementary attachments (21), making up a bayonet coupling.

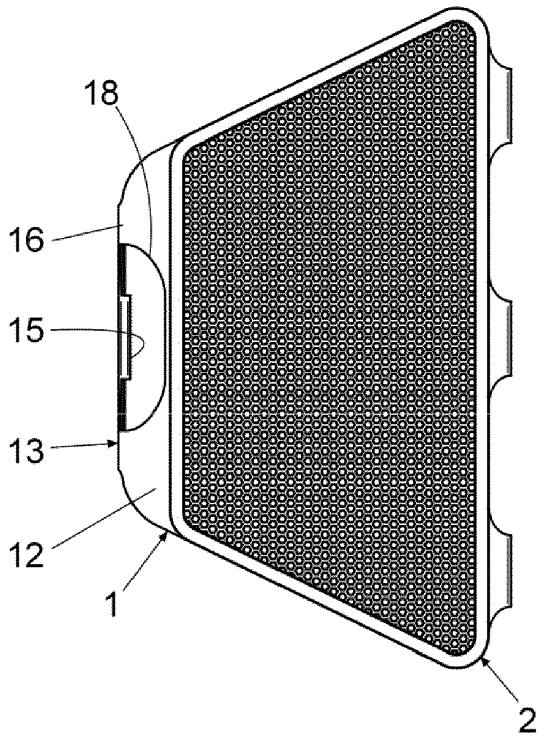

Fig. 1

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Description

Object of the invention

[0001] The object of the invention is a retroreflector intended to be fastened on a W-beam-type safety barrier, and which comprises a support for the fastening thereof to the barrier and reflectors fastened to the support and that reflect the light from the vehicles with the goal of marking the road.

Field of application of the invention

[0002] This invention is applicable in the sector dedicated to manufacturing elements for marking roads and specifically retroreflectors.

State of the art

[0003] Currently, retroreflectors are known that are arranged on the sides of roads, for example on W-beams or protective barriers, and which comprise a support and reflectors for reflecting the light from the vehicles and mark the road.

[0004] Utility model U181786 describes a retroreflector for safety barriers on highways of the type made up of a straight dihedral with identical faces shaped like triangles, the means of joining to the barrier being a cross bar welded on the ends thereof to the internal faces of the dihedral and which has a frame in the centre and on the inside thereof joined by welding on the outline of the anchoring drill, with two peripheral flaps able to be bent over the aforementioned central drill, for the purpose of being placed on the head of an anchoring rod.

[0005] These retroreflectors that have a body made up of at least two pieces of sheet metal that are folded and fastened to each other by welding considerably increase manufacturing costs.

[0006] Furthermore, the need to disassemble the fastening screw of the safety or W-bar barrier to perform the assembly thereof through the hole of the retroreflector considerably increases the assembly time of the retroreflectors and the labour costs when all of a road must be marked.

[0007] A solution applied in known retroreflectors which partially solves this disadvantage consists of making the support of the retroreflectors from a single piece of folded sheet metal that laterally extends towards the outside in a tab in a U-shaped cantilevered manner which enables the assembly of the retroreflector to be performed in a lateral direction in a screw for fastening to the barrier or W-beam, slightly loosening said screw being enough to do so.

[0008] A disadvantage of these retroreflectors is that this type of support with an open configuration has a lesser resistance to deformation and can be easily bent from the base of the tab when struck, for example by snow sprayed by the snowploughs, the retroreflector being deformed and in a non-operational position.

[0009] In the known retroreflectors, reflectors are fastened to the support made of folded sheet metal by means of rivets which causes different problems, among which the following are worth mentioning: - the use of a portion of the surface of the reflectors for the placement of the rivets, reducing the reflective surface thereof; - the need to have rivets and a rivet gun to perform the assembly or substitution of reflectors; - the breakage of the reflectors due to the pressure of the rivets and the dilating or contracting forces, and - the difficulty of removing the rivets and substituting a broken or deteriorated reflector with another one.

Description of the invention

[0010] The retroreflectors for safety barriers object of this invention is the type comprising: a support provided with two main faces forming a dihedral and with a base that has a lateral inlet slot for a screw for fastening to a safety barrier; and reflectors fastened to the main faces of the support.

[0011] This retroreflector has construction particularities intended to enable the configuration of a support with a high mechanical resistance, with a single piece of bent sheet metal, without welding or additional fastening elements (screws, rivets, etc.); and to obtain an assembly, disassembly and substitution of the reflectors that are fast and simple, keeping the entirety of the reflective surface thereof intact.

[0012] To do so and according to the invention, the support is made up of a folded piece of sheet metal that extends along the lower end of the main faces in corresponding tabs facing each other and respectively provided with a hook and a hole for the mutual coupling in an assembly position wherein said tabs are maintained practically coplanar and make up the base of the support.

[0013] Said tabs thus enable the hooking or clipping of the two opposite ends of the metal sheet of the support to be carried out, providing said support with a closed configuration without needing to use welding or other additional fastening elements.

[0014] The main faces of the support and the rear surfaces of the reflectors comprise windows and complementary attachments, making up a bayonet coupling such that it is enough to introduce the attachments of the reflectors into the windows of the corresponding support faces and rotate said reflectors laterally so that they are fastened in an assembly position.

[0015] Given that the aforementioned attachments are defined in the rear surface of the reflectors, the reflective surface of the reflectors stays intact, maintaining the reflective character in all the extension thereof.

[0016] The lateral inlet slot for the screw for fastening to the base of the retroreflectors is defined in one of the tabs of the base and extends into an inlet mouth for the fastening screw defined in the corresponding main face of the support.

[0017] In one embodiment of the invention, the main faces of the support and the rear surfaces of the reflectors comprise at least one housing and a complementary projection for the retention thereof in an assembly position.

Description of the figures

[0018] As a complement to the description provided herein, and for the purpose of helping to make the characteristics of the invention more readily understandable, this specification is accompanied by a set of drawings which, by way of illustration and not limitation, represent the following:

- Figure 1 shows an elevation view of an exemplary embodiment of the retroreflector for safety barriers according to the invention.
- Figure 2 shows a profile view of the retroreflector wherein the base thereof can be seen.
- Figure 3 shows a plan view of the retroreflector of the previous figures during the placement thereof with a screw for fastening to a protective railing.
- Figure 4 shows a perspective view of the retroreflector of the previous figures mounted in a protective W-beam-type railing.
- Figure 5 shows a plan view of a sheet metal made from galvanised steel starting from which the support of the reflector is formed simply by bending it.
- Figures 6 and 7 show corresponding rear and profile elevation views of one of the reflectors.
- Figures 8 and 9 show corresponding elevation views of the support of the reflective surfaces in an initial and final assembly position with respect to said support.
- Figures 10 and 11 show corresponding elevation and profile views of a plate of a reflector with corresponding rivets (23) for the fastening thereof in the support (1).
- Figure 12 shows the reflector of the previous figures, the plates of which are fastened by means of corresponding rivets (23) in the support (1).

Preferred embodiment of the invention

[0019] The retroreflector for safety barriers shown in figures 1 to 4 comprises a support (1) provided with two main faces (11, 12) forming a dihedral and with a base (13) that has a lateral inlet slot (14) for a screw (T) for fastening to a safety barrier (B); and reflectors (2) fastened to the main faces (11, 12) of the support,

[0020] The support (1) is made up of folded sheet metal made of galvanised steel, shown in a plan view in figure 5, which is extended along the lower end of the main faces (11, 12) in corresponding tabs (15, 16) facing each other and respectively provided with a hook and a hole for the mutual coupling thereof in an assembly position wherein they make up the base of the support (13).

[0021] The configuration of the tabs (15,16) enables that once the sheet metal of the support is folded, said tabs are hooked, closing the support at the area of the base.

[0022] In figure 2, the lateral inlet slot (14) for the fastening screw (T) is defined in one of the tabs (16) of the base and extends into an inlet mouth (18) for the screw (T) defined in the corresponding main face (12) of the support (1) and that can be seen in figures 1 and 2.

[0023] In figure 3, the retroreflector can be seen during the lateral assembly thereof with a fastening screw (T), the head of said screw being introduced through the inlet mouth (18); the retroreflector being assembled in the position represented in figure 4.

[0024] As seen in figure 5, the main faces of the support (11, 12) are provided with windows (17) for the assembly of the reflectors (2) that, as seen in figures 6 and 7 have complementary attachments (21) on the rear surface thereof, which, together with the aforementioned windows (17), make up a bayonet coupling.

[0025] The main faces (11, 12) of the support (1) and the rear surfaces of the reflectors (2) further comprise a housing (19) and a complementary projection (22) for the retention thereof in an assembly position.

[0026] With these characteristics, and as seen in figures 8 and 9, in order to perform the assembly of the reflectors in the support it is necessary to introduce the attachments (21) of the reflectors into the windows (17) in a position determined by the shape of the windows and by lateral flaps of said attachments (21), and rotate said reflectors laterally until they reach the position represented in figure 9, wherein the projection (22) of each one of them is housed in the corresponding housing (19), being retained in said coupling or assembly position.

[0027] In order to obtain a greater stability of the reflectors (2) in the assembly position with respect to the support (1), it is envisaged that both the windows (17) and the attachments (21) can have a central area that is slightly oval-shaped instead of round, such that a progressive fitting of the profiles thereof is produced as they start to rotate towards the coupling position shown in figure 9.

[0028] In figures 10 to 12 another assembly solution is shown for the reflectors (2) in the support (1), in this case performed by means of corresponding rivets (23).

[0029] Having sufficiently described the nature of the invention, in addition to an example of preferred embodiment, it is hereby stated for the relevant purposes that the materials, shape, size and layout of the described elements may be modified, provided that it does not imply altering the essential characteristics of the invention claimed below.

Claims

1. A retroreflector for safety barriers, comprising a support (1) provided with two main faces (11, 12) forming a dihedral and with a base (13) that has a lateral inlet

slot (14) for a screw (T) for fastening to a safety barrier (B); and reflectors (2) fastened to the main faces (11, 12) of the support; **characterised in that** the support (1) is made up of a piece of folded sheet metal which extends along the lower end of the main faces (11, 12) in corresponding tabs (15, 16) facing each other and provided with a hook and a hole for the mutual coupling thereof in an assembly position wherein they make up the base of the support (13); one of the tabs (16) of the base having lateral inlet slot (14) for the fastening screw (T) that extends into an inlet mouth (18) for the screw (T) defined in the corresponding main face (12) of the support (1).

2. The retroreflector, according to claim 1, **characterised in that** the main faces of the support (11, 12) and the rear surfaces of the reflectors (2) comprise windows (17) and complementary attachments (21), making up a bayonet coupling.

3. The retroreflector, according to claim 2, **characterised in that** the main faces (11, 12) of the support (1) and the rear surfaces of the reflectors (2) comprise at least one housing (19) and a complementary projection (22) for the retention thereof in an assembly position.

4. The retroreflector, according to claim 1, **characterised in that** the main faces (11, 12) of the support (1) and the surfaces of the reflectors (2) comprise holes for the mutual fastening thereof by means of corresponding rivets (23).

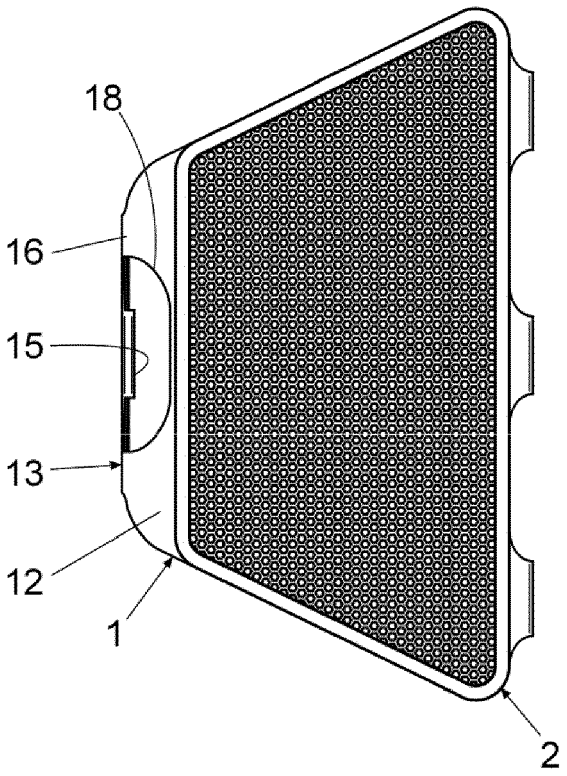

Fig. 1

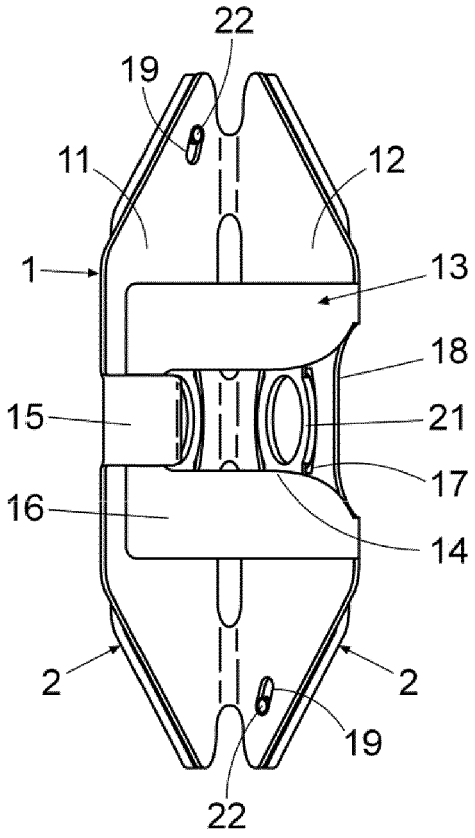

Fig. 2

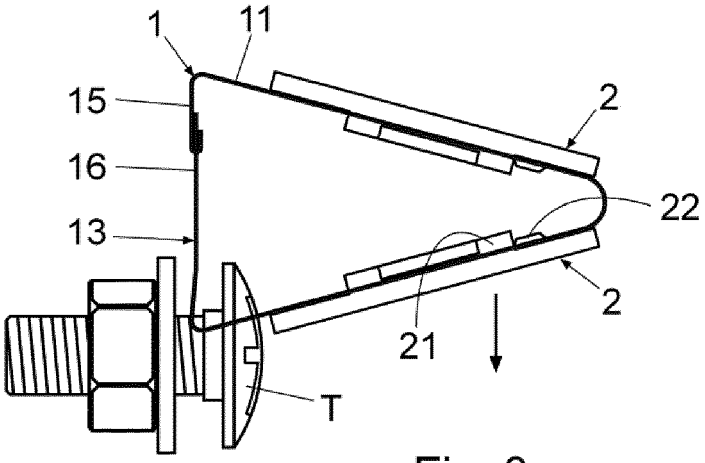

Fig. 3

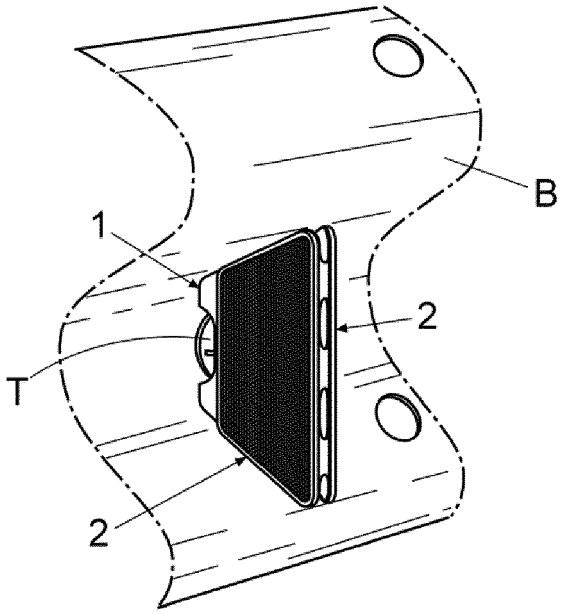

Fig. 4

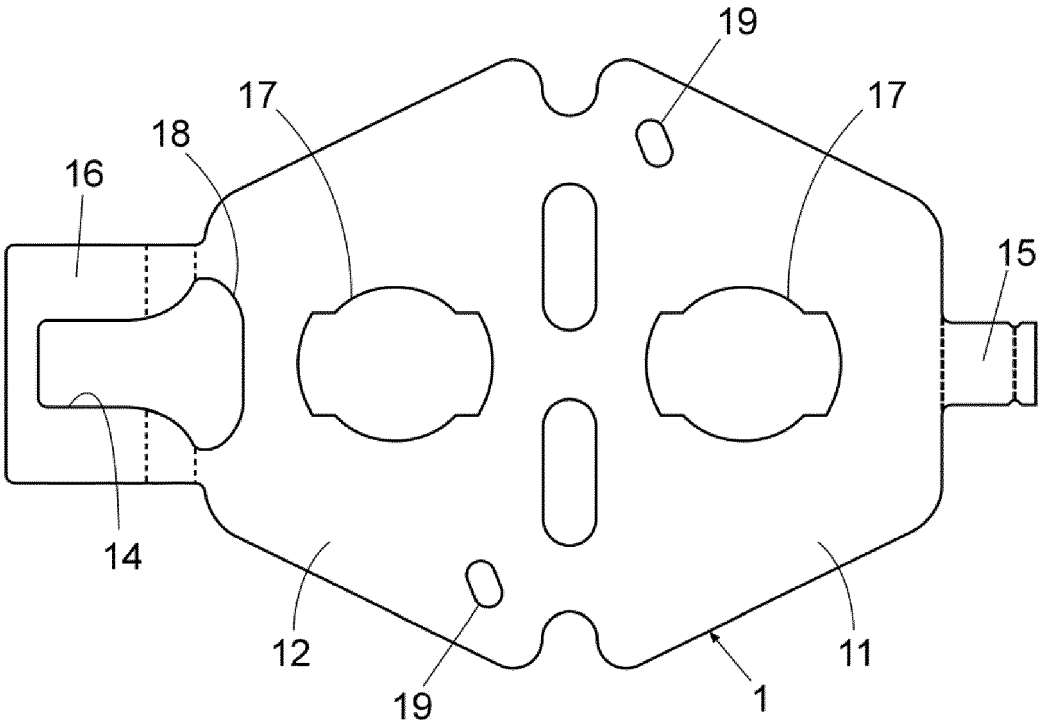

Fig. 5

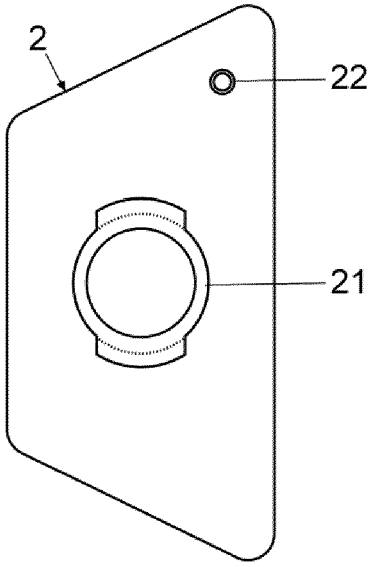

Fig. 6

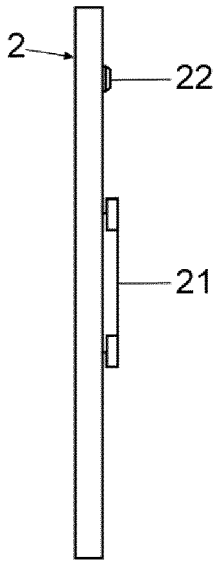

Fig. 7

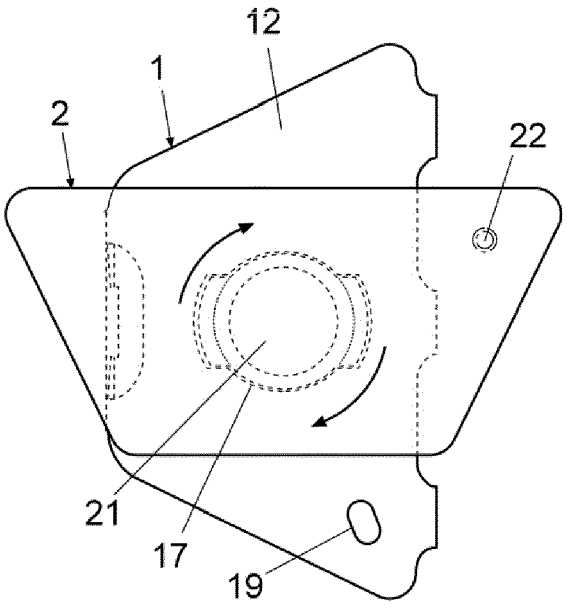

Fig. 8

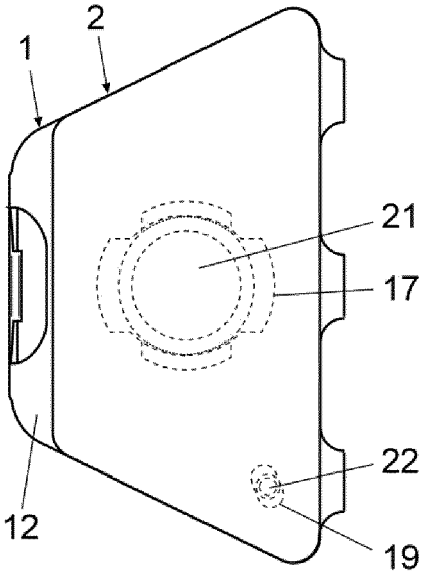

Fig. 9

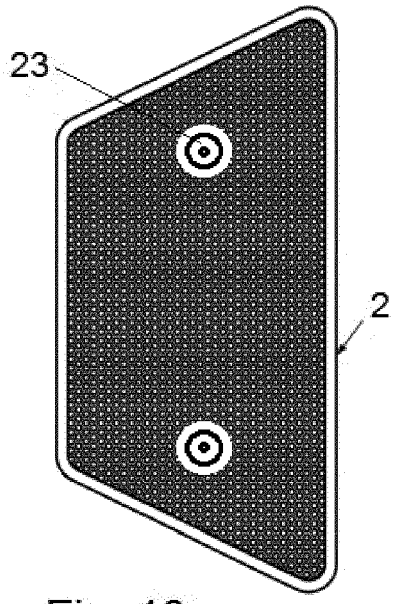

Fig. 10

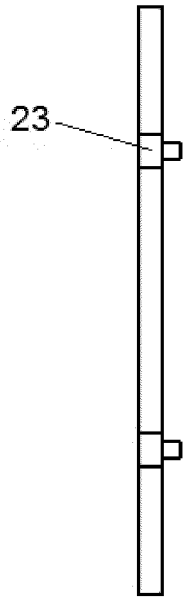

Fig. 11

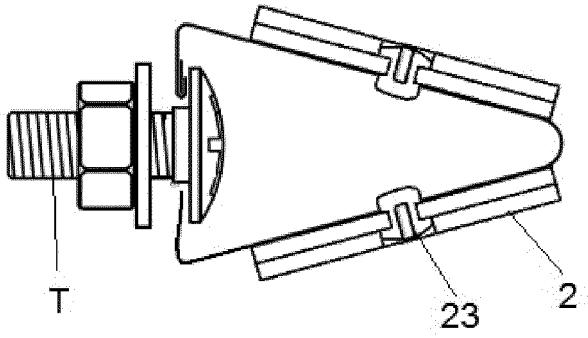

Fig. 12

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EUROPEAN SEARCH REPORT

Application Number
EP 18 18 1597

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	WO 2015/058218 A1 (PIENAAR SIMONE [ZA]) 23 April 2015 (2015-04-23) * page 4, paragraph 9 - page 7, paragraph 4; figure 4 *	1	INV. E01F9/669
A	US 4 191 449 A (HIRATA MASUZO [JP]) 4 March 1980 (1980-03-04) * figures *	1	
A	US 7 014 389 B1 (SIBLIK ALLEN D [US]) 21 March 2006 (2006-03-21) * figures *	1	
A	DE 42 24 549 A1 (WILI KONSTRUKTIONSBUERO FUER F [DE]) 27 January 1994 (1994-01-27) * figures *	1	

TECHNICAL FIELDS SEARCHED (IPC)
E01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 October 2018	Stern, Claudio

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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15-10-2018

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