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GB 2310173 A
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(54) Title of the Invention: **Safety device for an interior of a motor vehicle and arrangement of a safety device in an interior of a motor vehicle**
Abstract Title: **Protective net with pivotable lateral wings for interior of motor vehicle**

(57) Safety device 1 for an interior of a motor vehicle, serving e.g. as a partition between a car boot 101 and a passenger compartment to protect passengers from loads flung around in the boot due to hazard braking or a crash. It is shaped like a trapezoid and has a generally flexible surface, e.g. that of a net 6. It comprises an inner main frame 3 and two wings 4, 5 protruding laterally therefrom. The side wings are pivotable at least in part relative to the main frame about respective pivot axes 7, 8, vertical when the invention is installed in the vehicle. The wing frames may be integral with the main frame and made from a bendable material, so that pivoting occurs by deformation. Alternatively, the wing frames may be made from a flexurally stiff material and comprise hinges aligned with the vertical pivot axes. An arrangement (100, fig. 2) of a safety device inside a motor vehicle is also claimed, wherein its side wings bear against the vehicle's side wall panels 103. Preferably the two wings are releasably fastened to the vehicle side walls by appropriate fastening means 11 without needing any tools.

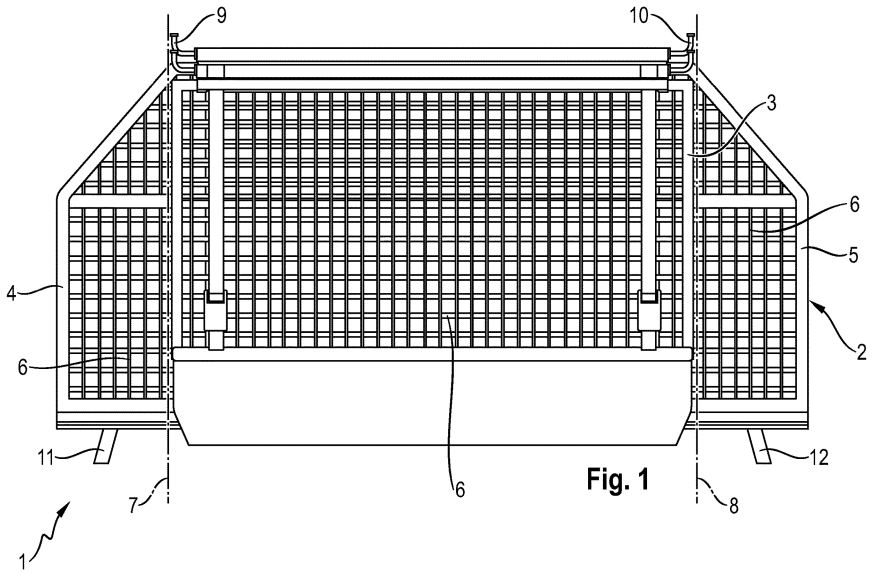

Fig. 1

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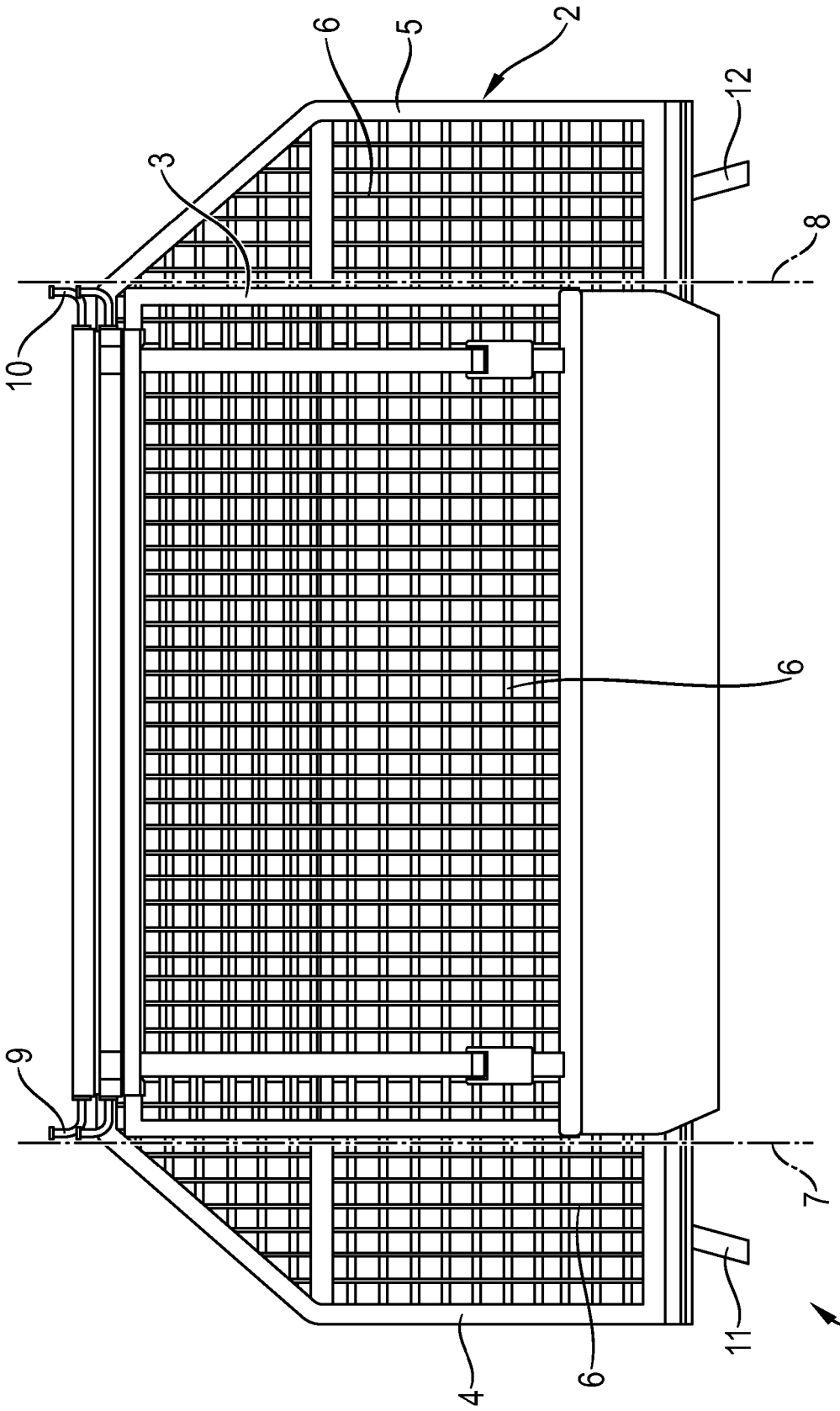

Fig. 1

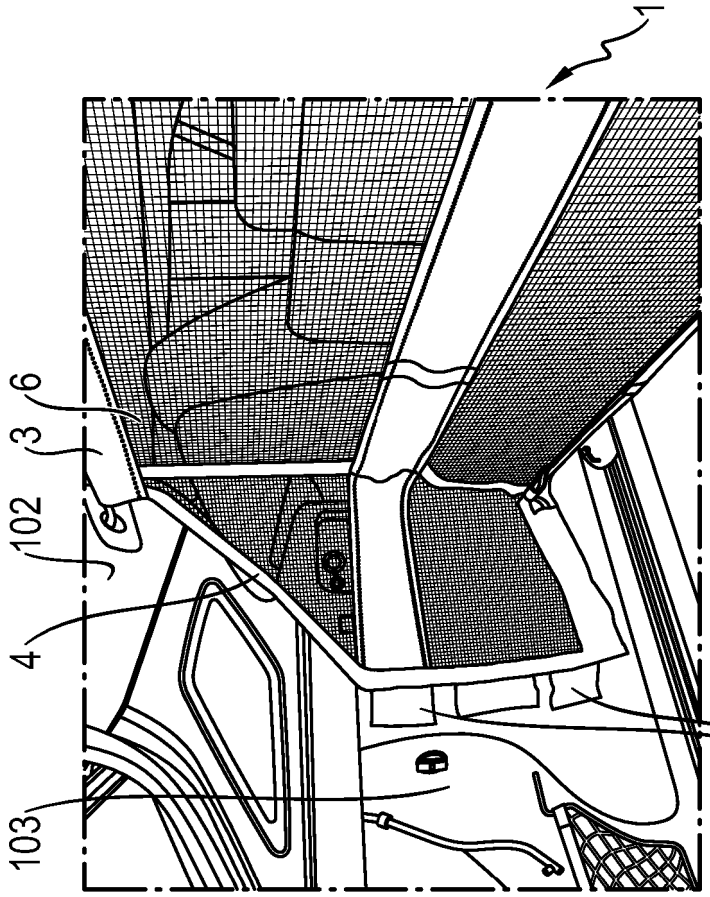

Fig. 3

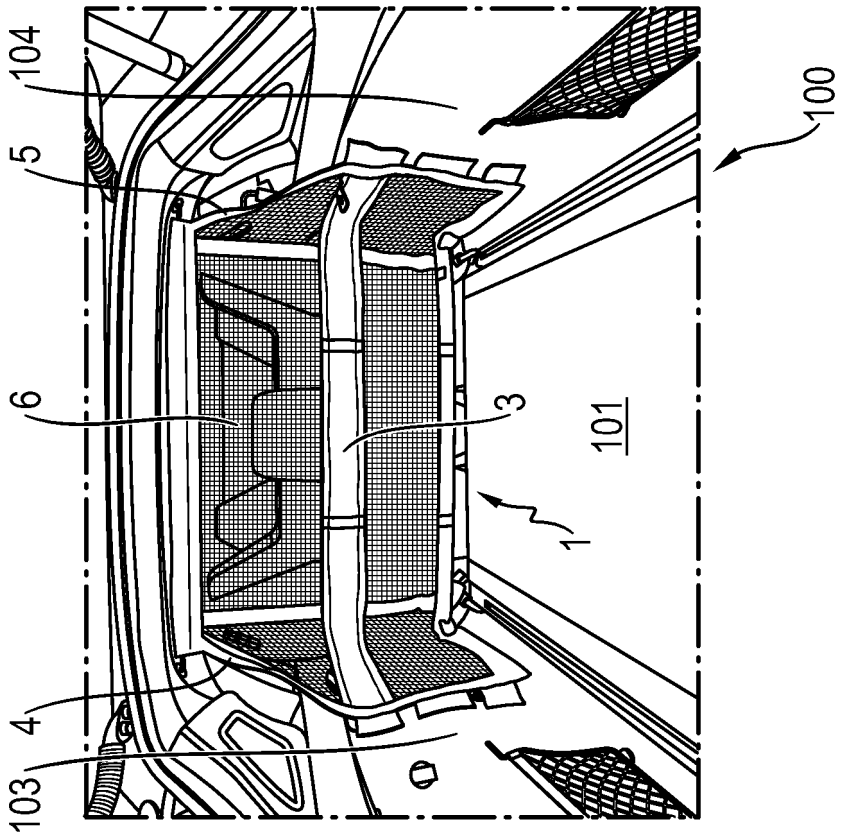

Fig. 2

Safety device for an interior of a motor vehicle and arrangement of a safety device in an interior of a motor vehicle

Aspects of the present invention relate to a safety device for an interior of a motor vehicle, comprising a trapezoid base structure with an inner main frame and two wings protruding laterally from the latter, wherein the two wings are pivotable relative to the main frame, and a flexible surface structure which is defined by the main frame and the two wings. Aspects of the present invention further relate to an arrangement of a safety device in an interior of a motor vehicle.

In motor vehicles, particularly in station wagons, the efficient safety of a load is very important. This is necessary in order, among other things, to protect the vehicle occupants from loads that are flung around, for example in the event of hazard braking, when strong decelerations of the motor vehicle take place, or also in the event of a crash. The safety devices known from the prior art are arranged between a passenger compartment and a loading space of the motor vehicle and have a main frame across which a flexible surface structure is stretched. A safety device of this kind, which extends in the vertical direction of the vehicle in its predetermined installation position, allows loads that are flung around to be restrained to a certain extent in a frontal direction, in order thereby to protect the vehicle occupants from injury. By contrast, a safety device of this kind does not provide lateral protection from loads that are flung around.

A safety device of the type mentioned at the outset is known from DE 196 05 907 B4. This safety device has, in addition to the main frame, two wings which can be deployed laterally by pivoting about a rotation axis

that extends in the horizontal direction in the predetermined installation position of the safety device in the motor vehicle, in order thereby to be able to optionally enlarge the total surface area of the safety device usable for frontal restraint of the load. After deployment, the wings extend into the plane defined by the main frame. This safety device known from the prior art has the disadvantage that it provides only limited protection from objects that are flung around laterally.

The present invention seeks to make available a safety device and an arrangement of a safety device in an interior of a motor vehicle, which are able to better protect the vehicle occupants from flying loads, or provide a useful alternative to prior safety devices.

This may be solved by a safety device of the aforementioned type as claimed in claim 1, and by an arrangement of a safety device in an interior of a motor vehicle as claimed in claim 8. The dependent claims relate to advantageous developments of the invention.

A safety device according to an aspect of the invention is characterized in that each of the two wings is pivotable at least in part about a pivot axis that extends in the vertical direction of the vehicle in a predetermined installation position of the safety device. In contrast to the prior art, the two wings are thus not pivoted outward about a horizontal pivot axis and thereby deployed. The safety device according to the invention has, for each of the two wings, a fold mechanism which allows the wings to pivot about a pivot axis that extends in the vertical direction of the vehicle in the predetermined installation position of the safety device. In this way, during installation,

the wings can be pivoted relative to the main frame into the loading space, in such a way that they can each be made to bear on a side panel, for example. The safety device according to the invention has the effect that the load stowed in the loading space of the motor vehicle can be held back, in the event of hazard braking or in the event of a crash, not only frontally by the main frame and the part of the flexible surface structure defined by the latter, but also laterally by the two wings and by the parts of the flexible surface structure defined by these. In this way, it is advantageously possible also to provide lateral protection of the vehicle occupants from loads that are flung around, such that the risk of injury to the vehicle occupants can be further reduced.

The fold mechanism, which allows the two wings to pivot at least in part relative to the main frame about a pivot axis extending in the vertical direction of the vehicle, can be designed in very different ways. In an advantageous embodiment, it is proposed that the two wings are produced from a bendable material. By producing them from a bendable material, an intrinsic flexibility of the two wings is thus obtained, which makes it unnecessary to provide corresponding hinge means in order to permit a pivoting of the wings relative to the main frame in said manner about the pivot axes extending in the vertical direction of the vehicle. In this way, the production costs of the safety device can in particular be reduced, since no additional hinge means have to be produced, kept in stock and installed in corresponding installation steps. The omission of corresponding hinge means additionally reduces the risk of wear, which can sometimes occur in hinge means. It is in particular possible that the trapezoid base structure, which comprises the main frame and the two wings, is a one-

piece component. This affords further advantages in terms of production and costs.

In an alternative embodiment, provision can be made that the two wings are produced from a flexurally stiff material and comprise hinge means which are configured and positioned such that they define the two pivot axes. It is possible here that the hinge means are arranged between the wings and the main frame, such that the wings are pivotable relative to the main frame. Alternatively, the wings can also be divided into two parts by the hinge means. A first part of the wings can be rigidly connected to the main frame, and a second part can be pivotable relative to the first part with the aid of the hinge means. By producing the wings from a flexurally stiff material, it is possible to achieve a greater structural strength of the wings and, consequently, also of the entire base structure. The wings can be produced in particular from plastic or from a light metal material. Similarly, the main frame can also be produced from plastic or from a light metal material.

In a preferred embodiment, it is possible that each of the two wings has fastening means which are configured for releasably fastening the wings to mutually opposite side wall panels inside a loading space of the motor vehicle. By this measure, after being pivoted relative to the main frame in the direction of the loading space of the motor vehicle, the wings can be fastened to the side wall panels inside the loading space. Preferably, the fastening means can be configured to be assembled on and disassembled from the side wall panels without the use of tools. Assembly and disassembly can then take place in a particularly simple way.

The flexible surface structure can preferably be a protective net.

An arrangement, according to the invention, of a safety device in an interior of a motor vehicle is characterized in that the safety device as claimed in one of claims 1 through 7 and the two wings are pivoted relative to the main frame, about their respective pivot axis, in such a way that they each bear on one of two mutually opposite side wall panels inside a loading space of the motor vehicle. The arrangement according to the invention advantageously permits not only frontal protection but also effective lateral protection of the vehicle occupants from loads that are flung around.

In a preferred embodiment, it is proposed that each of the two wings is fastened releasably to one of the two side wall panels. Preferably, the two wings can be fastened to one of the two side wall panels in such a way as to be releasable without the use of tools, in order thereby to permit particularly simple assembly or disassembly of the safety device.

Further features and advantages of the present invention will become clear from the following description of preferred illustrative embodiments and by reference to the attached drawings, in which:

Fig. 1 shows a safety device for an interior of a motor vehicle, which safety device is designed in accordance with a preferred illustrative embodiment of the present invention,

Fig. 2 shows an arrangement of a safety device in an interior of a motor vehicle in accordance with a

preferred illustrative embodiment of the present invention,

Fig. 3 shows a detail of the arrangement according to Fig. 2.

Referring to Fig. 1, a safety device 1 provided for an interior of a motor vehicle, and designed in accordance with a preferred illustrative embodiment of the present invention, comprises a trapezoid base structure 2 with an inner main frame 3 and two wings 4, 5 protruding laterally from the latter. The main frame 3 is preferably produced from plastic or a light metal material and is in particular designed as a tube frame or profile frame. The two wings 4, 5 can likewise be designed like frames and produced from plastic or from a light metal material. Inside the base structure 2, a flexible surface structure in the form of a stable, narrow-mesh protective net 6 is defined by the main frame 3 and the two wings 4, 5. The safety device 1 can be installed in the interior of a motor vehicle, in particular of a station wagon, between a passenger compartment and a loading space 101 (see Fig. 2) and, in its predetermined installation position, extends in the vertical direction (z direction) of the vehicle in order thereby to create a separation of the loading space 101 from the passenger compartment.

The safety device 1 moreover has two fastening means 9, 10 which are mounted on two mutually opposite ends at a top of the base structure 2. These fastening means 9, 10 serve the purpose of fastening the safety device 1 to a roof liner 102 of the vehicle interior. The fastening means 9, 10 can in particular be peg-like and shaped such that they can engage in correspondingly shaped latching receptacles that are formed on the roof liner 102.

Each of the two lateral wings 4, 5 of the safety device 1 has an integrated fold mechanism which allows the wings 4, 5 to pivot at least in part relative to the main frame 3, in each case about a pivot axis 7, 8 that extends in the vertical direction (z direction) of the vehicle in the predetermined installation position of the safety device 1. The fold mechanism can be designed in a completely different way. For example, it is possible to produce the wings 4, 5 from an elastically deformable material in order thereby to achieve an intrinsic bendability of the wings 4, 5 relative to the main frame 3, without additional hinge means. If the two wings 4, 5 are formed, for example, completely by a tube frame or profile frame and thus themselves have a corresponding flexural stiffness, the wings 4, 5 can each have two hinge means which are arranged between the relevant wing 4, 5 and the main frame 3 and are designed and positioned such that they define the pivot axes 7, 8 which extend in the vertical direction of the vehicle and about which the wings 4, 5 can be pivoted. The wings 4, 5 can also be designed in two parts, wherein the hinge means are arranged between the two parts, and the wings 4, 5 are thus themselves foldable.

Details of an arrangement 100 of a safety device 1 in an interior of a motor vehicle will be explained in more detail below with further reference to Figures 2 and 3.

During the installation of the safety device 1, the base structure 2, with the aid of the two fastening means 9, 10, is fastened to the roof liner 102 of the vehicle interior between the loading space 101 and the passenger compartment of the motor vehicle. The two wings 4, 5 are pivoted relative to the main frame 3 in such a way that they protrude into the loading space

101 of the motor vehicle. As can be seen from Fig. 2, the main frame 3 of the base structure 2 extends across almost the entire width of the motor vehicle in this region, which is located in particular behind the rear seats or the rear seat bench of the motor vehicle. The main frame 3, with the part of the protective net 6 defined by it, extends substantially over the entire height of the loading space 101 of the motor vehicle and thus forms a frontal barrier to loads flying around particularly in the event of hazard braking, when a considerable deceleration of the motor vehicle takes place, or in the event of a crash.

For their part, the two wings 4, 5 have fastening means 11, 12 which are each designed for releasable fastening to one of two mutually opposite side wall panels 103, 104 inside the loading space 102. A first wing 4 is fastened to a first side wall panel 103 during installation. A second wing 5 is for its part fastened to a second side wall panel 104 which lies opposite the first side wall panel 103. The fastening means 11, 12 can preferably be designed such that they are configured to be assembled on and disassembled from the respective side wall panels 103, 104 without the use of tools.

The arrangement 100 of a safety device 1 in an interior of a motor vehicle, as proposed here, has the effect that a load stowed in the loading space 101 of the motor vehicle can be held back, in the event of hazard braking or in the event of a crash, not only frontally by the main frame 3 and the part of the protective net 6 defined by the latter, but also laterally by the two wings 4, 5 and by the parts of the protective net 6 defined by these. In this way, it is advantageously possible also to provide lateral protection of the vehicle occupants from loads that are flung around,

such that improved protection of the vehicle occupants against injury can be achieved.

Claims

1. A safety device for an interior of a motor vehicle, comprising
   - a trapezoid base structure with an inner main frame and two wings protruding laterally from the latter, wherein the two wings are pivotable relative to the main frame, and
   - a flexible surface structure which is defined by the main frame and the two wings,
   wherein each of the two wings is pivotable at least in part about a pivot axis that extends in the vertical direction of the vehicle in a predetermined installation position of the safety device.

2. The safety device as claimed in claim 1, wherein the two wings are produced from a bendable material.

3. The safety device as claimed in either of claims 1 and 2, wherein the two wings are formed integrally with the main frame.

4. The safety device as claimed in claim 1, wherein the two wings are produced from a flexurally stiff material and comprise hinge means which are designed and positioned such that they define the two pivot axes.

5. The safety device as claimed in any one of claims 1 through 4, wherein each of the two wings has fastening means which are configured for releasably fastening the wings to mutually opposite side wall panels inside a loading space of the motor vehicle.

6. The safety device as claimed in claim 5, wherein the fastening means are configured to be assembled on and disassembled from the side wall panels without the use of tools.

7. The safety device as claimed in any one of claims 1 through 6, wherein the flexible surface structure is designed as a protective net.

8. An arrangement of a safety device in an interior of a motor vehicle, wherein the safety device is designed as claimed in any one of claims 1 through 7 and the two wings are pivoted relative to the main frame, about their respective pivot axis, in such a way that they each bear on one of two mutually opposite side wall panels inside a loading space of the motor vehicle.

9. The arrangement as claimed in claim 8, wherein each of the two wings is fastened releasably to one of the two side wall panels.

Intellectual Property Office

Application No:	GB1802691.4	**Examiner:**	Mr Ioannis Papakostas
Claims searched:	1-9	**Date of search:**	27 July 2018

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X,Y	X: 1, 4, 7, 8; Y: 5, 6, 9	GB 2310173 A (BAUMEISTER & OSTLER GMBH & CO KG) See figure 4 / page 7, last whole paragraph.
Y	5, 6, 9	US 2007/0176450 A1 (SETINA MFG CO INC) See fig. 14 and paragraph [0060].
X	1, 4-9	DE 7037962 U (PAEUKER) See fig. 1, 2 / claims 1, 2.
X	X: 1, 4, 7, 8	US 5820187 A (BAUMEISTER & OSTLER GMBH CO) See fig. 9 / EPODOC abstract / col. 5, line 49 - col. 6, line 13.
X	1-3, 5-9	US 2008/0136205 A1 (SOLVIT PRODUCTS LP) See fig. 1-3 / EPODOC abstract / paragraphs [0018], [0020], [0026]-[0028].

Categories:

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Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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Worldwide search of patent documents classified in the following areas of the IPC

B60R

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI, Patent Fulltext

International Classification:

Subclass	Subgroup	Valid From
B60R	0021/06	01/01/2006