US 20130306515A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2013/0306515 A1

(43) Pub. Date: Nov. 21, 2013

Murdoch et al.

(54) CURVED EDGE PROTECTOR

(76) Inventors: **Thomas Murdoch**, London (GB); **Stephen Tyldsley**, London (GB)

(21) Appl. No.: **13/979,970**

(22) PCT Filed: **Jan. 16, 2012**

(86) PCT No.: **PCT/GB12/50077**

§ 371 (c)(1),
(2), (4) Date: **Jul. 16, 2013**

(30) **Foreign Application Priority Data**

Jan. 18, 2011 (GB) 1100762.2

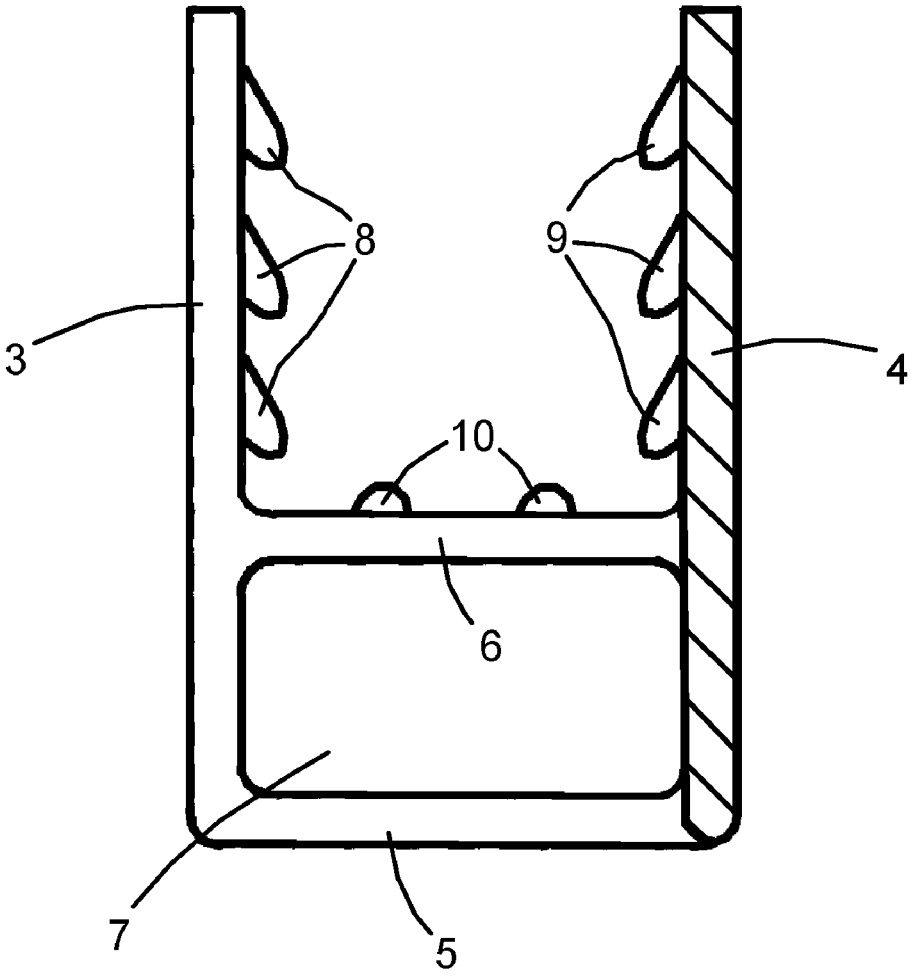
Publication Classification

(51) **Int. Cl.**
B65D 81/02 (2006.01)

(52) **U.S. Cl.**
CPC ***B65D 81/02*** (2013.01)
USPC **206/586**

(57) **ABSTRACT**

An edge protector which can be applied to complex curved edges without on-site adaptation has interconnected elements **2** aligned in a longitudinal direction. Each of the elements has first and second opposing side walls **3** and **4** joined by an end wall **5** and an intermediate wall **6** to form a box section **7**, and opposing faces of the side walls **3** and **4** which project beyond the box section are each provided with elastomeric gripping projections **8** and **9**. Adjacent pairs of elements are spaced apart to form a gap **11** and interconnected by an integral hinge connection between one of said side and end walls **3**, **4** or **5**. A single edge protector may include adjacent pairs of elements interconnected by hinge connections between one of their side walls **3**, **4** and adjacent pairs of elements interconnected by hinge connections between their end walls **5** allowing the edge protector to be manually manipulated in two mutually perpendicular planes.



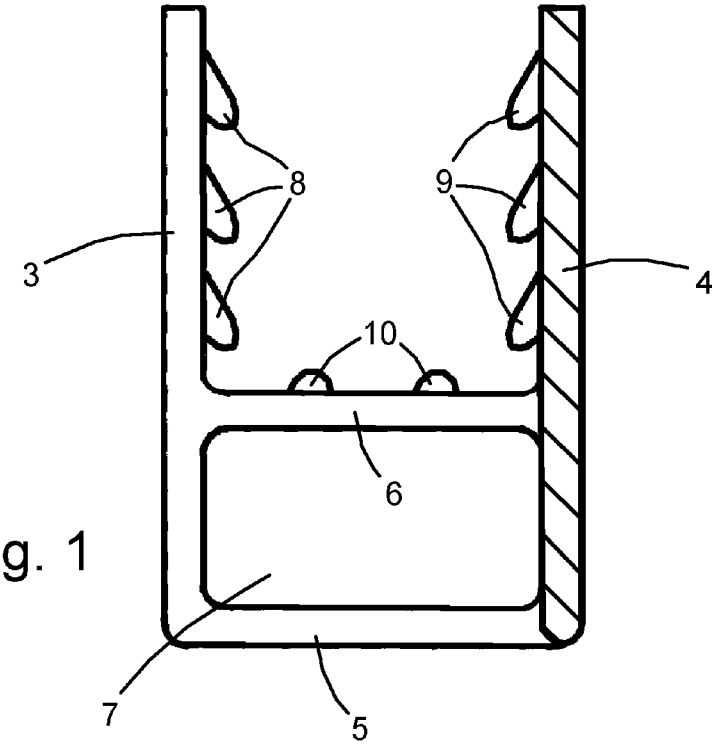
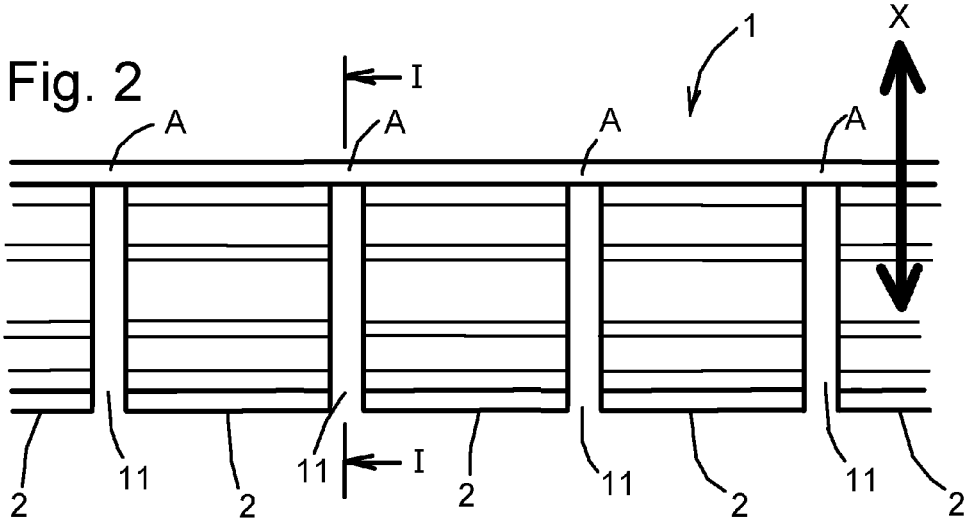


Fig. 1

Fig. 2



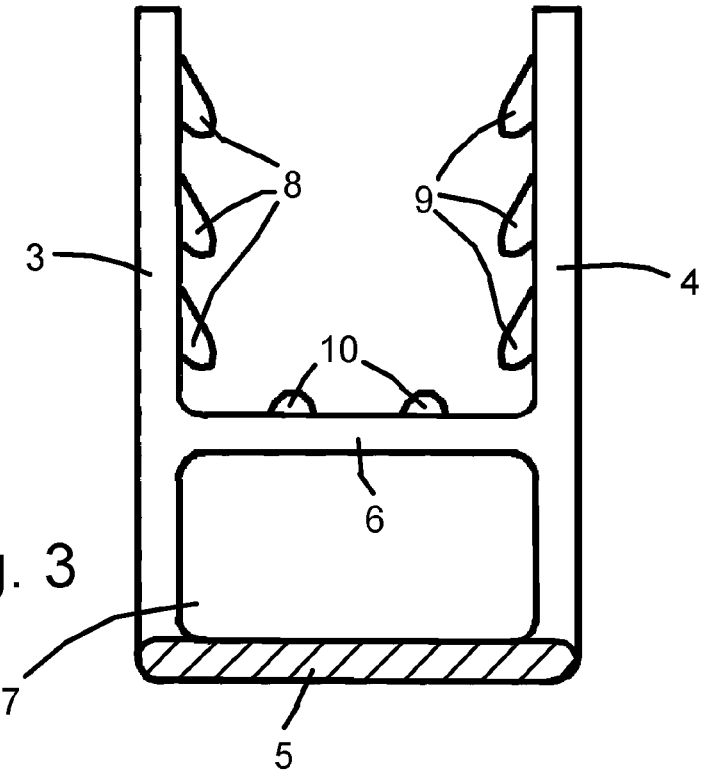


Fig. 3

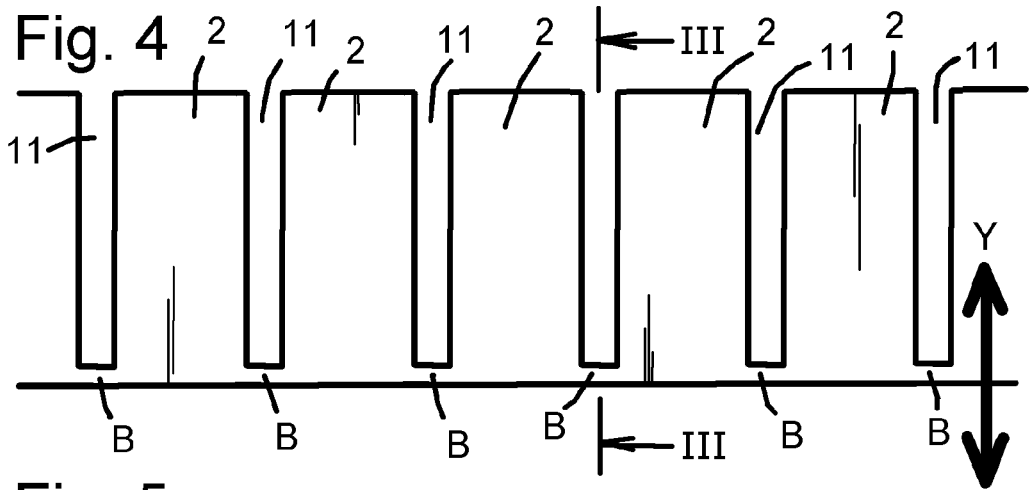


Fig. 4

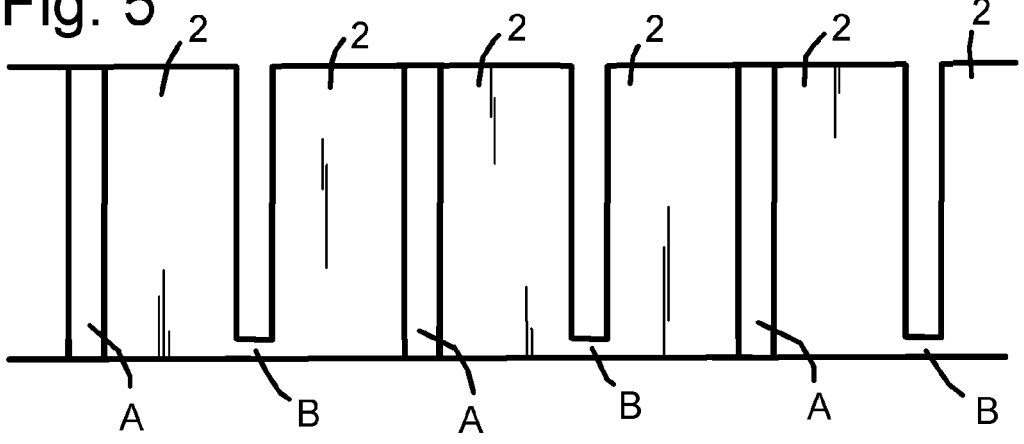


Fig. 5

CURVED EDGE PROTECTOR

TECHNICAL FIELD OF THE INVENTION

[0001] This invention relates to an edge protector which is principally intended for protecting curved edges of sheets of glass during handling and transportation. The edge protector can also be used to protect other easily damaged curved edges, e.g. of metal sheets, furniture, pictures, marble, masonry, etc. Apart from protecting such edges from damage the edge protector can also prevent the edges from causing damage to other items within the immediate environment such as floors or items of furniture.

BACKGROUND

[0002] WO 2008 087370 A2 discloses an edge protector which is extruded from thermoplastic material such as PVC. The extrusion includes a hollow box section and a pair of limbs which project from one side of the box section to extend on opposite sides of the edge to be protected. Opposing interior faces of the limbs are provided with longitudinally-extending gripping tongues which are angled inwardly towards the box section. The known edge protector is extremely effective for protecting straight edges. To a large extent this is due to the box section, which acts as an outer crush zone which is able to deform, collapse or even break to absorb the force of a heavy impact. On the other hand, the presence of the box section tends to make the extrusion very rigid. Although the known edge protector can be adapted to edges having a very slight curve by making slits and notches in the side limbs the extrusion is still substantially inflexible, and the extrusion cannot easily be applied to complex curved edges without a considerable amount of time-consuming manual work on site.

[0003] GB 2 367 800 A discloses an edge protection strip which consists of a longitudinally extending channel formed between a base and opposed side walls. The side walls have sets of longitudinally arranged, laterally extending teeth whereby the strip is capable of flexing or bending in the spaced regions between the teeth, thus allowing curved or contoured edge pieces to be protected. The teeth may have side edges which converge towards the root of the tooth, thus defining a spaced array of substantially 'V' or 'U' shaped gaps between adjacent teeth. Whilst such a strip is capable of inherently greater flexibility it provides only poor protection against impact damage since impacts are transmitted directly through the solid base with little or no attenuation.

[0004] The present invention seeks to provide a new and inventive form of edge protector which can be applied to both straight and complex curved edges without on-site adaptation.

SUMMARY OF THE INVENTION

[0005] The present invention proposes an edge protector having a longitudinal direction and comprising an element which, when viewed in said longitudinal direction, has first and second opposing side walls joined by an end wall and an intermediate wall to form a box section, and opposing faces of said side walls which project beyond said box section are each provided with elastomeric gripping projections,

[0006] characterised in that the edge protector comprises a plurality of such elements which are aligned in said longitudinal direction, and each adjacent pair of elements are mutually spaced apart to form a gap with each pair of elements interconnected by a hinge connection between one of said walls.

[0007] It has been found that by incorporating such hinge connections it is possible to fit the edge protector to straight or complex curved edges without on-site adaptation. Moreover, it has also been found that since the integrity of the box section is maintained within each of the individual elements there is no significant reduction in the amount of impact protection.

[0008] The term "complex curve" is used herein to encompass any curve having more than a single radius of curvature.

[0009] In a preferred form of the edge protector the hinge connection is integrally formed with said elements. Such hinges may conveniently be formed by continuing said side or end wall between said elements, without significantly reducing the strength of the edge protector.

[0010] Adjacent pairs of elements may be interconnected by hinge connections between their side walls or hinge connections between their end walls. A particularly useful form of edge protector which can be manipulated in two dimensions includes adjacent pairs of elements interconnected by hinge connections between one of their side walls and adjacent pairs of elements interconnected by hinge connections between their end walls.

[0011] For optimum flexibility the length of the elements in the longitudinal direction is preferably less than the maximum width of the side walls transverse to said longitudinal direction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The following description and the accompanying drawings referred to therein are included by way of non-limiting example in order to illustrate how the invention may be put into practice. In the drawings:

[0013] FIG. **1** is a transverse section through a curved edge protector in accordance with the invention;

[0014] FIG. **2** is a plan view of the curved edge protector, showing the plane I-I of the sectional view shown in FIG. **1**;

[0015] FIG. **3** is a transverse section through a second form of the curved edge protector;

[0016] FIG. **4** is a side view of the second form of curved edge protector, showing the plane III-III of the sectional view shown in FIG. **3**; and

[0017] FIG. **5** is a side view of a third form of the curved edge protector.

DETAILED DESCRIPTION OF THE DRAWINGS

[0018] Referring firstly to FIGS. **1** and **2**, the curved edge protector **1** is formed of a polymer such as pvc and includes a number of substantially identical elements **2**, of equal length, which are aligned in a longitudinal direction of the edge protector. When viewed in the longitudinal direction as in FIG. **1**, each of the elements has first and second opposing planar side walls **3** and **4** which are joined by an end wall **5** and an intermediate wall **6** to form a hollow box section **7**. Portions of the side walls **3** and **4** which project beyond the box section **7** are provided with elastomeric longitudinally-extending gripping projections **8** and **9** on their opposing internal faces. In addition, the intermediate wall **6** may be provided with one or more longitudinally-extending elastomeric ribs **10** directed towards the projections **8** and **9**.

[0019] In the embodiment of FIGS. **1** and **2** each adjacent pair of elements **2** are interconnected by one of the side walls **4**, which extends across a gap **11** between the two elements to form an interconnecting hinge A. Slight inherent resilience in each of the hinges A allows the edge protector to be flexed in opposite directions in a plane which is perpendicular to the side wall **4**, as indicated by the double-headed arrow X. The edge protector can be manually manipulated into any complex curved snake-like shape, enabling the edge protector to be easily applied to sheets which have a complex non-planar curvature, e.g. sheets which are formed into an S-shape.

[0020] Once applied to the edge, the elastomeric projections **8** and **9** ensure that each element maintains a tight grip on the sheet.

[0021] It would be possible for an edge protector to include hinge connections between the side walls **3** and hinge connections between the side walls **4** (although not of course at the same position).

[0022] In the embodiment of FIGS. **3** and **4** each adjacent pair of elements **2** are interconnected by means of the end wall **5**, which extends across a gap **11** between the two elements to form an interconnecting hinge B. In this example parts which correspond to those of FIGS. **1** and **2** have the same reference numerals. Slight inherent resilience in each of the hinges B allows the edge protector to be flexed in opposite directions in the plane of each of the side walls **3** and **4**, as indicated by the double-headed arrow Y. This edge protector can be manually manipulated into any complex curved snake-like shape which allows the edge protector to be applied to planar sheets having curved edges, e.g. S-shaped edges.

[0023] Once applied to the edge, the elastomeric projections **8** and **9** ensure that each element maintains a tight grip on the sheet.

[0024] It should be noted that the hinges B could be formed between the intermediate walls **6**, although this would result in less flexibility for a given size of gap **11**.

[0025] A single curved edge protector can include type A and type B hinges allowing the edge protector to be curved in two mutually perpendicular planes. For example, the curved edge protector which is shown in FIG. **5** has type A hinges which alternate with type B hinges.

[0026] The curved edge protectors described herein can, of course, be applied to straight edges as well as complex curved edges. In some directions the maximum amount of curvature may be determined by the size of the gap **11** between adjacent elements **2**. Furthermore, for optimum flexibility the length of the elements **2** in the longitudinal direction is preferably no greater than the maximum width of the side walls **3** and **4** transverse to said longitudinal direction. In the illustrated embodiments the length of the elements **2** is about half the width of the side walls **3** and **4**.

[0027] Whilst the above description places emphasis on the areas which are believed to be new and addresses specific problems which have been identified, it is intended that the features disclosed herein may be used in any combination which is capable of providing a new and useful advance in the art.

1. An edge protector having a longitudinal direction and comprising an element which, when viewed in said longitudinal direction, has first and second opposing side walls (**3**, **4**) joined by an end wall (**5**) and an intermediate wall (**6**) to form a box section (**7**), and opposing faces of said side walls (**3**, **4**) which project beyond said box section are each provided with elastomeric gripping projections (**8**, **9**),

characterised in that the edge protector comprises a plurality of such elements (**2**) which are aligned in said longitudinal direction, and each adjacent pair of elements (**2**) are mutually spaced apart to form a gap (**11**) with each pair of elements interconnected by a hinge connection (A, B) between one of said walls (**3**-**6**).

2. An edge protector according to claim **1** in which said hinge connection (A, B) is integrally formed with said elements (**2**).

3. An edge protector according to claim **2** in which said hinge connection (A, B) is formed by a continuation of said wall (**3**-**6**) which extends between said elements (**2**).

4. An edge protector according to claim **1** in which adjacent pairs of elements (**2**) are interconnected by hinge connections (A) between their side walls (**3**, **4**).

5. An edge protector according to claim **1** in which adjacent pairs of elements (**2**) are interconnected by hinge connections (B) between their end walls (**5**).

6. An edge protector according to claim **1** which includes adjacent pairs of elements (**2**) interconnected by hinge connections (A) between one of their side walls (**3**, **4**) and adjacent pairs of elements interconnected by hinge connections (B) between their end walls (**5**).

7. An edge protector according to claim **1** in which the length of the elements (**2**) in the longitudinal direction is less than the maximum width of the side walls (**3**, **4**) transverse to said longitudinal direction.

* * * * *