



EUROPEAN PATENT SPECIFICATION

Date of publication of patent specification :
18.05.94 Bulletin 94/20

Int. Cl.⁵ : **E06B 9/15**

Application number : **91610010.0**

Date of filing : **25.02.91**

Roll-up safety grating.

Priority : **01.03.90 NO 900967**

Proprietor : **JSA- SIKRING ApS**
Elstedvej, 172
DK-8520 Lystrup (DK)

Date of publication of application :
04.09.91 Bulletin 91/36

Inventor : **Knudsen, Finn**
Elstedvej 172
DK-8520 Lystrup (DK)

Publication of the grant of the patent :
18.05.94 Bulletin 94/20

Designated Contracting States :
DE DK GB NL SE

Representative : **Hansen, Kaj**
c/o Kaj Hansen ApS, Radgivende
ingeniorfirma, Elsegarde Skovvej 5
DK-8400 Ebeltoft (DK)

References cited :
EP-A- 0 310 548
DE-A- 1 046 295
DE-U- 9 002 171
GB-A- 2 120 306
GB-A- 2 204 899

EP 0 445 064 B1

Note : Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid (Art. 99(1) European patent convention).

Description

The present invention relates to a safety grid of the kind described in the introduction to Claim 1.

Such a safety grid is by way of example known from DE-C-1046295.

This document discloses a roll-up safety grid which consists of a number of mutually parallel track profiles which are made of a light metal and inserted at the ends into guide rails, and of a number of bridge elements with a convex centre portion and with concave outer portions, which are of uniform width, curved towards the outside of the safety grid and being of equal lengths and arranged with the same mutual distance, and which at the ends have hinge pins embodied as beads by means of which they are swingably hinged in longitudinal - inwardly open towards the internal side - cylindrical tracks which are located at the top and bottom of the internal side of the track profile and reaching in the full length of a track profile.

Safety grids of this type are mounted e.g. behind the glazing in display windows of shops, and they serve to prevent thieves from gaining access to the displayed articles after the pane has been smashed.

The safety grid is normally rolled up on a cylindrical core in the daytime and rolled down after closing time. The safety grid can be locked in the rolled-down position by a drum brake, so that it cannot be raised from the outside. The glazing in front of it can be connected to an alarm system so that the alarm is set off and the police or a safety guard is called if the pane is broken. Therefore the safety grid must be transparent and at the same time obstruct access to the displayed articles for as long time as possible after the pane has been broken.

These known safety grids are characterized by being of simple construction and easy to assemble as the individual bridge elements and distance pieces are inserted into tracks in the track profiles from one end. They are therefore cheap to produce, and can furthermore be rolled up round a core so that their outside diameter is the smallest possible.

However, the disadvantage of these known safety grids is that they have openings between the individual bridge elements through which the displayed articles can be fished out.

From GB-A-2 120 306 a safety grid is known which consists of a number of transparent, equally long panels, which at each end are hinged in metal rails. This known safety grid is thus completely closed, but it has the drawback that it cannot be rolled up on a cylindrical core, that in the rolled-up condition it has too large outside measurements, and that some of the metal rails in the rolled-up position come to rest against the transparent panels, which may thus suffer damage.

From EP-A-0310548 a roll-up grid is known in

which the bridge elements constitute an integral part of a track profile. Each track profile has a groove at the bottom, and each bridge element has a longitudinal end at the top which is swingably embedded in the groove in the track profile immediately above. Between the individual bridge elements are inserted other elements, which are produced from a transparent material, and which at the top are embodied with a groove and at the bottom with a contact surface and an elastic lobe. These transparent elements are slid into position sideways into the openings in the grid, and they are therefore cumbersome to mount.

From GB-A-2 204 899 a roll-up grid is known in which each track profile consists of two mutually hinged parts. The track profiles are assembled to form a grid by means of bridge elements, which at each end has a groove which is squeezed or slid in over a track profile. Between the bridge elements are inserted transparent, plane elements. As is clearly seen, some of the track profiles in the rolled-up position of the grid will come to rest against a bridge element between two track profiles, whereby the former and consequently the transparent elements are subjected to a bending moment and may suffer damage.

From DE-U-9 002 171 a safety grid is known which consists of a number of plane, transparent panels, which at each end are fastened in profiles embodied as hinges. This known safety grid is thus completely closed, but it has the disadvantage that if it is to be capable of being rolled up, it is necessary that the individual panels are of different lengths, shortest at the end which is rolled up first, and longest at the end which is rolled up last. The grid is therefore complicated to produce and assemble.

It is the purpose of the present invention to describe a safety grid which does not exhibit the disadvantages of the known safety grids.

This is achieved by embodying a safety grid of the type dealt with in the introduction to Claim 1 and described in the characterizing part of Claim 1.

The result will thus be that the safety grid is completely closed and at the same time it can be rolled up on a cylindrical core to form a cylindrical body of a very small outside diameter. It is furthermore avoided that the transparent panels suffer damage.

By what is described in Claim 2 it is achieved that the whole field of vision between the two track profiles becomes transparent and that there will be no light-refracting effects around the joint between two bridge elements.

Claim 3 describes an embodiment of a safety grid according to the invention

The invention will be described in detail below with reference to the accompanying drawing in which fig. 1 is a front view of a section of a known safety grid,

fig. 2 shows a section after the line I-I in fig. 1, fig. 3 is a front view of a section of a safety grid according to an embodiment of the invention, fig. 4 is a front view of a section of a safety grid according to another embodiment of the invention, fig. 5 shows a larger-scale section after the line V-V in fig. 5, fig. 6 is an end-view of two bridge elements according to the invention, and mounted in a track profile, and fig. 7 shows a cross-section through a track profile.

As shown in fig. 1 a known roll-up safety grid consists of a number of mutually parallel track profiles 1, which at their ends are inserted into and slidable in guide rails 2 so that the grid can be moved in the vertical direction, up or down, by a not shown cylindrical roll by a tube motor in the top of the safety grid.

At their top and bottom the track profiles 1 are on their interior side embodied with cylindrical tracks 3 in the full length of the track profile 1. The tracks 3 have a number of swingably embedded bridge elements 4, which at their ends are embodied with hinge pins in the shape of beads 5. The bridge elements 4 connect the track profiles 1 to form a coherent grid. The bridge elements 4 have a uniform width and are held by cylindrical distance pieces, which are inserted into the tracks 3 with a fixed mutual distance.

The track profiles 1 are made of aluminium, and the bridge elements 4 may also be made of aluminium.

Between the bridge elements 4 there are openings 6 through which the objects displayed behind the safety grid can be viewed.

According to the invention and as shown in figs. 3-5 other bridge elements 4a are inserted in the safety grid between the first bridge elements 4. The bridge elements 4a are made from a glass-clear transparent material, preferably a polycarbonate, and they fill out the openings 6 and come to rest on and adjoin a preceding or following bridge element 4 along the edge 7 in the full length of the edge. As shown in fig. 5 the bridge elements 4 and 4a are held in position against each other by cylindrical lock pins 8. The bridge elements 4 and 4a thus combine to form a closed rim 9 between the track profiles. This rim 9 is at both ends, as shown in fig. 5, taken a distance into the guide rails 2.

The bridge elements 4 can be embodied with the same cross-sectional profile as the elements 4a, and they can be made of the same type of material.

As shown in fig. 4 the bridge elements 4 can have the same length as the bridge elements 4a.

As shown in fig. 6 a bridge element 4a according to the invention is embodied with a convex centre portion 10 and concave outer portions 11 which on the outside at their transition to the longitudinal

beads 5, which are embodied as a part of a cylinder, have a mutual tangent t_1 with the latter. The inclination of this tangent v_1 is less than or equal to the inclination v_2 of the tangent t_2 to the circular cross section in the tracks 3 at the outer edge 12 of the tracks. In the full length of the cross section between the longitudinal beads 5, the bridge elements 4a are of a uniform thickness t , which is less than the diameter of a bead 5.

A bridge element 4a with such a cross-sectional profile and produced from a transparent polycarbonate can have a great width and at the same time be impact proof.

Claims

1. Roll-up safety grid which consists of a number of mutually parallel track profiles (1) which are made of a light metal and inserted at the ends into guide rails (2), and of a number of bridge elements with a convex centre portion and with concave outer portions, which are of uniform width, curved towards the outside of the safety grid and being of equal lengths and arranged with the same mutual distance, and which at the ends have hinge pins embodied as beads (5) by means of which they are swingably hinged in longitudinal - inwardly open towards the internal side - cylindrical tracks (3) which are located at the top and bottom of the internal side of the track profile (1) and reaching in the full length of a track profile (1), **characterized** by the fact that between the first bridge elements (4) other bridge elements (4a) are inserted, which join up to and come to rest on the first bridge elements (4) edge (7) to edge in the full length of the edge (7), so that the bridge elements (4,4a) in combination form a closed rim (9) between the track profiles (1), the said rim (9) having a length so that it is carried a distance into the guide rails (2) in both sides, and that the other bridge elements (4a) are produced from a glass-clear transparent material, preferably a polycarbonate, and that the concave outer portions (11) of each bridge element (4a) at the transition to the longitudinal beads (5), which are embodied as a part of a cylinder, have a mutual tangent (t_1) with a bead (5), that the inclination (v_1) of the tangent (t_1) in the vertical position of the safety grid is less than or equal to the inclination (v_2) of the tangent (t_2) to the circular cross section in the tracks (3) at the outermost edge (12) of the tracks, and that the other bridge elements (4a) in the overall length of the cross section between the beads (5) are of a uniform thickness (t), which is less than the diameter of a bead (5).

2. Roll-up safety grid according to Claim 1 **characterized** by the fact that the first bridge elements (4) are made of the same material and have the same cross-sectional profile as the other bridge elements (4a). 5
3. Roll-up safety grid according to Claim 1 **characterized** by the fact that all bridge elements (4,4a) have the same width. 10

Patentansprüche

1. Sicherheitsrolladen aus einer Anzahl parallel angeordneter Profilschienen (1) aus Leichtmetall, die an den Endkanten in Gleitschienen (2) eingeführt sind und aus einer Anzahl Brückenelementen mit einem konvexen Mittelstück und konkaven Aussenseiten gleicher Breite und nach der Rolladenaussenseite hin gekrümmt, von gleicher Länge und in gleichem Abstand zueinander, an den Ecken mit Scharnierzapfen in Form von Wulsten (5) versehen, mit denen sie drehbar an längslaufenden - nach innen gegen die Rolladennenseite, offenen - zylinderförmigen Schienen (3) angeschlagen sind, die oben und unten an der Innenseite einer Profilschiene (1) angebracht sind und sich über die ganze Länge einer Profilschiene strecken, dadurch **gekennzeichnet**, dass zwischen den ersten Brückenelementen (4) andere Brückenelemente (4a) eingeschoben sind, die an die ersten Brückenelemente (4) anstossen und über die ganze Kantenlänge (7), Kante an Kante (7) anliegen, so dass die Brückenelemente (4,4a) zusammen zwischen den Profilschienen (1) eine geschlossene Verbrämung (9) bilden, die eine solche Länge hat, dass sie an beiden Seiten ein Stück in die Gleitschienen (2) eingeführt ist, dass die anderen Brückenelemente (4a) aus einem glasklaren, durchsichtigen Material, vorzugsweise aus einem Polycarbonat, hergestellt sind, und dass die konkaven Aussenseiten (11) jedes Brückenelementes (4a) im Übergang zu den längslaufenden Wulsten (5), die wie ein Zylinderteil ausgeformt sind, gemeinsame Tangente (t1) mit einer Wulste (5) bilden, dass die Neigung (v1) der Tangente (t1), wenn sich der Sicherheitsrolladen in senkrechter Stellung befindet, kleiner oder gleich gross ist mit der Neigung (v2) der Tangente (t2) zum kreisförmigen Querschnitt der äussersten Kante (12) der Schienen (3), und dass die anderen Brückenelemente (4a) über die ganze Länge des Querschnitts zwischen den Wulsten (5) eine gleichartige Dicke (t) hat, die kleiner ist als der Durchschnitt eines Wulstes (5). 15 20 25 30 35 40 45 50 55
2. Sicherheitsrolladen nach Anspruch 1, dadurch

gekennzeichnet, dass die ersten Brückenelemente (4) aus dem gleichen Material hergestellt sind und das gleiche Querprofil haben wie die anderen Brückenelemente (4a).

3. Sicherheitsrolladen nach Anspruch 1, dadurch **gekennzeichnet**, dass alle Brückenelemente (4,4a) die gleiche Breite haben.

Revendications

1. Grille de sécurité à enrouler constituée d'un nombre de profilés (1) parallèles, fabriqués en métal léger et introduits aux extrémités dans des rails de guidage (2) et d'un nombre d'éléments de liaison avec une partie médiane convexe et des parties extrêmes concaves de largeur identique qui se-courbent vers le côté extérieur de la grille de sécurité, qui sont de longueur identique et placées à distance identique les unes des autres et qui sont munies aux extrémités de pivots sous forme de boudins (5) au moyen desquels elles sont articulées sur des rails (3) longitudinaux - ouverts contre le côté intérieur de la grille de sécurité - et cylindriques, placés en haut et en bas sur le côté intérieur d'un profilé (1) et s'étendant sur toute la longueur d'un profilé, **caractérisée par le fait** qu'il a été inséré entre les premiers éléments de liaison (4) d'autres éléments de liaison (4a) qui s'adosent à et s'appuient sur les premiers éléments (4), bord (7) à bord sur toute la longueur du bord (7) de sorte que les éléments de liaison (4, 4a) forment-ensemble une bande fermée (9) entre les profilés (1), cette bande (9) étant suffisamment longue pour permettre son introduction dans les rails de guidage (2) placés sur les deux côtés, que les autres éléments de liaison (4a) sont faits avec un matériau transparent, de préférence un polycarbonate, et que les parties extrêmes concaves (11) de chaque élément de liaison (4a) présentent, à l'endroit où commencent les boudins à déplacement longitudinal, ceux-ci faisant partie d'un cylindre, une tangente (t₂) en commun avec un boudin (5), que l'inclinaison (v₁) de la tangente (t₂) - au moment où la grille de sécurité se trouve en position verticale - est inférieure ou égale à l'inclinaison (v₂) de la tangente (t₂) à la coupe transversale circulaire des rails (3) au bord extérieur (12) des rails et que les autres éléments (4a) sur toute l'étendue de la coupe transversale entre les boudins (5) ont une épaisseur (t) uniforme inférieure au diamètre d'un boudin (5). 15 20 25 30 35 40 45 50 55
2. Grille de sécurité à enrouler selon l'objet 1 **caractérisée par le fait** que les premiers éléments de liaison (4) sont faits avec le même matériau et

présentent le même profil de section que les autres éléments de liaison (4a).

3. Grille de sécurité à enrouler selon l'objet 1 **caractérisée par le fait** que tous les éléments (4, 4a) de liaison ont la même largeur. 5

10

15

20

25

30

35

40

45

50

55

5

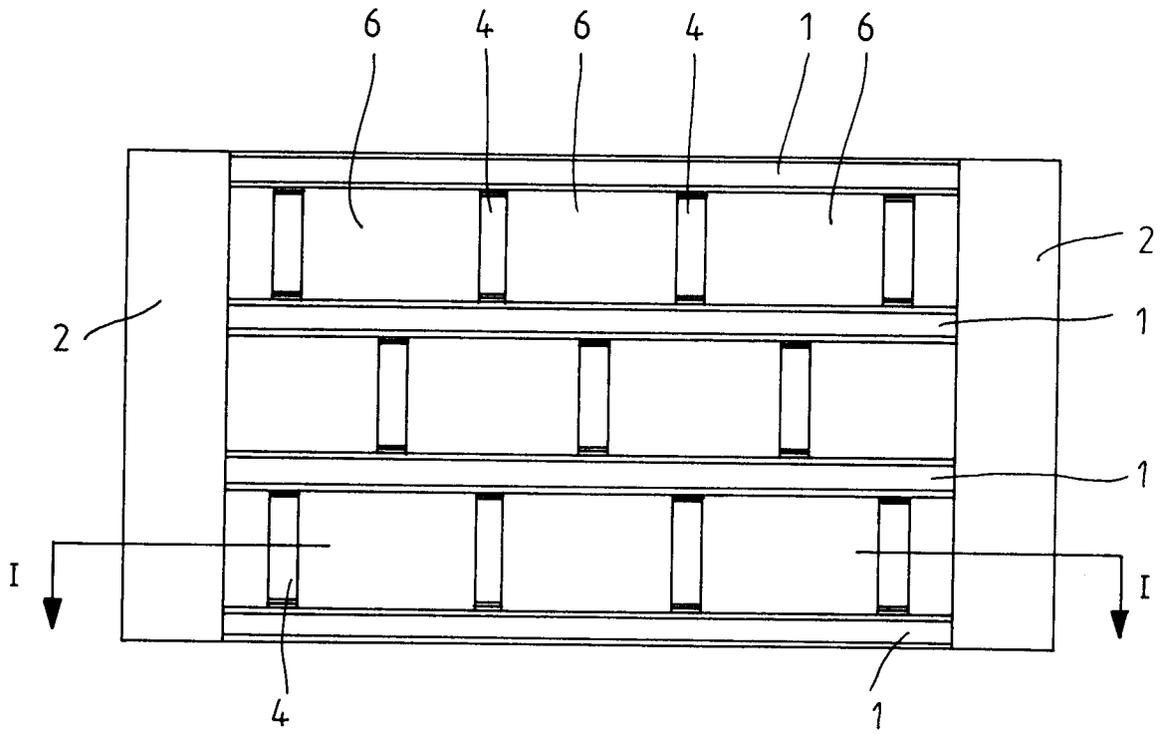


FIG 1

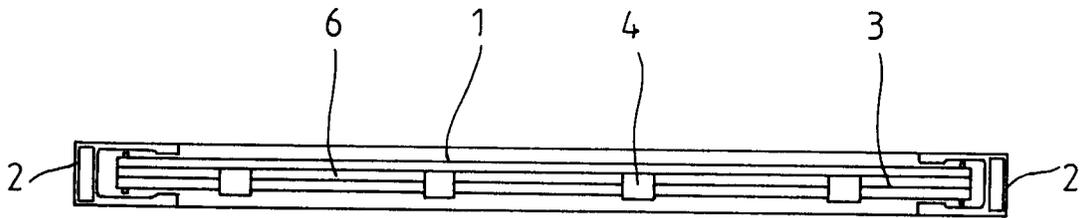


FIG 2

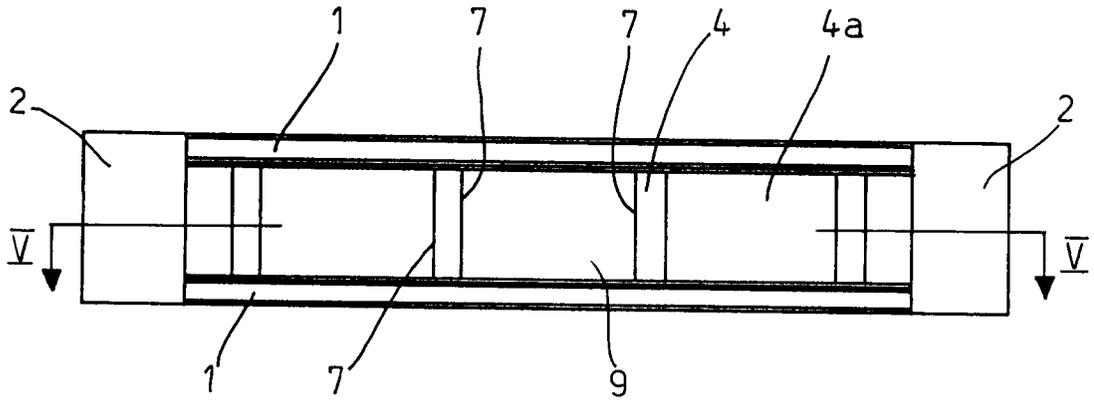


FIG 3

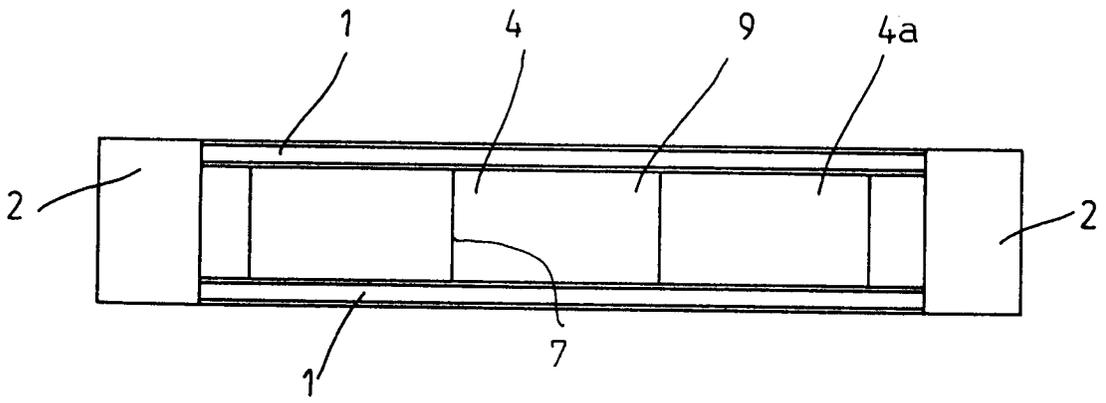


FIG 4

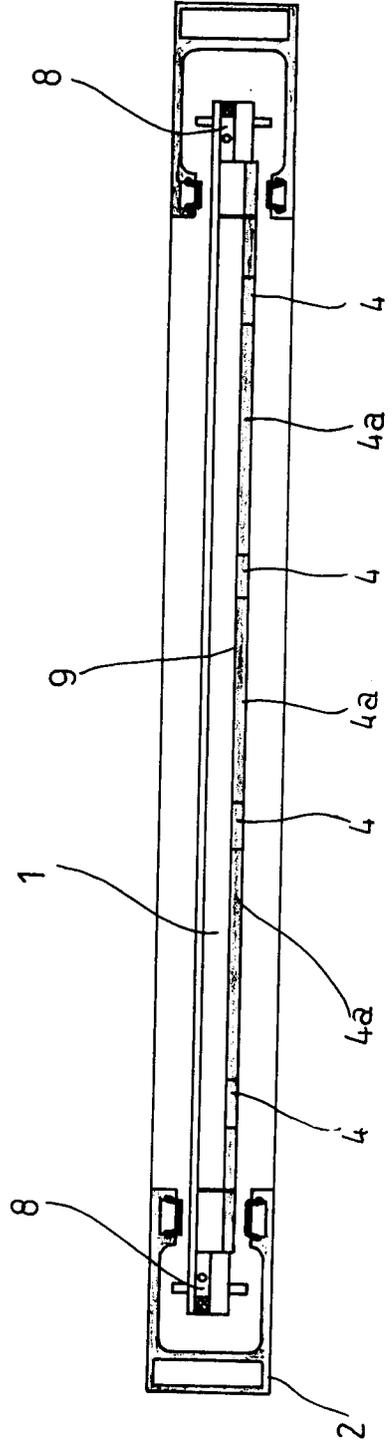


FIG 5

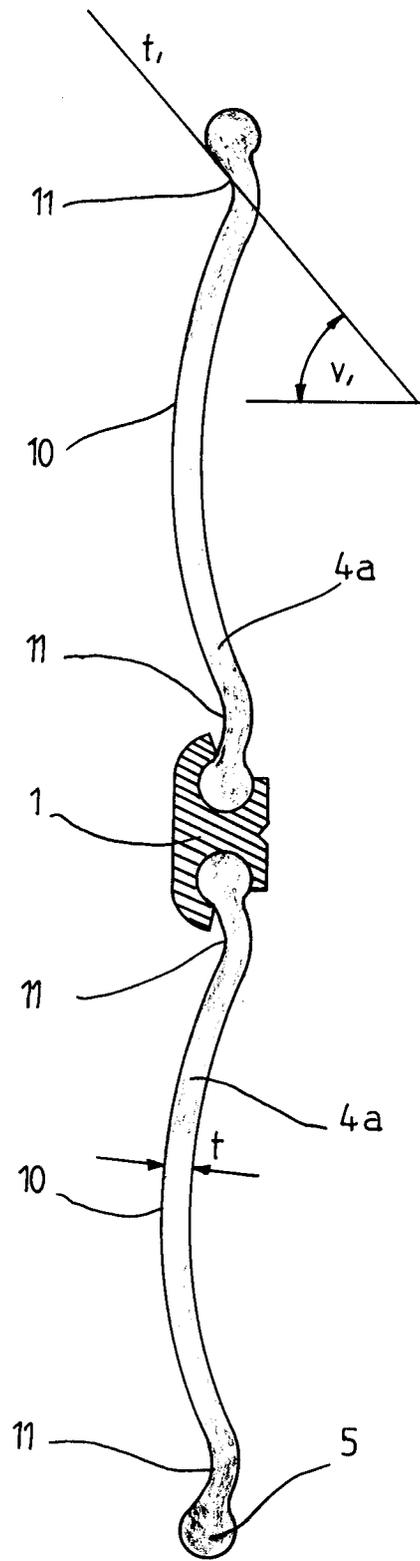


FIG 6

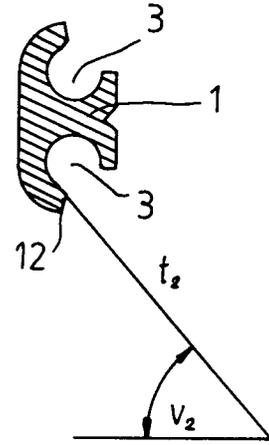


FIG 7