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(71) Applicant: **Lider-System Leszek Chyla**
64-000 Koscian (PL)

(72) Inventors:
- **Tomkiewicz, Jacek**
  62-032 Lubon (PL)
- **Chyla, Jaroslaw**
  64-000 Koscian (PL)

(54) A corner protector

(57) A corner protector, according to the invention, having the shape of one element in a shape of an angle which consists of two arms situated towards each other in an unbiased state at an angle larger than an angle of 90 degrees, moreover on the outer surface of the corner protector there are bulging reinforcing ribs, situated along longer sides of the arms, and among bulging reinforcing ribs there are stiffening ribs, which are situated along each arm from the top of the corner protector towards shorter side of the arm and these stiffening ribs are parallel to one another and to bulging reinforcing ribs, whereas on each arm there is a field with smooth surface and this field is situated among ribs and bulging reinforcing ribs, **characterised in that**, the stiffening ribs (6) coming out of the top (2) are joined by transversely situated partitions (12) which make transverse stiffening ribs, and the field (10), which is among ribs (6 , 8) and bulging reinforcing ribs(3) is situated below upper surface of bulging reinforcing ribs (3).

Bulging reinforcing ribs (3), in crosswise section, have a shape of a non-symmetrical trapezoid, in which a side (13), situated from the side of the stiffening ribs (6), is inclined towards the surface of arms (1) at smaller angle than angle of inclination of the side (14) situated from the side of the rim.

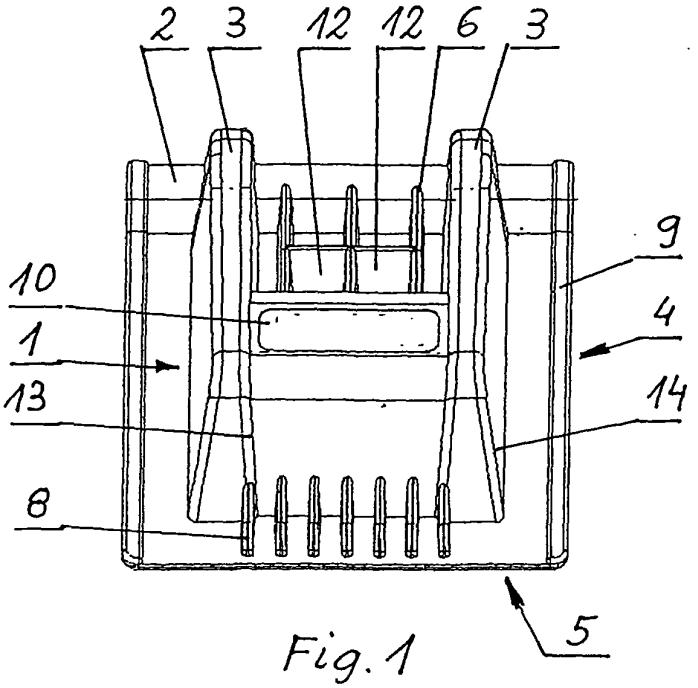

Fig. 1

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Description

[0001] This invention relates to a corner protector designed for protection of corner edges of cargoes during storage and transport.
The invention is used for protection of different materials, esspecially paper transported in columns, subjected to squeezing and to other damages, which may occur both during transport and storage.

[0002] A known corner protector has the shape of one element in a shape of an angle which consists of two arms situated towards each other in an unbiased state at an angle a little larger than an angle of 90 degrees.

[0003] The top of an angle, in a point of contact of two arms, is rounded.

[0004] On the outer surface of the corner protector there are bulging reinforcing ribs, situated along longer sides of the arms. The reinforcing ribs, with their ends are leant towards shorter sides of arms.

[0005] The reinforcing ribs make a full line passing also through a rounded top.

[0006] Among the reinforcing ribs there are situated narrow, straight, stiffening ribs, which are parallel to each other and to reinforcing ribs. The narrow straight, stiffening ribs are situated along each arm, from the top of the corner protector towards a shorter side of the arm, moreover, the ribs coming out of the top, are situated from the outer side and and they make ribs situated from the inner side which next make ribs situated from the outer side. The ribs, led from the top of the corner protector are elongated.

[0007] On each arm, among straight ribs, there is a field with a smooth upper surface, and this upper surface is situated on the same height as the upper surface of bulging reinforcing ribs.

[0008] The ribs, which are on the outer side, have a flat base from the inner side but fields with smooth surface, which are on the outer surface, have, from the inner side, ribs situated longitudinally relatively to longer sides of the corner protector.

[0009] From a side view, the tops of ribs, situated from the outer side make concave lines, and the tops of ribs situated from the inner side make convex lines.

[0010] The rims of longer arms of the corner protector are thickened.

[0011] On surfaces of the outer arms of the corner protector one places a belt which fastens a cargo. The belt is situated on the ribs between bulging reinforcing ribs and it is situated on the field with a smooth surface which is on the same surface as the upper surface of the bulging reinforcing ribs.

[0012] The corner protector is made of plastics. After pulling belts, the arms of the corner protectors deform in such a way, that they ensure pressure to sides of a cargo.

[0013] It happens, that in view of occuring of stresses which arrise as a result of tightening of the belts fastening a cargo and as a result of vibrations, which occur during transport, insignificant deformation of the corner protector takes place in the area, among the top and bulging reinforcing ribs,in which narrow and oblong and stiffenig ribs are situated.

[0014] Construction of ribs, in the mentioned area does not protect in the righ way against forming of this phenomenon. Moreover, part of the belt, which is situated on the field with a smooth surface has tendency to side slipping off, which may cause complete slipping of the belt from the corner protector during transport. All this makes working inconveniences of corner protectors as known so far because it may cause increase of risk of damage of cargo connected with deformation of corner protector in the mentioned area and slipping of the belt which fastens cargo.

[0015] In order to eliminate the above inconveniences, one designed a corner protector which construction and disposal of ribs decidedly decrease possibility of occurrence of deformation of the corner protector and protect against side slipping of the belt, which fastens a cargo, from the corner protector.

[0016] A corner protector, according to the invention, having the shape of one element in a shape of an angle which consists of two arms situated towards each other in an unbiased state at an angle larger than an angle of 90 degrees, moreover on the outer surface of the corner protector there are bulging reinforcing ribs situated along longer sides of the arms, and among bulging reinforcing ribs there are stiffening ribs, which are situated along each arm from the top of the corner protector towards shorter side of the arm and these stiffening ribs are parallel to one another and to bulging reinforcing ribs, whereas on each arm there is a field with smooth surface and this field is situated among ribs and bulging reinforcing ribs, **characterised in that**, the stiffening ribs coming out of the top are joined by transversely situated partitions which make transverse stiffening ribs, and the field, which is among ribs and bulging reinforcing ribs is situated below upper surface of bulging reinforcing ribs.

[0017] Bulging reinforcing ribs, in cross section, have the shape of a non-symmetrical trapezoid, in which a side, situated from the side of the stiffening ribs, is inclined towards the surface of arms at smaller angle than angle of inclination of the side situated from the side of the rim.

[0018] From the side view, tops of ribs, situated from outer and inner side, make straight lines.

[0019] Additional transverse ribs, situated among longitudinally situated stiffening ribs, increase stiffness in this area of the corner protector and thus decreases possibility of occurrence of deformation near the top of the corner protector. Construction of stiffening ribs and bulging reinforcing ribs in the corner protector, according to the invention prevents damage of corner edges of transported cargo, esspecially paper in colums. Lowered position of a field towards the upper surface of bulging reinforcing ribs makes a seat, in which one may effectivelly mount a belt fastening a cargo and thus prevent slipping of the belt from the arms of the corner edge protector.

[0020] The invention is represented in the example, on the drawing, on which fig.1 shows a corner protector from the front view, fig 2 - a corner protector from above, fig. 3 - a corner protector from the side view, fig 4 - a corner protector from the perspective view, fig.5 - a corner protector the view from bellow, fig.6 - a corner protector in the longitudinal section A-A, marked on fig 2, fig .7 - a corner protector in the transverse section B-B, marked on fig.2, and fig.8 - the corner protector in the transverse section C-C , marked on fig.2.

[0021] The corner protector, according to the invention is made of plastic and has the shape of one element in a shape of an angle which consists of two arms 1 situated towards each other in an unbiased state at an angle a little larger that an angle of 90 degrees. The top 2 of an angle , in a point of contact of two arms 1 is rounded. On the outer surface of the corner protector there are bulging reinforcing ribs 3 situated along longer sides 4. The bulging reinforcing ribs 3 , with their ends are leant towards shorter sides 5 of arms 1. The bulging reinforcing ribs 3 make a full line line passing also through a rounded top 2.

[0022] Among bulging reinforcing ribs 3 there are situated stiffening ribs, which are situated in parallel to one other and to bulging reinforcing ribs 3. Stiffening ribs are situated along each arm 1 from the top 2 of the corner protector towards a shorter side 5 of an arm 1, moreover ribs 6 coming out of the top 2 are situated from the outer side and they make ribs 7 situated from the inner side, which next make ribs 8 situated from the outer side. The rims of longer sides 4 of arms 1 are thickened and they make an element 9 sticking outside a surface.

[0023] On each arm 1 , among ribs 6 , situated from outer side, and ribs 8 which are also situated from outer side, there is a field 10 with a smooth surface, which is situated bellow the upper surface of bulging reinforcing ribs 3.

[0024] The ribs 6, which are on the outer side, have a flat base 11 from the inner side but fields 10 with smooth surface situated on the outer surface have, from the inner side, ribs 7 which are situated longitudinally relatively to longer sides 4 of the corner protector.

[0025] The stiffening ribs 6 coming out of the top 2 are connected by transversely situated partitions 12 which make transverse stiffening ribs. Bulging reinforcing ribs 3 , in crosswise section, have a shape of a non-symmetrical trapezoid, in which a side 13 , situated from sides of stiffening ribs 6, is inclined towards the surface of arms 1 at a smaller angle than an angle of inclination of a side 14 situated from the side of a rim.

[0026] From a side view tops 15 of ribs 6, 7, 8, situated from outer and inner side, make straight lines.

[0027] Among bulging reinforcing ribs 3 there are three stiffening ribs 6 which next make also three ribs 7 situated from the inner side.

[0028] One puts a corner protector on corner edges of carried cargo. The belt, which fastens the cargo, one puts on outer surfaces of arms 1 in such a way that the belt takes place on ribs 6 between bulging reinforcing ribs 3 and on a field 10 with a smooth surface between bulging reinforcing ribs 3.

[0029] After tightening fastening belts, a corner protector deforms and presses with its arms 1 against sides of a cargo, by means of which the belt in corner edges does not have direct contact with a cargo.

Claims

1. A corner protector, having the shape of one element in a shape of an angle which consists of two arms situated towards each other in an unbiased state at an angle larger than an angle of 90 degrees, moreover on the outer surface of the corner protector there are bulging reinforcing ribs situated along longer sides of the arms, and among bulging reinforcing ribs there are stiffening ribs, which are situated along each arm from the top of the corner protector towards shorter side of the arm and these stiffening ribs are parallel to one another and to bulging reinforcing ribs, whereas on each arm there is a field with smooth surface and this field is situated among ribs and bulging reinforcing ribs, **characterised in that**, the stiffening ribs (6) coming out of the top (2) are joined by transversely situated partitions (12) which make transverse stiffening ribs, and the field (10), which is among ribs (6 , 8) and bulging reinforcing ribs (3) is situated below upper surface of bulging reinforcing ribs (3).

2. A corner protector, according to claim 1, **characterised in that,** bulging reinforcing ribs(3), in cross section, have the shape of a non-symmetrical trapezoid, in which a side (13), situated from the side of the stiffening ribs (6), is inclined towards the surface of arms (1) at smaller angle than angle of inclination of the side (14) situated from the side of the rim.

3. A corner protector, according to claim 1, **characterised in that**, from the side view, tops (15) of ribs (6 , 7 , 8), situated from outer and inner side, make straight lines.

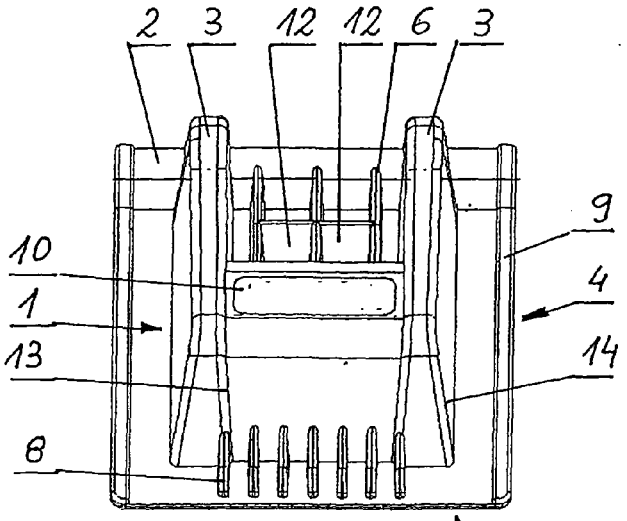

Fig. 1

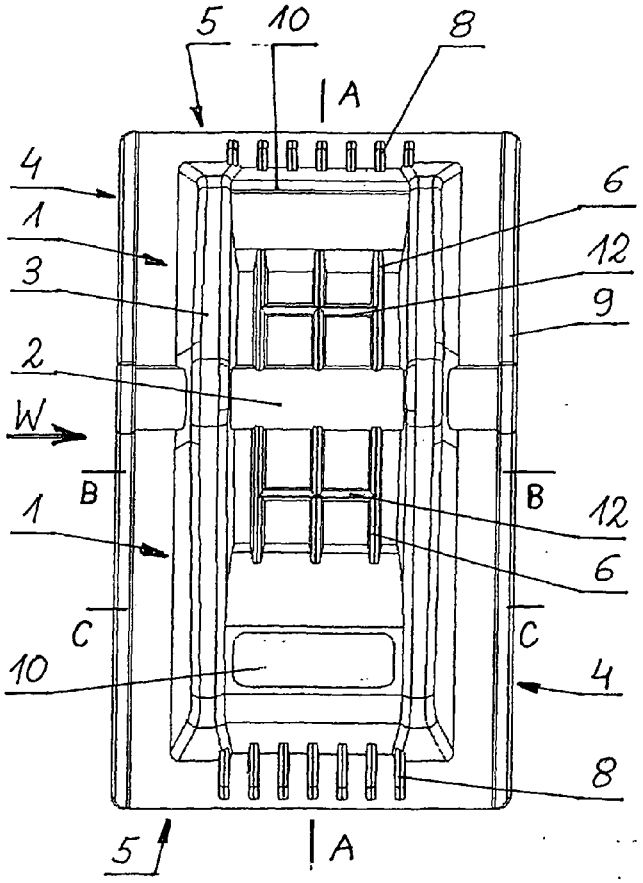

Fig. 2

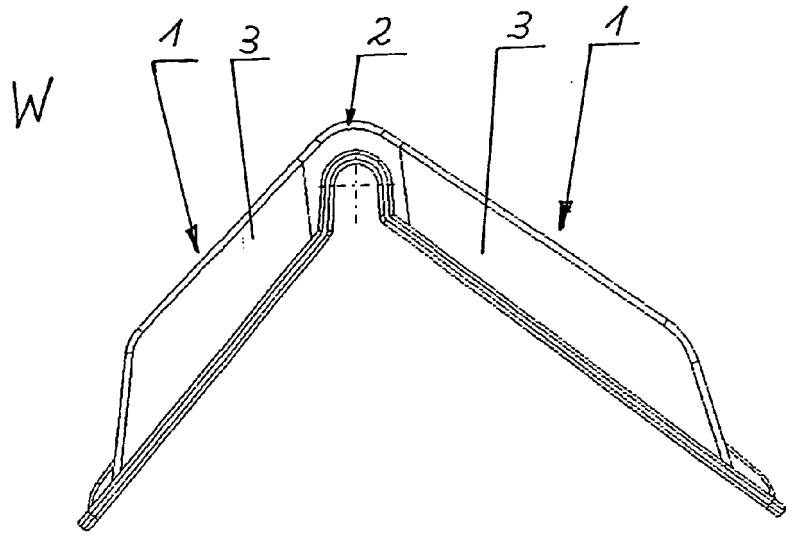

Fig. 3

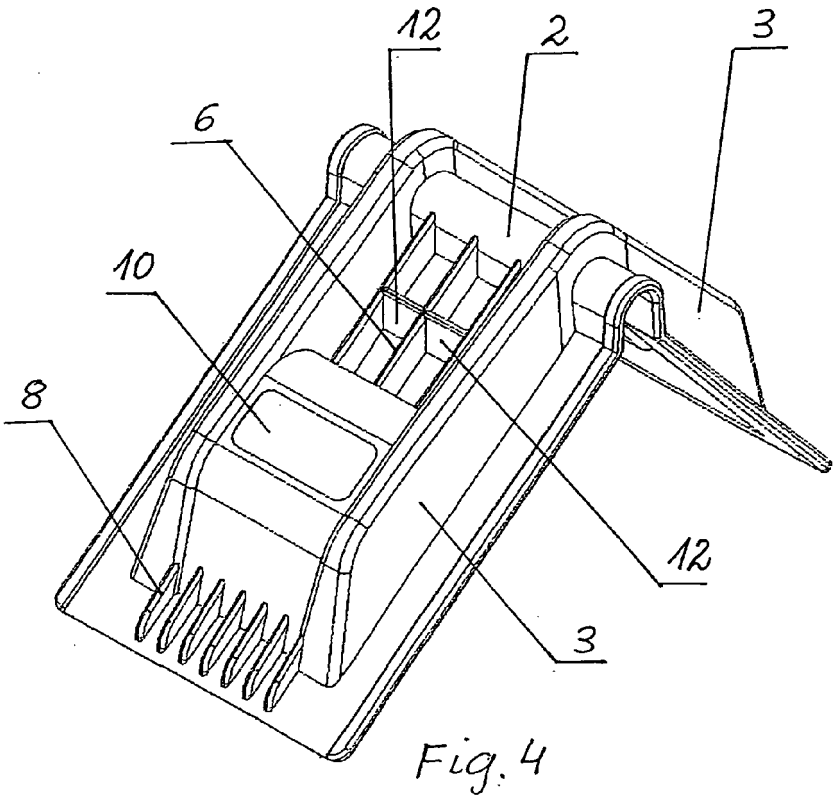

Fig. 4

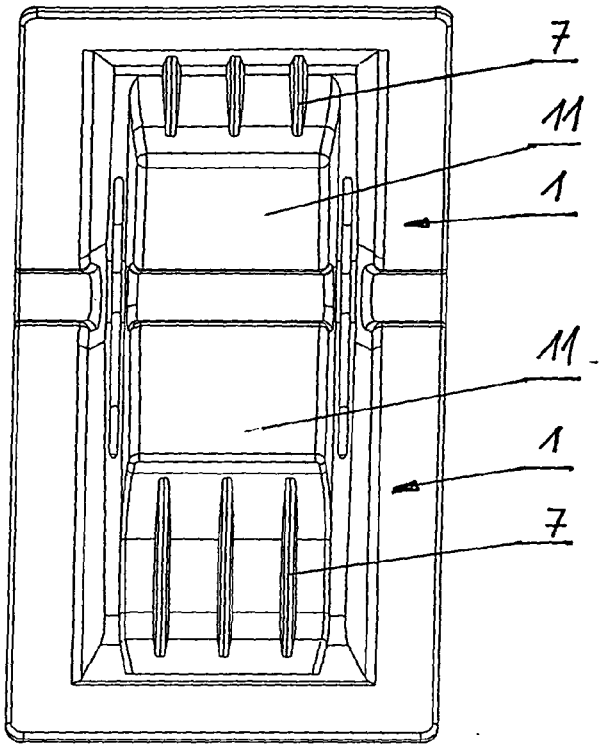

Fig. 5

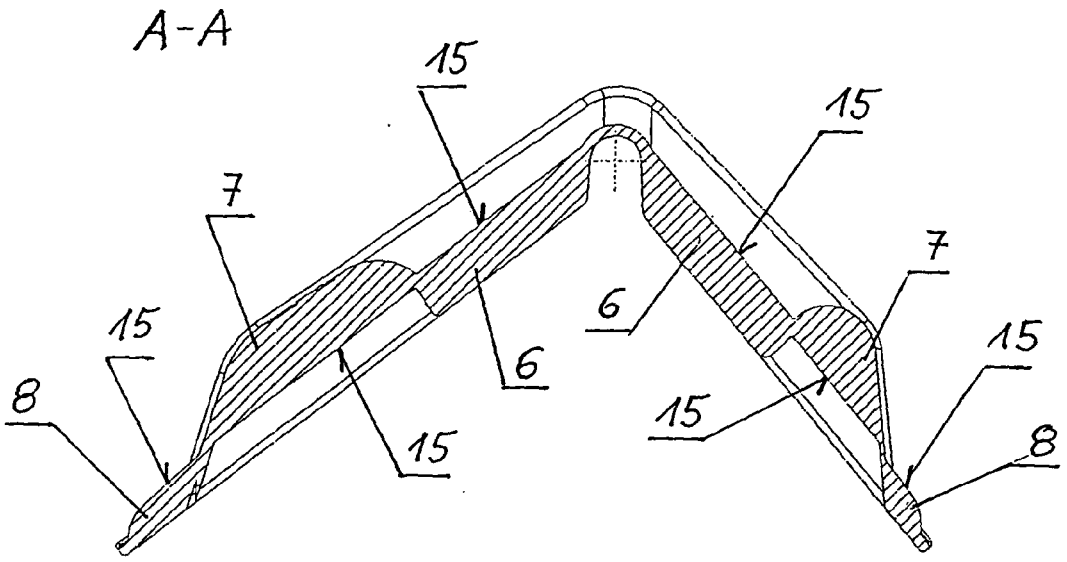

Fig. 6

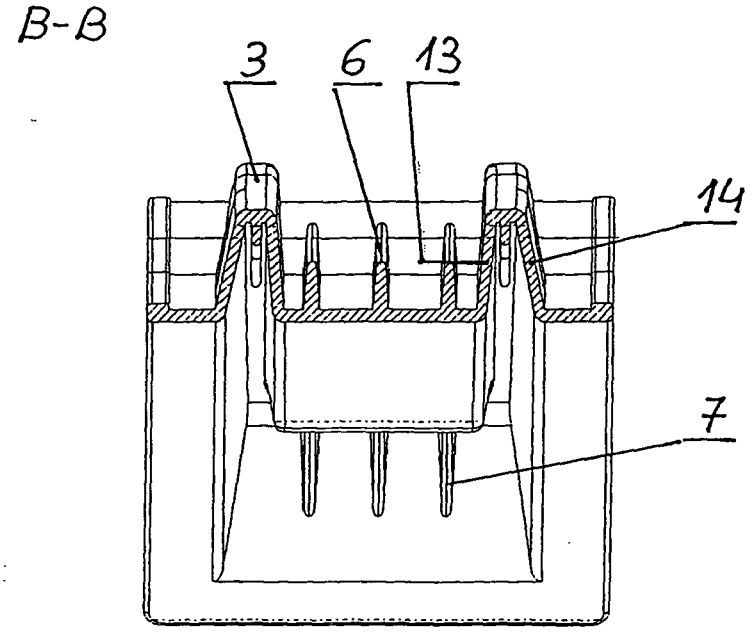

Fig. 7

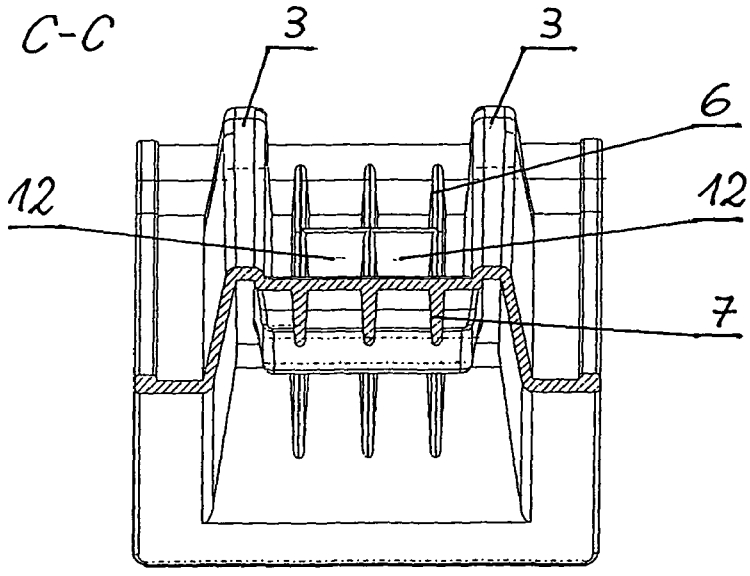

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 09 46 0027

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 94/10058 A1 (HARTMANN AS BRDR [DK]; RASMUSSEN TORBEN [DK]; KJELDSEN IB JORGEN [DK];) 11 May 1994 (1994-05-11) * figure 1 *	1	INV. B65D81/05
A	DE 201 17 852 U1 (THIESSEN UWE [DE]) 10 January 2002 (2002-01-10) * figure 2 *	1	
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			TECHNICAL FIELDS SEARCHED (IPC)
			B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	2 November 2009	Jervelund, Niels

CATEGORY OF CITED DOCUMENTS

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