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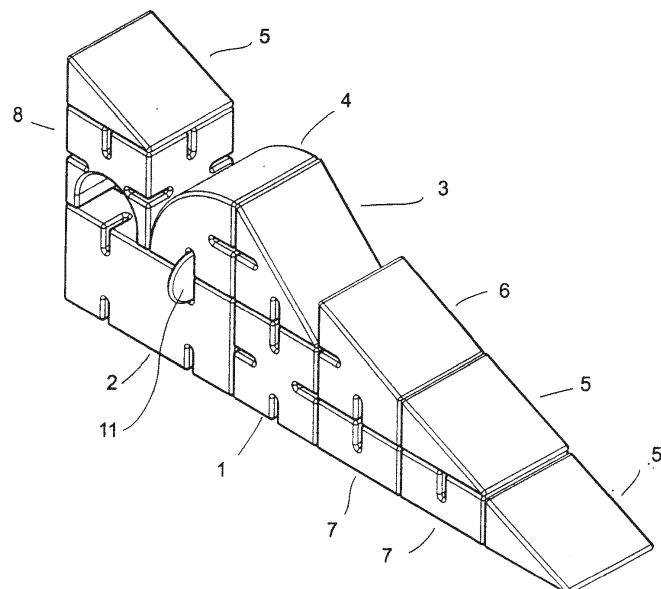
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**(54) PLAY TOY IN THE FORM OF INTERCHANGEABLE BLOCKS AND METHOD FOR LOCKING
INTERCHANGEABLE BLOCKS**

(57) Invention Patent for a set of interchangeable blocks, intended for the field of toys, toys that promote motor skills, toys that promote the planning and construction concepts, the blocks (1, 2, 3, 4, 5, 6, 7 and 8) are formed from a basic geometry of the cube block (1) comprised of rounded edges (9) and, at the common edge of two adjacent faces (A and B and / or B and C and / or A and C and / or A and D and / or A and E and

/ or F and B and / or F and C and / or F and D and / or F and E), perpendicularly to mentioned faces, at least one tight canal (10) adapted to a portion (111) of the locking disc (11); called cube block (1) presents itself in the shape of the parallelepipedic block (2), scalene block (3), bulged triangular block (4), a rectangular triangle block (5), a trapezoidal block (6), a half cube block (7) and portal block (8).

Figure 1



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Description**FIELD OF INVENTION**

[0001] The present invention relates to a toy, more specifically a set of interchangeable blocks with locking method by means of an additional device, allowing to set up any ludic scenario in view of the different configurations of the forms in which it is presented, intended for the field of toys, toys that promote motor skills, toys that promote the plannification and construction concepts.

BACKGROUND OF THE INVENTION AND PRIOR ART

[0002] It remounts to the year of 1693, the first references to toys in the blocks formats. There are wood models with different shapes that were stacked in order to form something. In order to improve the experience and to increase the time of exposure of the model, some people have created fitting solutions between those modules or blocks.

[0003] A solution can be understood by patent application US349646, issued 21/09/1886, entitled BLOCK, which claimed, a rectangular block with grooves on the top, which conform to multiple squares, adapted and designed to receive lower edges from other corresponding blocks.

[0004] This solution came to be staggered and produced in many different forms in the product of the manufacturer INTERLEGO, with numerous patents dating, as from the middle of the 20th century.

[0005] A different form of interlocking is disclosed in U. S. Patent 3822499, issued July 9, 1974, entitled TOY BUILDING BLOCK SUITABLE FOR A PAD, RAFT OR THE LIKE which claimed a plurality of semi rigid blocks to form a floating cushion or raft, each block being cube-shaped, and may have truncated corners. The faces are provided with a hole to receive detachable elements with cylindrical body with spherical heads, allowing it to be attached to another block, with the head inserted in its hole.

[0006] The national patent application, PI9402723-4, published on 04/02/1996, entitled TOY, claimed a toy made of rectangular blocks, each equipped with ditch, on its bottom, symmetrical to spike at the top to coupling adjacent blocks.

[0007] To the models listed, their relevance lies in the stacking form and lateral predisposition. The model discussed in US349646, like the clear majority of existing blocks, has a face provided with a protruding device and a face with symmetrical recess or that allows it to receive and interlock the mentioned protruding device. The US3822499 document, in turn, requires a certain coupling ability between the components, in that, when the detachable member is inserted in the first block, by compression of the ball head into the bore, the free, opposing head, upon compression of an adjacent block, may press the head into the block to which the other head inter-

locked. Although the body is solid and the mentioned hole has a limited depth, in view of the structural conformation of the block in semi-rigid material, it may cause failure of the head to be coupled with the corresponding hole. Another drawback of the listed models, except for PI9402723-4, as well as most interchangeable block toy models, is that the improved locking requires a greater effort and technique of the child, incurring in frustration that can trigger momentary and, even continuous stress, if successive attempts fail.

ABSTRACT OF THE INVENTION

[0008] Taking into account the known elements, the inventor has developed the present toy, object of this patent application, hereinafter referred to as **LUDIC TOY IN INTERCHANGEABLE BLOCKS AND INTERCHANGEABLE BLOCK LOCKING METHOD** and which is synthesized by blocks in polymeric material, formed from a basic quadrangular geometry of a cube with rounded edges, having projected at the common edge of two adjacent faces, centered perpendicularly to mentioned faces, at least one narrow, rounded canal, whose geometry is adapted to a portion which is equal to $\frac{1}{4}$ of a locking device, the thickness of which is equal to or greater than the width of mentioned canal. The block may have the shape of a cube, extended to form a parallelepiped or, furthermore, with a triangular scalene profile, with triangular profile having bulging on the larger face, with trapezoidal profile, half cube or cube with cavity. The toy is complemented with locking elements in the form of a disc, half disc or polygonal (quadrilateral, pentagonal, hexagonal, octagonal, among others). The method of interaction with the toy, consists of a juxtaposition of two or more blocks, aligning at least one canal of each, coupling a locking device and, if desired, juxtaposing other blocks, directing one of its canals, against the exposed portion of the locking device, which has the function of providing the immobilization and alignment between adjacent blocks, dispensing accurate technique for the engagement and undocking of the parts. Blocks and locking device may be in polymeric material of varying densities, having smooth or textured surface to improve grip for handling, in differentiated colors between each of the blended elements, patterns or colors.

[0009] The benefits of this toy in interchangeable block format with flattened locking device are extensive: it aids in the construction of force on the fingers and hands, improving coordination between the eye and the hand, without requiring too much effort; encourages the child to make friends and cooperate; encourages the interaction and imagination of the child, combined with increased creativity with stimulation in the design and construction of assemblies; intellectually, the child develops mental and vocabulary potential, describing shapes, sizes, colors and positions; in grouping elements, the child develops mathematical skills, adding or subtracting; sharpens their perception of disposition and alignment

between the blocks; expands your experience with gravity, balance and geometry learned from the blocks toy.

FIGURES THAT ILLUSTRATE THE OBJECT OF THE PATENT APPLICATION

[0010] Hereinafter, the object of this patent application will be detailed, also with jointed numerical references to the following description, without intending a restriction regarding the proportions and materials that will be used in its industrial manufacture, where:

Figures 1 and 2 are respectively top and bottom perspective views of a multi-geometry block assembly having locking devices in their forms, coupled, for the interaction understanding, between the blocks and the locking method;

Figure 3 is an enlarged view of detail A of Figure 2; Figures 4 and 5 are orthogonal, respectively, front and lower, views of an assembly of several blocks of different geometries;

Figure 6 is a cross-sectional view of Figure 5;

Figure 7 is an enlarged view of detail A of Figure 6;

Figure 8 is a top perspective view of a block, in the shape of a cube;

Figure 9 is a top perspective view of a block, in parallelepiped format;

Figures 10 and 11 are perspective views, of opposite angles, of a block with triangular profile;

Figures 12 and 13 are perspective views, of opposite angles, of a block with a triangular profile and a larger bulged face;

Figures 14 and 15 are perspective views, of opposite angles, of a block with rectangular profile;

Figures 16 and 17 are perspective views, of opposite angles, of a block with trapezoidal profile;

Figures 18 and 19 are perspective views, of opposite angles, of a block with half-cube profile;

Figures 20 and 21 are perspective views, of opposite angles, of a block, in the shape of a cube with cavity for forming a portal;

Figures 22 and 23 are perspective views, of opposite angles, of a block, in the shape of a cube with cavity for forming a portal;

Figure 23 is a perspective view of the disk-shaped locking device;

Figures 24 and 25 are orthogonal, respectively, front and profile views of the disk-shaped locking device;

Figure 26 is a perspective view of the locking device, in its half-moon or half-disc variant.

DETAILED DESCRIPTION OF THE INVENTION

[0011] According to the above figures, the **LUDIC TOY IN INTERCHANGEABLE BLOCKS AND INTERCHANGEABLE BLOCKS LOCKING METHOD**, a major object of this patent application, comprises blocks (1, 2, 3, 4, 5, 6, 7 and 8) shaped to from a basic geometry -

see Figure 8, of the cube block (1) with rounded edges (9); those blocks (1, 2, 3, 4, 5, 6, 7 and 8) are provided at the common edge of two adjacent faces (A and B and / or B and C and / or A and C and / or A and D and / or A and E and / or F and B and / or F and C and / or F and D and / or F and E), those blocks (1, 2, 3, 4, 5, 6, 7 and 8) are provided at the common edge of two adjacent faces (A and B and / or B and C and / or A and C and / or A and D and / or A and E and / or F and B and / or F and C and / or F and D and / or F and E), centrally, perpendicularly to mentioned faces, at least one canal (10) narrow and rounded (101), the radius of which has its axis (102), centered, at the intersection of the faces; the geometry of the canal (10) conforms to a portion (111) which is equivalent to at least $\frac{1}{4}$ - see Figure 24 - of the locking device (11) or half of the locking device (12), with a thickness equal to or greater than the width of mentioned canal (10). Mentioned block, in addition to the basic form, of cube (1), presents variants of the parallelepipedic block (2), which consists of doubling the width of the cube block (1); scalene block (3), with triangular scalene profile, from the angular cut, at 45 degrees from the cube block (1); bulged triangular block (4), from the angular cut on, at 45 degrees of the cube block (1), with rounding of the larger face (41); Rectangle triangle block (5), from the angular cut on, of half the cube block (1); a trapezoidal block (6), constructed from the cube block on (1) with angular cut, from the upper end to the median portion (M) of the cube block (1); half cube block (7) is obtained from the parallel cut with any of the faces, in the medial portion (M), of half of the cube block (1); and the portal block (8) consists of the geometry of the cube block (1), providing it with cavity (81).

[0012] A preferred construction form of the blocks (1, 2, 3, 4, 5, 6, 7 or 8) comprises forming 12 (twelve) canals (10) in the cube block (1); the conformation of 12 (twelve) canals (10) in the parallelepipedic block (2); the conformation of 5 (five) canals (10) in the scalene block (3); the conformation of 5 (five) canals (10) in the bulged triangular block (4); the conformation of 1 (one) canal (10) in the rectangular triangle block (5); the conformation of 6 (six) canals (10) in the trapezoidal block (6); the conformation of 4 (four) canals (10) in the half cube block (7) and the conformation of 8 (eight) canals (10) in the portal block (8). A variant - not shown - of the parallelepiped block (2), provides for the conformation of 16 (sixteen) canals (10).

[0013] The method of blocks locking (1 and / or 2 and / or 3 and / or 4 and / or 5 and / or 6 and / or 7 and / or 8) comprises the juxtaposition of at least two blocks, aligning to at least one canal (10) of each, coupling a locking device (11) or a half locking device (12) and, if desired, juxtaposing other blocks, directing one of its canals, against the exposed portion of the locking device (11 or 12). The locking device (11) allows the locking of up to 4 (four) adjacent blocks (1 and / or 2 and / or 3 and / or 4 and / or 5 and / or 6 and / or 7 and / or 8) or, by means of the locking device (12), the locking of up to 2

adjacent blocks is achieved (1 and / or 2 and / or 3 and / or 4 and / or 5 and / or 6 and / or 7 and / or 8). Each block (1, 2, 3, 4, 5, 6, 7 or 8) or locking device (11 or 12) may have a smooth or textured surface to improve grip for handling, in differentiated colors between each of the blended elements, patterns or colors. Other shapes, having as basic geometry - see Figure 8, the cube block (1) and shaped or not, by canal(s) (10) may have for example, a profile with corrugations, repeated triangles, channels, arcs, passing borehole to the opposite face, holes, pyramidal geometry, cylindrical geometry. The locking device (11 or 12) can be replaced by a device with a polygonal shape (pentagonal, hexagonal, octagonal), for example, whole or divided in half, thus fitting the geometry of the canal (10). A preferable form of canal geometry, comprises a right angle, which allows accommodating the locking device in its various polygonal shapes (pentagonal, hexagonal, octagonal).

Claims

1. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, a set of interchangeable blocks, intended to the field of toys, toys that promote motor skills, toys that promote the planification and construction concepts, **typified** by the fact that the blocks (1, 2, 3, 4, 5, 6, 7 and 8) are formed from a basic geometry, of the cube block (1) comprised by rounded edges (9) and, at the common edge of two adjacent faces (A and B and / or B and C and / or A and C and / or A and D and / or A and E and / or F and B and / or F and C and / or F and D and / or F and E), perpendicularly to mentioned faces, at least one narrow canal (10) adapted to a portion (111) which is equivalent to at least $\frac{1}{4}$ of the locking device (11); comprises a parallelepipedal block (2) with a width greater than its height and length; comprises a scalene block (3), with a triangular scalene profile, from the angular cut, at 45 degrees from the cube block (1); comprises bulged triangular block (4), from the angular cut on, at 45 degrees of the cube block (1), with rounding of the larger face (41); comprises rectangular triangle block (5), from the angular cut, of half of the cube block (1); comprises a trapezoidal block (6) from the cube block (1) with angular cut, from the upper end to the median portion (M) of the cube block (1); comprises a half cube block (7), from the parallel cut to either side, in the median portion (M), of half the cube block (1); comprises a portal block (8), from the cube block (1), with a cavity (81);
2. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that the canal (10) is centered on the common edge of two adjacent faces (A and B and / or B and C and / or A and C and / or A and D and / or A and E and / or F and B and / or F and C and / or F and D and / or F and E);

3. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that the canal (10) comprises a rounding (101), the radius of which has its axis (102) centered, at the intersection of the faces;
4. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that the canal (10) comprises a right angle in its depth;
5. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that the canal (10) comprises a polygonal, pentagonal, hexagonal, octagonal shape;
6. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that the locking device (11) comprises the flat-disc shape;
7. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that the locking device (11) comprises the half-disc shape;
8. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that the locking device (11) comprises a polygonal, pentagonal, hexagonal, octagonal shape;
9. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that the thickness of the locking device (11) is equal to the width of the canal (10);
10. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that the thickness of the locking device (11) is greater than the width of the channel (10);
11. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that the width of the parallelepipedal block (2) comprises twice the width of the cube block (1);
12. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that it comprises the conformation of 12 (twelve) canals (10) in the cube block (1) and in the parallelepipedic block (2);
13. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**, according to claim 1, **characterized by** the fact that it comprises the conformation of 16 (sixteen) canals (10) in the parallelepipedic block (2);
14. **LUDIC TOY IN INTERCHANGEABLE BLOCKS**,

according to claim 1, characterized by the fact that it comprises the conformation of 5 (five) canals (10) in the scalene block (3) and in the bulged triangular block (4);

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15. LUDIC TOY IN INTERCHANGEABLE BLOCKS,
according to claim 1, characterized by the fact that it comprises the conformation of 1 (one) canal (10) in the Rectangle triangle block (5);

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16. LUDIC TOY IN INTERCHANGEABLE BLOCKS,
according to claim 1, characterized by the fact that it comprises the conformation of 6 (six) canals (10) in the trapezoidal block (6);

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17. LUDIC TOY IN INTERCHANGEABLE BLOCKS,
according to claim 1, characterized by the fact that it comprises the conformation of 4 (four) canals (10) in the half-cube block (7);

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18. LUDIC TOY IN INTERCHANGEABLE BLOCKS,
according to claim 1, characterized by the fact that it comprises the conformation of 8 (eight) canals (10) in the portal block (8);

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19. INTERCHANGEABLE BLOCKS LOCKING METHOD, according to precedent claim 1, characterized by the fact that the locking method of the blocks (1) and / or 2 and / or 3 and / or 4 and / or 5 and / or 6 and / or 7 and / or 8) comprises juxtaposing at least two blocks, aligning at least one canal (10) of each, coupling a locking device (11) or a half locking device (12) and, if desired, juxtaposing other blocks, directing one of its canals, against the exposed portion of the locking device (11 or 12). 30 35

20. INTERCHANGEABLE BLOCKS LOCKING METHOD, according to precedent claims 1 and 19, characterized by the fact that the locking device (11) comprises the locking of up to 4 (four) adjacent blocks (1 and / or 2 and / or 3 and / or 4 and / or 5 and / or 6 and / or 7 and / or 8); the half locking device (12), comprises the locking of up to 2 (two) adjacent blocks (1 and / or 2 and / or 3 and / or 4 and / or 5 and / or 6 and / or 7 and / or 8). 40 45

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Figure 1

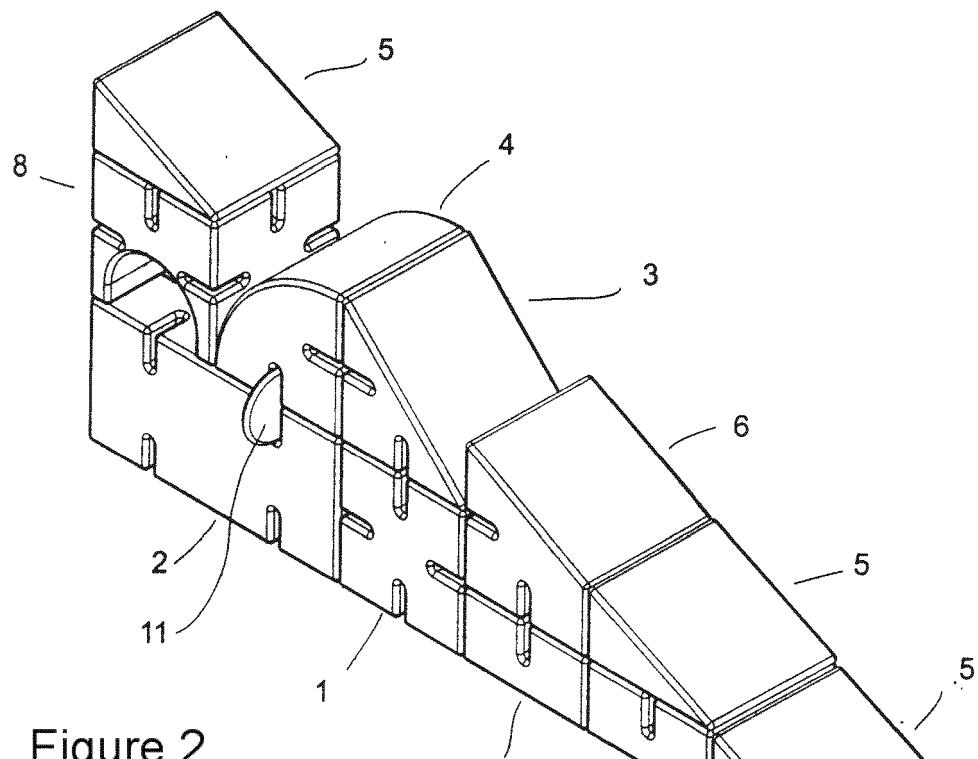


Figure 2



Figure 3

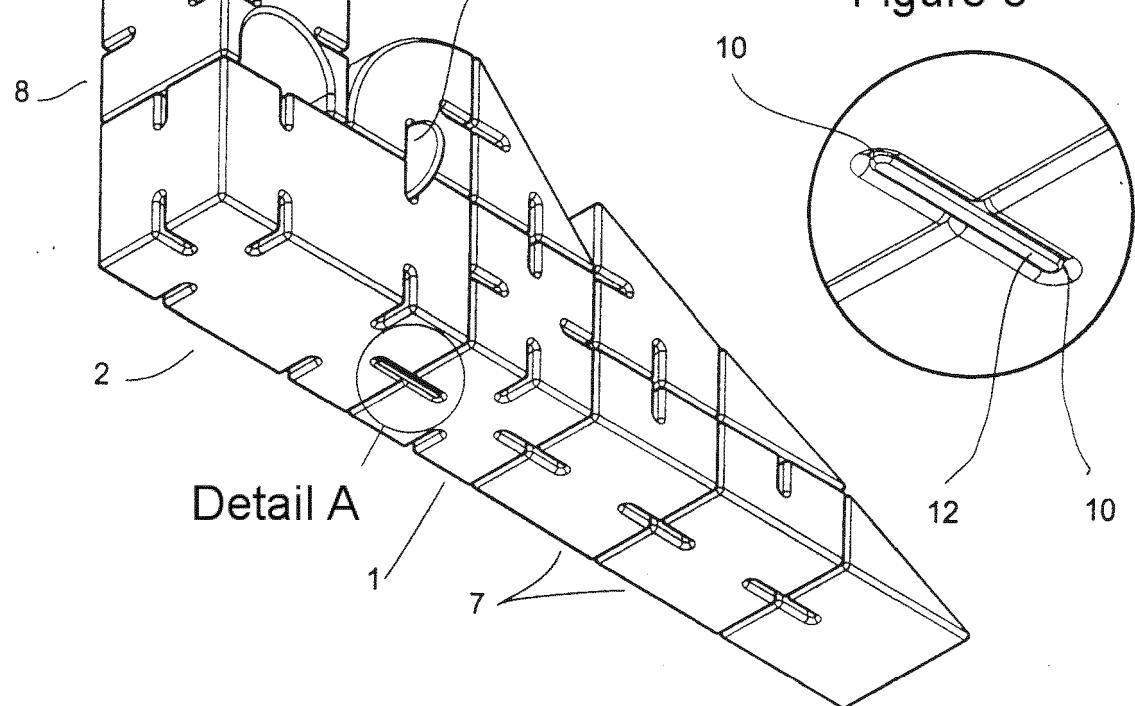


Figure 4

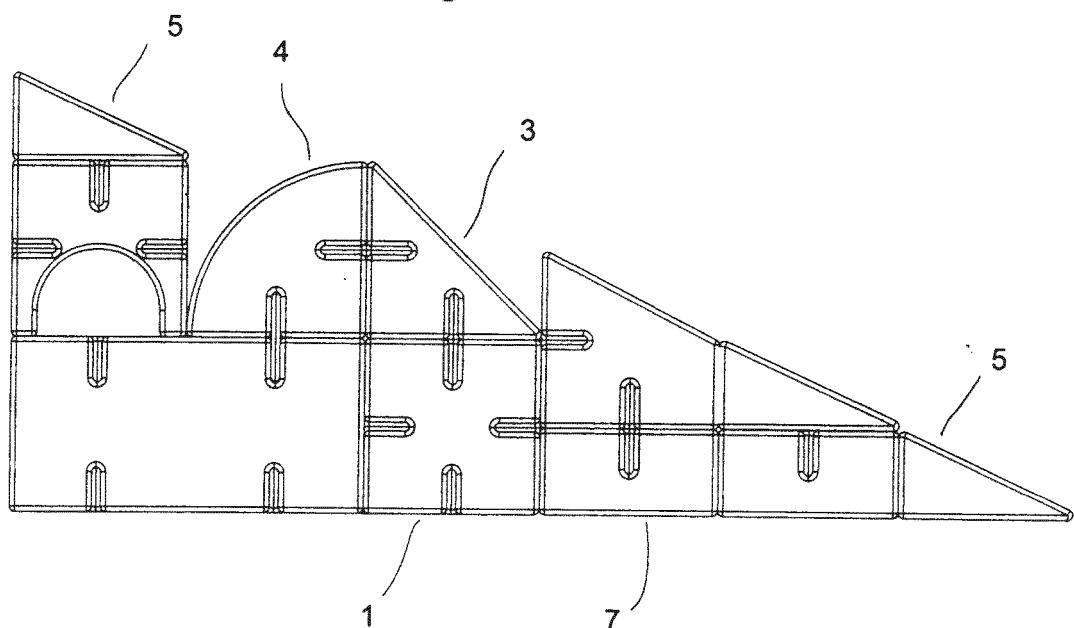


Figure 5

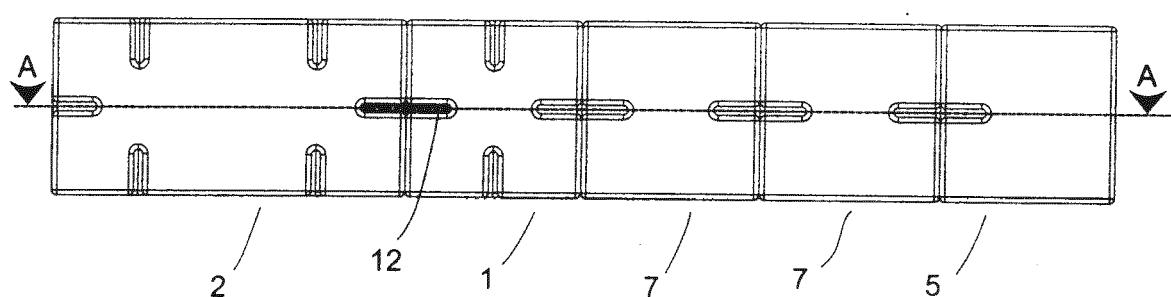


Figure 6

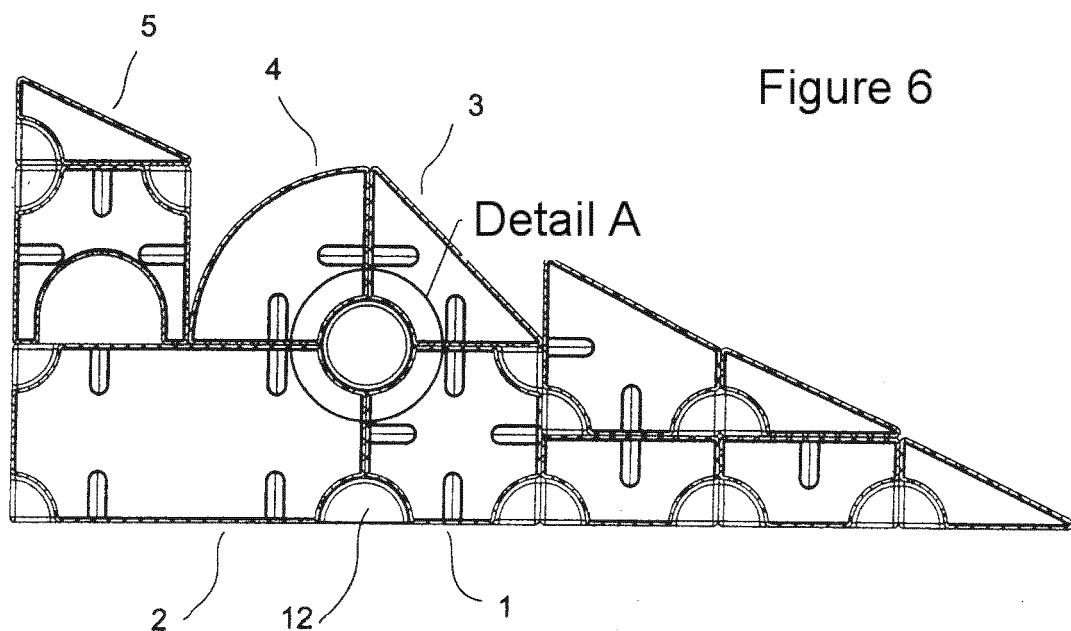


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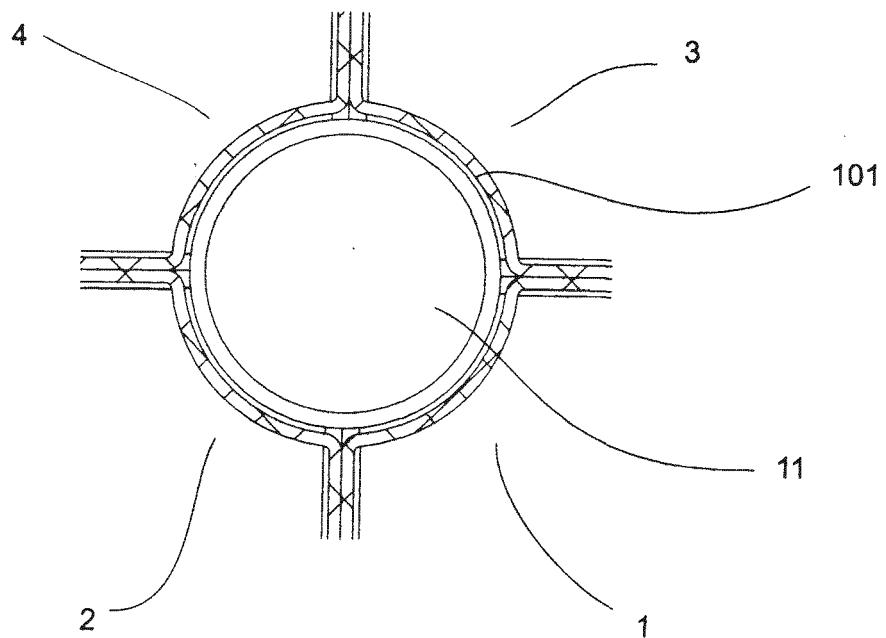


Figure 8

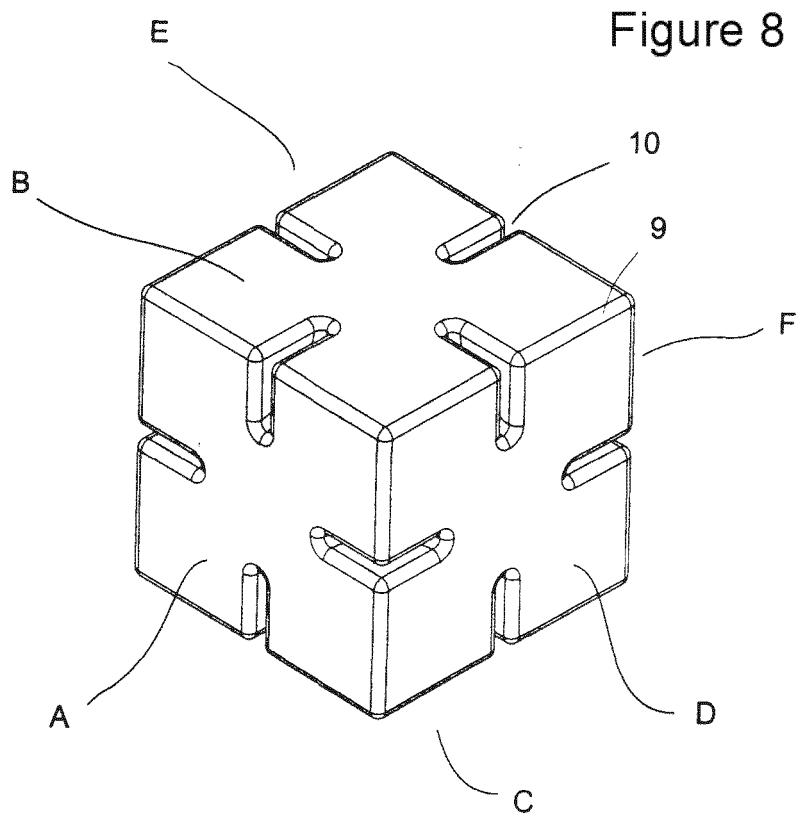


Figure 9

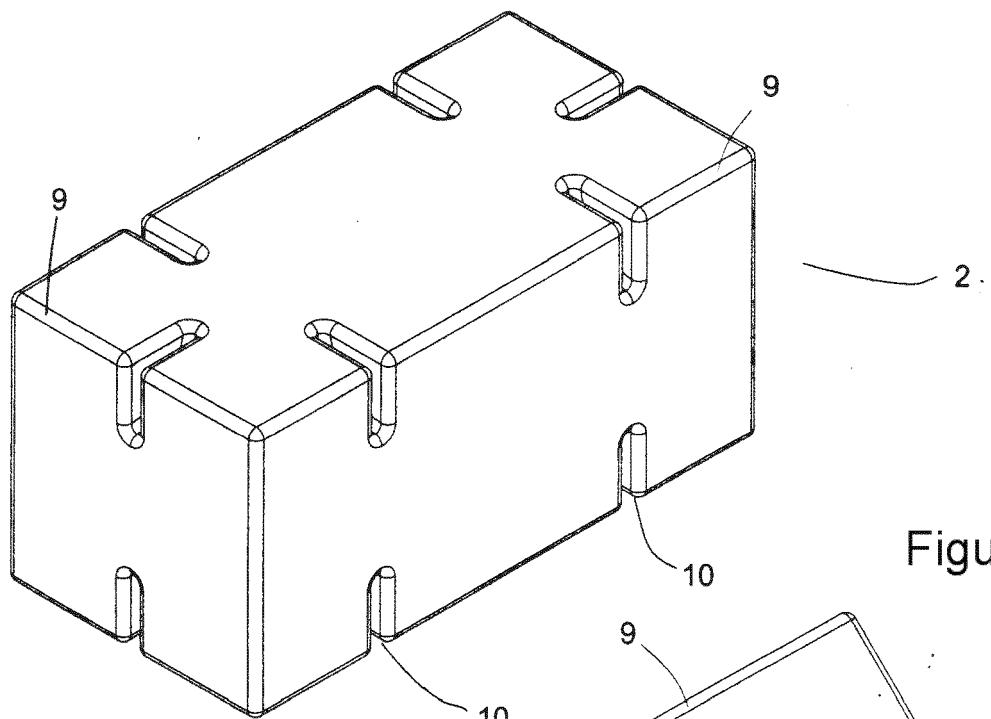


Figure 10

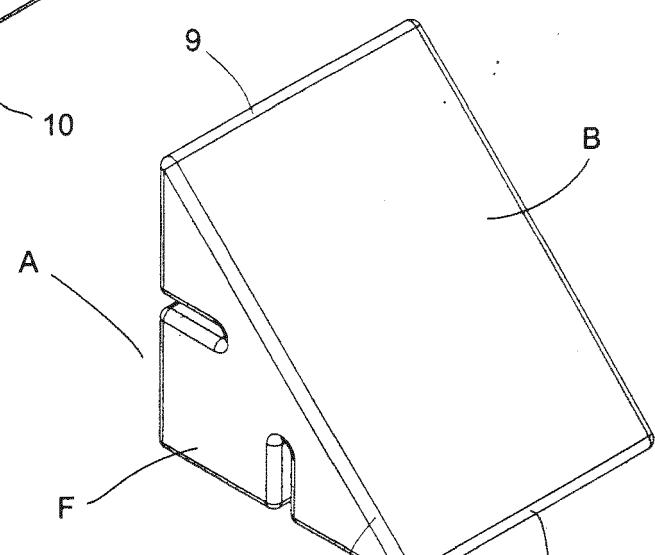


Figure 11

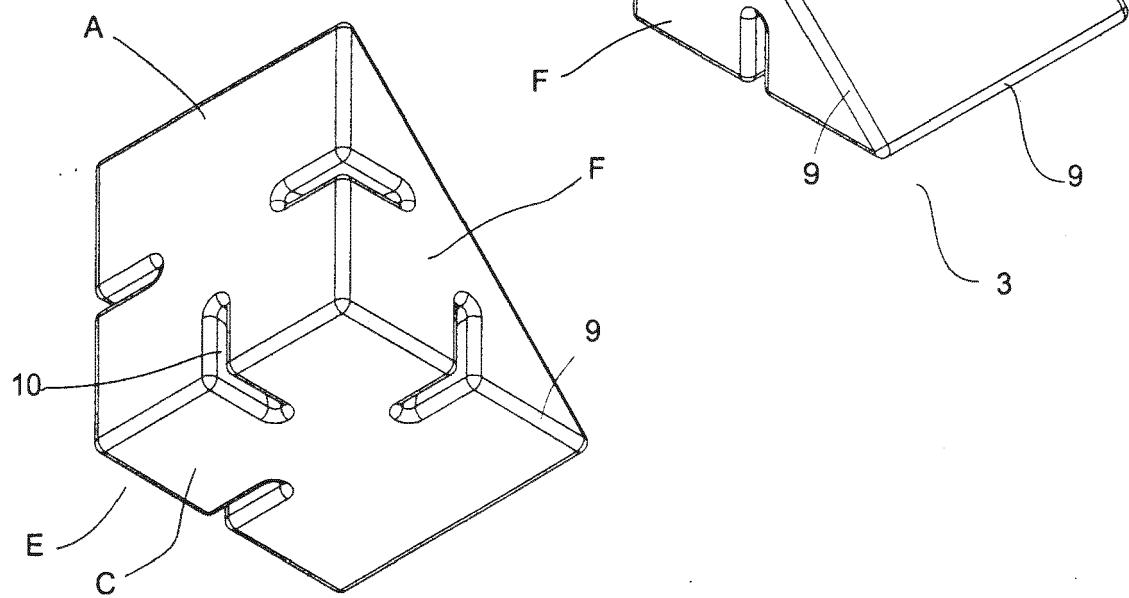


Figure 12

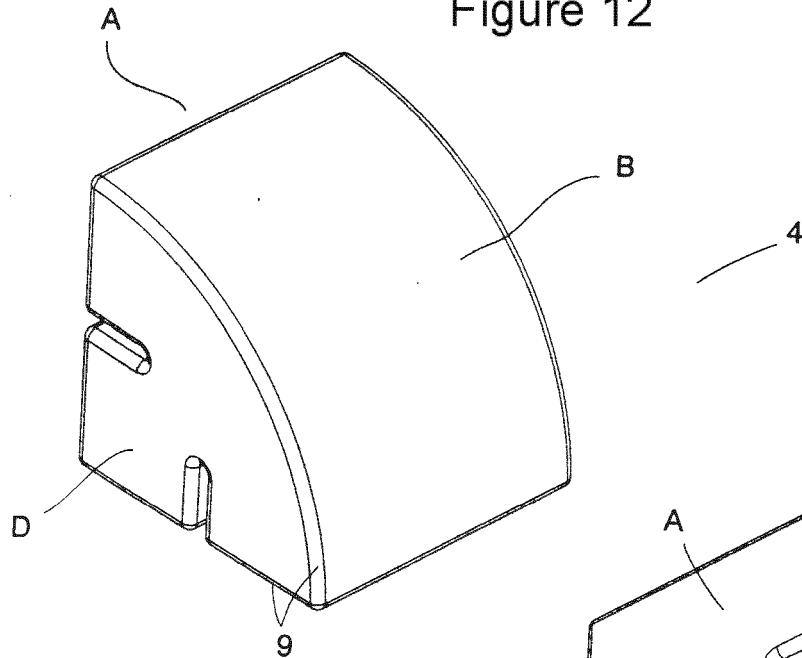


Figure 13

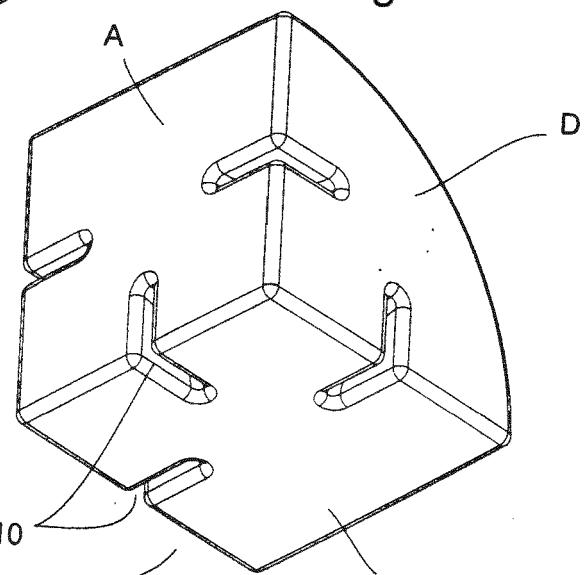


Figure 14

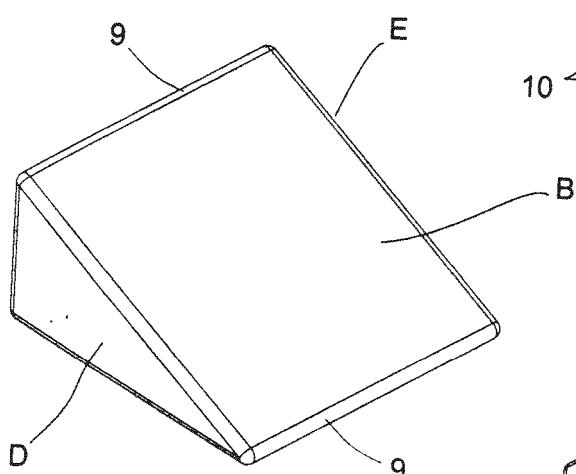


Figure 15

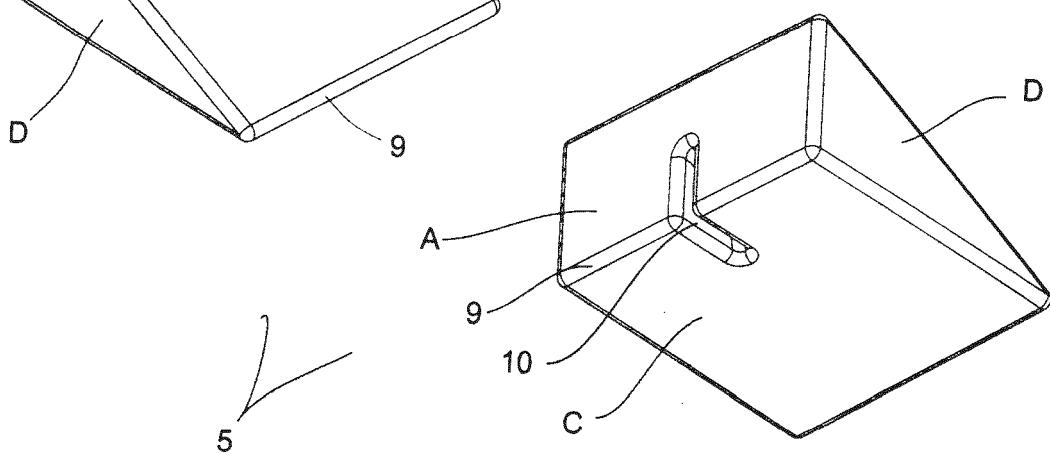


Figure 16

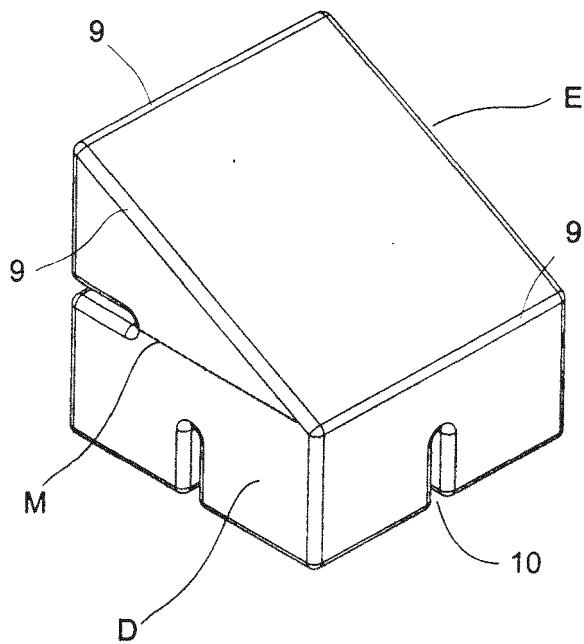


Figure 17

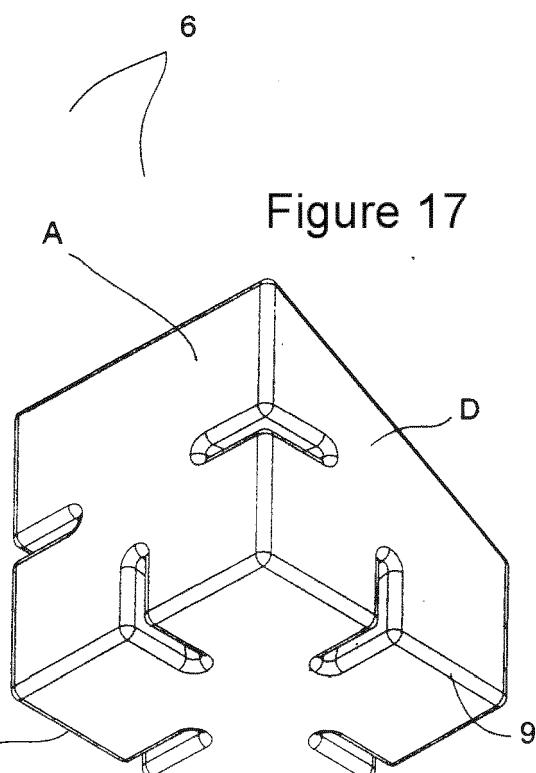


Figure 18

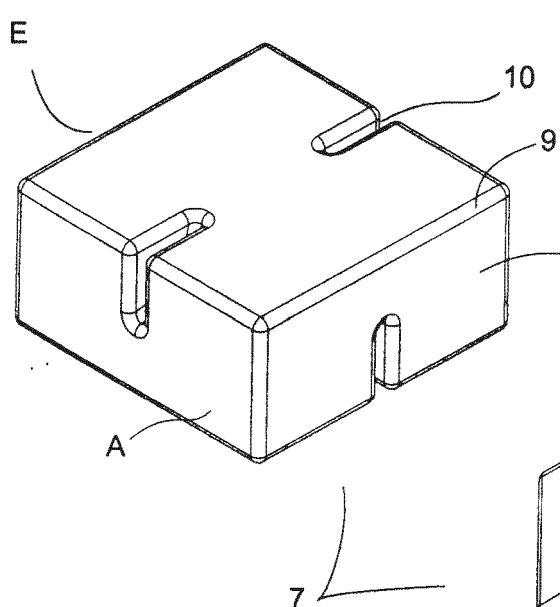


Figure 19

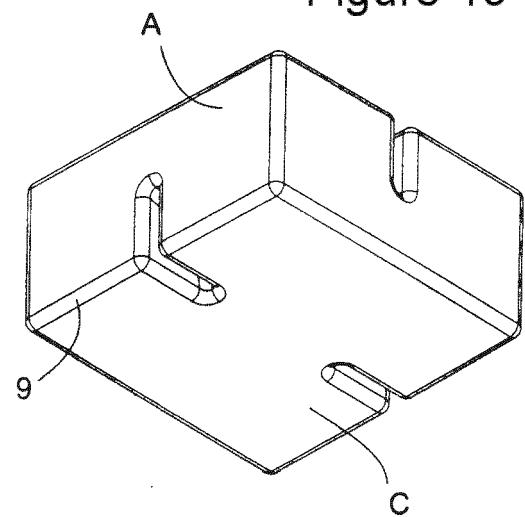


Figure 20

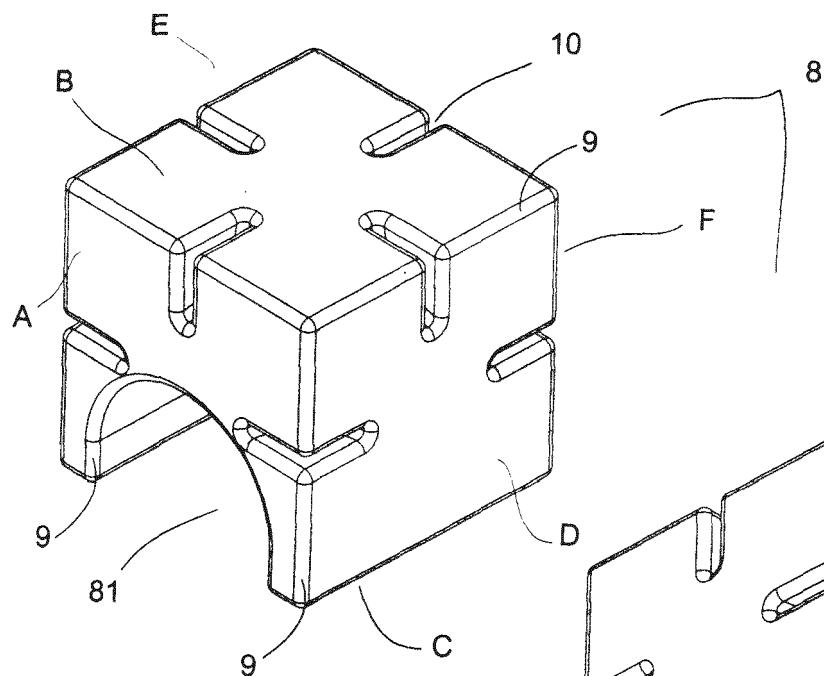


Figure 21

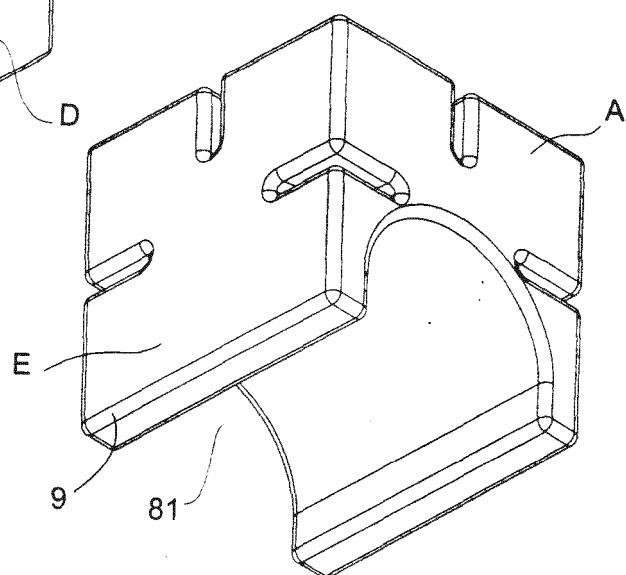


Figure 22

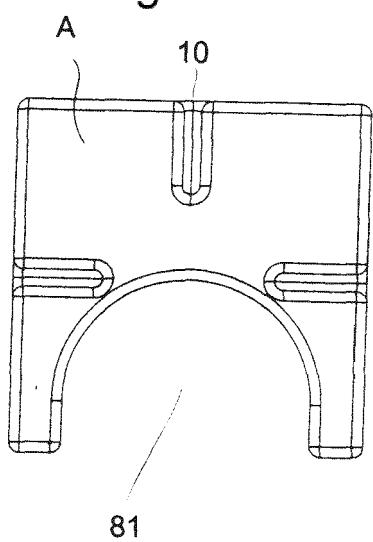


Figure 23

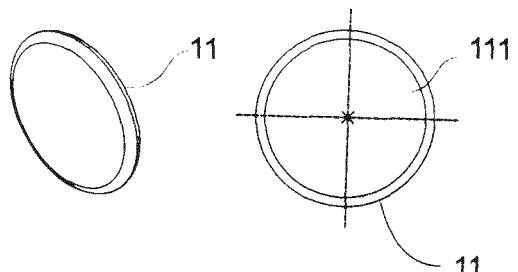
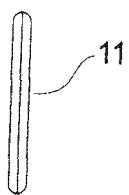


Figure 24

Figure 25



12 Figure 26

INTERNATIONAL SEARCH REPORT

International application No.

PCT/BR2016/050110

5	A. CLASSIFICATION OF SUBJECT MATTER A63H33/08 (2006.01), A63H33/04 (2006.01)																
	According to International Patent Classification (IPC) or to both national classification and IPC																
10	B. FIELDS SEARCHED																
	Minimum documentation searched (classification system followed by classification symbols)																
	A63H																
15	Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																
	Base de dados do INPI - SINPI																
20	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)																
	Espacenet, EpoDoc																
25	C. DOCUMENTS CONSIDERED TO BE RELEVANT																
	<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>US 2009017707 A1 (ARIAS DAVID A [US]; GRIMM ALFRED E [US]; JONES MONICA [US]) 15 JAN 2009 (15.01.2009)</td> <td>1-20</td> </tr> <tr> <td>A</td> <td>US 5302148 A (HEINZ TED [US]) 12 APR 1994 (12.04.1994)</td> <td>1-20</td> </tr> <tr> <td>A</td> <td>US 6482063 B1 (FRIGARD CHARLES RAYMOND [US]) 19 NOV 2002 (19.11.2002)</td> <td>1-20</td> </tr> <tr> <td>A</td> <td>WO 03022379 A1 (WATKINS DAVID [NO]) 20 MAR 2003 (20.03.2003)</td> <td>1-20</td> </tr> </tbody> </table>		Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	A	US 2009017707 A1 (ARIAS DAVID A [US]; GRIMM ALFRED E [US]; JONES MONICA [US]) 15 JAN 2009 (15.01.2009)	1-20	A	US 5302148 A (HEINZ TED [US]) 12 APR 1994 (12.04.1994)	1-20	A	US 6482063 B1 (FRIGARD CHARLES RAYMOND [US]) 19 NOV 2002 (19.11.2002)	1-20	A	WO 03022379 A1 (WATKINS DAVID [NO]) 20 MAR 2003 (20.03.2003)	1-20
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A	US 6482063 B1 (FRIGARD CHARLES RAYMOND [US]) 19 NOV 2002 (19.11.2002)	1-20															
A	WO 03022379 A1 (WATKINS DAVID [NO]) 20 MAR 2003 (20.03.2003)	1-20															
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35	<p>* Special categories of cited documents:</p> <p>“A” document defining the general state of the art which is not considered to be of particular relevance</p> <p>“E” earlier application or patent but published on or after the international filing date</p> <p>“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>“O” document referring to an oral disclosure, use, exhibition or other means</p> <p>“P” document published prior to the international filing date but later than the priority date claimed</p> <p>“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>“&” document member of the same patent family</p>																
40	<p>Date of the actual completion of the international search</p> <p>27 JUN 2016 (27.06.2016)</p> <p>Name and mailing address of the ISA/</p> <p>Facsimile No.</p>																
45	<p>Date of mailing of the international search report</p> <p>14 JUL 2016 (14.07.2016)</p> <p>Authorized officer</p> <p>Luciana de Moraes Pereira da Rosa</p> <p>Telephone No.</p>																
50	<p>Form PCT/ISA/210 (second sheet) (January 2015)</p>																
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INTERNATIONAL SEARCH REPORT

International application No. PCT/BR2016/050110

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10	Category*	Citation of document, with indication, where appropriate, of the relevant passages
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Information on patent family members

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REFERENCES CITED IN THE DESCRIPTION

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