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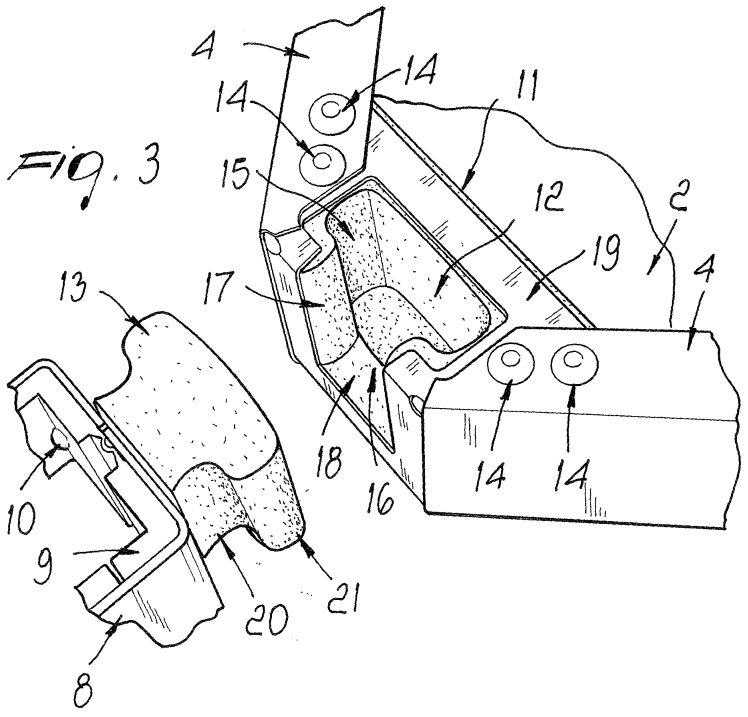
(54) **Structure with modular elements for technical-functional furnishing of interiors, particularly a set of shelves**

(57) A structure (1) with modular elements for technical-functional furnishing of interiors, particularly a set of shelves, which comprises: a shelf (2) provided with first square and open corners (5); uprights (6), in which two second diametrically opposite corners are provided with mirror-symmetrical and equidistant punch holes (7); a supporting means (8) for anchoring to the first corners of the shelf, which is constituted by a quadrangular conical element. There is also a core (9), which is arranged annularly with respect to the upright (6) and can be inserted within the supporting means (8). An insert (11) made of plastics is riveted to the shelf (2) at each one of the first square and open corners (5) and is provided with a frustum-shaped and partially-closed female receptacle (12) for the removable axial engagement and perimetric locking on three sides of a complementarily shaped male element (13) made of plastics, which is riveted and protrudes laterally with respect to the supporting means (8).

Fig. 3



EP 1 690 470 A1

Description

[0001] The present invention relates to an improved structure with modular elements for technical-functional furnishing of interiors, particularly a set of shelves.

[0002] Currently, modular shelves suitable to accommodate the most disparate products are used particularly in the field of the food industry and in catering.

[0003] In particular, the Italian patent filed on 4 November 1996 with application No. TV96A000138 in the name of ARTINOX S.r.l. and granted on 23 September 1998 as No. 01288683 is known which claims a structure with modular elements for technical-functional furnishing of interiors, particularly a set of shelves.

[0004] Such structure comprises one or more shelves, preferably having a rectangular plan shape, typically made of steel suitable for food use, which are supported one above the other by means of at least four corresponding uprights, constituted by a tube having a square cross-section in which two diametrically opposite corners are provided longitudinally with mirror-symmetrical and equidistant punch holes.

[0005] The ends of the shelf have, along its edge, diagonal surfaces, in each of which there is a seat which is open upward.

[0006] An upright can be anchored to an end of a shelf by means of a supporting means constituted by a quadrangular conical element, which is typically metallic and in which at least one side is provided with a male means for mutual interlocking in one of said female seats provided on the diagonal surfaces of the shelf to be supported.

[0007] Such male means is constituted by a metallic slider, which is associated stably and vertically at at least one side of the quadrangular conical element.

[0008] A core is arranged annularly with respect to each upright, can be inserted within the respective supporting means, is divided into two elements and is provided, along its internal walls, with protruding bodies, which can be inserted within the punch holes provided along the respective upright.

[0009] This known type of structure has many advantages but also has an aspect which can be improved, such as the aspect of production costs.

[0010] Moreover, in the known solution the interlocking between the sliders of the quadrangular conical elements and the respective seats provided in the shelves can be inaccurate, since said sliders and shelves, made of metal, have plays during mating which entail a less than optimum mating and a less than optimum stability of the structure as a whole.

[0011] The aim of the present invention is to solve the above-mentioned problems, eliminating the drawbacks of the cited prior art, by providing a structure with modular elements for technical-functional furnishing of interiors, particularly a set of shelves, which has low production costs and at the same time allows to achieve optimum mating between the shelves and the quadrangular conical elements, so as to achieve a structure with modular elements which is stable and in which its shelves are arranged stably in a horizontal position.

[0012] Within this aim, an object is to provide a structure which is structurally simple and quick and easy to assemble.

[0013] This aim and this and other objects, which will become better apparent hereinafter, are achieved by a structure with modular elements for technical-functional furnishing of interiors, particularly a set of shelves, which comprises:

- a shelf provided with first square and open corners;
- an upright, in which two second diametrically opposite corners are provided with mirror-symmetrical and equidistant punch holes;
- a supporting means for anchoring to said first corners of said shelf, said means consisting of a quadrangular conical element;
- a core which is arranged annularly with respect to said upright and can be inserted within said supporting means;

characterized in that an insert made of plastics is riveted to said shelf at each one of said first square and open corners, said insert being provided with a frustum-shaped and partially-closed female receptacle for the removable axial engagement and perimetric locking on three sides of a complementarily shaped male element made of plastics, which is riveted and protrudes laterally with respect to said supporting means.

[0014] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a particular but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of part of a structure with modular elements for technical-functional furnishing of interiors, particularly a set of shelves, according to the invention;

Figure 2 is a perspective view of a corner of a shelf of a structure according to the invention with a means for supporting an upright associated therewith;

Figure 3 is a bottom perspective view of a corner of the shelf of a structure according to the invention and of a detail of a supporting means which can be associated with said corner;

Figure 4 is a bottom perspective view of a corner of the shelf of a structure according to the invention, with a supporting means associated therewith;

Figure 5 is a bottom plan view of a corner of the shelf of a structure according to the invention and of a supporting means which can be associated with said corner;

Figure 6 is a perspective view of a supporting means;

Figure 7 is a bottom plan view of a corner of the shelf of a structure according to the invention with sup-

porting means associated therewith.

[0015] In the exemplary embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0016] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0017] With reference to the figures, the reference numeral 1 designates a structure with modular elements for technical-functional furnishing of interiors, particularly a set of shelves.

[0018] The structure 1 comprises at least one shelf 2, which is advantageously metallic and made of flat sheet metal, and is preferably rectangular, its perimetric edges being conveniently folded approximately in an L-shape so as to form a border 3, which is substantially perpendicular to the plane of arrangement of the flat sheet metal, followed by a foot 4, which is approximately perpendicular to the contiguous border 3 and is directed toward the inside of the shelf 2.

[0019] Each shelf 2 is provided with first square and open corners 5.

[0020] Each shelf 2 can be associated, at each first corner 5, with an upright 6 which is constituted by a tube, which is advantageously metallic and has a substantially square cross-section; the upright 6 has two second corners which are arranged diametrically with respect to each other and on which punch holes 7 which form recesses are formed approximately on identical parallel planes.

[0021] A supporting means 8 is provided for anchoring the first corners 5 of the shelf 2 and is constituted by a quadrangular conical element which is advantageously metallic.

[0022] The structure 1 further comprises a core 9, which can be arranged annularly with respect to the upright 6, can be inserted within the supporting means 8, and is constituted by two laminas for example made of plastics, each of which is folded substantially in a C-shape and connected to the other; the core 9 is approximately frustum-shaped, with studs 10 which are suitable to allow the anchoring of the supporting means 8 to the upright 6.

[0023] An insert 11 for example made of plastics and shaped complementarily with respect to the first corner 5 is associated with the shelf 2 at each one of the first open and square corners 5.

[0024] The insert 11 therefore has, in plan view, a trapezoidal shape which is approximately as thick as the distance between the facing surfaces of the shelf 2 and of the foot 4.

[0025] An element for stiffening the first corners 5 of the shelf 2 is thus formed.

[0026] The insert 11 is fixed to the shelf 2 by means of first rivets 14, which interconnect the feet 4 to an underlying portion of the insert 11.

[0027] A female receptacle 12 is provided in the insert 11 and is frustum-shaped and partially closed for the removable axial engagement and perimetric locking on three sides of a complementarily shaped male element 13, which is made of plastics and is riveted and protrudes laterally with respect to the supporting means 8.

[0028] Advantageously, the female receptacle 12 is substantially vertical and advantageously has a substantially T-shaped transverse cross-section with rounded edges, so as to form a first lower opening 15, which is therefore arranged on the opposite side with respect to the plane of arrangement of the shelf 2, and a second lateral opening 16.

[0029] An arc-like lateral surface 17 is formed at the first opening 15 and at the second opening 16 and forms a T-shaped plan configuration which is connected, on the opposite side with respect to the first opening 15, by a flat base 18a and 18b, which optionally lie on different planes.

[0030] Advantageously, the transverse cross-section of the female receptacle 12 decreases slightly as the distance from the first opening 15 increases, and therefore the female receptacle 12 is itself substantially frustum-shaped.

[0031] Advantageously but not necessarily, between the insert 11 and the shelf 2 it is possible to provide a reinforcement element 19, constituted by a substantially L-shaped lamina, which is fixed at the first rivets 14 and has a hole which is shaped approximately complementarily with respect to the perimetric edge of the female receptacle 12.

[0032] The male element 13 is constituted by a block which is shaped complementarily with respect to the female receptacle 12 and is therefore approximately vertical and has a substantially T-shaped transverse cross-section with rounded edges which forms a stem 20 and a contiguous head 21.

[0033] The stem 20 and the head 21 interact with the lateral surface 17 and abut respectively against the base 18a and 18b.

[0034] The male element 13 is fixed advantageously to the supporting means 8 for example by means of two second rivets 24, which are driven into the head 21 and pass axially with respect to the stem 20 and therefore with respect to the supporting means 8.

[0035] The use of the structure of the invention is therefore as follows. With reference to Figure 1, a core 9 is associated with an upright 6 in one of the preset positions determined by the insertion of the two studs 10 which protrude internally from the core 9 into two slots provided in the upright 6; therefore, by arranging the supporting means 8 coaxially to the core 9, said core is rigidly coupled to the upright 6.

[0036] It is then possible to insert the male element 13 in the female receptacle 12 formed in the insert 11 associated with one of the first corners 5 of the shelf 2, thus

fixing the upright 6 to the shelf 2.

[0037] It has thus been found that the invention has achieved the intended aim and object, a structure with modular elements for technical-functional furnishing of interiors, particularly a set of shelves, having been obtained which has low production costs by way of the use of the insert and of the male element made of plastics.

[0038] Further, in the illustrated solution the engagement surfaces in the mating between the male element and the female receptacle are large, and therefore said mating is highly effective and accordingly the structure is very stable.

[0039] Moreover, the use of plastic material to provide the male element and the female receptacle allows to obtain parts with very good finish and shape tolerances, thus ensuring optimum meeting among the components.

[0040] Further, the use of the insert allows to strengthen the structure.

[0041] The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0042] The materials used, as well as the dimensions which constitute the individual components of the invention, may of course be more pertinent according to specific requirements.

[0043] The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment but can be present per se in many embodiments, including ones that are not illustrated.

[0044] The characteristics indicated as advantageous, convenient or the like may also be omitted or be replaced with equivalents.

[0045] The disclosures in Italian Patent Application No. TV2005A000023 from which this application claims priority are incorporated herein by reference.

[0046] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A structure with modular elements for technical-functional furnishing of interiors, particularly a set of shelves, comprising:

   - a shelf provided with first square and open corners;
   - uprights, in which two second diametrically opposite corners are provided with mirror-symmetrical and equidistant punch holes;
   - a supporting means for anchoring to said first corners of said shelf, said means consisting of a quadrangular conical element;
   - a core, which is arranged annularly with respect to said upright and can be inserted within said supporting means;

   characterized in that an insert made of plastics is riveted to said shelf at each one of said first square and open corners, said insert being provided with a frustum-shaped and partially-closed female receptacle for the removable axial engagement and perimetric locking on three sides of a complementarily shaped male element made of plastics, which is riveted and protrudes laterally with respect to said supporting means.

2. The structure according to claim 1, **characterized in that** said insert made of plastics is shaped complementarily with respect to said first corner and is associated with said shelf at each one of said first square and open corners.

3. The structure according to claim 1, **characterized in that** said metallic shelf is obtained from a flat metal sheet, the perimetric edges of which are folded approximately in an L-shape so as to form a border followed by a foot, said insert having, in plan view, a trapezoidal shape with a thickness approximately equal to the distance between the facing surfaces of said shelf and said foot.

4. The structure according to claims 1 and 3, **characterized in that** said insert constitutes an element for stiffening said first corners of said shelf.

5. The structure according to claims 1 and 3, **characterized in that** said insert is fixed to said shelf by way of first rivets, which connect said feet to an underlying portion of said insert.

6. The structure according to claims 1 and 5, **characterized in that** in said insert there is a frustum-shaped and partially-closed female receptacle for removable axial engagement and perimetric locking on three sides of a complementarily shaped male element made of plastic material, which is riveted and protrudes laterally with respect to said supporting means.

7. The structure according to claims 1 and 6, **characterized in that** said female receptacle is substantially vertical and has a substantially T-shaped transverse cross-section, with rounded edges, so as to form a first lower opening, which is therefore located on the opposite side with respect to the plane of arrangement of said shelf, and a second lateral opening.

8. The structure according to claims 1 and 7, **characterized in that** an arc-like lateral surface is formed

at said first and second openings, has a T-shaped plan configuration and is connected, or the opposite side with respect to said first opening, by a flat base or by two separate flat bases which lie on mutually parallel planes.

9. The structure according to claims 1 and 8, **characterized in that** the transverse cross-section of said female receptacle decreases slightly as the distance from said first opening increases, thus having a substantially frustum-shaped configuration.

10. The structure according to claims 1 and 9, **characterized in that** a reinforcement element is provided between said insert and said shelf and is constituted by a substantially L-shaped lamina, which is fixed at said first rivets and has a hole which is shaped approximately complementarily to the perimetric edge of said female receptacle.

11. The structure according to claims 1 and 10, **characterized in that** said male element is constituted by a block which is shaped complementarily with respect to said female receptacle and therefore is approximately vertical and has a substantially T-shaped transverse cross-section with rounded edges so as to form a stem and a contiguous head which interact with said arc-like lateral surface and abut against said base of said female receptacle.

12. The structure according to claims 1 and 11, **characterized in that** said male element is fixed to said supporting means by way of two second rivets, which are driven into said head and pass axially through said stem and then through said supporting means.

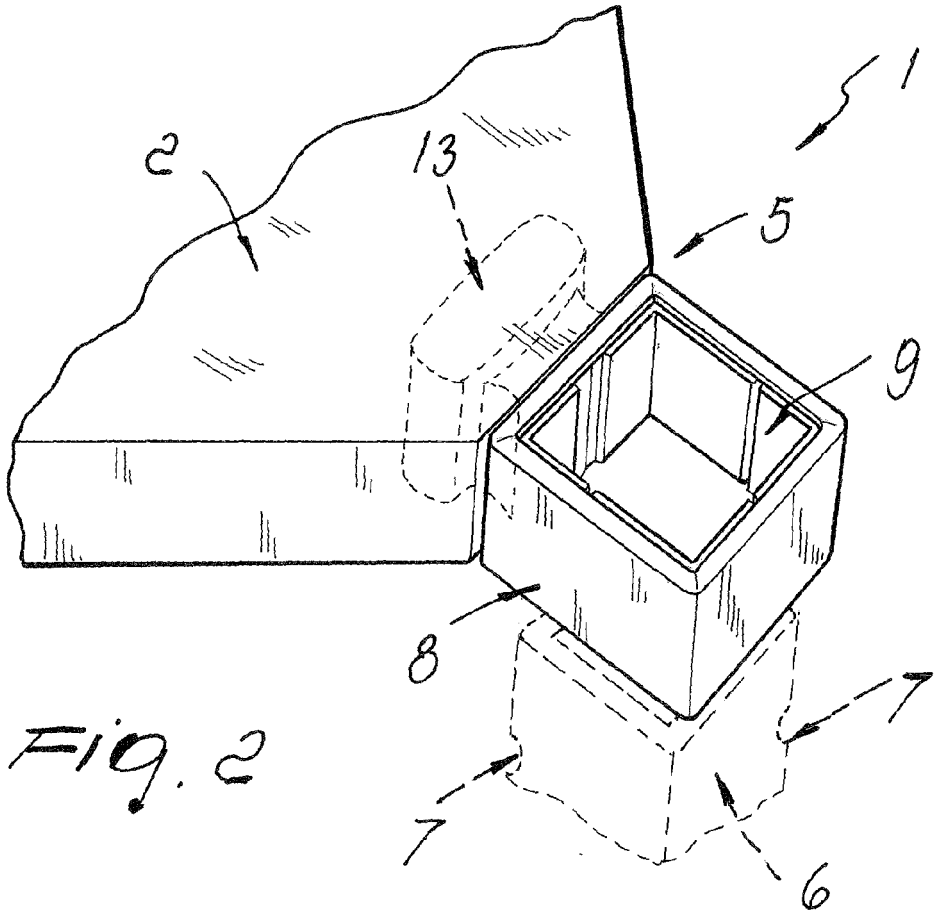


FIG. 2

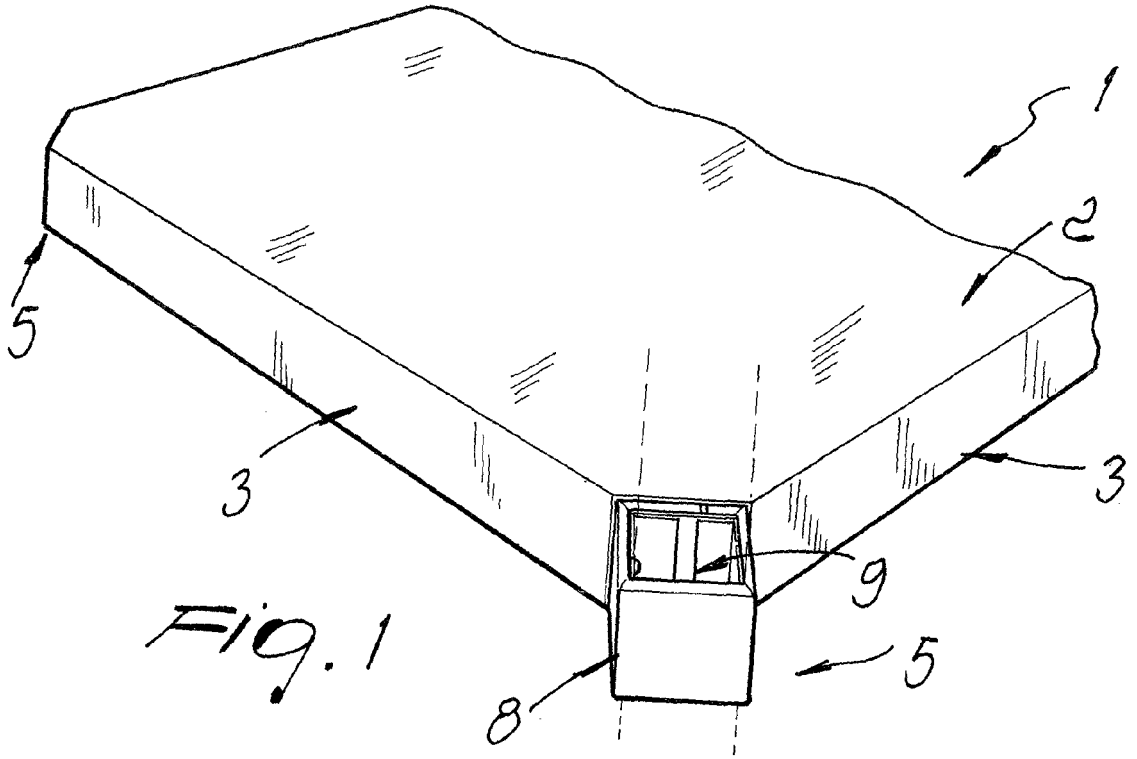


FIG. 1

Fig. 3

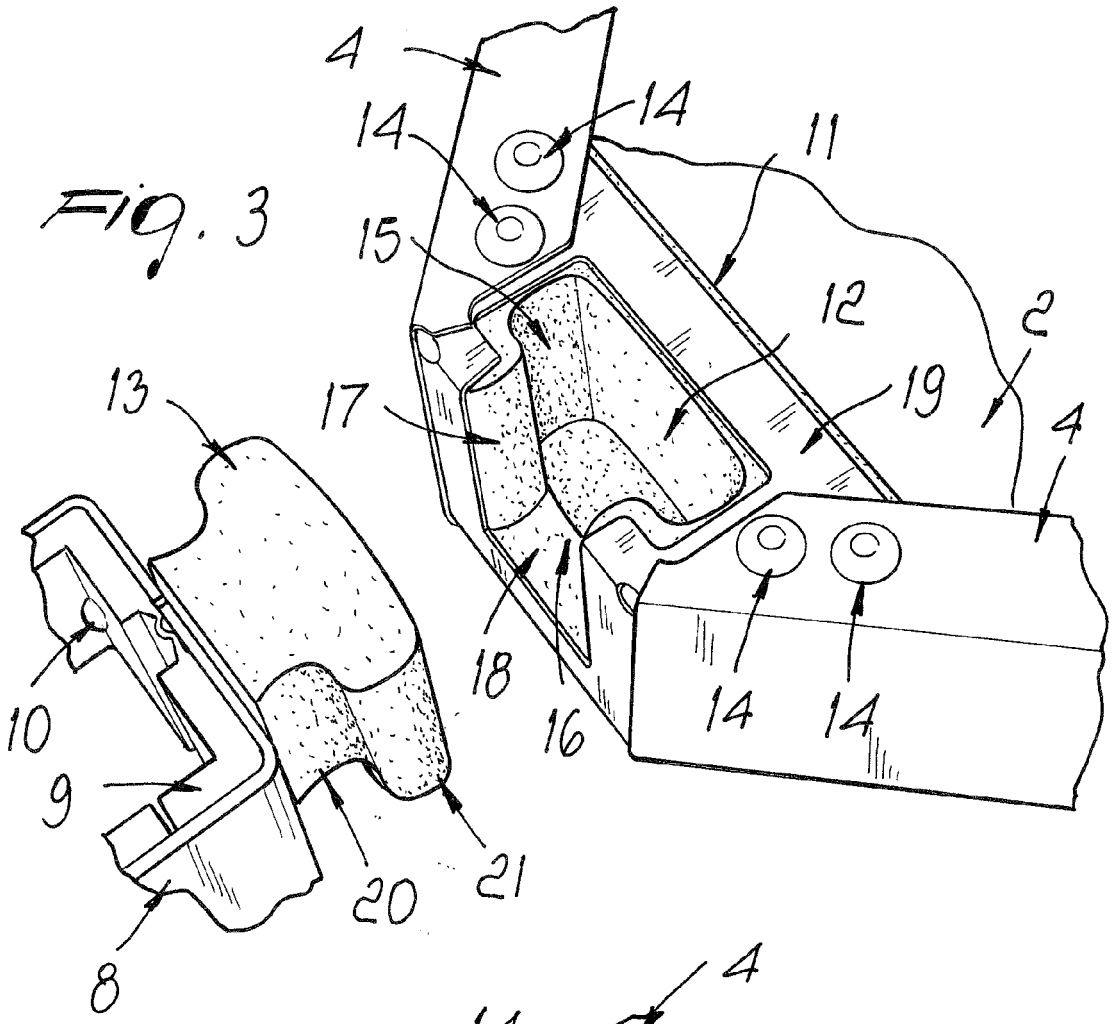

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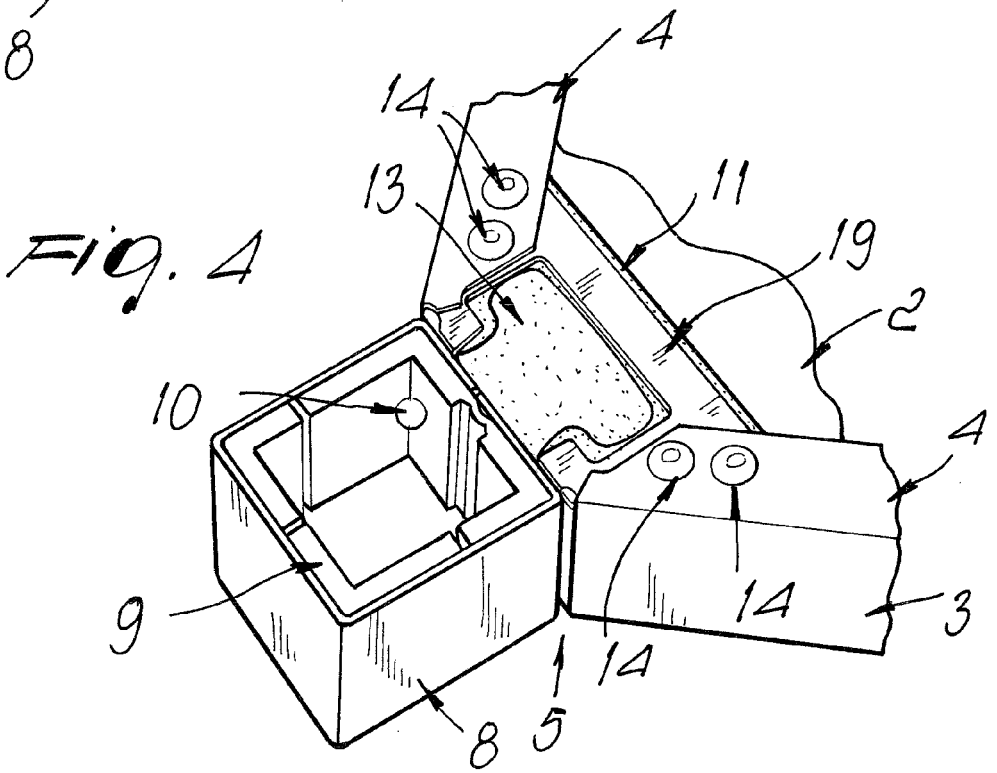
Fig. 4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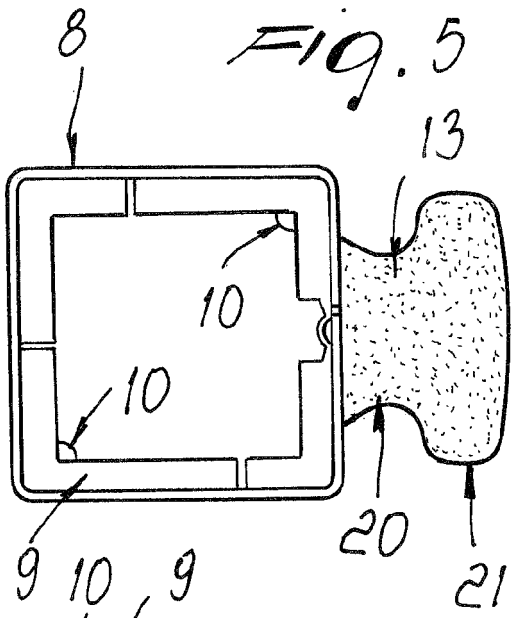
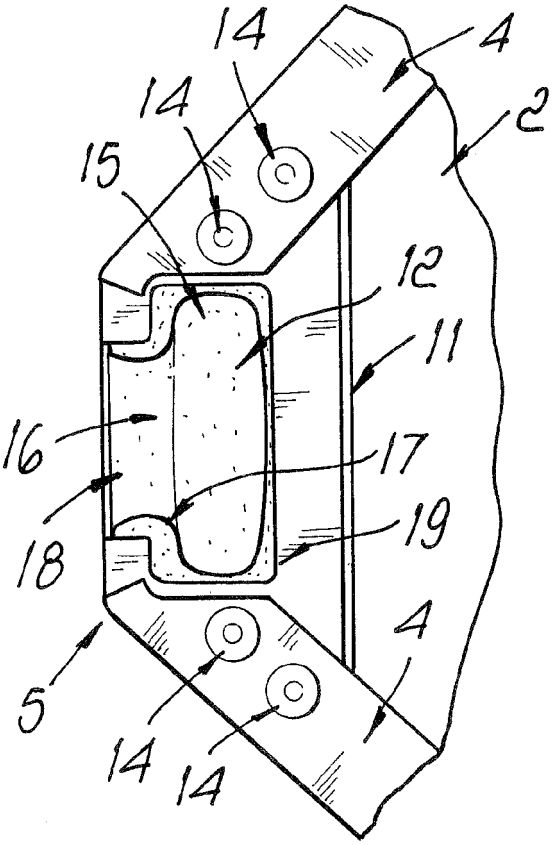


FIG. 5



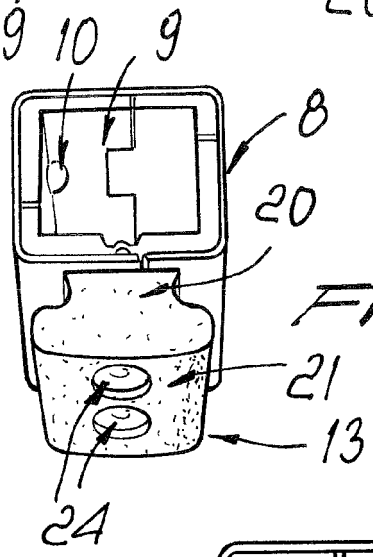


FIG. 6

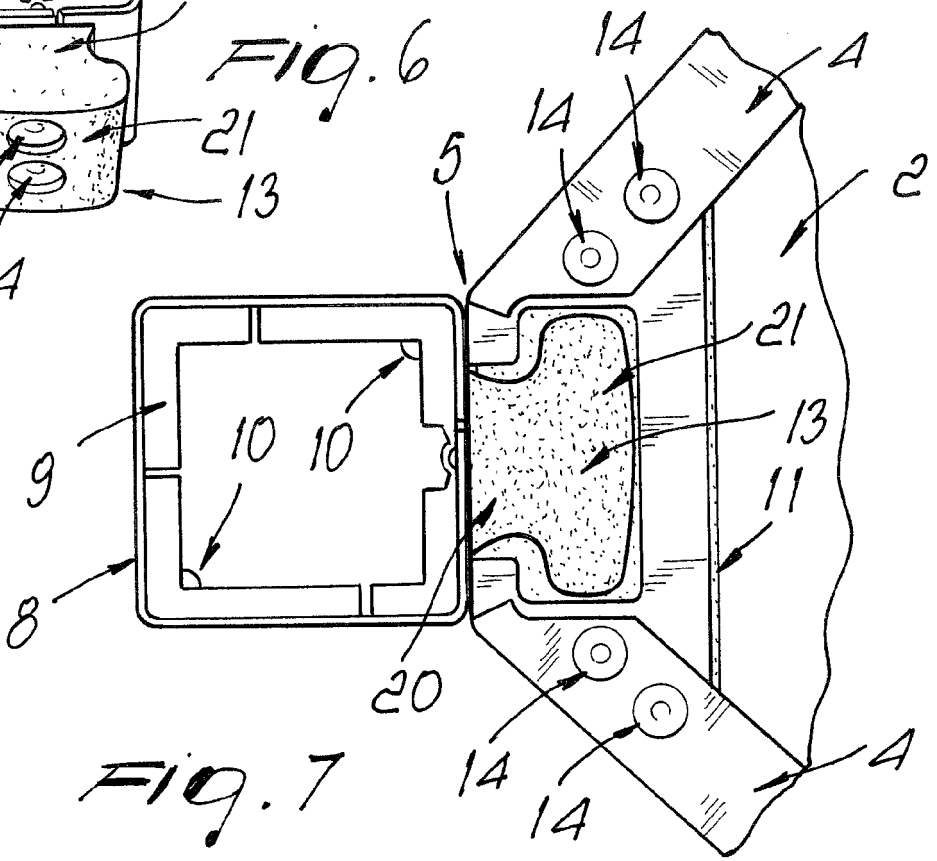


FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 06 10 0626

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	EP 0 839 476 A (ARTINOX S.R.L) 6 May 1998 (1998-05-06) * the whole document *	1-12	INV. A47B57/54
A	US 3 874 511 A (MASLOW ET AL) 1 April 1975 (1975-04-01) * the whole document *		
A	US 6 044 988 A (YANG ET AL) 4 April 2000 (2000-04-04) * the whole document *	1-12	
A	US 4 852 501 A (OLSON ET AL) 1 August 1989 (1989-08-01) * the whole document *	1-12	
A	EP 0 983 735 A (ARTINOX S.R.L) 8 March 2000 (2000-03-08) * the whole document *	1-12	
A	US 5 695 081 A (ALKALAY ET AL) 9 December 1997 (1997-12-09) * the whole document *	1-12	TECHNICAL FIELDS SEARCHED (IPC) A47B
A	US 5 971 175 A (BUSTOS ET AL) 26 October 1999 (1999-10-26) * the whole document *	1-12	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 May 2006	Cardan, C

CATEGORY OF CITED DOCUMENTS

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16-05-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0839476 A	06-05-1998	AT 230573 T	15-01-2003
		DE 69718273 D1	13-02-2003
		DE 69718273 T2	20-11-2003
		IT TV960138 A1	04-05-1998
US 3874511 A	01-04-1975	AU 6882674 A	13-11-1975
		BE 813099 A1	30-09-1974
		CA 989353 A1	18-05-1976
		CH 568208 A5	31-10-1975
		DE 2362529 A1	09-01-1975
		DK 678573 A	27-01-1975
		ES 426671 A1	01-01-1977
		FI 397073 A	14-12-1974
		FR 2233013 A1	10-01-1975
		GB 1454021 A	27-10-1976
		IT 1013426 B	30-03-1977
		JP 1159326 C	25-07-1983
		JP 50036268 A	05-04-1975
		JP 57048205 B	14-10-1982
		NL 7401156 A	17-12-1974
		NO 463673 A	06-01-1975
		SE 7403265 A	16-12-1974
US 6044988 A	04-04-2000	DE 29919098 U1	13-01-2000
US 4852501 A	01-08-1989	NONE	
EP 0983735 A	08-03-2000	AT 254869 T	15-12-2003
		DE 69913055 D1	08-01-2004
		DE 69913055 T2	09-09-2004
		IT TV980120 A1	06-03-2000
US 5695081 A	09-12-1997	CA 2164463 A1	07-06-1996
		IL 111888 A	30-09-1997
US 5971175 A	26-10-1999	AU 2310499 A	29-05-2000
		BR 9914974 A	24-07-2001
		CA 2348859 A1	18-05-2000
		CN 1325282 A	05-12-2001
		EP 1128747 A1	05-09-2001
		HU 0103776 A2	28-03-2002
		JP 2002529126 T	10-09-2002
		PL 348330 A1	20-05-2002
		TR 200101334 T2	21-11-2001
		WO 0027249 A1	18-05-2000

EPO FORM P0459

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