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(71) Applicant: **Whirlpool Corporation**
Benton Harbor, MI 49022 (US)

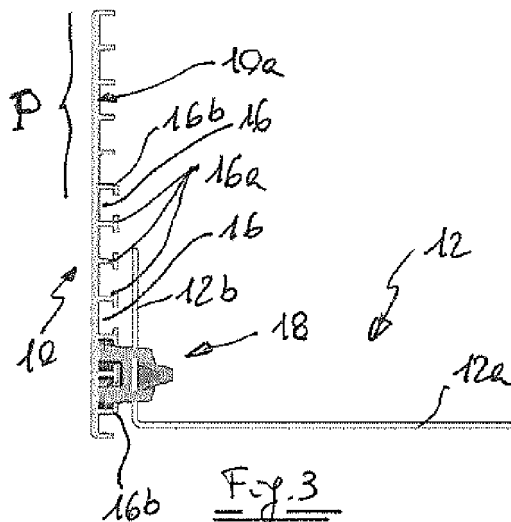
(72) Inventor: **Drzazga, Mariusz**
21025 Comerio (IT)

(74) Representative: **Guerci, Alessandro**
Whirlpool Europe S.r.l.
Patent Department
Viale G. Borghi 27
21025 Comerio (VA) (IT)

(54) **A system for installing a front plinth to a built-in appliance**

(57) A system for connecting and adjusting a front plinth (10) or the like to a piece of furniture, particularly to a built-in dishwasher (D), comprises a support element (12) connected to the piece of furniture and presenting a vertical portion (12b) whose distance from the piece of furniture (D) can be adjusted, and a bracket element (18)

having a portion slidably mounted in at least a longitudinal groove (16) on the rear surface (10a) of the plinth (10) and an elastic portion (18b) adapted to snap engage said vertical portion (12b) of the support element (12) and to slide thereon in order to adjust the position of the plinth (10).



EP 2 628 433 A1

Description

[0001] The present invention relates to a system for connecting and adjusting a plinth to a piece of kitchen furniture, particularly a built-in dishwashing machine.

[0002] With the term "plinth" we mean any fascia or skirting board which is used for hiding the lower part of pieces of furniture and domestic appliances in a modern kitchen, such lower parts having possible legs and technical parts which can affect the overall appearance of kitchen furniture. Such plinth may be made in different portions positioned side by side or, more frequently, in integral long portions which cover lower portions of several pieces of furniture and appliances. While the fixing to pieces of furniture with legs may be quite easy with the known systems in which no position adjustment is needed, this is not so for appliances like built-in dishwashers where it is necessary to adjust the position of the plinth in order to match its position with other portions facing kitchen furniture.

[0003] The current designs of connecting systems for assembling front plinths to built-in appliances are quite complex since they include many parts. Moreover the person installing the plinth has to use screws and the like, usually with templates, which make the overall process quite cumbersome.

[0004] An object of the present invention is to provide a system as mentioned at the beginning of the description which does not present the above problems and which is simple to be installed, easy to be adjusted and of limited overall cost.

[0005] According to the invention, such object is reached thanks to the features listed in the appended claims.

[0006] The system according to the invention is basically composed of only two elements, i.e. an elongated shaped support element slidably mounted (preferably in pair) on a front side of the piece of furniture or domestic built-in appliance and an elastic bracket element which can slide in longitudinal grooves of the plinth and on which, after a snap engagement easy connection, a vertical end of the shaped support element can slide for easy adjustment of the position of the plinth relative to the piece of furniture or appliance. Thanks to such simple construction the plinth can be easily adjusted in all directions, i.e. three movements, vertical, horizontal and lateral (side), without the need of any screws or similar fastening devices. Another advantage is that with few components the overall cost is reduced, and there is no risk of installing the plinth in an incorrect way.

[0007] Further advantages and features according to the present invention will become clear in view of the following detailed description, provided merely as a not limiting example, with reference to the attached drawings in which:

- Figure 1 is a side view of the system according to the invention in which the plinth is mounted on a built-

in dishwasher;

- Figure 2 is a side view similar to figure 1 and referring to a second embodiment of the invention, particularly for built-in dishwashers having support legs;
- Figure 3 is an enlarged view of a detail of figure 1;
- Figure 4 is an enlarged view of a detail of figure 2;
- Figure 5 is a view taken from arrow V of figure 4;
- Figure 6 is a perspective view of the detail of figure 5;
- Figure 7 is a perspective view of a component of the system of figures 1 and 2;
- Figure 8 is a side view of the component of figure 7;
- Figure 9 is another side view of the component of figure 7; and
- Figure 10 is a perspective view on a different embodiment of the component similar to the one shown in figure 7.

[0008] With reference to the drawings, a built-in dishwasher D presents a cabinet D1 placed on a floor with legs (figure 2) or without legs (figure 1). The dishwasher presents a front door T whose lower end T1 has to assume a configuration in which it is substantially flush with a decorative plinth 10. On the bottom of the cabinet D1 it is mounted a L-shaped support 12 in the form of a metal strap having a first flat portion 12a (horizontal in the installed configuration) with a longitudinal slot 14 adapted to slide on a corresponding couple of pins (not shown) fixed to the cabinet D1 of the dishwasher D. Such pin may be also screws which can be used to fix the L-shaped support 12 in the desired position.

[0009] The L-shaped support 12 has a second portion 12b, which is vertical in the assembled configuration shown in the drawings, whose distance from the built-in dishwasher D can be adjusted by sliding the support 12 on its slot 14.

[0010] The plinth 10, for instance of polymeric material, has on its rear surface 10a a plurality of longitudinal grooves 16 easily obtained by extrusion. Each groove 16 is delimited by T profiles 16a or L profiles 16b (there may be other profiles for increasing the rigidity of the plinth, as shown in the drawings). In a couple of adjacent grooves 16 it is slidably mounted an adjustable bracket 18 which is advantageously made by injection moulding of a polymer. The adjustable bracket 18 (figures 7, 8, 9 and 10) presents a base part 18a with four sliding portions 20 (two external and two internal) adapted to cooperate with two adjacent grooves 16 in order to keep the bracket 18 mounted to the plinth but freely slidable longitudinally thereon. Each sliding portion 20 has a slanted surface 20a adapted to facilitate the insertion of the bracket at an end of longitudinal grooves 16 of the plinth 10. Moreover the height of each sliding portion 20 (identified in figure 9 with the reference H) is slightly lower than the height of profiles 16a or 16b in order to allow such sliding movement. For the same purpose, the distance K between the two internal portions 20 (figure 7) of the bracket 18 corresponds substantially to the thickness of the profiles 16a and 16b. Integral with the base part 18a, the

bracket 18 comprises two distal arc-shaped parts 18b adapted to cooperate with the second portion 12b of the L-shaped support 12. Each arc-shaped part 18b presents two leg portions 22 linked by a shaped bridge portion 24. The bridge portion 24 presents a slanted smooth surface 24a adapted to cooperate elastically with the second portion 12b of the L-shaped support 12 in order to obtain a snap engagement therebetween. The distance M (figure 8) between a central raised matching part 18c of the bracket 18 and a lower end 28 of the slanted surface 24a corresponds substantially to the thickness of the second portion 12b of the L-shaped support 12.

[0011] In order to assemble the plinth 10 to the built-in dishwasher D, the user has to install each L-shaped support 12 to the lower part of the dishwasher for instance by matching the slot 14 with two pins or screws (not shown) of the machine. The L-shaped supports may be also fixed to the machine (for instance by tightening the screws) once the second portions 12b of the L-shaped supports 12 is at the desired front distance from the machine D. The second step of the easy assembling procedure consists in inserting the adjustable brackets 18 in two adjacent grooves 16 of the plinth 10 and to slide them so that they are in a position corresponding to the position of the L-shaped supports 12. The choice of the grooves 16 depends on the actual width of the plinth 10 and it is made so that the lower edge of the plinth 10 can be positioned substantially in contact with the floor in a subsequent adjustment movement. The third step is a snap engagement of the bracket 18 on the vertical portions 12b of the L-shaped supports 12 during which side edges of the second portion 12b of the L-shaped support 12 slides on the slanted surfaces 24a of the bridge portions 24 and open them wide up to when the portion 12b goes beyond edges 28, followed by a vertical sliding of the bracket 18 on such portions in order to have the lower edge of the plinth substantially in contact with the floor. Of course, during such vertical adjustment of the plinth position also the longitudinal position thereof can be adjusted as well, by sliding the bracket 18 into the grooves 16.

[0012] In both the above embodiments of the invention, and particularly in the embodiment according to figures 1 and 3, where the T profiles 16a are positioned in the bottom part of the plinth 10 and the dishwasher has no legs, the upper or lower part of the plinth 10 can be cut off (e.g. by knife) during installation to appropriate height in order to avoid mechanical interference with the bottom edge T1 of the door T. The same adjustment can be carried out also for the bottom part of the plinth 10 of the embodiment of figures 2 and 4 (related to a dishwasher with legs). In figure 3 the portion to be cut off in order to arrive at the situation shown in figure 1 is indicated with reference P.

[0013] Figure 10 shows a small variant of the bracket 18, in which a pair of auxiliary retainers 30 are integrally protruding from the central raised part 18c of bracket 18, on sides thereof. Such retainers 30 are adapted to co-

operate with a corresponding longitudinal slot 32 (figures 5 and 6) of the second portion 12b of the L-shaped support 12 in order to improve the overall strength of the assembly L-shaped support 12 and bracket 18.

[0014] Even if in the above description a L-shaped support element is disclosed, such element can have different shape with the only limitation of having a vertical front portion along which the bracket 18 can be engaged and can slide; for instance, such support could be integral with the base portion of the appliance.

Claims

1. System for connecting and adjusting a front plinth (10) or the like to a piece of furniture, particularly to a built-in dishwashing machine (D), **characterised in that** it comprises a support element (12) for connection to the piece of furniture and presenting a vertical portion (12b) whose distance from the piece of furniture (D) can be adjusted, and a bracket element (18) having a portion (18a) slidably mounted in at least a longitudinal groove (16) of the plinth (10) and an elastic portion (18b) adapted to snap engage said vertical portion (12b) of the support element (12) and to slide thereon in order to adjust the position of the plinth (10).
2. System according to claim 1, wherein the support element (12) is a L-shaped strap.
3. System according to claim 2, wherein one portion (12a) of the support element (12) presents a longitudinal slot (14) adapted to cooperate with pin devices in order to adjust the distance of the vertical portion (12b) of the support element (12) from the piece of furniture (D).
4. System according to any of the preceding claims, wherein the elastic portion (18b) of the bracket element (18) presents two elastic parts (22, 24) having slanted surfaces (24a) adapted to cooperate with edges of the vertical portion (12b) of the support element (12) during the snap-engagement coupling.
5. System according claim 4, wherein the bracket element (18) presents a central portion (18c) on which the vertical portion (12b) of the support element (12) rests after snap-engagement.
6. System according to claim 5, wherein each of the two elastic parts (22, 24) of the bracket element (18) is arc-shaped and presents two leg portions (22) integral with a base portion (18a) and linked by an upper cross portion (24) defining said slanted surface (24a).
7. System according to claim 5, wherein the bracket

element (18) presents at least one protruding portion (30) adapted to cooperate with an auxiliary slot (32) of the vertical portion (12b) of the support element (12).

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8. System according to any of the preceding claims, wherein the plinth (10) presents a plurality of parallel longitudinal grooves (16).

9. System according to claim 7, wherein each groove (16) is defined by longitudinal fins (16a, 16b) having T or L cross section.

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10. System according to any of the preceding claims, wherein the plinth (10) is adapted to be longitudinally cut in order to further adjust its distance from the piece of furniture (T1, T) and the floor.

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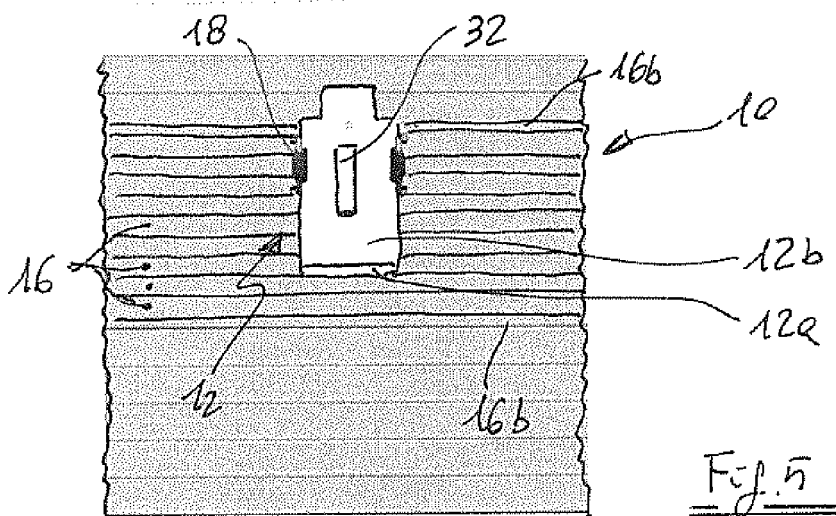
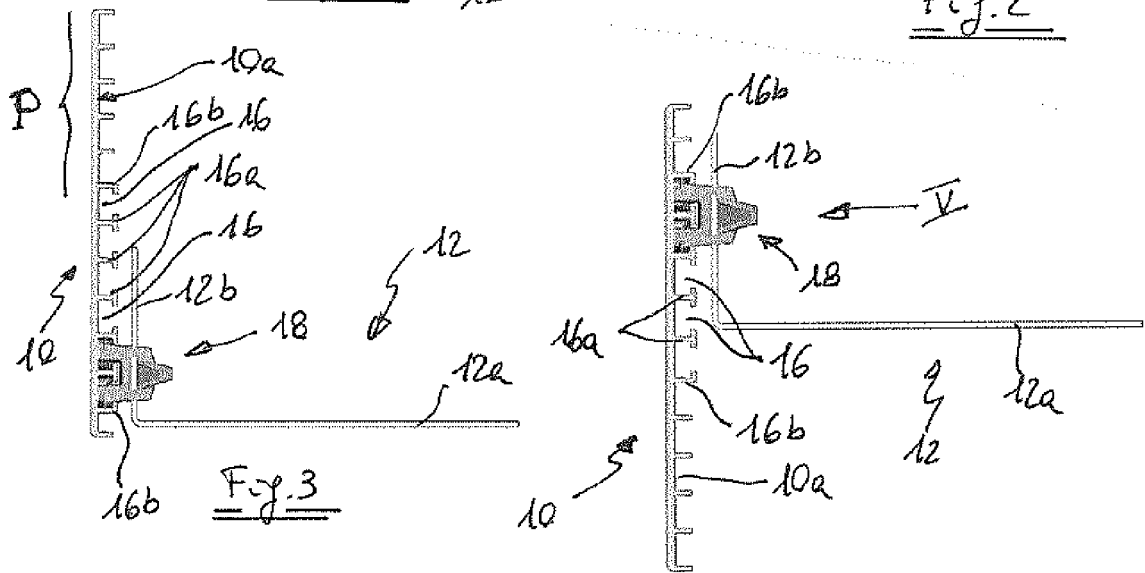
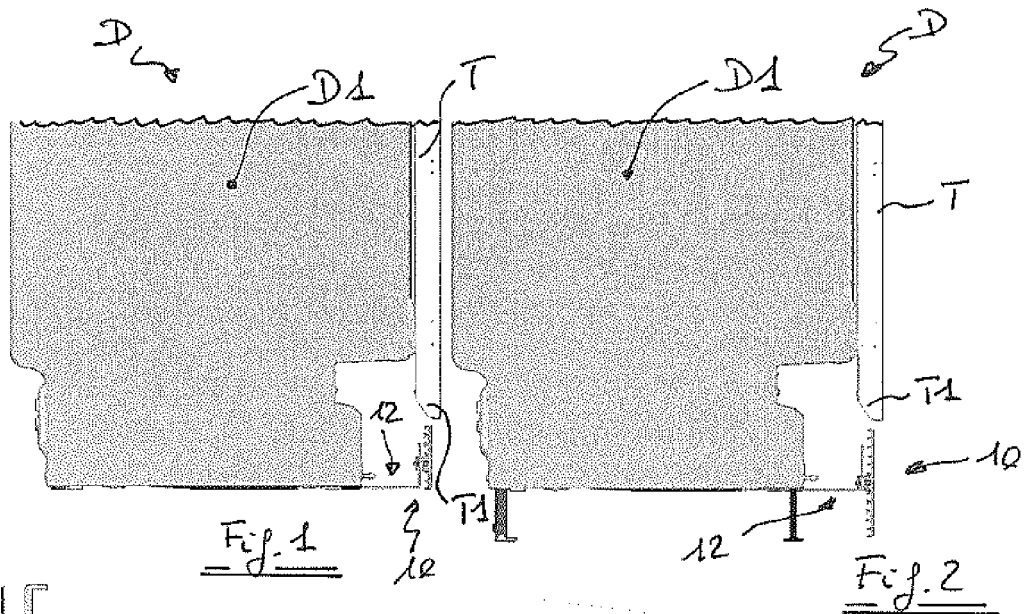
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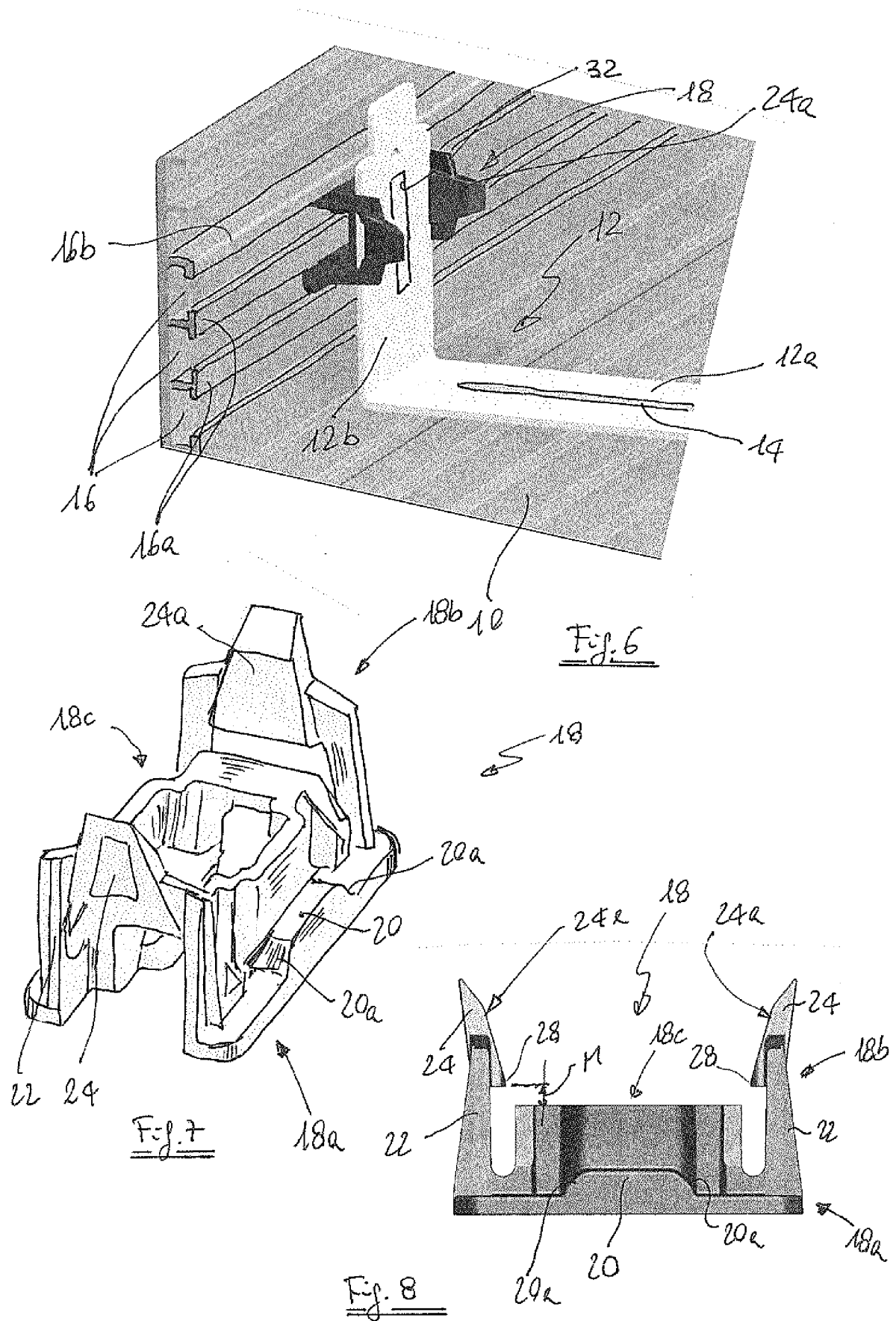
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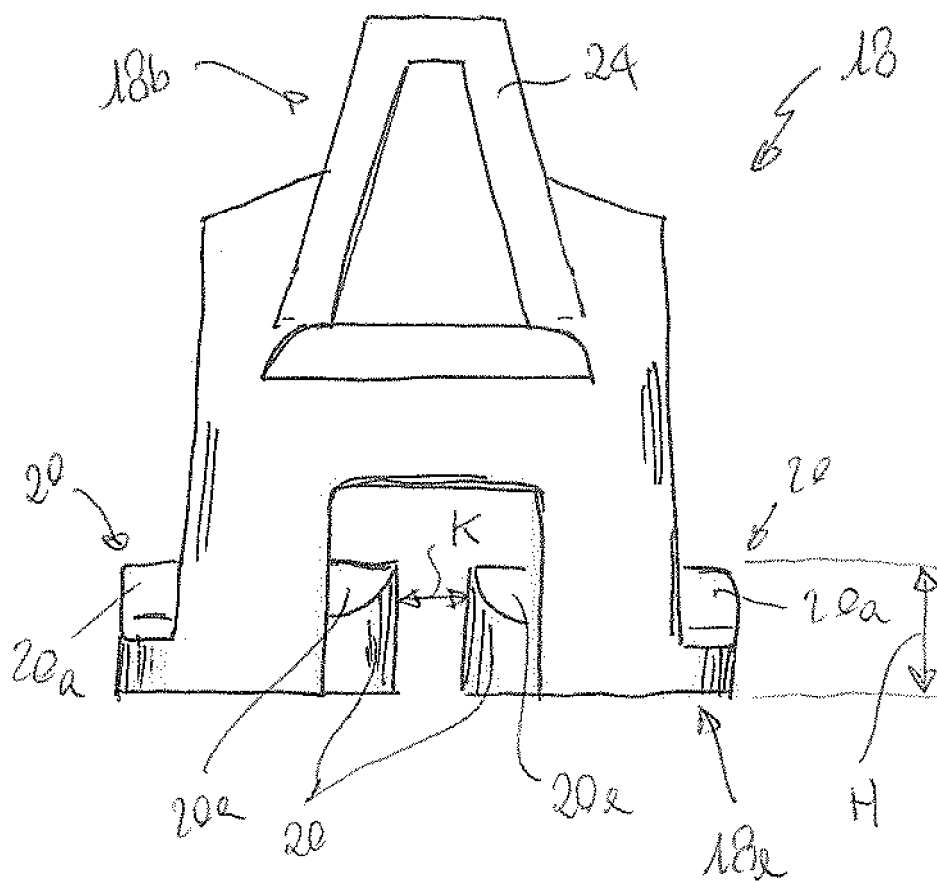


Fig. 9

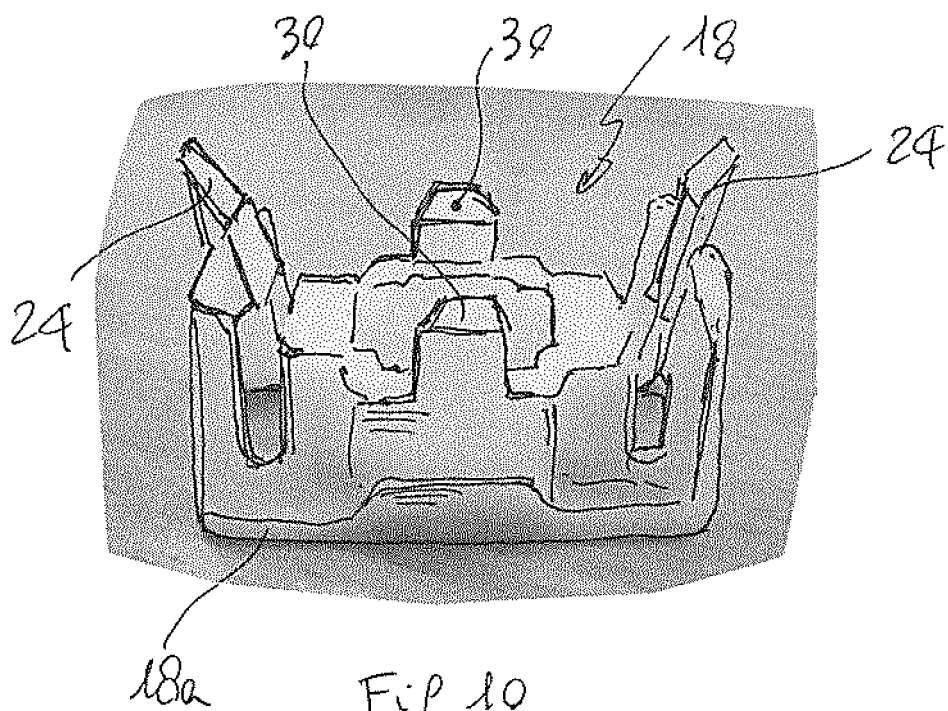


Fig. 10



EUROPEAN SEARCH REPORT

Application Number
EP 12 15 6234

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 90 00 702 U1 (E-NORM BESCHLAG GMBH & CO KG [DE]) 1 March 1990 (1990-03-01) * page 3; figure 1 *	1,10	INV. A47L15/42 F25D23/02 A47B95/00
A	WO 2004/058037 A1 (ARCELIK AS [TR]; AKIN TOLGA [TR]) 15 July 2004 (2004-07-15) * abstract; claims 1-7; figures 1-7b *	1-3,7	
A	DE 196 07 935 A1 (HENKE PAUL GMBH & CO KG [DE]) 12 September 1996 (1996-09-12) * abstract; figure 1 *	1,4-6	
A	EP 1 362 530 A1 (SCILM SPA [IT]) 19 November 2003 (2003-11-19) * abstract; figures 1-4 *	1,8-10	
A	DE 44 33 173 C1 (VOLPATO IND SRL [IT]) 5 October 1995 (1995-10-05) * column 3, line 52 - column 4, line 48 * * figures 1-3 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47L F25D D06F A47B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 18 July 2012	Examiner Weinberg, Ekkehard
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 15 6234

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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18-07-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 9000702	U1	01-03-1990	NONE
WO 2004058037	A1	15-07-2004	AT 427690 T 15-04-2009
		AU 2003298502 A1	22-07-2004
		DK 1583456 T3	22-06-2009
		EP 1583456 A1	12-10-2005
		ES 2323420 T3	15-07-2009
		WO 2004058037 A1	15-07-2004
DE 19607935	A1	12-09-1996	NONE
EP 1362530	A1	19-11-2003	AT 292917 T 15-04-2005
		DE 60300493 D1	19-05-2005
		DE 60300493 T2	15-09-2005
		EP 1362530 A1	19-11-2003
		ES 2239742 T3	01-10-2005
		IT PD20020128 A1	17-11-2003
DE 4433173	C1	05-10-1995	NONE