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(72) Inventor: **Jerkic, Niko**  
**5216 Most na Soci (SI)**

(74) Representative: **Skubic, Vinko**  
**Patentna pisarna d.o.o.**  
**Copova 14**  
**P.O. Box 1725**  
**1001 Ljubljana (SI)**

(71) Applicant: **ITW Metalflex d.o.o. Tolmin**  
**5220 Tolmin (SI)**

**(54) Engagement of a junction member and a sheet-type carrier support**

(57) Engagement of a receptacle of a safety closure of a door of a drum-type household machine and a front wall of said drum-type household machine, precisely a detachable connection of an inserting projection (1) and an opening (2). With a front bar-shaped extension (4) said inserting projection (1) provides a recess (6). With the side of said recess (6), the outer surface (F) of a front wall of a housing of the junction member is limited by two L-sections (7) with said front wall of the housing of said junction member and said L-sections (7) constituting a

C-section arranged normally to said recess (6). A slide plate (8) is adapted to and inserted into said C-section. A front end of said slide plate (8) is shaped to form a bar-like feather (9) adapted to said recess (6). In the assembled state, the extension by height of said slide plate (8) exceeds the upper edge of said L-sections (7). At the end of the slide plate (8) residing opposite said bar-like feather (9) there is, on each side thereof, arranged a two-legged lever (11) having a notch (12). On each L-section (7) there is provided, integral with it, a counter notch (13).

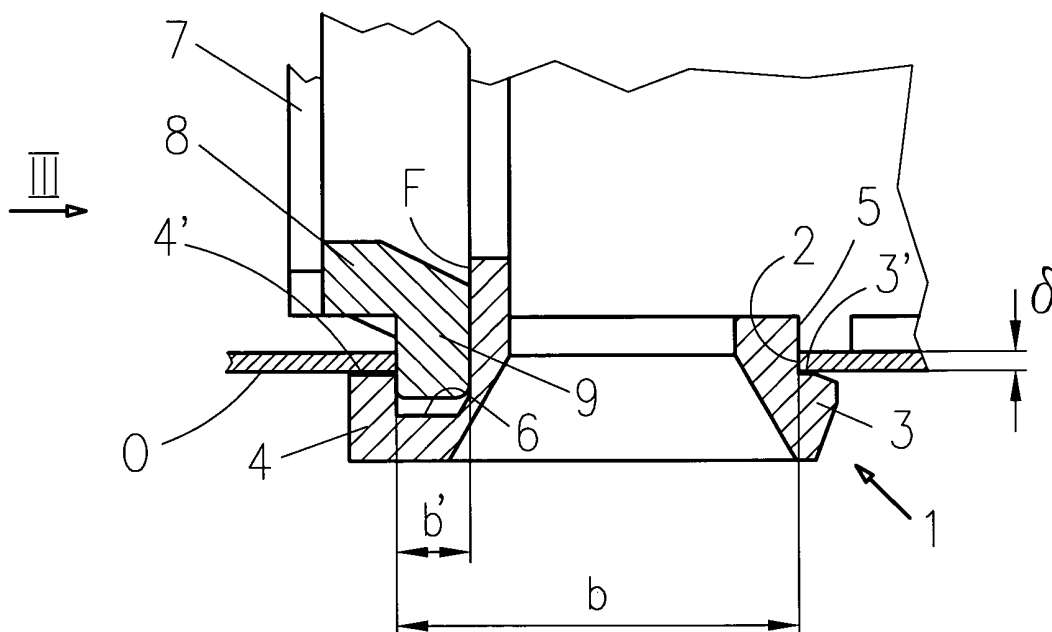


Fig.1

## Description

**[0001]** The present invention relates to an engagement of a junction member and a sheet-type carrier support with said junction member being, e.g., a receptacle of a closure of a drum-type household machine, preferably a receptacle of a safety closure of said drum-type household machine, and said sheet-type carrier support being, e.g., a front wall of said drum-type household machine, with said engagement constituting a detachable connection of an inserting projection of said junction member (a material member) and an opening provided in said sheet-type carrier support (intangibility).

**[0002]** An engagement of an inserting projection of a closure of a drum-type household machine and a front wall of said drum-type household machine, precisely a device for locking the closure door of a washing machine, is known from the patent specification No. EP1418266 (Rocchitelli). When incorporated, said device evidently resides in registry with a horizontal diameter of a door of said washing machine. In a front wall of the washing machine, three recesses arranged in a vertical line are foreseen to locate said device as to the position thereof, with the mutual spacing of their two outer recesses being large enough to establish sufficient anchoring rigidity, but too large to arrange said three recesses along a horizontal line if taking into account a given configuration of a washing machine. The usability of said known engagement is thus limited.

**[0003]** Looking for an engagement of a junction member and a sheet-type carrier support being invariant to the orientation of said junction member with respect to said carrier support, more precisely looking for an engagement of a junction member and a sheet-type carrier support being substantially invariant to the configuration of a front wall of the machine, it is a goal of the present invention to provide an engagement based on a single recess.

**[0004]** According to the present invention, said goal is obtained so that with a front bar-shaped extension said inserting projection of a junction member as set forth in the introductory part of this specification provides a substantially trough-shaped or a trough-like recess, whose distal edge is flush with a side of an opening provided in said sheet-type carrier support, while its proximal edge is flush with an outer surface of a front wall of a housing of said junction member. The words *a trough-shaped or a trough-like recess* indicate each and every intangibility serving as a receptacle to accommodate a material part adapted to it, and the terms *distal/proximal* refer to the position of a functional unit of said junction member relative to said front bar-shaped extension. The mounting of the inserting projection into the opening is evidently facilitated if said recess residing with said front bar-shaped extension of said junction member is a trough-shaped recess.

**[0005]** Besides, with the side of said recess, said outer surface of the front wall of the housing of the junction

member is limited, according to the present invention, by two L-sections with said front wall of the housing of said junction member and said L-sections constituting a C-section arranged normally to said recess. Said L-sections are advantageously used to increase the stability of the mounted junction member since they reside outside the area of the receiving opening.

**[0006]** According to the invention, a slide plate is adapted to and inserted into said C-section, which in this case acts as a guidance. Actually, the substance of the present invention resides in said slide plate since no tool is required for its inserting and removal, respectively.

**[0007]** A front end of said slide plate is shaped to form a bar-like or a substantially bar-like feather adapted to said recess with the term *front* determining the respective direction of inserting the slide plate. Obtaining a locking connection based on mating said recess and said bar-like feather is thus evident.

**[0008]** In order to complete said locking connection it is important that, in the assembled state of the connection, the extension by height of said slide plate exceeds the upper edge of said L-sections. Namely, at the end of the slide plate residing opposite said bar-like feather there is, on each side thereof, actually at its upper side and flush with it, arranged, by means of a scarf hinge integral with it, a two-legged lever positioned in parallel with said L-section, with said scarf hinge acting preferably substantially as a spring and the end part of said L-section oriented to the front wall of the machine providing a notch preferably of the type of an indentation, while the other end of said two-legged lever serves as an unlocking key. According to the configuration of said levers as stated hereinbefore, on the edge of each L-section removed from the front wall of the machine there is provided, integral with it, a notch preferably of the type of a counter-indentation. Hence, said slide plate is secured against removal since indentations and counter-indentations mutually engage on the basis of yielding/returning capability of the indentations.

**[0009]** Hereinafter, the present invention is disclosed in more detail on the basis of an embodiment of engagement of a junction member and a front wall of a washing machine, said embodiment being shown on two annexed sheets of drawings with said junction member comprising a *sensor of door openness of household appliances* (only shown by indication of an outline of its housing) of the Slovenian patent application P-200400269 (Lavrencic) filed on 28 September 2004.

**[0010]** Each drawing is an orthogonal elevation.

- FIG. 1 is a plan view of the longitudinal centric section of the captioned inventive engagement according to detail I in FIG. 8,
- FIG. 2 is the captioned inventive engagement shown in direction of arrow II in FIG. 7 (prior-to-locking state),
- FIG. 3 is the captioned inventive engagement shown in direction of arrow III in FIGS. 1

and 8 (locking state),  
 FIGS. 4 to 7 is an action illustration of embodying the captioned inventive engagement of a junction member and a sheet-type carrier support with said junction member being schematically shown,  
 FIG. 8 is substantially FIG. 1 with the junction member presented entirely, and  
 FIG. 9 is an opening in a front wall of a washing machine, to retain an inserting projection of a junction member.

**[0011]** Actually, the engagement composed of a *sensor of door openness of household appliances* (junction member) and a front wall of a washing machine (sheet-type carrier support) is a detachable connection of an inserting projection 1 of said sensor (a material part) and an opening 2 of a front wall of a washing machine (intangibility) with said inserting projection providing an orifice for entering a latch (not shown) arranged on a wing of a door of said washing machine, said sensor being fastened on the inner side of said front wall of said washing machine, and said inserting projection 1, when assembled, residing on the outer side of said front wall of said washing machine, thus visible from the outside.

**[0012]** The opening 2 is rectangular having a long side  $a$  and a short side  $b$  with said long side constituting vertical limitations of said opening and said short side constituting horizontal limitations of said opening. In this embodiment, the extent  $a$  of the inserting projection 1 (FIG. 3) corresponds to the extent  $a$  of the opening 2.

**[0013]** In comparison with the extent  $b$  of the opening 2, the inserting projection 1 has a surplus of said extent (FIG. 1). With a first end, it has a front bar-shaped or substantially bar-like extension 3 parallel to the side  $a$  and extending beyond the side  $b$ , and with a second end, it has a rear bar-shaped or substantially bar-like extension 4 also parallel to the side  $a$  and extending beyond the side  $b$ . Each of them provides a support area 3', 4' oriented to the outer surface  $O$  of the front wall of the washing machine with the normal spacing from the supporting area  $L$  of the junction member being adapted to the thickness  $\delta$  of the material of the front wall of the washing machine. In combination with a riser 5, the support area 3' of the bar-like extension 3 constitutes a bearing surface to retain the side  $a$  of the opening 2 with the riser 5, then abutting the side  $a$ , being arranged normally to the support area 3' and projecting into the inside of the junction member. By contrast with the bar-like extension 3, the bar-like extension 4 of the inserting projection 1 provides a trough-like recess 6 having a width  $b'$ , whose distal edge is flush with the side  $a$  of the opening 2, while its proximal edge is flush with an outer surface  $F$  of a front wall of a housing of the junction member.

**[0014]** With the side of the recess 6 outside the side  $a$ , with both lateral sides, the outer surface  $F$  of the front wall of the housing of the junction member is limited by two L-sections 7 positioned normally to the front wall of

the washing machine. In said embodiment, the front wall of the housing of the junction member and the L-sections 7 constitute a C-section arranged normally to the recess 6. A slide plate 8 is adapted to and inserted into said C-section that in this case acts as a guidance. A front end of the slide plate 8 is shaped to form a bar-like feather 9 having a length  $a$ , a thickness  $b'$  and a height equal to the sum of the depression of the recess 6 and the thickness  $\delta$  of the material of the front wall of the washing machine.

**[0015]** In the assembled state (FIG. 3), the extension by height of the slide plate 8 exceeds the upper edge of the L-sections 7. With the end of the slide plate 8 residing opposite the bar-like feather 9 there is, on each side thereof, actually at its upper side and flush with it, arranged, by means of a short scarf hinge 10 integral with it, a two-legged lever 11 positioned in parallel with the L-section 7, with the scarf hinge 10 acting as a spring and the end part of the L-section 7 oriented to the front wall of the washing machine providing a notch 12, while the other end of said two-legged lever serving as an unlocking key. With the edge of each L-section 7 removed from the front wall of the washing machine there is provided, integral with it, a counter notch 13. With inserting the slide plate 8 into the C-guidance, the two notches 12 slide over the two counter notches 13 and engage them in the position of accommodating the bar-like feather 9 in the trough-like recess 6. Of course, the disassembling of the slide plate 8 precedes in the reverse way.

**[0016]** In addition to the features disclosed hereinbefore, respective provisions are foreseen to obviate the looseness, if the captioned engagement is prepared for a thickness  $\delta$  not known in advance or for loose tolerances, respectively, with said provisions being selected from the respective prior art.

**[0017]** When realizing the captioned engagement of a junction member (*a sensor of door openness of household appliances*) and a sheet-type carrier support (a front wall of a drum-type household machine), said junction member is positioned to be inclined with respect to the opening 2 and the front wall of the washing machine (FIG. 4) with the front bar-like extension 4 being pushed, in the direction  $V$  (FIG. 5), into the opening 2. As a result of the existence of the recess 6 then applied for entering the edge of the opening 2, the assembling is thus extremely simple.

**[0018]** Mutually, individual dimensions of the inserting projection 1 are coordinated so as to make it possible the step of FIG. 5 to be followed by swinging said junction member in the direction of the arrow  $VI$  (FIG. 6), i.e., the rear bar-like extension 3, too, enters the opening 2. In the said state, the base area  $L$  of the junction member is supported by the inner surface of the front wall of the washing machine.

**[0019]** In a next step, while shifting in the direction of the arrow  $VII$  (FIG. 7), the inserting projection 1, by its rear bar-like extension 3, abuts a first side  $a$  of the opening 2. In this position, the distal edge of the recess 6 is

flush with a second side *a* of the opening 2 with the recess 6 of the inserting projection 1 being prepared to engage the bar-like feather 9 of the slide plate 8.

[0020] By the slide plate 8 shifted in the direction of the arrow VIII (FIG. 8), the bar-like feather 9 is accommodated in the recess 6. Two notches 12 engage two counter notches 13 and, hence, the detachable connection of the junction member and the sheet-type carrier support is established.

[0021] Of course, the disengagement precedes in the reverse way.

[0022] Due to the fact that with the captioned engagement a locking function (giving the word its strictest meaning) is constituted by two great sides of the inserting projection 1 and the opening 2, there is obtained so called "narrow" guiding, and due to the fact that the captioned engagement is based on a single opening there are now possible all incorporating orientations of the junction member: a horizontal one that is considered most frequent, as well as a respective hinging or standing one.

## Claims

1. Engagement of a junction member and a sheet-type carrier support with said junction member being, e.g., a receptacle of a closure of a drum-type household machine, preferably a receptacle of a safety closure of said drum-type household machine, and said sheet-type carrier support being, e.g., a front wall of said drum-type household machine, with said engagement constituting a detachable connection of an inserting projection (1) of said junction member, as a material member, and an opening (2) provided in said sheet-type carrier support, as intangibility, **characterized in that**, with a front bar-shaped extension (4), said inserting projection (1) provides a substantially trough-shaped or a trough-like recess (6), whose distal edge is flush with a side of the opening (2) provided in said sheet-type carrier support, while its proximal edge is flush with an outer surface (F) of a front wall of a housing of said junction member.
2. Engagement of claim 1, **characterized in that**, with the side of said recess (6), said outer surface (F) of the front wall of the housing of the junction member is limited by two L-sections (7) with said front wall of the housing of said junction member and said L-sections constituting a C-section arranged normally to said recess (6).
3. Engagement of claim 2, **characterized in that** a slide plate (8) is adapted to and inserted into said C-section.
4. Engagement of claim 2 or 3, **characterized in that** a front end of said slide plate (8) is shaped to form

a bar-like feather (9) adapted to said recess (6).

5. Engagement of claim 3, **characterized in that** in the assembled state, the extension by height of said slide plate (8) exceeds the upper edge of said L-sections (7).
6. Engagement of one of the preceding claims, **characterized in that** at the end of the slide plate (8) residing opposite said bar-like feather (9) there is, on each side thereof, actually at its upper side and flush with it, arranged, by means of a scarf hinge (10) integral with it, a two-legged lever (11) positioned in parallel with said L-section (7), with said scarf hinge (10) acting preferably substantially as a spring and the end part of said L-section (7) oriented to the front wall of the machine providing a notch (12) preferably of the type of an indentation, while the other end of said two-legged lever (11) serves as an unlocking key.
7. Engagement of claim 6, **characterized in that** on the edge of each L-section (7) removed from the front wall of the machine there is provided, integral with it, a counter notch (13) preferably of the type of a counter indentation.

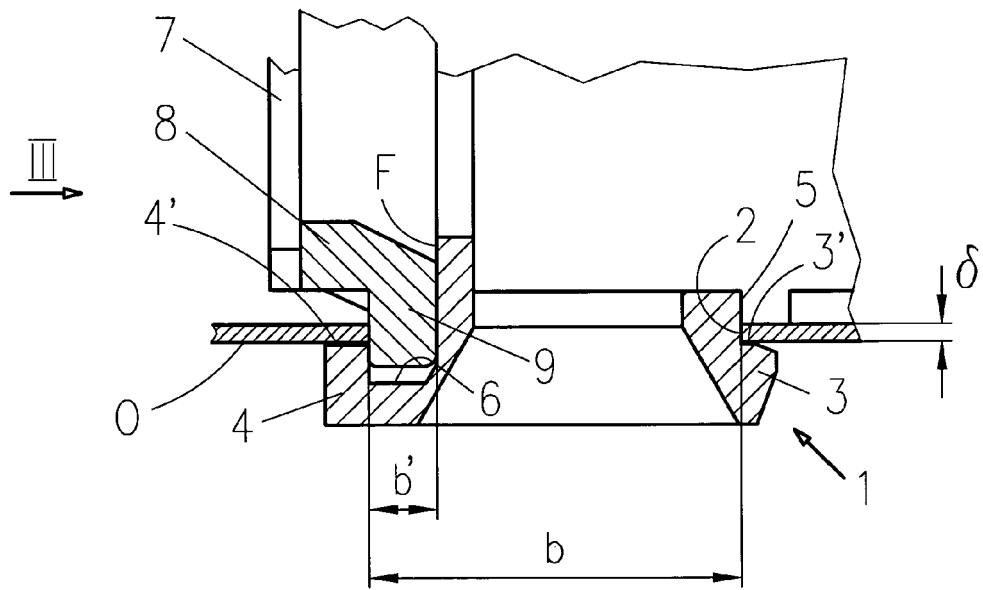


Fig.1

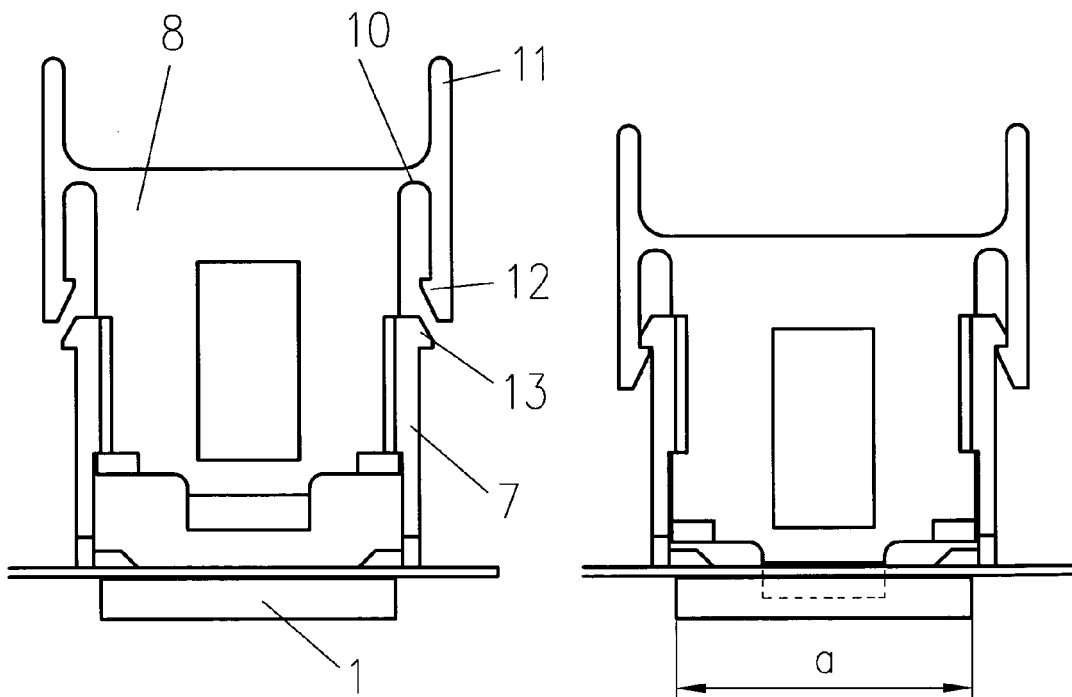


Fig.2

Fig.3

Fig.4

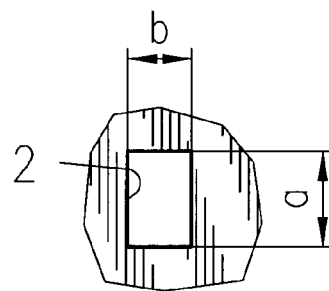
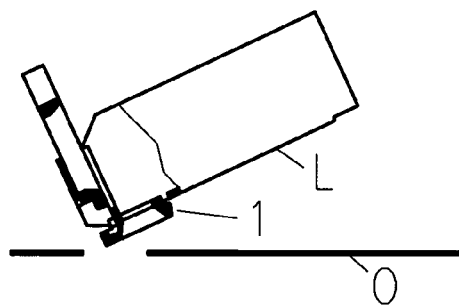


Fig.9

Fig.5

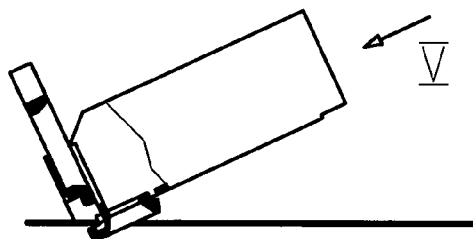


Fig.6

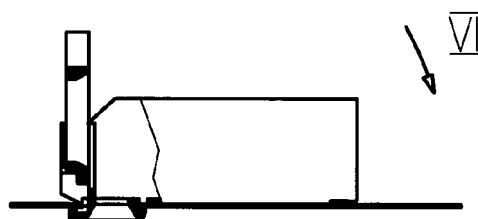


Fig.7

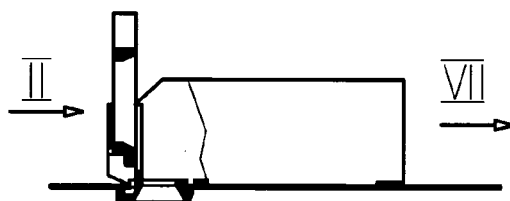
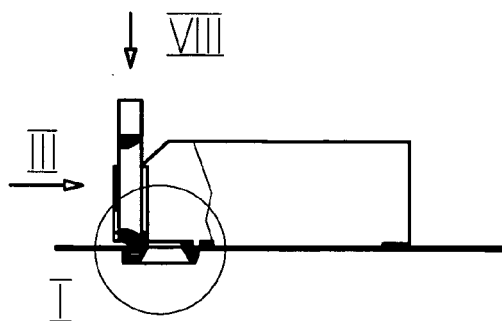


Fig.8





European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 05 46 8003

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 3 455 129 A (JOHN P. FORBES ET AL) 15 July 1969 (1969-07-15) * figure 3 *	1	D06F39/14 E06B9/08 E05B65/02
D,A	EP 1 418 266 A (ELETTROTECNICA ROLD SRL) 12 May 2004 (2004-05-12) * the whole document *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			D06F A47L E05B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 27 July 2005	Examiner Ureta, R
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EPO FORM 1503 03 82 (P04C01)

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

EP 05 46 8003

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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27-07-2005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3455129	A	15-07-1969	NONE	
EP 1418266	A	12-05-2004	EP 1418266 A2	12-05-2004