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(54) Door latch and household appliance

(57) The invention is in particular directed to a door latch (2) for latching a front door (4) of a household appliance (1). The door latch (2) comprises a fixing portion (6) and a latching portion (7). The fixing portion (6) and latching portion (7) are twisted by about 90 degrees.

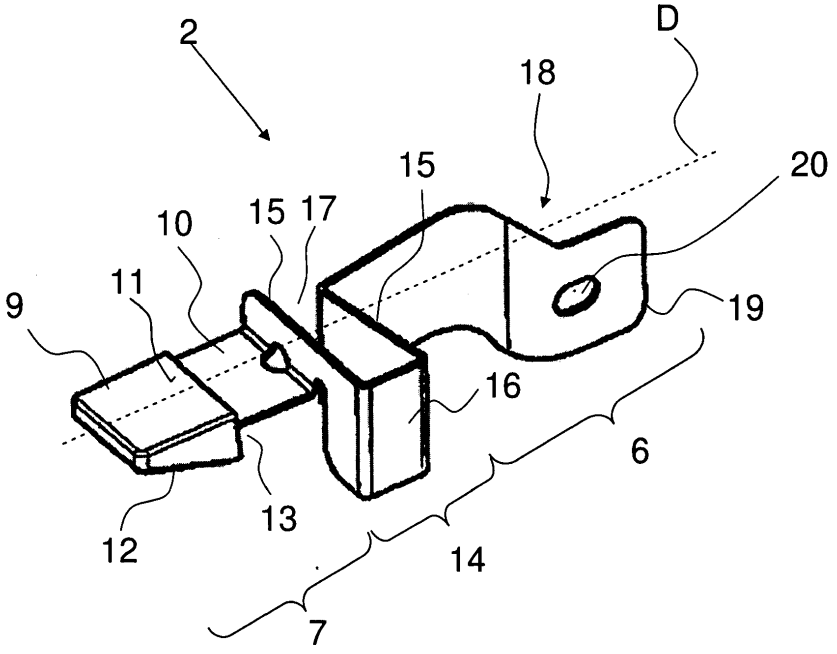

Fig. 2

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Description

[0001] The invention is directed to a door latch and a household appliance comprising such a door latch.

[0002] Door latches in connection with household appliances are often required to disable unauthorized access to treatment chambers such as baking muffles of baking ovens, washing chambers of dishwashers and the like.

[0003] A door latch for latching the front door of an electronic oven is known for example from DE 81 37 942 U1 showing a double L-shaped bent sheet metal elastic strip with a hook for engaging a latching edge of the door.

[0004] In spite of the known door latch there is still need for further refining latching efficiency and ensuring easy assembly.

[0005] It is therefore an object of the invention to provide a door latch for household appliances, having refined latching efficiency and allowing for easy assembly.

[0006] This object is solved by claims 1 and 8. Preferred embodiments result from respective dependent claims.

[0007] According to claim 1, a door latch for latching a door, in particular a front door, of a household appliance, preferably a front door of a baking oven, is provided.

[0008] The door latch comprises a fixing portion adapted and designed for fixing the door latch to the appliance. The door latch can for example be fixed to the appliance by one or more screws, by rivets, by welding and similar techniques. However, detachable fixing techniques, such as screws, are preferred in cases in which the door latch shall removably and/or temporarily be attached to the appliance.

[0009] The door latch further comprises a latching portion for latching engagement with the door of the appliance. At least the latching portion, but also other parts and sections of the door latch, in particular a base body of the door latch, may be made from a flexible and/or elastic material.

[0010] Further, the door latch is designed such that the fixing portion and latching portion are, with respect to the overall lengthwise direction of the door latch, twisted by about 90 degrees.

[0011] The twisted configuration contributes to enhanced mechanical strength and stiffness resulting in refined latching efficiency. Overstretching and decreasing resilience can at least be suppressed.

[0012] Twisted by about 90 degrees shall in particular mean, that planes defined by the latching portion and fixing portion, respectively, are twisted by 90 degrees, i. e. enclose an angle of about 90 degrees, or in other words are rotated, i. e. twisted, with respect to the overall lengthwise direction by about 90 degrees.

[0013] In general, the latching portion and fixing portion are provided at opposite ends of the door latch. The overall lengthwise direction is in particular given by a lengthwise or axial direction of an envelope of the door latch, enveloping the whole door latch, in particular the opposite ends of the door latch.

[0014] In one embodiment, the door latch comprises a hook type latching element, preferably fixed to the latching portion, in particular to a latching tab of the latching portion. The tab may be a strap or tongue shaped section of the door latch, projecting therefrom.

[0015] If the hook type latching element and latching tab are implemented as two parts, the latching element may have a slot into which the tab is or can be inserted. The dimension of the slot and tab may be adapted to one another such that the latching element is safely fixed to the tab. In a refinement, the hook type latching element and/or tab can comprise snap or hook elements for snap-connecting the latching element and tab. The latching element may be fixed by other means, such for example by adhesive and the like.

[0016] In particular with the embodiment mentioned beforehand, the latching element may be made from plastics, whereas other parts of the door latch may be made from metal, in particular stainless steel, light metals, spring steel and the like, coated metals, in particular enamel coated metals (*please complete if necessary).* All or single elements of the door latch may be coated, for example by a lacquer layer, and/or plated, for example with chrome and the like.

[0017] In a further embodiment, the latching tab projects parallel to the overall lengthwise direction from a, preferably strip shaped, intermediate section which is oriented transversally, in particular in an angle of 90 degrees, to the overall lengthwise direction. The latching tab and intermediate section preferably enclose an angle of about 90 degrees. In particular in this configuration, the door latch, in particular a base body of the door latch can be formed or bent from a single sheet metal strip. This allows easy and cheap manufacture of the door latch. Further, with a transversal intermediate section favorable mechanical strength and stability can be obtained, guaranteeing long-term efficient latching.

[0018] In a further embodiment, the intermediate section comprises a U-section, i. e. a U-shaped section, wherein a section opening of the U-shaped section is oriented transversally to the overall lengthwise direction. Further, with this embodiment, the latching portion extends from one of the legs of the U-shaped section and the fixing portion extends from the other one of the legs of the U-shaped section in opposite direction to the latching portion. This configuration has excellent stability and elasticity, and further, wear stretch can be greatly reduced.

[0019] In a yet further embodiment, the door latch comprises a base body, which comprises at least the fixing portion and latching portion. The base body is made as a one-piece part bent sheet-type elastic body, preferably made from metal, in particular metal alloys, and/or plastics. Such a base body can, as already mentioned, be formed as a single sheet metal strip. Such base bodies can be produced in a relative simple and cost efficient way, and the final assembly of the door latch can be great-

ly simplified.

[0020] In a further embodiment, the fixing portion has a planar s-type end section preferably having an oblong screw hole for fixing the door latch to the appliance. S-type end section in particular shall mean that two sections in the end region of the door latch are offset from each other in a plane defined by the fixing portion itself, and are connected by a curved connector section. The S-type end section therefore has an s-bend like geometry. With such design and geometry, in particular of the screw hole, the mounting position and orientation of the door latch can be fine tuned, which in turn simplifies mounting and secures proper function of the door latch.

[0021] In a preferred embodiment a wedge shaped element is attached to the latching tab, in combination making up or resulting in a latching tooth for latching engagement with the door. The wedge shaped element can be made from plastics or other suitable materials, in particular by casting or other techniques. Further, the design of the wedge shaped element can be such that it can be snap-connected and/or locked to the latching tab. In particular, the wedge shaped element and the tab, and therefore in particular the base body, are interconnected or interlocked by respective connecting or locking elements. Claim 8 is directed to a household appliance, in particular baking oven, comprising a front door and a door latch as described beforehand, in particular including any embodiment described so far. The door latch is mounted and fixed to the appliance and adapted to latch the door in a closed state, preferably at an upper or lateral edge of the door. The door latch, in particular the latching section, in particular the wedge shaped element, can engage a glass and/or decorative element, plate or cover of the door. It is also conceivable that the door latch, in particular the latching section, in particular the wedge shaped element engages a recess provided in the door.

[0022] In an embodiment, the door latch is attached to a sidewall of the household appliance, and, in the closed state of the door, the latching portion at least partially projects from a front face of the appliance. The latching portion preferably projects through a gap between a lower edge of an upper cover plate and an upper edge of the door. In this configuration, the door latch can easily be mounted and removed from the appliance. Further, it is possible to design the mounting position and mounting space for the door latch in such a way that no extra cover elements are required if the door latch is removed or detached from the appliance. Beyond that, door latch projecting slightly from the appliance is not disruptive to the general handling and to the outer appearance of the appliance, and can easily be operated.

[0023] In a yet further embodiment of the household appliance the U-shaped section, preferably loosely, engages a respective vertical bar of the appliance. The vertical bar may be a protrusion provided at the upper or lateral face side of the appliance, in particular of a casing of the appliance. Such an additional engagement improves latching efficiency and latching strength.

[0024] As to further advantages and advantageous effects, reference is made to the description further above, in particular related to the door latch and embodiments thereof.

[0025] Example embodiments will now be described in connection with the annexed figures, in which:

Fig. 1 shows a sectional view of a baking oven with a door latch mounted thereto;

Fig. 2 shows a single door latch;

Fig. 3 shows an enlarged section of the baking oven of Fig. 1;

Fig. 4 shows an enlarged side view of the baking oven; and

Fig. 5 shows an enlarged front view of a section of the baking oven.

[0026] Fig. 1 shows a sectional view of a baking oven 1 with a door latch 2 mounted thereto. Note that the baking oven 1, which is just an example of a household appliance, will be described only in so far as is necessary for fully understanding the invention. Further, the figures are not necessarily true to scale and scales between figures may vary. Throughout the text, like reference signs are used for like elements.

[0027] The baking oven 1 comprises a casing 3, a baking chamber or muffle (not shown) and a front door 4 for closing a front opening of the baking chamber. With the situation in Fig. 1, the door 4 is in a closed state. Above the door 4, an upper cover plate 5 is provided to which one or several control elements are mounted.

[0028] In some situations it is desirable to latch the door 4 in order to prevent unauthorized opening of the door 4, i. e. access to the baking chamber. In particular it is desirable to latch the door 4 to prevent little children from opening the door 4 during operation of the baking oven 1.

[0029] In connection with door latches 2 it is desirable that they have adequate latching efficiency and can be easily and flexibly attached and detached to the baking oven 1.

[0030] From Fig. 1 it can be seen, and it will be described in more detail below, that the door 4 in its closed state is latched by the door latch 2. In this way, unauthorized opening of the door 4 can at least to some extent be blocked and access to the baking chamber can at least be handicapped.

[0031] A detailed view of the door latch 2 is given in Fig. 2. As can be seen, the door latch 2 comprises a fixing portion 6 adapted and designed for fixing the door latch 2 to the baking oven 1. The door latch 2 further comprises a latching portion 7 for latching the door 4.

[0032] As becomes obvious from Fig. 2, the fixing portion 6 and latching portion 7 are, with respect to the overall

lengthwise direction D or overall longitudinal axis D of the door latch 2, twisted by about 90 degrees. In other words, a plane defined by the sheet-like fixing portion 6 and a plane defined by the latching portion 7 enclose an angle of about 90 degrees.

[0033] The twisted configuration of the door latch 2 on the one hand allows simple and flexible attachment to a side wall 8 of the baking oven 1 or casing 3, and on the other hand leads to enhanced operability, latching efficiency and latching strength.

[0034] With respect to Fig. 2, the door latch 2 comprises a hook type latching element 9 which is plugged on a latching tab 10 of the door latch 2. The latching element 9 therefore may have a slot having inner dimensions adapted to the outer dimensions of the latching tab 10 and configured such that the latching tab 10 can be fixedly plugged into the slot. If required, the latching element 9 can be secured to the latching tab 10 additionally by snap or latch elements engaging each other upon plugging the latching element 9 on the latching tab 10. Snap or latch elements may for example be provided within the slot and on the surface of the latching tab 10. As an alternative or in addition, it is possible to secure the latching element 10 on the latching tab 10 by adhesive.

[0035] The latching element 9 wedge shape is single sided, i. e. asymmetric with respect to the latching tab 10. More precisely, when mounted on the latching tab 10, one surface, in Fig. 2 the upper surface 11, of the latching element 9 is parallel to the latching tab 10 and the opposite surface, i.e. the lower surface 12, is slanted downwards. The lower surface 12 is slanted in such a way, that a step-like latching projection 13 is formed at the lower side of the door latch 2 in a transitional region between the latching element 9 and latching tab 10. The step size of the latching projection 13 can easily be adjusted by appropriately shaping the latching element 9 or by plugging adequate latching elements 9 on the latching tab 10. In this way, a high degree of flexibility and efficient and adequate latching engagement with different types of doors can be obtained.

[0036] As is also apparent from Fig. 2, the latching tab 10 projects in overall lengthwise direction D from an intermediate section 14. The intermediate section 14 comprises a U-section with two legs 15 and a base 16. The U-section is oriented transversally to the overall lengthwise direction D, i. e. the base 16 is oriented parallel to the overall lengthwise direction D, the legs 15 are oriented essentially perpendicular to the overall lengthwise direction D and a section opening 17 is directed transversally to the overall lengthwise direction D.

[0037] The latching tab 10 and fixing portion 6 extend from a respective leg 15 in opposite directions in overall lengthwise direction D. In the present case, the latching tab 10 and the intermediate section 14, i. e. the respective leg 15, enclose an angle of about 90 degrees. Also, the fixing portion 6 and the intermediate section 14, i. e. the respective leg 15, enclose an angle of about 90 degrees.

[0038] As becomes obvious from Fig. 2, an intersection line between the latching tab 10 and the respective leg 15 of the intermediate section 14 is oriented essentially horizontal. Due to the fact, that the latching tab 10 and fixing portion 6 are twisted by about 90 degrees an intersection line between the respective leg 15 of the intermediate section 14 and the fixing portion 6 is oriented essentially vertical. Note that the terms horizontal and vertical relate to the ordinary mounting position of the door latch 2, which in particular become obvious from Fig. 1, and 3 to 5.

[0039] The fixing portion 6 of the door latch 2 has an s-shaped end section 18. Further, the fixing portion 6 comprises an end tab 19 having an oblong screw hole 20. The oblong screw hole 20 permits adjusting the mounting position of the door latch 2 parallel to the overall lengthwise direction D, in the present case in horizontal direction. The s-shaped section 18 permits vertical offsets between screw hole 20 and latching tab 10. Such vertical offsets, essentially defined by adequate heights of the s-shaped end section 18, may be chosen to best fit respective mounting positions and latching functionality.

[0040] Considering Fig. 2, it becomes obvious that the door latch 2, in more details the base body of the door latch 2, can be formed from a single metal strip bended accordingly. The metal strip can be made from stainless steel, standard steel and others. If required, suitable coating, plating and/or finishing can be applied to the base body, such as enamel coating, chrome plating and/or lacquers, respectively. However, it would also be possible that the base body is formed from plastics. As already indicated, the latching element 9 is preferably made from plastics. In case that the base body is also made from plastics, the base body and latching element 9 can be manufactured as a one-piece part, via injection molding for example.

[0041] The door latch 2 and its function will now be described in further details with respect to figures 3 to 5. Fig. 3 shows an enlarged section of the baking oven 1, in more detail a region to which the door latch 2 is mounted to. Fig. 4 shows an enlarged side view of the baking oven 1 in a region of the door latch 2. Fig. 5 shows an enlarged front view of the baking oven 1 in a region of the door latch 2.

[0042] As can be seen from the figures, the fixing portion 6 is attached to the side wall 8 by a screw 21 passing through the screw hole 20. The two-dimensional, i. e. areal, extent of the fixing portion 6 is parallel to the side wall 8. As already mentioned, the position of the door latch 2 can be adjusted in horizontal direction because the screw hole 20 is implemented as an oblong hole.

[0043] Movement in horizontal direction of the door latch 2 is guided by a horizontal abutment edge 22 provided on the side wall 8. The abutment edge 22 also prevents the door latch 2 from rotating around screw 21. However an abutment edge 22 is not mandatory as anti-rotation properties can also be obtained by providing two screws and/or similar engagement elements.

[0044] Latching engagement between the door 4 and the door latch 2 is obtained in the present case in an upper section, more precisely an upper edge, of a front pane of the door 4. The front pane may be a glass pane and/or any decorative pane mounted or applied to the door 4. Note that any other site of the door 4 can be used and selected for latching engagement.

[0045] The latching portion 7, in more detail the latching element 9 and a part of the latching tab 10, project from the front face of the baking oven 1. The latching tab 10 passes through a gap 23 between an upper edge of the door 4 and a lower edge of the upper cover plate 5.

[0046] The gap is dimensioned such that upon pushing the latching element 9 and latching tab 10 fully upwards, i. e. until the section of the latching tab 10 running within the gap 23 abuts the lower edge of the cover plate 5, the upper edge of the door 4 can pass below the latching projection 13, and the door can be opened. In situations in which the latching element 9 and latching tab 10 are not pushed upwards, the latching projection 13 prevents the door 4 from passing by. In other words, if the door latch 2 is not deflected, the latching projection 13 prevents the door 4 from being opened in that an upper edge of the door 4 abuts the latching projection 13. Hence opening of the door can at least be handicapped.

[0047] The door latch 2, in particular the base body, is made from a flexible and elastic material. This means, that the latching element 9 is held in latching position as long as no pushing force is applied to the latching portion. If a pushing force acting essentially perpendicular to the overall lengthwise direction and perpendicular to the upper surface 11 is applied to the latching portion 7, the latching portion 7 is elastically deflected. The latching portion 7 returns to the latching position again if the pushing force releases. Note that the door latch 2 is shown in Fig. 1 to 5 in the non-deflected configuration only. If deflected, at least the latching tab 10 of the door latch shall be bent.

[0048] As can be seen from Fig. 3 and Fig. 4, the intermediate section 14, more precisely the U-section, engages a vertical bar 24 of the baking oven 1. Here, additional stability and in particular high latching efficiency of the door latch 2 can be obtained.

[0049] It shall be noted, that a connection between single components of the door latch 2 and connection between the door latch 2 and the baking oven can be implemented in other or alternative ways as set out beforehand. For example, connections can be established not only by screws but also by rivets, bonding techniques, in particular adhesion techniques, welding, fusing, two-component methods and the like.

[0050] As can be seen, the proposed door latch can easily be attached and detached to baking ovens, in more general terms household appliances. In addition, the proposed door latch can easily be applied to existing appliances. Further, the door latch may be composed of just a few components, which in turn can easily be manufactured and assembled. Beyond this, the door latch allows high latching efficiency and is comparatively robust.

Reference signs

[0051]

1	baking oven
2	door latch
3	casing
4	door
5	upper cover plate
6	fixing portion
7	latching portion
8	side wall
9	latching element
10	latching tab
11	upper surface
12	lower surface
13	latching projection
14	intermediate section
15	leg
16	base
17	section opening
18	s-shaped end section
19	end tab
20	screw hole
21	screw
22	abutment edge
23	gap
24	vertical bar
D	overall lengthwise direction

Claims

1. Door latch (2) for latching a door (4), in particular a front door (4), of a household appliance (1), comprising a fixing portion (6) for fixing the door latch (2) to the appliance (1) and a latching portion (7) for latching engagement with the door (4), wherein the fixing portion (6) and latching portion (7) are, with respect to the overall lengthwise direction (D) of the door latch (2), twisted by about 90 degrees.

2. Door latch (2) according to claim 2, wherein a hook type latching element (9) is provided, preferably fixed to a latching tab (10) of the latching portion (7) .

3. Door latch (2) according to claim 1 or 2, wherein the latching tab (10) projects in overall lengthwise direction (D) from a, preferably strip shaped, intermediate section (14) which is oriented transversally to the overall lengthwise direction (D), wherein the latching tab (10) and intermediate section (14) preferably enclose an angle of about 90 degrees.

4. Door latch (2) according to any of claims 1 to 3, wherein the intermediate section (14) comprises a U-section (15, 16), wherein a section opening (17) of the U-section (15, 16) is oriented transversally to the overall lengthwise direction (D), and the latching portion (7) extends from one of the legs (15) of the U-shaped section (15, 16) and the fixing portion (6) extends from the other one of the legs (15) of the U-shaped section (15, 16) in opposite direction to the latching portion (7).

5. Door latch (2) according to any of claims 1 to 4, wherein a base body, comprising at least the fixing portion (6) and latching portion (7), is made as a one-piece part bent sheet-type elastic body, preferably made from metal and/or plastics.

6. Door latch (2) according to any of claims 1 to 5, wherein the fixing portion (6) has a planar s-shaped end section (18) preferably having an oblong screw hole (20) for fixing the door latch (2) to the appliance (1).

7. Door latch (2) according to any of claims 1 to 6, wherein the latching element (9) comprises a wedge shaped element (9) attached to the latching tab (10), in combination making up a latching tooth (13) for latching engagement with the door (4).

8. Household appliance (1), in particular baking oven (1), comprising a front door (4) and a door latch (2) according to at least one of the preceding claims, wherein the door latch (2) is adapted to latch the door (4) in a closed state, preferably at an upper or lateral edge of the door (4).

9. Household appliance (1) according to claim 8, wherein the door latch (2) is attached to a side wall (8) of the household appliance (1), and wherein in the closed state of the door (4), the latching portion (7) at least partially projects from a front face of the appliance (1), preferably through a gap (23) between a lower edge of an upper cover plate (5) and an upper edge of the door (4).

10. Household appliance (1) according to at least one of claims 8 or 9, wherein the U-shaped section (15, 16) engages a respective vertical bar (24) of the appliance (1).

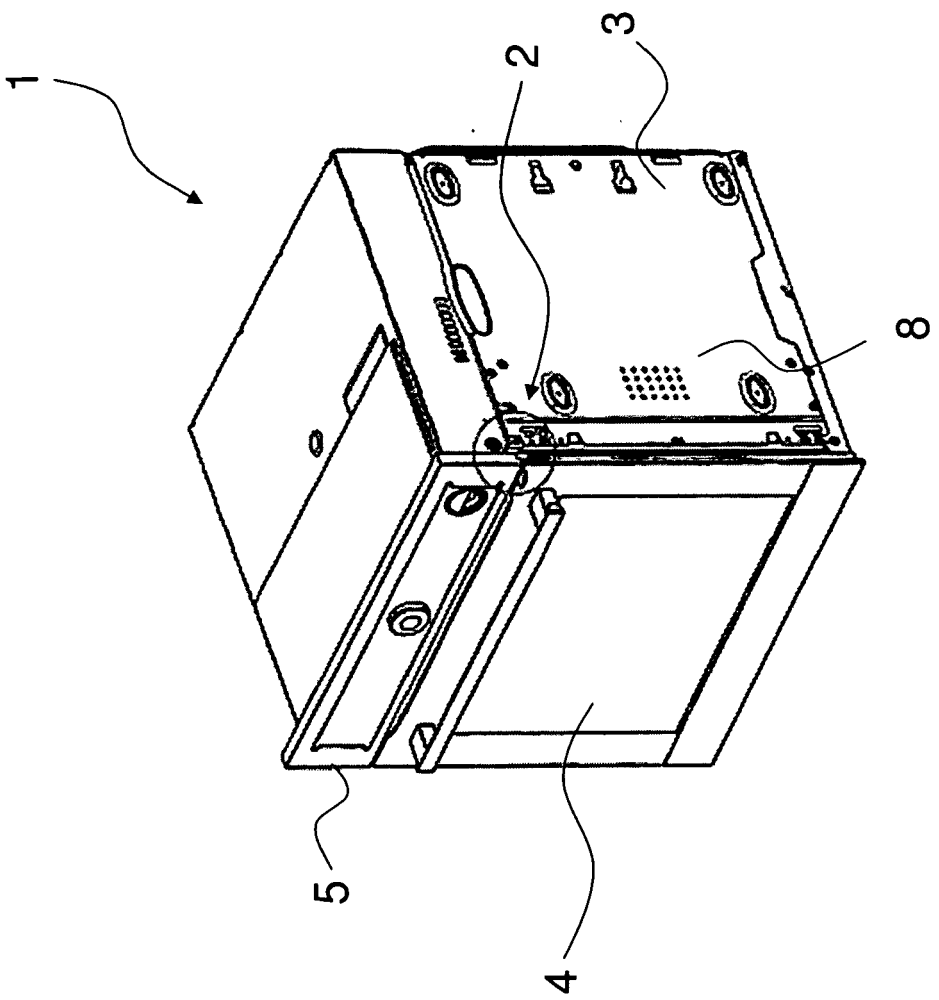

Fig. 1

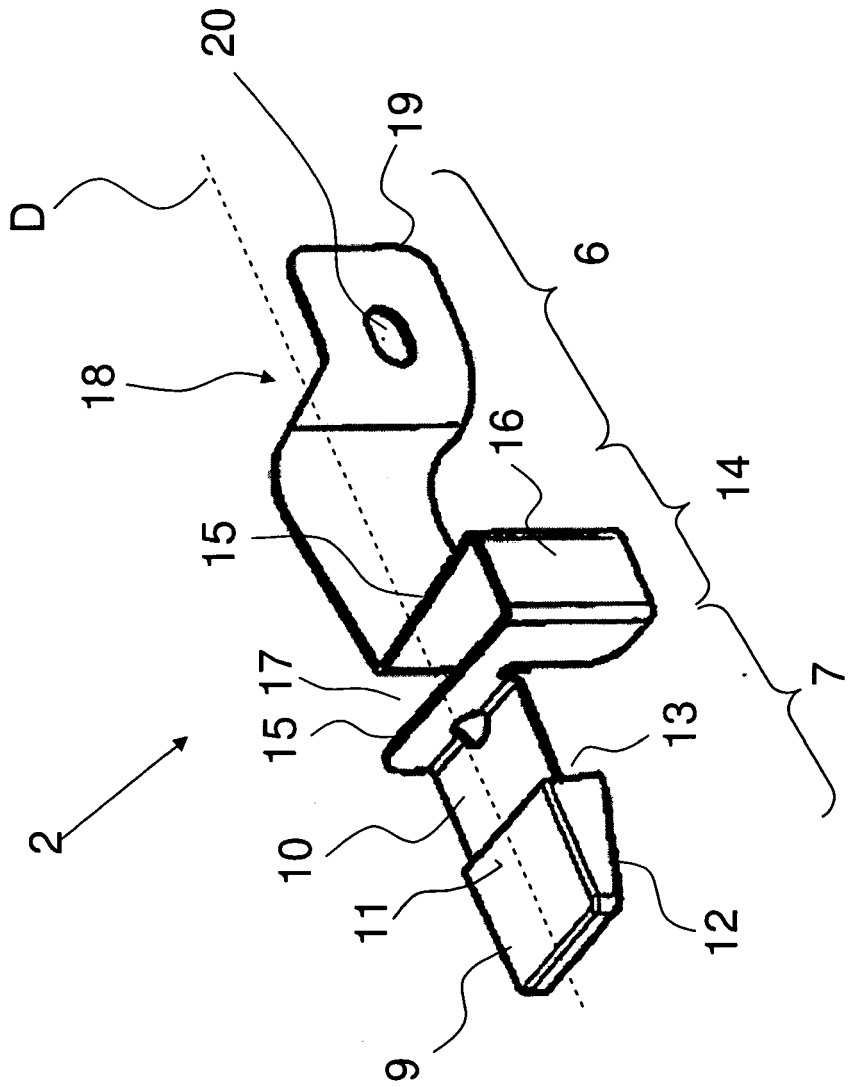

Fig. 2

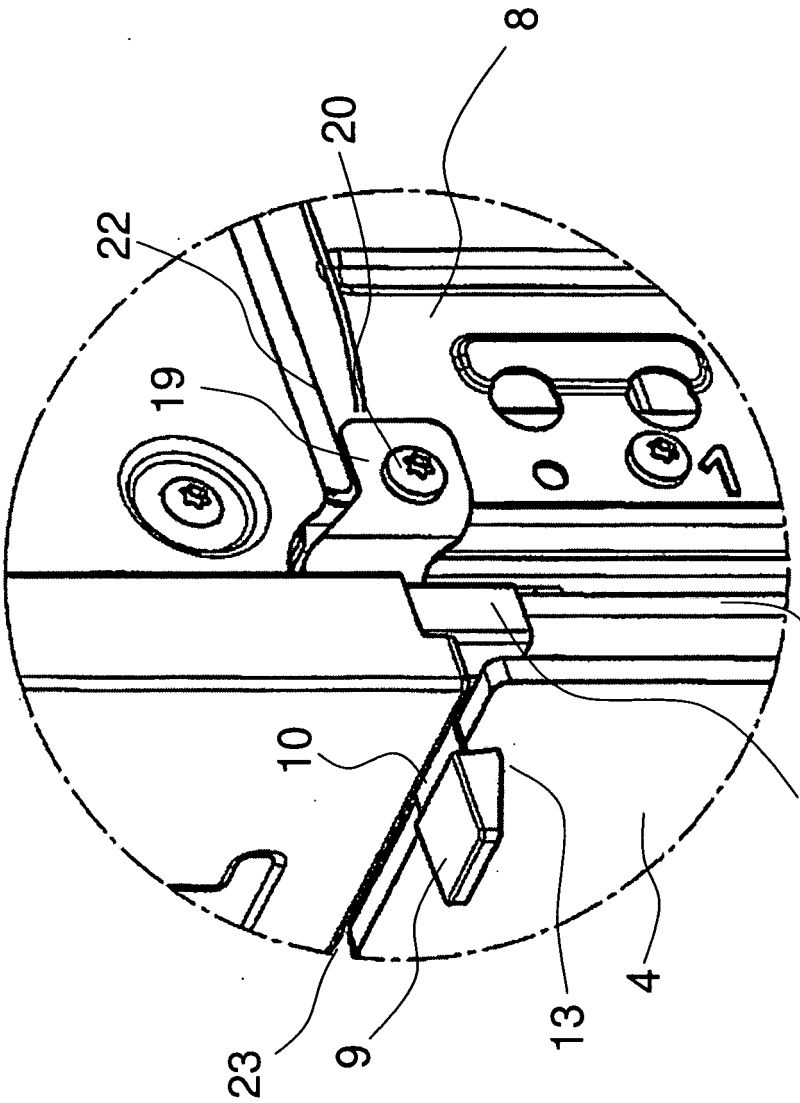

Fig. 3

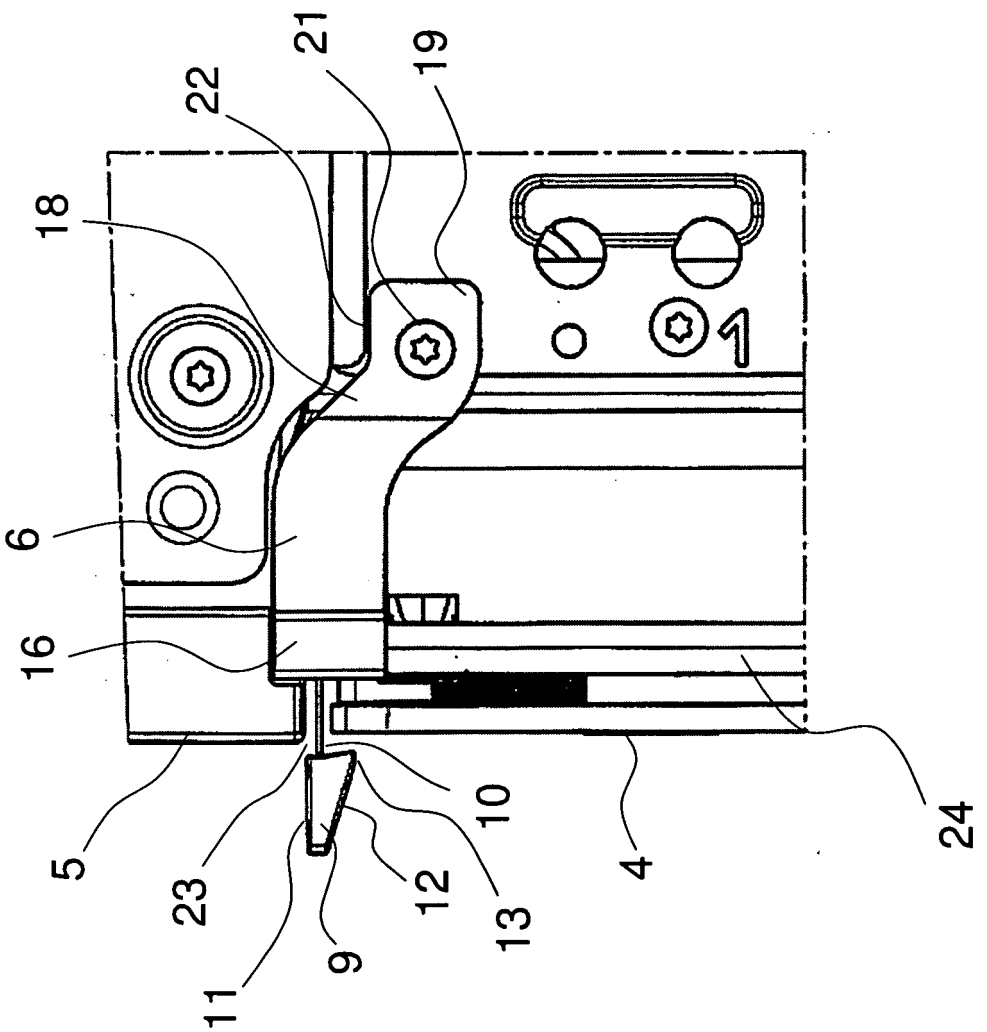

Fig. 4

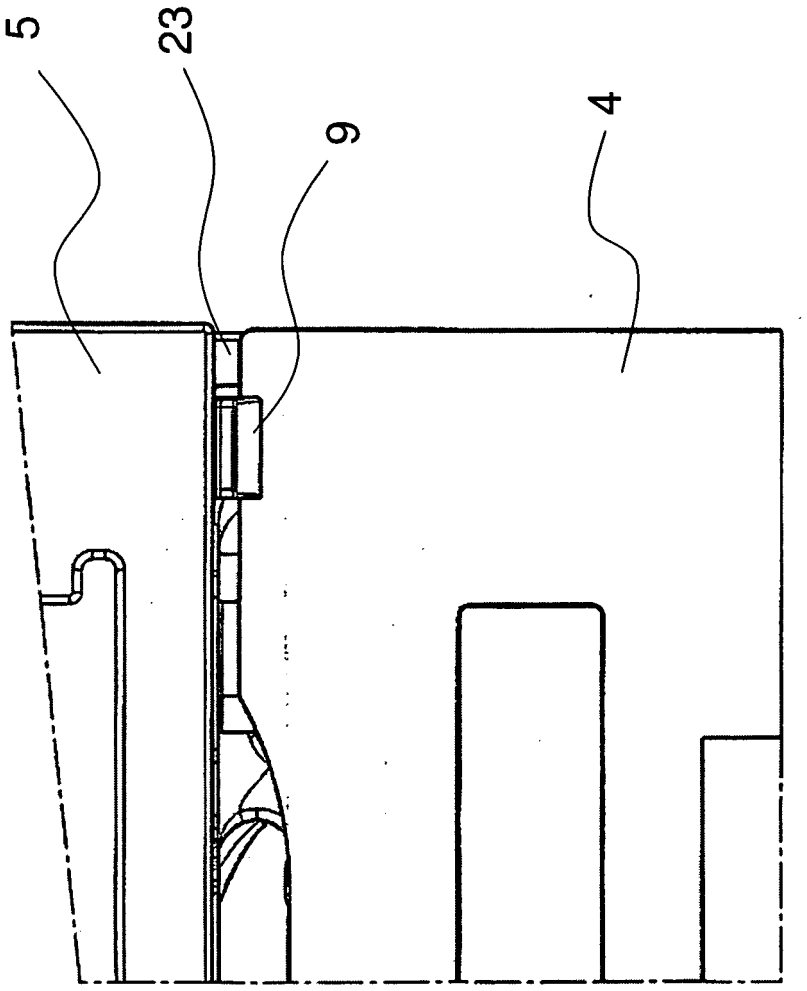

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 11 00 4646

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 10 2006 007328 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 30 August 2007 (2007-08-30) * paragraphs [0020], [0032]; figures 1,5 *	1-10	INV. F24C15/02 E05C19/10
X	DE 299 02 943 U1 (EMKA BESCHLAGTEILE [DE]) 22 July 1999 (1999-07-22) * figure 1 *	1	
X	JP 2008 196733 A (SHARP KK) 28 August 2008 (2008-08-28) * figures 4,5 *	1	
X	US 2 794 663 A (GRODT WILLIAM F ET AL) 4 June 1957 (1957-06-04) * figures 1,2 *	1	
Y	DE 81 37 042 U1 (BOSCH SIEMENS HAUSGERÀTE GMBH [DE]) 18 March 1982 (1982-03-18) * figure 2 *	1	TECHNICAL FIELDS SEARCHED (IPC)
Y	US 2 142 690 A (GOSERUD CHESTER O) 3 January 1939 (1939-01-03) * figure 1 *	1	F24C E05C
A	WO 03/018943 A1 (ARCELIK AS [TR]; MIRZA ALPER [TR]; CELIK ERSIN [TR]) 6 March 2003 (2003-03-06) * the whole document *	1-10	
A	DE 94 06 610 U1 (BOSCH SIEMENS HAUSGERAETE [DE]) 23 June 1994 (1994-06-23) * the whole document *	1-10	
A	EP 2 314 962 A2 (LIEBHERR HAUSGERAETE LIENZ [AT]) 27 April 2011 (2011-04-27) * the whole document *	1-10	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	6 September 2011	Rodriguez, Alexander

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 11 00 4646

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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06-09-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102006007328 A1	30-08-2007	SE 0700291 A	17-08-2007
DE 29902943 U1	22-07-1999	EP 1030016 A2	23-08-2000
JP 2008196733 A	28-08-2008	NONE	
US 2794663 A	04-06-1957	NONE	
DE 8137042 U1	18-03-1982	NONE	
US 2142690 A	03-01-1939	NONE	
WO 03018943 A1	06-03-2003	NONE	
DE 9406610 U1	23-06-1994	EP 0678710 A1	25-10-1995
		FI 951889 A	21-10-1995
EP 2314962 A2	27-04-2011	DE 102009053714 A1	28-04-2011
		US 2011113816 A1	19-05-2011

EPO FORM P0459

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 8137942 U1 **[0003]**