(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 943 284 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.09.1999 Bulletin 1999/38

(51) Int. Cl.[6]: **A47L 15/42**

(21) Application number: **99104330.8**

(22) Date of filing: **04.03.1999**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **20.03.1998 DE 19812328**

(71) Applicant: **WHIRLPOOL CORPORATION**
Benton Harbor Michigan 49022 (US)

(72) Inventors:
- **Nagel, Thomas**
  c/o Whirlpool Europe s.r.l.
  21025 Comerio (IT)
- **Stegemeyer, Ulrich**
  c/o Whirlpool Europe s.r.l.
  21025 Comerio (IT)

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

(54) Household device with a casing made from prefabricated sheet metal wall panels, in particular a washing machine or dishwasher

(57) The invention refers to a household device with a casing made from pre-fabricated wall panels, particularly a washing machine or dishwasher, where latching openings are applied to the sheet metal wall panels in which latch elements of a built-in device are inserted and latched from one side or latch elements of an attached device are inserted and latched from the other side, where the latch elements designed as latch springs reach through the latch ring openings with their latch areas at least in part. A particular design of the latch opening means that built-in devices and attached devices can be built-in or attached from the inner side out or from the outer side of the sheet metal wall panel respectively, even if the latch depth of these devices are different and greater than the thickness of the sheet metal wall panel.

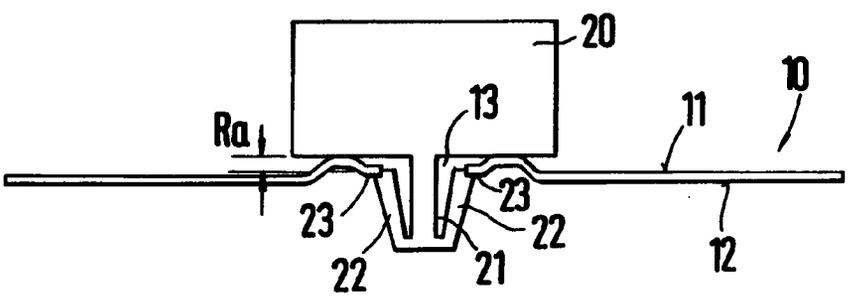

Fig.1

EP 0 943 284 A1

Description

[0001] The invention refers to a household device with a casing made from pre-fabricated sheet metal wall panels, in particular a washing machine or dishwasher where the prefabricated sheet metal wall panels have latch openings applied, into which latching elements of a built-in device can be inserted from one side and latched, or latching elements of an attached device can be inserted from the other side and latched, in which the latching elements designed as latch springs at least partially reach around behind the locking ring opening with its locking area.

[0002] With this type of household device, it is always necessary to fix different built-in devices onto the inner side of a sheet metal wall panel such as the rear wall and/or to apply attached devices to the outer side, where the latter will not be attached until the household device is able to be installed at home. Thus the problem often occurs that a latch opening will have to be able to be optionally used from the inner side or from the outer side of the pre-fabricated sheet metal wall panel for fitting a built-in device or attaching an attached device. Built-in devices and attached devices can be latched at the same prescribed depth in the latching opening or a relatively thick sheet metal wall panel. In order to achieve a clear latching effect with a firm fitting, a minimum latching depth is required which greatly exceeds the pre-fabricated sheet metal wall panel thickness used in household devices.

[0003] It is the task of the invention to create the possibility for the type of household device mentioned at the start to use thin sheet metal wall panels to be able to make fastenings on both sides for built-in and attached devices, even when these have a latching depth thicker than the sheet metal wall panel or even differing latching depths.

[0004] This task is solved by the invention, in that to enlarge the latching depth for built-in and attached devices, the latch ring with its latching area is offset vertically to the level of the sheet metal wall panel and the ring shaped part of the transition from the latch ring to the sheet metal wall panel is also offset as an installation level in addition to the level of the sheet metal wall panel and/or latch ring.

[0005] This type of latch pick-up can be easily punched into and stamped in the sheet metal wall panel. The latch rings with their latch areas and the additional installation levels with the ring shaped parts of the transition from the latches to the sheet metal wall panel allow latching depths greater than the thickness of the sheet metal wall panel simply through the offset. In this way, different latch depths can be prescribed by the offset which are solely obtained by the stamp. The ring shaped parts can completely surround the latch opening; the installation level can also be formed by concentrically shaped sections arranged in a ring.

[0006] The offset on the sheet metal wall panel to increase the latch depth can be designed so that the latch ring and the ring shaped parts protrude on the inner side or outer side of the sheet metal wall panel. However, the arrangement can be designed so that the latch rings and the ring shaped parts are placed on opposite sides of the sheet metal wall panel.

[0007] To clearly latch between the built-in or attached device and the sheet metal wall panel, it is planned that facing the sheet metal wall panel, the built-in device and the attached device have an installation area on which the latching elements are formed. The arrangement and alignment of the latching elements according to the design is carried out so that the latch elements have a carrier element, which on the end facing away from the built-in or attached device is a lock spring which is aligned to the installation area of the built-in or attached device and whose ends reach to the latch areas on the side away from the latch rings.

[0008] If it is planned that the latch springs of the built-in and attached devices have latch steps on the outside of their ends which hold the latch rings, then the latch springs will brace themselves due to their own elasticity in the latch rings.

[0009] The latch connection between the built-in or attached device and the sheet metal wall panel can, on the one hand, be designed so that the built-in or attached device is fixed by means of several latch elements on the sheet metal wall panel and that the carrier elements are designed as carrier bars.

[0010] However, the design can also be achieved so that the built-in or attached device is fixed by means of a single latch element to the sheet metal wall panel and that the carrier element is designed as a socket.

[0011] With a washing machine or a dishwasher, the water connection is preferably designed so that on the inner side of the sheet metal wall panel, the built-in device has a valve with a connection for an inner hose which can be connected on the outer side of the sheet metal wall panel to a feed hose and that on the outer side of the sheet metal wall panel, the attached device has an aquastop adapter with a connection for an aquastop hose with a valve which can be connected to the inner side of the sheet metal wall panel using an inner hose.

[0012] The invention will be described in more detail using the embodiments shown in the drawings. The figure shows the following:

Fig 1	is a schematic diagram of a built-in device with a latch element which, from the inner side of a sheet metal wall panel, can be latched into a latch pick-up according to the invention
Fig. 2	is a schematic diagram of an attached device with a latch element which, from the outer side of

a sheet metal wall panel, can be latched into a latch pick-up according to the invention

Fig. 3 and Fig. 4 show situations with built-in and attached devices corresponding to Fig 1 and Fig 2 with latch pick-ups stamped in the other direction and a different design of latch element

Fig. 5 shows an enlarged cross-section of the stamped latch pick-up according to the invention

Fig. 6 shows the connection of a feed hose and

Fig. 7 shows the connection of an aquastop hose to a washing machine.

[0013] Figures 1 and 2 show sheet metal wall panel 10 which has a latch opening 13, as can be seen more clearly in section in Figure 5. This latch opening 13 is surrounded by a latch ring 14 which lies with its latch area 15 on the inner side 11 and with its latch area 16 on the outer side 12 of the sheet metal wall panel 10. In this way, the outer side 12 of the sheet metal wall panel 10 and the inner latch area 15 form a latch depth Rb for a fitting element 30 which can be inserted and latched from the outer side 12 of the sheet metal wall panel 10, as can be seen in Figures 2 and 5.

[0014] The transition from the latch ring 14 to the sheet metal wall panel 10 has a ring shaped part 17 which defines an installation level, 18 which protrudes above the inner side 11 of the sheet metal wall panel 10 and with the outermost latch area 16 of the latch ring 14 defines a latch depth Ra for a built-in device 20.

[0015] The built-in device 20 is inserted and latched from the inner side 11 of the sheet metal wall panel 10 to the latch opening 13, as can be seen in Figures 1 and 5.

[0016] In the embodiment, the built-in device 20 and the attached device 30 only carry one latch element which consists of a carrier element 21 or 31 with latch springs 22 and 32 on the free end. These latch springs 22 and 23 are aligned to the sheet metal wall panel 10 and in the area of their free ends on the outer sides contain latch steps 23 and 33 which pick up the latch ring 14. In this way, part of the latch spring 22 and 32 penetrates into the latch opening 13 so that the latch springs 22 and 32 can be braced in the latch opening 13 due to their own elasticity.

[0017] The installation area of the built-in or attached devices 20 or 30 and the distance to the latch steps 23 and 33 of the latch springs 22 or 32 matches the latch depths Ra or Rb which are established by the distance of the latch area 16 of the latch ring 14 from the installation level 18 or by the distance of the latch area 15 of the latch ring 14 from the outer side 12 of the sheet metal wall panel 10.

[0018] The built-in device 20 and the attached device 30 can also be latched over several latch elements and latch openings of this type to the sheet metal wall panel 10. In this, the carrier elements 21 and 31 are arranged evenly distributed over the installation areas of the built-in device 20 and attached device 30 like the latch openings 13 in the sheet metal wall panel 10.

[0019] As can be seen from Figures 3 and 4, the stamping in the area of the latch opening 13 can be carried out so that the latch ring 14 and the ring shaped part 17 also protrudes as an additional installation level 18 on the outer side 12 of the sheet metal wall panel 10. The built-in device 20 then lies on the inner side 11 of the sheet metal wall element 10 and not on the part 17, whilst the latching of the latch springs 21 to the outer latch area 16 of the latch ring 14 remains the same. The attached device 30 lies on the installation level 18 of the part 17 whilst the latching of the latch springs 32 to the inner latch area 15 of the latch ring 14 remains the same.

[0020] The ring shaped part 17 of the transition from the latch ring 14 to the sheet metal wall panel 10 can enclose the latch opening 13 as a closed ring shaped installation level 18; it can also be designed with sections arranged concentrically. The built-in device 20 and the attached device 30 can also only be fixed using a single latch connection to the sheet metal wall panel 10. In this way, the carrier element 21 or 32 can be designed as a socket on whose outer extent the latch springs 22 or 32 are arranged.

[0021] Thus carrying a medium such as water is possible through the built-in device 20 or the attached device 30 which is particularly important for water-carrying household devices such as washing machines and dishwashers, as shown in Figures 6 and 7.

[0022] If a washing machine WA is switched on over a feed hose ZS, then a valve V is latched into a socket from the inner side of the rear wall. In the casing an inner hose IS is attached to the valve. The valve V is linked to the feed hose ZS on the outside of the casing, as shown in Figure 6.

[0023] If, on the other hand, the washing machine WA is connected over an aquastop hose ASt, then from the outside of the casing, an aquastop adapter ASt-Ad is latched into a latch opening in the rear wall, and the aquastop hose ASt is connected to the adapter ASt-Ad, as seen in Figure 7. The aquastop hose ASt is equipped with a valve V on the free end of the connection. An inner hose IS can be connected to the aquastop adapter ASt-Ad on the inner side of the rear wall.

Claims

1. Household device with a casing made from pre-fabricated sheet metal wall panels, particularly a wash-

ing machine or dishwasher with latch openings applied to the sheet metal wall panel, in which latching elements of a built-in device can be inserted and latched from one side, or latching elements of an attached device can be inserted and latched from the other side, where the latching elements designed as latch springs reach around the latch opening rings with their latch areas at least in part,
characterised in that
to enlarge the latch depth (Ra, Rb) for built-in and attached devices (20 and 30), the latch rings (14) with their latch areas (15, 16) are offset vertically to the level of the sheet metal wall panel (10) and in that the ring shaped parts (17) of the transition from the latch rings (14) to the sheet metal wall panel (10) are also vertically offset as additional installation levels to the level of the sheet metal wall panel (10) and/or the latch rings (14) are offset.

2. Household device according to claim 1,
characterised in that
the latch rings (14) and the ring shaped parts (17) are offset and protrude to the inner side (11) or the outer side (12) of the sheet metal wall panel (10).

3. Household device according to claim 1,
characterised in that
the latch rings (14) and the ring shaped parts (17) are offset and protrude on opposite sides of the sheet metal wall panel (10).

4. Household device according to one of the claims 1 to 3,
characterised in that
the built-in device (20) and the attached device (30) have an installation area turned towards the sheet metal wall panel (10) and on which the latch elements are formed.

5. Household device according to claim 4,
characterised in that
the latch elements have a carrier element (21, 31) on which are formed latch springs (22, 32) on the end turned away from the installation area of the built-in or attached device (20 or 30), which are aligned to the installation area of the built-in or attached device (20 or 30) and whose ends reach behind the latch areas (15 or 16) on the side of the latch rings (14) turned away from the installation area.

6. Household device according to one of the claims 1 to 5,
characterised in that
the latch springs (22, 32) of the built-in and attached devices (20 and 30) have latch steps on the outer sides of their ends (23, 33) which hold the latch rings (14).

7. Household device according to claim 5,
characterised in that
the built-in or attached device (20 or 30) is fixed using several latch elements to the sheet metal wall panel (10) and that the carrier elements (21) are designed as carrier bars.

8. Household device according to claim 5,
characterised in that
the built-in or attached device (20 or 30) is fixed by means of a single latch element to the sheet metal wall panel (10) and that the carrier element (31) is designed as a socket.

9. Household device according to claim 8,
characterised in that
the built-in device is designed as a valve (V) on the inner side (11) of the sheet metal wall panel (10) with a connection for an inner hose (IS) which can be connected to the outer side (12) of the sheet metal wall panel (10) using a feed hose (ZS) (Figure 6).

10. Household device according to claim 8,
characterised in that
the attached device (30) is designed as an aquastop adapter (ASt-Ad) on the outer side (12) of the sheet metal wall panel (10) with a connection for an aquastop hose (ASt) equipped with a valve (V), which can be connected to an inner hose (IS) on the inner side (11) of the sheet metal wall panel (10) (Figure 7).

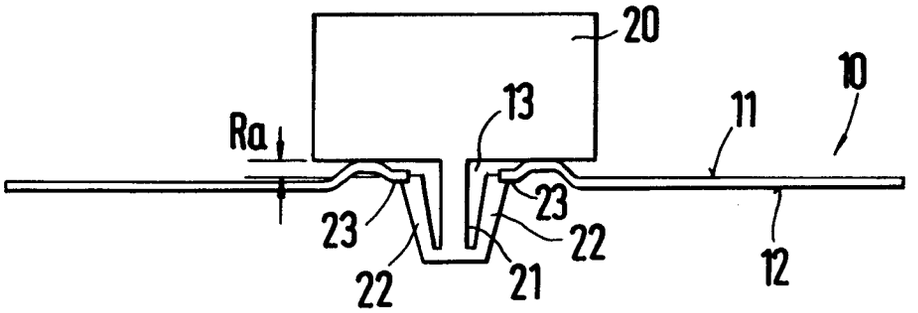

Fig.1

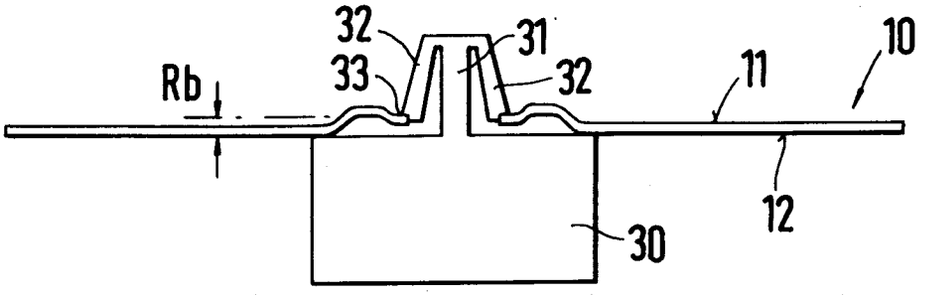

Fig.2

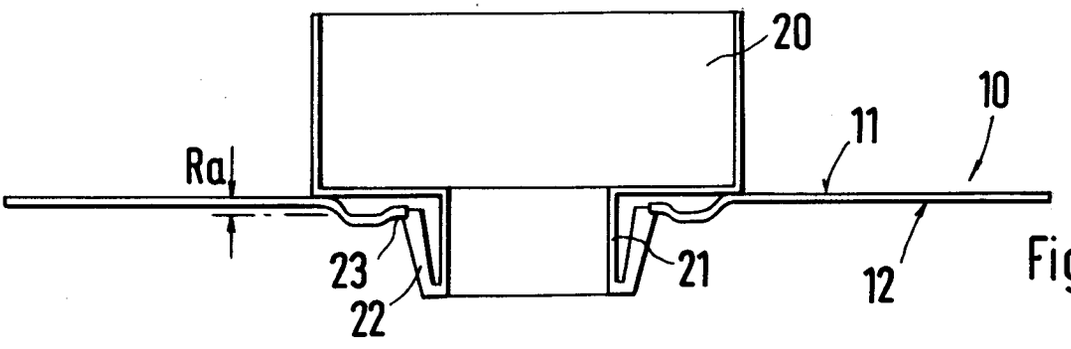

Fig.3

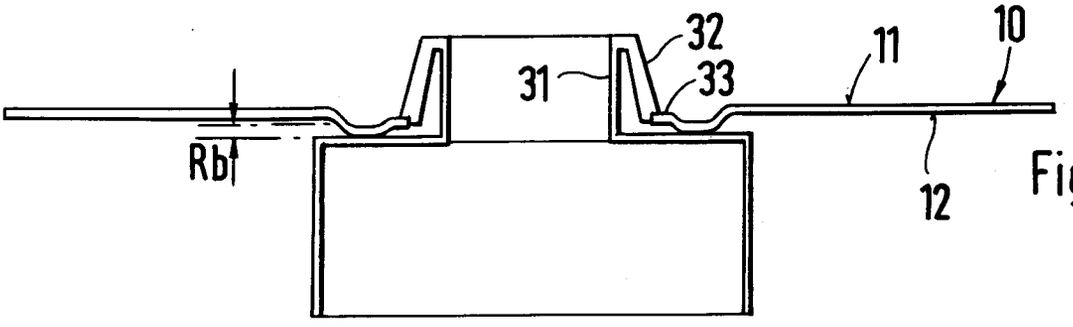

Fig.4

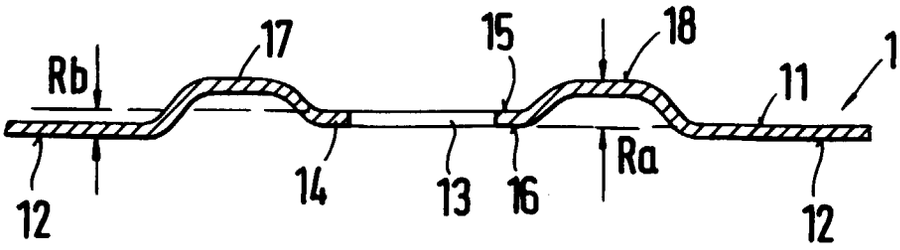

Fig. 5

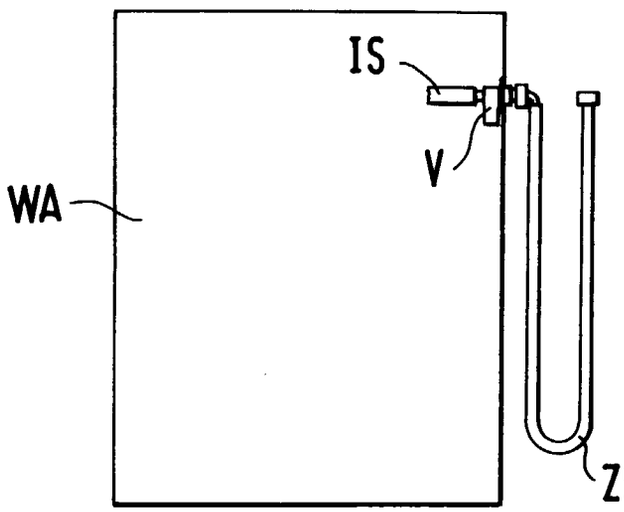

Fig. 6

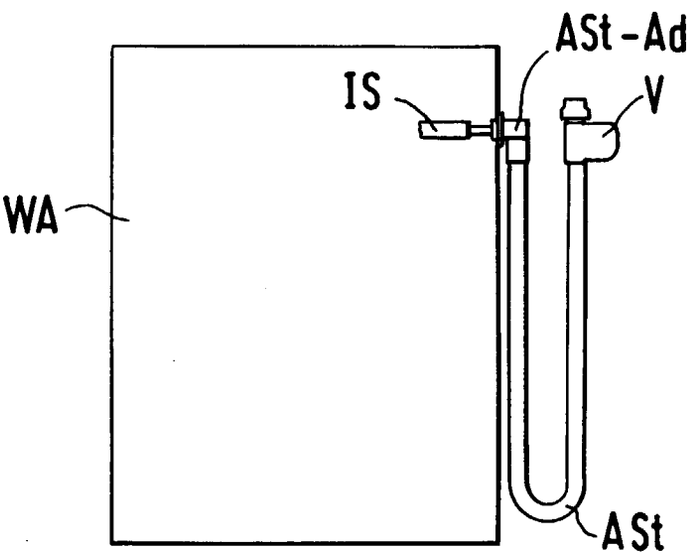

Fig. 7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 10 4330

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.6)
A	DE 85 29 264 U (BLOMBERG-WERKE) 27 March 1986 * page 4, line 21 - page 8, line 4; figures 1-6 *	1,4,9	A47L15/42
A	US 3 592 495 A (FISHER JULIAN V) 13 July 1971 * column 2, line 15 - column 3, line 75; figures 1-7 *	1	
A	DE 18 25 382 U (MASCHINENFABRIK PETER PFENNINGSBERG G.M.B.H.)		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A47L
D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	6 July 1999	Laue, F

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 99 10 4330

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-07-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 8529264 U	27-03-1986	NONE	
US 3592495 A	13-07-1971	FR 2055475 A	07-05-1971
		GB 1263036 A	09-02-1972
DE 1825382 U		NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82