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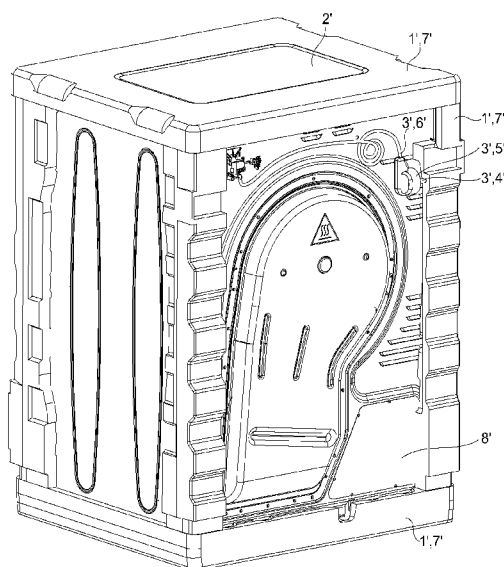
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(54) Title: PROTECTIVE PACKAGING ASSEMBLY FOR ELECTRICAL HOUSEHOLD APPLIANCE

Fig. 1

PRIOR ART



(57) Abstract: The present invention relates to a protective packaging as-
sembly (1) for packaging an electrical household appliance (2), in particular
a laundry dryer, a laundry washer, a dishwasher or a refrigerator. The elec-
trical household appliance (2) comprises an electric plug (3) that includes
pins (4), an insulating body (5) and a power cable (6). The protective pack-
aging assembly (1) comprises one or more resilient members (7) which are
each adapted to cushion the outer casing (8) of the household appliance (2)
from inevitable knocks.

Description**PROTECTIVE PACKAGING ASSEMBLY FOR ELECTRICAL HOUSEHOLD APPLIANCE**

- [0001] The present invention relates to a protective packaging assembly for packaging an electrical household appliance, in particular a laundry dryer, a laundry washer, a dishwasher, or a refrigerator.
- [0002] In general, cargoes such as electrical household appliances must withstand comparatively high mechanical stresses that are generated during the various stages of the transportation. These mechanical stresses are practically unavoidable. In order to mitigate the adverse effects of the impacts, the electrical household appliances are generally packaged in protective packaging assemblies which cushion the impacts. Protective packaging assemblies are commonly known in the art. A protective packaging assembly generally comprises a plurality of resilient members for cushioning the outer casing of the household appliance from inevitable knocks. The resilient members are commonly manufactured from various materials such as foam, plastic, corrugated cardboard, or wood. During an ordinary impact, the resilient members partly absorb the energy of the impact and usually recover their initial shapes. When packaging the household appliance such as a laundry dryer, a laundry washer, a dishwasher, or a refrigerator, the resilient members are first fitted onto the outer casing of the appliance and then wrapped in a protective transparent foil and secured by one or more straps. The electric plug, including the power cable is commonly bundled up and stowed away into the gap between the transparent protective foil and the outer casing of the appliance. Fig. 1 to 3 shows a household appliance (2') in particular a laundry dryer which has been packaged in a protective packaging assembly (1') that is known from the prior art. This protective packaging assembly (1') has a plurality of resilient members (7') for cushioning the outer casing (8') of the household appliance (2') from inevitable knocks. A problem with the packaged household appliance (2') is that there are incidents where the electric plug (3') is dislocated inside the aforementioned gap to an unfavorable position such that the pins (4')

thereof tear the transparent protective foil (hatched area) as shown in Fig. 2. In such incidents, the torn foil gives the impression that the appliance (2') is of inferior quality. Another problem with the packaged household appliance (2') is that there are also incidents where the electric plug (3') is dislocated to an unfavorable position such that the pins (4') and the insulating body (5') thereof becomes damaged by an inevitable knock as shown in Fig. 3. In such incidents, the appliance (2') is generally returned and the damaged electric plug (3'), including the pins (4'), the insulating body (5') and the power cable (6') must be replaced.

- [0003] In the aforementioned incidents, the customer satisfaction easily decreases and also the customer complaints increase. It is of utmost importance that the household appliance is reliably and safely packaged in the protective packaging assembly in order to ensure that it can be delivered in the intact state.
- [0004] WO 2010/076317 A1 discloses a prior art protective packaging assembly for a laundry washer.
- [0005] An objective of the present invention is to provide a protective packaging assembly for packaging a household appliance, in particular a laundry dryer, a laundry washer, a dishwasher, or a refrigerator which solves the aforementioned problems of the prior art in a cost-effective way and which enables an improved reliability and safety.
- [0006] This objective have been achieved by the protective packaging assembly as defined in claim 1 and the household appliance as defined in claim 12. Further achievements have been attained by the subject-matters respectively defined in the dependent claims.
- [0007] The protective packaging assembly of the present invention comprises a recess which is directly formed into one of the resilient members and which has a size and shape that is adapted to form-fittingly accommodate at least a part of the electric plug and releasably secure the same.
- [0008] A major advantageous effect of the present invention is that by virtue of the recess, the electric plug can be securely held in place during the transportation and the risk that the electric plug becomes dislocated to an unfavorable position can be eliminated or reduced as much as possible.

Thereby, the electric plug can be protected from receiving any damages. Thereby, the electric plug can be also prevented from causing any damages to the transparent protective foil. Another advantageous effect of the present invention is that by virtue of the recess inside the resilient members, the electric plug can be securely held in place without the need of using any auxiliary retainers. Thereby, the number of parts can be reduced in an environment friendly way and the assembly process can be expedited. Thereby also the overall costs can be reduced both in material and labor.

[0009] In alternative embodiments, the recess form-fittingly accommodates at least part of the pins, the insulating body or the power cable respectively. These embodiments are particularly advantageous as the electric plug can be securely held in place without the need of using any auxiliary retainers. The electric plugs vary among countries. The various types of plugs are known to those skilled in the art. Manufacturers generally provide the electrical household appliance with a two-pin type electric plug or a three-pin type electric plug in accordance with the target country. In particular, the electric plugs may include flat shaped pins and/or round shaped pins. In other alternative embodiments, the recess comprises one or more different sets of holes which form-fittingly accommodate and releasably secure the respective pins of a corresponding type of electric plug. These embodiments are particularly advantageous as the protective packaging assembly can be used in combination with one or more different electrical household appliances that vary in their electric plugs. Thereby, the production and assembly costs can be further reduced. In another embodiment, at least one set of holes is adapted for a two-pin type electric plug. In another embodiment, at least one set of holes is adapted for a three-pin type electric plug. These holes may be flat shaped or round shaped in accordance with the corresponding pin. In another embodiment, the set of holes have, if possible, one or more holes in common.

[0010] In other alternative embodiments, the recess is formed into one of the resilient members, particularly at an easily accessible area thereof. In

another embodiment, the recess is accessible from the outside, in particular from the back of the appliance in the assembled state of the resilient members. This embodiment is particularly advantageous as the electric plug can be secured into the recess by the assembly operator after the resilient members have been fitted onto the outer casing of the appliance. Thereby, also the user can easily take off the electric plug and put it safely aside prior to removing the resilient members.

- [0011] In other alternative embodiments, the recess is formed into one of the horizontally or vertically extending resilient members that cushion the rear corner at the top/bottom or lateral sides of the appliance respectively. These embodiments are particularly advantageous as the electric plug can be more easily secured into the recess from the back of the appliance.
- [0012] In other alternative embodiments, the recess is located at the inwardly facing lateral section of one of the resilient members which cushion the rear corners respectively. These embodiments are particularly advantageous as the electric plug can be more securely embedded into the resilient member.
- [0013] In alternative embodiments, the resilient members are manufactured from various different materials such as cardboard, plastic, wood or polymeric foam respectively. In another embodiment, the polymeric foam material comprises expanded polystyrene. In another embodiment, the recess, including the holes is formed into the resilient member by a suitable fabrication process. In another alternative embodiment, the recess, including the holes is formed during the molding process of the resilient member.
- [0014] In other alternative embodiments, the protective packaging assembly also comprises a transparent protective foil and/or a cardboard cover for partly or entirely enclosing the appliance.
- [0015] Additional features and additional advantageous effects of the protective packaging assembly and the electrical household appliance of the present invention will become more apparent with the detailed description of the embodiments with reference to the accompanying drawings in which:
- [0016] Figure 1 – is a schematic perspective view of a laundry dryer which is

packaged in a protective packaging assembly according to the prior art, wherein the transparent protective foil has been omitted for ease of illustration;

[0017] Figure 2 – is a schematic partial perspective enlarged view of the packaged laundry dryer of Fig. 1, wherein the transparent protective foil has been torn by the pins of the two-pin type electric plug which has been dislocated to an unfavorable position;

[0018] Figure 3 – is a schematic partial perspective enlarged view of the packaged laundry dryer of the Fig. 2, wherein the transparent protective foil has been omitted for ease of illustration and wherein the pins of the two-pin type electric plug have been damaged by an inevitable knock;

[0019] Figure 4 – is a schematic partial perspective enlarged view of a laundry dryer which is packaged in a protective packaging assembly according to an embodiment of the present invention, wherein the transparent protective foil and the electric plug have been omitted for ease of illustration;

[0020] Figure 5 – is a schematic partial perspective enlarged view of a laundry dryer which is packaged in a protective packaging assembly according to an embodiment of the present invention, prior to securing the two-pin type electric plug into the recess of the resilient member and prior to wrapping the transparent protective foil around the laundry dryer;

[0021] Figure 6 – is a schematic partial perspective enlarged view of the packaged laundry dryer of Fig. 5, after having secured the two-pin type electric plug into the recess of the resilient member;

[0022] Figure 7 – is a schematic partial perspective enlarged view of a laundry dryer which is packaged in a protective packaging assembly according to an embodiment of the present invention, prior to securing the three-pin type electric plug into the recess of the resilient member and prior to wrapping the transparent protective foil around the laundry dryer.

[0023] The reference signs appearing on the drawings relate to the following technical features.

1. Packaging assembly
2. Household appliance

3. Electric plug
4. Pin
5. Insulating body
6. Power cable
7. Resilient member
8. Outer casing
9. Recess
10. Hole
11. Hole
12. Corner section
13. Lateral section

[0024] The protective packaging assembly (1) is suitable for packaging an electrical household appliance (2), in particular a laundry dryer, a laundry washer, a dishwasher or a refrigerator. The household appliance (2) comprises an electric plug (3) that includes pins (4) for making an electrical connection with the mains (not shown), an insulating body (5) which supports the pins (4) and a power cable (6) which leads from the pins (4) into the household appliance (2) (Fig. 4 to 7).

[0025] The protective packaging assembly (1) comprises one or more resilient members (7) which are each adapted to cushion the outer casing (8) of the household appliance (2) from inevitable knocks.

[0026] The protective packaging assembly (1) of the present invention further comprises a recess (9) which is directly formed into one of the resilient members (7). This recess (9) has a size and shape which is adapted to form-fittingly accommodate at least a part of the electric plug (3) and releasably secure the same.

[0027] The household appliance (2) of the present invention is packaged in the protective packaging assembly (1).

[0028] In another embodiment, the packaged household appliance (2) comprises a two-pin type electric plug (3) (Fig. 5 and 6).

[0029] In another alternative embodiment, the packaged household appliance (2) comprises a three-pin type electric plug (3) (Fig. 7).

[0030] In another embodiment, the recess (9) comprises two sets of holes

- (10;11). In this embodiment, the holes (10;11) in each set are each adapted to form-fittingly accommodate and releasably secure the respective pin (4) of a corresponding type of electric plug (3) (Fig. 4 to 7).
- [0031] In another embodiment, the recess (9) comprises a first set of holes (10) which includes only two holes (10) each adapted to form-fittingly accommodate and releasably secure the respective pin (4) of a two-pin type electric plug (3) (Fig. 5 and 6).
- [0032] In another embodiment, the recess (9) also comprises a second set of holes (11) which includes only three holes (11) each adapted to form-fittingly accommodate and releasably secure the respective pin (4) of a three-pin type electric plug (3) (Fig. 7).
- [0033] In another embodiment, the recess (9) is formed into an area of the respective resilient member (7) such that said area is accessible from the outside, in particular from the back of the household appliance (2) in the assembled state of the resilient member (7) (Fig. 4 to 7).
- [0034] In another embodiment, the recess (9) is formed into the resilient member (7) that is adapted to cushion one of the vertically extending rear corner sections (12) of the outer casing (8) of the household appliance (2) (Fig. 4 to 7).
- [0035] In another embodiment, the recess (9) is formed into the resilient member (7) that is adapted to cushion the vertically extending rear corner section (12) that is opposite to the corner section (12) that bears the power cable (6) (Fig. 4 to 7).
- [0036] In another embodiment, the recess (9) is formed into the inwardly facing lateral section (13) of the resilient member (7) that is adapted cushion one of the vertically extending rear corner sections (12) of the outer casing (8) (Fig. 4 to 7).
- [0037] In another embodiment, the resilient members (7) comprise polymeric foam. In another embodiment, the polymeric foam comprises expanded polystyrene.
- [0038] In another embodiment, the protective packaging assembly (1) further comprises a transparent protective foil (not shown) for wrapping the resilient members (7) and the household appliance (2).

[0039] A major advantageous effect of the present invention is that by virtue of the recess (9), the electric plug (3) can be securely held in place during the transportation and the risk that the electric plug (3) becomes dislocated to an unfavorable position can be eliminated or reduced as much as possible. Thereby, the electric plug (3) can be protected from receiving any damages. Thereby, the electric plug (3) can also be prevented from causing any damages to the transparent protective foil. Another advantageous effect of the present invention is that by virtue of the recess (9) inside the resilient member (7), the electric plug (3) can be securely held in place without the need of using any auxiliary retainers (not shown). Thereby, the number of parts can be reduced in an environment friendly way and the assembly process can be expedited. Thereby also the overall costs can be reduced both in material and labor. Other advantageous effects of the present invention can be taken from the aforementioned particular embodiments.

Claims

1. A protective packaging assembly (1) for packaging a household appliance (2), in particular a laundry dryer, a laundry washer, a dishwasher or a refrigerator which comprises an electric plug (3) that includes pins (4) for making an electrical connection with the mains; an insulating body (5) which supports the pins (4) and a power cable (6) which leads from the pins (4) into the household appliance (2), the protective packaging assembly (1) comprising one or more resilient members (7) which are each adapted to cushion the outer casing (8) of the household appliance (2) from inevitable knocks, the protective packaging assembly (1) being **characterized in that** a recess (9) which is directly formed into one of the resilient members (7), wherein the recess (9) has a size and shape which is adapted to form-fittingly accommodate at least a part of the electric plug (3) and releasably secure the same.
2. The protective packaging assembly (1) according to claim 1, **characterized in that** the recess (9) comprises one or more sets of holes (10, 11), wherein the holes (10, 11) in each set are each adapted to form-fittingly accommodate and releasably secure the respective pin (4) of a corresponding type of electric plug (3).
3. The protective packaging assembly (1) according to claim 2, **characterized in that** the recess (9) comprises a first set of holes (10) which includes only two holes (10) each adapted to form-fittingly accommodate and releasably secure the respective pin (4) of a two-pin type electric plug (3).
4. The protective packaging assembly (1) according to claim 3, **characterized in that** the recess (9) comprises a second set of holes (11) which includes only three holes (11) each adapted to form-fittingly accommodate and releasably secure the respective pin (4) of a three-pin type electric plug (3).
5. The protective packaging assembly (1) according to claim 4, **characterized in that** the recess (9) is formed into an area of the respective resilient member (7) such that said area is accessible from the outside in the assembled state of the resilient member (7).
6. The protective packaging assembly (1) according to claim 5, **characterized in that** said area is accessible from the back of the household appliance (2) in the assembled state of the resilient member (7).

7. The protective packaging assembly (1) according to claim 6, **characterized in that** the recess (9) is formed into the resilient member (7) that is adapted to cushion one of the vertically or horizontally extending rear corner sections (12) of the outer casing (8) of the household appliance (2).
8. The protective packaging assembly (1) according to claim 7, **characterized in that** the recess (9) is formed into the inwardly facing lateral section (13) of the respective resilient member (7).
9. The protective packaging assembly (1) according to claim 1, **characterized in that** the resilient members (7) comprise polymeric foam.
10. The protective packaging assembly (1) according to claim 9, **characterized in that** the polymeric foam comprises expanded polystyrene.
11. The protective packaging assembly (1) according to claim 1, **characterized in that** a transparent protective foil for wrapping the resilient members (7) and the household appliance (2).
12. A household appliance (2), in particular a laundry dryer, a laundry washer, a dishwasher or a refrigerator comprising an electric plug (3) that includes pins (4) for making an electrical connection with the mains; an insulating body (5) which supports the pins (4) and a power cable (6) which leads from the pins (4) into the household appliance (2), **characterized in that** the protective packaging assembly (1) as defined in any one of claims 1 to 11.
13. The household appliance (2) according to claim 12, **characterized in that** a two-pin type electric plug (3).
14. The household appliance (2) according to claim 12, **characterized in that** a three-pin type electric plug (3).

Fig. 1

PRIOR ART

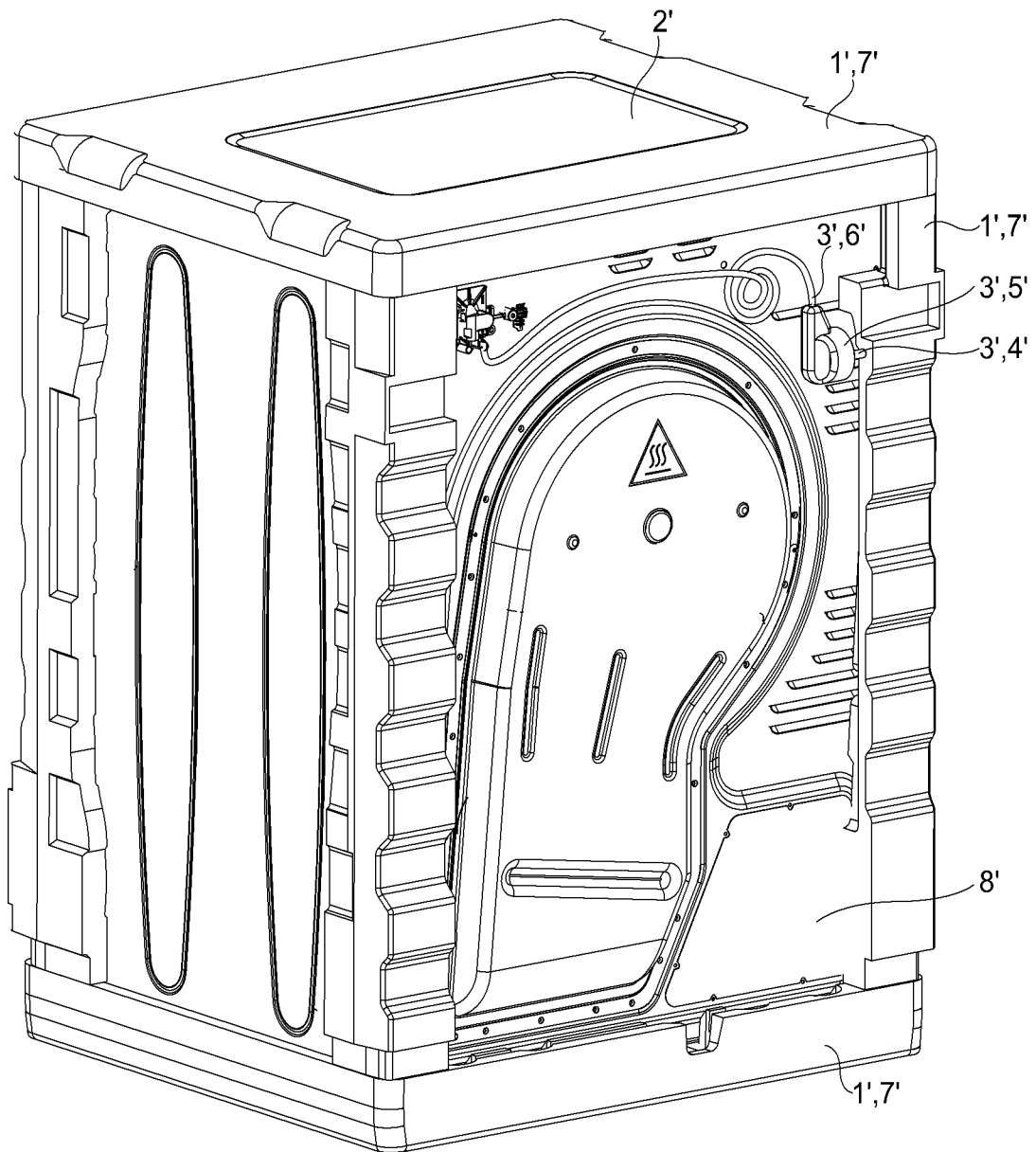


Fig. 2

PRIOR ART

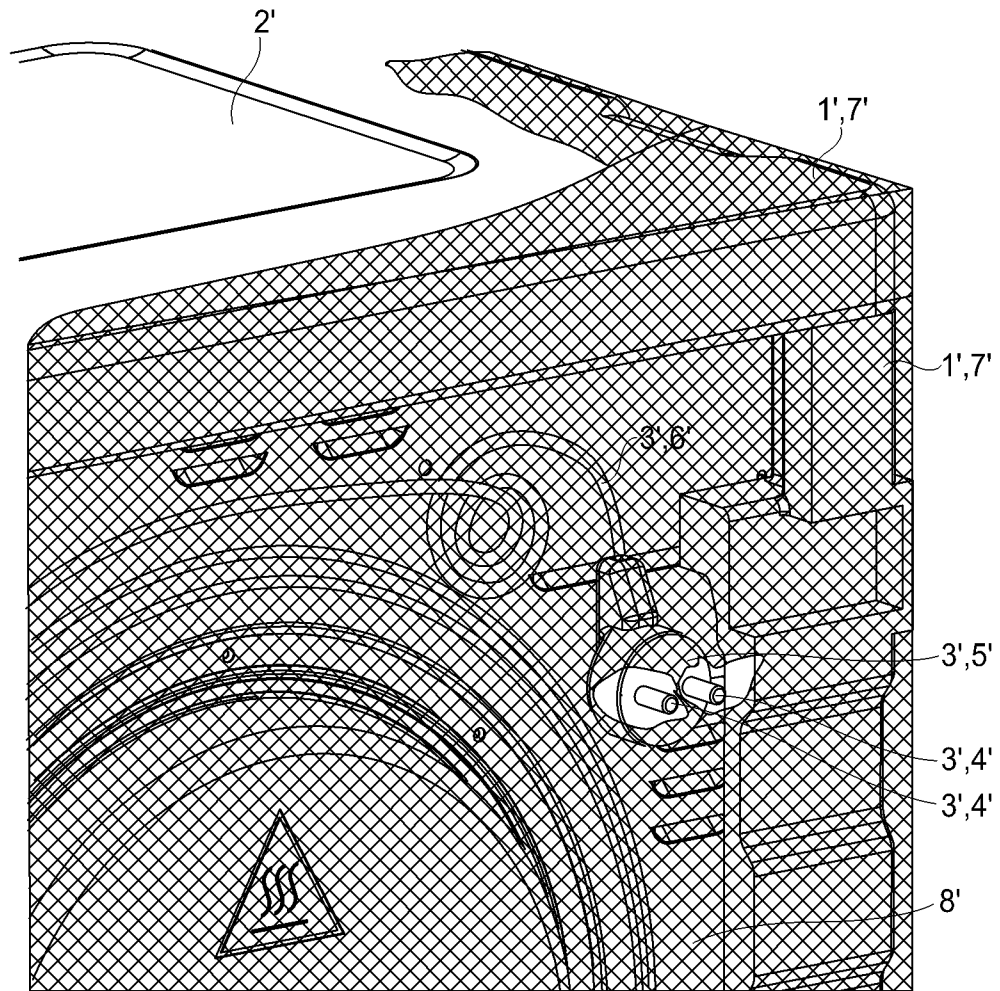


Fig. 3

PRIOR ART

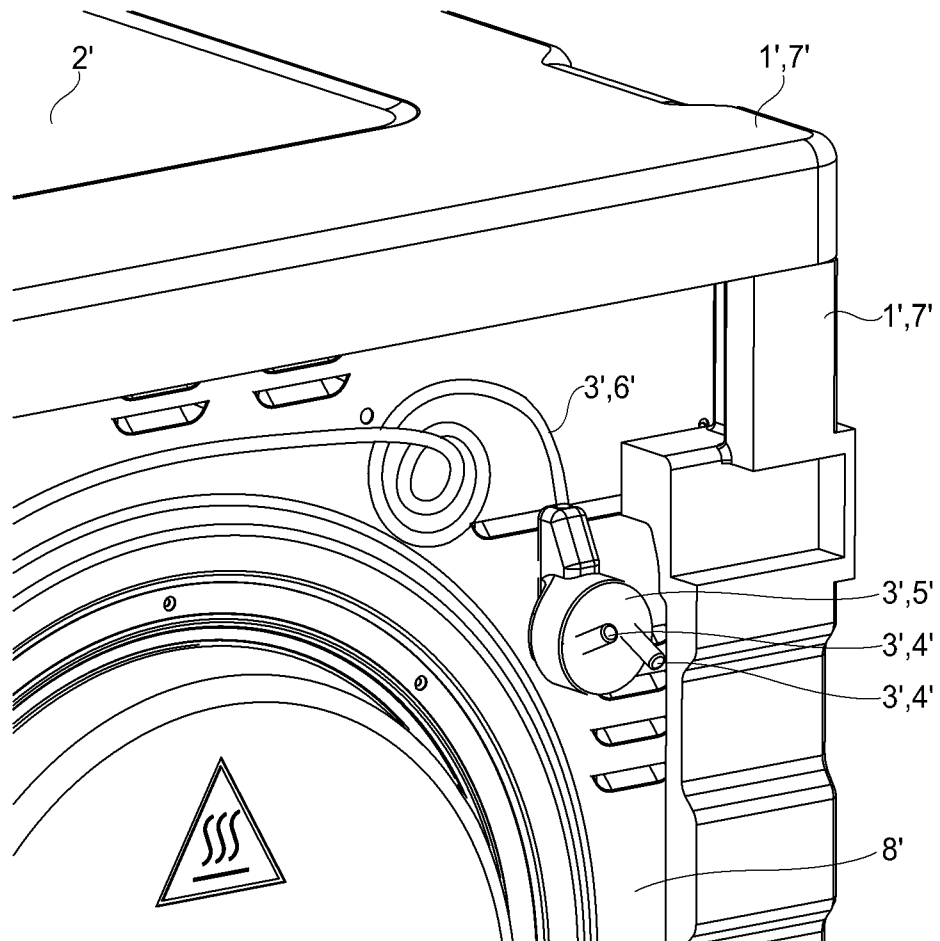


Fig. 4

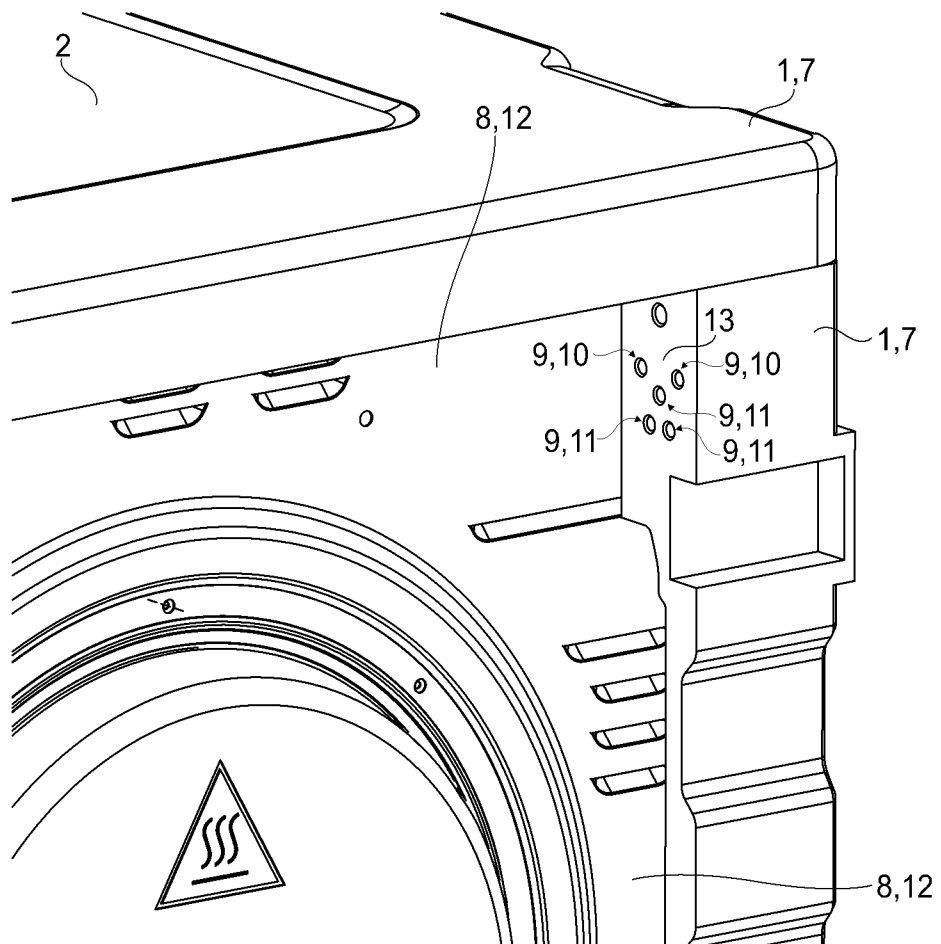


Fig. 5

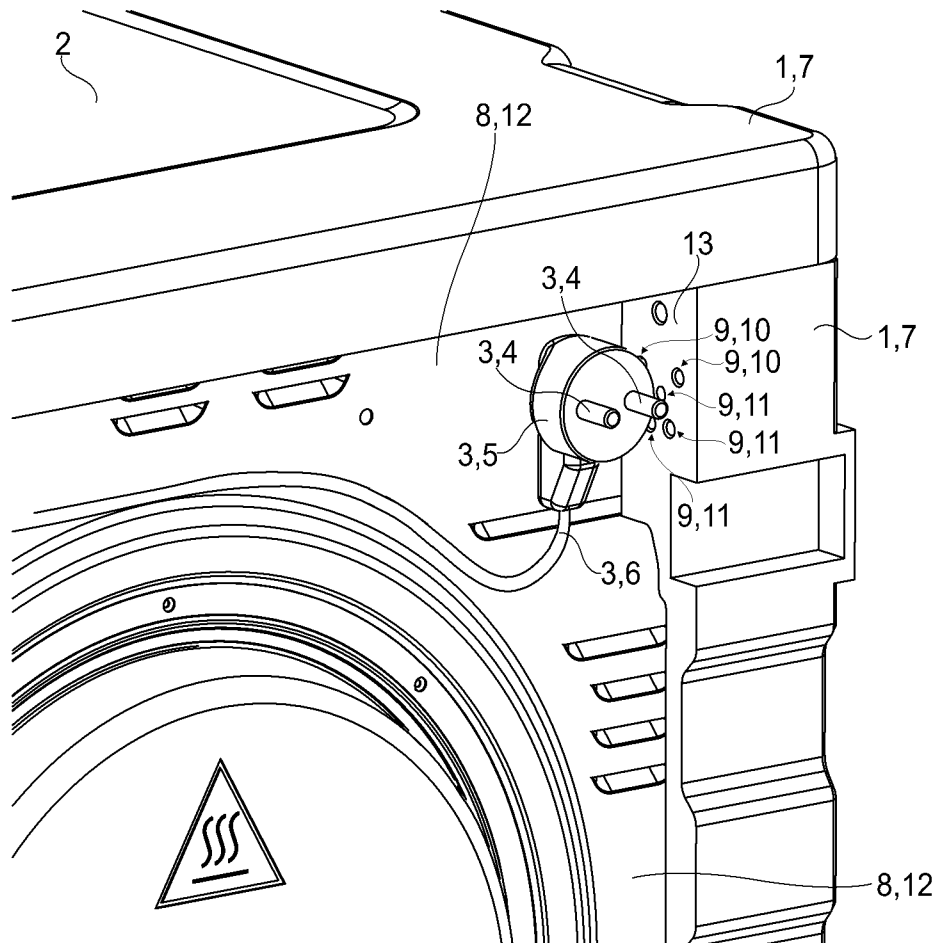


Fig. 6

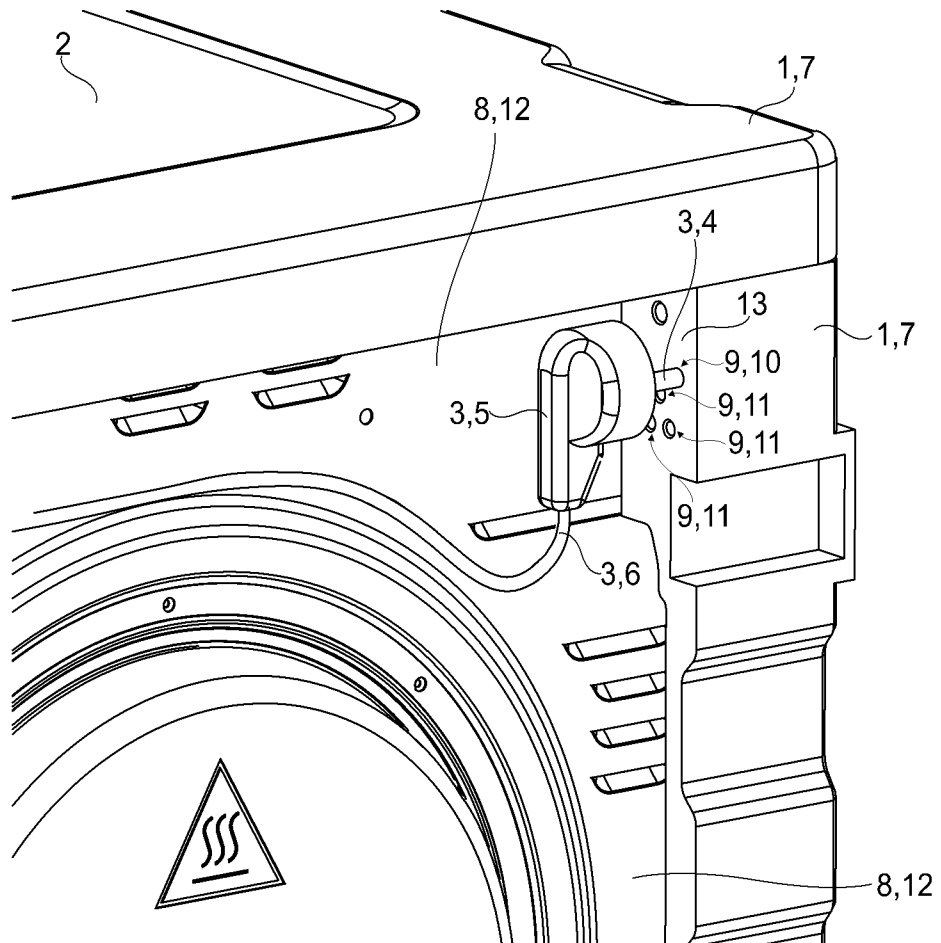
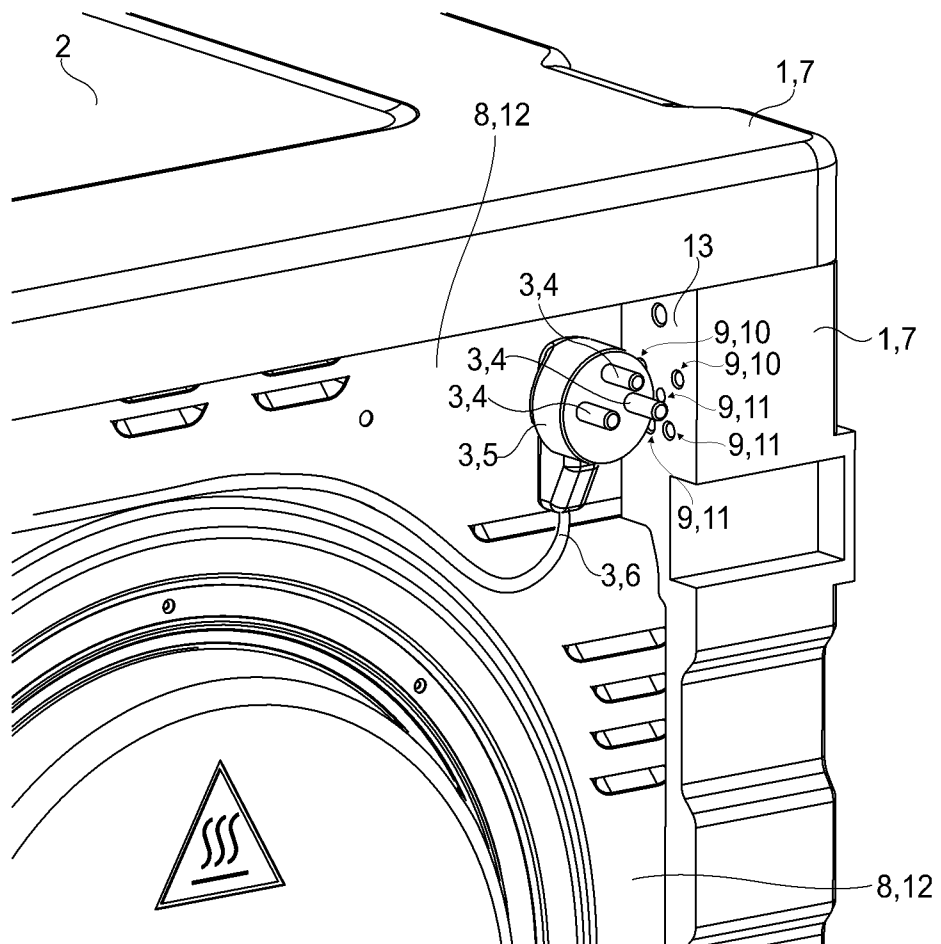


Fig. 7



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/065505

A. CLASSIFICATION OF SUBJECT MATTER INV. B65D85/68 B65D81/113 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) B65D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/242456 A1 (GODA HIDEYUKI [JP]) 1 October 2009 (2009-10-01) paragraph [0029] - paragraph [0058]; figure 2	1-10
X	----- EP 1 661 819 A1 (ORION ELECTRIC CO LTD [JP]) 31 May 2006 (2006-05-31) paragraph [0028] - paragraph [0029]; figures 5,6 -----	1-10
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 9 December 2015	Date of mailing of the international search report 14/03/2016	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Vesterholm, Mika	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2015/065505

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-10

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-10

How to provide a fixing point for an electric plug

2. claim: 11

How to maintain resilient members in their positions

3. claims: 12-14

How to package a household appliance

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2015/065505

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 2009242456	A1	01-10-2009	CN 101544295 A	30-09-2009
			JP 5142079 B2	13-02-2013
			JP 2009234644 A	15-10-2009
			US 2009242456 A1	01-10-2009

EP 1661819	A1	31-05-2006	EP 1661819 A1	31-05-2006
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