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

(11) **EP 3 296 451 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
**17.11.2021 Bulletin 2021/46**

(51) Int Cl.:
***D06F 58/20*** *(2006.01)* ***D06F 58/26*** *(2006.01)*

(21) Application number: **17186868.0**

(22) Date of filing: **18.08.2017**

# (54) LAUNDRY CARE MACHINE WITH A THERMAL INSULATION PART

WÄSCHEPFLEGEMASCHINE MIT EINEM WÄRMEISOLATIONSTEIL

MACHINE À LAVER AVEC UNE PARTIE D'ISOLATION THERMIQUE

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

(30) Priority: **20.09.2016 CN 201621065975 U**

(43) Date of publication of application:
**21.03.2018 Bulletin 2018/12**

(73) Proprietor: **BSH Hausgeräte GmbH**
**81739 München (DE)**

(72) Inventors:
- **Chen, Lijun**
  **Nanjing city 210000 (CN)**
- **Lu, Fei**
  **Nanjing city 210000 (CN)**
- **Wang, Yongjia**
  **Nanjing 210000 (CN)**

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EP 3 296 451 B1

Printed by Jouve, 75001 PARIS (FR)

## Description

**[0001]** The present invention relates to a laundry care machine having a thermal insulation part.

**[0002]** A laundry care machine such as a washing machine, a laundry dryer, and a washer-dryer usually has a high-temperature unit. When the high-temperature unit is fixed to a component whose thermal resistance is relatively poor, a thermal insulation unit is always required to prevent a heating unit from directly touching the component whose thermal resistance is relatively poor, and to insulate heat transfer, thereby avoiding heat loss.

**[0003]** A relatively common thermal insulation unit is a single thermal insulation pad or two independent thermal insulation pads. Heat of the single thermal insulation pad may be further transferred by using a connection part such as a bolt. However, during installation of the two independent thermal insulation pads, the two thermal insulation pads need to be separately located, and then the two thermal insulation pads are fixed by using connection parts such as bolts. As a result, there are multiple operations and the thermal insulation pad is hardly located. In addition, once the thermal insulation pad is incorrectly located, the connection part is hardly installed.

**[0004]** EP 2 597 185 A1 discloses a spacing element which consists of two parts. These two parts of the spacing element are fixed together by means of one or two screws. Thereby, the hot air duct is fixed to the tub in such a manner that thermal insulation takes place-

**[0005]** US 2005/262885 A1 discloses a heat shield which is fastened between the dry duct and the tub. The heat shield comprises a base portion and a two-stage embossing portion.

**[0006]** CA 771787 discloses a heater comprising heating wires which are attached to insulator blocks. Furthermore, the heater has a thermal insulator group which connects the lead-in wires to the resistant wires.

**[0007]** DE 93 15 194 U1 discloses a pipe clamp with two rubber inlays which have a noise-cancelling effect.

**[0008]** BE 1 011 040 A6 describes thermally insulated roof profile sections for veranda roofs. For providing a thermal insulation a one-part clamp block is used to connect an upper profile section and a lower profile section. Further state of the art is described in CN 201 086 353 Y.

**[0009]** An objective of the present invention is to provide a laundry care machine with a thermal insulation part that is easy to install.

**[0010]** For the foregoing objective, the technical solution embodied as a laundry care machine is provided as claimed in the respective independent claim. Facultative preferred embodiments of the invention are claimed in respective dependent claims, described in the subsequent description and exhibited in the attached drawing, respectively.

**[0011]** The laundry care machine includes a first thermal insulated part and a second thermal insulated part that are adjacently disposed, where the thermal insulation part is installed on the first thermal insulated part, and the second thermal insulation pad separates the first thermal insulated part from the second thermal insulated part.

**[0012]** The beneficial effects of using the foregoing technical solution are that: the first thermal insulation pad is connected to the second thermal insulation pad by using the girder, so that a part includes two thermal insulation pads, and the two thermal insulation pads may be installed by means of one operation. In addition, during the installation, a gap between the first thermal insulation pad and the second thermal insulation pad may be aligned to the thermal insulated part and then the thermal insulated part is directly pushed into the gap. Therefore, the thermal insulated part is installed in place by means of such a simple operation.

**[0013]** Preferably, the girder is disposed on a first side of the first thermal insulation pad and the second thermal insulation pad, and the girder has elasticity, so that the first thermal insulation pad and the second thermal insulation pad can relatively open along a second side opposite to the first side. Such a structure makes matching between the first thermal insulation pad, the second thermal insulation pad, and the thermal insulated part closer, so that it is not necessary to set a relatively large tolerance for the installation.

**[0014]** Preferably, the first thermal insulation pad, the second thermal insulation pad, and the girder connecting the first thermal insulation pad to the second thermal insulation pad are integrally made of plastic.

**[0015]** Preferably, the first thermal insulation pad and the second thermal insulation pad are respectively provided with a first hole and a second hole that are coaxially arranged, so as to enable a fixing part to pass through.

**[0016]** Preferably, hollows are provided on at least one of the first thermal insulation pad and the second thermal insulation pad. By means of setting the hollows, used materials are reduced and thermal performance of air within the hollows is improved.

**[0017]** Preferably, the first thermal insulated part is provided with a third hole that is coaxial with the first hole and the second hole, and the fixing part passes through the first hole, the second hole, and the third hole, and connects to the thermal insulation pads, the first thermal insulated part, and the second thermal insulated part.

**[0018]** The first thermal insulated part may be implemented as a high-temperature metal part, and the second thermal insulated part may be implemented as a plastic part.

**[0019]** The first thermal insulated part may be implemented as an air heating channel wall, and the second thermal insulated part may be implemented as a laundry care bucket.

**[0020]** In the following and the accompany drawing, the present invention is further described by preferred embodiments using a laundry dryer and a thermal insulation part installed on the laundry dryer as an example. In the drawing:

FIG. 1 is a schematic assembling diagram of a thermal insulation part of a laundry dryer, an air heating channel wall, and a laundry care bucket;

FIG. 2 is an axially sectional view along the center location of the thermal insulation part in FIG. 1; and

FIG. 3 is a schematic three-dimensional view of a thermal insulation part.

**[0021]** As shown in FIG. 1 and FIG. 2, a laundry dryer has an air heating channel 2 that heats air and a laundry care bucket 4 that accommodates laundry. The air heating channel 2 has a channel arm 21 horizontally extending out, and is connected to a connection base 41 of the laundry care bucket 4 by using a bolt 6. In this way, the air heating channel 2 is fixed onto the laundry care bucket 4. The air heating channel 2 is made of metal, and a heating part (not shown in the figure) is disposed inside of the air heating channel 2, so that when the heating part works, the air heating channel 2 has relatively high temperature. The laundry care bucket 4 is made of plastic. The connection base 41 and the laundry care bucket 4 are integrally formed. Due to a limitation from an attribute of the plastic, thermal resistance of the connection base 41 and the laundry care bucket 4 is relatively poor, the high-temperature channel arm 21 needs to be prevented from directly touching the connection base 41. Therefore, a thermal insulation part 10 is configured between the channel arm 21 and the connection base 41 of the laundry care bucket 4, so as to implement thermal insulation.

**[0022]** Referring to FIG. 3, the thermal insulation part 10 includes a first thermal insulation pad 11 and a second thermal insulation pad 12 that are disposed opposite to each other, and the first thermal insulation pad 11 is connected to the second thermal insulation pad 12 by using a girder 13. The girder 13 in a free state has rigidity that enables the first thermal insulation pad 11 and the second thermal insulation pad 12 to keep a gap 14, and has relatively small elasticity. The girder 13 is disposed on a first side S1 of the first thermal insulation pad 11 and the second thermal insulation pad 12, so that the first thermal insulation pad 11 and the second thermal insulation pad 12 may overcome elasticity and open a relatively small angle along a second side S2 relative to the first side S1, so that the channel arm 21 easily extends into the gap 14 between the first thermal insulation pad 11 and the second thermal insulation pad 12.

**[0023]** The first thermal insulation pad 11, the second thermal insulation pad 12, and the girder 13 are integrally made of plastic.

**[0024]** The first thermal insulation pad 11 and the second thermal insulation pad 12 are both disc-shaped, and have thickness that is suitable for thermal insulation. The girder 13 is of a flake structure. The girder 13 provides necessary elasticity when keeping a stable connection, and the girder 13 is hardly broken.

**[0025]** The first thermal insulation pad 11 and the second thermal insulation pad 12 are respectively provided with a first hole 15 and a second hole 16 that are coaxially arranged. The channel arm 21 is provided with a third hole 22 that is coaxial with the first hole 15 and the second hole 16.

**[0026]** During assembling, the gap 14 of the thermal insulation part 10 is aligned to the channel arm 21 and the thermal insulation part 10 is pushed first, so that the channel arm is extended into the gap 14 of the thermal insulation part 10. In this case, the first hole 15, the second hole 16, and the third hole 22 are coaxially aligned. Then the bolt 6 is made to pass through the connection base 41, the second hole 16, the third hole 22, and the first hole 15 and then is fixed. Therefore, a fixed connection is implemented between the connection base 41, the thermal insulation part 10, and the channel arm 21. In this case, the second thermal insulation pad 12 thermally insulates the connection base 41 from the channel arm 21. The first thermal insulation pad 11 thermally insulates the bolt 61 from the channel arm 21.

**[0027]** In addition, the first thermal insulation pad 11 and the second thermal insulation pad 12 are provided with hollows 18 that are axially extend. By means of setting the hollows 18, used materials are reduced and thermal performance of air within the hollows 18 is improved.

## REFERENCE NUMERALS

**[0028]**

| | |
|---|---|
| 1 | Laundry dryer |
| 2 | Heating air channel |
| 4 | Laundry care bucket |
| 6 | Bolt |
| 10 | Thermal insulation part |
| 11 | First thermal insulation pad |
| 12 | Second thermal insulation pad |
| 13 | Girder |
| 14 | Gap |
| 15 | First hole |
| 16 | Second hole |
| 18 | Hollow |
| 21 | Channel arm |
| 22 | Third hole |
| 41 | Connection base |
| 61 | Bolt |
| S1 | First side |
| S2 | Second side |

## Claims

**1.** A laundry care machine (1), comprising

a thermal insulation part (10),
a first thermal insulated part and a second thermal insulated part that are adjacently disposed, **characterized in that** the thermal insulation part (10)
comprises: a first thermal insulation pad (11), a second thermal insulation pad (12), and a girder (13) connecting the first thermal insulation pad (11) to the second thermal insulation pad (12), the first thermal insulation pad (11) is disposed opposite to the second thermal insulation pad (12), and the first thermal insulation pad (11) and the second thermal insulation pad (12) have a gap (14) that accommodates at least a part of the first thermal insulated part, wherein the thermal insulation part (10) is installed on the first thermal insulated part, and the second thermal insulation pad (12) separates the first thermal insulated part from the second thermal insulated part.

2. The laundry care machine according to claim 1, **characterized in that** the girder (13) is disposed on a first side (S1) of the first thermal insulation pad (11) and the second thermal insulation pad (12), and the girder (13) has elasticity, so that the first thermal insulation pad (11) and the second thermal insulation pad (12) can relatively open along a second side (S2) opposite to the first side (S1).

3. The laundry care machine according to claim 1, **characterized in that** the first thermal insulation pad (11), the second thermal insulation pad (12), and the girder (13) connecting the first thermal insulation pad (11) to the second thermal insulation pad (12) are integrally made of plastic.

4. The laundry care machine according to claim 1, **characterized in that** the first thermal insulation pad (11) and the second thermal insulation pad (12) are respectively provided with a first hole (15) and a second hole (16) that are coaxially arranged, so as to enable a fixing part to pass through.

5. The laundry care machine according to claim 1, **characterized in that** hollows (18) are provided on at least one of the first thermal insulation pad (11) and the second thermal insulation pad (12).

6. The laundry care machine (1) according to claim 4, **characterized in that** the first thermal insulated part is provided with a third hole (22) that is coaxial with the first hole (15) and the second hole (16), and the fixing part passes through the first hole (15), the second hole (16), and the third hole (22), and connects to the thermal insulation pads (11, 12), the first thermal insulated part, and the second thermal insulated part.

7. The laundry care machine (1) according to claim 1, **characterized in that** the first thermal insulated part is a high-temperature metal part, and the second thermal insulated part is a plastic part.

8. The laundry care machine (1) according to claim 7, **characterized in that** the first thermal insulated part is an air heating channel wall, and the second thermal insulated part is a laundry care bucket (4).

**Patentansprüche**

1. Wäschepflegemaschine (1), die Folgendes umfasst:

ein Wärmeisolierteil (10),
ein erstes und ein zweites wärmeisoliertes Teil, die nebeneinander angeordnet sind,
**dadurch gekennzeichnet, dass** das Wärmeisolierteil (10) Folgendes umfasst: ein erstes Wärmeisolierelement (11), ein zweites Wärmeisolierelement (12) und ein Verbindungsteil (13), das das erste Wärmeisolierelement (11) mit dem zweiten Wärmeisolierelement (12) verbindet, wobei das erste Wärmeisolierelement (11) dem zweiten Wärmeisolierelement (12) gegenüber angeordnet ist und das erste Wärmeisolierelement (11) und das zweite Wärmeisolierelement (12) einen Spalt (14) aufweisen, der zumindest einen Teil des ersten wärmeisolierten Teils aufnimmt, wobei der Wärmeisolierteil (10) an dem ersten wärmeisolierten Teil angebracht ist und das zweite Wärmeisolierelement (12) den ersten von dem zweiten wärmeisolierten Teil trennt.

2. Wäschepflegemaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** das Verbindungsteil (13) an einer ersten Seite (S1) des ersten Wärmeisolierelements (11) und des zweiten Wärmeisolierelements (12) angeordnet und elastisch ist, so dass sich das erste Wärmeisolierelement (11) und das zweite Wärmeisolierelement (12) auf einer der ersten Seite (S1) gegenüberliegenden zweiten Seite (S2) verhältnismäßig öffnen können.

3. Wäschepflegemaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** das erste Wärmeisolierelement (11), das zweite Wärmeisolierelement (12) und das das erste Wärmeisolierelement (11) mit dem zweiten Wärmeisolierelement (12) verbindende Verbindungsteil (13) einstückig aus Kunststoff hergestellt sind.

4. Wäschepflegemaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** das erste Wärmeisolierelement (11) und das zweite Wärmeisolierelement (12) mit einem ersten Loch (15) beziehungsweise einem

zweiten Loch (16) versehen sind, die koaxial so angeordnet sind, dass ein Befestigungsteil hindurchverlaufen kann.

**5.** Wäschepflegemaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** an dem ersten Wärmeisolierelement (11) und/oder dem zweiten Wärmeisolierelement (12) Hohlräume (18) vorgesehen sind.

**6.** Wäschepflegemaschine (1) nach Anspruch 4, **dadurch gekennzeichnet, dass** der erste wärmeisolierte Teil mit einem dritten Loch (22) versehen ist, das mit dem ersten Loch (15) und dem zweiten Loch (16) koaxial ist, und das Befestigungsteil durch das erste Loch (15), das zweite Loch (16) und das dritte Loch (22) hindurch verläuft und mit den Wärmeisolierelementen (11, 12), dem ersten und dem zweiten wärmeisolierten Teil verbunden ist.

**7.** Wäschepflegemaschine (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** es sich bei dem ersten wärmeisolierten Teil um ein Hochtemperatur-Metallteil und bei dem zweiten wärmeisolierten Teil um ein Kunststoffteil handelt.

**8.** Wäschepflegemaschine (1) nach Anspruch 7, **dadurch gekennzeichnet, dass** es sich bei dem ersten wärmeisolierten Teil um eine Luftaufheizkanalwand und bei dem zweiten wärmeisolierten Teil um einen Wäschepflegebottich (4) handelt.

## Revendications

**1.** Machine pour l'entretien du linge (1), comprenant

une partie d'isolation thermique (10),
une première partie isolée thermiquement et une deuxième partie isolée thermiquement disposées de façon adjacente,
**caractérisée en ce que** la partie d'isolation thermique (10) comprend : une première plaque d'isolation thermique (11), une deuxième plaque d'isolation thermique (12),
et une traverse (13) reliant la première plaque d'isolation thermique (11) à la deuxième plaque d'isolation thermique (12), la première plaque d'isolation thermique (11) est disposée en face de la deuxième plaque d'isolation thermique (12) et la première plaque d'isolation thermique (11) et la deuxième plaque d'isolation thermique (12) possèdent un vide (14) qui accueille au moins une partie de la première partie isolée thermiquement, dans laquelle la partie d'isolation thermique (10) est installée sur la première partie isolée thermiquement et la deuxième plaque d'isolation thermique (12) sépare la première partie isolée thermiquement de la deuxième partie isolée thermiquement.

**2.** Machine pour l'entretien du linge selon la revendication 1, **caractérisée en ce que** la traverse (13) est disposée sur un premier côté (S1) de la première plaque d'isolation thermique (11) et la deuxième plaque d'isolation thermique (12) et la traverse (13) possèdent une élasticité, de sorte que la première plaque d'isolation thermique (11) et la deuxième plaque d'isolation thermique (12) peuvent s'ouvrir l'une par rapport à l'autre le long d'un deuxième côté (S2) opposé au premier côté (S1).

**3.** Machine pour l'entretien du linge selon la revendication 1, **caractérisée en ce que** la première plaque d'isolation thermique (11), la deuxième plaque d'isolation thermique (12) et la traverse (13) reliant la première plaque d'isolation thermique (11) à la deuxième plaque d'isolation thermique (12) sont intégralement réalisées en plastique.

**4.** Machine pour l'entretien du linge selon la revendication 1, **caractérisée en ce que** la première plaque d'isolation thermique (11) et la deuxième plaque d'isolation thermique (12) sont respectivement dotées d'un premier orifice (15) et d'un deuxième orifice (16) disposés de façon coaxiale, de sorte à permettre la traversée d'une pièce de fixation.

**5.** Machine pour l'entretien du linge selon la revendication 1, **caractérisée en ce que** des creux (18) sont prévus sur au moins une parmi la première plaque d'isolation thermique (11) et la deuxième plaque d'isolation thermique (12).

**6.** Machine pour l'entretien du linge (1) selon la revendication 4, **caractérisée en ce que** la première partie isolée thermiquement est pourvue d'un troisième orifice (22) coaxial au premier orifice (15) et au deuxième orifice (16), et la pièce de fixation traverse le premier orifice (15), le deuxième orifice (16) et le troisième orifice (22) et relie les plaques d'isolation thermique (11, 12), la première partie isolée thermiquement et la deuxième partie isolée thermiquement.

**7.** Machine pour l'entretien du linge (1) selon la revendication 1, **caractérisée en ce que** la première partie isolée thermiquement est une partie métallique à haute température et la deuxième partie isolée thermiquement est une partie en plastique.

**8.** Machine pour l'entretien du linge (1) selon la revendication 7, **caractérisée en ce que** la première partie isolée thermiquement est une paroi de conduit de chauffage d'air et la deuxième partie isolée thermiquement est un tambour pour l'entretien du linge.

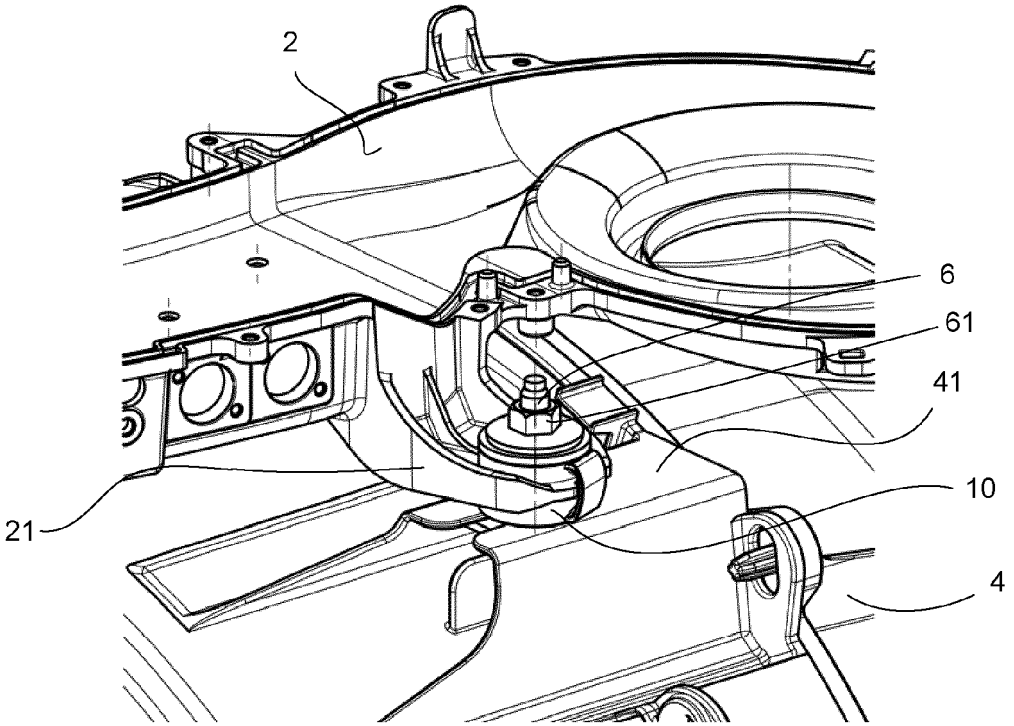


FIG. 1

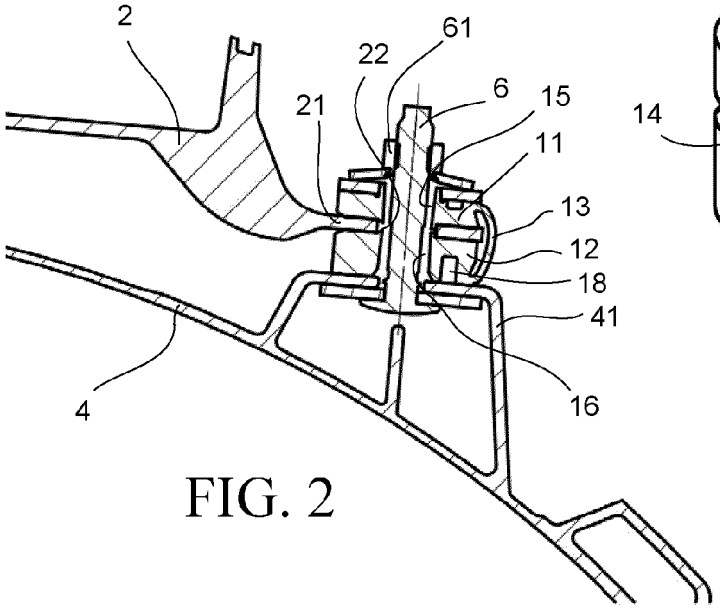


FIG. 2

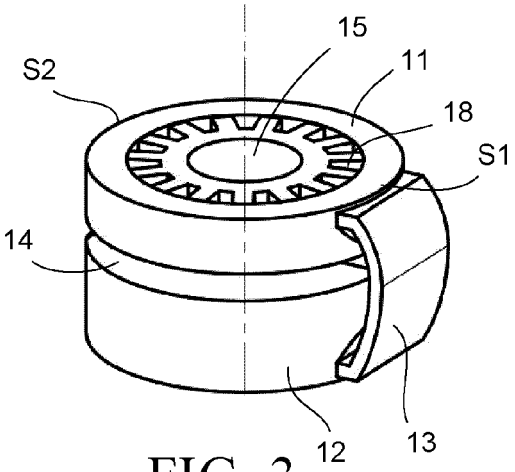


FIG. 3

## REFERENCES CITED IN THE DESCRIPTION

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