



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.05.2017 Bulletin 2017/20

(51) Int Cl.:
D06F 39/12 (2006.01)

(21) Application number: **16197452.2**

(22) Date of filing: **07.11.2016**

(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**
Designated Extension States:
BA ME
Designated Validation States:
MA MD

- **CEPON, Gregor**
1354 Horjul (SI)
- **BOLTEZAR, Miha**
1000 Ljubljana (SI)
- **STIMULAK, Mitja**
3204 Dobrna (SI)
- **POGOREVC, Robi**
2382 Mislinja (SI)
- **MIHELIC, Ales**
1000 Ljubljana (SI)

(30) Priority: **11.11.2015 SI 201500270**

(71) Applicant: **Gorenje Gospodinjski aparati d.d.**
3503 Velenje (SI)

(74) Representative: **Ivancic, Bojan**
Inventio d.o.o.
Dolenjska cesta 11
1000 Ljubljana (SI)

(72) Inventors:
• **KUHAR, Matjaz**
3320 Velenje (SI)

(54) **WASHING MACHINE WITH ADJUSTABLE SUPPORTS**

(57) The present invention refers to a washing machine for washing laundry, comprising a body with a casing (1) and a front wall (2) having an access opening (3) for loading/unloading laundry to be washed, wherein a plurality of vertically adjustable supports (13) are connected to the lower section of the casing (1) and the front wall (2) which is intended for mounting the washing ma-

chine on a surface. It is provided for according to the present invention, that at least a horizontal fold (4,5) of the casing (1) or of the front wall (2) is at least partially and/or at least piecewise continuously formed with a reinforcing elevation (16) extending in the longitudinal direction of the fold (4, 5).

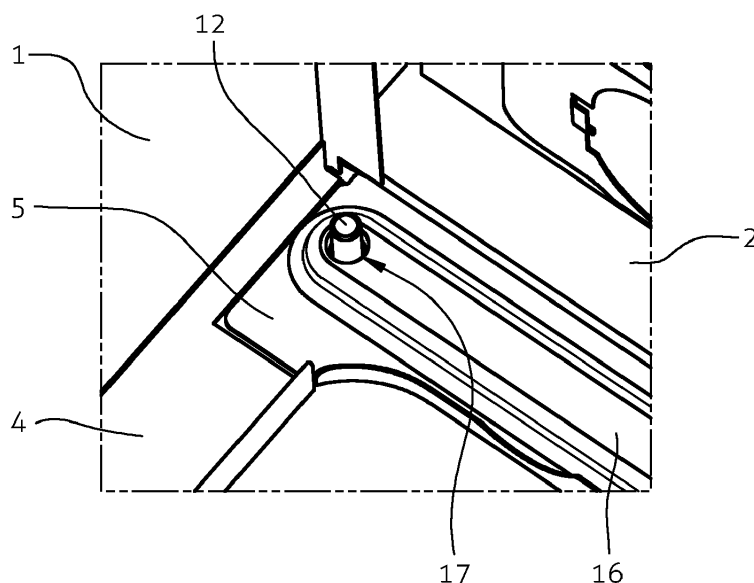


FIG. 3

Description

[0001] The present invention refers to a washing machine for washing laundry, comprising a body with an access opening for loading/unloading laundry to be washed, and in the lower section thereof which is intended for mounting the washing machine on the surface, a plurality of vertically adjustable supports connected to said body.

[0002] Vibrations caused in operation of a washing machine are transmitted to the body and exert negative impact not only to the loaded parts of the body but to the stability of the washing machine as well. In particular, it is important for the body to be formed in a manner that the vibration forces transmitted to the supports of the washing machine and the surface act as less as possible in horizontal direction to prevent the washing machine to be displaced on the surface. In order to avoid said problems, known solutions provide reinforcement of the body in the area of supports by means of additional elements. Moreover, known are solutions that try to increase the stiffness of the body by means of plastic deformation and, respectively, deep drawing, and the folds in the corners of the body of the machine at the places where supports are attached. Due to potentially uneven surface and limited mounting stability, the washing machines are provided as a rule with at least one vertically adjustable support. Said support is formed with a base cooperating with the surface on which the washing machine is mounted. A threaded shank projects from said base being screwed from the bottom side to the body of the washing machine. Drawback of such solutions is relatively thin and flexible material the body is produced of, thus, resulting in a local deflection of said material and in transmission of unwanted vibrations to the surface.

[0003] It is the object of the present invention to create a washing machine of the aforementioned kind in which a body in the vicinity of supports is as rigid as possible, thus, preventing transfer of the vibrations to the ground.

[0004] According to the present invention, the object as set above is solved in a manner, that an input of a plastic deformation, such as a deep drawing, is provided in the section of the body bottom in the horizontal extension thereof, wherein at the side of said plastic deformation which is averted from the surface on which a washing machine is mounted, there is provided a through hole the centre line thereof lies coaxially with the centre line of a support of the washing machine and, respectively, with the centre line of a threaded shank of said support. Said through hole preferably comprises greater diameter than is the diameter of said threaded shank.

[0005] The invention will be more readily understood on reading the following description of a non-limiting embodiment and with reference to the accompanying drawings

Fig. 1 shows a three-dimensional view of a body of a washing machine according to the invention,

Fig. 2 shows a three-dimensional bottom side view of the washing machine of Fig. 1,

Fig. 3 shows a three-dimensional detailed view of the corner area of the washing machine of Fig. 1,

5 Fig. 4 shows a longitudinal section along a centreline of a support of the washing machine,

Fig. 5 shows a transversal section along a centreline of a support of the washing machine.

10 **[0006]** A washing machine according to the invention comprises a body consisting of a U shaped casing 1, and a front wall 2 comprising an opening 3 for loading/unloading laundry to be washed. Said front wall 2 is associated with said casing 1, for example by means of a spot welding. Said casing 1 of the body and, respectively, the
15 front wall 2 are formed at the bottom end thereof which, with the normally mounted washing machine, faces the surface the washing machine is mounted on, with a first horizontal fold 4 and with a second horizontal fold 5 both projecting to the interior of the washing machine.

20 **[0007]** A flat reinforcing element 10 is attached to each corner section 6, 7, 8, 9 of the horizontal fold 4; 5 which cooperates with the surface the washing machine is mounted on. Said reinforcing element 10 is formed with a flange 11 comprising a threaded through hole into which
25 a support 13 of the washing machine is screwed in by means of a threaded shank 12. In order to act on said support 13, the latter is formed at the side which cooperates with said surface with at least one, and preferably with two polygonal sections 14, 15 to be engaged with
30 the tool by means of which a user may act to the support 13. Each horizontal fold 4; 5 is formed in the area of said flange 11 of the reinforcing element 10 with a through hole in order to allow free passage of the threaded shank 12 of the support 13 when the latter is installed and/or
35 vertically adjusted.

[0008] In order to increase rigidity of the washing machine and, as a result, decrease vibrations thereof, at least one of horizontal folds 4; 5 of the casing 1 and, respectively, the front wall 2 is formed at least partially
40 and/or at least piecewise continuously with a reinforcing elevation 16 extending in longitudinal direction of the fold 4; 5. Said elevation 16 is made by means of plastic deformation, such as by bending the fold 4; 5 or by input of a deep draw into the fold 4; 5. According to the preferred embodiment, said elevation 16 is formed uninterrupted and essentially over the entire length of the fold 4; 5, and in direction away from said surface on which the washing machine is mounted on. Said elevation 16 is formed in
45 the area of the arrangement of the support 13 with a through hole 17 to allow passage for the threaded shank 12 of the support 13. It is provided for according to the present invention, that with the assembled body of the washing machine each horizontal fold 4; 5 of the casing
50 1 and, respectively, of the front wall 2 which is formed with said elevation 16 rests on the horizontal fold 4; 5 which is formed without the elevation 16.

[0009] With the present embodiment shown in accom-

panied drawings, said elevation is formed on the second horizontal fold 5 of the front wall 2. Therefore, with the assembled body the second horizontal fold 5 of the front wall 2 rests on said first horizontal fold 4 of the casing 1.

[0010] Furthermore, it is possible according to one of the embodiments, that said flange 11 of the reinforcing element 10 extends to the area of said through hole 17 of the elevation 16 and is there tightly connected to said elevation 16.

5

10

Claims

1. A washing machine with adjustable supports, comprising a body with a casing (1) and a front wall (2) with an access opening (3) for loading/unloading the laundry to be washed, wherein the casing (1) of the body and, respectively, the front wall (2) of the body are formed at the bottom end thereof with a first horizontal fold (4) and with a second horizontal fold (5) projecting to the interior of the washing machine, and comprising in the bottom section which is intended to mount the washing machine on the surface a plurality of vertically adjustable supports (13) associated with said body, **characterized in that** at least one of horizontal folds (4; 5) of a casing (1) and, respectively, of a front wall (2) is at least partially and/or at least piecewise continuously formed with a reinforcing elevation (16) extending in the longitudinal direction of the second fold (5).
2. A washing machine with vertically adjustable supports according to claim 1, **characterized in that** said elevation (16) is made by means of plastic deformation of said at least one horizontal fold (4; 5).
3. A washing machine with vertically adjustable supports according to claims 1 and 2, **characterized in that** said plastic deformation of said at least one horizontal fold (4; 5) of the casing (1) and, respectively, the front wall (2) comprises bending or deep drawing.
4. A washing machine with vertically adjustable supports according to claims 1 to 3, **characterized in that** said elevation (16) is formed uninterrupted and essentially over the entire length of said at least one horizontal fold (4; 5).
5. A washing machine with vertically adjustable supports according to claims 1 to 4, **characterized in that** said elevation (16) is formed in the area of arrangement of the support (13) with a through hole (17) for a threaded shank (12) of the support (13) to pass through.

15

20

25

30

35

40

45

50

55

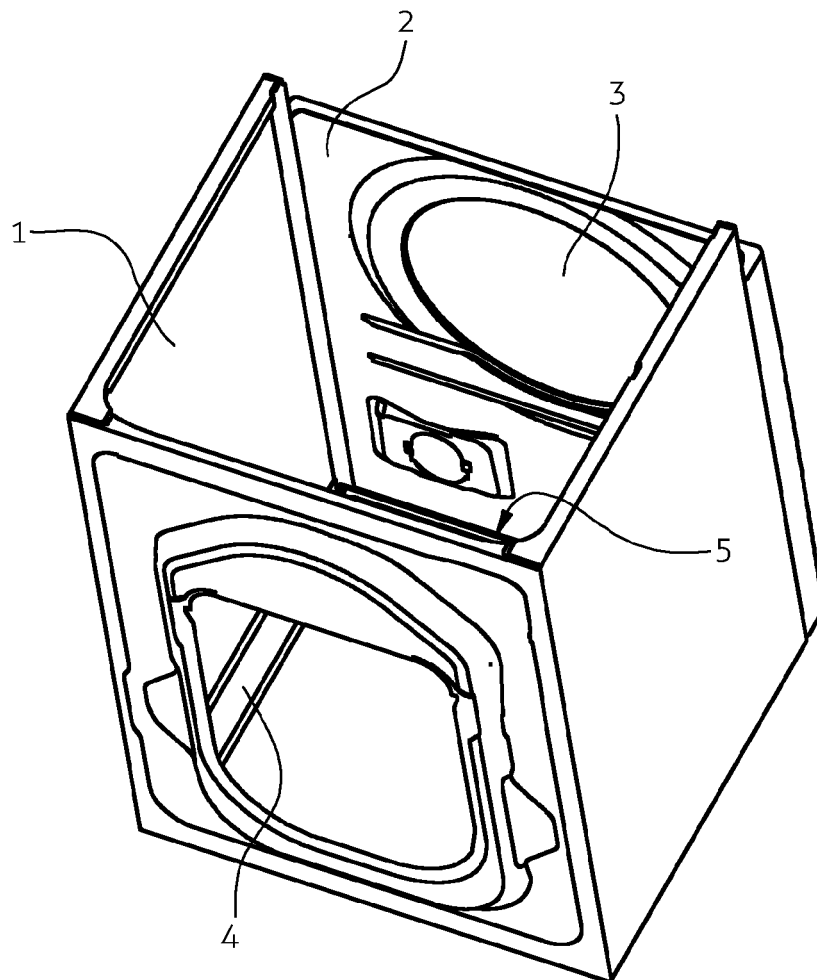


FIG. 1

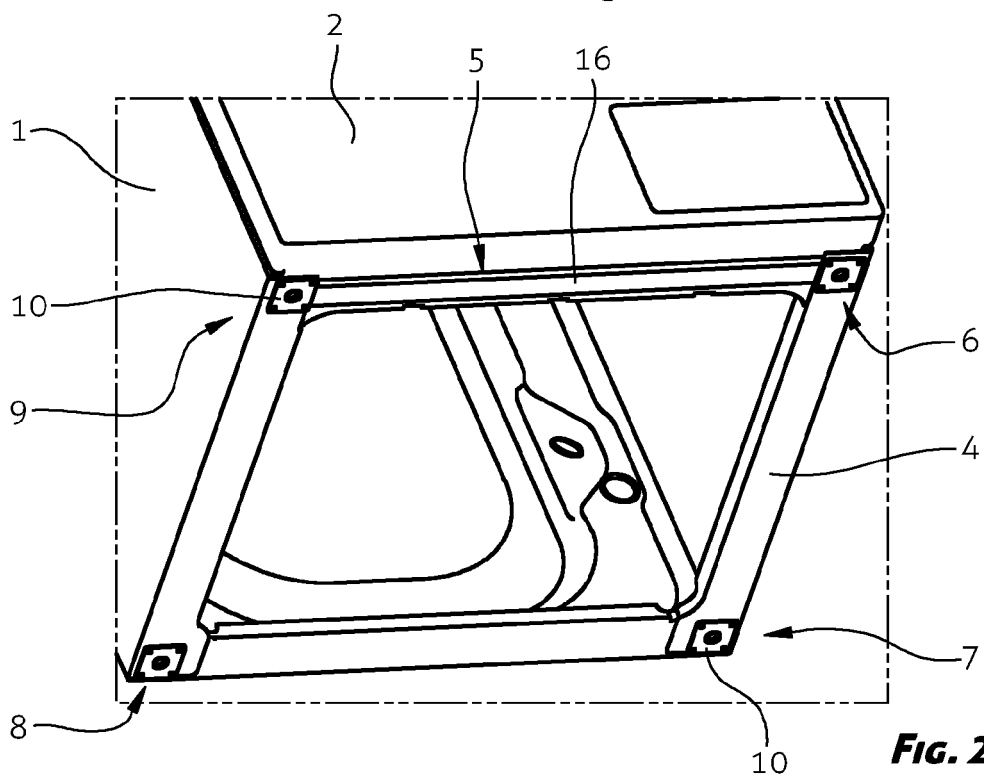


FIG. 2

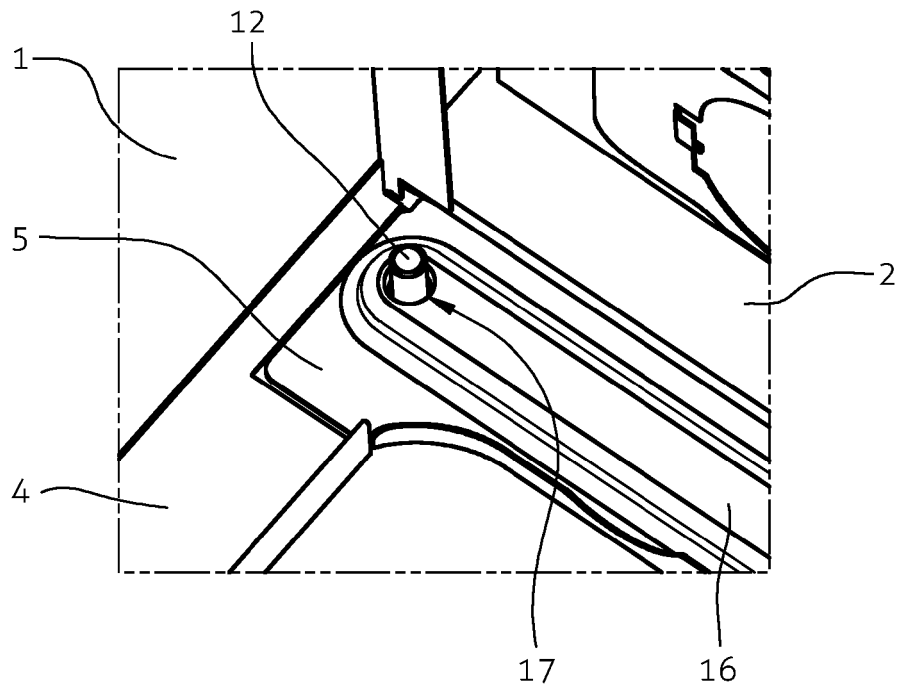


FIG. 3

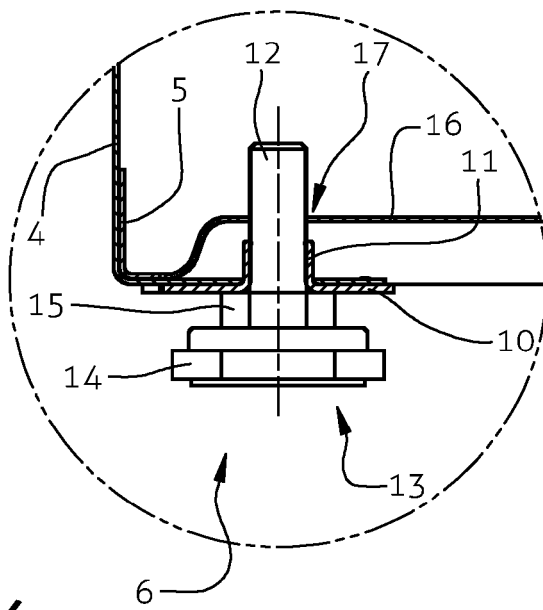


FIG. 4

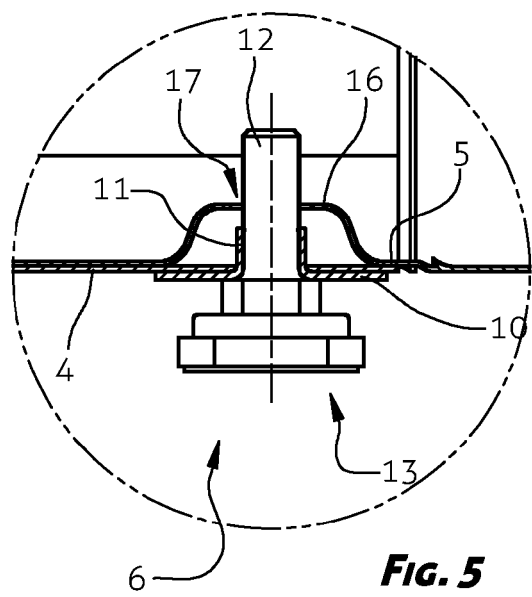


FIG. 5



EUROPEAN SEARCH REPORT

Application Number
EP 16 19 7452

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	GB 2 022 621 A (DOMAR SA) 19 December 1979 (1979-12-19)	1,4,5	INV. D06F39/12
A	* page 1, line 93 - page 1, line 120; figure 1 * * page 2, line 19 - page 2, line 39; figures 1, 12 * * page 2, line 101 - page 2, line 104; figures 21, 22 *	2,3	
Y	EP 1 550 397 A1 (LG ELECTRONICS INC [KR]) 6 July 2005 (2005-07-06) * paragraph [0011] * * paragraph [0049] * * paragraph [0055] - paragraph [0068]; figures 2-4 *	1,4,5	
A	JP 2009 148397 A (PANASONIC CORP) 9 July 2009 (2009-07-09) * abstract; figures 1, 8 *	1,4,5	
A	JP 2004 154537 A (WATANABE TADAYOSHI) 3 June 2004 (2004-06-03) * abstract; figures 1, 2b, 5, 6 *	1-5	TECHNICAL FIELDS SEARCHED (IPC) D06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 3 March 2017	Examiner Sabatucci, Arianna
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 16 19 7452

5 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.

03-03-2017

	Patent document cited in search report		Publication date		Patent family member(s)		Publication date
10	GB 2022621	A	19-12-1979	DE	2840939 A1		06-12-1979
15				ES	470524 A1		01-02-1979
				FR	2426762 A1		21-12-1979
				GB	2022621 A		19-12-1979
				IT	1100861 B		28-09-1985

20	EP 1550397	A1	06-07-2005	AU	2004242499 A1		14-07-2005
				CN	1637195 A		13-07-2005
				EP	1550397 A1		06-07-2005
				US	2005138836 A1		30-06-2005

25	JP 2009148397	A	09-07-2009	JP	5003461 B2		15-08-2012
				JP	2009148397 A		09-07-2009

	JP 2004154537	A	03-06-2004	NONE			

30							
35							
40							
45							
50							
55							

ORM P0459