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(54) **DRUM TYPE WASHING MACHINE**

TROMMELWASCHMASCHINE

MACHINE A LAVER A TAMBOUR

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Description

BACKGROUND

1. Field

[0001] Embodiments of the present invention relate to a drum type washing machine in which a rotating tub receives a rotational force from a driving motor and rotates.

2. Description of the Related Art

[0002] Generally, washing machines are apparatuses which include a reservoir which stores water and a rotating tub rotatably installed in the reservoir. Here, the rotating tub in which laundry is accommodated rotates inside the reservoir, thereby washing the laundry.

[0003] Recently, among washing machines described above, there are drum type washing machines in which a rotation shaft of a rotating tub is disposed in an approximately horizontal direction to allow laundry to be pulled upward according to rotation of a rotating tub and to drop, thereby washing the laundry due to head thereof.

[0004] Also, in drum type washing machines described above, there are direct connection drum type washing machines in which a rotation shaft of a driving motor is directly connected to a rear side of a rotating tub to directly transfer a rotational force of the driving motor to the rotating tub and belt drum type washing machines in which a rotating tub receives the rotational force generated by a driving motor transferred through a driving pulley, a driven pulley, and a belt and rotates.

[0005] In belt drum type washing machines, the driving motor is fixed to a reservoir, the driving pulley is installed at a driving shaft of the driving motor, and the driven pulley is installed at a rotation shaft of the rotating tub. Also, the belt is wound on the driving pulley and the driven pulley and transfers the rotational force from the driving pulley to the driven pulley.

[0006] The document DE 10 2010 062822 A1 discloses a drum type washing machine comprising a reservoir which contains water, a rotating tub rotatably installed in the reservoir, a driving apparatus which generates a rotational force for rotating the rotating tub, and at least one fixing bracket for fixing the driving motor to the reservoir, wherein the driving apparatus comprises the driving motor which generates the rotational force, the driving motor comprises a case for forming an exterior thereof, the case is formed of a metal material, and the fixing bracket is formed of a resin material and fixed to the case.

[0007] The document EP 2 620 537 A1 discloses a drum type washing machine comprising, a reservoir which contains water, a rotating tub rotatably installed in the reservoir, a driving apparatus which generates a rotational force for rotating the rotating tub, and a first and a second fixing bracket for fixing the driving motor to the reservoir, wherein the driving apparatus comprises the

driving motor which generates the rotational force, the driving motor comprises a case for forming an exterior thereof, wherein the case comprises a first case which supports one side of the stator and a second case which supports the other side of the stator, wherein the first fixing bracket is fixed to the first case, and the second fixing bracket is fixed to the second case.

SUMMARY

[0008] Therefore, it is an aspect of the present invention to provide a drum type washing machine capable of smoothly discharging heat generated in a driving motor and reducing a weight of the driving motor to be easily stored and installed.

[0009] Additional aspects of the invention will be set forth in part in the description which follows.

[0010] In accordance with a first aspect of the present invention, a drum type washing machine is provided according to independent claim 1. In a second aspect of the present invention, a drum type washing machine is provided according to independent claim 2. These drum type washing machines include each a reservoir which contains water, a rotating tub rotatably installed in the reservoir, a driving apparatus which generates a rotational force for rotating the rotating tub, and at least one fixing bracket for fixing the driving motor to the reservoir. Here, the driving apparatus includes the driving motor which generates the rotational force. Also, the driving motor includes a case forming an exterior thereof. Also, the case is formed of a metal material. Also, the fixing bracket is formed of a resin material and fixed to the case.

[0011] The fixing bracket may include a motor fixing portion fixed to the case, a pair of reservoir fixing portions fixed to the reservoir, a pair of first frame portions which connect the motor fixing portion with the pair of reservoir fixing portions, respectively, and a second frame portion which mutually connects the pair of reservoir fixing portions.

[0012] The fixing bracket may include a plurality of supporting ribs for reinforcing the strength thereof.

[0013] The plurality of supporting ribs may include a plurality of first supporting ribs which provide support in a space between the motor fixing portion and the pair of reservoir fixing portions and a plurality of second supporting ribs which provide support in a space between the motor fixing portion and the second frame portion.

[0014] The plurality of supporting ribs may include a plurality of third supporting ribs which are formed in an X shape and provide support in the space between the motor fixing portion and the second frame portion.

[0015] The driving motor may include a stator, a rotor which interacts with the stator and rotates, a driving shaft which is fixed to the rotor and rotates together with the rotor, and a pair of bearings which rotatably support the driving shaft.

[0016] The case may include a bearing installation portion in which the pair of bearings are installed, a shaft

installation hole which is provided in one side of the case, through which one end of the driving shaft passes and protrudes therefrom, and a bracket installation groove which has an annular shape concavely provided outside the bearing installation portion. Also, the fixing bracket may include a mounting hole into which the bearing installation portion is mounted therein and an extended rib which extends from a portion adjacent to the mounting hole in an annular shape and supports a surface of the bearing installation portion therein.

[0017] The drum type washing machine may further include a plurality of reinforcing ribs which extend outward from the extended rib in a radial direction and are spaced apart in a circumferential direction.

[0018] At least one step portion stepped in an annular shape around the bearing installation portion may be provided at one surface of the case to which the fixing bracket is fixed.

[0019] The at least one step portion may include a plurality of stepped portions sequentially provided in a radial direction around the bearing installation portion.

[0020] The fixing bracket may include temporary assembly protrusions which protrude from the motor fixing portion toward the case. Also, the case may include temporary assembly holes into which the temporary assembly protrusions are inserted.

[0021] The fixing bracket and the case may include first fastening holes and second fastening holes which are provided at mutually corresponding positions, to which fastening members are fastened, respectively.

[0022] The temporary assembly protrusions and the first fastening holes may be alternately provided in a circumferential direction. Also, the temporary assembly holes and the second fastening holes may be alternately provided in the circumferential direction.

[0023] According to the first aspect of the invention, the case includes a first case which supports one side of the stator and a second case which supports the other side of the stator. Also, the fixing bracket is fixed to the first case. Also, the second case includes a fixing portion which integrally extends from the second case and which is fixed to the reservoir.

[0024] According to the second aspect of the invention, the case includes a first case which supports one side of the stator and the rotor and a second case which supports the other side of the stator and the rotor. Also, the fixing bracket comprises a first fixing bracket installed in the first case and a second fixing bracket installed in the second case so that the driving motor is fixed to the reservoir through the first fixing bracket and the second fixing bracket.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] These and/or other aspects of the invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:

FIG. 1 is a schematic diagram of a washing machine in accordance with one embodiment of the present invention;

FIG. 2 is an exploded perspective view of a driving motor and a fixing bracket applied to the washing machine in accordance with one embodiment of the present invention;

FIG. 3 is a cross-sectional view of the driving motor and the fixing bracket applied to the washing machine in accordance with one embodiment of the present invention;

FIG. 4 is a rear view of the fixing bracket applied to the washing machine in accordance with one embodiment of the present invention;

FIG. 5 is a perspective view of a driving motor applied to a washing machine in accordance with another embodiment of the present invention; and

FIG. 6 is an exploded perspective view of a driving motor and a fixing bracket applied to a washing machine in accordance with still another embodiment of the present invention.

DETAILED DESCRIPTION

[0026] Hereinafter, a drum type washing machine in accordance with one embodiment of the present invention will be described with reference to the attached drawings.

[0027] The drum type washing machine in accordance with one embodiment of the present invention, as shown in FIG. 1, includes a housing 10 which forms an exterior, a reservoir 20 installed inside the housing 10 while being suspended to store water, and a rotating tub 30 rotatably installed in the reservoir 20.

[0028] An inlet 10a is provided at a front of the housing 10 to introduce laundry into the rotating tub 30. Through holes 20a and 30a corresponding to the inlet 10a are provided in fronts of the reservoir 20 and the rotating tub 30, respectively. A door 11 is installed at the front of the housing 10 to open or close the inlet 10a.

[0029] A water supply apparatus 40 for supplying water to the reservoir is disposed at an upper inside of the housing 10, and a drainage apparatus 50 for outwardly discharging washing water used for washing is disposed at a lower inside of the housing 10.

[0030] The water supply apparatus 40 includes a water supply pipe 41 connected to an external water supply source, a water supply valve 42 disposed at the water supply pipe 41 to open and close the water supply pipe 41, a detergent supply unit 43 which mixes water transferred through the water supply pipe 41 with a detergent, and a washing water supply pipe 44 which connects the detergent supply unit 43 with the reservoir 20 and guides the water and detergent to the reservoir 20.

[0031] The drainage apparatus 50 includes a drainage pipe 51 which is connected to a bottom of the reservoir 20 and guides the washing water used in the reservoir 20 to be discharged outside the washing machine and a

drainage pump 52 disposed at the drainage pipe 51 to allow the washing water to be discharged outside through the drainage pipe 51.

[0032] The rotating tub 30 has a hollow cylindrical shape. A plurality of through holes 30b are provided in an outer circumferential surface of the rotating tub 30 to allow the water to pass. Lifters 30c are disposed on an inner circumferential surface of the rotating tub 30 while being spaced apart in a circumferential direction to lift laundry in the rotating tub 30 upward. Also, a rotation shaft 31 which receives a rotational force and allows the rotating tub 30 to rotate in the reservoir 20 is coupled to a rear surface of the rotating tub 30. The rotation shaft 31 is rotatably installed at a rear surface of the reservoir 20, and a rear end of the rotation shaft 31 passes through the rear surface of the reservoir 20 and protrudes from a rear side of the reservoir 20.

[0033] Also, the drum type washing machine includes a driving apparatus 60 which generates power to rotate the rotating tub 30.

[0034] The driving apparatus 60 includes a driving motor 61 which generates a rotational force, a driving pulley 62 installed at a rear end of a driving shaft 613 of the driving motor 61, which will be described below, and a driven pulley 63 which is installed at the rear end of the rotation shaft 31 and receives a rotational force from the driving pulley 62 through a belt 64.

[0035] The driving motor 61, as shown in FIGS. 2 and 3, includes a stator 611, a rotor 612 which is rotatably installed in the stator 611 and rotates while interacting with the stator 611, and the driving shaft 613 which is installed in a center of the rotor 612 and rotates together with the rotor 612. The driving pulley 62 described above is installed at the rear end of the driving shaft 613.

[0036] Also, the driving motor 61 includes cases 614F and 614S which form an exterior of the driving motor 61 and support the stator 611 and one pair of bearings 615 which are installed in each of the cases 614F and 614S and rotatably support both sides of the driving shaft 613.

[0037] The cases 614F and 614S include a first case 614F fixed to cover one side of the stator 611 and a second case 614S fixed to cover the other side of the stator 611. Bearing installation portions 614a which have hollow cylindrical shapes in which the bearings 615 described above are installed are provided in central portions of the first case 614F and the second case 614S. A shaft installation hole 614b which allows the rear end of the driving shaft 613 to pass through the second case 614S and to protrude from a rear side thereof is provided in a center of the second case 614S. Also, a bracket installation groove 614c concavely formed in an annular shape outside the bearing installation portion 614a, in which a fixing bracket 70 is installed, is provided in the first case 614F.

[0038] The driving motor 61 is installed on and fixed to an outer surface of the reservoir 20. To fix the driving motor 61 to the reservoir 20, the fixing bracket 70 is fixed to one side of the driving motor 61 and fixing portions 614d which integrally extend from the case 614S are pro-

vided at the other side of the driving motor 61.

[0039] The fixing bracket 70 is fixed to the first case 614F, and the fixing portions 614d are integrally extended from the second case 614S. Also, the first and second cases 614F and 614S are formed of a metal material and the fixing bracket 70 is formed of a resin material.

[0040] Accordingly, the emission of heat generated by the driving motor 61 is smoothly performed through the cases 614F and 614S formed of a metal. Since the driving motor 61 can be stored while being not coupled with the fixing bracket 70, it is easy to store the driving motor 61. Even though the fixing bracket 70 is fixed to the driving motor 61, since the fixing bracket 70 is formed of a relatively lightweight resin material rather than metal, the driving motor 61 may be simply installed.

[0041] The fixing bracket 70 includes a motor fixing portion 71 fixed to the first case 614F, a pair of reservoir fixing portions 72 fixed to an outer surface of the reservoir 20, a pair of first frame portions 73 which connect the pair of reservoir fixing portions 72 with the motor fixing portion 71, and a second frame portion 74 which connects the two reservoir fixing portions 72 with each other.

[0042] The motor fixing portion 71 includes a mounting hole 71a into which a bearing installation portion 614a provided in the first case 614F is mounted to allow an outer circumferential surface of the bearing installation portion 614a of the first case 614F to be supported by an inner circumferential surface of the mounting hole 71a. Also, the motor fixing portion 71 includes an extended rib 71b which is integrally extended from a portion adjacent to the mounting hole 71a in an annular shape and enters in the bracket installation groove 614c to support an outer surface of the bearing installation portion 614a and a plurality of reinforcing ribs 71c which extend from the extended rib 71b in a radial direction and are spaced apart in a circumferential direction. The extended ribs 71b forms the mounting hole 71a together with the motor fixing portion 71 to provide an effect of extending a length of the mounting hole 71a. Accordingly, the bearing installation portion 614a of the first case 614F may be stably mounted into and supported by the mounting hole 71a formed by the motor fixing portion 71 and the extended ribs 71b.

[0043] Also, a step portion 614e formed in an annular shape around the bearing installation portion 614a is provided at one surface of the first case 614F to which the motor fixing portion 71 of the fixing bracket 70 is fixed.

[0044] The two reservoir fixing portions 72 include fastening holes 72a to which fastening members are fastened, respectively. Also, although not shown in the drawings, buffering members for reducing the transfer of vibrations generated during an operation of the drum type washing machine may be installed at the fastening holes 72a in the two reservoir fixing portions 72, respectively.

[0045] The first frame portions 73, as shown in FIG. 4, are formed to have thicknesses which taper from the reservoir fixing portions 72 to the motor fixing portion 71. The second frame portion 74 is formed in a plate shape

curved toward the motor fixing portion 71.

[0046] Also, the fixing bracket 70 includes supporting ribs 75, 76, and 77 which allow the components of the fixing bracket 70 described above to be mutually supported to increase the strength of the fixing bracket 70. The supporting ribs 75, 76, and 77 include a plurality of first supporting ribs 75 which are provided in an approximately triangular space formed between the first frame portions 73 and the second frame portion 74 and provide support in a space between the motor fixing portion 71 and the pair of reservoir fixing portions 72, a plurality of second supporting ribs 76 which provide support in a space between the motor fixing portion 71 and the second frame portion 74, and a plurality of third supporting ribs 77 which have an X shape and provide support in the space between the motor fixing portion 71 and the second frame portion 74. The third supporting ribs 77 comprise at least two portions which intersect to form an X shape.

[0047] Also, as shown in FIGS. 2 and 3, a plurality of temporary assembly protrusions 71d which protrude toward the first case 614F are provided at the motor fixing portion 71 and a plurality of temporary assembly holes 614f which are provided at positions corresponding to the plurality of temporary assembly protrusions 71d to allow the plurality of temporary assembly protrusions 71d to be respectively inserted therein are provided in the first case 614F.

[0048] Also, first fastening holes 71e and second fastening holes 614g are provided in the motor fixing portion 71 and the first case 614F in mutually corresponding positions, respectively, to allow the motor fixing portion 71 of the fixing bracket 70 to be fixed to the first case 614F using fastening members.

[0049] Accordingly, the fixing bracket 70 is temporarily assembled with the first case 614F by inserting the temporary assembly protrusions 71d into the temporary assembly holes 614f and then fastening members are fastened to the first fastening holes 713 and the second fastening holes 614g, thereby fixing the fixing bracket 70 to the first case 614F.

[0050] In the embodiment, the temporary assembly protrusions 71d and the first fastening holes 71e are alternately provided at the motor fixing portion 71 in a circumferential direction and the temporary assembly holes 614f and the second fastening holes 614g are alternately provided in the first case 614F in a circumferential direction.

[0051] In the embodiment, although one step portion 614e is shown as being provided, this is merely an example and not limited thereto. In another embodiment shown in FIG. 5, in a driving motor 61', a plurality of step portions 614e may be sequentially formed outside in a radial direction around the bearing installation portion 614a.

[0052] Also, in the embodiment, one side of the driving motor 61 is fixed to the reservoir 20 through the fixing bracket 70 coupled with the first case 614F and the other side thereof is coupled with the reservoir 20 through the

fixing portions 614d integrally provided at the second case 614S but this is not limited thereto. As still another embodiment shown in FIG. 6, a first fixing bracket 70A is coupled with a first case 614F' of a driving motor 61" and a second fixing bracket 70B may be fixed to a second case 614S' to allow the driving motor 61" to be fixed to the reservoir 20 through the first fixing bracket 70A and the second fixing bracket 70B.

[0053] As is apparent from the above description, since a case of a driving motor is formed of a metal and a fixing bracket is formed of a resin material, the emission of heat generated by the driving motor can be easily performed, and since a weight of the driving motor is greatly reduced due to the fixing bracket formed of the resin material, it can be easily stored and installed.

[0054] Although a few embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the invention as defined in the claims.

Claims

1. A drum type washing machine comprising:

a reservoir (20) which contains water;
a rotating tub (30) rotatably installed in the reservoir (20);
a driving apparatus (60) which generates a rotational force for rotating the rotating tub (30);
and
at least one fixing bracket (70) for fixing the driving motor to the reservoir (20),
wherein the driving apparatus (60) comprises the driving motor (61) which generates the rotational force,
the driving motor (61) comprises a case (614) for forming an exterior thereof,
the case (614) is formed of a metal material, and
the fixing bracket (70) is formed of a resin material and fixed to the case (614), wherein the case (614) comprises:

a first case (614F) which supports one side of the stator (611) and a second case (614S) which supports the other side of the stator (611),
wherein the fixing bracket (70) is fixed to the first case (614F), and
wherein the second case (614S) comprises a fixing portion (614d) which integrally extends from the second case (614S) and which is fixed to the reservoir (20).

2. A drum type washing machine comprising:

a reservoir (20) which contains water;

- a rotating tub (30) rotatably installed in the reservoir (20);
 a driving apparatus (60) which generates a rotational force for rotating the rotating tub (30);
 and
 at least one fixing bracket (70) for fixing the driving motor to the reservoir (20),
 wherein the driving apparatus (60) comprises the driving motor (61) which generates the rotational force,
 the driving motor (61) comprises a case (614) for forming an exterior thereof,
 the case (614) is formed of a metal material, and the fixing bracket (70) is formed of a resin material and fixed to the case (614), wherein the case (614) comprises a first case (614F') which supports one side of the stator (611) and the rotor (612) and a second case (614S') which supports the other side of the stator (611) and the rotor (612), and
 wherein the fixing bracket (70) comprises a first fixing bracket (70A) installed in the first case (614F') and a second fixing bracket (70B) installed in the second case (614S') so that the driving motor (61) is fixed to the reservoir (20) through the first fixing bracket (70A) and the second fixing bracket (70B).
3. The drum type washing machine of claims 1 or 2, wherein the fixing bracket (70) comprises:
- a motor fixing portion (71) fixed to the case (614);
 a pair of reservoir fixing portions (72) fixed to the reservoir (20);
 a pair of first frame portions (73) which connect the motor fixing portion (71) with the pair of reservoir fixing portions (72), respectively; and
 a second frame portion (74) which mutually connects the pair of reservoir fixing portions (72).
4. The drum type washing machine of any of the previous claims, wherein the fixing bracket (70) comprises a plurality of supporting ribs (75, 76, 77) for reinforcing the strength thereof.
5. The drum type washing machine of claim 4, wherein the plurality of supporting ribs (75, 76, 77) comprise a plurality of first supporting ribs (75) which provide support in a space between the motor fixing portion (71) and the pair of reservoir fixing portions (72) and a plurality of second supporting ribs (76) which provide support in a space between the motor fixing portion (71) and the second frame portion (74).
6. The drum type washing machine of claim 5, wherein the plurality of supporting ribs (75, 76, 77) comprise a plurality of third supporting ribs (77) which are formed in an X shape and provide support in the space between the motor fixing portion (71) and the second frame portion (74).
7. The drum type washing machine of any one of the previous claims, wherein the driving motor (61) comprises:
- a stator (611);
 a rotor (612) which interacts with the stator (611) and rotates;
 a driving shaft (613) which is fixed to the rotor (612) and rotates together with the rotor (612); and
 a pair of bearings (615) which rotatably support the driving shaft (613).
8. The drum type washing machine of claim 7, wherein the case (614) comprises:
- a bearing installation portion (614a) in which the pair of bearings (615) are installed;
 a shaft installation hole (614b) which is provided in one side of the case (614), through which one end of the driving shaft (613) passes and protrudes therefrom; and
 a bracket installation groove (614c) which has an annular shape concavely provided outside the bearing installation portion (614a), and wherein the fixing bracket (70) comprises:
- a mounting hole (71a) into which the bearing installation portion (614a) is mounted; and
 an extended rib (71b) which extends from a portion adjacent to the mounting hole (71a) in an annular shape and supports a surface of the bearing installation portion (614a) therein.
9. The drum type washing machine of claim 8, further comprising a plurality of reinforcing ribs (71c) which extend outward from the extended rib (71b) in a radial direction and are spaced apart in a circumferential direction.
10. The drum type washing machine of claim 8 or 9, wherein at least one step portion (71e) stepped in an annular shape around the bearing installation portion (614a) is provided at one surface of the case (614) to which the fixing bracket (70) is fixed.
11. The drum type washing machine of claim 10, wherein the at least one step portion (71e) comprises a plurality of stepped portions (614e) sequentially provided in a radial direction around the bearing installation portion (614a).
12. The drum type washing machine of any one of the previous claims, wherein the fixing bracket (70) com-

prises temporary assembly protrusions (71d) which protrude from the motor fixing portion (71) toward the case (614), and the case (614) comprises temporary assembly holes (614f) into which the temporary assembly protrusions (71d) are inserted.

13. The drum type washing machine of any one of the previous claims, wherein the fixing bracket (70) and the case (614) comprise first fastening holes (71e) and second fastening holes (614g) which are provided at mutually corresponding positions, to which fastening members are fastened, respectively.

14. The drum type washing machine of claim 13 when being dependent on claim 12, wherein the temporary assembly protrusions (71d) and the first fastening holes (71e) are alternately provided in a circumferential direction, and the temporary assembly holes (614f) and the second fastening holes (614g) are alternately provided in the circumferential direction.

Patentansprüche

1. Trommelwaschmaschine, umfassend:

ein Reservoir (20), das Wasser enthält;
einen sich drehenden Behälter (30), der drehbar im Reservoir (20) installiert ist;
eine Antriebsvorrichtung (60), die eine Drehkraft zum Drehen des sich drehenden Behälters (30) erzeugt; und
zumindest eine Befestigungsklammer (70) zum Befestigen des Antriebsmotors am Reservoir (20),
wobei die Antriebsvorrichtung (60) den Antriebsmotor (61) umfasst, der die Drehkraft erzeugt,
wobei der Antriebsmotor (61) ein Gehäuse (614) zum Ausbilden einer Außenseite desselben umfasst,
wobei das Gehäuse (614) aus einem Metallwerkstoff ausgebildet ist und
wobei die Befestigungsklammer (70) aus einem Harzwerkstoff ausgebildet und am Gehäuse (614) befestigt ist,
wobei das Gehäuse (614) Folgendes umfasst:

ein erstes Gehäuse (614F), das eine Seite des Stators (611) stützt, und ein zweites Gehäuse (614S), das die andere Seite des Stators (611) stützt,
wobei die Befestigungsklammer (70) am ersten Gehäuse (614F) befestigt ist und
wobei das zweite Gehäuse (614S) einen Befestigungsabschnitt (614d) umfasst, der

sich einstückig vom zweiten Gehäuse (614S) erstreckt und der am Reservoir (20) befestigt ist.

2. Trommelwaschmaschine, umfassend:

ein Reservoir (20), das Wasser enthält;
einen sich drehenden Behälter (30), der drehbar im Reservoir (20) installiert ist;
eine Antriebsvorrichtung (60), die eine Drehkraft zum Drehen des sich drehenden Behälters (30) erzeugt; und
zumindest eine Befestigungsklammer (70) zum Befestigen des Antriebsmotors am Reservoir (20),
wobei die Antriebsvorrichtung (60) den Antriebsmotor (61) umfasst, der die Drehkraft erzeugt,
wobei der Antriebsmotor (61) ein Gehäuse (614) zum Ausbilden einer Außenseite desselben umfasst,
wobei das Gehäuse (614) aus einem Metallwerkstoff ausgebildet ist und
wobei die Befestigungsklammer (70) aus einem Harzwerkstoff ausgebildet und am Gehäuse (614) befestigt ist,
wobei das Gehäuse (614) ein erstes Gehäuse (614F'), das eine Seite des Stators (611) und des Rotors (612) stützt, und ein zweites Gehäuse (614S'), das die andere Seite des Stators (611) und des Rotors (612) stützt, umfasst und
wobei die Befestigungsklammer (70) eine im ersten Gehäuse (614F') installierte erste Befestigungsklammer (70A) und eine im zweiten Gehäuse (614S') installierte zweite Befestigungsklammer (70B) umfasst, so dass der Antriebsmotor (61) durch die erste Befestigungsklammer (70A) und die zweite Befestigungsklammer (70B) am Reservoir (20) befestigt ist.

3. Trommelwaschmaschine nach Anspruch 1 oder 2, wobei die Befestigungsklammer (70) Folgendes umfasst:

einen Motorbefestigungsabschnitt (71), der am Gehäuse (614) befestigt ist;
ein Paar Reservoirbefestigungsabschnitte (72), die am Reservoir (20) befestigt sind;
ein Paar erster Rahmenabschnitte (73), die jeweils den Motorbefestigungsabschnitt (71) mit dem Paar Reservoirbefestigungsabschnitte (72) verbinden; und
einen zweiten Rahmenabschnitt (74), der das Paar Reservoirbefestigungsabschnitte (72) miteinander verbindet.

4. Trommelwaschmaschine nach einem der vorangehenden Ansprüche, wobei die Befestigungsklammer

(70) mehrere Stützrippen (75, 76, 77) zum Verstärken ihrer Festigkeit umfasst.

5. Trommelwaschmaschine nach Anspruch 4, wobei die mehreren Stützrippen (75, 76, 77) mehrere erste Stützrippen (75), die Unterstützung in einem Raum zwischen dem Motorbefestigungsabschnitt (71) und dem Paar Reservoirbefestigungsabschnitte (72) bereitstellen, und mehrere zweite Stützrippen (76), die Unterstützung in einem Raum zwischen dem Motorbefestigungsabschnitt (71) und dem zweiten Rahmenabschnitt (74) bereitstellen, umfassen.
6. Trommelwaschmaschine nach Anspruch 5, wobei die mehreren Stützrippen (75, 76, 77) mehrere dritte Stützrippen (77) umfassen, die in einer X-Form ausgebildet sind und Unterstützung im Raum zwischen dem Motorbefestigungsabschnitt (71) und dem zweiten Rahmenabschnitt (74) bereitstellen.
7. Trommelwaschmaschine nach einem der vorangehenden Ansprüche, wobei der Antriebsmotor (61) Folgendes umfasst:
 - einen Stator (611);
 - einen Rotor (612), der mit dem Stator (611) zusammenwirkt und sich dreht;
 - eine Antriebswelle (613), die am Rotor (612) befestigt ist und sich zusammen mit dem Rotor (612) dreht; und
 - ein Paar Lager (615), welche die Antriebswelle (613) drehbar stützen.
8. Trommelwaschmaschine nach Anspruch 7, wobei das Gehäuse (614) Folgendes umfasst:
 - einen Lagerinstallationsabschnitt (614a), in dem das Paar Lager (615) installiert ist;
 - ein in einer Seite des Gehäuses (614) bereitgestelltes Welleninstallationsloch (614b), durch das ein Ende der Antriebswelle (613) verläuft und darüber hinausragt; und
 - eine Klammerinstallationsnut (614c) mit einer Ringform, die außerhalb des Lagerinstallationsabschnitts (614a) konkav bereitgestellt ist, und wobei die Befestigungsklammer (70) Folgendes umfasst:
 - ein Montageloch (71a), in das der Lagerinstallationsabschnitt (614a) montiert ist; und
 - eine verlängerte Rippe (71b), die sich von einem an das Montageloch (71a) angrenzenden Abschnitt ringförmig erstreckt und eine Fläche des Lagerinstallationsabschnitts (614a) darin stützt.
9. Trommelwaschmaschine nach Anspruch 8, ferner umfassend mehrere Verstärkungsrippen (71c), die

sich von der verlängerten Rippe (71b) in einer radialen Richtung nach außen erstrecken und in einer Umfangsrichtung voneinander beabstandet sind.

10. Trommelwaschmaschine nach Anspruch 8 oder 9, wobei zumindest ein Stufenabschnitt (71e), der in einer Ringform um den Lagerinstallationsabschnitt (614a) herum abgestuft ist, an einer Fläche des Gehäuses (614), an der die Befestigungsklammer (70) befestigt ist, bereitgestellt ist.
11. Trommelwaschmaschine nach Anspruch 10, wobei der zumindest eine Stufenabschnitt (71e) mehrere abgestufte Abschnitte (614e) umfasst, die nacheinander in einer radialen Richtung um den Lagerinstallationsabschnitt (614a) herum bereitgestellt sind.
12. Trommelwaschmaschine nach einem der vorangehenden Ansprüche, wobei die Befestigungsklammer (70) temporäre Montagevorsprünge (71d) umfasst, die vom Motorbefestigungsabschnitt (71) in Richtung des Gehäuses (614) hervorragen, und wobei das Gehäuse (614) temporäre Montagelöcher (614f) umfasst, in welche die temporären Montagevorsprünge (71d) eingesetzt sind.
13. Trommelwaschmaschine nach einem der vorangehenden Ansprüche, wobei die Befestigungsklammer (70) und das Gehäuse (614) erste Befestigungslöcher (71e) und zweite Befestigungslöcher (614g) umfassen, die an einander entsprechenden Positionen bereitgestellt sind, an denen jeweils Befestigungselemente befestigt sind.
14. Trommelwaschmaschine nach Anspruch 13, soweit von Anspruch 12 abhängig, wobei die temporären Montagevorsprünge (71d) und die ersten Befestigungslöcher (71e) abwechselnd in einer Umfangsrichtung bereitgestellt sind und wobei die temporären Montagelöcher (614f) und die zweiten Befestigungslöcher (614g) abwechselnd in der Umfangsrichtung bereitgestellt sind.

Revendications

1. Machine à laver à tambour comprenant :

- un réservoir (20) qui contient de l'eau ;
- une cuve rotative (30) installée de manière rotative dans le réservoir (20) ;
- un appareil d'entraînement (60) qui génère une force de rotation pour faire tourner la cuve rotative (30) ; et
- au moins un support de fixation (70) pour fixer le moteur d'entraînement au réservoir (20), dans laquelle l'appareil d'entraînement (60) comprend le moteur d'entraînement (61) qui gé-

nère la force de rotation,
le moteur d'entraînement (61) comprend un boîtier (614) pour former un extérieur de celui-ci, le boîtier (614) est formé d'un matériau métallique, et
le support de fixation (70) est formé d'un matériau de résine et fixé au boîtier (614),
dans laquelle le boîtier (614) comprend :

un premier boîtier (614F) qui supporte un côté du stator (611) et un second boîtier (614S) qui supporte l'autre côté du stator (611),
dans laquelle le support de fixation (70) est fixé au premier boîtier (614F), et
dans laquelle le second boîtier (614S) comprend une partie de fixation (614d) qui s'étend d'un seul tenant à partir du second boîtier (614S) et qui est fixée au réservoir (20).

2. Machine à laver à tambour comprenant :

un réservoir (20) qui contient de l'eau ;
une cuve rotative (30) installée de manière rotative dans le réservoir (20) ;
un appareil d'entraînement (60) qui génère une force de rotation pour faire tourner la cuve rotative (30) ; et
au moins un support de fixation (70) pour fixer le moteur d'entraînement au réservoir (20),
dans laquelle l'appareil d'entraînement (60) comprend le moteur d'entraînement (61) qui génère la force de rotation,
le moteur d'entraînement (61) comprend un boîtier (614) pour former un extérieur de celui-ci, le boîtier (614) est formé d'un matériau métallique, et
le support de fixation (70) est formé d'un matériau de résine et fixé au boîtier (614),
dans laquelle le boîtier (614) comprend un premier boîtier (614F') qui supporte un côté du stator (611) et du rotor (612) et un second boîtier (614S') qui supporte l'autre côté du stator (611) et du rotor (612), et
dans laquelle le support de fixation (70) comprend un premier support de fixation (70A) installé dans le premier boîtier (614F') et un second support de fixation (70B) installé dans le second boîtier (614S') de sorte que le moteur d'entraînement (61) est fixé au réservoir (20) par l'intermédiaire du support de fixation (70A) et du second support de fixation (70B).

3. Machine à laver à tambour selon les revendications 1 ou 2, le support de fixation (70) comprenant :

une partie de fixation de moteur (71) fixée au

boîtier (614) ;
une paire de parties de fixation de réservoir (72) fixées au réservoir (20) ;
une paire de premières parties de cadre (73) qui relient la partie de fixation de moteur (71) à la paire de parties de fixation de réservoir (72), respectivement ; et
une seconde partie de cadre (74) qui relie mutuellement la paire de parties de fixation de réservoir (72).

4. Machine à laver à tambour selon une quelconque des revendications précédentes, le support de fixation (70) comprenant une pluralité de nervures de support (75, 76, 77) pour renforcer sa solidité.

5. Machine à laver à tambour selon la revendication 4, la pluralité de nervures de support (75, 76, 77) comprenant une pluralité de premières nervures de support (75) qui fournissent un support dans un espace entre la partie de fixation de moteur (71) et la paire de parties de fixation de réservoir (72) et une pluralité de deuxièmees nervures de support (76) qui fournissent un support dans un espace entre la partie de fixation de moteur (71) et la seconde partie de cadre (74).

6. Machine à laver à tambour selon la revendication 5, la pluralité de nervures de support (75, 76, 77) comprenant une pluralité de troisièmees nervures de support (77) qui sont formées selon une forme en X et fournissent un support dans l'espace entre la partie de fixation de moteur (71) et la seconde partie de cadre (74).

7. Machine à laver à tambour selon une quelconque des revendications précédentes, le moteur d'entraînement (61) comprenant :

un stator (611) ;
un rotor (612) qui interagit avec le stator (611) et tourne ;
un arbre d'entraînement (613) qui est fixé au rotor (612) et tourne conjointement avec le rotor (612) ; et
une paire de paliers (615) qui supportent en rotation l'arbre d'entraînement (613).

8. Machine à laver à tambour selon la revendication 7, le boîtier (614) comprenant :

une partie d'installation de palier (614a) dans laquelle la paire de paliers (615) est installée ;
un orifice d'installation d'arbre (614b) qui est fourni dans un côté du boîtier (614), à travers lequel une extrémité de l'arbre d'entraînement (613) passe et fait saillie à partir de celui-ci ; et
une rainure d'installation de support (614c) qui

présente une forme annulaire fournie de manière concave à l'extérieur de la partie d'installation de palier (614a), et le support de fixation (70) comprenant :

un orifice de montage (71a) dans lequel la partie d'installation de palier (614a) est montée ; et
une nervure étendue (71b) qui s'étend depuis une partie adjacente à l'orifice de montage (71a) dans une forme annulaire et supporte une surface de la partie d'installation de palier (614a) à l'intérieur.

et les orifices d'assemblage temporaire (614f) et les seconds orifices d'attache (614g) sont fournis de manière alternée dans la direction circonférentielle.

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9. Machine à laver à tambour selon la revendication 8, comprenant en outre une pluralité de nervures de renforcement (71c) qui s'étendent vers l'extérieur depuis la nervure étendue (71b) dans une direction radiale et sont espacées dans une direction circonférentielle.
10. Machine à laver à tambour selon la revendication 8 ou 9, au moins une partie de segment (71e) segmentée dans une forme annulaire autour de la partie d'installation de palier (614a) étant fournie au niveau d'une surface du boîtier (614) à laquelle le support de fixation (70) est fixé.
11. Machine à laver à tambour selon la revendication 10, l'au moins une partie de segment (71e) comprenant une pluralité de parties segmentées (614e) fournies de manière séquentielle dans une direction radiale autour de la partie d'installation de palier (614a).
12. Machine à laver à tambour selon une quelconque des revendications précédentes, le support de fixation (70) comprenant des saillies d'assemblage temporaire (71d) qui font saillie depuis la partie de fixation de moteur (71) vers le boîtier (614), et le boîtier (614) comprenant des orifices d'assemblage temporaire (614f) dans lesquels les saillies d'assemblage temporaires (71d) sont insérées.
13. Machine à laver à tambour selon une quelconque des revendications précédentes, le support de fixation (70) et le boîtier (614) comprenant des premiers orifices d'attache (71e) et des seconds orifices d'attache (614g) qui sont fournis au niveau de saillies mutuellement correspondantes auxquelles les éléments d'attache sont attachés, respectivement.
14. Machine à laver à tambour selon la revendication 13, tout en étant dépendante de la revendication 12, dans laquelle les saillies d'assemblage temporaire (71d) et les premiers orifices d'attache (71e) sont fournis de manière alternée dans une direction circonférentielle,

FIG. 1

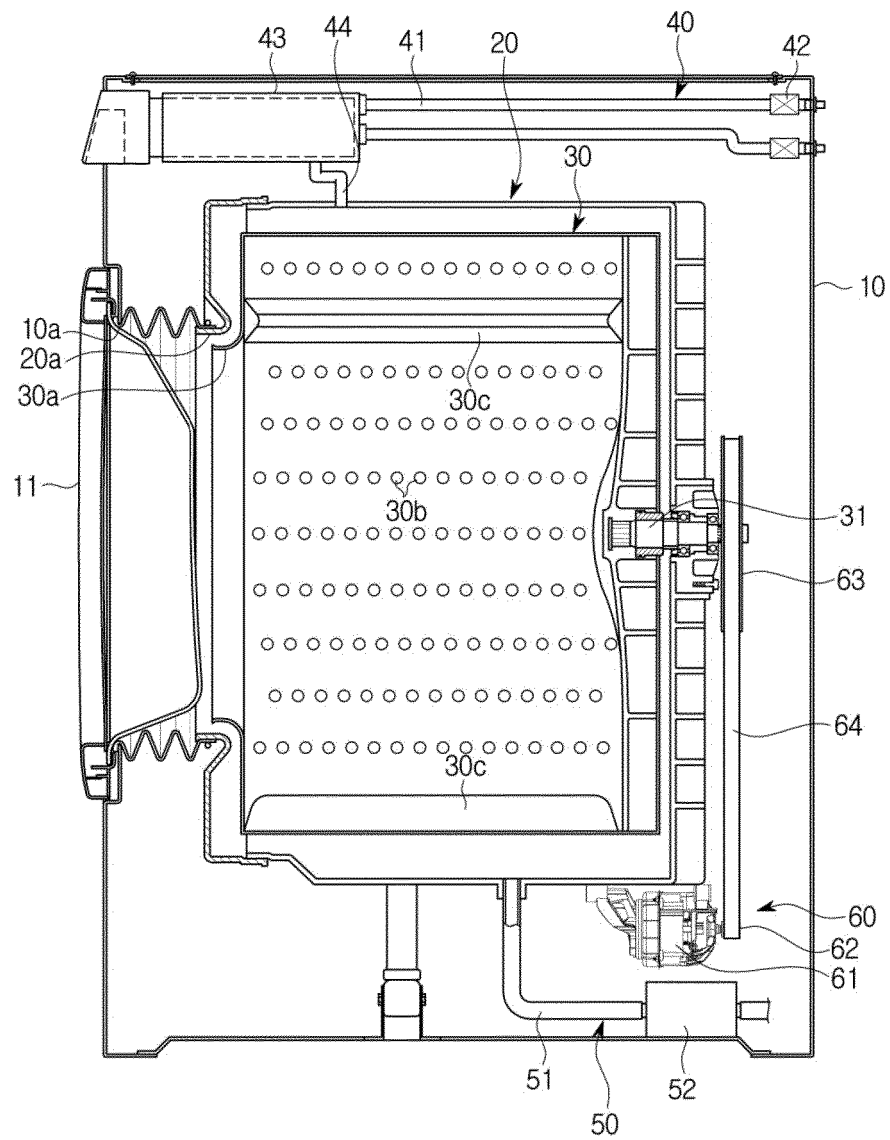


FIG. 2

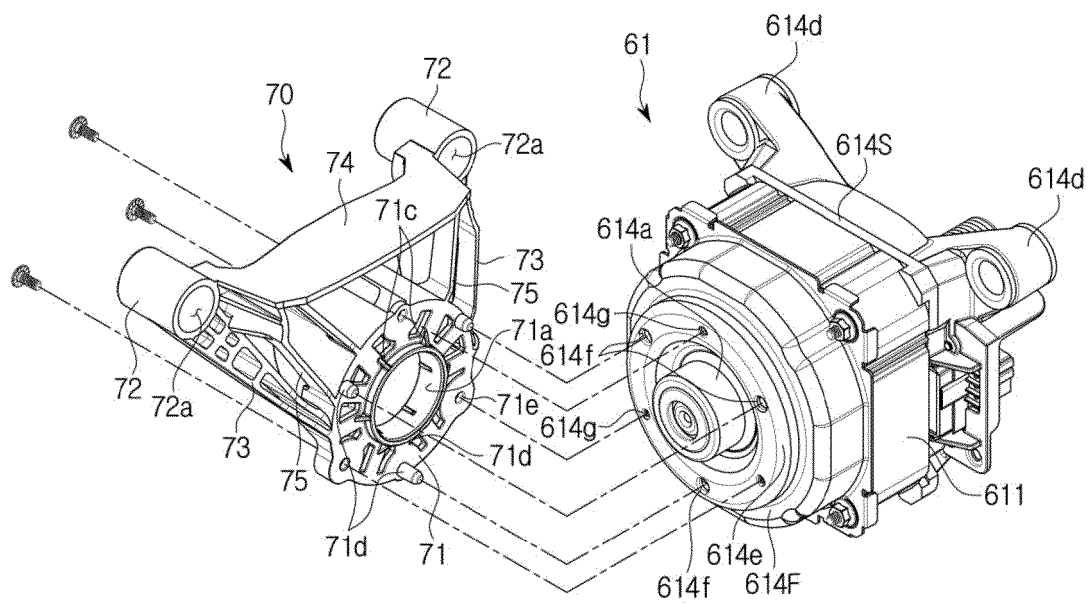


FIG. 3

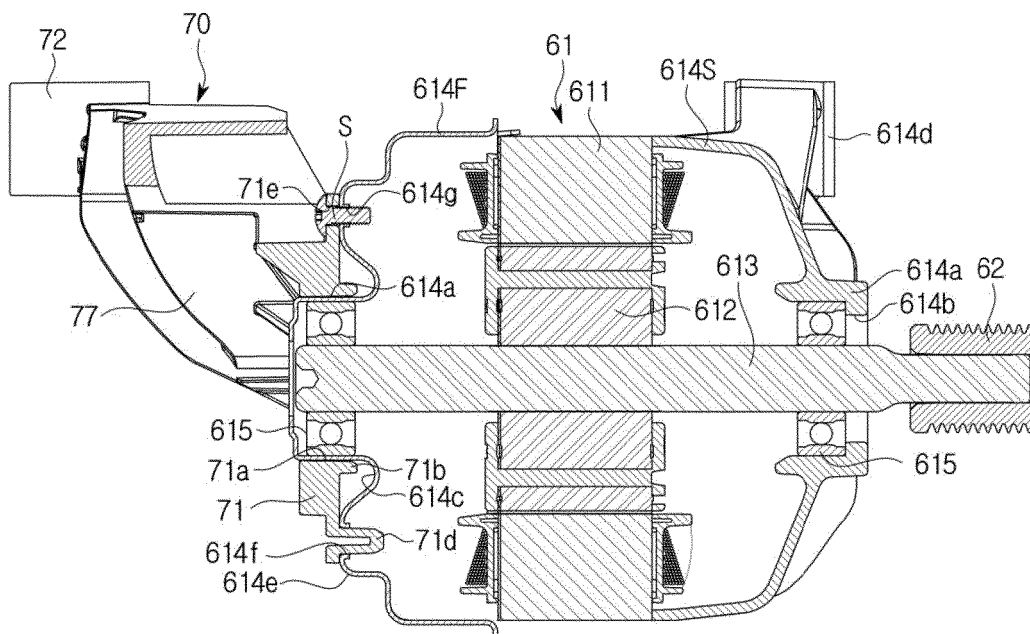


FIG. 4

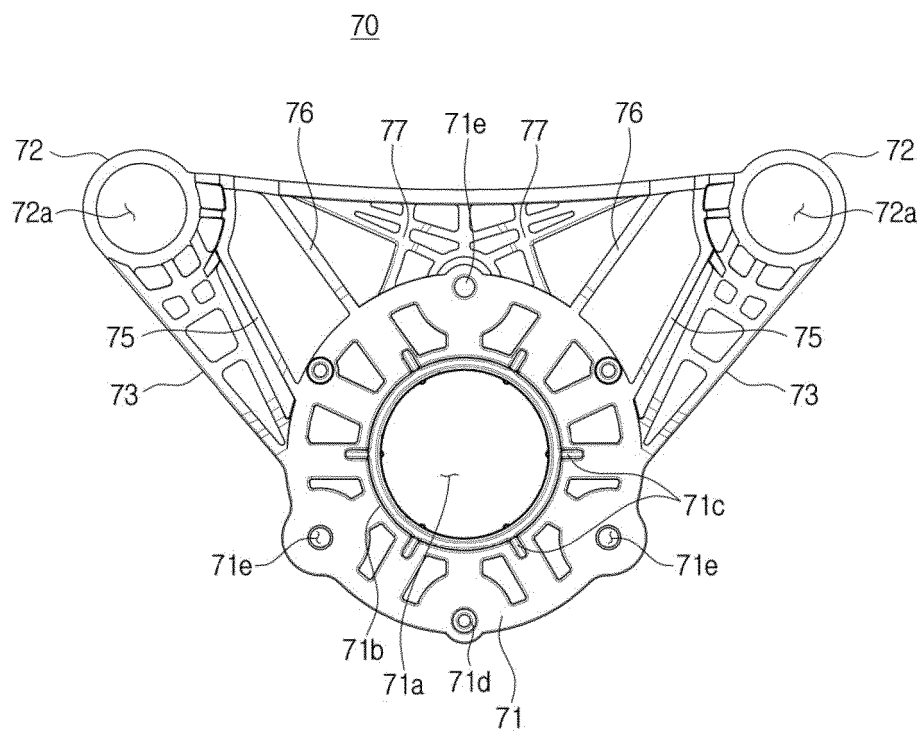


FIG. 5

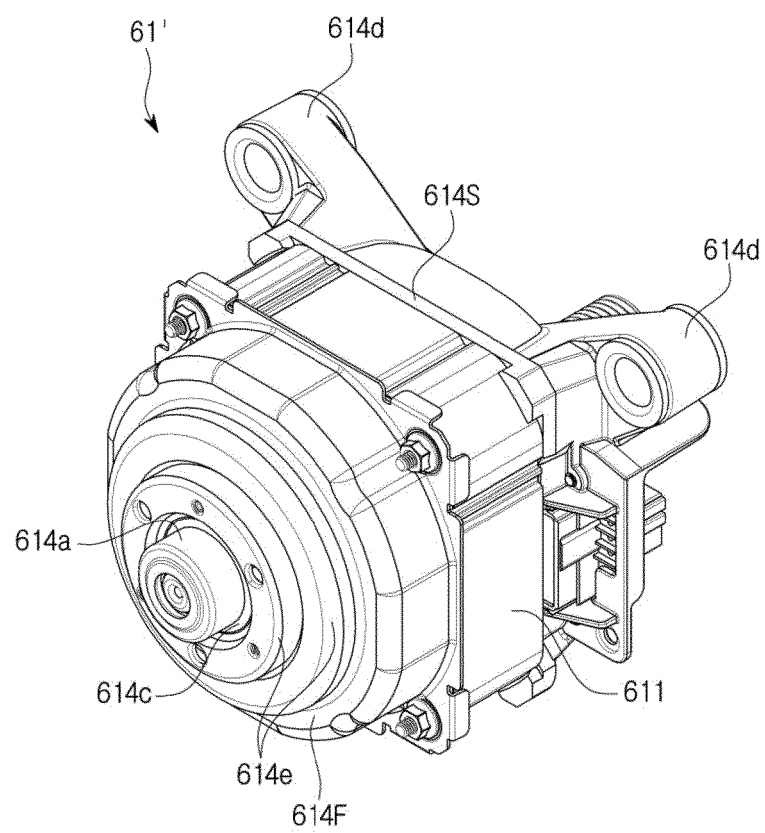
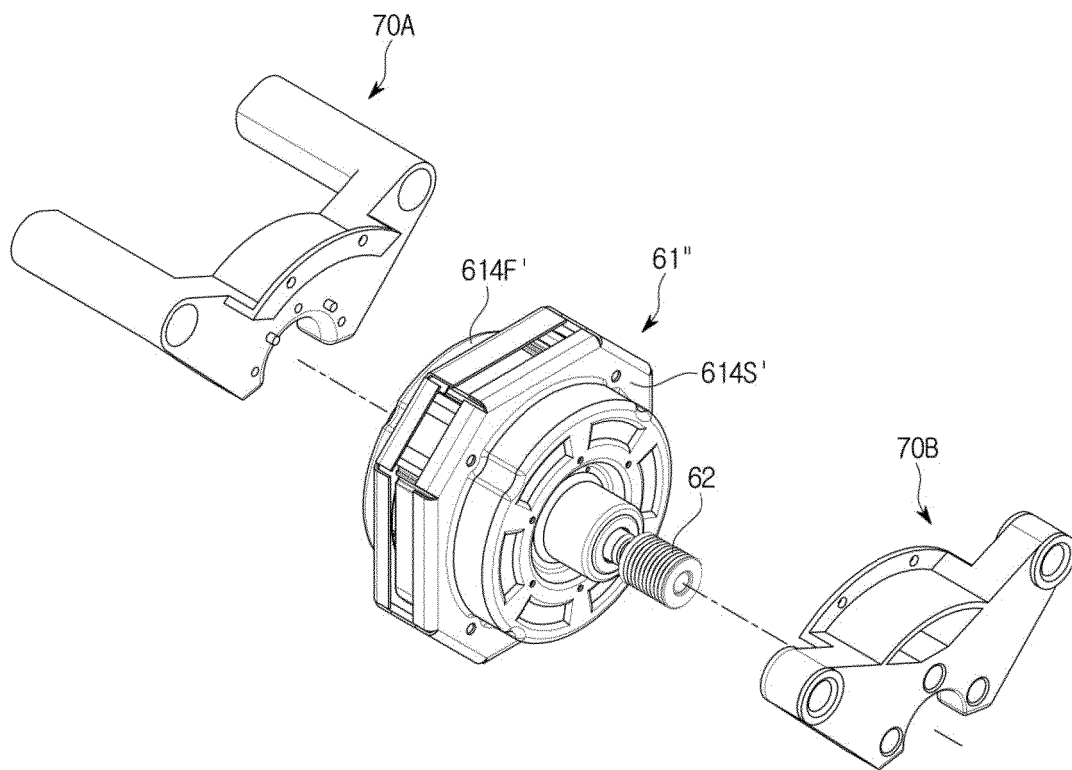


FIG. 6



REFERENCES CITED IN THE DESCRIPTION

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