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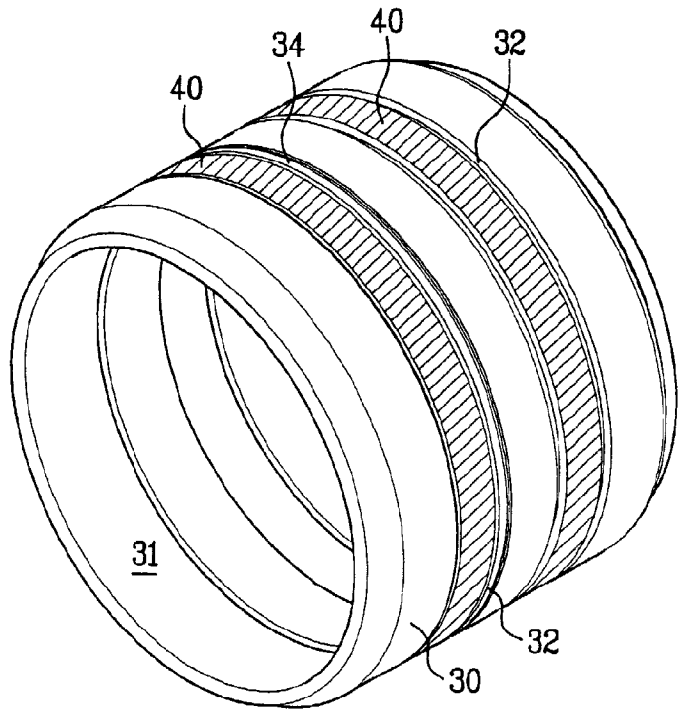

(57) Abstract: Drum device for a home appliance having a chamber (31) for drying or washing laundry, including a sound attenuation member (40) fitted to an outside surface thereof, thereby effectively attenuating noise caused by impact of articles, such as buttons, zippers, clips, and the like fitted to the laundry, to the metallic drum when the laundry introduced into the chamber is lifted and dropped as the drum rotates.

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DRUM DEVICE FOR HOME APPLIANCE

Technical Field

The present invention relates to a home appliance, and more particularly, to a drum device for minimizing noise from a drum in which washing or drying is in progress in a washing machine or a drying machine.

Background Art

In general, the dryer is an apparatus for drying objects, such as laundry, introduced into the drum by blowing air heated by an electric heater or a gas burner.

The specification takes a drum device used in the dryer as an example for convenience of description. However, the present invention is applicable to any apparatus which uses a drum, such as a washing machine.

FIG. 1 illustrates a disassembled perspective view of key parts of a related art dryer. As shown, a drum 1 is installed in a cabinet (not shown) that forms an outside shape of the dryer.

The drum 1 is cylindrical, with opposite opened ends, and has a belt groove 2 along an outside circumference of a middle of the drum 1 for winding a drum belt 4 driven by a motor 3. The drum 1 has a drying chamber 5 therein for carrying out drying. The drum 1 has a plurality of baffles 6 for turning drying objects in the drying chamber 5. Since the drum 1 has high temperature air circulating inside of the drum 1, the drum 1 is in general formed of a metal, for an example, stainless steel. Reference numeral 3' denotes a pulley for transmission of power from the motor 3 to the drum belt 4.

The drum 1 is provided with a front head 7 and a rear head 9 fitted to a front end and a rear end thereof, oppositely. The front heat 7 and the rear head 9 close

opened parts of the drum 1, to form the drying chamber 5, and support the front end and the rear end of the drum 1. There are sealing members 10 fitted between the front head 7 and the drum 1, and the rear head 9 and the drum 1, both make relative motion, for prevention of leakage. Of course, there are a plurality of rollers (not shown) provided at required positions of the front end and the rear end of the drum 1, for supporting the drum 1.

The front head 7 has an opening 8 for making inside and outside of the drying chamber 5 in communication. The opening 8 is selectively opened by a door (not shown).

The rear head 9 is fitted with an air supply duct 12, in communication with the inside of the drying chamber 5 for serving as a passage for supplying air, more precisely, a heated air to the inside of the drying chamber 5.

There is a lint duct 15, an air escape from the drying chamber 5, at one side of the front head 7 at a bottom of the opening 8 of the front head 7, having a lint filter therein for filtering foreign matters (for example, lint and dust) contained in the air escaping from the drying chamber 5.

There is a blower 17 connected to the lint duct 15, for drawing air inside of the drying chamber 5 through the lint duct 15.

The blower 17 is fitted to an inside of a blower housing 18 having one side in communication with the lint duct 15 and the other side connected to an air discharge pipe 19. Therefore, the air, escaped from the drying chamber 5 and passed through the lint duct 15, is discharge to an outside through the air discharge pipe 19 by the blower 17.

In the meantime, there is a hot air duct 20 connected to the air supply duct 12.

The hot air duct 20 supplies hot air which makes drying action in the drying chamber 5. To do this, the hot air duct 20 is provided with a system for generating a thermal energy for heating the air.

That is, the hot air duct 20 has a mixing tube 24, for mixing a gas sprayed from a gas nozzle 22 with a primary air. The gas nozzle 22 is fitted to one side of a valve 30 for controlling gas supply. The reference numeral 23 denotes a gas supply tube 23 connected to the valve 30. The gas nozzle 22 at one side of the valve 30 is fitted to an inlet to the mixing tube 24 opposite thereto.

Accordingly, the gas sprayed from the gas nozzle 22 and external air introduced through the inlet of the mixing tube 24, i.e., the primary air, are mixed inside of the mixing tube 24.

In the meantime, there is an ignition plug 26 at an outlet side of the mixing tube 24.

The operation of the foregoing related art dryer will be explained.

Upon pressing a starting button after laundry, drying objects, is introduced into the drying chamber 5 in the drum 1, and a door thereon is closed, the drum 1 starts to rotate as the drum belt 4 wound around the belt groove 2 is driven by the motor 3. As the blower 17 starts, the air inside of the drying chamber 5 is drawn through the lint duct 15. Then, external air is introduced into the inside of the drying chamber 5 through the air supply duct 12.

The air to the air supply duct 12 is heated to a relatively high temperature by heat supplied from the gas burned as the gas passes through the hot air duct 20. The hot air is introduced to the inside of the drying chamber 5 in the drum 1 through the air supply duct 12. After absorbing moist contained in the laundry in the drying

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chamber 5, the hot air escapes the drying chamber 5 owing to a suction power of the blower 17.

The air is involved in filtering dust and lint as the hot air passes through the lint filter fitted to an inside of the lint duct 15.

However, the foregoing related art has the following problems.

The laundry inside of the drum 1 of a metal, such as stainless steel, repeats a process of being lifted and dropped by the baffles 6 as the laundry rotates along with the drum 1. In this instance, fittings to the laundry, such as buttons, zippers, clips, collide with a surface of the metallic drum when the laundry drops inside of the drum 1, to generate noise.

Moreover metallic foreign matters, such as coin, also drop and collide with the drum surface to generate noise when the drum rotates, which is amplified as the drum acts as a kind of a resonator.

Disclosure of Invention

It would be desirable for the present invention, designed for solving the foregoing various problems, to provide effective insulation of vibratory noise occurring due to fittings to laundry, or metallic foreign matters, colliding with an inside surface of the drum in a home appliance during drum rotation.

In one aspect of the present invention, there is provided a drum device for a home appliance including a drum having a chamber therein rotatably fitting for carrying out a work, wherein an outside surface of the drum has a recess and vibration reductive sound insulating member disposed in and fitted to the recess of the drum for insulating vibratory sound caused by collision of objects within the chamber with the drum as the drum is rotated.

The vibration reductive sound insulating member may be fitted around an outside circumferential surface of the drum. The outside circumferential surface of the drum has recesses for fitting the vibration reductive sound insulating members therein.

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A plurality of the vibration reductive sound insulating members may be fitted to the outside surface of the drum in a length direction of the drum. The outside circumferential surface of the drum can have a plurality of recesses for fitting the vibration reductive sound insulating members therein in a length direction of the drum.

The vibration reductive sound insulating member is formed of an elastic material, preferably butyl rubber.

The vibration reductive sound insulating member is attached to the outside surface of the drum, and the vibration reductive sound insulating member preferably has a form of sheet.

The vibration reductive sound insulating member may be a butyl rubber layer added with a sound absorbing material layer, such as a polyester layer.

Thus, the drum device in a home appliance of the present invention can insulate the vibratory sound caused by collision of fittings to laundry and the drum when the drum is rotated, thereby securing silence of the home appliance, to enhance a product reliability.

Brief Description of Drawings

FIG. 1 illustrates a disassembled perspective view of key parts of a related art dryer;

FIG. 2 illustrates a perspective view of a drum device in a home appliance in accordance with a preferred embodiment of the present invention; and

FIG. 3 illustrates a perspective view of a system in accordance with another preferred embodiment of the present invention.

Best Mode for Carrying Out the Invention

Preferred embodiments of a drum device in a home appliance of the present invention having the foregoing system will be explained, with reference to the attached drawings. Components identical to the related art will be given the same reference symbols with the related art drawings.

Referring to FIG. 2, the drum 30 is cylindrical, to form a chamber 31 therein. If the drum 30 of the present invention is employed in a dryer or a drum type washing machine, the chamber 31 has laundry introduced thereto, for drying or washing the laundry.

There are grooves along an outside circumference of the drum 30. There is a drum belt 34 wound at one side of the groove 32 for driving the drum 30.

Though the groove 32 around the outside surface of the drum has an annular form along a circumference, the groove may be helical along the outside circumferential surface of the drum.

There is a vibration reductive sound insulating member in the groove 32 for insulating vibratory sound caused by collision occurred inside of the metallic drum 30. The vibration reductive sound insulating member serves to insulate vibratory sound occurred when a hard object collide with the metallic drum 30, effectively.

The vibration reductive sound insulating member is preferably formed of an elastic material, for example, rubber, or leather, and most preferably, butyl rubber, which has a good processibility, is easy to composite with other material, has an excellent heat resistance, an excellent fire retardancy, and strong vibration reductive capability. The butyl rubber is attached around the outside circumferential surface of the drum 30 along the groove 32, to do which an adhesive is coated on one side of the

butyl rubber 40.

The vibration reductive sound insulating member may be a composite layer of a butyl rubber layer and a sound absorbing material layer, such as a polyester sheet.

It is preferable that the butyl rubber 40 is attached to a location where the fittings to the laundry collide the most frequently. Though the location may be found by experiment, in general the location is in the vicinity of a middle part of the drum 10.

The butyl rubber 40 has a thickness suitable to the groove 32 such that the butyl rubber 40 is not projected beyond the outside surface of the drum 30, for not affecting rotation of the drum 30.

The embodiment in FIG. 2 illustrates two wound lines of butyl rubber 40. However, a number of the wound lines of the butyl rubber 40 may differ depending on design conditions.

Next, another embodiment of the present invention is illustrated FIG. 3. Referring to the drawing, there is a chamber 131 in a cylindrical drum 130. The chamber 131 has laundry introduced thereto for, as an example, washing or drying.

The drum 130 has a drum belt 134 wound around an outside surface of the drum 130 for transmission of power for rotating the drum 130. The drum belt 134 is wound in a belt groove 132 formed along an outside circumferential surface of the drum 130.

In the meantime, there are a plurality of butyl rubbers 140, vibration reductive sound insulating members, attached to the outside surface of the drum 130. The embodiment has a plurality of butyl rubbers 140 attached on both sides of the belt groove 132 in parallel in a length direction of the drum 130. Recesses 232 may be formed in the outside surface of the drum 130 for attachment of the butyl rubbers 140.

The operation of the foregoing drum device in a home appliance of the present invention will be explained, in detail.

The present invention has butyl rubber 40, a vibration reductive sound insulating member, attached to the outside surface of the drum 30, for insulating vibratory sound occurred during rotation of the drum 30.

That is, when the drum 30 is rotated in a state the laundry is introduced into the chamber 31 of a dryer, or a washing machine, the laundry repeats a process of being dropped after lifted to an upper part of the chamber 31.

In the process, fittings, such as buttons, zippers, and clips of hard materials, such as metal or plastic collide with the inside surface of the drum 30. Because the drum 30 is formed of a metal, such as stainless steel, and has a vacant inside, vibratory sound is generated when the fittings collide with the drum 30. However, such vibratory sound can be insulated effectively by the vibration reductive sound insulating member attached to the outside of the drum 30.

Moreover, the butyl rubber 40 is particularly favorable for the dryer, and the like that has a danger of fire, as the butyl rubber 40 is fire retardant.

It will be apparent to those skilled in the art that various modifications and variations can be made in the drum device in a home appliance of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

Industrial Applicability

As has been explained in detail, the drum device in a home appliance of the

present invention has vibration reductive sound insulating member fitted to an outside surface of a drum for insulating vibratory sound caused by collision of fittings, such as buttons, and the like, with an inside surface of the drum as the laundry is dropped when the drum is rotated, thereby improving silence of a drum type washing machine, or a home appliance, to enhance a product reliability of consumer by one stage higher.

Accordingly, the present invention is very useful for industries.

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The claims defining the invention are as follows:

1. A drum device for a home appliance comprising:

a drum having a chamber therein rotatably fitted for carrying out a work wherein an outside surface of the drum has a recess; and

vibration reductive sound insulating member disposed in and fitted to the recess of the drum for insulating vibratory sound caused by collision of objects within the chamber with the drum as the drum is rotated.

2. A drum device as claimed in claim 1, wherein the vibration reductive sound insulating member is fitted to the recess around an outside circumferential surface of the drum.

3. A drum device as claimed in claim 1, wherein the outside circumferential surface of the drum has a plurality of recesses for fitting the vibration reductive sound insulating members.

4. A drum device as claimed in claim 3, wherein the plurality of recesses for fitting the vibration reductive sound insulating members are aligned in a length direction of the drum.

5. A drum device as claimed in one of claims 1 to 4, wherein the vibration reductive sound insulating member is formed of an elastic material.

6. A drum device as claimed in claim 2 or 4, wherein the vibration reductive sound insulating member is attached to a recess.

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7. A drum device as claimed in any one of the preceding claims, wherein a vibration reductive sound insulating member has a form of a sheet.

8. A drum device as claimed in any one of the preceding claims, wherein a vibration reductive sound insulating member is formed of butyl rubber.

9. A drum device as claimed in claim 1, wherein the vibration reductive sound insulating member includes a composite layer of a butyl rubber layer and a polyester layer.

10. A drum device for a home appliance substantially as hereinbefore described with reference to the accompanying drawings.

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FIG.1

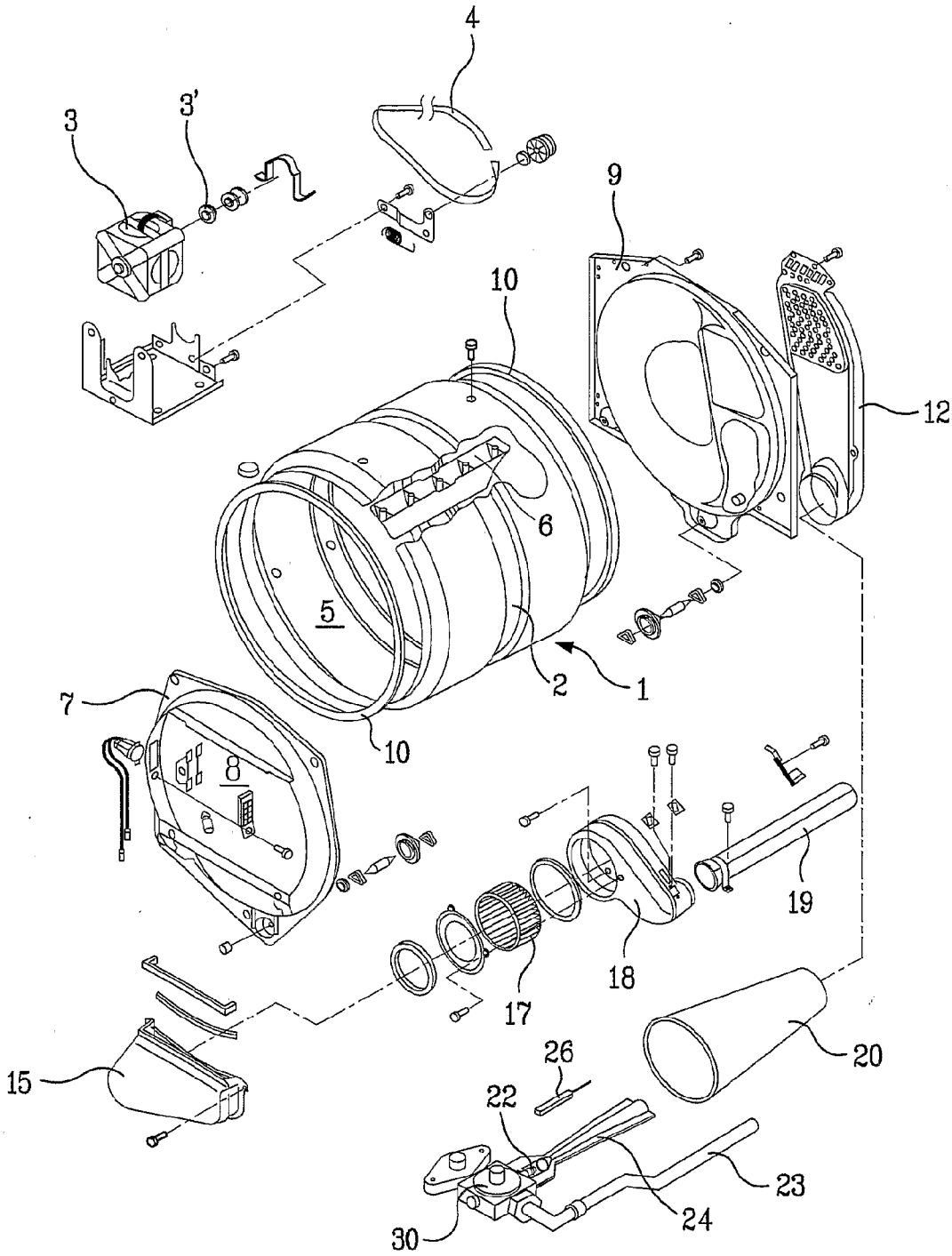

FIG.2

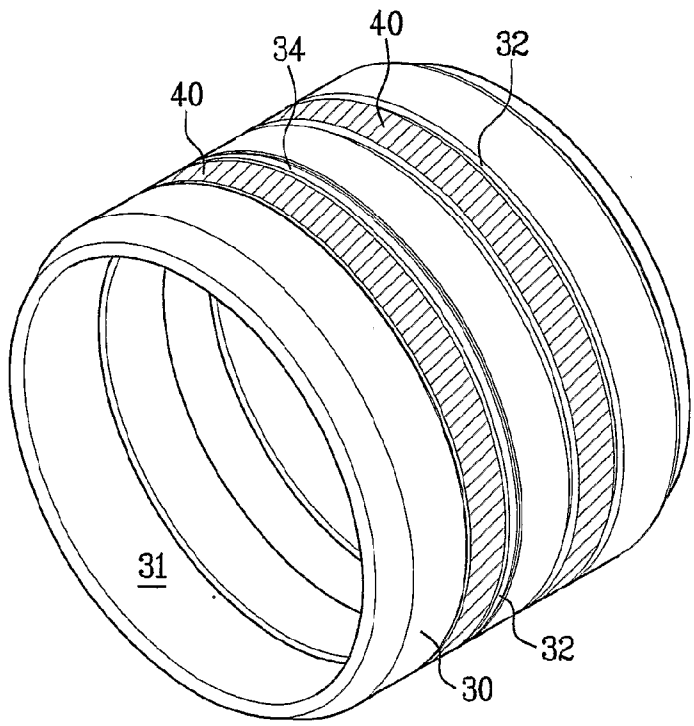

FIG.3