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(54) **A LAUNDRY WASHING AND/OR DRYING MACHINE WITH REDUCED NOISE LEVEL**

WASCHMASCHINE UND/ODER TROCKNER MIT VERRINGERTEM GERÄUSCHPEGEL

MACHINE DE TYPE LAVE-LINGE ET/OU SÈCHE-LINGE À NIVEAU DE BRUIT RÉDUIT

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Description

[0001] The present invention relates to a laundry washing and/or drying machine that is enabled to be work in a more silent manner.

The laundry washing and/or drying machines comprise a window that is produced from a transparent material, preferably from glass and that enables the laundry that is being washed or dried to be viewed from the outside when the lid is closed. The laundry to be washed and/or dried contacting the window produced from glass with the movement of the drum causes noise. The surface of the glass being uneven increases the values of surface skewness (ssk) and surface kurtosis (sku), thus as the laundry contacts the uneven surface, the noise level varying uncontrollably increases.

[0002] European Patent Application EP 2 287 387 A2 discloses a dryer with a door having a concave portion or an inclined portion formed at an end surface of a door glass.

[0003] International Patent Application WO 2014/122022 A1 discloses a treatment plate for a garment treatment appliance, which plate has a contact surface which is provided with a sol-gel coating.

[0004] In the state of the art Chinese Patent Application No. CN201212333, the noise generated during the operation of the washing machine is prevented from dissipating to the outside environment by means of the double-layer glass window.

The aim of the present invention is the realization of a laundry washing and/or drying machine that is operated in a more silent manner.

The laundry washing and/or drying machine realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof comprises a lid that enables the user to load and unload the laundry on a panel, an inner frame that is disposed on the lid, an outer frame that is mounted to the inner frame and a glass window that is disposed between the inner frame and the outer frame and that enables the laundry to be viewed when the lid is closed. The glass window is coated with an organic-inorganic hybrid sol-gel material. The organic-inorganic hybrid sol-gel coating modifies the surface morphology of the glass window without decreasing its light transmittance, thereby decreasing the noise level generated by the laundry impacting the glass window during the washing or drying process.

[0005] According to the present invention, the glass window surface in contact with the laundry is coated with an organic-inorganic hybrid sol-gel material. Thus, the laundry is prevented from generating noise by impacting the glass window during the washing or drying process.

[0006] The laundry washing and/or drying machine realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the perspective view of a laundry washing and/or drying machine.

Figure 2 - is the sideways view of a lid.

[0007] The elements illustrated in the figures are numbered as follows:

1. Laundry washing and/or drying machine
2. Inner frame
3. Outer frame
4. Glass window
5. Lid

[0008] The laundry washing and/or drying machine (1) comprises a lid (5), an inner frame (2) that is disposed on the lid (5), an outer frame (3) that is joined with the inner frame (2) and a glass window (4) that is disposed between the inner frame (2) and the outer frame (3). By means of the glass window (4), that is resistant to impacts and that has improved esthetic appearance, the user can monitor the process steps of the laundry washing and/or drying machine (1) from the outside.

[0009] In the laundry washing and/or drying machine (1) of the present invention, the glass window (4) is coated with an organic-inorganic hybrid sol-gel material. The organic-inorganic hybrid sol-gel coating fills the micron-scale recesses on the glass surface without changing the light transmittance of the glass, thus improving the surface morphology of the glass. The organic-inorganic hybrid sol-gel coating creates a more homogeneous and smooth structure on the glass window (4) and enables the level of the friction-induced noise to be reduced.

[0010] In an embodiment of the present invention, the glass window (4) surface facing the interior of the drum is coated with an organic-inorganic hybrid sol-gel material. The organic-inorganic hybrid sol-gel coating is coated only over the side of the glass window (4) in contact with the laundry, thereby decreasing the noise level generated by the laundry impacting the glass window (4) during the washing or drying process.

[0011] In an embodiment of the present invention, the glass window (4) is coated with an organosilane-based hybrid material.

[0012] In an embodiment of the present invention, the glass window (4) is configured asymmetrically so as to enable the water to reach the laundry more efficiently upon hitting the glass window (4). The asymmetric glass window (4) increasing the washing and/or drying performance causes the generation of noises in different decibels due to the varying contact angle of its surface with the laundry. By means of the organic-inorganic hybrid sol-gel coating, the values of surface skewness (ssk) and surface kurtosis (sku) of the glass window (4) are reduced, thus decreasing the noise level varying uncontrollably.

[0013] By coating the glass window (4) with organic-inorganic hybrid sol-gel material, a smoother form is obtained on the glass window (4) surface and the friction between the glass window (4) and the laundry is decreased. By means of the present invention, the surface

morphology of the glass window (4) is improved, thus enabling the laundry washing and/or drying machine (1) to be operated in a more silent manner.

Claims

1. A laundry washing and/or drying machine (1) comprising a lid (5), an inner frame (2) that is disposed on the lid (5), an outer frame (3) that is joined with the inner frame (2) and a glass window (4) that is disposed between the inner frame (2) and the outer frame (3),
characterized by the glass window (4), of which the surface facing the interior of the drum is coated with organic-inorganic hybrid sol-gel material.

2. A laundry washing and/or drying machine (1) as in Claim 1, **characterized by** the glass window (4) that is coated with organosilane-based hybrid material.

3. A laundry washing and/or drying machine (1) as in Claim 1 or 2, **characterized by** the asymmetric glass window (4).

Patentansprüche

1. Eine Waschmaschine und/oder Wäschetrockner (1) umfasst einen Deckel (5), einen innenrahmen (2), der innerhalb des Deckels (5) angeordnet ist, einen Außenrahmen (3), der an den innenrahmen (2) mit einem Glasfenster (4) angeordnet ist und zwischen dem innenrahmen (2) und Außenrahmen (3) befestigt ist, diese sind **gekennzeichnet durch** das Glasfenster (4), dessen Oberfläche an die Innenfläche der Trommel mit einem organisch-anorganisch beschichtetem Hybrid-Sol-Gel-Material zugewandt ist.

2. Eine Waschmaschine und/oder Wäschetrockner (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** das Glasfenster (4) mit einem Hybridmaterial auf Organosilan-Basis beschichtet ist.

3. Eine Waschmaschine und/oder Wäschetrockner (1), wie in Anspruch 1 oder 2 aufgeführt, **ist dadurch gekennzeichnet, dass** das Glasfenster (4) asymmetrisch ist.

Revendications

1. Un lave-linge et/ou sèche-linge (1) comprenant un couvercle (5), un cadre intérieur (2) qui est disposé sur le couvercle (5), un cadre extérieur (3) qui est relié au cadre intérieur (2) et un hublot (4) en verre qui est disposé entre le cadre intérieur (2) et le cadre extérieur (3),
est caractérisé par le hublot en verre (4), dont la surface tournée vers l'intérieur du tambour est revêtue d'un matériau sol-gel hybride organique et inorganique.

2. Un lave-linge et/ou sèche-linge (1) selon la déclaration 1, **est caractérisé par** le hublot en verre (4) qui est revêtu d'un matériau hybride à base d'organosilane.

3. Un lave-linge et/ou sèche-linge (1) selon la déclaration 1 ou 2, **est caractérisé par** le hublot asymétrique en verre (4).

Figure 1

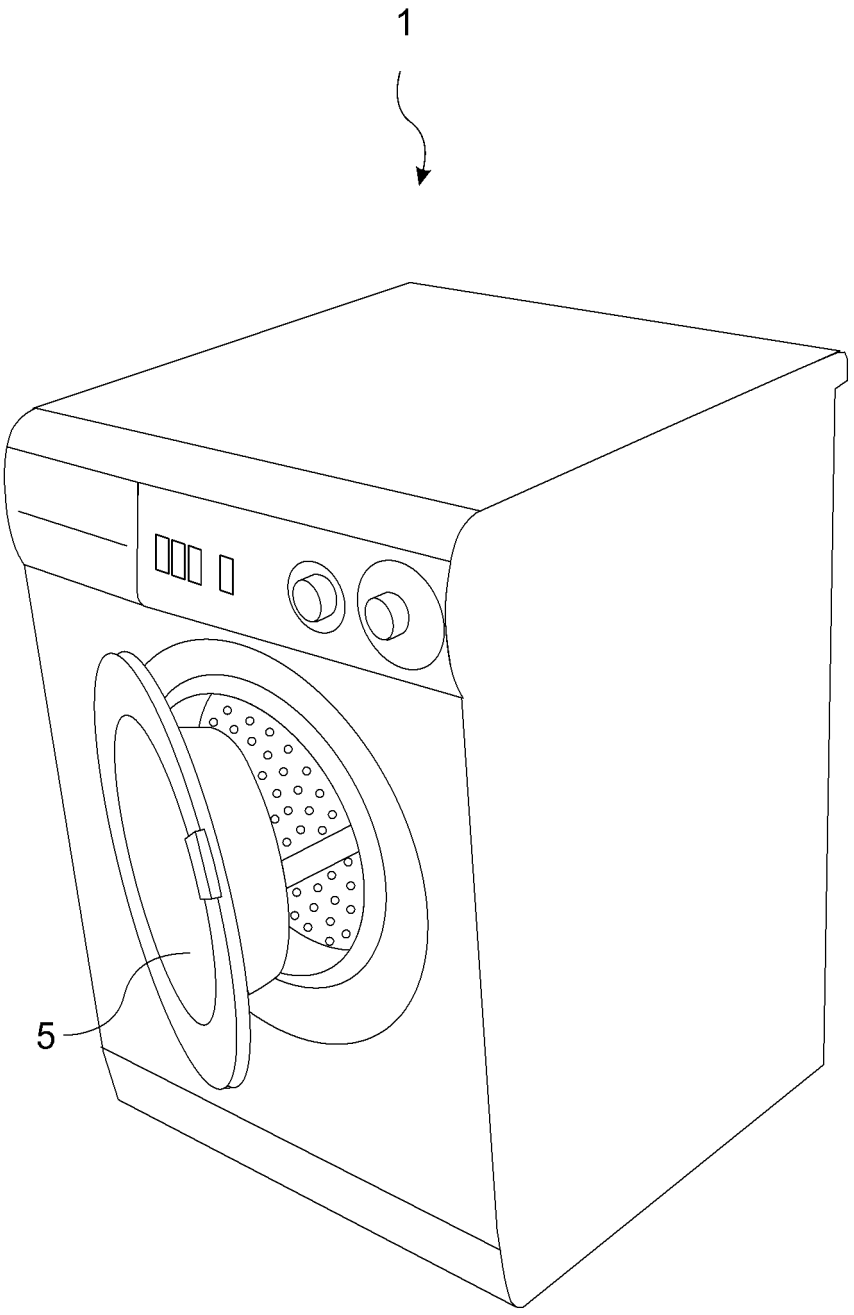
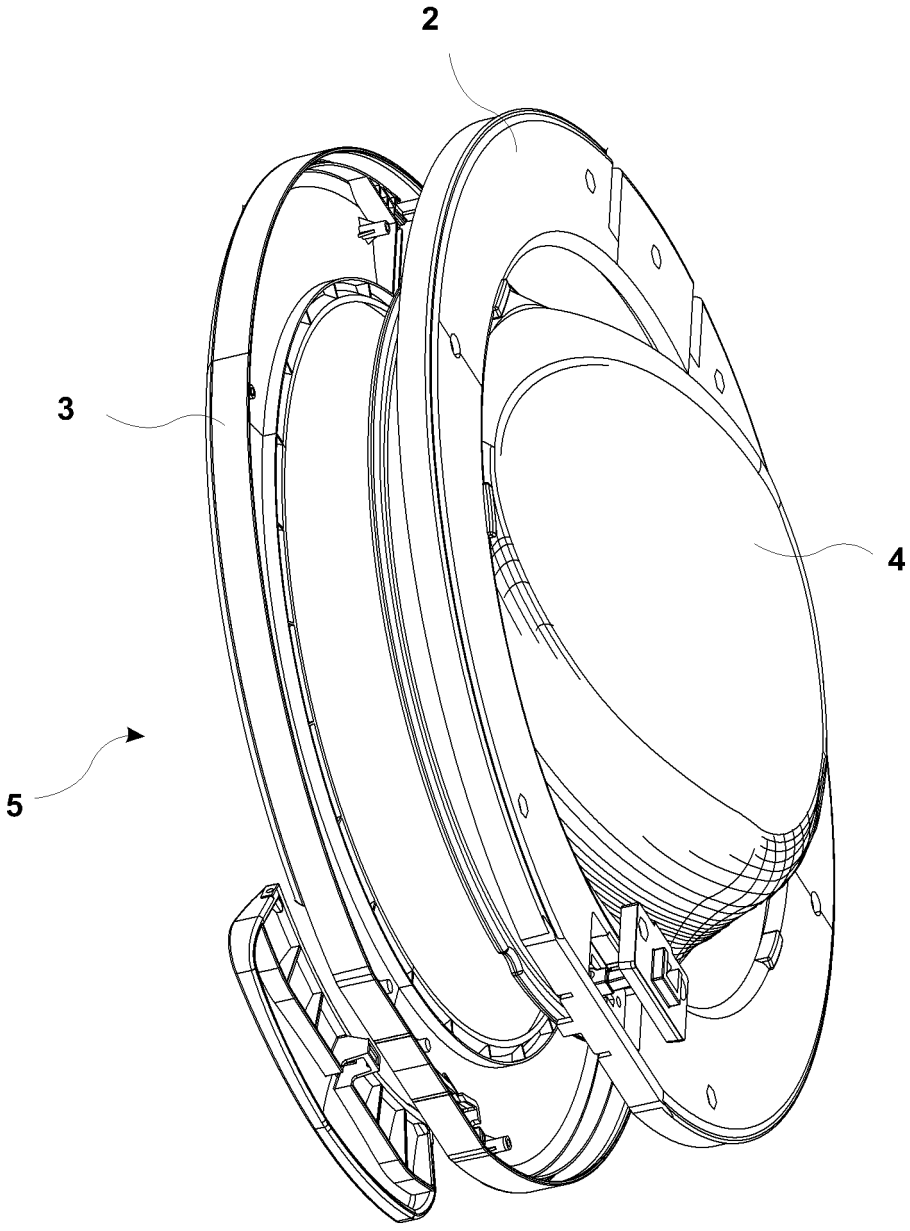


Figure 2



REFERENCES CITED IN THE DESCRIPTION

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- EP 2287387 A2 **[0002]**
- WO 2014122022 A1 **[0003]**
- CN 201212333 **[0004]**