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(54) **A WASHER/DRYER**

WASCHMASCHINE/TROCKNER

LAVE-LINGE/SÈCHE-LINGE

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Description

[0001] The present invention relates to a washer/dryer wherein the interior of the drum is illuminated.

[0002] In washer/dryers, the interior of the drum wherein the laundry is placed is illuminated by means of illumination elements disposed on the tub bellows, the door or the tub inlet hose. In implementations wherein the illumination elements are disposed on the movable components, the interior of the drum cannot be illuminated effectively due to the disposed place and the illumination elements may be damaged. Illumination becomes costly and ineffective and more energy is consumed for an effective illumination.

[0003] In the German Patent Document No DE19649039 in a washing machine, the light received from a light source near the loading door hinge is delivered inside from the bull's eye window by means of the fiber optic light conductors disposed at the loading door and thus the interior of the tub is illuminated.

[0004] In the International Patent Document No W02005093149, an illumination ring is described that is disposed on the edge of the loading door illuminating the area of the door that is disposed on the front side of the body.

[0005] In the German Patent Document No DE 4026547, an illuminating body is built into the water supply line. The light radiated from the illuminating body illuminates the inner space of the drum passing through the drum perforation.

[0006] In the German Patent Document No DE3843386, in a washing machine, a light guide delivers the light received from a light source towards the inside of the drum guiding through the concertina-type seal of the tub.

[0007] The aim of the present invention is the realization of a washer/dryer wherein the interior of the drum is illuminated effectively by consuming a small amount of energy.

[0008] The washer/dryer realized in order to attain the aim of the present invention is explicated in the claims.

[0009] In the washer/dryer of the present invention, a light conductor is used that receives the light from a light source disposed on its body and delivers it to the side of the transparent part called as bull's eye window situated in the door that covers the loading port, for example the door glass and which preferably encircles the transparent part circumferentially. The transparent part is constituted of a concave structure that extends towards the inside of the drum and the light conductor delivers the light received from the light source by circumferentially encircling the transparent part. In the washer/dryer of the present invention, the light conductor is disposed inside the window frame since effective illumination of the drum interior is intended and cannot be viewed from the outside.

[0010] In the embodiment of the present invention, the transparent part comprises light piping dots that have a

light piping effect.

[0011] In an embodiment of the present invention, the light piping dots are concentrated in the middle of the concave section of the transparent part and provide the light to diffuse into the drum for effective illumination.

[0012] In an embodiment of the present invention, the light piping dots are formed by engraving with a laser device inside the transparent part. In this embodiment, various designs or inscriptions can be formed in the transparent part to provide an esthetic appearance.

[0013] In an embodiment of the present invention, the light piping dots are formed on the surface of the transparent part by employing dot matrix. The dot matrix is formed by printing white dots by, for example, an ink-jet printer on the surface of the transparent part.

[0014] In an embodiment of the present invention, the light piping dots are formed of particles having luminescence property when light acts thereon that are added to the material, e.g. glass, of the transparent part during production. The particles having luminescence property are produced of for example phosphorus or silicon based materials.

[0015] The washer/dryer realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

[0016] Figure 1 - is the schematic view of a washer/dryer.

[0017] The elements illustrated in the figures are numbered as follows:

1. Washer/dryer
2. Body
3. Drum
4. Tub
5. Loading port
6. Door
7. Transparent part
8. Frame
9. Frame housing
10. Light source
11. Light conductor
12. Light piping dots

[0018] The washer/dryer (1) comprises a body (2), a drum (3) wherein the laundry is placed, a tub (4) wherein the drum (3) rotates, a loading port (5) for loading and unloading the laundry into/from the drum (3), a door (6) that covers the loading port (5), a transparent part (7) situated in the door (6) for monitoring the laundry, a frame (8) disposed around the transparent part (7) and a light source (10) assembled to the body (2) or the door (6).

[0019] The door (6) is secured with a hinge in front of the loading port (5) that is situated on the front wall of the washer/dryer (1) and is opened, closed in the axis of the hinge.

[0020] The transparent part (7) is produced of a light-transmitting material, for example of glass, and it has concave structure towards the inside of the drum (3) so

that the laundry is prevented from being stuck in the bel-
lows.

[0021] The washer/dryer (1) of the present invention comprises :

- a light conductor (11) disposed in the frame (8) and delivers the light received from the light source (10) to the side of the transparent part (7), and
- more than one light piping dots (12) that are spread on the surfaces or in the material of the transparent part (7), conveying the light received from the light conductor (11) providing illumination of the interior of the drum (3) by means of the transparent part (7).

[0022] In an embodiment of the present invention, the light conductor (11) is configured as a ring that circumferentially encircles the side of the transparent part (7) inside the frame (8) and delivers light from all the periphery of the transparent part (7) towards the interior.

[0023] In another embodiment of the present invention, the light piping dots (12) are spread intensively in the middle of the concave section of the transparent part (7) and convey the light received from the light conductor (11) directing from the middle of the concave section of the transparent part (7) into the drum (3). Thus the light is delivered to the interior region of the drum (3) to be illuminated effectively by radiating from the middle of the concave section of the transparent part (7).

[0024] The beams emitted from the light source (10) illuminate the light conductor (11) that preferably encircles the periphery of the transparent part (7) like a ring. The light conductor (11) remaining within the frame (8) is not visible from the outside and the interior of the drum (3) can be conveniently monitored without disrupting the vision of the user since it does not have outward glow effect. The beams emitted from the light conductor (11) enter inside from the side of the transparent part (7) and directed towards the interior of the drum (3) by means of the light piping dots (12) spread in the transparent part (7).

[0025] In an embodiment of the present invention, the light piping dots (12) are spread homogeneously to the entirety of the transparent part (7) and the interior of the drum (3) is also illuminated homogeneously.

[0026] In an embodiment of the present invention, the light piping dots (12) are formed by engraving with a laser device inside the transparent part (7). In this embodiment, various designs or inscriptions can be formed in the transparent part (7) to provide an esthetic appearance.

[0027] In an embodiment of the present invention, the light piping dots (12) are formed on the surface of the transparent part (7) by employing dot matrix. The dot matrix is formed by tracing white dots with for example an ink-jet printer on the surface of the transparent part (7).

[0028] In an embodiment of the present invention, the light piping dots (12) are formed of particles having luminescence property when light acts thereon that are added

to the material of the transparent part (7) during production. The particles having luminescence property are produced of for example phosphorus or silicon based materials and added to the material, e.g. glass, of the transparent part (7) during production.

[0029] In an embodiment of the present invention, the light source (10) is disposed inside the frame (8) and directly illuminates the light conductor (11) that is also disposed within the frame (8).

[0030] In an embodiment of the present invention, the washer/dryer (1) comprises a frame housing (9) situated on the body (2), on which the frame (8) is seated when the door (6) is closed. In this embodiment, the light source (10) is disposed on the frame housing (9) and when the frame (8) is seated on the frame housing (9) by closing the door (6), the light conductor (11) situated in the frame (8) is illuminated.

[0031] By means of the present invention, the interior of the drum (3) in the washer/dryer (1) is effectively illuminated and the transparent part (7) of the door (6) providing illumination presents an esthetic appearance.

Claims

1. A washer/dryer (1) comprising a body (2), a drum (3) wherein the laundry is placed, a loading port (5) for loading and unloading the laundry from the drum (3), a door (6) that covers the loading port (5), a transparent part (7) situated in the door (6) for monitoring the laundry, a frame (8) disposed around the transparent part (7), a light source (10) assembled to the body (2) or the door (6), and a light conductor (11) disposed in the frame (8) and delivering the light received from the light source (10) to the side of the transparent part (7), **characterized in that** more than one light piping dots (12) are spread on the surfaces or in the material of the transparent part (7), conveying the light received from the light conductor (11) providing illumination of the interior of the drum (3) by means of the transparent part (7).
2. A washer/dryer (1) as in Claim 1, **characterized by** the light conductor (11) configured as a ring that circumferentially encircles the side of the transparent part (7) inside the frame (8).
3. A washer/dryer (1) as in Claim 1 or 2, **characterized by** the light piping dots (12) that are spread intensively in the middle of the concave section of the transparent part (7) extending into the drum (3) and convey the light received from the light conductor (11) directing from the middle of the concave section of the transparent part (7) into the drum (3).
4. A washer/dryer (1) as in Claim 1 or 2, **characterized by** the light piping dots (12) that are spread homogeneously to the entirety of the transparent part (7).

5. A washer/dryer (1) as in any one of the above claims, **characterized by** the light piping dots (12) that are formed by engraving with a laser device in the transparent part (7).
6. A washer/dryer (1) as in any one of the Claims 1 to 4, **characterized by** the light piping dots (12) that are formed by employing dot matrix on the surface of the transparent part (7).
7. A washer/dryer (1) as in any one of the Claims 1 to 4, **characterized by** the light piping dots (12) that are formed of particles having luminescence property when light acts thereon that are added to the material of the transparent part (7) during production.
8. A washer/dryer (1) as in any one of the above claims, **characterized by** the light source (10) disposed inside the frame (8).
9. A washer/dryer (1) as in any one of the Claims 1 to 7, **characterized by** a frame housing (9) situated on the body (2), on which the frame (8) is seated when the door (6) is closed and the light source (10) disposed on the frame housing (9) that illuminates the light conductor (11) situated in the frame (8) when the frame (8) is seated on the frame housing (9) by closing the door (6).

Patentansprüche

1. Wasch-/Trockenmaschine (1), umfassend einen Körper (2), eine Trommel (3), in die die Wäsche gegeben wird, eine Ladeöffnung (5) zum Einladen und Entladen der Wäsche in der Trommel (3), eine Tür (6), die die Ladeöffnung (5) abdeckt, ein transparentes Element (7), das in der Tür (6) angeordnet ist und dem Überwachen der Wäsche dient, einen Rahmen (8), der um das transparente Element (7) herum angeordnet ist, eine Lichtquelle (10), die an dem Körper (2) oder der Tür (6) angebracht ist, und einen Lichtleiter (11), der im Rahmen (8) angeordnet ist und das Licht, das er von der Lichtquelle (10) erhält, zur Seite der transparenten Element (7) hin leitet, **dadurch gekennzeichnet, dass** mehrere Hohllichtleiterpunkte (12) an den Flächen oder in dem Material des transparenten Elements (7) verteilt sind, die das Licht, das sie vom Lichtleiter (11) erhalten, weiterleiten, und so die Beleuchtung des Inneren der Trommel (3) mittels des transparenten Elements (7) ermöglichen.
2. Wasch-/Trockenmaschine (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Lichtleiter (11) als ein Ring ausgebildet ist, der die Seite des transparenten Elements (7) im Rahmen (8) in Umfangsrichtung umgibt.

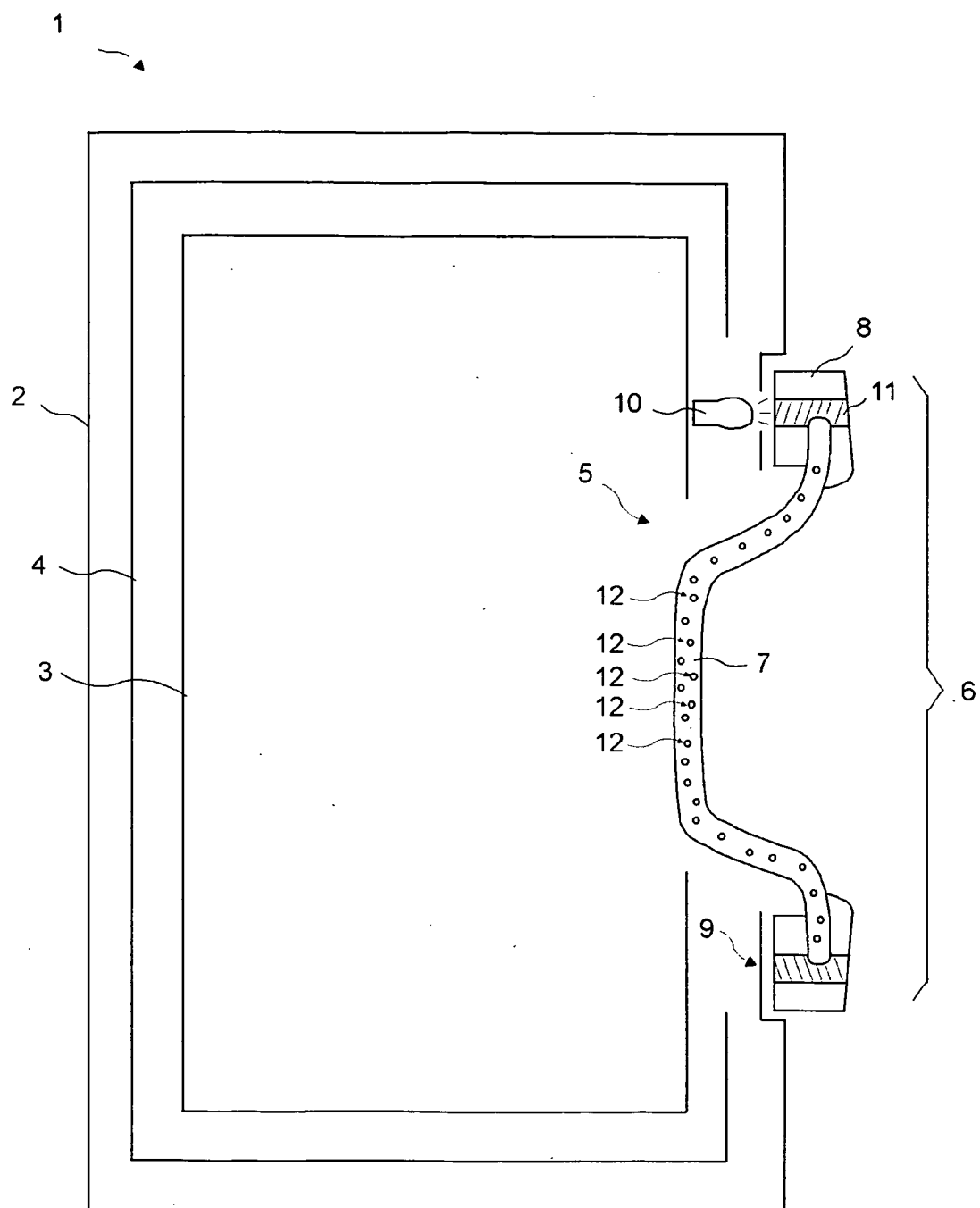
3. Wasch-/Trockenmaschine (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Hohllichtleiterpunkte (12) in der Mitte des konkaven Abschnitts des transparenten Elements (7), der sich in die Trommel (3) hinein wölbt, dicht verteilt sind, und das Licht, das sie von dem Lichtleiter (11) erhalten, von der Mitte des konkaven Abschnitts des transparenten Elements (7) aus in die Trommel (3) lenken.
4. Wasch-/Trockenmaschine (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Hohllichtleiterpunkte (12) gleichmäßig über das gesamte transparente Element (7) verteilt sind.
5. Wasch-/Trockenmaschine (1) nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Hohllichtleiterpunkte (12) durch Einbrennen des transparenten Elements (7) mit einer Laservorrichtung ausgebildet sind.
6. Wasch-/Trockenmaschine (1) nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** die Hohllichtleiterpunkte (12) unter Verwendung einer Punktmatrix auf der Fläche des transparenten Elements (7) ausgebildet sind.
7. Wasch-/Trockenmaschine (1) nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** die Hohllichtleiterpunkte (12) aus Partikeln gebildet sind, die Leuchteigenschaften aufweisen, wenn Licht auf sie einwirkt, und die dem Material des transparenten Elements (7) während der Herstellung zugesetzt werden.
8. Wasch-/Trockenmaschine (1) nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Lichtquelle (10) im Inneren des Rahmens (8) angeordnet ist.
9. Wasch-/Trockenmaschine (1) nach einem der Ansprüche 1 bis 7, **gekennzeichnet durch** ein Rahmengehäuse (9), das am Körper (2) angeordnet ist, und auf dem der Rahmen (8) aufsitzt, wenn die Tür (6) geschlossen ist, und die Lichtquelle (10) am Rahmengehäuse (9) angeordnet ist und den Lichtleiter (11), der im Rahmen (8) angeordnet ist, beleuchtet, wenn der Rahmen (8) durch Schließen der Tür (6) auf dem Rahmengehäuse (9) aufsitzt.

Revendications

1. Une machine à laver / sécheuse (1) comprenant un corps (2), un tambour (3) dans lequel le linge est placé, un port de chargement (5) pour le chargement et le déchargement du linge du tambour (3), une porte (6) qui couvre le port de chargement (5), une partie transparente (7) située sur la porte (6) pour le suivi

- de la ligne, un cadre (8) disposé autour de la partie transparente (7), une source de lumière (10) assemblée au corps (2) ou à la porte (6), et un conducteur de lumière (11) disposé dans le cadre (8) et pour transmettre la lumière reçue de la source de lumière (10) à côté de la partie transparente (7), **caractérisée en ce que** plus d'un point de la tuyauterie de lumière (12) sont répartis sur les surfaces ou dans le matériau de la partie transparente (7), véhiculant ainsi la lumière reçue par le conducteur de lumière (11) qui assure un éclairage de l'intérieur du tambour (3) par des moyens de la partie transparente (7). 5 10
2. Une machine à laver / sècheuse (1) selon la Revendication 1, **caractérisée par** le conducteur de lumière (11) configuré comme un anneau qui entoure la circonférence du côté de la partie transparente (7) à l'intérieur du cadre (8). 15
3. Une machine à laver / sècheuse (1) selon la Revendication 1 ou 2, **caractérisée par** des points de la tuyauterie de lumière (12) qui sont répartis de manière intensive au milieu de la partie concave de la partie transparente (7) qui s'étend dans le tambour (3) et transmettant la lumière reçue par le conducteur de lumière (11) à partir du milieu de la concave section de la partie transparente (7) dans le tambour (3). 20 25
4. Une machine à laver / sècheuse (1) selon la Revendication 1 ou 2, **caractérisée par** des points de la tuyauterie de lumière (12) qui sont répartis de façon homogène sur l'ensemble de la partie transparente (7). 30
5. Une machine à laver (1) selon l'une quelconque des revendications précédentes, **caractérisée par** des points de la tuyauterie de lumière (12) qui sont formés par la gravure d'un dispositif laser dans la partie transparente (7). 35 40
6. Une machine à laver / sècheuse (1) selon l'une quelconque des revendications précédentes, **caractérisée par** des points de la tuyauterie de lumière (12) qui sont formés en employant une matrice de points sur la surface de la partie transparente (7). 45
7. Une machine à laver / sècheuse (1) selon l'une quelconque des revendications de 1 à 4, **caractérisée par** des points de la tuyauterie de lumière (12) qui sont formés de particules ayant la propriété de luminescence lorsque la lumière agit dessus, ce qui crée des actes qui sont ajoutés à la matière de la partie transparente (7) pendant la production. 50
8. Une machine à laver / sècheuse (1) selon l'une quelconque des revendications précédentes, **caractérisée par** la source de lumière (10) disposée dans le cadre (8). 55
9. Une machine à laver / sècheuse (1) selon l'une quelconque des revendications de 1 à 4, **caractérisée par** un boîtier de cadre (9) situé sur le corps (2), sur lequel le cadre (8) est assis lorsque la porte (6) est fermée et la source lumineuse (10) disposée sur le boîtier de cadre (9) qui éclaire le conducteur de lumière (11) situé dans le cadre (8) lorsque le cadre (8) est assis sur le boîtier de cadre (9) en fermant la porte (6).

Figure 1



REFERENCES CITED IN THE DESCRIPTION

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