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(54) **A DRYER**

TROCKNER

SÉCHOIR

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(56) References cited:

EP-A- 1 541 742 WO-A-2005/064069
DE-C1- 19 615 822 GB-A- 752 189

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Description

[0001] The present invention relates to a dryer that comprises a drum.

[0002] As is known, laundry to be dried is loaded inside a drum in dryers. A drying process is performed by the spinning of said drum driven by a motor.

[0003] In the state of the art, sliding and wheeled systems are employed for front bearing of the drum. Fracture problem is seen due to the fatigue of the front door of the drum as a result of pressure of wheels on neck of the front door in advantageous wheeled system owing to the fact that drum is less dependent on the surface flatness of the drum. Producing the drum with completely or respectively thick and strong material to prevent fractures increases the overall cost of the drum.

[0004] In state of the art Chinese Patent Application No CN1970874, an embodiment relating to narrowing the contact surface by means of channels formed on wheels to decrease the friction between wheels and drum is explained.

[0005] In state of the art Korean Patent Application No. KR20040012005, an embodiment relating to the coating of the wheels with Teflon and self-lubricating material is explained. Document GB-A-752189 discloses a dryer with a rotating drum. The drum has a front door with a ring-shaped neck. Further, wheels are provided at the dryer for rotatably supporting the drum. This document provides a depression formed as a groove in the neck of the drum; however this groove serves as complementary guiding and seating groove for the wheels. A disadvantage of this arrangement is the large wear-out of the wheels.

[0006] The aim of the present invention is the realization of a dryer comprising a high strength and easy to manufacture drum.

[0007] The dryer realized in order to attain the aim of the present invention is defined in the attached claims.

[0008] The dryer of the present invention, wherein a wheeled front bearing is employed comprises a drum having at least one depression formed on the neck where the wheels contact the front door to increase endurance against fatigue occurring on the front door due to the friction of wheels.

[0009] Thus, the life of the front door against the fatigue impact occurring due to the pressure of the wheels is improved and damages due to the fatigue are prevented without increasing the cost of the material.

[0010] In an embodiment of the present invention, the depression is in form of a circular groove surrounding the neck. Contacting surface of wheels is broader than the width of the depression and thus it is not possible for wheels to fit into the depression.

[0011] In another embodiment of the present invention, the drum comprises multiple depressions in form of circular grooves surrounding on the line where the wheels contact.

[0012] In another embodiment of the present invention,

the depression is in the form of bow outward.

[0013] By means of the present invention, in the dryers wherein the front part of the drum is supported with the wheels whereon the front part is seated, manufactured strongly and hence the life time of the drum is improved.

[0014] The model embodiments related to the dryer realized in order to attain the aim of the present invention are illustrated in the attached figures, where:

Figure 1 - is the schematic view of a dryer.

Figure 2 - is front view of drum and wheels.

Figure 3 - is schematic view of front door and a wheel in an embodiment of the present invention.

Figure 4 - is schematic view of front door and a wheel in another embodiment of the present invention.

Figure 5 - is schematic view of front door and a wheel in other embodiment of the present invention.

[0015] The elements illustrated in the figures are numbered as follows:

1. Dryer
2. Drum
3. Body
4. Front door
5. Neck
6. Wheel
7. Depression

[0016] The dryer (1) comprises a drum (2) rotating around itself (Figure 1).

[0017] The dryer (1) of the present invention, is preferably a horizontal axis dryer (1).

[0018] The drum (2) comprises

- a cylindrical body (3),
- a front door (4) having a neck (5) in the form of ring advancing forward and forming the front surface of body (3)
- at least two wheels, whereon the neck (5) is seated, supporting the drum (2) by rotating around themselves with the movement of the drum (2) during drying process and located on both sides of the body (3). (Figure 2).

[0019] The drum (2) also comprises at least one depression (7) formed along the line, where the wheels (6) contact the said neck (6). The depression (7) increases the strength of the neck (5). Thus, the front door (4) is affected less by the impact acting due to the movement of the wheels (6), and fatigue thereof and an area more resistant to the fatigue occurring in the front part of the drum (2) during its operation is obtained.

[0020] In various embodiments of the present invention, the front door (4) is fitted to the body (3) with welding or clamp or the body (3) and the front door (4) are formed by deep drawing of one piece sheet metal.

[0021] In an embodiment of the present invention, the

depression (7) is in the form of groove (Figure 3 and 4).

[0022] In another embodiment of the present invention, the drum (2) comprises several depressions (7) in the form of circular grooves all along around the contacting points where the wheels touch on the neck (5) (Figure 4).

[0023] In another embodiment of the present invention the depression (7) is in the form of a protrusion towards wheels (6) from the front door (4) (Figure 5).

[0024] By means of the dryer (1) of the present invention, the drum is realized to resist to fatigue and fractures thereof on the front door (4) where wheels (6) press on.

[0025] It is to be understood that the present invention is not limited to the embodiments disclosed above and an expert in the technique can easily introduce different depression forms increasing the strength. These should be considered within the scope of the protection postulated by the claims of the present invention.

Claims

1. A dryer (1) comprising a cylindrical body (3) with capacity to rotate around itself, a drum (2) comprising said cylindrical body (3) and having a front door (4) with a neck (5) in the form of a ring, protruding from and forming the front surface of the cylindrical body (3), at least two wheels (6) located on both sides of the cylindrical body (3), whereby the neck (5) is seated on the wheels (6) and the wheels (6) are supporting the drum (2) by rotating around themselves with the movement of the drum (2) during the drying process and, whereby the neck (5) has a depression (7) increasing the strength of the neck (5) formed along the line where the wheels (6) contact the said front door (4), **characterized in that** the contacting surface of the wheels (6) is broader than the width of the depression (7) such that the wheels (6) do not fit into the depression (7).
2. A dryer (1) as in Claim 1, **characterized in that** the depression (7) is configured as a groove.
3. A dryer (1) as in Claim 1, **characterized in that** the depression (7) configured as a bow from the neck (5) to the wheels (6).
4. A dryer (1), as in any one of the above claims, **characterized in that** the front door (4) is fitted to the cylindrical body (3) with a clamp.
5. A dryer (1), as in any one of the above claims 1 to 3, **characterized in that** the front door (4) is fitted to the cylindrical body (3) by welding.
6. A dryer (1), as in any one of the claims 1 to 3, **characterized in that** the cylindrical body (3) and the front door (4) are formed by deep drawing of a single piece of sheet metal.

Patentansprüche

1. Trockner (1), umfassend einen zylindrischen Körper (3) mit der Fähigkeit, sich um sich selbst zu drehen, eine Trommel (2), umfassend den zylindrischen Körper (3) und aufweisend eine Vordertür (4) mit einem Halsstück (5) in der Form eines Rings, das von dem zylindrischen Gehäusekörper (3) vorspringt und seine Vorderfläche bildet, wenigstens zwei Räder (6), die auf beiden Seiten des zylindrischen Körpers (3) angeordnet sind, wobei das Halsstück (5) auf den Rädern (6) sitzt und die Räder (6) die Trommel (2) tragen, indem sie sich zusammen mit der Drehung der Trommel (2) während des Trockenvorgangs um sich selbst drehen, wobei das Halsstück (5) eine Vertiefung (7) aufweist, die die Festigkeit des Halsstücks (5) erhöht und entlang der Linie gebildet ist, an der die Räder (6) mit der Vordertür in Kontakt treten (4), **dadurch gekennzeichnet, dass** die Kontaktfläche der Räder (6) breiter als die Breite der Vertiefung (7) ist, derart, dass die Räder (6) nicht in die Vertiefung (7) passen.
2. Trockner (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Vertiefung (7) als eine Nut konfiguriert ist.
3. Trockner (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Vertiefung (7) als ein Bogen von dem Halsstück (5) zu den Rädern (6) konfiguriert ist.
4. Trockner (1) nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Vordertür (4) mit einer Klemme auf den zylindrischen Körper (3) gesetzt ist.
5. Trockner (1) nach einem der vorangehenden Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die Vordertür (4) durch Schweißen auf den zylindrischen Körper (3) gesetzt ist.
6. Trockner (1) nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** der zylindrische Körper (3) und die Vordertür (4) durch Tiefziehen eines einzelnen Stücks Blech gebildet sind.

Revendications

1. Un sèche-linge (1) comprenant un corps cylindrique (3) qui peut tourner autour de lui-même, un tambour (2) comprenant ledit corps cylindrique (3) et qui présente une porte avant (4) avec un col (5) en forme d'un anneau, faisant saillie à partir de et formant la surface avant du corps cylindrique (3), au moins deux roues (6) qui sont sur les deux côtés du corps cylindrique (3), où le col (5) est placé sur les roues (6) et les roues (6) supportent le tambour (2) en tour-

nant autour d'elles-mêmes par le mouvement du tambour (2) pendant le processus de séchage, et où le col (5) présente une dépression (7) augmentant la résistance du col (5) formée le long de la ligne sur laquelle les roues (6) sont en contact de ladite porte avant (4), **caractérisé en ce que** la surface de contact des roues (6) est plus large que la largeur de la dépression (7) de telle sorte que les roues (6) ne rentrent pas dans la dépression (7).

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2. Un sèche-linge (1) selon la Revendication 1, **caractérisé en ce que** la dépression (7) est formée comme une rainure.
3. Un sèche-linge (1) selon la Revendication 1, **caractérisé en ce que** la dépression (7) est formée comme un arc à partir du col (5) vers les roues (6).
4. Un sèche-linge (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la porte avant (4) est monté sur le corps cylindrique (3) avec une pince.
5. Un sèche-linge (1) selon l'une quelconque des revendications de 1 à 3, **caractérisé en ce que** la porte avant (4) est monté sur le corps cylindrique (3) par soudage.
6. Un sèche-linge (1) selon l'une quelconque des revendications de 1 à 3, **caractérisé en ce que** le corps cylindrique (3) et la porte avant (4) sont formés par l'emboutissage profond d'une seule pièce en tôle.

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Figure 1

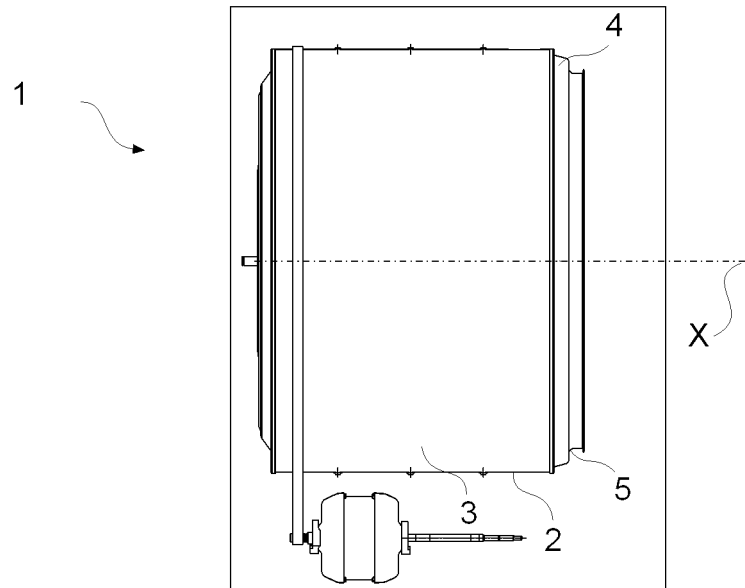


Figure 2

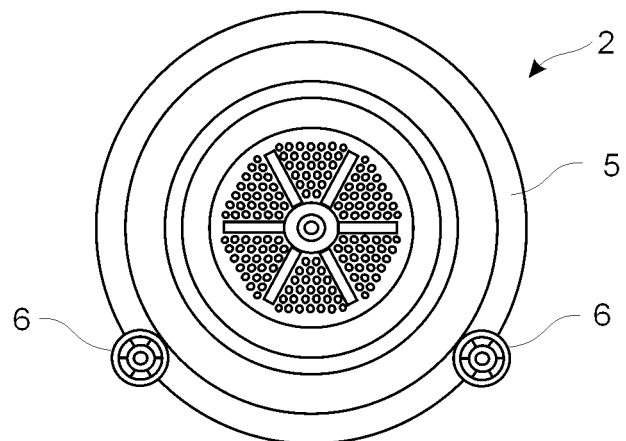


Figure 3

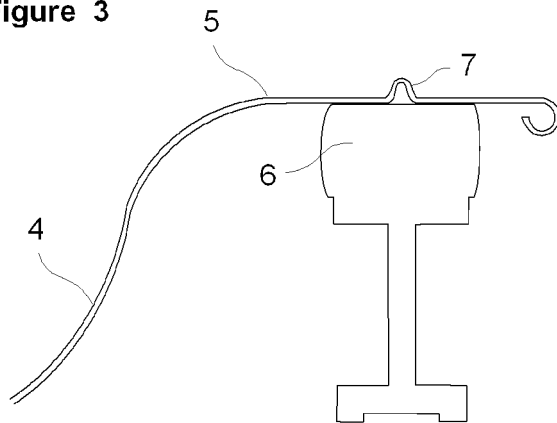


Figure 4

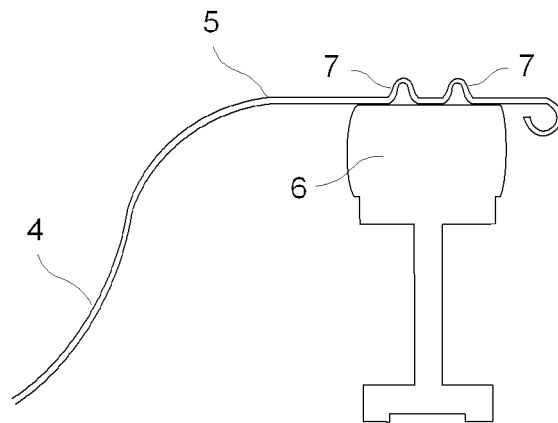
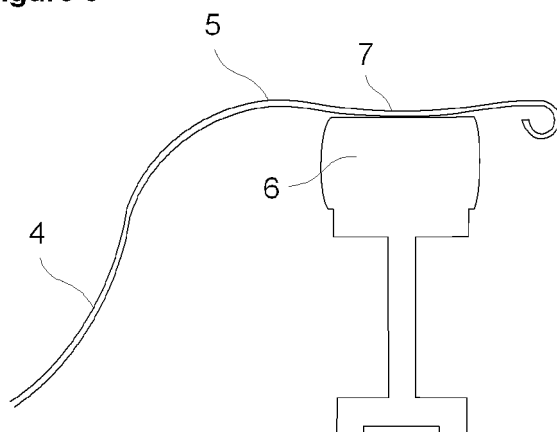


Figure 5



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 1970874 [0004]
- KR 20040012005 [0005]
- GB 752189 A [0005]