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(54) A drum for washing machines and tumble dryers

(57) The perforated drum (3) of the present invention has been developed for use in washing machines and tumbles dryers and contains perforations (4) that are given a special geometrical form so as to prevent the laundry from getting worn out. Accordingly, each drum perforation (4) has been produced extending toward the outer surface of the drum (6); their internal and external edges (7, 8) moved off the center of the perforation (C); and the internal surface of the perforations (9) designed in such a way as not to form a sharp line and its cross-section to have a curved surface (10).

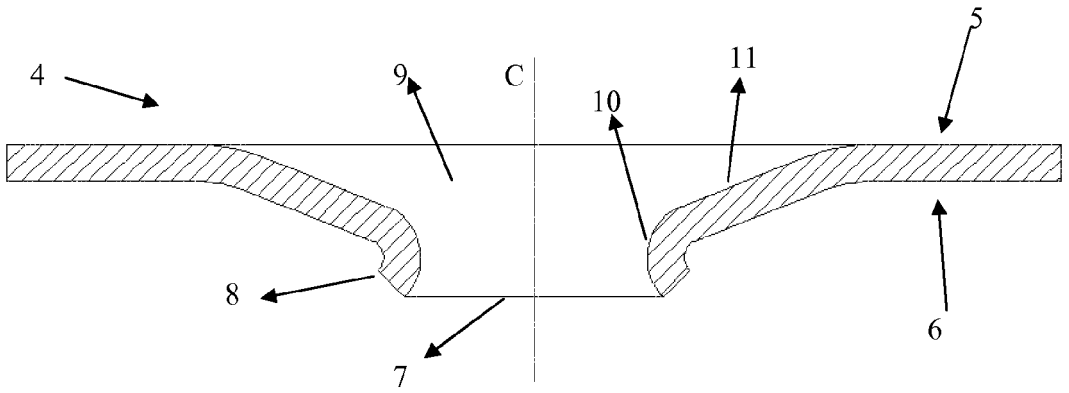

Figure – 4

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Description

Technical Field

[0001] This invention is related to the drums that are used in the washing machines and tumble dryers.

Description of the Prior Art

[0002] As well known, there are drums inside such white goods as washing machines and tumble dryers used so as to clean the laundry and dry them. Mounted inside such machines, the drums are units with a perforated structure which can spin at a pre - determined speed. These perforations are designed with a view to enabling the water to reach the laundry in the drum of the washing machine and discharging water in the drum during the process of wringing out. And in the drums of the tumble dryers, similarly these perforated structure functions to move the evaporating water off the laundry. However, during the spinning of the drums, if the mentioned perforations have sharp edges in particular, they wear out the laundry. Therefore drum units which functions without wearing out the laundry are required.

[0003] There are several solutions available which are included in the existing technical know - how for the laundry to be dried. For example, in the patent publication with the number W02009090107, a drum with "V" shaped channels is disclosed. The perforations on this drum are opened in such a way as to be placed on the same flanges of the channels. The drum also designed to spin only in one direction and this reduces the extent the laundry touch the perforations during the spinning process. Though, it is possible for the soft texture laundry in particular to rub against these perforations on a drum having such a structure. The geometrical forms of the perforations disclosed in the aforementioned application do not have the capacity to protect the laundry against wearing out.

Short Description of the Invention

[0004] The perforated drum of present invention has been developed for the washing machines and / or tumbles dryers and contains perforations having special geometrical forms to prevent the laundry from wearing out. Accordingly, each drum perforation has been produced extending toward the outer surface of the drum; their internal and external flanges moved off the center of the perforation; and the internal surface of the perforations are designed in such a way as not to form a sharp line and its cross-section to have a curved surface. Thus, the wearing out of the laundry during the washing and drying processes is avoided. Moreover, even the existence of burrs left around the perforations during the production is considered as a factor that does not affect the laundry. Additionally, this eliminates the need to perform the burr removing process during the production of the drum and reduces the production costs of the drum.

Aim of the Invention

[0005] The aim of this invention is to ensure that the perforations in the drums used in the washing machines and/or tumble dryers do not harm the laundry.

[0006] Another aim of the invention is to produce drum perforations in such a form as to prevent the laundry from wearing out.

[0007] A further aim of this invention is to provide a safe drum the manufacture of which is easy and cost-effective.

Description of Figures

[0008] The examples of the drums and the perforations of the present invention have been illustrated in the annexed figures wherein;

Figure 1 is the perspective view of the internal structure of a washing machine.

Figure 2 is the perspective view of a drum.

Figure 3 is the sectional view of a sample drum perforation of the known art.

Figure 4 is the sectional view of the present invention of drum perforation.

Figure 5 is the sectional view of another said invention of drum perforation.

Figure 6 is the sectional view of another said invention of drum perforation.

[0009] The units in displayed in the figures are assigned individual numbers and what these numbers stand for is provided below.

White goods (1)

Tub (2)

Drum (3)

Drum perforation (4)

Drum perforation (4') (of the known art)

Internal surface (5)

Internal surface (5') (of the known art)

Outer surface (6)

Outer surface (6') (of the known art)

Internal Edge (7)

Internal Edge (7') (of the known art)

Outer edge (8)

Outer edge (8') (of the known art)

Perforation internal surface (9)

Curved cross-sectional surface (10)

Tilted cross-sectional surface (11)

Flat cross-sectional surface (12)

Perforation center (C)

Back wall (D)

Disclosure of the Invention

[0010] The perspective view of a sample white goods (1) is given in the Figure 1. Here the white goods (1) is given as a washing machine but the invention can be applied to both the drying machines and also the machines that can wash and dry the laundry. As it is known, the laundry and drying machines include a tub (2) containing a rotatable drum (3) with perforations. Drums (3) are generally manufactured by circularly forming the flat sheet materials after perforation. A laundry loading opening is placed at the frontal side of the drums (3). Perforation may be applied to the back wall of the drum (3) which is in flat form. In Figure 2, a drum (3) with perforations (4, 4') is shown. While, the perforations (4, 4') here are shown on the curved surface of the drum (3), they can also be placed on the back wall (D) of the drum (3).

[0011] Cross sectional views from different geometrical shapes of a drum perforation (4, 4') are given in the Figure 3-6. In Figure 3, a cross sectional geometry of a drum perforation (4') of the prior art is shown. The edge (7') of this drum perforation (4') at the internal surface of the drum (5') (the surface contacting with the laundry) and the edge (8') at the external surface (6') are sharp. Since the internal and external edges (7', 8') of drum perforation (4') in such a geometrical structure contact with the laundry thus damaging the clothes, new drum perforation (4) with different geometrical structures have been developed as shown on the Figure 4-6.

[0012] The common points of drum perforations (4) of this invention, as shown in the Figure 4-6, are that the perforation (4) is extended towards the external surface of the drum (6), that the internal and external edges (7, 8) are alienated away from the perforation center (C) and that the internal edge (9) of the perforation is formed by avoiding any sharp lines, in a way that the cross section of the internal edge has a curved surface (10). Additionally, the section, where the internal surface of the perforation (9) and the internal surface of the drum (5) are connected, is rounded.

[0013] In the sample drum perforation (4) given in the Figure 4, there is a surface (11) the cross section of which is inclined between the internal surface of the drum (5) and the curved surface(10).

[0014] The sample drum perforation shown in the Figure 5, on the other hand, is similar to the perforation at the Figure 4; the difference here is that there is a surface (12) in the drum perforation (4), the cross section of which is flat and which divides the curved surface (10) into two.

[0015] In Figure 6, on the other hand; a drum perforation (4), the internal surface (9) of which is formed as a completely curved surface cross section (10) is shown.

[0016] The wearing out of the clothes during the washing and drying processes is prevented by the fact that the internal and external edges (7, 8) of drum perforations (4) shown in the Figure 4-6, are curved outwardly from the perforation center (C) to avoid contact with the clothes, along with the fact that the internal surface of the perforation (9) is curved and that the perforation is extended to the external surface (6) of the drum. Additionally, even if burrs, remaining from the manufacturing process, are present at perforation edges (7, 8) they will be considered as an element not having any effect on clothes. Besides, this also eliminates the necessity of burr removal process during the manufacture of the drum (3) which decreases the manufacture cost of the drum (3).

Claims

1. A perforated drum (3) for the washing machines and tumble dryers **characterized in that** each drum perforation (4) have been produced extending toward the outer surface of the drum (6); their internal and external edges (7, 8) moved off the center of the perforation (C); and the internal surface of the perforations (9) designed in such a way as not to form a sharp line and its cross - section to have a curved surface (10).

2. A perforated drum (3) according to Claim 1 **characterized in that** inside the perforation drum (4) is a tilted cross-sectional surface (11) between the internal surface of the drum (5) and the mentioned curved surface (10).

3. A perforated drum (3) according to Claim 1 or Claim 2 and **characterized in that** there is a flat cross-sectional surface (12) in the drum perforations (4) which divides the curved surface (10) into two.

4. A perforated drum (3) according to any of the aforementioned claims and **characterized in that** the section where the internal surface of perforation (9) and internal surface of the drum (5) are connected is rounded.

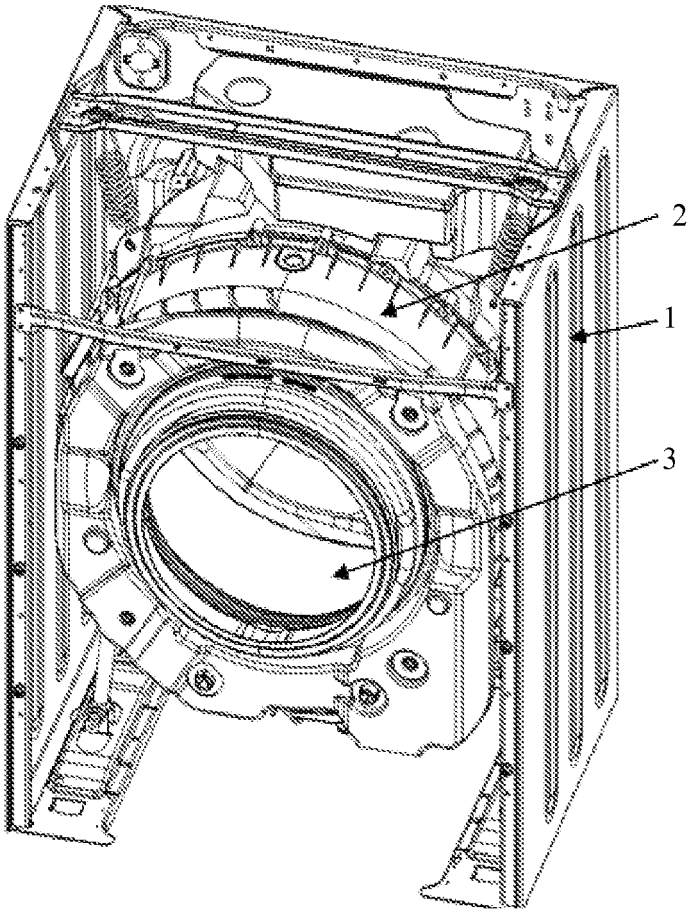

Figure – 1

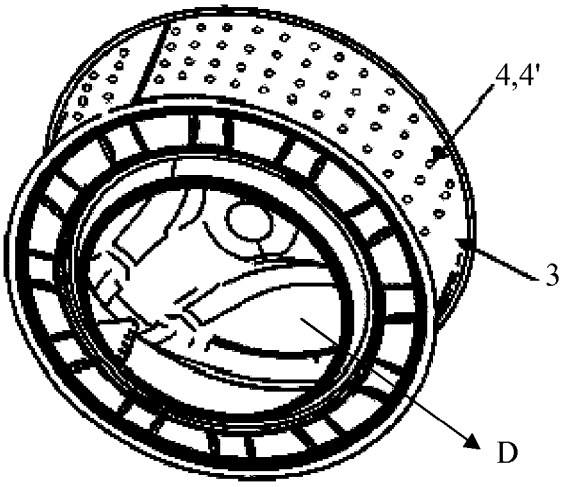

Figure – 2

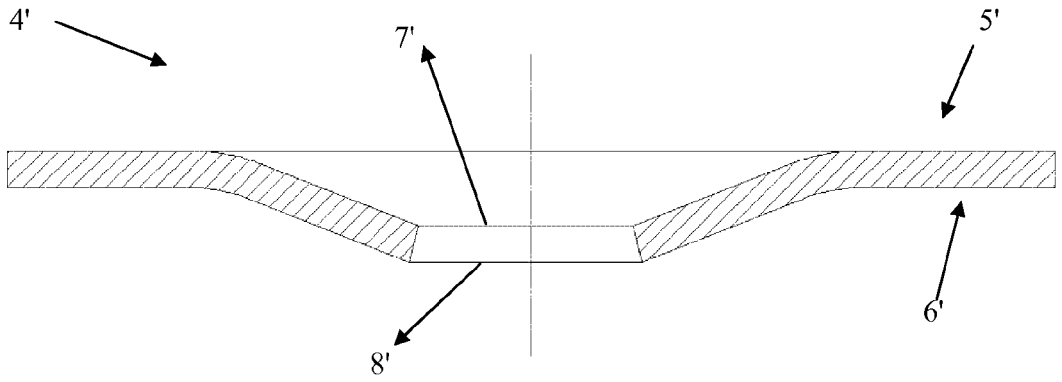

Figure – 3

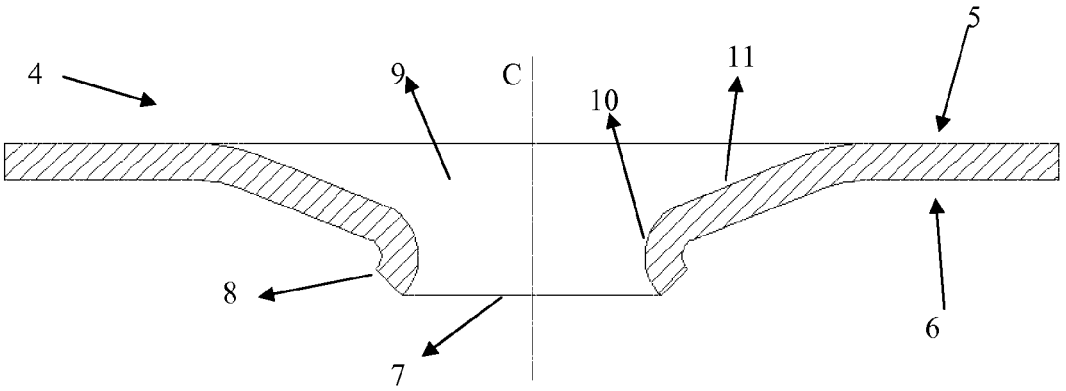

Figure – 4

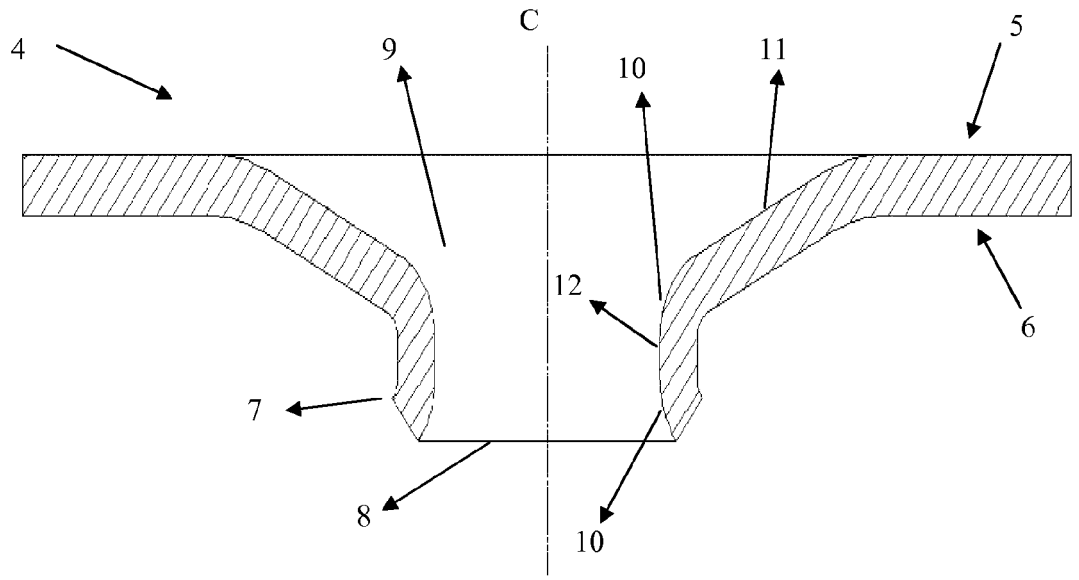

Figure – 5

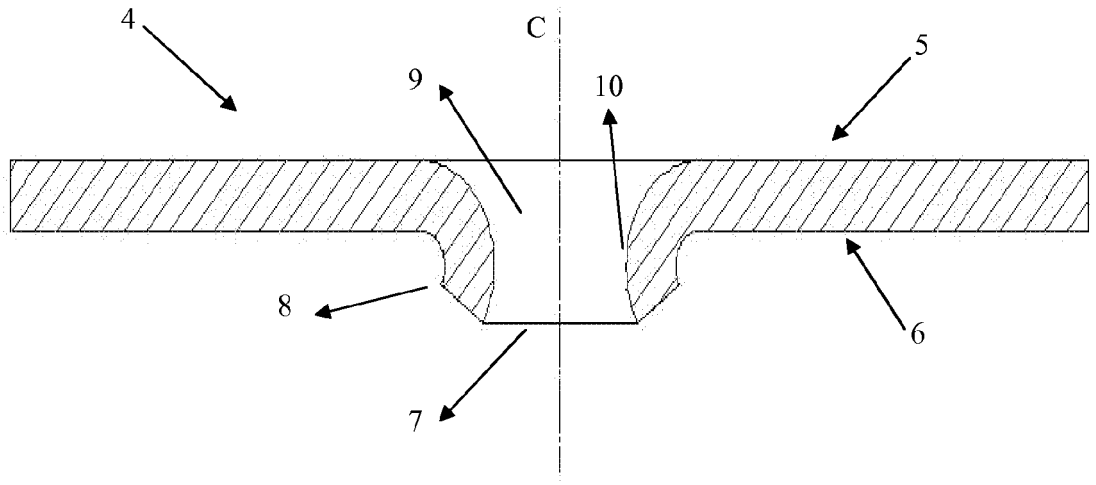

Figure – 6

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EUROPEAN SEARCH REPORT

Application Number
EP 09 17 6615

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	US 2005/229647 A1 (KIM HEUNG G [KR] ET AL) 20 October 2005 (2005-10-20) * paragraph [0054] - paragraph [0055]; figures 4,5 *	1-4	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 April 2010	Hannam, Martin

CATEGORY OF CITED DOCUMENTS

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