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(54) **BAG FOR LAUNDRY BALLS INTRODUCED INTO A CYLINDRICAL LAUNDRY RECIPIENT, AND PRODUCTION METHOD THEREFOR**

(57) Bag for laundry balls and method for their production, which prevents small fragments or remains of laundry balls from being passed, if they break down, into the cylindrical washing container, allowing water and air to be always transferred.

According to the invention, the non-woven fabric is applied with the adhesives, and the polyethylene (PE) is bonded on the layer of adhesives and it is passed through the rollers performing compression and cooling for being rolled following the hardening. Then, the nonwoven fabric

with the already hardened PE is passed through the punching roller for punching of micro openings in the surface of the PE. Finally, cutting of the non-woven fabric with the layer of the punched PE is carried out, introducing the laundry balls therein, and closing the top and bottom portions of the non-woven fabric, thus facilitating the method for producing the bag for laundry balls, reaching the goal.

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## Description

### Object of the invention

[0001] The present invention relates to the method for producing a bag for laundry balls located within the cylindrical washing container.

### Background of the Invention

[0002] In general, laundry balls are within the cylindrical washing container which is introduced into the drum of the washing machine for facilitating garment wash. The balls used for improving washing results perform a bactericidal and deodorant function through the emission of negative ions. They are made of materials such as aluminum, silicon, zirconium and/or zeolite ceramics. In addition, the cylindrical washing container contains openings on the outside thereof through which the benefits and performance of the laundry balls, located therein are expanded.

[0003] Although the hardness of such laundry balls allows certain wash performance to be maintained, if balls are broken, such feature could even improve garment wash results. From what has been known so far through similar inventions it is usual that ceramic balls break down in the cylindrical washing container by friction or shock, causing the breakages, then the broken pieces of the balls go out through the openings in the container and remains thereof were attached to the garments thus generating some spots.

[0004] Some features of the laundry balls and the cylindrical washing container are shared with the object of further Korean patents number 10-220276, Korean utility model number 20-211024, utility model number 2000-20297, published Korean patent number 2003-88829, however none of the above inventions solves the above mentioned problems.

### Description of the invention

[0005] The present invention relates to a bag for laundry balls and a method for their production, which prevents the small fragments or remains of laundry balls from being passed to the outside of the cylindrical laundry container, allowing only water and air to be transferred.

[0006] According to the invention, the adhesives are applied to the nonwoven fabric, and the polyethylene (PE) is bonded to the layer of adhesives and passed through rollers performing compression and cooling for being rolled and subsequently hardened. The nonwoven fabric with the already hardened PE is subsequently passed through the punching roller for punching of micro openings on the PE surface. Finally, the nonwoven fabric with the layer of punched PE is cut, inside of which the laundry balls are introduced and the top and the bottom portions of the nonwoven fabric are closed, thus facilitating the method of producing the bag for laundry balls,

reaching the goal.

[0007] This invention further relates to the bag as such, which contains laundry balls as mentioned above.

### Results of the invention

[0008] According to the present invention, the PE layer bonded to the nonwoven fabric has micro openings inside of which balls are added being easy to break, it being subsequently closed as if it were a bag.

[0009] Thus, such a bag with the balls therein is introduced into the cylindrical laundry container, in order for the broken down remains of the laundry balls not to be transferred out of the bag, allowing only water and air to be transferred, thus avoiding possible spots on garments, and even if the most fragile materials in the composition of the laundry balls are used, obtaining better yields, and having the advantage of obtaining better results.

### Preferred embodiment of the invention

[0010] For the first embodiment of the present invention, the non-woven fabric is prepared and the adhesives will feature a two-component mixture, that is, preferably the mixture of adhesive and hardeners such as N3126 that is in widespread use.

[0011] Furthermore, for the non-woven fabric, it is convenient to use short-fiber having micro-membranes instead of long-fiber.

[0012] For the embodiment of the present invention, the non-woven fabric is passed between the mesh roller and the rubber roller. The mesh roller is preferably 120 mesh. In this case, the mesh roller is fitted within the adhesive container and as the non-woven fabric is passed to the rollers, the adhesives are automatically applied to one side by the rotating action of the rollers.

[0013] By applying the adhesives to one side, the non-woven fabrics are passed through the compression and cooling rollers, between which a laminating machine is installed.

[0014] PE is inside such laminating machine at 250-350 degrees Celsius, and as the non-woven fabric with adhesives is passed between the rollers, the PE is bonded in the adhesive layer.

[0015] It is noted that since the reason why the temperature that has to be maintained by the PE ranges from 250 to 350 degrees Celsius is because below 250 degrees Celsius the desired fluidity could not be obtained and the temperature above 350 degrees Celsius would render the PE too liquid and could even cause fire. In addition, following the method the ball remains are prevented from going out and the color of the PE is maintained in white. Thus, the layer of PE should preferably be of about 30-60  $\mu\text{m}$ , since less than 30  $\mu\text{m}$  it could burst and more than 60  $\mu\text{m}$  the activity is prevented from being carried out properly, whereby the required level is the mentioned range for the layer of PE. In addition, the compression roller should be a roller made of rubber, in

order to avoid the non-woven fabric from breaking down and the cooling roller should maintain the temperature below 10 degrees Celsius so that the PE bonded to the top layer of the non-woven fabric is rapidly cooled for subsequent rolling thereof.

**[0016]** The non-woven fabric with the layer of adhesives with the linked PE should be introduced into the hardening section where the temperature is maintained at 60-80 degrees Celsius for hardening, but the hardener should not be below 60 degrees Celsius since in this way the result is not obtained, and the hardener temperature shall not exceed 80 degrees Celsius for its possible solution. The hardening time should not be less than 20 hours since hardening may be incomplete and should not exceed 30 hours taking into account economic costs.

**[0017]** Following the hardening process, a punching method is carried out with the non-woven fabric already hardened passing through further punching and rubber rollers. At that moment, the punching roller is provided with very thin needles, punching the layer of PE bonded to the non-woven fabric. Therefore, only water and air is allowed to pass through the openings and not other materials.

**[0018]** In the non-woven fabric with the punched layer of PE, contents, such as the laundry balls, are introduced therein and the top and bottom portions are closed, introducing such bag into the cylindrical washing container, along with other larger balls or they are put with other bag separately.

### Claims

1. the present invention consists of a bag for a cylindrical washing container and a method for their production, **characterized in that** the bag that is introduced inside the cylindrical washing container is formed with a layer of PE, and an layer of adhesives along with the non-woven fabric with which said layers are applied, thus the layer of PE has micro openings that prevent broken down remains of the laundry balls from going out, which are inserted within the bag.
2. the method for producing the bag as claimed in claim 1 wherein it comprises applying the adhesives to the non-woven fabric and bonding polyethylene (PE) thereon, passing said fabric with the layer of PE through the rollers compressing and cooling for being subsequently rolled. Following the hardening, the non-woven fabric already bonded to the polyethylene is passed to the punching roller causing micro openings to be punched in the surface of the layer of PE. Cutting of said fabric is subsequently carried out introducing the laundry balls therein and closing the bottom and top portions of the non-woven fabric, thus facilitating the method for producing the bag for laundry balls reaching the goal.

3. as claimed in claim 2, wherein applying of the adhesives to the layer of non-woven fabric is carried out by passing the non-woven fabric between the rubber and mesh rollers through which the adhesives are automatically applied on the surface of the top portion of the nonwoven fabric, as a feature of producing the bag for the laundry balls.
4. as claimed in claim 3, wherein the mesh roller is technically **characterized in that** it is a roller of an exact 120 mesh size, as a feature of producing the bag for the laundry balls.
5. as claimed in claim 2, wherein bonding of the PE is carried out by sliding of the PE through the laminator, installed between the compression and cooling rollers on the adhesive layer in the top surface of the non-woven fabric, as a feature of producing the bag for the laundry balls.
6. as claimed in claim 5, wherein the PE should maintain a temperature ranging from 250 to 350 degrees Celsius, as a feature of producing the bag for the laundry balls.
7. as claimed in claim 2, wherein the cooling roller should maintain a temperature ranging from 5 to 15 degrees Celsius, as a feature of producing the bag for the laundry balls.
8. as claimed in claim 2, wherein hardening is carried out in the hardening section where the hardening material is provided, as a feature of producing the bag for the laundry balls.
9. as claimed in claim 8, wherein the hardener should maintain a temperature ranging from 60 to 80 degrees Celsius and hardening should be applied for 20 to 30 hours, as a feature of producing the bag for the laundry balls.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2009/070260

## A. CLASSIFICATION OF SUBJECT MATTER

**D06F 39/02** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

D06F, B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

INVENES,EPODOC. Bag/sachet/pouch, net/mesh, coating, polyethylene/polyethen (PE), adhesive/binding resin, non-woven, drill/bore/hole/pore/interstice/slit.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 0133151 A1 (CUSTOM CLEANER INC; SMITH JAMES A) 10.05.2001, abstract; page 4, line 28 - page 7, line 7; page 12, lines 1-19; figures.	1
A		2
X	GB 1298454 A (LANTOR LTD) 06.12.1972, page 1, lines 38-45; page 2, lines 20-33; page 2, lines 115-119.	1
A	WO 2005077064 A2 (ECO SAFE TECHNOLOGIES L L C ; EVANS K DONALD ; COOK CORY E) 25.08.2005, abstract; paragraphs [0022-0024,0066-0068]; figures 1-5.	1
A	CN 1712610 A (ZHANG XIAOPING) 28.12.2005, figure & Abstract of the base of datos EPODOC. Recuperado de EPOQUE; Número of acceso CN-200410049710-A.	1
A	WO 8505120 A1 (UNILEVER PLC; UNILEVER NV) 21.11.1985, page 1, lines 3-7; page 2, line 35 - page 3, line 5; page 3, line 31 - page 4, line 7; page 8, lines 1-23.	1

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance.

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document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents, such combination being obvious to a person skilled in the art

"&amp;"

document member of the same patent family

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/ ES 2009/070260

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Form PCT/ISA/210 (patent family annex) (July 2008)

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- KR 10220276 [0004]
- KR 20211024 [0004]
- KR 200020297 [0004]
- KR 200388829 [0004]