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(54) **CONSUMER UNIT FOR DYEING TEXTILE**

VERBRAUCHEREINHEIT ZUM FÄRBEN VON TEXTILIEN

UNITÉ DE CONSOMMATION POUR TEINDRE UN TEXTILE

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(73) Proprietor: **Henkel AG & Co. KGaA**
40589 Düsseldorf (DE)

(72) Inventors:
- **HANER, Murat**
  40723 Hilden (DE)
- **FILECCIA, Salvatore**
  46049 Oberhausen (DE)

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Description

[0001] The present invention concerns a consumer unit for dyeing textile.

[0002] It is known to dye textiles at home. This is done usually by adding a dyeing product, comprising a dyeing agent, to a water based solution in which the textile, such as while clothes are added for a certain period of time. The dyeing can be done, e.g., either by giving a white textile a color or by reinforcing the existing color of the textile. For instance a blue jeans which has acquired a pale color over the time due to washing can be treated with a blue dyeing product to reinforce its color so that it can look like new, at least regarding to the color. It is also possible to use a bleaching agent to bleach the color of a textile so that this textile can be latter on dyed with a different dye resulting in a different color. The change of color allows a user to choose its preferred color for chosen clothes.

[0003] Typically a consumer unit for the dyeing of textiles is a bag, e.g. a flow pack, comprising a certain amount of dyeing product. The bag needs to be open and the product dispensed into a bucket into which the fabric will be treated. The consumer unit may also comprise a paper box containing the bag.

[0004] This kind of known consumer unit has the disadvantage that the consumer has to open the bag and dispense its content, the handling of the bag is cumbersome and often ends into the consumer having direct contact with the dyeing product, and/or the product being partially spilled out of the bucket during dispensing.

[0005] US 2009/249562 A1 is describing a consumer product for dying textiles with a reactive dye composition for rejuvenation of the color or dark colored textile fabrics. For easy dosing of the dye composition it is preferably used together with a dosing container comprising an opening which could be closed by a corresponding removable cap. Generally the dosing container with the dye is used preferably within a usual laundry washing machine to rejuvenate the textile fabrics. Even such a dying product is showing some deficiencies with regard to convenience, usability and a tamper-proof packaging.

[0006] Further WO 90/12864 A1 is showing a cleaning product for textile fabrics which is used within a usual laundry washing machine. The cleaning composition is stored and used within a dosing container comprising an opening closed by a water-soluble or water-dispersible closure member. When using the dosing container within the washing machine the container is opened after contact of the closure member with water.

[0007] It is therefore objective of the present invention to overcome these disadvantages by providing an easy to use consumer unit for dyeing textile. The consumer unit according to the invention is easy to use, and can easily be placed inside the drum of a washing machine, without a user needing to dispense its content.

[0008] The objective of the invention is solved by the feature combination of claim 1. Further preferred developments of the invention are described by the dependent claims.

[0009] The objective of the invention is solved by a consumer unit for use in a washing machine for dyeing textile. The consumer unit comprises a textile dyeing agent stored in a crucible. The crucible comprises a bottom and an opening arranged at the other end from the bottom. The opening is round, such as oval, and preferably circular. The crucible further comprises a circumferential wall between the bottom and the opening. The crucible preferably has a general shape of a body of revolution. The opening is surrounded by an annular surface extending in a plane, and a lid is attached to the annular surface thereby closing the opening.

[0010] The crucible is formed as a single piece. A single piece is more stable and less unlikely to break during laundry treatment process. Breaking or falling apart of pieces from the crucible should be avoided because these parts may generate non foreseen noise during treatment in a drum. Further the crucible is insoluble in water. The crucible is preferably made of a material which can be blow molded, such as a polypropylene based composition. A crucible which is insoluble in water has the advantage that is does not interfere in, i.e. it does not reduce, the relative concentration of the dyeing agent in the treatment solution. The treatment solution is the solution resulting when the dyeing product is dissolved in water.

[0011] Beyond that the crucible is sleeved by a tear-off sleeve. A tear-off sleeve allows information to be shown on the outer surface of the crucible, while it can be removed before use. It was found that using a consumer unit with removed sleeve in a wash machine drum has advantages, because no dyeing agent can be left stuck between crucible and sleeve, thus the whole process can be done in a much cleaner way and more complete way. Further the tear-off sleeve covers at least part of the lid, such that the lid can only be removed, after said sleeve is removed. Therefore an enhanced protection can be given to the whole consumer unit because the sleeve also works as a tamper evident, also giving a better aesthetical appearance.

[0012] In a preferred embodiment, the crucible is barrel shaped so that the bottom and the opening, are, each, smaller than a largest portion of the crucible. It is further preferred that the greatest annular perimeter of the crucible is at a location between the bottom and the opening, preferably at a distance of at least 1/5 of the height of the crucible from each of the bottom and from the opening. This provides a good dynamic of the crucible into the washing machine, since the largest part of the barrel can absorb chocks much better than the corners from bottom and/or opening.

[0013] It is preferred that the amount of the dyeing product is a single unit dose. A single unit dose is preferably sufficient to fully dye at least 250g of cotton textile. Such dose preferably has a mass of greater than 100 g, preferably

between 150 g and 3 Kg, more preferably between 200 g and 500 g.

[0014] The dyeing product in the crucible comprises the dye composition and the dye fix, preferably as a mixture.

[0015] It is preferred that the lid is a sheet like material. It is attached to the annular surface so that it can be peeled off by a consumer. Due to the difference in materials of the crucible with a form stable material and the lid which is flexible and can easily be rolled or folded, the step of opening the crucible is made simple for a user. The user can hold the crucible, peel off the lid, and move the crucible to its place of use in a convenient way, with low efforts, without spilling out and/or entering into skin contact with the dyeing agent. In this case it is preferred that the lid is water insoluble.

[0016] In an alternative of the invention, the lid is water soluble. Example of a soluble lid is a foil based on polyvinyl alcohol (PVA), such foils are available with diverse temperatures and solubility rates. A crucible closed with such foil can be added directly to a washing machine's drum, without a user needing to peel it off.

[0017] The lid may be thermoformed.

[0018] It is highly preferred that the dyeing product comprises less than 0.01weigth% of surfactant. Higher concentrations of surfactants would disturb the dyeing process. With less than 0.01weigth% of surfactant, in the dyeing product, best dyeing actions can be obtained.

[0019] It is highly preferred that the dyeing product comprises less than 0.01weigth% of bleach. Bleach do react with most of the dyes or their precursors thus interfering negatively with the dyeing.

[0020] It is highly preferred that the dyeing product comprises less than 0.01weigth% of enzyme. It is believed that enzymes interfere with the dyeing process.

[0021] Preferably, the annular surface is continuous, meaning uninterrupted, so as to allow for a tight sealing of the opening by the lid.

[0022] The consumer unit, preferably, comprises a booklet. Such booklet can be used to provide the instructions of how to use the product. Alternatively or in addition, the booklet comprises a color matching pattern, of at least 2 cm2, preferably of at least 4 cm2. The user can place close to a piece of fabric to observe the color the textile will have after the dyeing the textile. In one embodiment, the booklet is placed over the lid, preferably secured in place by a sleeve, which covers at least part of the booklet and lid. Preferably the booklet has a counter at least partially matching the contour of the lid. For example, the booklet may have rounded corners.

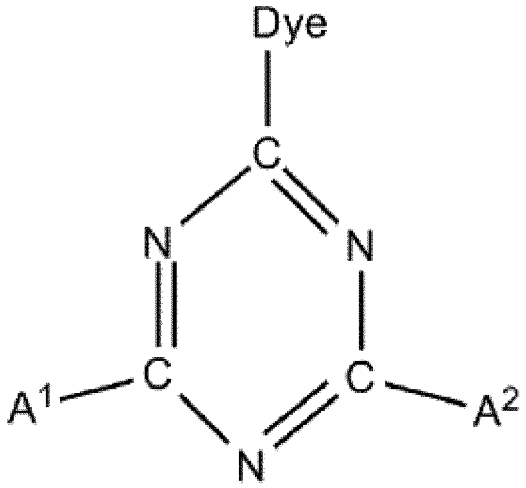
[0023] The crucible preferably comprise a transition corner located between the wall and the annular surface, wherein the corner preferably has a minor radius of greater than 0,3 mm, more preferably greater than 3 mm. In one embodiment the wall transitions into the annular surface at the transition corner. In another, preferred, embodiment, the crucible comprises a transition surface between the transition corner and the annular surface. In this embodiment it is preferred that the annular surface is offset (a) out of plane from the transition surface. The offset is away from the crucible's interior. Due to the offset, the annular surface forms a well-defined region for which the lid can be attached, and therefore detached, to the crucible. The offset (a) is preferably smaller than the smallest distance (b) between the annular surface and the transition corner. Due to the relatively low offset, the annular surface is less prone to hit the drum of a washing machine when this machine is operating.

[0024] The preferred use of the consumer unit according to the invention, is in a washing machine. The normal washing cycle program of the washing machine can be used for dyeing.

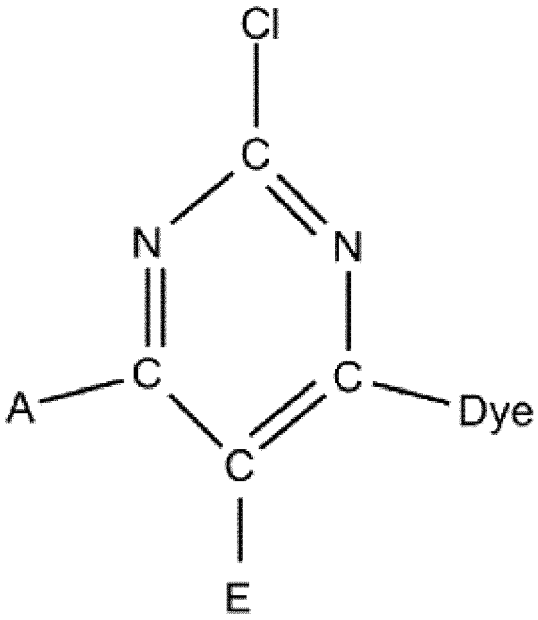
Dye Composition

[0025] As used herein, the term "reactive dye" is intended to mean that a reactive substituent group in the dye molecule can form a covalent chemical bond with molecules in the fabric to be dyed. The terms "dyeing agent" and "reactive dye" can be interchanged when the dyeing agent is of the reactive kind. Reactive dyes are the most suitable dyes for home use as they work at a low temperature, give color fast results and do not stain the washing machine.

[0026] Suitable reactive dyes include those from the triazine, pyrimidine and vinyl derivative classes, having the following formulae:



wherein A^1 is Cl and A^2 is aryl or Cl, preferably Cl;



wherein A is Cl and E is H or Cl; and
Dye-X-CH_2-CH_2-0-S0_3H
wherein X is -S0_2-, -NHCO- or-S0_2_NH-.

[0027] As used herein, the term "aryl" means a monocyclic or polycyclic-aromatic ring or ring radical comprising carbon and hydrogen atoms and which may be substituted or unsubstituted. Examples of suitable aryl groups include, but are not limited to, phenyl, tolyl, anthracenyl, fluorenyl, indenyl, azulenyl, and naphthyl, as well as benzo-fused carbocyclic moieties such as 5,6,7,8-tetrahydronaphthyl.

[0028] Preferred reactive dyes for use in the invention include one or more of the following:

- CI Reactive Black 5 =tetrasodium 4-amino-5-hydroxy-3,6-bis[[4-[[2 (sulphonatooxy)ethyl]sulphonyl]phenyl]azo]naphthalene-2,7-disulphonate
- Everzol Orange GR = disodium 6-(4,6-dichloro-1,3,5-triazin-2- ylamino)-1-hydroxy-2-(4-(2-(sulfonatooxy)ethylsulfonyl)phenylazo)naphthalene-3- sulfonate
- CI Reactive Red 239 = pentasodium 2-[[8-[[4-chloro-6-[[4-(2-sulfonatoethylsulfonyl)]phenyl]amino]-1,3,5-triazin-2-yl]amino-1- hydroxy-3,6-disulfonato-2-naphthalenyl]azo]naphthalene-1,5-disulfonate 2-[[8-[[4-chloro-6-[[4-[[2-ethenyl]sulfonyl]phenyl]amino]-1,3,5-triazin-2-yl]amino]-1-hydroxy-3,6-disulfonato-2-naphthalenyl]azo]naphthalene-1,5-disulfonate

- CI Reactive Yellow 125 = disodium 7-[[2-(acetylamino)-4-[(5-chloro-2,6-difluoro-4-pyrimidinyl)amino]phenyl]azo]naphthalene-1,3-disulphonate
- CI Reactive Yellow 27 = trisodium 4-[[4-[[(2,3-dichloro-6-quinoxalinyl)carbonyl]amino]-2-sulphonatophenyl]azo]-4,5-dihydro-5-oxo-1-(4-sulphonatophenyl)-1 H-pyrazole-3-carboxylate
- CI Reactive Orange 64 = 2-[[6-[(5-chloro-2,6-difluoro-4-pyrimidinyl)amino]-1-hydroxy-3-sulpho-2-naphthyl]azo]naphthalene-1,5-disulphonic acid, sodium salt
- CI Reactive Red 123 = disodium 7-[(5-chloro-2,6-difluoropyrimidin-4-yl)amino]-4-hydroxy-3-[(4-methoxy-2-sulphonatophenyl)azo]naphthalene-2-sulphonate
- CI Reactive Red 159 = 5-(benzoylamino)-3-[[5-[[(5-chloro-2,6-difluoro-4-pyrimidinyl)amino]methyl]-1-sulpho-2-naphthyl]azo]-4-hydroxynaphthalene-2,7-disulphonic acid, lithium sodium salt
- CI Reactive Red 147 = tetrasodium 2-[[8-[[3-[(5-chloro-2,6-difluoro-4-pyrimidinyl)amino]benzoyl]amino]-1-hydroxy-3,6-disulphonato-2-naphthyl]azo]naphthalene-1,5-disulphonate
- CI Reactive Blue 224
- CI Reactive Blue 1 16 = Copper, [[[[3-[(5-chloro-2,6-difluoro-4-pyrimidinyl)amino]phenyl]amino]sulfonyl]-29H,31 H-phthalocyaninato(2-)-N29,N30,N31,N32]-, aminosulfonyl sulfo derivatives, sodium salts
- CI Reactive Blue 21 = Copper, [29H,31 H-phthalocyaninato(2-)-N29,N30,N31,N32]-, sulfo [[4-[[2-(sulfooxy)ethyl]sulfonyl]phenyl]amino]sulfonyl derivatives
- CI Reactive Blue 225 = lithium sodium hydrogen 4-amino-6-(5-(5-chloro-2,6-difluoropyrimidin-4-ylamino)-2-sulfonatophenylazo)-5-hydroxy-3-(4-(2-(sulfonatooxy)ethylsulfonyl)phenylazo)naphthalene-2,7-disulfonate
- CI Reactive Blue 204 = hexasodium 6, 13-dichloro-3,10-bis((4-(2,5-disulfonatoanilino)-6-fluoro-1,3,5-triazin-2-ylamino)prop-3-ylamino)-5, 12-dioxa-7, 14-diazapentacene-4, 1 1-disulphonate

[0029] The reactive dye used herein preferably comprises at least 50%, or at least 60%, or at least 70%, or at least 75%, or at least 80%, or at least 85%, or at least 90%, or at least 95%, by weight of the dye itself, of a black, navy or deep blue reactive dye or a combination thereof. A suitable black reactive dye is CI Reactive Black 5, and a suitable navy dye is CI Reactive Blue 225.

[0030] It should be noted that commercial preparations of reactive dyes generally contain salt, usually sodium chloride or sodium sulphate, as a diluent. However, the percentages by weight quoted herein for the reactive dye do not include the salt of the commercial preparations, which is included in the percentages by weight quoted for the salt in the dye composition. The salts suitable for use in the dye composition or in the dye fix composition herein include alkali metal salts of inorganic acids, preferably sodium or potassium chloride and sodium or potassium sulphate and combinations thereof. Sodium salts are preferred, especially sodium chloride.

[0031] The alkalis suitable for use in the dye composition or in the dye fix composition include sodium or potassium carbonate, sodium or potassium hydroxide, sodium or potassium metasilicate, sodium or potassium silicate, sodium or potassium bicarbonate, trisodium phosphate, ammonium hydroxide and organic alkalis such as triethanolamine, and combinations thereof. The sodium salts are preferred, especially sodium carbonate and sodium metasilicate. The alkali used is such that the final pH in the dye bath in the washing machine will be from about 10.5 to about 12.5, preferably about 11.5.

[0032] The dye composition may include from 0.1 to 1 % by weight of minor additives such as perfumes and the like.

[0033] The dye composition herein may be in particulate and/or granular and/or powder form. The dye composition herein preferably comprises the reactive dye in an amount of from about 45 to 65%, or about 50 to 60%, or about 55 to 65%, or about 60 to 70%, by weight of the total dye.

[0034] The dye composition herein preferably comprises from about 35 to 55%, or about 40 to 50%, or about 35 to 45%, or about 30 to 40%, by weight of the total dye composition in the crucible, of a mixture of salt and alkali, wherein, preferably, the weight ratio of salt to alkali in the dye composition is from about 2.5:1 to 7:1, more preferably about 3.5: 1 to 5:1 or about 4: 1 to 5:1.

[0035] The dye fix composition herein preferably comprises a mixture of one or more alkalis and one or more salts, wherein, preferably, the weight ratio of alkali to salt is from about 3.8: 1 to 2: 1, more preferably about 1 : 1 to 1.5:1 or about 1 : 1 to 1.25:1.

[0036] The weight ratio of the dye composition to the dye fix composition is preferably from about 1 :5 to 1 : 10, more preferably about 1 :6 to 1 :10, especially about 1 :6 or about 1 :8.

[0037] The fabric to be dyed may be, for example, one or more items of clothing or a home furnishing fabric and is preferably moistened before dyeing.

[0038] The dyeing product in the crucible comprises the dye composition and the dye fix, preferably as a mixture.

[0039] A dyeing product (dyeing product 1) according to the invention was prepared containing the following components

DYE composition

[0040]

	(wt%)
Sodium Metasilicate	9.70%
Petal Fragrance	0.05%
disodium 6-(4,6-dichloro-1,3,5-triazin-2-ylamino)-1-hydroxy-2-(4-(2-(sulfonatooxy) ethylsulfonyl) phenylazo)naphthalene-3-sulfonate - [Everzol Orange GR]	1.62%
pentasodium 2-[[8-[[4-chloro-6-[[4-(2-sulfonatoethylsulfonyl)]phenyl]amino]-1 ,3,5-triazin-2-yl]amino-1-hydroxy-3,6-disulfonato-2-naphthalenyl]azo]naphthalene-1,5-disulfonate 2-[[8-[[4-chloro-6-[[4-[[2-ethenyl]sulfonyl]phenyl]amino]-1,3,5-triazin-2-yl]amino]-1-hydroxy-3,6-disulfonato-2-naphthalenyl]azo] naphthalene-1,5-disulfonate - [Cl Reactive Red 239]	0.50%
tetrasodium 4-amino-5-hydroxy-3,6-bis[[4-[[2-(sulphonatooxy)ethyl]sulphonyl]phenyl]azo]naphthalene-2,7-disulphonate - [Cl Reactive Black 5]	45.60%
Sodium chloride	42.53%

DYE FIX composition

[0041]

Sodium metasilicate	9.70%
Sodium chloride	45.15%
Sodium carbonate	45.15%

[0042] Everzol Orange GR is available from Everlight Chemical Industrial Corp. Cl Reactive Red 239 is available from Everlight Chemical Industrial Corp. under the trade name Everzol Brilliant Red 3BS hc. Cl Reactive Black is available from Everlight Chemical Industrial Corp. under the trade name Everzol Black GSP.

[0043] The amount of salt present in the commercial dye preparations used is as follows:

Everzol Black GSP = 40% salt in commercial dye= contributes 30.40% salt to the final composition.
Everzol Brilliant Red 3BS he= 50% salt = contributes 0.5% salt to the final composition. Everzol Orange GR = 10% salt= contributes 0.18% salt to the final composition.

[0044] Accordingly, a total of 31.08% of the salt comes from the commercial dyes and an additional 11.45% is added to give 42.53% total salt in the dye composition. 45 g of the dye composition and 350 g of the dye fix composition are mixed and filled into a crucible according to the invention.

[0045] Preferably the concentration of surfactants is smaller than 0,02 wg%. Preferably the concentration of enzymes is smaller than 0,02 wg%.

Summary of Figures

[0046]

Fig. 1 shows a cross sectional view of a consumer unit according to the invention.
Fig. 2 shows part of the consumer unit, especially the connection between the crucible and the lid.
Fig. 3 shows part of the consumer unit, in detail of a preferred embodiment where the sleeve covers the annular surface.

[0047] A consumer unit according to the invention is shown in the figures, the reference numerals are the same among the figures. The figures are simplified, i.e. not showing all the details to facilitate visualization, nevertheless the cross section of Figure 1 (with exception of the wall thickness) is scaled to best fit on a page.

[0048] Figure 1 shows a consumer unit 1 comprising a crucible 2. The crucible 2 has a wall with an outer surface 3 which transitions on a transition corner 4 to the annular surface 5. In the embodiment depicted in the figure, a transition surface 7 is provided between the transition corner 4 and the annular surface 5. The annular surface 5 surrounds the opening 6. The dyeing agent (not shown) is stored in the crucible 2. The opening 6 of the crucible 2 is closed by a lid 10, as shown in Fig.2. The lid 10 is attached, preferably by welding or gluing to the annular surface 5, in such a way that it can be peeled off. The peeling off is done preferably with a force lower than 2,5N/15mm, according to DIN55543. In the detail of the consumer unit 1 shown in figure 3, the sleeve 11 is shown covering the outer wall 2 and the annular surface 5, thus overlapping over the lid 10 at the annular surface 5. Figure 2 further shows that the annular surface 5 is offset by a distance (a) out of the plane of the transition surface 7. The offset (a) is smaller than the offset (b), which is the offset in the plane of the opening 6, between the transition corner 4 to the annular surface 5. In case the transition surface 7 is angled, i.e., not parallel to the plane of the opening 6, the reference plane of measure (a) is the plane defined by the transition corner 4.

[0049] Figure 4 shows a detail of the consumer unit 1, wherein the booklet 12 is comprised between the lid 10 and the sleeve 11. The sleeve 11 could be further fixated to the lid 10 by a fixation means such as a glue point, which helps keeping the booklet 12 in position during the sleeving process.

[0050] Example of welding is heat sealing or ultrasonic sealing.

Example

[0051] A consumer unit was produced by blow molding a crucible of polypropylene with an internal volume of 410 ml, filling it 395 g of a dyeing product 1 as described above, and closing the crucible by sealing a circular multilayered sheet on the annular surface. A shrink sleeve was added to the crucible such as to cover the external wall's surface and the annular surface. The unit was stored under ambient conditions.

[0052] A consumer unit made as described above can be exemplary used for blue dying 600g of white cotton bath towels. The towels are firstly washed at 40° using the cotton cycle of the washing machine, using the normal cycle (no economy or half load) and without pre-wash.

[0053] The sleeve can be teared off from the crucible. No gloves are necessary, since the crucible is still closed by the lid, no dyeing agent can spill out. The crucible it held on a flat horizontal surface, and the lid is peeled off, thus opening the crucible. Here as well, no gloves are required, because the crucible is shape stable and no dyeing agent will be spilled out during normal use.

[0054] The open crucible with the dyeing agent is then introduced into the drum of the washing machine, it is placed over the towels. The machine is then closed. The wash machine is set to use a 40° cotton cycle, using the normal cycle (no economy or half load) and without pre-wash.

[0055] After the washing machine is completed, the same washing cycle is repeated with laundry detergent. Now the bath towels can be dried and used normally. The empty crucible can be recycled by conventional PP recycling processes.

Claims

1. Consumer unit (1) for use in a washing machine for dyeing textile comprising

- a crucible (2), preferably having a general shape of a body of revolution, formed as a single piece and being insoluble in water with a bottom (8), a round, preferably circular, opening (6) arranged at the other end from the bottom (8) and being surrounded by an annular surface (5) extending in a plane and a wall between the bottom (8) and the opening (6),
- a textile dyeing product stored in the crucible (2),
- a lid (10) attached to the annular surface (5) thereby closing the opening (6); wherein the crucible (2) is sleeved, by a tear-of sleeve (12), such that the lid (10) can only be removed, after said sleeve (12) is removed.

2. Consumer unit (1) as in any of the previous claims, wherein the dyeing product is a single unit dose.

3. Consumer unit (1) as in any of the previous claims, wherein the lid (10) is attached to the annular surface (5) so that it can be peeled off by consumer.

4. Consumer unit (1) as in any of the previous claims 1 to 3, wherein the lid (10) is water soluble.

5. Consumer unit (1) as in any of the previous claims, wherein the dyeing product comprises less than 0.01weigth% of surfactant.

6. Consumer unit (1) as in any of the previous claims, wherein the dyeing product comprises less than 0.01weigth% of bleach.

7. Consumer unit (1) as in any of the previous claims, wherein the dyeing product comprises less than 0.01weigth% of enzyme.

8. Consumer unit (1) as in any of the previous claims, wherein the annular surface (5) is continuous so as to allow for a tight sealing of the opening (6) by the lid (10).

9. Consumer unit (1) as in any of the previous claims, wherein the crucible (2) comprises a transition corner (4) located between the wall and the annular surface (5), wherein the transition corner (4) preferably has a minor radius of greater than 0,3 mm, more preferably greater than 3 mm.

10. Consumer unit (1) as in claim 9, wherein the wall transitions into the annular surface (5) at the transition corner (4).

11. Consumer unit (1) as in claim 9, wherein the crucible (2) comprises a transition surface (7) between the transition corner (4) and the annular surface (5) and preferably wherein the annular surface (5) is offset (a) out of plane from the transition surface (7).

12. Consumer unit (1) as in claim 11, wherein the offset (a) is smaller than the smallest distance (b) between the annular surface (5) and the transition corner (4).

Patentansprüche

1. Verbrauchereinheit (1) zur Verwendung in einer Waschmaschine zum Färben von Textilien, umfassend

   - einen Tiegel (2), der vorzugsweise eine allgemeine Form eines Rotationskörpers aufweist, der einstückig ausgebildet ist und in Wasser unlöslich ist, mit einem Boden (8) einer runden, vorzugsweise kreisförmigen, Öffnung (6), die am anderen Ende von dem Boden (8) angeordnet ist und von einer ringförmigen Oberfläche (5) umgeben ist, die sich in einer Ebene und einer Wand zwischen dem Boden (8) und der Öffnung (6) erstreckt,
   - ein in dem Tiegel (2) gelagertes Textilfärbeprodukt,
   - einen Deckel (10), der an der ringförmigen Oberfläche (5) befestigt ist, wodurch die Öffnung (6) geschlossen wird;
   wobei der Tiegel (2) durch eine Abreißhülse (12) derart umhüllt ist, dass der Deckel (10) nur entfernt werden kann, nachdem die Hülse (12) entfernt wurde.

2. Verbrauchereinheit (1) nach einem der vorstehenden Ansprüche, wobei das Färbeprodukt eine Einzeleinheitsdosis ist.

3. Verbrauchereinheit (1) nach einem der vorstehenden Ansprüche, wobei der Deckel (10) an der ringförmigen Oberfläche (5) angebracht ist, sodass er vom Verbraucher abgezogen werden kann.

4. Verbrauchereinheit (1) nach einem der vorstehenden Ansprüche 1 bis 3, wobei der Deckel (10) wasserlöslich ist.

5. Verbrauchereinheit (1) nach einem der vorstehenden Ansprüche, wobei das Färbeprodukt weniger als 0,01 Gew.-% Tensid umfasst.

6. Verbrauchereinheit (1) nach einem der vorstehenden Ansprüche, wobei das Färbeprodukt weniger als 0,01 Gew.-% Bleichmittel umfasst.

7. Verbrauchereinheit (1) nach einem der vorstehenden Ansprüche, wobei das Färbeprodukt weniger als 0,01 Gew.-% Enzym umfasst.

8. Verbrauchereinheit (1) nach einem der vorstehenden Ansprüche, wobei die ringförmige Oberfläche (5) kontinuierlich ist, um eine dichte Abdichtung der Öffnung (6) durch den Deckel (10) zu ermöglichen.

9. Verbrauchereinheit (1) nach einem der vorstehenden Ansprüche, wobei der Tiegel (2) eine Übergangsecke (4)

umfasst, die sich zwischen der Wand und der ringförmigen Oberfläche (5) befindet, wobei die Übergangsecke (4) vorzugsweise einen kleineren Radius von mehr als 0,3 mm, mehr bevorzugt von mehr als 3 mm aufweist.

10. Verbrauchereinheit (1) nach Anspruch 9, wobei die Wand an der Übergangsecke (4) in die ringförmige Oberfläche (5) übergeht.

11. Verbrauchereinheit (1) nach Anspruch 9, wobei der Tiegel (2) eine Übergangsfläche (7) zwischen der Übergangsecke (4) und der ringförmigen Oberfläche (5) umfasst und vorzugsweise wobei die ringförmige Oberfläche (5) von der Übergangsfläche (7) außerhalb der Ebene versetzt (a) ist.

12. Verbrauchereinheit (1) nach Anspruch 11, wobei der Versatz (a) kleiner ist als der kleinste Abstand (b) zwischen der ringförmigen Oberfläche (5) und der Übergangsecke (4).

Revendications

1. Unité de consommateur (1) à utiliser dans une machine à laver pour un textile de teinture, comprenant

- un creuset (2), de préférence ayant une forme générale de révolution, formé en une seule pièce et étant insoluble dans l'eau avec un fond (8), une ouverture (6) ronde, de préférence circulaire, agencée au niveau de l'autre extrémité depuis le fond (8) et étant entourée d'une surface annulaire (5) s'étendant dans un plan et une paroi entre le fond (8) et l'ouverture (6),

un produit de coloration textile stocké dans le creuset (2),
un couvercle (10) fixé à la surface annulaire (5) fermant ainsi l'ouverture (6) ;
le creuset (2) étant emmanché, par un manchon déchirable (12), de telle sorte que le couvercle (10) ne peut être retiré qu'après que ledit manchon (12) est retiré.

2. Unité de consommation (1) selon l'une quelconque des revendications précédentes, dans laquelle le produit de coloration est une dose unitaire unique.

3. Unité de consommateur (1) selon l'une quelconque des revendications précédentes, dans laquelle le couvercle (10) est fixé à la surface annulaire (5) de sorte qu'il peut être pelé par le consommateur.

4. Unité de consommateur (1) selon l'une quelconque des revendications précédentes 1 à 3, dans laquelle le couvercle (10) est soluble dans l'eau.

5. Unité de consommation (1) selon l'une quelconque des revendications précédentes, dans laquelle le produit de coloration comprend moins de 0,01 % en poids de tensioactif.

6. Unité de consommation (1) selon l'une quelconque des revendications précédentes, dans laquelle le produit de coloration comprend moins de 0,01 % en poids de blanchiment.

7. Unité de consommation (1) selon l'une quelconque des revendications précédentes, dans laquelle le produit de coloration comprend moins de 0,01 % en poids d'enzyme.

8. Unité de consommateur (1) selon l'une quelconque des revendications précédentes, dans laquelle la surface annulaire (5) est continue de manière à permettre un scellement étanche de l'ouverture (6) par le couvercle (10).

9. Unité de consommateur (1) selon l'une quelconque des revendications précédentes, dans laquelle le creuset (2) comprend un coin de transition (4) situé entre la paroi et la surface annulaire (5), le coin de transition (4) ayant de préférence un rayon mineur supérieur à 0,3 mm, plus préférablement supérieur à 3 mm.

10. Unité de consommateur (1) selon la revendication 9, dans laquelle la paroi passe dans la surface annulaire (5) au niveau du coin de transition (4).

11. Unité de consommateur (1) selon la revendication 9, dans laquelle le creuset (2) comprend une surface de transition (7) entre le coin de transition (4) et la surface annulaire (5) et de préférence, la surface annulaire (5) étant décalée

(a) hors du plan de la surface de transition (7).

12. Unité de consommateur (1) selon la revendication 11, dans laquelle le décalage (a) est inférieur à la plus petite distance (b) entre la surface annulaire (5) et le coin de transition (4).

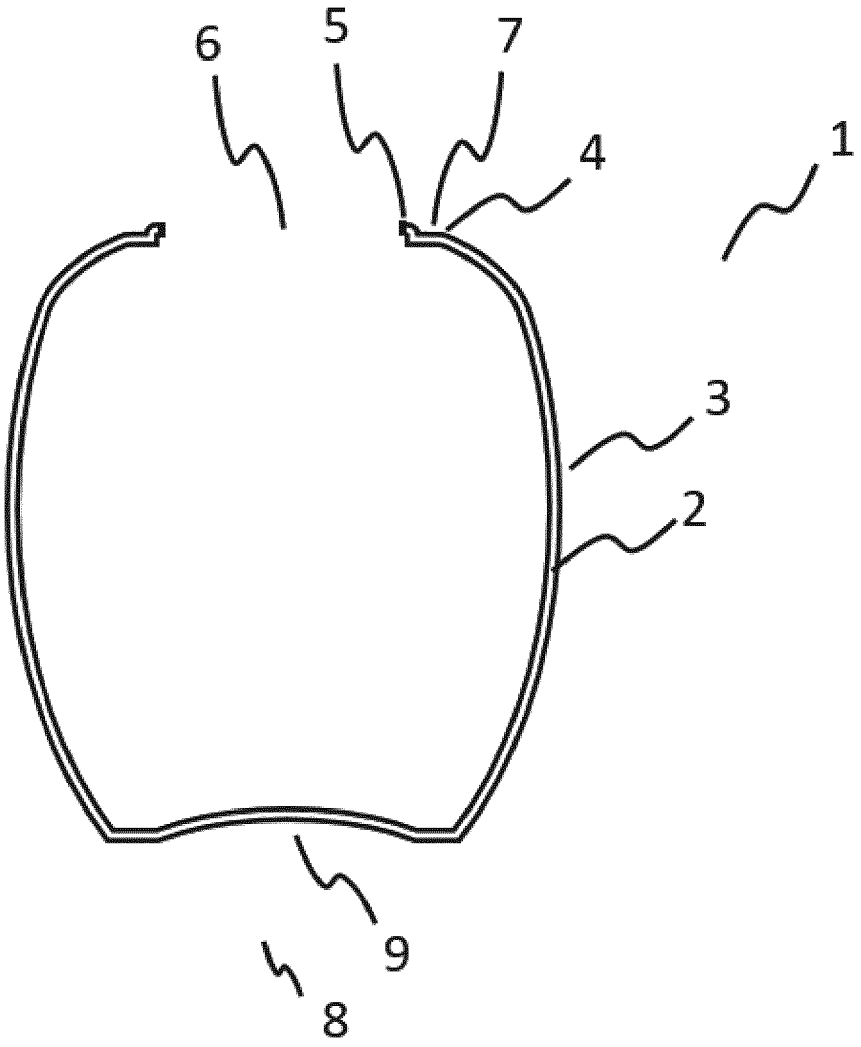


Figure 1

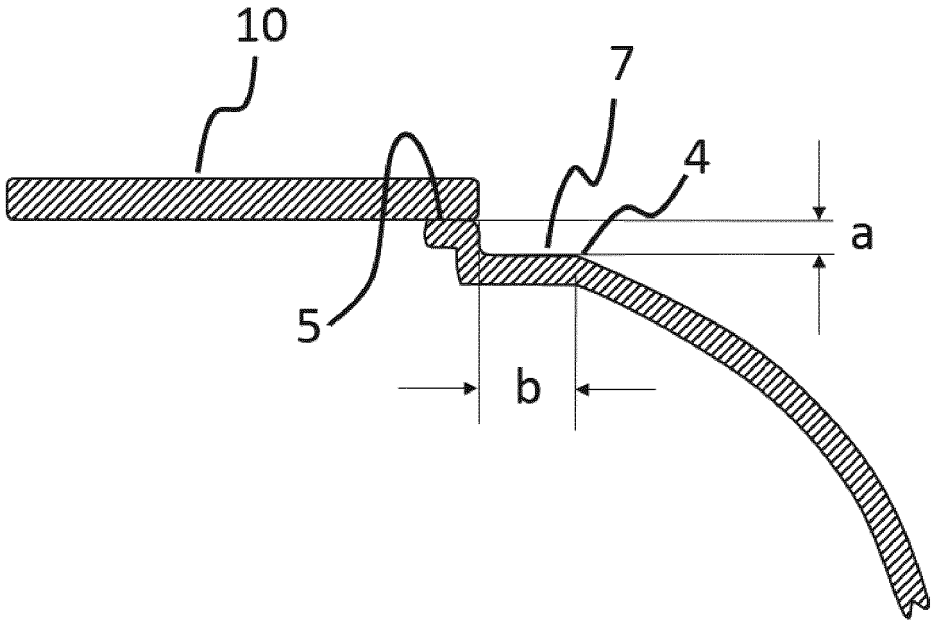


Figure 2

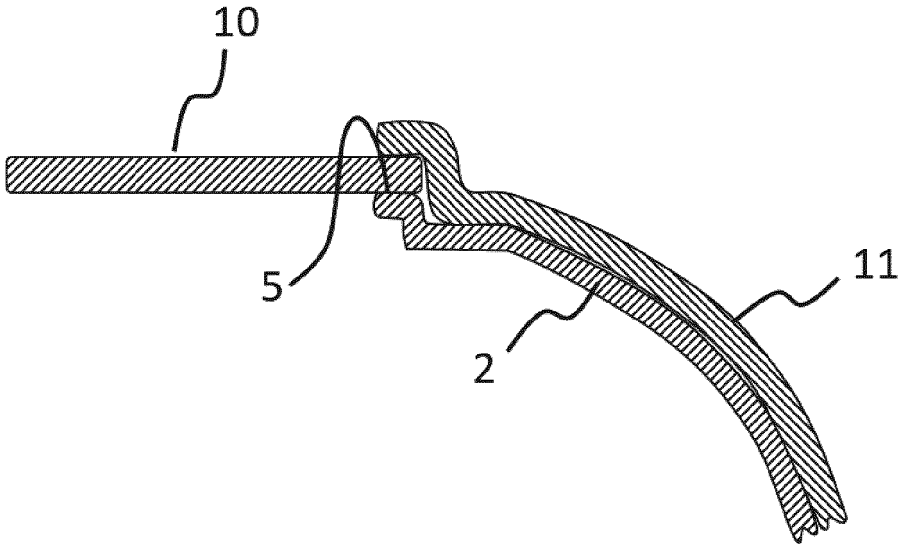


Figure 3

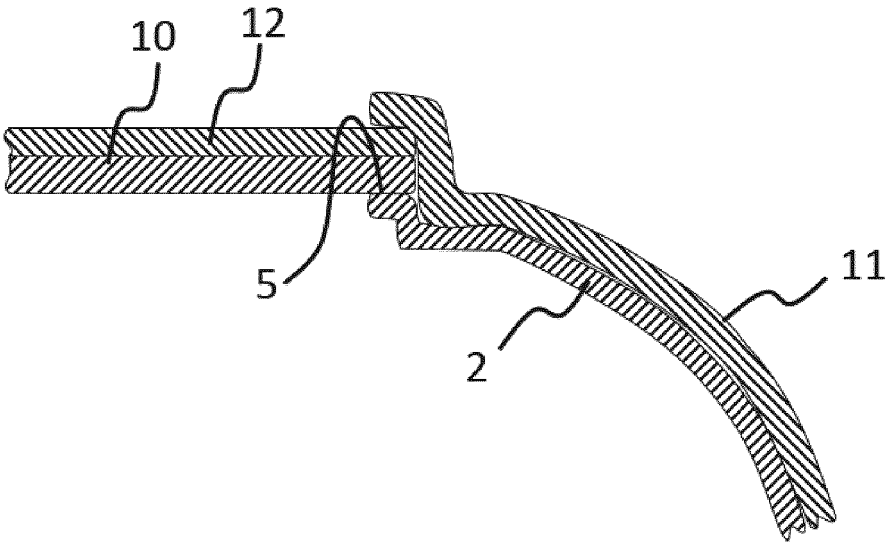


Figure 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 2009249562 A1 **[0005]**
- WO 9012864 A1 **[0006]**