(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 354 776 A1

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
01.08.2018 Bulletin 2018/31

(21) Application number: **15832780.9**

(22) Date of filing: **02.12.2015**

(51) Int Cl.:
D03D 11/00 *(2006.01)* ***D03D 13/00*** *(2006.01)*
D03D 15/00 *(2006.01)* ***D03D 1/00*** *(2006.01)*

(86) International application number:
PCT/KR2015/013099

(87) International publication number:
WO 2017/094932 (08.06.2017 Gazette 2017/23)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(71) Applicant: **Clembon Co., Ltd.**
Dongdaemun-gu,
Seoul 02530 (KR)

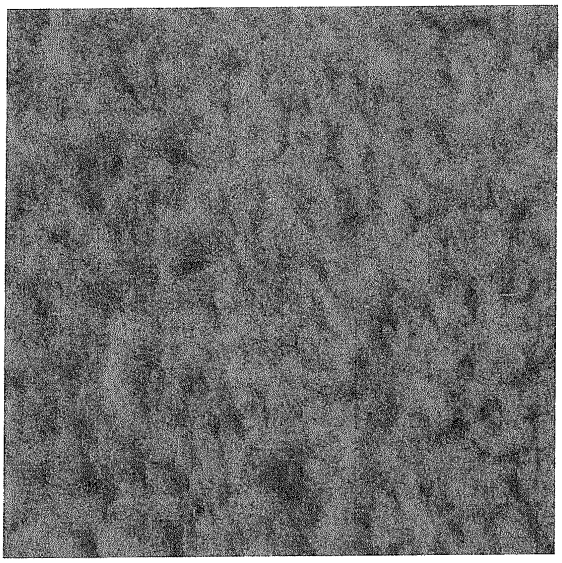
(72) Inventors:
- **LEE, Hyun Sam**
Busan 47509 (KR)
- **CHOI, Sung Hoon**
Seoul 02553 (KR)

(74) Representative: **Peter, Julian**
Staeger & Sperling
Partnerschaftsgesellschaft mbB
Sonnenstrasse 19
80331 München (DE)

(54) **FABRIC HAVING CUT-LOOP STRUCTURE, MANUFACTURING METHOD THEREFOR, AND PRODUCT USING SAME**

(57) The present invention relates to a fabric with a cut loop group, and the present invention provides a fabric with a cut loop group, including: a ground fabric in a woven or knitted form, which is formed of ground yarn; loop yarn formed on at least one surface of the ground fabric by weaving or knitting yarn; and a cut loop layer formed by cutting at least one portion of the loop yarn, wherein the yarn is manufactured by positioning at least one first yarn formed of one or two or more strands of fiber and at least one second yarn formed of one or two or more strands of fiber parallel to each other, and intermingling the first yarn and the second yarn by nipping longitudinally, and a fineness of the first yarn and a fineness of the fiber of the second yarn are different from each other.

Fig. 1



EP 3 354 776 A1

Description

Technical Field

[0001] The present invention relates to a fabric with a cut loop group, a manufacturing method thereof and a textile product using the same.

Background Art

[0002] A microfiber refers to a fiber which is thinner than one denier, has a three dimensional structure and includes innumerable microspaces formed during the processes of dyeing and splitting, and thus has excellent water absorption power, washing properties, texture and insulation. Dishcloths, rags, towels, gowns or the like, which are formed of microfibers, are highly rated due to their superior cleaning properties, rapid drying properties, excellent antibacterial and durable properties, etc. Particularly, rags formed of microfibers have become very popular and are widely used because the rags have at least 5 times the water absorption power, and 7 to 8 times the lifetime and efficiency of the typical cotton rags in cleaning stubborn stains through absorption, etc.

[0003] Fabrics generally used in rags are manufactured by weaving yarn to have loop groups and cutting the loops obtained therefrom. This is because the cleaning effect of the rags formed of fabrics with an uncut loop group is decreased due to pushing away foreign substances to be removed instead of catching them. That is, rags formed of fabrics with a cut loop group have an increased effect of removing foreign substances because foreign substances are removed by being caught between the cut loops. Accordingly, fabrics with a cut loop group are applied in most rags.

[0004] However, when microfibers are used to manufacture fabrics with a cut loop group for rags, there is an advantage of increased polishing properties during an initial stage of cleaning, but since microfibers are extremely thin, rebound resilience is decreased, and thus the restitution and resilience are degraded, and when microfibers absorb water or are pressed by the pressure during the cleaning process, there is a problem of reducing the cleaning effect by degradation of the sliding properties due to the existence of the matted or tangled threads.

[0005] In order to resolve these problems, Korea Patent No. 929510 discloses pile fabrics for cleaning, in which a cut pile layer is formed by pile yarn having a sheath-core composite structure. Here, the pile yarn having a sheath-core composite structure includes at least one core-forming yarn having a single filament fineness of 5 to 55 dtex, and at least one sheath-forming yarn having a single filament fineness of 0.01 to 2.5 dtex and surrounds the core. Further, Korea Patent No. 716623 discloses a technology in which a synthetic fiber divided yarn is used as core yarn, and split-type microfibers are used as covering yarn which is fixed to the core yarn through a heat treatment after yarn twisting the split-type microfibers into the core yarn.

[0006] When the cleaning tools formed of fabrics manufactured by the aforementioned methods are used, the cleaning tools exhibit excellent polishing properties, sliding properties, absorbency, rapid drying properties and texture, as compared to those of the cleaning tools formed of other fabrics according to the prior art.

[0007] In the aforementioned technology, pile yarn, that is, yarn for manufacturing fabrics is produced by twisting the covering yarn into the core yarn forming a core part. Accordingly, when fabrics with a cut loop group are manufactured using this yarn, there are problems in that the yarn manufacturing time is prolonged, thus reducing productivity, and the yarn manufacturing cost is high, thereby increasing manufacturing cost of the final fabrics or textile products.

Summary of Invention

Technical Problem

[0008] The inventors of the present invention have completed the invention by developing a fabric which may allow an increase in the productivity of fabrics with a cut loop group and a decrease in manufacturing cost, easily catch foreign substances such as fine dust particles, human hair or the like when applied in a textile product for cleaning, and maximize characteristics such as polishing properties, sliding properties, absorbency, rapid drying properties, texture, etc.

[0009] Therefore, the object of the present invention is to provide a fabric with a cut loop group which may easily catch foreign substances such as fine dust particles, human hair or the like when applied in a textile product for cleaning, and maximize characteristics such as polishing properties, sliding properties, absorbency, rapid drying properties, texture, etc.

[0010] Further, the present invention is direct to providing a method of manufacturing a fabric with a cut loop group, by which the fabric is effectively manufactured.

[0011] Further, the present invention is direct to providing a textile product manufactured using the fabric with a cut loop group.

Solution to Problem

[0012] To achieve above described objectives, the present invention provides a fabric with a cut loop group, including: a ground fabric in a woven or knitted form, which is formed of ground yarn; loop yarn formed on at least one surface of the ground fabric by weaving or knitting yarn; and a cut loop layer formed by cutting at least one portion of the loop yarn, wherein the yarn is manufactured by positioning at least one first yarn formed of one or two or more strands of fiber and at least one second yarn formed of one or two or more strands of fiber parallel to each other, and intermingling the first yarn and the second yarn to be nipped together, and a fineness of the first yarn and a fineness of the second yarn are different from each other.

[0013] Further, the present invention provides a method of manufacturing a fabric with a cut loop group, including: forming loop yarn on at least one surface of a ground fabric in a woven or knitted form using yarn; and cutting at least one portion of the loop yarn and performing a finishing process to form a cut loop layer, wherein the yarn is manufactured by positioning at least one first yarn formed of one or two or more strands of fiber and at least one second yarn formed of one or two or more strands of fiber parallel to each other, and intermingling the first yarn and the second yarn by nipping longitudinally, and a fineness of the first yarn and a fineness of the second yarn are different from each other.

[0014] The fineness of the first yarn may range from 4 to 60 deniers, and the fineness of the second yarn may range from 0.002 to 3.5 deniers.

[0015] A total fineness of the first yarn may range from 20 to 400 deniers, and a total fineness of the second yarn may range from 20 to 600 deniers.

[0016] The fiber of the first yarn may include at least one selected from the group consisting of a natural plant fiber, a natural animal fiber, regenerated fiber, a semisynthetic fiber and a synthetic fiber.

[0017] The fiber of the first yarn may be synthetic fiber divided yarn.

[0018] The synthetic fiber divided yarn may include polyester fiber divided yarn, nylon fiber divided yarn or rayon fiber divided yarn.

[0019] The fiber of the second yarn may include at least one selected from the group consisting of rayon, polyester, polyamide, polyvinylidene chloride and polypropylene.

[0020] The second yarn may be a split-type microfiber or sea island yarn, and preferably, the second yarn may be a split-type microfiber formed of polyester and nylon.

[0021] The first yarn or the second yarn may be twisted yarn.

[0022] The intermingling may be performed at predetermined intervals in the longitudinal direction.

[0023] The intermingling may be performed at intervals of 2 mm to 1 m.

[0024] The intermingling may be performed by an air intermingling method, in which compressed air is blown in.

[0025] A cut loop may have a length of 1 to 50 mm.

[0026] The finishing process may include a caustic reduction.

[0027] Cut loops of the cut loop layer may have a form in which the first yarn outwardly protrudes due to shrinking of the second yarn after performing the caustic reduction.

[0028] The finishing process may include a caustic reduction and a dyeing process.

[0029] The dyeing process may be performed at 100 to 150 °C for 30 to 60 minutes.

[0030] Cut loops of the cut loop layer in which the first yarn outwardly protrudes from the second yarn, may have an end which is in a hook shape due to being bent by heat, after performing the dyeing process.

[0031] Further, the present invention provides a textile product formed by processing the fabric.

[0032] The textile product may be any one selected from the group including dishcloths, rags, kitchen mats, bathroom mats, towels, bath gloves, and dandruff removers.

Advantageous Effects of Invention

[0033] The fabric with a cut loop group manufactured using the method according to the present invention can increase the productivity of fabrics and decrease the manufacturing cost by using yarns manufactured though easy processes as compared to when using the existing yarn which is manufactured by yarn twisting the covering yarn into the core yarn. Especially, the fabric has a form in which the first yarn outwardly protrudes due to shrinking of the second yarn and the end of the first yarn is bent to become a hook-like shape, and thus the first yarn serves as a hook and easily catches extremely fine dust particles, human hair or the like, and polishing properties, sliding properties, absorbency, rapid drying properties and texture become excellent owing to the second yarn. Accordingly, the fabric with a cut loop group according to the present invention can be used usefully in the products such as various type of mats, towels, bathroom products or the like including dishcloths and rags.

Brief Description of Drawings

[0034] FIG. 1 is a photograph showing the surface of fabrics manufactured according to one exemplary embodiment of the present invention.

Detailed Description of Embodiment

[0035] Hereinafter, the present invention will be described in further detail.

[0036] A fabric with a cut loop group according to the present invention includes a ground fabric in a woven or knitted form, which is formed of ground yarn; loop yarn formed on at least one surface of the ground fabric by weaving or knitting yarn; and a cut loop layer formed by cutting at least one portion of the loop yarn.

[0037] The fabric with a cut loop group may be manufactured by forming loop yarn on at least one surface of a ground fabric in a woven or knitted form using yarn; and cutting at least one portion of the loop yarn and performing a finishing process to form a cut loop layer.

[0038] Here, the yarn is manufactured by positioning at least one first yarn formed of one or two or more strands of fiber and at least one second yarn formed of one or two or more strands of fiber parallel to each other, and intermingling the first yarn and the second yarn by nipping longitudinally, and the fineness of the fiber of the first yarn is different from the fineness of the fiber of the second yarn.

[0039] According to the present invention, the fabric with a cut loop group is characterized by the structure of the yarn used to manufacture the fabric with a cut loop group.

[0040] The yarn includes at least one first yarn and at least one second yarn.

[0041] The first yarn may be formed of one or two or more strands of fiber. The second yarn may also be formed of one or two or more strands of fiber.

[0042] According to the present invention, the fineness of the fiber forming the first yarn is different from the fineness of the fiber forming the second yarn. In one example, the fineness of the fiber forming the first yarn may be greater than the fineness of the fiber forming the second yarn.

[0043] For example, the fiber of the first yarn may have fineness in the range of 4 to 60 deniers, and the second yarn may have fineness in the range of 0.002 to 3.5 deniers. Moreover, the first yarn may have total fineness in the range of 20 to 400 deniers, and the second yarn may have total fineness in the range of 20 to 600 deniers.

[0044] When fabrics with a cut loop group are manufactured using the yarn according to the present invention, the first yarn is relatively thick, and thus functions to enhance restitution and resilience by increasing the coefficient of restitution. Accordingly, when the manufactured fabrics are used in rags, the cleaning efficiency degraded due to a decrease in sliding properties may be prevented because the cut loops are immediately restored even they are pressed by pressure. It is preferable that the fiber of the first yarn has fineness in the range of 4 to 60 deniers, and the first yarn has total fineness in the range of 20 to 400 deniers for the first yarn to exhibit a sufficient effect.

[0045] Here, when the fiber forming the first yarn has fineness less than 4 deniers, and the first yarn has total fineness less than 20 deniers, there is a disadvantage that the restitution and resilience of cut loops may be insufficiently enhanced when the fabric with a cut loop group is manufactured using the yarn. Further, when the fiber forming the first yarn has fineness more than 60 deniers, and the first yarn has total fineness more than 400 deniers, there is a problem in which scratches may be formed on a surface cleaned with a textile product formed of the fabric with a cut loop group manufactured using the yarn.

[0046] When fabrics with a cut loop group are manufactured using the yarn according to the present invention, the second yarn is relatively thin, and thus functions to enhance absorbency or rapid drying properties and texture. Accordingly, when the manufactured fabrics are used in cleaning or as a bath gown or the like, excellent absorbency, rapid drying properties, and good texture may be exhibited due to the second yarn. It is preferable that the fiber of the second yarn has fineness in the range of 0.002 to 3.5 deniers, and the second yarn has total fineness in the range of 20 to 600 deniers for the second yarn to exhibit a sufficient effect.

[0047] When the fiber forming the second yarn has fineness less than 0.002 deniers, and the second yarn has total fineness less than 20 deniers, rapid drying properties are decreased when the fabric with a cut loop group is manufactured using the yarn. Further, when the fiber forming the second yarn has fineness more than 3.5 deniers and the first yarn has total fineness more than 600 deniers, there is a problem in which absorbency is reduced and texture is degraded.

[0048] The first yarn may be formed of one or two or more strands of fiber. When the first yarn is formed of two or more strands of fiber, the strands of fiber may have the same fineness, or may have different fineness. Furthermore, when the first yarn is formed of two or more strands of fiber, materials forming the strands may be identical or different. Moreover, when the first yarn is formed of two or more strands of fiber, the first yarn may be manufactured by yarn twisting or intermingling to form one thread.

[0049] Here, yarn twisting refers to combining and twisting more than two strands into a single thread; in general, directions of the twist during the yarn twisting process are denoted by two types; the one which is twisted to the left is

referred to as a left-handed twist or Z-twist while the one which is twisted to the right is referred to as a right-handed twist or S-twist. Machines widely used in such yarn twisting include a ring twister and a flyer twister.

[0050] Preferably, the fiber of the first yarn may include at least one selected from the group consisting of a natural plant fiber, a natural animal fiber, regenerated fiber, a semisynthetic fiber and a synthetic fiber.

[0051] The fiber of the first yarn may be preferably synthetic fiber divided yarns. The synthetic fiber divided yarns may be polyester fiber divided yarns, nylon fiber divided yarns or rayon fiber divided yarns. It is preferable to use the synthetic fiber divided yarns with 2 to 50 strands of fiber. For example, the polyester fiber divided yarns which are currently commercially available have a fineness of 200 D (denier)/10 F (filament), 300 D/10 F, 320 D/8 F, 300 D/6 F or the like, the nylon fiber divided yarns have a fineness of 180 D/12 F, 240 D/12 F or the like, and the rayon fiber divided yarn have a fineness of 200 D/10 F, 300 D/10 F, 320 D/8 F, 300 D/6 F or the like, but the present invention is not limited thereto.

[0052] The second yarn may be formed of one or two or more strands of fiber. When the second yarn is formed of two or more strands of fiber, the strands may have the same fineness, or may have different fineness. Furthermore, when the second yarn is formed of two or more strands of fiber, materials forming the strands may be identical or different. Moreover, when the second yarn is formed of two or more strands of fiber, the second yarn may be manufactured by yarn twisting or intermingling to form one thread.

[0053] The fiber of the second yarn may include at least one selected from the group consisting of rayon, polyester, polyamide, polyvinylidene chloride and polypropylene.

[0054] The second yarn may be a split-type microfiber or sea island yarn.

[0055] Here, any split-type microfiber and sea island yarn which are generally known in the field may be used without limitation. For example, the second yarn may be a split-type microfiber formed of polyester and nylon.

[0056] In order to manufacture yarn using the aforementioned first yarn and second yarn, at least one first yarn and at least one second yarn are positioned parallel to each other, and the first yarn and the second yarn are intermingled by nipping longitudinally, according to the present invention.

[0057] Here, any method which is generally known in the field may be used without limitation for intermingling. For example, the intermingling may be formed by an air intermingling method in which compressed air is blown in. However, the method of intermingling may be variously modified as necessary, and for example, the first yarn and second yarn may be intermingled by heat pressure.

[0058] Here, intermingling may be formed over the entire longitudinal direction. The intermingling may be preferably formed at predetermined intervals in the longitudinal direction. The intermingling may be preferably formed at intervals of 2 mm to 1 m. When the intermingling is formed at the aforementioned intervals, the manufactured yarn may be used to manufacture woven or knitted fabrics.

[0059] As described above, when the yarn is manufactured by positioning at least one first yarn and at least one second yarn parallel to each other and intermingling without using the existing method, there are advantages that the yarn manufacturing process becomes simple and the yarn manufacturing cost may be largely reduced (about 60 to 70%) as compared to the existing method of manufacturing yarn in which the covering yarn is twisted into the core yarn. Moreover, when the yarn according to the present invention is used to manufacture a fabric with a cut loop group which may be effectively used for cleaning, textile products may exhibit an effect equal to or higher than existing products.

[0060] According to the present invention, fabrics with a cut loop group are manufactured using the yarn. The fabric with a cut loop group according to the present invention includes a ground fabric in a woven or knitted form, which is formed of a ground yarn; a loop yarn formed on at least one surface of the ground fabric by weaving or knitting yarn; and a cut loop layer formed by cutting at least one portion of the loop yarn and performing a weight deduction process thereon.

[0061] Here, those skilled in the art may easily form the ground fabrics and the loop yarns on at least one surface of the ground fabric, and form the cut loop layer by cutting the loop yarns using a common pile weaving machine.

[0062] For example, types of the fabrics obtained by the pile weaving machine according to the present invention may include a pile woven fabric such as a single-side pile, a double-side pile, a double velvet pile or the like, and pile knitted fabric obtained by a tricot knitting machine, a Raschel knitting machine, a sinker pile knitting machine, and a sseal knitting machine.

[0063] For example, in the fabric according to the present invention, the ground fabric may be manufactured using a weft and a warp, the loop yarn may be formed on one or both sides of the ground fabric using yarn as the warp, and the cut loop layer may be formed by cutting the loop yarn.

[0064] Here, the length of the cut loops of the cut loop layer may be controlled in consideration of the application of the manufactured fabric. Preferably, the length of the cut loops may be in the range of 1 to 50 mm.

[0065] That is, cutting may be performed after adjusting the length of the loops outwardly protruding from the ground fabric through the general raising process to match with the usage of the fabric manufactured according to the present invention.

[0066] For example, when the manufactured fabric is to be used for a bathroom application such as a towel or the like, the suitable length of the cut loops is in the range of 2 to 5 mm, when the manufactured fabric is to be used for

kitchen applications such as sponges, gloves or the like, the suitable length of the cut loops is in the range of 5 to 8 mm, and when the manufactured fabric is to be used for a rag, the suitable length of the cut loops is in the range of 8 to 25 mm.

[0067] The raising and cutting may be performed using a raising machine, a cutting machine (shearing machine) and the like which are commonly used in the field, but the present invention is not limited thereto.

[0068] When cutting is completed, a finishing process which is generally performed in the field may be carried out. For example, the finishing process may be a caustic reduction, a dyeing process, etc.

[0069] For example, the caustic reduction may be performed by treating yarn with an alkaline solution at 100 to 130 °C for 30 to 60 minutes for splitting, weight deduction and shrinking of the second yarn forming the yarn.

[0070] For example, when the second yarn is a split-type microfiber formed of polyester and nylon, polyester is partially hydrolyzed to generate disodium terephthalate (hereinafter referred to as "DST") and ethylene glycol as soluble byproducts and polyamide (nylon) is separated during the caustic reduction. That is, the weight deduction, splitting and shrinking of the second yarn occur due to the caustic reduction. Particularly, the shrinking of the second yarn intensively occurs at the section where the loops are cut, and thus the first yarn at the section where the loops are cut outwardly protrudes from the second yarn. That is, the cut loops of the cut loop layer have a form in which the first yarn outwardly protrudes due to shrinking of the second yarn after the caustic reduction.

[0071] Any solution used for the common caustic reduction may be used as the alkaline solution without limitation, and for example, sodium hydroxide (NaOH) may be used.

[0072] When the first yarn outwardly protrudes from the second yarn through the aforementioned process, the first yarn may wipe by easily catching foreign substances such as extremely fine dust particles, human hair or the like, and thus polishing properties and sliding properties may be improved. Further, the second yarn is split to a plurality of microfibers by the caustic reduction, and thus the split microfibers enhance polishing properties, sliding properties, absorbency, rapid drying properties and texture.

[0073] Weight deduction in the caustic reduction is highly affected by the concentration and the treatment temperature of an alkaline solution, for example, sodium hydroxide (NaOH). It is preferable to perform weight deduction at 100 to 130 °C for 30 to 60 minutes in consideration of a shrinkage rate.

[0074] After the caustic reduction, a water-washing process may be performed to remove the generated byproducts of the hydrolyzing process. The water-washing process may include cleaning and refining processes. Here, cleaning may be water-washing using warm water at 70 to 80 °C. Refining is a process for removing foreign substances by injecting a refining agent during the water-washing process, and generally used sodium carbonate, sodium silicate or the like may be used. If necessary, tribasic sodium phosphate may be used to remove DST.

[0075] A dyeing process to dye the manufactured fabrics at high temperature may be further included after the caustic reduction, selectively. Here, dyeing may be easily performed using the methods which are commonly used in the field.

[0076] As necessary, an acid treatment may be performed before the dyeing and after the refining in the water-washing process to facilitate dyeing of the fabrics manufactured by the caustic reduction. The acid treatment may performed by adjusting pH to be in the range of 4 to 5 using an acid treatment agent RC Hydro (RC Cleaning, a product of Hansol Co. Ltd., Korea) which is used for a general dyeing process.

[0077] Dyes for the dyeing process may be dyes used for polyester microfibers or polyester and polyamide microfibers. Examples of the dyes may include Dianix fla vaine xf, Dianix red, cbn xf, (all these are the products of Dystar, a multinational company), etc. A variety of colors ranging from light colors to dark colors are available for dyeing.

[0078] Dyeing may be performed together with a dispersing agent, a leveling agent, a fiber softener, and an antibacterial agent in addition to dyes when dyeing. Dyeing may also be performed together with chloroxylenol which has an excellent effect of removing viruses.

[0079] The dyeing may be performed at 100 to 150 °C for 30 to 60 minutes.

[0080] When dyeing is performed at such a high temperature, the end of the first yarn, which is outwardly protruding from the section of the cut loops, becomes a hook-like shape by bending due to the heat. As described above, when the end of the first yarn becomes a hook-like shape by a high temperature dyeing process, foreign substances such as extremely fine dust particles, human hair or the like may be easily caught and removed, and thus polishing properties and sliding properties are maximized.

[0081] A dyed fabric may be obtained after completion of the dyeing process followed by water-washing and drying, and the water-washing and drying may be easily performed by applying the methods which are commonly performed in the field of dyeing fabrics.

[0082] As described above, a photograph of the surface of the fabric with a cut loop group according to the present invention is shown in FIG. 1. As shown in the photograph, the fabric has a form in which the first yarn outwardly protrudes from the second yarn, and the first yarn has sufficient restitution and resilience, and thus, when the fabrics are used for cleaning, even though they are pressed by a predetermined pressure, they are restituted instantly, and even when water is being absorbed, sliding properties are not degraded, and thus a decrease in cleaning properties may be prevented. Especially, the end of the first yarn which outwardly protruded was bent due to the heat during the high temperature dyeing process to have a hook-like shape, and thus the first yarn serves as a hook and easily catches extremely fine

dust particles, human hair or the like while cleaning, and therefore polishing properties and sliding properties are maximized. Furthermore, the second yarn allows for absorbency, rapid drying properties and texture to be excellent.

[0083] Accordingly, fabrics manufactured in accordance with the present invention can be used for various uses through processing after cutting them to predetermined sizes. Therefore, the present invention provides textile products made through processing of fabrics with a cut loop group manufactured in accordance with the present invention.

[0084] The above-described textile products may be one selected from the group including dishcloths, rags, kitchen mats, bathroom mats, towels, bath gloves, and dandruff remover cleaners.

[0085] For example, after the fabrics manufactured in accordance with the present invention are cut into pieces to have a predetermined size, they are used in making rags which have excellent polishing properties. Besides, the fabrics may be utilized for various uses such as mats installed in a bathroom or a kitchen, or golf turf and the like. Especially when it is used as a mat installed in a bathroom or a kitchen, not only the surroundings are kept clean by absorbing wetness from a wet body or scattered water during washing in the kitchen or bathroom but also, a floor may be prevented from becoming slippery due to the wetness of the scattered water; and there is an advantage in that since the rebound resilience of the cut loop is high, the raised yarn is upright and has superior cushioning properties and good texture during the usage thereof.

[0086] Hereinafter, the present invention will be described in more detail with reference to the following exemplary embodiments, which are presented only for better understanding of the present invention and not to limit the present invention thereto.

<Example 1>

[0087] 300 D/10 F polyester fiber divided yarn was used as the first yarn, and a split-type microfiber formed of 150 D/72 F nylon and polyester (each filament is a 16 split-type, composed of 80 wt % polyester and 20 wt % polyimide (nylon)) was used as the second yarn. After one strand of the first yarn and two strands of the second yarn were positioned parallel to one another, intermingling was performed at intervals of 5 mm to form one thread. Here, intermingling was performed by an air intermingling pirn winder (Daewon Industrial Co., Ltd.)

[0088] The manufactured yarn was weaved after being organized to have a loop group during the weaving on a circular knitting machine. After the raising process was performed, cutting was performed to manufacture fabrics having cut loop lengths of 8 mm.

[0089] The manufactured fabrics were treated in a sodium hydroxide solution (10 wt % NaOH was used) at 130 °C for 30 minutes. Then, they were cleaned by spraying 60 °C warm water and then refined using a refining agent. Thereafter, they were subjected to an acid treatment such that the pH was 4.5 using RC Hydro (a product of Hansol Co. Ltd., Korea), and dyeing was performed at 130 °C for 30 minutes in a dyeing bath together with a black dye Dianix Black (a product of Dystar), a dispersing agent DC-505 (a product of Shin Kwang Chemical Industry Co. Ltd.), an antistatic agent Anol-25B (a product of Shin Kwang Chemical Industry Co. Ltd.), and a fiber softener 3M (a product of Shin Kwang Chemical Industry Co. Ltd.). Then, water-washing and drying processes were performed to obtain final fabrics.

[0090] A photograph of the surface of the manufactured fabric is shown in FIG. 1.

<Example 2>

[0091] Fabrics were manufactured in the same manner as in Example 1 except that yarn manufactured according to the following method was used.

[0092] Yarn: a polyester fiber divided yarn of 200 D/10 F was used as the first yarn, and a split-type microfiber formed of 120 D/10 F nylon and polyester (each filament is a 16 split-type, composed of 80 wt % polyester and 20 wt % polyimide (nylon)) was used as the second yarn. After 2 strands of the first yarn and 4 strands of the second yarn were positioned parallel to one another, intermingling was performed at intervals of 5 mm to form one thread. Here, intermingling was performed by an air intermingling pirn winder (Daewon Industrial Co., Ltd.)

<Example 3>

[0093] Fabrics were manufactured in the same manner as in Example 1 except that yarn manufactured according to the following method was used.

[0094] Yarn: a nylon fiber divided yarn of 180 D/12 F was used as the first yarn, and a split-type microfiber formed of 120 D/10 F nylon and polyester (each filament is a 16 split-type, composed of 80 wt % polyester and 20 wt % polyimide (nylon)) was used as the second yarn. After 2 strands of the first yarn and 4 strands of the second yarn were positioned parallel to one another, intermingling was performed at intervals of 5 mm to form one thread. Here, intermingling was performed by an air intermingling pirn winder (Daewon Industrial Co., Ltd.)

<Example 4>

[0095] Fabrics were manufactured in the same manner as in Example 1 except that yarn manufactured according to the following method was used.

[0096] Yarn: a polyester fiber divided yarn of 300 D/10 F was used as the first yarn, and a split-type microfiber formed of 150 D/72 F and 150 D/48 F nylon and polyester (each filament is a 16 split-type, composed of 80 wt % polyester and 20 wt % polyimide (nylon)) was used as the second yarn. After one strand of the first yarn and two strands of the second yarn were positioned to be parallel to one another, intermingling was performed at intervals of 5 mm to form one thread. Here, intermingling was performed by an air intermingling pirn winder (Daewon Industrial Co., Ltd.)

<Comparative Example 1>

[0097] Fabrics were manufactured in the same manner as in Example 1 except that yarn manufactured according to the following method was used.

[0098] Yarn: a polyester divided yarn of 300 D/10 F was used as core yarn; a split-type microfiber made of 120 D/10 F nylon and polyester (each filament is a 16 split-type, composed of 80 wt % polyester and 20 wt % polyimide (nylon)) was used as covering yarn. The covering yarn was twisted around the core yarn in each of an S-twist and a Z-twist and thereby yarn was manufactured. The yarn twisting was performed by a twisting machine. Firstly, it was twisted to have 600TPM (twists per meter) in the S-twist, and secondly, it was twisted to have 540 TPM in the Z-twist.

<Experimental Example>

[0099] After the fabrics manufactured according to the above described Examples and Comparison Example were cut into squares, the edges were finished, and thereby rags were manufactured. Characteristics in polishing properties, sliding properties, restoring properties, absorbency, rapid drying properties, and texture of the manufactured rags were evaluated according to following methods and the results are shown in Table 1.

Polishing properties

[0100] 50 ml of coffee was poured on a floor covering that measured 2 meters wide and 2 meters long, and wiped off with a rag. Then, it was visually inspected by 30 house wives who were 30 to 40 years old and they evaluated the polishing properties on a scale of excellent, fair, and poor.

Sliding properties

[0101] After 100 ml of water was poured over a rag, and 30 house wives who were 30 to 40 years old wiped a floor covering that was 2 meters wide and 2 meters long. They evaluated sliding properties on a scale of excellent, fair, and poor.

Restitution

[0102] A 10-kg weight (10×200×200 mm) was put on a surface of the rag for 30 seconds and then the weight was removed. After 30 seconds has passed, the surface of the rag was observed with the naked eye and the restitution was evaluated as good, if the cut loops were recovered, or poor, if they remained depressed.

Water Absorbency

[0103] The absorbency was evaluated as follows: the rag was cut to a width of 2 cm, and while 1 cm of the bottom thereof was immersed in water, the time required for the water to rise by 1 cm was measured to evaluate the absorbency.

Drying Ability

[0104] The rag was weighed, 10 g of water was poured over a surface thereof, and then the rag was dried at room temperature. The drying ability was evaluated by measuring the time required for the weight of the rag to return to its initial weight.

Texture

[0105] 30 housewives in their 30s to 40s were asked to touch a surface of the rag and evaluate the texture on a scale

of very good (5 points), good (4 points), fair (3 points), poor (2 points), and very poor (1 point), and an average thereof was taken.

Color fastness to washing

[0106] The test was conducted by a standard method in accordance with KS K ISO 105-C01:207 (40 ± 2 °C, 30 minutes, 1% Spark(manufactured by Aekyung Co., Ltd.)).

<Table 1>

Classification		Example 1	Example 2	Example 3	Example 4	Comparative Example 1
Polishing properties (number of respondents)	Good	28	28	27	28	24
	Fair	2	2	3	2	5
	Poor	0	0	0	0	1
Sliding properties (number of respondents)	Good	29	28	28	27	24
	Fair	1	2	2	3	4
	Poor	0	0	0	0	2
Restitution		Good	Good	Good	Good	Good
Water absorbency (sec)		1.0	0.9	1.1	1.4	1.6
Rapid drying properties (min)		180	170	180	170	180
Texture		4.9	4.6	4.6	4.6	4.6
Color fastness to wash (grade)	Discoloration	4-5	4-5	4-5	4-5	4-5
	Contamination (polyester)	4-5	4-5	4-5	4-5	4-5

[0107] As shown in Table 1 above, it can be recognized that rags that were produced using the yarn that was prepared according to Examples 1 to 4 of the present invention exhibit excellent polishing properties, sliding properties, and texture, in comparison to the fabric of Comparative Example 1 that was prepared according to a conventional method.

Claims

1. A fabric with a cut loop group, comprising:

a ground fabric in a woven or knitted form, which is formed of ground yarn;
loop yarn formed on at least one surface of the ground fabric by weaving or knitting yarn; and
a cut loop layer formed by cutting at least one portion of the loop yarn,
wherein the yarn is manufactured by positioning at least one first yarn formed of one or two or more strands of fiber and at least one second yarn formed of one or two or more strands of fiber parallel to each other, and intermingling the first yarn and the second yarn by nipping longitudinally, and
a fineness of the first yarn and a fineness of the second yarn are different from each other.

2. The fabric of claim 1, wherein a fineness of the first yarn ranges from 4 to 60 deniers and a fineness of the second yarn ranges from 0.002 to 3.5 deniers.

3. The fabric of claim 1, wherein a total fineness of the first yarn ranges from 20 to 400 deniers and a total fineness of the second yarn ranges from 20 to 600 deniers.

4. The fabric of claim 1, wherein the fiber of the first yarn includes at least one selected from the group consisting of a natural plant fiber, a natural animal fiber, regenerated fiber, a semisynthetic fiber and a synthetic fiber.

5. The fabric of claim 1, wherein the fiber of the first yarn is synthetic fiber divided yarn.

6. The fabric of claim 5, wherein the synthetic fiber divided yarn includes polyester fiber divided yarn, nylon fiber divided yarn or rayon fiber divided yarn.

7. The fabric of claim 1, wherein the fiber of the second yarn includes at least one selected from the group consisting of rayon, polyester, polyamide, polyvinylidene chloride and polypropylene.

8. The fabric of claim 1, wherein the second yarn is a split-type microfiber or sea island yarn.

9. The fabric of claim 8, wherein the second yarn is a split-type microfiber formed of polyester and nylon.

10. The fabric of claim 1, wherein the first yarn or the second yarn is twisted yarn.

11. The fabric of claim 1, wherein the intermingling is performed at predetermined intervals in the longitudinal direction.

12. The fabric of claim 11, wherein the intermingling is performed at intervals of 2 mm to 1 m.

13. The fabric of claim 1, wherein the intermingling is performed by an air intermingling method, in which compressed air is blown in.

14. The fabric of claim 1, wherein a cut loop has a length of 1 to 50 mm.

15. The fabric of claim 1, wherein a cut loop of the cut loop layer has a form in which the first yarn outwardly protrudes due to shrinking of the second yarn.

16. The fabric of claim 1, wherein a cut loop of the cut loop layer in which the first yarn outwardly protrudes from the second yarn, has an end which is in a hook shape due to being bent by heat.

17. A method of manufacturing a fabric with a cut loop group, comprising:

forming loop yarn on at least one surface of a ground fabric in a woven or knitted form using yarn; and
cutting at least one portion of the loop yarn and performing a finishing process to form a cut loop layer,
wherein the yarn is manufactured by positioning at least one first yarn formed of one or two or more strands of fiber and at least one second yarn formed of one or two or more strands of fiber parallel to each other, and intermingling the first yarn and the second yarn by nipping longitudinally, and
a fineness of the first yarn and a fineness of the second yarn are different from each other.

18. The method of claim 17, wherein a fineness of the first yarn ranges from 4 to 60 deniers and a fineness of the second yarn ranges from 0.002 to 3.5 deniers.

19. The method of claim 17, wherein a total fineness of the first yarn ranges from 20 to 400 deniers and a total fineness of the second yarn ranges from 20 to 600 deniers.

20. The method of claim 17, wherein a cut loop has a length of 1 to 50 mm.

21. The method of claim 17, wherein the finishing process includes a caustic reduction.

22. The method of claim 21, wherein the cut loop of the cut loop layer has a form in which the first yarn outwardly protrudes due to shrinking of the second yarn after performing the caustic reduction.

23. The method of claim 17, wherein the finishing process includes a caustic reduction and a dyeing process.

24. The method of claim 23, wherein the dyeing process is performed at 100 to 150 °C for 30 to 60 minutes.

25. The method of claim 24, wherein a cut loop of the cut loop layer in which the first yarn outwardly protrudes from the second yarn, has an end which is in a hook shape due to being bent by heat, after performing the dyeing process.

26. A textile product formed by processing the fabric of claims 1 to 16.

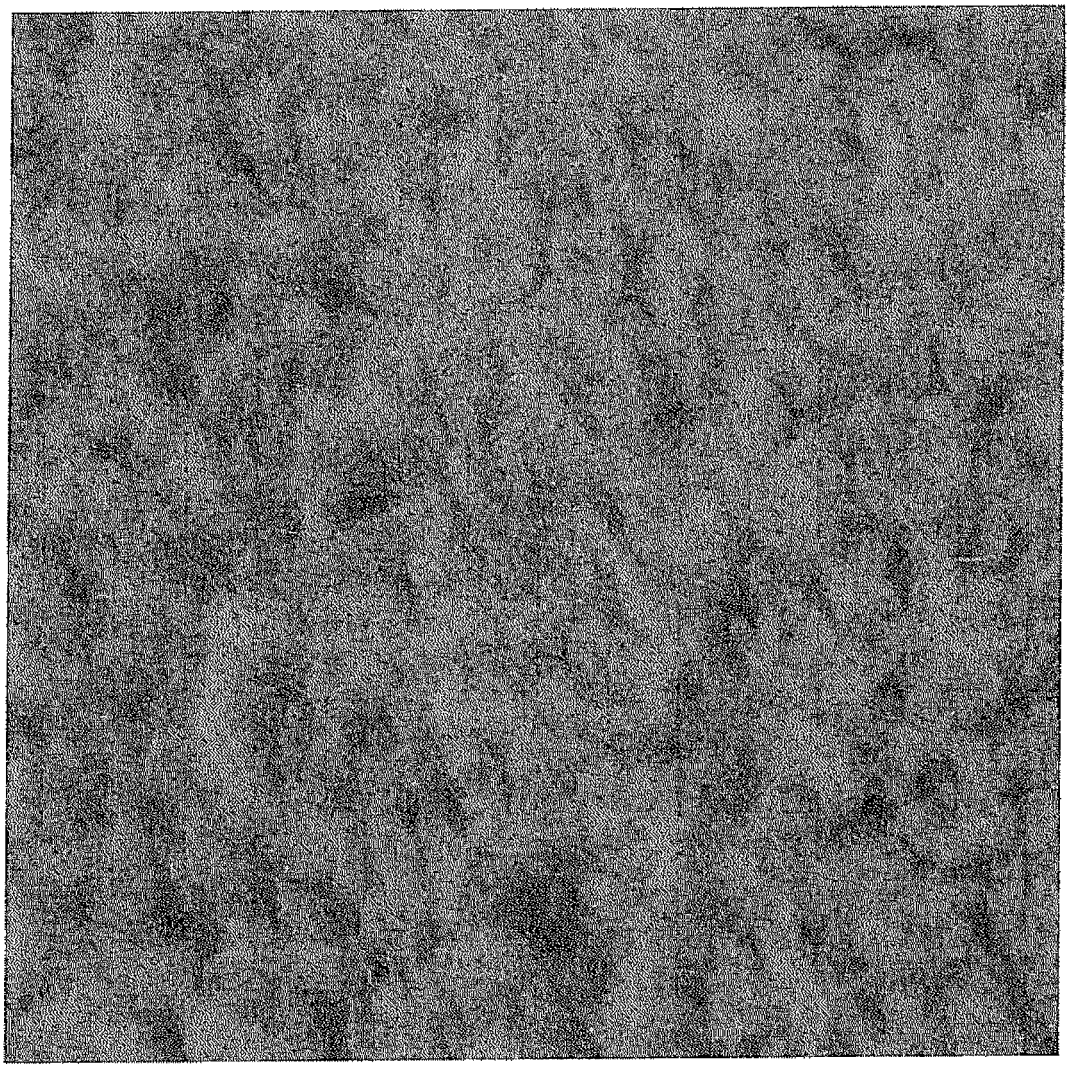
27. The textile product of claim 26, wherein a textile product is any one selected from the group including dishcloths, rags, kitchen mats, bathroom mats, towels, bath gloves, and dandruff removers.

28. A fabric with a cut loop group manufactured by the method of claims 17 to 25.

29. A textile product formed by processing the fabric of claim 28.

30. The textile product of claim 29, wherein a textile product is any one selected from the group including dishcloths, rags, kitchen mats, bathroom mats,
towels, bath gloves, and dandruff removers.

Fig. 1



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2015/013099

A. CLASSIFICATION OF SUBJECT MATTER

D03D 11/00(2006.01)i, D03D 13/00(2006.01)i, D03D 15/00(2006.01)i, D03D 1/00(2006.01)i

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)

D03D 11/00; D02G 3/38; D02G 1/18; D06C 11/00; D03D 27/00; D01F 6/62; D01D 5/20; D04B 1/04; D03D 13/00; D03D 15/00; D03D 1/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models: IPC as above
Japanese Utility models and applications for Utility models: IPC as above

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

eKOMPASS (KIPO internal) & Keywords: cut-loop, loop yarn, inter, confounding, intermingle, interlacing, mother yarn for split, split-type microfiber, sea-island fiber

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-1326213 B1 (CLEMBON CO., LTD.) 11 November 2013 See abstract; claims 1, 8; and paragraphs [0010], [0053].	1-25
Y	KR 10-0737976 B1 (SAEHAN INDUSTRIES INCORPORATION) 13 July 2007 See abstract; claims 1, 2; and pages 4, 5.	1-25
Y	KR 10-0716623 B1 (CHOI, Sung Hoon) 09 May 2007 See abstract; claim 1; and pages 4, 5.	5,6,8,9,15,16,22 ,25
Y	KR 10-1258053 B1 (CHOI, Jin Hwa) 24 April 2013 See abstract; and claim 1.	10
A	KR 10-1994-0014988 A (TONG YANG POLYESTER CO., LTD.) 19 July 1994 See abstract; and claims 1, 2.	1-25
E	KR 10-2015-0136365 A (CLEMBON CO., LTD.) 07 December 2015 See the entire document.	1-25

☐ 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
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" 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 such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 OCTOBER 2016 (27.10.2016)	**31 OCTOBER 2016 (31.10.2016)**
Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon, 189 Seonsa-ro, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2015/013099

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: **27, 29, 30**
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
Claims 27, 29, and 30 refer to a claim, which does not comply with the second sentence of PCT Rule 6.4(a).

3. ☒ Claims Nos.: **26, 28**
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2015/013099

Patent document cited in search report	Publication date	Patent family member	Publication date
KR 10-1326213 B1	11/11/2013	CN 104024503 A CN 104024503 B JP 2015-504982 A US 2014-0356569 A1 WO 2014-046364 A1	03/09/2014 16/03/2016 16/02/2015 04/12/2014 27/03/2014
KR 10-0737976 B1	13/07/2007	NONE	
KR 10-0716623 B1	09/05/2007	NONE	
KR 10-1258053 B1	24/04/2013	NONE	
KR 10-1994-0014988 A	19/07/1994	NONE	
KR 10-2015-0136365 A	07/12/2015	KR 10-1609328 B1	05/04/2016

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- KR 929510 **[0005]**
- KR 716623 **[0005]**