

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
3 April 2008 (03.04.2008)

PCT

(10) International Publication Number
WO 2008/038850 A1

(51) International Patent Classification:
D03D 11/00 (2006.01) D03D 13/00 (2006.01)

(21) International Application Number:
PCT/KR2006/003938

(22) International Filing Date:
29 September 2006 (29.09.2006)

(25) Filing Language: English

(26) Publication Language: English

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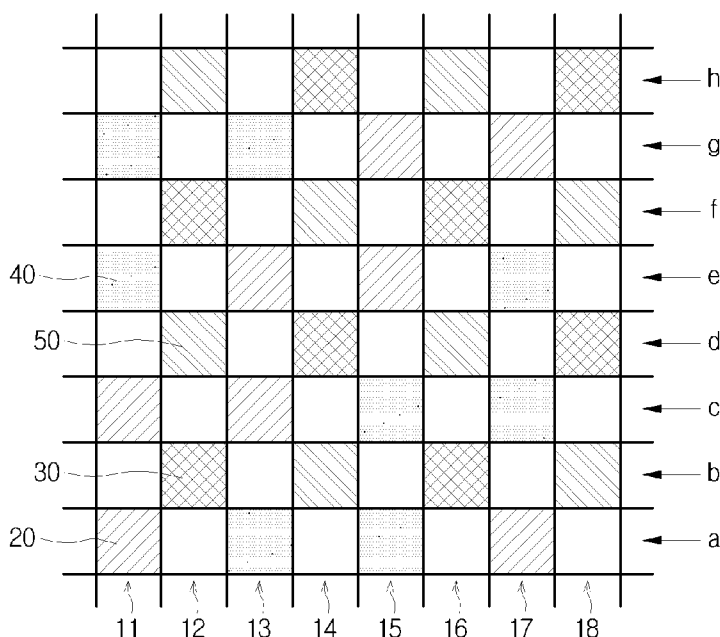
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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP,
KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT,
LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ,
NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU,
SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,
RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report

(54) Title: ABRASIVE BACKING, METHOD FOR MANUFACTURING ABRASIVE BACKING, AND ABRASIVE CLOTH



(57) Abstract: The present invention provides abrasive backing that has high tension, low extension rate, and superior smoothness, and a method of manufacturing the abrasive backing and abrasive cloth including this abrasive backing. One aspect of the present invention provides abrasive backing which includes a upper weave and lower weave; binding yarns that connect the upper weave and the lower weave. Said upper weave and the lower weave are heat-set after spreading the weave with a tenter in the weft direction. Further, the upper weave and the lower weave may be made simultaneously.

WO 2008/038850 A1

Description

ABRASIVE BACKING, METHOD FOR MANUFACTURING ABRASIVE BACKING, AND ABRASIVE CLOTH

Technical Field

- [1] The present invention relates to an abrasive backing, a method of producing the abrasive backing and abrasive cloth using such an abrasive backing. Particularly, it relates to an abrasive backing which has advantageous and improved functions for manufacturing weft direction sectional wide belts, a method of manufacturing this abrasive backing and abrasive cloth that includes this abrasive backing.

Background Art

- [2] An abrasive backing has been used by reprocessing to products such as sheets, rolls, belts, and rings etc., according to its usage. Particularly, in case of abrasive belts, the provision of sectional abrasive belts of more than 1650mm width is in need for the purpose of automating the manufacturing facility for an object to be ground, and improving the productivity. In case of existing abrasive cloth, because of limitations in processing it is impossible to produce a belt wider than 1390mm, so there was no choice but to continuously seam many pieces of abrasive cloths in order to produce ultrawide abrasive belt. This is also called a sectional wide belt.
- [3] In case of the sectional wide belt, serious problems that the abrasive belt shakes or is easily broken in use, and the quality of the objects to be ground deteriorates by the juncture formed in the seaming. Therefore, the improvement of the quality of sectional wide belts has been continuously requested.
- [4] Further, in manufacturing the existing abrasive backing and abrasive cloth, the discrepancy in velocity of roller allows uniform tension in the warp direction, so that the warp of the abrasive backing becomes to have lower extension rate and higher tension than the weft. Therefore, also in case of using the abrasive cloth containing this abrasive backing to produce the abrasive belts, the final product, this abrasive belt surely have strength and low extension rate by joining the abrasive belt in the warp direction. Therefore, so far no processing was conducted in the weft direction to guarantee low extension rate and high tension.
- [5] However, a method of joining the abrasive cloth, not in the warp direction but in the weft direction to manufacture the abrasive belt without limitation of width in producing the sectional wide belts, is recently on the rise. But if the sectional wide belts are produced by using the existing abrasive backing in which no tension was given in the weft, the abrasive belts tend to easily extend and break off or tilt to one side during rotating. This may cause unexpected abrasion of an object to be ground,

and raises danger of a fire. Therefore, although the weft is required to have low extension rate and high tension to produce weft direction sectional wide belts, so far abrasive backing containing the wefts that have low extension rate and high tension, a method of manufacturing the abrasive backing or abrasive cloth have not been proposed.

Disclosure of Invention

Technical Problem

- [6] The present invention provides an abrasive baking which has advantageous and improved functions for manufacturing weft direction sectional wide belts, a method of manufacturing this abrasive backing and abrasive cloth that includes this abrasive backing. Particularly, it provides abrasive backing containing the wefts that has low extension rate and high tension, a method of manufacturing the abrasive backing and abrasive cloth.

Technical Solution

- [7] One aspect of the invention provides an abrasive backing comprising a upper weave, a lower weave, and a binding yarn that connects the upper weave and the lower weave, the abrasive backing is manufactured by a method comprising:
- [8] arranging a warp of the upper weave and a warp of the lower weave to cross each other;
- [9] fixing the heddles of the lower weave when the wefts are woven into the upper weave, and alternatively, fixing the heddles of the upper weave when the wefts are woven into the lower weave, so that the upper weave and the lower weave are allowed to be woven simultaneously; and
- [10] connecting the upper weave and the lower weave with a binding yarn not to interrupt the composition of the upper weave and the lower weave.
- [11] The upper weave and the lower weave may be woven into a plain weave, a twill weave, a satin weave or modified weaves thereof.
- [12] According to an embodiment of the invention, the upper weave may be woven into a plain weave and the lower weave may be woven into a twill weave. The upper weave may be woven into a plain weave and the lower weave may be woven into a 2/2 twill weave. Such an abrasive backing is woven by arranging the warp that constitutes the plain weave of the upper weave and the warp that constitutes the twill weave of the lower weave to cross each other, and by crossing the warp alternately once to form a plain weave and then to form a twill weave.
- [13] According to a preferred embodiment, it is preferred that the binding yarn connects the upper weave and the lower weave not to overlap each crossing point of the upper weave and the lower weave.

- [14] Further, it is preferred that the binding yarn be the same kind of a yarn with the warp that constitutes the upper weave or the lower weave.
- [15] According to an embodiment of the invention, the upper weave and the lower weave, connected by the binding yarns, may be heat-set after spreading the weave with a tenter in the weft direction. Preferably, the upper weave and the lower weave, connected by the binding yarns, may be heat-set at 180 to 250°C for 1 to 3 minutes after spreading the weave in 1 to 7% in the weft direction.
- [16] Another aspect of the invention provides a method of manufacturing an abrasive backing comprising:
- [17] arranging the warp of the upper weave and the warp of the lower weave to cross each other;
- [18] fixing the heddles of the lower weave when the wefts are woven into the upper weave, and alternatively, fixing the heddles of the upper weave when the wefts are woven into the lower weave, so that the upper weave and the lower weave are allowed to be woven simultaneously; and
- [19] connecting the upper weave and the lower weave with a binding yarn not to interrupt the composition of the upper weave and the lower weave.
- [20] The upper weave and the lower weave may be woven into a plain weave, a twill weave, a satin weave or modified weaves thereof.
- [21] According to an embodiment of the invention, the upper weave may be woven into a plain weave and the lower weave may be woven into a twill weave.
- [22] The binding yarn may be the same kind of a yarn with the warps that constitutes the upper weave or the lower weave. Further, it is preferred that the binding yarn connects the upper weave and the lower weave not to overlap each crossing point of the upper weave and the lower weave.
- [23] According to an embodiment of the invention, the present invention may further include a step that the upper weave and the lower weave are heat-set after spreading at a tenter in the weft direction. Preferably, the upper weave and the lower weave connected by the binding yarn may be heat-set at 180 to 250°C for 1 to 3 minutes, after spreading the weave in 1 to 7% of the weft direction.
- [24] Another aspect of the invention provides abrasive cloth comprising:
- [25] an abrasive backing set forth above; an abrasive material that is sprayed over the abrasive backing; and an adhesive that adheres the abrasive backing and the abrasive material.
- [26] The abrasive material may be sprayed to permeate into the inside of the upper weave and the lower weave respectively, and into the gap between them.

Brief Description of the Drawings

- [27] Fig. 1 is a 1 complete design of a plain weave that forms an upper weave according to an embodiment of the invention;
- [28] Fig. 2 is a 1 complete design of a 2/2 twill weave that forms a lower weave according to an embodiment of the invention;
- [29] Fig. 3 is a 1 complete double weave design of the abrasive backing according to an embodiment of the invention;
- [30] Fig. 4 is a diagram that represents double weaves of the abrasive backing according to an embodiment of the invention;
- [31] Fig. 5 is a sectional diagram of the abrasive backing according to an embodiment of the invention;
- [32] Fig. 6 is a flowchart illustrating a method for manufacturing abrasive cloth according to an embodiment of the invention.
- [33] < Explanatory notes for the essential part of the figures >
- [34] 11, 13, 15, 17: the warps of 2/2 twill
- [35] 12, 14, 16, 18: the warps of plain
- [36] a, c, e, g : the wefts of 2/2 twill
- [37] b, d, f, h: the wefts of plain
- [38] 20: a portion where the warp of 2/2 twill is upside
- [39] 30: a portion where the warp of plain is upside
- [40] 40: a portion where the weft of 2/2 twill is upside
- [41] 50: a portion where the weft of plain is upside
- [42] 70: binding yarn

Mode for the Invention

- [43] Hereinafter, embodiments of an abrasive backing, a method of manufacturing the abrasive backing and abrasive cloth according to the invention will be described in detail with reference to the accompanying drawings. In the description with reference to the accompanying drawings, those components are rendered the same reference number that are the same or in correspondence regardless of the figure number, and redundant explanations are omitted.
- [44] In the present invention, double weaves is referred to as a single abrasive backing manufactured by combining two weaves. Here, the two weaves with the upper and lower weaves may be same weave, or different weave, and the upper weave and the lower weave may be woven into quite different colors. These two weaves are connected by binding yarns.
- [45] Further, before fully explaining embodiments of the invention, explanations for the general weaves of the fabrics, the weaves of the abrasive backing, and the composition of abrasive baking will be given.

- [46] Three foundation weaves of woven fabrics are plain weave, twill weave and satin weave. Plain weave is the simplest of the weaves, in which each warp yarn passes alternately under and over each weft yarn. Plain weave is generally designated as 1/1, strength of the plain-woven fabrics depends on thickness of the yarns and density of the weave. Twill weave is the weave in which two or more warp yarns alternately weave over and under two or more weft yarns in a regular repeated manner. These twill weaves have less mesh than the plain weaves, so that it is more flexible and softer, and designated as 1/2, 1/3, and 1/4, etc.
- [47] Satin weave is also called as dice satin, in which four or more weft(warp) yarns float over a warp(weft) yarn and thus only one of the warp or the weft is brought to the surface. In case of satin-woven fabrics, there is no mesh of the warp and the weft so that it has few bending, and designated as 1/4 satin. Furthermore, there are modified weaves of three foundation weaves, such as basket weave as modified weave of plain weave, pointed twill weaves or broken twill weave as modified weave of twill weave, and satin check weave as modified weave of satin weave, etc. There are other modified weaves such as mixture weave, pile weave and plain gauze, etc.
- [48] If a weave that forms abrasive cloth is woven into the plain weave in which warp and weft yarns have same thickness, an abrasive backing that has high tensile strength, excellent frictional resistance and superior surface smoothness can be obtained. In order to fix an extension rate, providing tension in the warp direction or spreading in the weft direction is required. But it is difficult to provide tension or to spread in case of the plain weave, due to too many mesh. Therefore, abrasive backing woven by the plain weave has a high extension rate, which is shortcoming for being used as abrasive backing.
- [49] Next, detailed description about the components that form abrasive cloth will be given. The abrasive cloth generally comprises an abrasive backing, an abrasive material and an adhesive, etc. Here, as abrasive backing, besides the cloth, paper, fiber, and combination which is manufactured by laminating cloth on paper maybe used. As the adhesive, thermosetting resins or thermoplastic resins, or glues, etc. may be used.
- [50] Examples of the abrasive material, the most important element for grinding include aluminum oxide (Al_2O_3), silicon carbide (Sic), zirconia alumina ($Al_2O_3-Zr_2O_3$), ceramic aluminum oxide, silica, garnet, emery, and crocus, etc. Besides these, fillers may be further included, calcium carbonate, clay, diatomite, etc. are generally used in order to complement physical characteristics of the adhesive.
- [51] Fig. 1 is a 1 complete design of a plain weave that forms upper weave according to an embodiment of the invention. Referring to Fig. 1, there is no difference from the normal design of a plain weave. Here, the plain weave is woven by crossing one warp strand (12, 14, 16, 18) to one weft strand (b, d, f, h), and the portion where the warp is

the upside (30) and the portion where the weft is upside (50) are illustrated separately.

[52] Fig. 2 is a 1 complete design of a 2/2 twill weave that forms lower weave according to an embodiment of the invention. Referring to Fig.2, it is identical with the normal design of a 2/2 twill weave. Here, the twill is woven by crossing two warp strands (11, 13, 15, 17) and two weft strands (a, c, e, g), and the portion where the warp is the upside (20) and the portion where the weft is the upside (40) are illustrated separately.

[53] Fig. 3 is a 1 complete double design of an abrasive backing according to an embodiment of the invention. Referring to Fig. 3, the warps of the plain weave illustrated in Fig. 1 and the warps of the 2/2 twill weave illustrated in Fig. 2 are arranged by crossing each other, and the wefts of the plain weave illustrated in Fig. 1 and the wefts of the 2/2 twill weave illustrated in Fig. 2 are arranged by crossing each other, to accomplish a 1 complete double weave design. The abrasive backing of the invention can be woven by repeatedly weaving in the warp direction and the weft direction with the 1 complete double weave design.

[54] Fig. 4 is a diagram that represents double weaves of the abrasive backing according to an embodiment of the invention. Referring to Fig. 4, it is an illustration of the double weave that can be embodied when the 1 complete double weave design illustrated in Fig. 3 is practically woven. As shown in the double weave, the upper weave is woven into plain weave, the lower weave is woven into twill weave, and these are woven separately. Further, the weft forms the plain weave and then the twill weave, so that the upper plain weave and the lower twill weave are woven simultaneously.

[55] Fig. 5 is a sectional diagram of the abrasive backing according to an embodiment of the invention. Referring to Fig. 5, it is a sectional diagram of an abrasive backing when the specific weft (e) is regarded as a baseline. As it is shown, the upper part is woven into plain weave and the lower part is woven into twill weave, and each constitutes the abrasive backing separately. These two layers are connected with a binding yarn (70). Here, the binding yarn passes through the crossing point of specific warp (12) and specific weft (d) of the plain weave and the crossing point of specific warp (15) and specific weft (e) of the twill weave, in the weft direction, to connect the upper plain weave and the lower twill weave.

[56] Fig. 6 is a flowchart illustrating a method for manufacturing abrasive cloth according to an embodiment of the invention. Referring to Fig. 6, S100 is a step where the abrasive backing of the double weave is made as set forth above. S110 is a step where the abrasive backing is spread and heat-set. In the present invention, the abrasive backing of the double weave is spread in the weft direction with a tenter and then is heat-set. S120 is a step where the abrasive material is permeated into the

abrasive backing and fixed to the abrasive backing by an adhesive. As a method of spraying the abrasive materials, gravity coating and electrodeposition may be used. S130 is a size coating step for fixing the abrasive materials on the abrasive backing tightly, S140 is a thermosetting step where the treated abrasive cloth is heated. S150 is humidifying step, S160 is softening step. S170 (MCM) step may be added as needed, where the mesh clogging is treated after the size coating process to prohibit sticking of grinding dust during the grinding process. Then the abrasive cloth is completed in step S180 by processing the abrasive cloth.

[57] Description was given above with figures generally illustrating an abrasive backing, hereinafter, a method of manufacturing the abrasive backing and abrasive cloth, referring to figures, an abrasive backing according to the invention will be described with detailed embodiments.

[58]

[59] Weaving an abrasive backing of double weaves

[60] (1) Weaving the upper weave and the lower weave

[61] A abrasive backing of the invention comprises an upper weave and an lower weave that can be separated from each other, and a binding yarn that connects these upper weave and lower weave. These upper weave and lower weave can be manufactured simultaneously. Here, these upper weave and lower weave may be woven into plain, twill, satin or modified weaves thereof. Examples of the modified weaves is same as set forth above.

[62] As an embodiment of the invention, detailed description about the cases of weaving the upper weave into plain weave and the lower weave into 2/2 twill weave will be given below.

[63] Referring to Fig. 4, in the upper weave one warp yarn (12, 14, 16, 18) of plain weave and one weft yarn (b, d, f, h) of plain weave cross and form the upper plain weave, in the lower weave two warp yarns (11, 13, 15, 17) of twill weave and two weft yarns (a, c, e, g) of twill weave cross and form the lower twill weave. Each of the upper weave and the lower weave is woven separately. That is, by arranging the warp that constitutes plain weave and the warp that constitutes twill weave to cross, and by weaving the weft once to form plain weave and then to form twill weave alternately, an abrasive backing having double weaves which are separated each other may be obtained.

[64] Here, during weaving the upper weave, the lower twill weave is prevented from weaving by fixing and immobilizing the heddles of the warp (11, 13, 15, 17) of the lower twill weave. Further, during weaving the lower twill weave, the upper plain weave is prevented from weaving by fixing and immobilizing the heddles of the warp (12, 14, 16, 18) of the upper plain weave.

[65] A kind of yarns that constitutes the double weave of the upper weave or the lower weave has no limitation. Examples of fibers that constitute the yarns may include cotton, wool, silk, hemp, synthetic fiber or synthetic yarns of synthetic fiber and these yarns, blended yarn, and conjugated yarn, etc. and it is not limited to these fibers. Spun yarns, filament yarns, or split yarns, etc. may be used and there is also no limitation in the method of spinning. Further, identical or different kinds or colors of the yarns that would constitute the upper weave and the lower may be used. It is preferable that yarns that constitute the upper weave and yarns that constitute the lower weave be identical.

[66]

[67] (2) Binding yarn (70)

[68] Binding yarn connects the upper weave and the lower weave to form a double weave. The positions of the binding yarns are essential. Positions where the binding yarns connect the upper weave and the lower weave are critical and should not interrupt the composition of each weave layer. Passing in the warp direction or the weft direction, the binding yarns can connect the upper weave and the lower weave. Each crossing point of the upper weave and each crossing point of the lower weave should not overlap each other by the binding yarns. Referring to Figs. 4 and 5, according to an embodiment of the invention, the crossing point (12-d) of the warp (12) and the weft (d) in the 1 complete double weave design does not interrupt the composition of the upper plain weave, although the weft (d) of the upper weave crosses over the warp (12) of the upper weave and then the binding yarn connects between them. Further, in the 1 complete double weave design, the crossing portion (15-e) of the warp (15) and the weft (e) does not interrupt the composition of the lower weave, although the weft (e) of the lower weave crosses under the warp (15) of the lower weave and then the binding yarn connects between them. Therefore, the binding yarns can pass through these crossing portions (12-d, 15-e). In Fig.5, a sectional diagram in which the binding yarn connects the upper weave and the lower weave is illustrated.

[69] Here, any yarn as the binding yarn may be used with no limitation. Any fiber that constitutes the yarn, such as cotton, wool, silk, hemp, synthetic fabric or synthetic yarns of synthetic fabric and these yarns, blended yarn, and conjugated yarn, etc. may be used with no limitation and filament yarns, or split yarns, etc. may be used and there is also no limitation in the method of spinning.

[70] Further, kinds and colors of the binding yarn may be identical or different from those of the weft constituting the upper or lower weave. It is however preferable that kinds and colors of the binding yarn be identical to those of the weft constituting the upper or the lower weave.

[71]

[72] (3) Abrasive backing in double weave

[73] The abrasive backing having double weave has not only low degree of crossing of the warp and the weft in the upper weave, but also low degree of crossing of the warp and the weft in the lower weave. Further, when connecting the upper weave and the lower weave, as illustrated in Fig. 4, the binding yarn connects the weaves without overlapping the crossing points of each weave. Therefore, the abrasive backing having double weave in the invention can have same tensile strength as abrasive backings having the same weave even if it is woven loosely by 20-40% decreased density of the warp and the weft that constitute the weave. That is, although crossing points of the upper weave and the lower weave are less than those of general fabrics, the abrasive backing is guaranteed to have enough tensile strength. Because each layer has less crossing points of the warp and the weft than general fabrics, not only the warp but also the weft are easily spread when treating the abrasive backing. Therefore, it is possible to control the extension rate in the weft direction in case of the abrasive backing of the invention. Further, because the weave of the abrasive backing is woven loosely, there are plentiful space in both the upper weave and the lower weave, and also plentiful space between the weave layers. Therefore, the abrasive backing into which abrasive materials or adhesive, etc. permeates easily may be obtained.

[74]

[75] (4) Spreading of the abrasive backing

[76] To manufacture weft direction sectional wide belts, a low extension rate is particularly required along the weft direction of the abrasive backing that constitutes abrasive cloth. Therefore, spreading and heat-set is demanded. If the extension rate of the weft direction which is consistent with the spinning direction of an abrasive belt is not lower than 3-7%, the abrasive belt may be lengthened or broken due to frictional heat and tension generated during use of the abrasive belt.

[77] The abrasive backing of the invention is easily spread in the weft direction. Therefore, providing tension is not necessary in the warp direction and the abrasive backing is spread by 1 to 7% only in the weft direction with a tenter and then heat-set at 180 to 250°C for 1 to 3 minutes. Via this heat treatment, abrasive backing with fixed extension rate in the weft direction may be obtained.

[78] Experimental condition

[79] (1) The density is the number of the warps and wefts within 1 inch width x 1 inch length of the weave.

[80] (2) Yarn number : Yarn number designates the diameter of yarn and marked by S.

[81] (3) Tension in the warp: A sample with 2.5 width x 12.5m length was tested in the warp direction at downward velocity of 1m/min with a static tension tester.

[82] (4) Tension in the weft: A sample with 2.5 width x 12.5m length was tested in the weft direction at downward velocity of 1m/min with a static tension tester.

[83] (5) Extension rate: The identical static tension tester was used. The extended length at 100kgf/in of tension in the weft is marked with extension rate(mm).

[84] (6) Smoothness: The number of protruded defects in width 1m x length 1 m of a weave.

[85]

[86] Example 1 and Comparison Example 1

[87] In Example 1, the upper weave and the lower weave were woven into double weaves of a plain weave. In Comparison Example 1, a satin weave was woven. According to the above experimental conditions, density, tension in the warp, tension in the weft, extension rate, and smoothness were investigated and the result was summerized in table 1. It is noted that the abrasive backing having double weaves showed higher tension in the weft and lower extension rate at 100kgf/in of tension in the weft, and higher smoothness than the satin-woven abrasive backing.

[88] Table 1

	Experiment 1	Comparison Example1
Density (in x in)	16 ^s x 15 ^s 1 (plain)80 x 70 1	16 ^s x 15 ^s 4 - ----- (satin)95 x 60 1
Tension in the warp (kgf/in)	95-97	100-105
Tension in the weft (kgf/in)	160-170	127-132
Extension rate at 100kgf/in of tension in the weft (mm)	22-26	33-36
Smoothness (number of protruded defects)	5-8	10-16

[89] Example 2 and Comparison Example 2

[90] In Example 2, the upper weave and the lower weave were woven into plain weave. No tension was given in the warp direction, and they were spread 3% in the weft direction and then heat-fixed at 250°C for 3 min. In Comparison Example 2, a satin weave was woven, and 3% spread in the weft direction and then heat-set at 250°C for 3 min. According to the above experimental conditions, density, tension in the warp, tension in the weft, extension rate were investigated and the result was summerized in table 2. The abrasive backing having double weaves showed higher tension in the weft and quite lower extension rate at 100kgf/in of tension in the weft than the satin-woven abrasive backing.

[91] Table 2

	Experiment 2	Comparison Example 2
Density (in x in)	16 ^s x 15 ^s 1 (plain)80 x 70 1	16 ^s x 15 ^s 4 - ----- (satin)95 x 60 1
Tension of the warp (kgf/in)	100- 110	110- 115
Tension in the weft (kgf/in)	170- 180	140- 150
Extension rate at 100kgf/in of tension in the weft (mm)	16- 18	38- 40
Smoothness (number of protruded defects)	5- 8	10- 16

[92] As described above, the abrasive material, the method of manufacturing the abrasive backing, and the abrasive cloth according to the invention, provides fewer crossing points of the warps and wefts in the upper weave and in the lower weave than general fabrics. Therefore, they provide higher smoothness. Further, because the control of extension rate along the weft direction is convenient, sectioned wide belts can be manufactured by joining the abrasive cloth having the weft of low extension rate in the weft direction. Further, because the weaves are woven loosely, there are plentiful space in the upper weave and the lower weave and also plentiful space between the weaves, so that abrasive materials or adhesive, etc. readily permeate. And thus, abrasive cloth having high tension and advanced ability of grinding may be obtained.

[93] Although a few embodiments of the present invention have been shown and described, it will be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the present invention, the scope of which is defined in the appended claims and their equivalents.

[94]

[95]

Claims

- [1] An abrasive backing comprising an upper weave, a lower weave, and a binding yarn that connects the upper weave and the lower weave, the abrasive backing is manufactured by a method comprising:
arranging a warp of the upper weave and a warp of the lower weave to cross each other;
fixing the heddles of the lower weave when the wefts are woven into the upper weave, and alternatively, fixing the heddles of the upper weave when the wefts are woven into the lower weave, so that the upper weave and the lower weave are allowed to be woven simultaneously; and
connecting the upper weave and the lower weave with a binding yarn not to interrupt the composition of the upper weave and the lower weave.
- [2] The abrasive backing of claim 1, wherein the upper weave and the lower weave are independently woven into a plain weave, a twill weave, a satin weave or modified weaves thereof.
- [3] The abrasive backing of claim 1, wherein the upper weave is woven into a plain weave and the lower weave is woven into a twill weave.
- [4] The abrasive backing of claim 3, wherein the upper weave is woven into a plain weave and the lower weave is woven into a 2/2 twill weave.
- [5] The abrasive backing of claim 3, wherein the abrasive backing is manufactured by arranging the warp that constitutes the plain weave of the upper weave and the warp that constitutes the twill weave of the lower weave to cross each other, and by weaving the weft to cross once the plain weave and then the twill weave alternately.
- [6] The abrasive backing of claim 1, wherein the binding yarn connects the upper weave and the lower weave without overlapping the crossing points of each weave.
- [7] The abrasive backing of claim 1, wherein the binding yarn is the same kind of a yarn with the weft that constitutes the lower weave.
- [8] The abrasive backing of claim 1, wherein the upper weave and the lower weave, connected by the binding yarn, is heat-set after spreading the weave with a tenter in the weft direction.
- [9] The abrasive backing of claim 1, wherein the upper weave and the lower weave connected by the binding yarns is heat-set at 180 to 250°C for 1 to 3 minutes after spreading by 1 to 7% of the weft direction.
- [10] A method of manufacturing an abrasive backing, comprising:
arranging the warp of the upper weave and the warp of the lower weave to cross

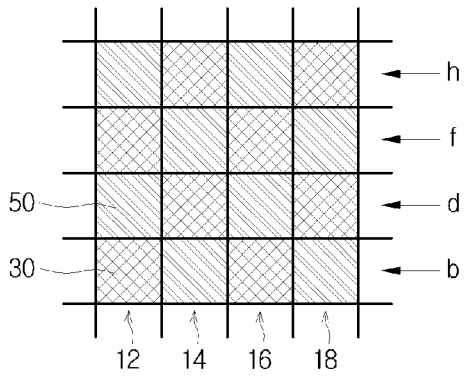
each other;

fixing the heddles of the lower weave when the wefts are woven into the upper weave, and alternatively, fixing the heddles of the upper weave when the wefts are woven into the lower weave, so that the upper weave and the lower weave are allowed to be woven simultaneously; and

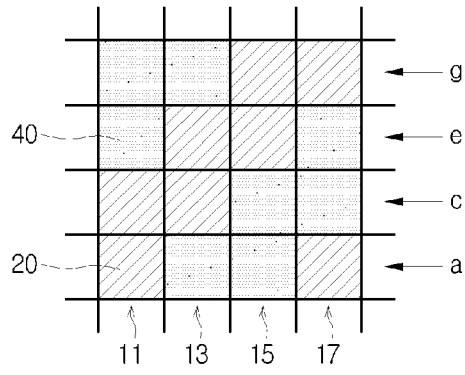
connecting the upper weave and the lower weave with a binding yarn not to interrupt the composition of the upper weave and the lower weave.

- [11] The method of claim 10, wherein the upper weave and the lower weave are independently woven into a plain weave, a twill weave, a satin weave or modified weaves thereof.
- [12] The method of claim 10, wherein the upper weave is woven into a plain weave and the lower weave is woven into a twill weave.
- [13] The method of claim 10, wherein the binding yarn is the same kind of a yarn with the weft that constitutes the upper or lower weave.
- [14] The method of claim 10, wherein the binding yarn connects the upper and lower weaves without overlapping the crossing points of each weave.
- [15] The method of claim 10, wherein the upper weave and the lower weave, connected by the binding yarn, is heat-set after spreading the weave with a tenter in the weft direction.
- [16] The method of claim 15, wherein the upper weave and the lower weave connected by the binding yarn is heat-set at 180 to 250°C for 1 to 3 minutes after spreading by 1 to 7% of the weft direction.
- [17] Abrasive cloth comprising:
an abrasive backing according to any one of claims 1 to 9;
an abrasive material that is sprayed over the abrasive backing;
an adhesive that adheres the abrasive backing and the abrasive material.
- [18] Abrasive cloth of claim 17, wherein the abrasive material is sprayed to permeate into inside of the upper weave and the lower weave, respectively and into the gap between them.

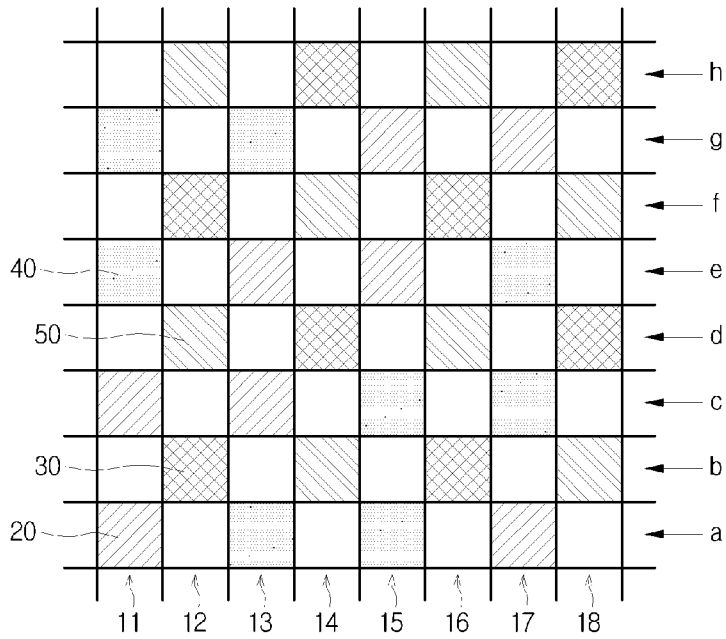
[Fig. 1]



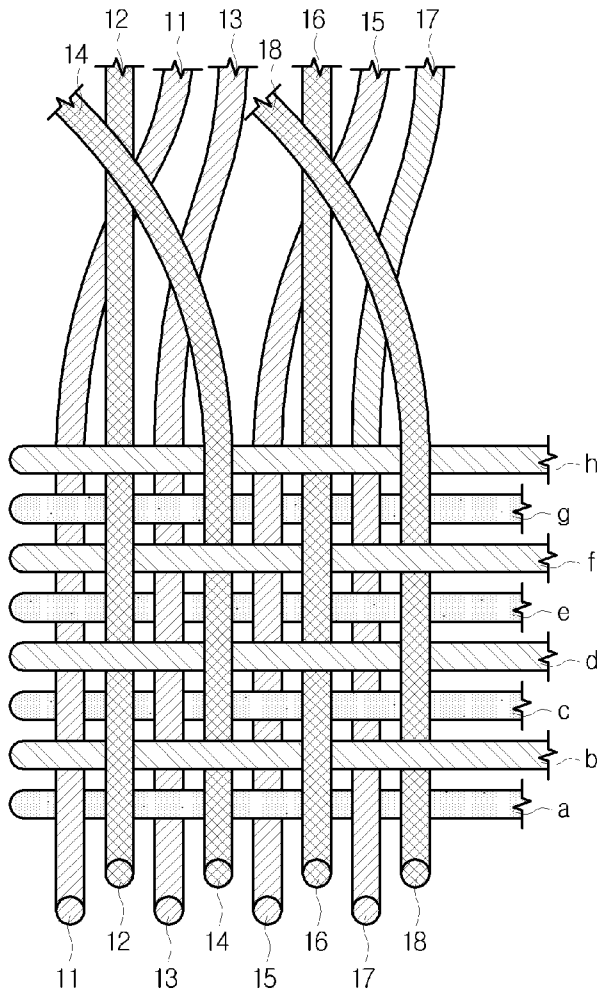
[Fig. 2]



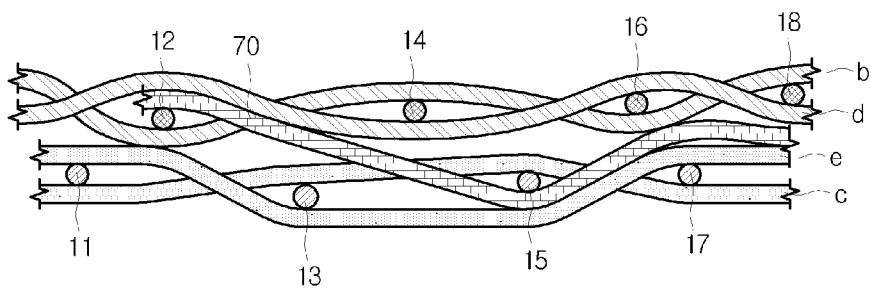
[Fig. 3]



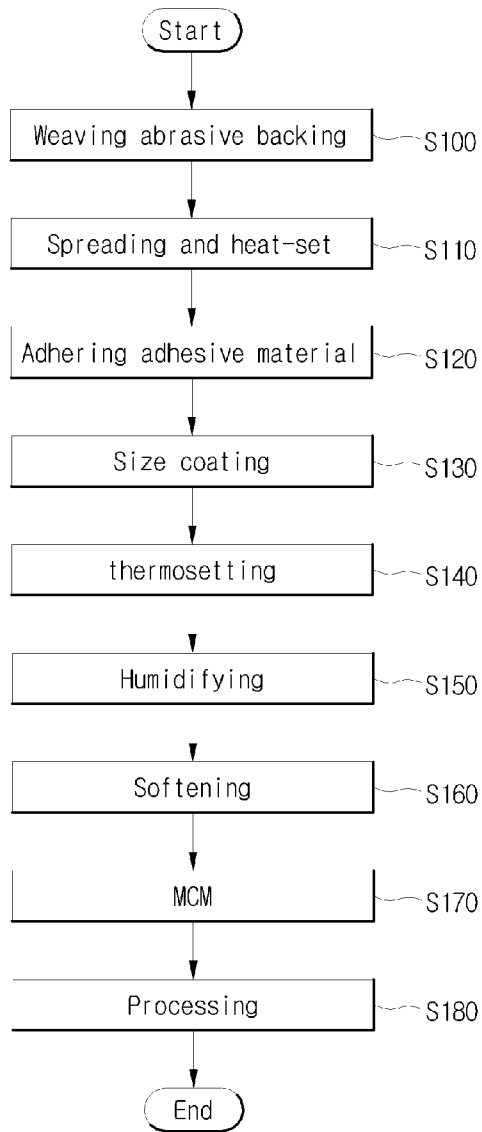
[Fig. 4]



[Fig. 5]



[Fig. 6]



A. CLASSIFICATION OF SUBJECT MATTER*D03D 11/00(2006.01)i, D03D 13/00(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)

IPC 8: D03D 11/00, D03D 15/08, B24D 11/00

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 since 1975

Japanese Utility Models and Applications for Utility Models since 1975

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

eKIPASS, WPI, USPTO, PAJ, etc.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	JP 16107824 A (Masaoka Towel Co., Ltd.) 8 Apr. 2004 See the whole document.	1-18
E	KR1020060105210 A (Zoomtextile Co., Ltd.) 11 Oct. 2006 See the whole document.	1-18

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

* Special categories of cited documents:

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"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

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"&" document member of the same patent family


Date of the actual completion of the international search

25 JUNE 2007 (25.06.2007)

Date of mailing of the international search report

25 JUNE 2007 (25.06.2007)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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