(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
28 May 2009 (28.05.2009)

PCT

(10) International Publication Number
WO 2009/067403 A1

(51) International Patent Classification:
A47L 17/08 (2006.01) *A47L 17/04* (2006.01)

(21) International Application Number:
PCT/US2008/083766

(22) International Filing Date:
17 November 2008 (17.11.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/988,948 19 November 2007 (19.11.2007) US

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, 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, ST, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, 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*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(54) **Title:** SCRUBBING MEMBER AND CLEANING ARTICLE THEREOF

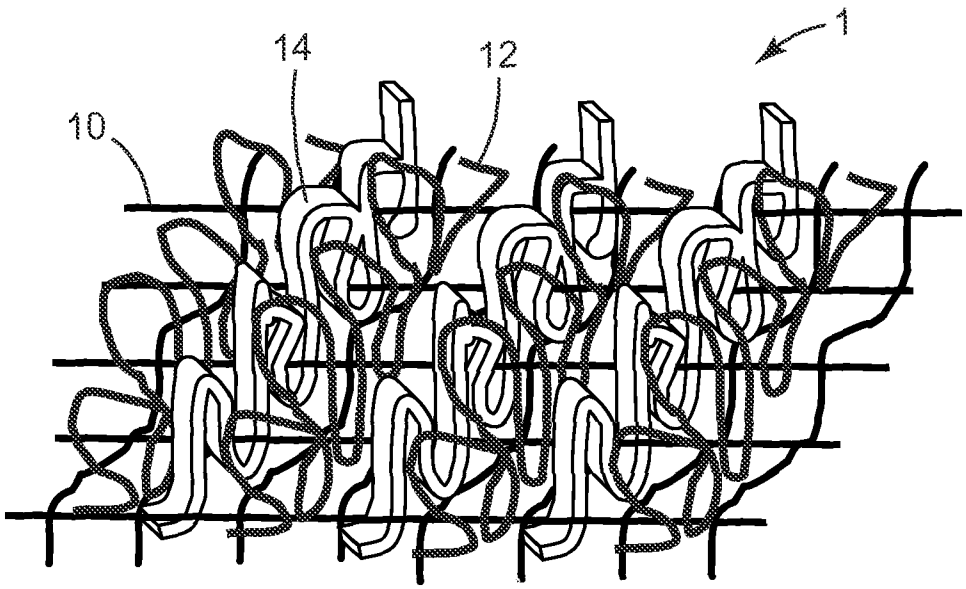

FIG. 1

(57) **Abstract:** A scrubbing member comprising a foundation yarn and a hydrophobic knit-de-knit yarn is provided. A cleaning article having the scrubbing member and a water-absorbing member is also provided.

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SCRUBBING MEMBER AND CLEANING ARTICLE THEREOF

Field of the Disclosure

The present disclosure relates to a scrubbing member and a cleaning article comprising the scrubbing member.

Background

Scouring products comprising a scrubbing member made by one or more kinds of knitting or weaving yarn have been used for washing dishes, pans, pots, glasses, sink or other kitchen stuff. Further, scouring products comprising the scrubbing member and a water-absorbing member such as polyurethane foam have also been known.

When washing dishes or other similar kitchen surfaces, consumers see foam as an indication of cleaning power. At the same time, it is desirable to remove tough dirt such as food stains, soap scum or greasy grime easily.

Summary

The present disclosure provides a scrubbing member comprising a foundation yarn and a hydrophobic knit-de-knit yarn, wherein the foundation yarn and the hydrophobic knit-de-knit yarn are knitted together to form a pile of the hydrophobic knit-de-knit yarn. Additionally, the present disclosure provides a cleaning article comprising the scrubbing member and a water-absorbing member.

Brief Description of the Drawings

Figure 1 is a view showing one embodiment of the scrubbing member of the present disclosure.

Figure 2 is a view showing one embodiment of a cleaning article.

Figure 3 is a view showing another embodiment of a cleaning article comprising a bag made of the scrubbing member.

Detailed Description

The scrubbing member 1 of the present disclosure includes a foundation yarn 10 and a hydrophobic knit-de-knit yarn 12. The foundation yarn 10 and the hydrophobic knit-de-knit yarn 12 are knitted together, thereby piles of the hydrophobic knit-de-knit yarn 12 can be formed on the surface of the scrubbing member. In some embodiments, the scrubbing member may include a flat yarn14, and the flat yarn 14 can be knitted to the foundation yarn 10, thereby piles of the flat yarn can also be formed on the surface of the scrubbing member.

The foundation yarn 10 of the present disclosure includes yarns usually used for scouring products or wiping products. Example materials of the foundation yarn 10 include, but are not limited to, polypropylene, polyethylene terephthalate (PET), polystyrene or nylon. The foundation yarn can be woolly yarn. Total fineness of the foundation yarn includes for example, but is not limited to, about 10 decitex to 200 decitex. The foundation yarn 10 may include mono filament or multi filaments.

The hydrophobic knit-de-knit yarn 12 of the present disclosure includes a knit-de-knit (KdK) yarn made of hydrophobic yarn such as, for example, polypropylene,

PET or polystyrene. The KdK yarn 12 is yarn having fluffy texture and can be prepared by known method such as, for example, unknitting the knit after initial production. The KdK yarn 12 can provide three-dimensional structure if it makes a pile on the surface of the scrubbing member 1 of the present disclosure. The three-dimensional structure can also provide more foam when the scrubbing member 1 is used with detergents. In the present disclosure, more foam can be provided by forming piles of hydrophobic KdK yarn on the surface of the scrubbing member 1.

Total fineness of the KdK yarn 12 for example, but is not limited to, about 10 decitex to about 1000 decitex. The KdK yarn 12 may include mono filament or multi filaments such as from one filament (1F) to about 100 filaments (100F). The height of piles of the KdK yarn 12 is not limited but can be from about 0.1 mm to about 10 mm.

The scrubbing member 1 of the present disclosure may further include a flat yarn 14. The flat yarn 14 includes, but is not limited to, a plastic film such as, for example, a film made by polypropylene, PET or polystyrene. Examples of the thickness of flat yarn 14 can be from about 20 μm to about 50 μm and the width of the flat yarn 14 can be from about 0.10 mm to about 10.0 mm. If the flat yarn makes piles on the scrubbing member, the height of piles can be from about 0.1mm to about 10 mm. Examples of the weight per square meter of the scrubbing member is not limited, but can be from about 140 grams to about 1400 grams.

The scrubbing member 1 of the present disclosure can be prepared by knitting the foundation yarn 10 and the hydrophobic KdK yarn 12 together to form piles of the hydrophobic KdK yarn 12 on the surface of the scrubbing member 1. If used, the flat yarn 14 can be knitted to the foundation yarn 10, and may form piles on the surface of the scrubbing member 1. The ordinary knitting method such as, for example, circular

knitting can be applied to prepare the scrubbing member 1 of the present disclosure. The piles of the KdK yarn and/or the flat yarn on the surface of the scrubbing member 1 may be cut piles.

In one embodiment, a cleaning article 2 of the present disclosure includes the scrubbing member 1 of the present disclosure and a water-absorbing member 3. In some embodiments, the water-absorbing member 3 of the cleaning article can be laminated to the scrubbing member 1, such as shown in FIG. 2, or contained within a bag of the scrubbing member 1, such as shown in FIG. 3. The water-absorbing member 3 includes, for example, but is not limited to, natural sponge, cellulose sponge, plastic foam such as polyurethane foam, woven fabric, or non-woven fabric.

The cleaning article 2 of the present disclosure can be prepared by laminating the scrubbing member 1 and the water-absorbing member 3 with means known to those skilled in the art, such as, for example, adhesion, ultrasonic or sewing. Alternatively, the cleaning article 2 of the present disclosure can be prepared by containing the water-absorbing member 3 within a bag of the scrubbing member 1. The bag can be prepared by known method such as, for example, sewing or adhering top and bottom of cylindrical shaped scrubbing member 1 made by circular knitting. The bag can be closed or open-ended.

The scrubbing member 1 or the cleaning article 2 of the present disclosure can be used for washing, scrubbing, scouring or wiping kitchen stuff. The scrubbing member 1 or the cleaning article 2 of the present disclosure can be used alone, or with detergents or soap such as liquid, gel, powder or solid shaped. The scrubbing member 1 or the cleaning article 2 of the present disclosure has piles made by hydrophobic KdK yarn 12, so more foam can be formed if the detergents or soap are used.

In the present specification, the following abbreviations can be used.

KdK : Knit de knit, PET : polyethylene terephtalate, PP : polypropylene

Examples

Foaming test

A solution of Jokinnodekiru JOY (5 mL; kitchen detergent by P&G Japan) having a concentration of 0.075 mL/L(water) was injected into the samples with a 5 mL syringe (without needle) by TERUMO Corporation while circulating. A vertical mixer was used to make foam (RUD-101 by AS ONE). The vertical mixer was used for 20 times at the speed of 36 times/minute. The volume of foam was determined. The results are shown in Table 1.

Soap scum removing test

Fatty acid calcium dispersion of isopropyl alcohol was spread uniformly on a stainless panel (JIS G4305 (SUS304) 2B). The alcohol was dried over and heated with a hot plate for two minutes to give a test plate. Then, each sample obtained was used to scratch a test plate by drawing the sample across the test plate while applying thumb pressure of 130 grams. The results are shown in Table 1.

Example 1

Sample for the foaming test

Flat yarn made of 25 μm thick, slit PET film having a width of 0.7575 mm by TORAY Corp. and a knit-de-knit yarn made of PP having 330 decitex/10F by MITSUBISHI RAYON CO., LTD. were knitted into the foundation yarn made of woolly PP having 84 decitex/30F by MITSUBISHI RAYON CO., LTD., to form a scrubbing

member with piles of the flat yarn and the knit-de-knit yarn. The obtained scrubbing member was punched out to give round-shaped scrubbing member samples having a diameter of 60 mm. Then, the two of the samples were doubled by ultrasonic welding (SUZUKI PLASTIC WELDER BELFA SUW-0150 by Suzuki Motor Corporation) to make a round-shaped back-to-back sample. Polyurethane foam by Achilles Corporation was punched out to give a round-shaped foam sample having a diameter of 60 mm and a thickness of 22 mm. The foam sample was wetted and squeezed with hands, then placed in a 300 mL beaker. The round-shaped back-to-back sample was placed onto the round-shaped foam sample and used in the foaming test. There were three samples tested and the average of the three is shown in Table 1.

Sample for the soap scum removing test

The scrubbing member obtained above was cut into 4 cm length by 2 cm width to form a sample for the soap scum removing test.

Example 2

Sample for the foaming test

The same sample as Example 1 was used except that the scrubbing member of the sample was washed in a washing machine (TOSHIBA AW-FY603G(WT) by Toshiba) to remove the finish on the yarns. The washing machine washed for eight minutes, rinsed twice with water, and spun dry for five minutes. There were three samples tested and the average of the three is shown in Table 1.

Sample for the soap scum removing test

The scrubbing member obtained above was cut into 4 cm length by 2 cm width to form a sample for the soap scum removing test.

Comparative Example 1

Sample for the foaming test

A round-shaped back-to-back sample of the outer net of Awadatsu-Sponge-Net KS303 by Aisen Kougyou Co., Ltd. (KS303) was prepared in the same manner as Example 1. The outer net included nylon foundation yarn and piles of nylon, but the nylon forming piles were not a knit-de-knit yarn. The round-shaped foam sample was prepared, wetted, squeezed, and placed in a beaker. Then, the obtained round-shaped back-to-back sample was placed onto the foam sample in the same manner as Example 1. There were three samples and the average of the three is shown in Table 1.

Sample for the soap scum removing test

The outer net of KS303 was cut into 4 cm length by 2 cm width to form a sample for the soap scum removing test.

Comparative Example 2

Sample for the foaming test

A round-shaped back-to-back sample of the outer net of Scotch-Brite™ Hybrid Net Sponge by Sumitomo 3M Limited (Hybrid Net Sponge) was prepared in the same manner as Example 1. The outer net was a knit uniformly knitted and made by an acrylic knit and PET without piles. The round-shaped foam sample was prepared, wetted, squeezed, and placed in a beaker. Then, the obtained round-shaped back-to-back sample was placed onto the foam sample in the same manner as Example 1. There were three samples and the average of the three is shown in Table 1.

Sample for the soap scum removing test

The outer net of the Scotch-Brite™ Hybrid Net Sponge was cut into 4 cm length by 2 cm width to form a sample for the soap scum removing test.

Comparative Example 3

Sample for the foaming test

The same sample as Example 1 was used except that the wooly PP yarn was used instead of the knit-de-knit yarn made of PP. There were three samples and the average of the three is shown in Table 1.

Sample for the soap scum removing test

The scrubbing member obtained above was cut into 4 cm length by 2 cm width to form a sample for the soap scum removing test.

Comparative Example 4

Sample for the foaming test

Flat yarn made of 25 μm thick, slit PET film having a width of 0.7575 mm by TORAY Corp. and PP yarn made of woolly PP having 84 decitex/30F by MITSUBISHI RAYON CO., LTD., was knitted uniformly to form a scrubbing member without piles. The knit structure was the same as the scrubbing member of Comparative Example 2. The round-shaped foam sample was prepared, wetted, squeezed, and placed in a beaker. Then, the obtained round-shaped back-to-back sample was placed onto the foam sample in the same manner as Example 1. There were three samples and the average of the three is show in Table 1.

Sample for the soap scum removing test

The scrubbing member obtained above was cut into 4 cm length by 2 cm width to form a sample for the soap scum removing test.

Table 1

	Foaming test	Soap scum removing test
Ex. 1	3	++
Ex. 2	3	++
C. Ex. 1	1	+
C. Ex. 2	1	++
C. Ex. 3	2.67	+
C. Ex. 4	2	++

Foaming test

3 : More than 150 mL of foam was made

2 : More than 100 mL and less than 150 mL of foam was made

1 : Less than 100 mL of foam was made

Soap scum removing test

++: More than 10% of the surface area of the test plate (scum) was removed

+ : Less than 10% of the surface area of the test plate (scum) was removed

What is claimed is:

1. A scrubbing member comprising a foundation yarn and a hydrophobic knit-de-knit yarn, wherein the foundation yarn and the hydrophobic knit-de-knit yarn are knitted together to form a pile of the hydrophobic knit-de-knit yarn.

2. The scrubbing member according to claim 1 further comprising a flat yarn, wherein the flat yarn is knitted to the foundation yarn.

3. The scrubbing member according to claim 2, wherein the flat yarn is knitted to form piles.

4. The scrubbing member according to claim 1, wherein the hydrophobic knit-de-knit yarn is selected from polypropylene, polyester, and polystyrene.

5. The scrubbing member according to claim 2, wherein the flat yarn is a plastic film.

6. The scrubbing member according to claim 5, wherein the plastic film is selected from polypropylene, polyester, and polystyrene.

7. A cleaning article comprising the scrubbing member according to any one of claims 1 to 6 and a water-absorbing member.

8. The cleaning article according to claim 7, wherein the water-absorbing member is laminated to the scrubbing member.

9. The cleaning article according to claim 7, wherein the water-absorbing member is contained within a bag of the scrubbing member.

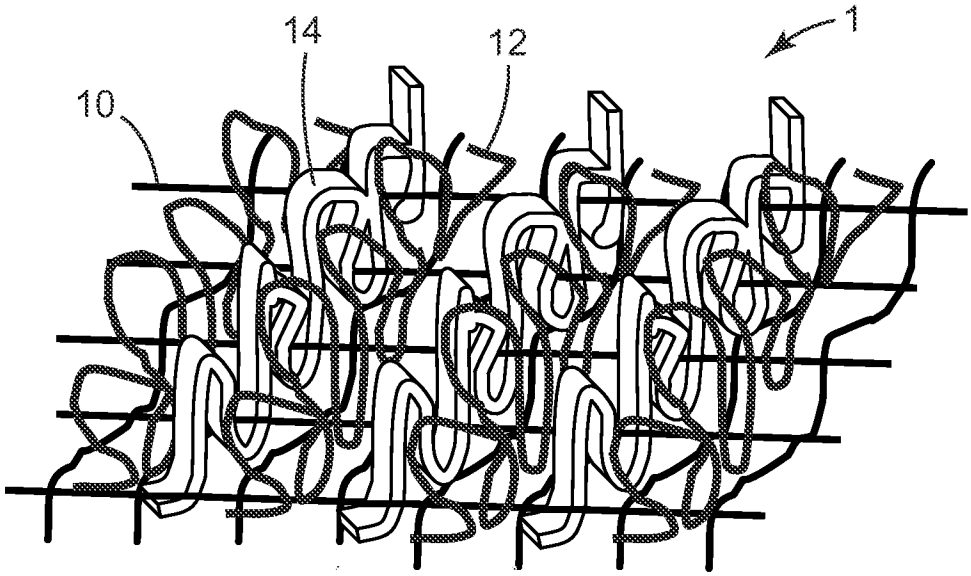

FIG. 1

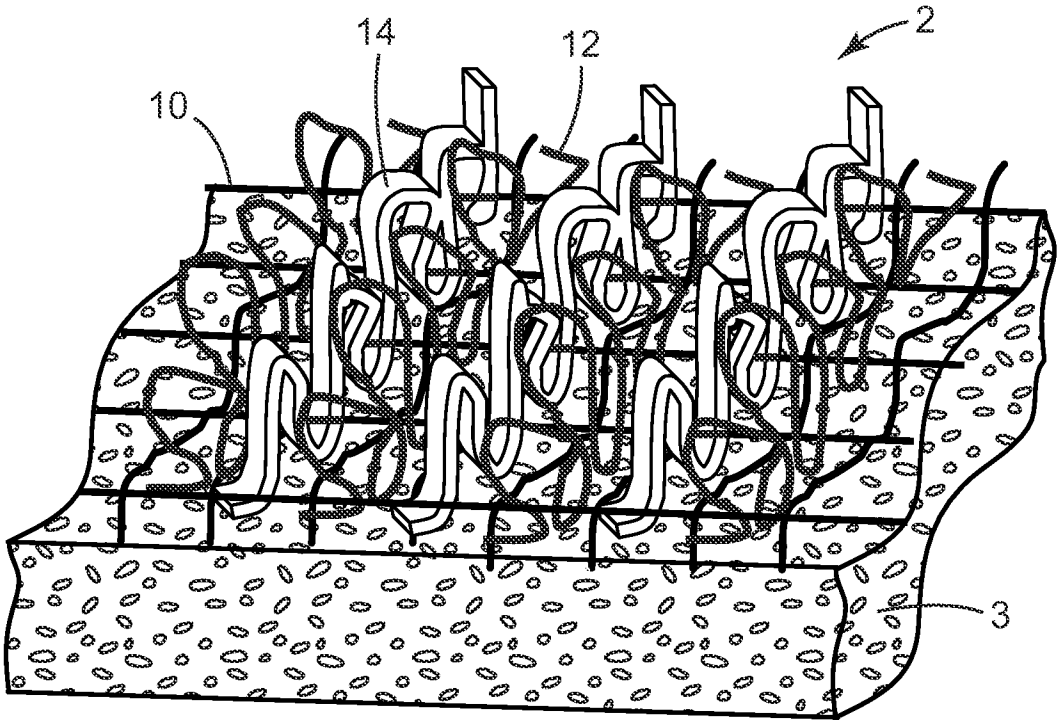

FIG. 2

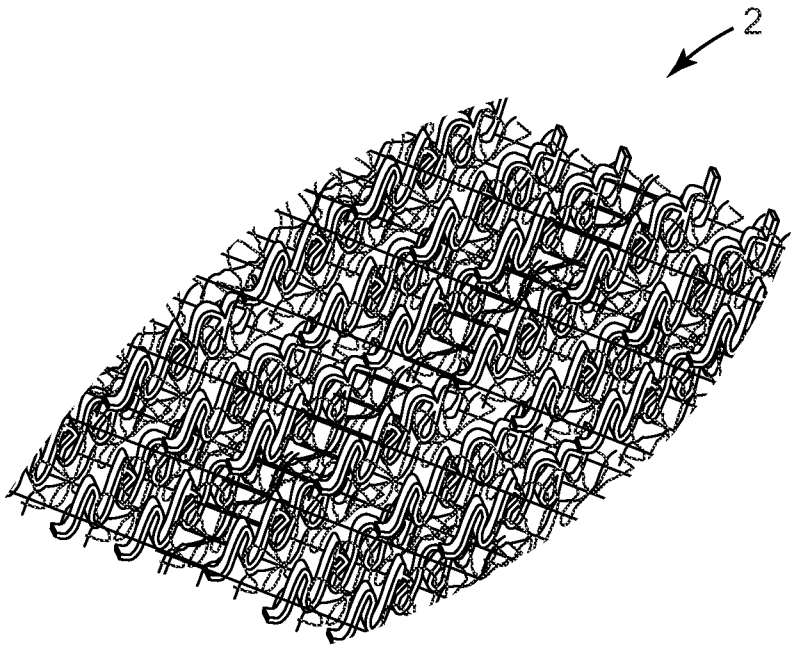

FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/083766

A. CLASSIFICATION OF SUBJECT MATTER

A47L 17/08(2006.01)i, A47L 17/04(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 A47L 17/08, A47L 17/04

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(KIPO internal) & Keyword : polypropylene, polyester, polystyrene

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 1995-0008362 B1 (LEE, H.-S.) 28 July 1995 See abstract; figures 3,4; pages 1,2 and claims 1,2.	1-9
X	KR 10-0466572 B1 (YANG, S. B.) 15 January 2005 See abstract; figures 1,2; page 3 and claims 1,3.	1-9
X	JP 2003-210381 A (NAKATANI, K.) 29 July 2003 See abstract; figures 1-4; pages 2-3 and claims 1-6.	1-9
A	US 5594970 A (BENGE, W. D.) 21 January 1997 See abstract; figures 5-7 and claim 1.	1-9

☐ 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 citation or other special reason (as specified)
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"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
29 APRIL 2009 (29.04.2009)	**29 APRIL 2009 (29.04.2009)**

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/083766

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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