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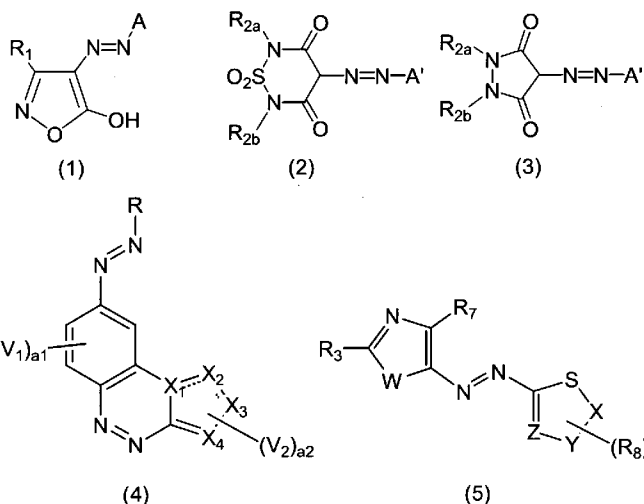
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[Continued on next page]

(54) Title: HAIR DYE COMPOSITION



(57) Abstract: A hair dye composition containing an azo dye represented by any one of the formulas (1) to (5): [wherein R_1 , R_{2a} , and R_{2b} each represents a hydrogen atom or a substituent, A and A' each represents an aromatic heterocyclic residue (having a free valence at carbon atom thereof) and these groups have, in the structure thereof, none of a carboxy group, a sulfo group, and a quaternary ammonium group]; [R represents a coupler component, X_1 to X_4 represent atoms coupled together with the carbon atom sandwiched between X_1 and X_4 to form a 5-membered heteroaromatic ring, V_1 and V_2 each represents a substituent, and a1 and a2 each stands for from 0 to 3]; and [R₃ represents a hydroxy group, an alkylsulfonylamino group, an arylsulfonylamino group, or -CH(R₄)(R₅) (R₄ and R₅ each representing a substituent having a Hammett's constant ρ of 0.2 or greater and less than 1.4), W represents a S atom or N-R₆ (R₆ representing a substituent), X, Y and Z each represents a nitrogen atom or a carbon atom, R₇ and R₈ each represents a substituent, and b stands for from 0 to 2].



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INTERNATIONAL SEARCH REPORT

International application No
PCT/JP2008/062121

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61K8/49 A61Q5/06 A61Q5/10

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)

A61K A61Q

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

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

EPO-Internal, WPI Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 398 020 A (KAO CORP [JP]; FUJI PHOTO FILM CO LTD [JP]) 17 March 2004 (2004-03-17) cited in the application paragraphs [0001], [0050]; claims 1,4-10 -----	1-3,13, 14
P,A	EP 1 832 276 A (KAO CORP [JP]; FUJIFILM CORP [JP]) 12 September 2007 (2007-09-12) cited in the application paragraphs [0036] - [0040]; claims	1-3,13, 14
A	& WO 2006/068104 A (KAO CORP [JP]; FUJI PHOTO FILM CO LTD [JP]; YAMAGUCHI MASAKAZU [JP]; P) 29 June 2006 (2006-06-29) -----	1-3,13, 14
A	EP 1 366 752 A (KAO CORP [JP]; FUJI PHOTO FILM CO LTD [JP]) 3 December 2003 (2003-12-03) paragraph [0053]; claims -----	1-3,13, 14
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☒ 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 document 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.
- *G* document member of the same patent family

Date of the actual completion of the international search

20 October 2008

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09/01/2009

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/JP2008/062121

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	MOHAREB RM; SHERIF SM; GABER HM; GHABRIAL SS; AZIZ SI: "Thiophenylhydrazonoacetates in heterocyclic synthesis" HETEROATOM CHEMISTRY, vol. 15, no. 1, 2004, pages 15-20, XP002500409 Retrieved from the Internet: URL: http://www3.interscience.wiley.com/cgi-bin/fulltext/107061169/PDFSTART compounds 13a and 13b -----	1
X	JP 2001 214084 A (MITSUBISHI CHEM CORP) 7 August 2001 (2001-08-07) paragraphs [0020] - [0025] -----	1
X	JP 2005 162855 A (KONICA MINOLTA HOLDINGS INC) 23 June 2005 (2005-06-23) compound 1-3 -----	1
X	JP 2005 171079 A (KONICA MINOLTA HOLDINGS INC) 30 June 2005 (2005-06-30) compound 4-1 -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2008/062121

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.:
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:
3. ☐ Claims Nos.:
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:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an 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 reportcovers 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.:

see annex

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1(part),2,3,13(part),14(part)

composition and method for dying hair comprising an azo dye represented by formula (1)

2. claims: 1(part),4,5,13(part),14(part)

composition and method for dying hair comprising an azo dye represented by formula (2)

3. claims: 1(part),6,7,13(part),14(part)

composition and method for dying hair comprising an azo dye represented by formula (3)

4. claims: 1(part),8,9,13(part),14(part)

composition and method for dying hair comprising an azo dye represented by formula (4)

5. claims: 1(part),10,11,12,13(part),14(part)

composition and method for dying hair comprising an azo dye represented by formula (5)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/JP2008/062121

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1398020	A	17-03-2004	JP 4045227 B2	13-02-2008
			JP 2004107343 A	08-04-2004
			US 2005015896 A1	27-01-2005
EP 1832276	A	12-09-2007	JP 2006182653 A	13-07-2006
			WO 2006068104 A1	29-06-2006
			US 2008134448 A1	12-06-2008
WO 2006068104	A	29-06-2006	EP 1832276 A1	12-09-2007
			JP 2006182653 A	13-07-2006
			US 2008134448 A1	12-06-2008
EP 1366752	A	03-12-2003	JP 4080947 B2	23-04-2008
			JP 2003342139 A	03-12-2003
			US 2004019982 A1	05-02-2004
JP 2001214084	A	07-08-2001	NONE	
JP 2005162855	A	23-06-2005	NONE	
JP 2005171079	A	30-06-2005	NONE	