

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
31 August 2006 (31.08.2006)

PCT

(10) International Publication Number
WO 2006/089495 A1

(51) International Patent Classification:
C09D 11/16 (2006.01) *C09D 11/18* (2006.01)

(21) International Application Number:
PCT/CZ2005/000062

(22) International Filing Date: 17 August 2005 (17.08.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PV 2005-98 16 February 2005 (16.02.2005) CZ

(71) Applicant (for all designated States except US): **CEN-TROPEN A.S.** [CZ/CZ]; ul. 9. kvetna 161, 380 12 Dacice (CZ).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VÁVRU, Jaroslav** [CZ/CZ]; Palackého nám. 171/I, 380 01 Dacice (CZ). **LESNÁ, Vladimíra** [CZ/CZ]; Jiráskova 252/V, 380 01 Dacice (CZ). **DUCHÁCKOVÁ, Marie** [CZ/CZ]; ul. U stadionu 448/V, 380 01 Dacice (CZ). **SCHLOSSEROVÁ, Dana** [CZ/CZ]; Antonína Dvoračka 2/V, 380 01 Dacice (CZ).

(74) Agent: **SEDLÁK, Jirí**; Husova 5, 370 01 České Budějovice (CZ).

(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, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, 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
- with amended claims and statement

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: INK WITH INCREASED RESISTANCE AGAINST DRYING

(57) Abstract: The ink with increased resistance against drying under the invention consists of 0.1 to 25 wt.% of organic dye or pigment, 0.1 to 40 wt.% of glycols or polyethylene glycols with molecule weights from 100 to 6000, 0.1 to 20 wt.% of glycol ethers with boiling points over 150° C and up to 15 wt.% of additives and admixtures such as biocides, defoamers, leveling agents, film formers or separators, while the balance to 100 wt.% is water or low aliphatic alcohols or their mixtures. The ink under this invention lasts up to 60 days in an open tip of a writing tool without drying out.



WO 2006/089495 A1

Ink with Increased Resistance against Drying

Background and summary of the invention

This invention concerns the ink to be filled into writing tools, e.g. pens, felt pens, roller pens, liner pens, markers, highlight pens etc. The inks currently in use are characterized by application properties on which their development focuses. This means they can be removed from textiles by washing, they can be washed off from skin, they cannot be wiped off from nonporous materials, they are resistant against wear etc. These main application characteristics of the inks have some negative properties which the solution under this invention seeks to eliminate. The property to be eliminated is the tendency to dry out, which is demonstrated particularly in alcohol-based inks consisting of a mixture of low aliphatic alcohols, pigments and other components, but also in water-based inks containing organic dyes and other components (examples of water-based inks are described in the patent No. 289 465 "Washable inks easily removable from skin").

The disadvantage of the known writing liquids consists in the fact that the writing tools need to have their writing tips protected against drying. If the tip is not covered with a protective cap for a while it relatively quickly dries out, its function deteriorates and after a longer period of time it is completely degraded.

The mentioned disadvantage is eliminated by the ink under this invention with the increased resistance against drying.

The subject matter of the invention consists in the composition of the ink containing 0.1 to 25 wt. % of organic dye or pigment, 0.1 to 40 wt. % of glycols or polyethylene glycols with molecule weights from 100 to 6 000, 0.1 to 20 wt. % of glycol ethers with boiling points over 150° C and up to 15 wt. % of additives and admixtures such as biocides, defoamers, leveling agents, film formers or separators, while the balance to 100 wt. % is water or low aliphatic alcohols or their mixtures.

- 2 -

When filled into writing tools, the inks under this invention do not dry out even if the tool is not used for writing and left for a long time without a protective cap, which significantly improves capabilities of the products. The increased resistance against drying is created particularly by a combination of polyethylene glycols and glycol ethers with high boiling points, which form a layer on the ink surface and prevent evaporation of low-boiling solvents and gradual drying of the ink in the writing tool tip. The ink under this invention lasts up to 60 days in an open tip without drying out.

Detailed description of the preferred embodiments

It is understood that specific examples of realization of the invention, as described and depicted below, are provided only as an illustration and that they in no way limit realization of the invention to such examples. Experts proficient in the state of the art will find and will be able to identify through routine experimenting one or more equivalents of the realizations of the invention as specifically described herein. Such equivalents shall be covered by the scope of patent claims contained herein.

Example 1 – non-drying ink, black

Acid blue 9 (under Color Index)	2.22% wt.
Acid orange 7 (under Color Index)	4.00% wt.
Acid red 1 (under Color Index)	1.78% wt.
sodium-diethyl sulphosuccinate	0.02% wt.
water - polyglycol - ether solution	
of a mixture of quarter ammonium salts	0.27% wt.
propylene glycol phenyl ether	0.44% wt.
tetraethylene glycol	26.87% wt.
water	64.40% wt.

- 3 -

Example 2 – non-drying ink, red

Acid red 18 (under Color Index)	1.22% wt.
Acid red 1 (under Color Index)	0.94% wt.
Food yellow 4 (under Color Index)	0.47% wt.
sodium-diethyl sulphosuccinate	0.02% wt.
water - polyglycol - ether solution of a mixture of quarter ammonium salts	0.28% wt.
propylene glycol phenyl ether	0.47% wt.
tetraethylene glycol	26.39% wt.
water	70.21% wt.

Example 3 – non-drying ink, blue

Acid red 52 (under Color Index)	0.43% wt.
Acid blue 9 (under Color Index)	0.77% wt.
sodium-diethyl sulphosuccinate	0.02% wt.
water - polyglycol - ether solution of a mixture of quarter ammonium salts	0.29% wt.
propylene glycol phenyl ether	0.48% wt.
tetraethylene glycol	26.78% wt.
water	71.23% wt.

Example 4 – non-drying ink, red

Solvent red 160 (under Color Index)	4.00% wt.
triglyceride of caprylic and capric acids	0.50% wt.
propylene glycol phenyl ether	2.00% wt.
n-propanol	balance to 100% wt.

Example 5 – non-drying ink, blue

Basic blue 26 (under Color Index)	4.00% wt.
triglyceride of caprylic and capric acids	0.50% wt.
propylene glycol phenyl ether	1.50% wt.
n-propanol	50.00% wt.
butanol	balance to 100% wt.

Example 6 – non-drying ink, blue

Solvent blue 44 (under Color Index)	7.00% wt.
Basic violet 1 (under Color Index)	1.00% wt.
triglyceride of caprylic and capric acids	2.50% wt.
tripropylene glycol-n-butyl ether	0.50% wt.
n-propanol	balance to 100% wt.

Example 7 – non-drying ink, green

mixture of Solvent yellow	83:1,
Solvent blue 44 (under Color Index)	8.00% wt.
triglyceride of caprylic and capric acids	3.20% wt.
propylene glycol phenyl ether	1.80% wt.
n-propanol	47.00% wt.
butanol	balance to 100% wt.

Example 8 – non-drying ink, black

mixture of Basic violet 10, Basic orange 59,	
Basic violet 3, Basic blue 26 (under Color Index)	9.00% wt.
triglyceride of caprylic and capric acids	2.70% wt.
propylene glycol phenyl ether	3.30% wt.
n-propanol	balance to 100% wt.

- 5 -

The ink with increased resistance against drying under this invention can be used particularly as a filling in writing tools, such as pens, felt pens, roller pens, liner pens, markers, highlight pens etc.

CLAIMS

The ink with increased resistance against drying characterized by containing 0.1 to 25 wt. % of organic dye or pigment, 0.1 to 40 wt. % of glycols or polyethylene glycols with molecule weights from 100 to 6000, 0.1 to 20 wt. % of glycol ethers with boiling points over 150° C and up to 15 wt. % of additives and admixtures such as biocides, defoamers, leveling agents, film formers or separators, while the balance to 100 wt. % is water or low aliphatic alcohols or their mixtures.

AMENDED CLAIMS
received by the International Bureau on 07 June 2006 (07.06.2006).
+ STATEMENT

1. The ink with increased resistance against drying characterized by containing 0.1 to 25 wt. % of organic dye or pigment, 0.1 to 40 wt. % of glycols with molecule weights from 100 to 6000, 0.1 to 20 wt. % of glycol ethers with boiling points over 150° C and up to 15 wt. % of additives and admixtures such as biocides, defoamers, leveling agents, film formers or separators, while the balance to 100 wt. % is water or low aliphatic alcohols or their mixtures.

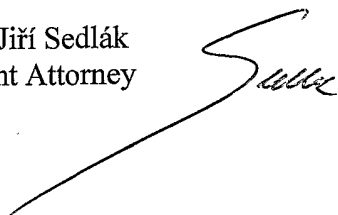
STATEMENT UNDER ARTICLE 19 (1)

The definitions of the glycols and polyethylene glycols overlap. Polyethylene glycols fall under the definitions of glycols. This is the reason why the applicant removed the words "or polyethylene glycols" from the claim as amended. Therefore, the scope of amended Cl. 1 encompasses a glycol having a specified range of molecular weights and a glycol ether having a specified boiling point.

Concerning the glycols and glycol ethers, they are two different groups of compounds which have a different characteristics.

Yours sincerely,

Ing. Jiří Sedlák
Patent Attorney

A handwritten signature in black ink, appearing to be 'J. Sedlák', written over a long horizontal line that extends from the left margin towards the center of the page.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CZ2005/000062

A. CLASSIFICATION OF SUBJECT MATTER

C09D11/16 C09D11/18

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)

C09D

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 062 890 A (MIYASHITA ET AL) 5 November 1991 (1991-11-05)	1
X	column 3, lines 16-65; claims 1,6,7	1
X	US 4 545 818 A (INOUE ET AL) 8 October 1985 (1985-10-08)	1
X	claims 1-28	1
X	US 5 882 390 A (NAGAI ET AL) 16 March 1999 (1999-03-16)	1
X	column 19, line 57 - column 20, line 55; claims 1,7	1



Further documents are listed in the continuation of box C.



Patent family members are listed in 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.

"&" document member of the same patent family

Date of the actual completion of the international search

17 November 2005

Date of mailing of the international search report

25/11/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Feldmann, G

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CZ2005/000062

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 5062890	A	05-11-1991	DE	3625557 A1	05-02-1987
			FR	2585358 A1	30-01-1987
			JP	1843199 C	12-05-1994
			JP	5054875 B	13-08-1993
			JP	62027479 A	05-02-1987
US 4545818	A	08-10-1985	CA	1194652 A1	08-10-1985
			CH	654323 A5	14-02-1986
			DE	3337866 A1	26-04-1984
			FR	2540881 A1	17-08-1984
			GB	2131040 A	13-06-1984
			IT	1172568 B	18-06-1987
US 5882390	A	16-03-1999	JP	3475249 B2	08-12-2003
			JP	10036741 A	10-02-1998