Paper No. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LAL C. VISHWAKARMA
and CHIN H. CHEN

Appeal No. 94-4495
Application 07/865,165[1]

HEARD: October 17, 1997

Before JOHN D. SMITH, WEIFFENBACH and PAK, *Administrative Patent Judges*.

WEIFFENBACH, *Administrative Patent Judge*.

DECISION ON APPEAL

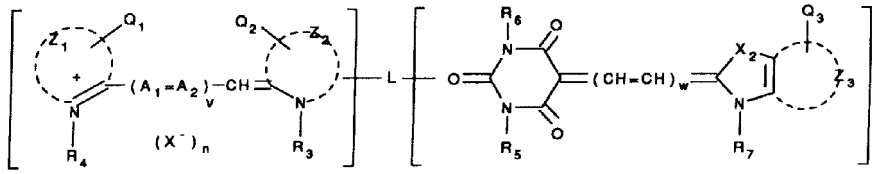
This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 and 3-15, the only claims remaining in the application. We reverse.

[1] Application for patent filed April 8, 1992.

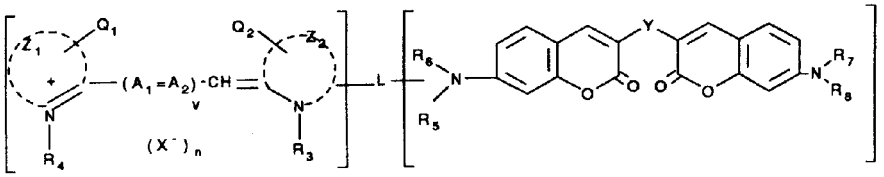
The Claimed Subject Matter

The claims on appeal are directed to a process for preparing a binary sensitizing dye compound. Claims 1 and 3 are illustrative of the claimed subject matter:

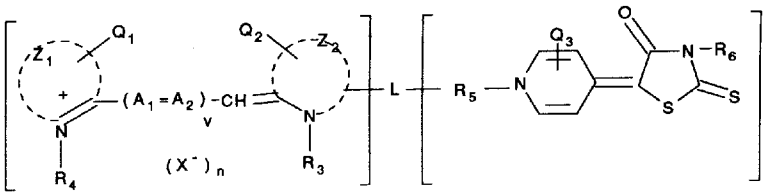
> 1. A process for the preparation of binary sensitizing dyes comprising reacting a solution of two dye compounds, one of which contains a carboxyl and the other of which contains an amino or a hydroxyalkyl, in the presence of a 2-halo-1-1-alkylpyridinium salt and a 4-dialkylaminopyridine so that the two dye compounds undergo a dehydrative condensation reaction.
>
> 3. A process according to claim 1 wherein one of said dye compounds can adsorb to a silver halide grain surface and the other of said dye compounds is substantially non-adsorbable to a silver halide grain surface, and the resulting binary sensitizing dye is of general formulas (I), (II), or (III)



I



II



III

wherein A_1 and A_2 each individually represent unsubstituted or alkylsubstituted methine; L represents 4 to about 20 atoms and includes at least two alkylenes and at least one carbonyloxy or carbonylamino, and covalently links the two dye compounds so they are nonconjugated; Z_1, Z_2, and Z_3 each represent non-metallic atoms which complete a substituted or unsubstituted 5- or 6- membered heterocylic ring; R_3 and R_4 each individually represents an alkyl of 1 to about 10 carbon atoms, or an aryl, aralkyl, or cycloalkyl of 5 to about 12 carbon atoms, or, joined with R_5, R_6, R_7, R_8, or Q_3, represents L; R_5, R_6, R_7, and R_8 each individually represents an alkyl of 1 to about 10 carbon atoms, or an aryl, aralkyl, or cycloalkyl of 5 to about 12 carbon atoms, or, joined with R_3, R_4, Q_1, or Q_2, represents L; Q_1 and Q_2 each individually represents hydrogen, or an alkyl of 1 to about 10 carbon atoms, or an aryl, aralkyl, or cycloalkyl of 5 to about 12 carbon atoms, or, joined with R_5, R_6, R_7, R_8, or Q_3, represents L; Q_3 represents hydrogen, or an alkyl of 1 to about 10 carbon atoms, or an aryl, aralkyl, or cycloalkyl of 5 to about 12 carbon atoms, or, joined with R_3 R_4, Q_1, or Q_2, represents L; Y represents a carbonyl, sulfonyl or an amino; X& represents an anion and n represents an integer of 1 or more, provided that when the formula forms a zwitterionic dye, n is 0; X_2 represents a carbon atom or hetero atom N, O, S, Se, or Te; and v and w individually represent integrer numbers from 0 to 3.

The Prior Art

The following prior art references are relied upon by the examiner to support the rejection of the claims:

Steglich et al. (Steglich), *Angew. Chem. Internat. Edit.*, "*N,N*-Dimethyl-4-pyridinamine, a Very Effective Acylation Catalyst," Vol. 8, No. 12, p. 981 (1969)

Fieser et al. (Fieser I), *Reagents for Organic Synthesis*, Vol. 3, Wiley-Interscience, pp. 118-119 (1972) (received in the PTO Scientific Library on June 6, 1972).

Bald et al. (Bald), *Chemistry Letters*, "A Facile Synthesis of Carboxamides by Using 1-Methyl-2-Halopyridinium Iodides as Coupling Reagents," pp. 1163-1166 (1975).

Mukaiyama et al. (Mukaiyama), *Chemistry Letters*, "A Convenient Method For The Synthesis of Carboxylic Esters," pp. 1045-1048 (1975).

Fieser et al. (Fieser II), *Reagents for Organic Synthesis*, Vol. 9, Wiley-Interscience, pp. 156-157 (1981) (received in the PTO Scientific Library on October 5, 1983).

Scriven, *Chem. Soc. Rev.*, "4-Dialkylaminopyridines: Super Acylation and Alkylation Catalysts," Vol. 12, No. 2, pp. 129-161 (1983).

The Rejection

Claims 1 and 3-15 stand rejected under 35 U.S.C. § 103 as being unpatentable over Mukaiyma or Balt taken with Steglich or Scriven or Fieser I or II.

Opinion

We have carefully considered the respective positions advanced by appellants and the examiner. For the reasons set forth below, we will not sustain the examiner's rejection.

We point out that in a rejection under 35 U.S.C. § 103, it is basic that all elements recited

in a claim must be considered and given effect in judging the patentability of that claim against the prior art. *In re Geerdes*, 491 F.2d 1260, 1262-63, 180 USPQ 789, 791 (CCPA 1974); *In re Wilder*, 429 F.2d 447, 450, 166 USPQ 545, 548 (CCPA 1970). Appellants' claims are directed to the preparation of a binary sensitizing dye comprising the step of reacting a solution of a *dye* containing a carboxyl functional group and a *dye* containing an amino or a hydroxyalkyl functional group in the presence of a *combination* of 2-halo-1-alkylpyridinum salt and a 4-dialkylaminopyridine compound such that the two dye compounds undergo a dehydrative condensation reaction. Claim 3, in particular, defines the binary dye compound by its chemical structure.

The prior art is not seen to disclose or suggest the claimed subject matter set forth in the claims on appeal. None of the references relied upon by the examiner teaches forming the binary sensitizing dye by subjecting two dyes as defined in the claims on appeal to dehydrative condensation reaction conditions. While Mukaiyama and Bald disclose using a 2-halo-1-alkylpyridinium salt in a dehydrative condensation reaction and Steglich, Scriven and the Fieser references teach that 4-dialkylaminopyridine is a superior acylation catalyst, none of the references taken alone or collectively would have suggested *combining* the 2-halo-1-alkyl-pyridinum salt and a 4-dialkylaminopyridine compound in a reaction to form a binary dye. The only suggestion for combining the pyridinum salt and pyridine compound could only have come from appellants' disclosure. The suggestion must be found in the prior art, not in applicant's disclosure. *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). As for the binary dye compounds set forth in claim 3 and in the claims dependent thereon, the examiner has not pointed to any disclosure in the prior art relied

upon or explained how the prior art would have suggested or led one skilled in the art to thes e particular binary dye compounds being claimed.

For the foregoing reasons, we find the examiner has not made out a *prima facie* case of obviousness over the teachings of the prior art. Accordingly, the decis ion of the examiner is reversed.

REVERSED

JOHN D. SMITH)
Administrative Patent Judge)
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) BOARD OF PATENT
) APPEALS AND
CAMERON WEIFFENBACH) INTERFERENCES
Administrative Patent Judge)
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