

**OPINION UNDER SECTION 74A**

Patent	EP 1837182 B1
Proprietor(s)	FUJIFILM Corporation
Exclusive Licensee	
Requester	Acredian IP
Observer(s)	
Date Opinion issued	04 June 2015

**The request**

1. The comptroller has been requested by Acredian IP (the requester) to issue an opinion as to whether EP (GB) 1837182 B1 (“the patent”) is valid in terms of novelty and inventiveness in light of the following documents:

D1: JP 2004-182875 A (KONICA MINOLTA HOLDINGS INC.)

D2: US 2005/0018023 A1 (MOMOSE et al.)

D3: EP 1621348 A1 (TOSHIBA TEC)

**Allowance of the request**

2. The request for an opinion on the validity of the patent is allowable in part, as discussed below.
3. Rule 94 (1)(b) states that the comptroller shall not issue an opinion if the question upon which the opinion is sought appears to him to have been sufficiently considered in any relevant proceedings. In decision BLO/370/07 the hearing officer stated that:

*“It is an intrinsic part of the substantive examination process to assess the novelty and obviousness of the claims, as properly construed, in the light of the prior art. In this context “prior art” means documents cited in the search report (at least under category “X” or “Y”, which indicate possible relevance to novelty or inventive step) as well as material which has come to the examiner’s attention in some other way. I think it reasonable to suppose in general that the examiner will have done his or her job properly in the absence of indication to the contrary, and I see no reason why this*

*assumption should not apply even if the examiner has decided not to raise objection on the basis of any citations at substantive examination.”*

4. D2 and D3 were both cited on the European Patent Office (“EPO”) search report as two of nine category “X” documents i.e. relevant to novelty or inventive step. The requester submits that whilst both of these documents were considered during prosecution of EP 070051598.4 (the application from which the patent was granted) they were given insufficient consideration.
5. The requester does not provide any supporting evidence to the assertion that the examiner at the EPO did not give sufficient consideration to either D2 or D3. On the contrary, both documents were cited as relevant to the claims in the EPO Search Opinion of 17 August 2007. Furthermore, D3 was maintained in the EPO examination report of 12 January 2009 following amendment of the claims as still being relevant to the inventiveness of the amended claims.
6. From the above I consider it reasonable to assume that the EPO examiner has given due consideration to both D2 and D3 during the examination process. I shall therefore not consider either D2 or D3 in this opinion.
7. D1 was not considered by the EPO examiner prior to grant of the patent and was published before the priority date of the patent. Therefore I will consider the relevance of D1. D1 was considered by the US examiner during prosecution of the corresponding US patent application, US 2007/225185 A1. Largely on the basis of this document, the US application was refused.

## **Observations**

8. No observations were received.

## **The Patent**

9. The patent, EP 1837182 B1, is titled “Ink washing liquid and cleaning method”. It was filed on 13<sup>th</sup> March 2007, published on 26<sup>th</sup> September 2007 and granted on 12<sup>th</sup> May 2010. The patent remains in force.
10. The patent relates to an ink washing liquid for a photocurable ink. According to the patent, inkjet printing systems are inexpensive and more efficient in their consumption of ink when compared to electrophotographic and thermal printing systems.
11. Inkjet printing systems use a variety of inks, which include wax inks, which are solid at normal temperature, solvent inks, which mainly comprise an aqueous solvent or an organic solvent, photocurable inks, which cure upon exposure to light, etc. Among them, photocurable inks are attracting attention since they have low odour compared with other recording systems and can record not only on special paper but also on a recording medium that does not have fast-drying properties or ink absorbing properties.

12. The patent discusses the problem of the inkjet printer discharge orifices becoming blocked. An inkjet printer discharges ink via a very small diameter discharge orifice formed in a head, and this can lead to the discharge orifice becoming blocked by residual ink being cured in the discharge orifice or becoming attached to the surroundings of the discharge orifice.
13. The patent alleges that the techniques disclosed by the prior art are not sufficient for washing an ink composition. In particular, the washing properties are not sufficient for a photocurable oil-soluble ink.
14. The invention disclosed in the patent is aimed at providing an ink washing liquid for a photocurable ink, the ink washing liquid having excellent cleaning properties for the photocurable ink. This is achieved by including at least one type of ether compound in the ink washing liquid. The patent states that any ether compound may be used as long as it is a compound having an ether group (-O-) in the molecule.
15. According to the patent inclusion of an ether compound in the washing liquid allows cleaning to be carried out without making insoluble components in the ink aggregate; makes stable operation without head clogging possible in a situation in which cleaning is necessary when restarting equipment after replacing a solution or after it has been inactive for a long period of time; and furthermore, the continuous discharge reliability during printing is improved by its use in cleaning after the head is clogged.
16. The patent has nine claims including a single independent claim. Independent claim 1 reads as follows:
  1. *Use of a liquid as an ink washing liquid for a photocurable ink of an ink set in an inkjet printer system or an inkjet recording device, wherein the liquid comprises at least one type of ether compound, the ink set includes at least a cyan ink, a magenta ink, a yellow ink, a black ink and a white ink and the photocurable ink comprises a polymerizable compound and a polymerization initiator.*
17. I shall discuss the dependent claims later on, if I find that claim 1 is invalid.

## **Claim construction**

18. Before considering D1 I will need to construe the claims of the patent following the well known authority on claim construction which is *Kirin-Amgen and others v Hoechst Marion Roussel Limited and others* [2005] RPC 9. This requires that I put a purposive construction on the claims, interpret it in the light of the description and drawings as instructed by Section 125(1) and take account of the Protocol to Article 69 of the EPC. Simply put, I must decide what a person skilled in the art would have understood the patentee to have used the language of the claim to mean.
19. Section 125(1) of the Act states that:

*For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.*

20. And the Protocol on the Interpretation of Article 69 of the EPC (which corresponds to section 125(1) ) states that:

*Article 69 should not be interpreted in the sense that the extent of the protection conferred by a European patent is to be understood as that defined by the strict, literal meaning of the wording used in the claims, the description and drawings being employed only for the purpose of resolving an ambiguity found in the claims. Neither should it be interpreted in the sense that the claims serve only as a guideline and that the actual protection conferred may extend to what, from a consideration of the description and drawings by a person skilled in the art, the patentee has contemplated. On the contrary, it is to be interpreted as defining a position between these extremes which combines a fair protection for the patentee with a reasonable degree of certainty for third parties.*

21. The requester has argued that whilst claim 1 defines the use of a liquid as an ink washing liquid for an ink set comprising cyan, magenta, yellow, black and white where all inks in the set are photocurable and comprising a polymerizable compound and a polymerization initiator, it is important to recognise that each colour of an ink set is handled separately within a printer in its own cartridge. Accordingly the ink washing liquid flushes each colour or pigment type separately and thus only one pigment type in each and every flush.
22. I agree with the requester that it is obvious each colour of an ink set would be handled separately within a printer in its own cartridge. The patent explains in paragraph [0205] that the washing liquid is intended for use with any commercial inkjet recording device. It is well established in the art of printers that either each separate colour cartridge would supply its respective inkjet head via a respective ink supply path or where separate ink chambers containing different colours supply a single inkjet head, the head would be provided with separate nozzle arrays for each colour. In either scenario the different coloured inks in the ink set are handled separately within the printer. As stated by the requester, this means the ink washing liquid flushes each colour or pigment type separately.
23. The requester further argues that the performance of the washing liquid does not vary significantly with pigment type. I can find nothing in the patent to refute this. The requester draws attention to paragraph [0139] of the patent which reads:

*“The pigment is not particularly limited, and it is possible to use any generally commercially available organic pigment or inorganic pigment, a dispersion of a pigment in an insoluble resin, etc. as a dispersion medium, a pigment on the surface of which a resin has been grafted, etc. It is also possible to use resin particles colored with a dye, etc.”*

24. Paragraphs [0230] to [0235] of the patent discuss two types of evaluations (A and B) which were carried out on the described inkjet discharge system. Evaluations A and B were carried out using the ink washing liquid on the inkjet discharge system which printed with inks of five colours (cyan, magenta, yellow, black, and white). The performance data is listed in Tables 1-3 in the patent and does not distinguish between various colours used. Taking this and paragraph [0139] into account I consider and agree with the requester that the performance of the washing liquid can be expected to not vary significantly between the different colours.
25. I do not consider there to be any issue with the construction of claim 1. Claim 1 is directed to "Use of a liquid as an ink washing liquid for a photocurable ink..." and I have construed the claim as equivalent to a "process" claim of the form "a process of cleaning an inkjet head using the liquid". I have not interpreted the claim as directed to the liquid recognisable as intended for use as an ink washing liquid. Furthermore use of the word "for" is non-limiting and merely requires the liquid to be suitable for use with a photocurable ink.

## **Novelty**

26. I will now consider the disclosure of D1 and its relevance to the claims of the patent. The requester has argued that D1 discloses all of the features of independent claim 1.
27. D1 discloses a cleaning method of a penetrant remover for a cationic photocurable ink. Paragraph [0015] describes the penetrant remover as having a basic substance having an ether linkage. Furthermore, in paragraph [0019] the penetrant remover is described as containing any of the following ether compounds: diethylene glycol monoethyl ether, Triethylene glycol monomethyl ether, tripropylene glycol monomethyl ether, Dipropylene glycol monomethyl ether, Triethylene glycol monoethyl ether, dipropylene glycol monoethyl ether, Tetraethylene glycol monoethyl ether, tetraethylene glycol monomethyl ether, triethylene glycol monoisopropyl ether, tripropylene glycol monoethyl ether.
28. As highlighted by the requester, paragraph [0025] describes the applicability of the penetrant remover for a variety of "...inorganic pigments, such as various kinds of chromatic colour organic pigments...carbon black, a titanium white...". The example given in paragraph [0038] describes an ink set of cyan, magenta, yellow and black ink.
29. Paragraph [0021] describes the cationic photocurable ink as containing a polymerization compound and a photopolymerization initiator. Paragraph [0023] describes the photocurable ink including a polymerization compound including one of a styrene derivative, a vinyl naphthalene derivative, vinyl ether, and N-vinyl compounds as examples.
30. I consider D1 to disclose use of a penetrant remover (ink washing liquid) suitable for use with a photocurable ink, wherein the penetrant remover comprises an ether compound; an ink set including a cyan, magenta, yellow, black and white ink; and the photocurable ink comprises a polymerization compound and a photopolymerization initiator. Therefore I agree with the requester that D1 anticipates

independent claim 1.

31. Dependent claims 2-9 are as follows:

*2. The use of the liquid according to Claim 1, wherein the liquid further comprises at least one type of pigment-dispersing agent.*

*3. The use of the liquid according to Claim 1 or 2, wherein the liquid further comprises at least one type of basic compound.*

*4. The use of the liquid according to Claim 3, wherein the basic compound is an organic amine.*

*5. The use of the liquid according to any one of Claims 1-4, wherein the ether compound is a glycol ether compound.*

*6. The use of the liquid according to any one of Claims 1-5, wherein the photocurable ink is a radically polymerizable ink.*

*7. The use of the liquid according to Claim 6, wherein the photocurable ink comprises an N-vinylactam as a radically polymerizable compound.*

*8. The use of the liquid according to any one of Claims 1-7, wherein the ink comprises titan white.*

*9. The use of the liquid according to any one of Claims 1-8, wherein the ether compound is at least one selected from tripropylene glycol monomethyl ether, dipropylene glycol monomethyl ether, propylene glycol monomethyl ether, triethylene glycol divinyl ether, dipropylene glycol diacrylate, ethylene glycol monobutyl ether, diethylene glycol monobutyl ether, triethylene glycol monobutyl ether, ethylene glycol monobenzyl ether, diethylene glycol monobenzyl ether, tripropylene glycol divinyl ether, dipropylene glycol divinyl ether, and tripropylene glycol diacrylate.*

32. I can see no issue with the construction of any of dependent claims 2-7 or 9. These dependent claims are clear and a person skilled in the art would have no difficulty in construing their scope. Claim 8 appears to contain a typographical error which is discussed in paragraph 38 below.

33. In paragraph [0020] of D1 the addition of a surfactant to the penetrant remover is described. Surfactants are pigment dispersing agents and thus claim 2 is considered to be anticipated.

34. Claim 3 is anticipated at paragraph [0008] which discloses the penetrant remover as containing a basic substance.

35. Paragraph [0015] contains a list of organic compounds that could form the basic compound. The list includes primary amine and hydroxyl amine thus anticipating claim 4.

36. Paragraph [0019] describes the penetrant remover as including glycol ether

compounds. Therefore claim 5 is anticipated.

37. D1 discloses a cationic photocurable ink rather than a radically polymerizable photocurable ink. Therefore claim 6 is not anticipated and due to its dependence upon claim 6 neither is claim 7.
38. The scope of claim 8 has been highlighted by the requester as unclear as the feature of the ink comprising "titan white" is not supported by the description of the patent. Paragraphs [0147] and [0148] of the patent discuss specific examples of white pigments and read:

*"[0142] Specific examples of white pigments that can be used include basic lead carbonate ( $2PbCO_3Pb(OH)_2$ , also known as silver white), zinc oxide ( $ZnO$ , also known as zinc white), titanium oxide ( $TiO_2$ , also known as titanium white), and strontium titanate ( $SrTiO_3$ , also known as titan strontium white).*

*[0143] Titanium oxide has, compared with other white pigments, a low specific gravity, a high refractive index, and is chemically and physically stable, and therefore has high hiding power and coloring power as a pigment and, furthermore, has excellent durability toward acids, alkalis, and other environments. It is therefore preferable to use titanium oxide as the white pigment. It is of course possible to use another white pigment (which can be any white pigment, in addition to the white pigments cited above) as necessary."*

From the above paragraphs I agree with the requester and construe claim 8 to define the ink as comprising "titanium white". Paragraph [0025] of D1 discloses the ink as being titanium white and thus claim 8 is anticipated.

39. In paragraph [0019] the ether compound is disclosed as tripropylene glycol monomethyl ether or dipropylene glycol monomethyl ether among other examples. Claim 9 is therefore anticipated.

## **Inventive step**

40. I will now consider whether claims 6 and 7 are inventive in light of the disclosure in D1.
41. In the UK the law to determine whether or not an invention defined in a particular claim is inventive over the prior art and that which I must follow is set out in *Pozzoli SPA v BDMO SA [2007] EWCA Civ 588*, in which the well known Windsurfing steps were reformulated:

*(1)(a) Identify the notional "person skilled in the art";*  
*(1)(b) Identify the relevant common general knowledge of that person;*  
*(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;*  
*(3) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the*

*claim as construed;*

*(4) Viewed without any knowledge of the alleged invention as claimed, determine whether those differences constitute steps which would have been obvious to the person skilled in the art.*

42. The person skilled in the art is a designer and manufacturer of ink washing liquids. In that role their common general knowledge would include the composition of known inks and the composition of prior art ink washing liquids for use with different inks.
43. Claim 6 requires the photocurable ink to be a radically polymerizable ink. D1 discloses a penetrant remover for a cationic photocurable ink and not a radically polymerizable ink. However, D1 does discuss prior art photo-curing ink as including radical polymerization nature photo-curing ink in paragraph [0003]. The requester has argued that the skilled person would not perceive difficulties in flushing arising from the inks being cationic as opposed to radically polymerizable and therefore the skilled person would consider the penetrant remover equally suitable for use with a radically polymerizable ink. I agree with the requester and consider claim 6 to be obvious in light of D1.
44. Paragraph [0023] discloses the cationic photocurable ink as comprising N-vinyl pyrrolidone (N-vinyl lactam). The skilled person would consider it obvious that the radically polymerizable ink of claim 6 would include N-vinyl lactam as a radically polymerizable compound. Claim 7 is also considered to be obvious in light of D1.

## **Conclusion**

45. I am therefore of the opinion that claims 1-5 and 8-9 of the patent lack novelty and claims 6-7 are obvious in light of the disclosure of D1.

## **Application for review**

46. Under section 74B and rule 98, the proprietor may, within three months of the date of issue of this opinion, apply to the comptroller for a review of the opinion.

Mr Marc Collins  
Examiner

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## **NOTE**

*This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.*