

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

SENG-TIONG HO and YINGYAN HUANG,)	
)	
Plaintiffs,)	
)	
v.)	No. 07 C 4305
)	
ALLEN TAFLOVE and SHIH-HUI CHANG,)	
)	
Defendants.)	
)	

MEMORANDUM OPINION AND ORDER

Plaintiffs Seng-Tiong Ho ("Ho") and Yingyan Huang ("Huang") filed suit against defendants Allen Taflove ("Taflove") and Shih-Hui Chang ("Chang") alleging copyright infringement, trade secret misappropriation, false designation of origin, fraud, conversion, and unfair competition. Plaintiffs claims center around a mathematical model they originated, which defendants are alleged to have copied and used in various publications. Defendants move both to dismiss and for summary judgment on all counts. For the following reasons, the motion for summary judgment is granted and the motion to dismiss is denied as moot. Plaintiffs' motion to strike defendants' reply to plaintiffs' response to defendants' Rule 56.1 statement of facts is granted.

I.

Ho and Taflove are professors of engineering at Northwestern University ("Northwestern") and, during the relevant period, Huang and Chang were engineering graduate students at Northwestern. In 1998, Ho first conceived and formulated a "4-level 2-electron

atomic model with Pauli Exclusion Principle¹ for simulating the electron dynamics of active media using Finite Difference Time Domain² method" (the "Model"). The Model is an advance relative to earlier models³ that did not include the Pauli Exclusion Principle or certain "pumping dynamics," among other things.

Plaintiffs implemented and validated the Model for various applications, including optical switching and various gain media. Ho completed the derivation of equations for the Model by 1999 and involved Chang in implementing the equations into a FDTD computer program code for the purpose of running simulations of the Model. The computer program was developed from an earlier FDTD program, which was created at least in part by Chang. Chang was a research assistant for Ho and worked under his instruction until sometime in 2002 when he left to join Taflove's research group.

Huang started working for Ho in his lab in September of 2000.

¹ A quantum mechanical principle formulated by Wolfgang Pauli in 1925. See generally, http://en.wikipedia.org/wiki/Pauli_exclusion_principle (last visited on January 12, 2010).

² Finite Difference Time Domain ("FDTD") is a popular computational electrodynamics modeling technique that is considered easy to understand and implement. See generally, <http://en.wikipedia.org/wiki/FDTD> (last visited on January 12, 2010).

³ Generally speaking, mathematical models use mathematical language to describe a system by a set of variables that represent properties of the system and a set of equations that establish relationships between the variables. The model is the set of functions that describe relationships between the different variables. See generally, http://en.wikipedia.org/wiki/Mathematical_model (last visited on January 7, 2010).

Between 2000 and 2001, she worked on applications of the Model to various mediums. The main focus of her work with Ho was to apply the Model to a range of gain medium (e.g., laser) parameters. Plaintiffs' research results and the Model were partially published in a conference paper in 2001 and then published in detail in 2002 in Huang's thesis.

The Model's original formulation and derivation of equations were also contained in Ho's 1998 and 1999 notebooks, and published in a 2002 presentation. The notebooks, the 2002 presentation, Huang's thesis, and two figures used in Huang's thesis were registered with the Copyright Office in 2007.⁴ (See Pls.' Resp. at 3.) (providing copyright registration numbers). There is presently no known commercial use for the Model.

Defendants submitted an article to the Optics Express Journal ("OE") and a four-page symposium paper to IEEE APS ("APS"), an online archival publication, describing the Model and discussing its applications. Some of the figures and equations published in Huang's thesis were used in these articles. The OE article was published in 2003 and covered the same subject matter as the APS

⁴ No copies of the certificates of registration were filed as evidence of a valid copyright in the five subject works, although the registration numbers were provided by the plaintiffs. Copies of the 2002 presentation and Ho's research notebooks are not included with the summary judgment exhibits either. Defendants submitted a copy of Huang's thesis in their exhibits, which apparently contains the two figures that were separately registered with the Copyright Office at issue. (See Defs.' SOF, Ex. D3.)

Paper, but with more detail. Defendants did not include attributions to plaintiffs for their work or reference Huang's thesis. Plaintiffs filed complaints against defendants with OE, APS, and Northwestern alleging plagiarism. On July 31, 2007, plaintiffs filed the present suit alleging copyright infringement, trade secret misappropriation, false designation of origin, fraud, conversion, and unfair competition.⁵

II.

Summary judgment is appropriate where the record shows that "there is no genuine issue as to any material fact and that the moving party is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(c). A genuine issue for trial exists "if the evidence is such that a reasonable jury could return a verdict for the nonmoving party." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248, 106 S. Ct. 2505, 91 L. Ed.2d 202 (1986). The movant initially bears the burden of "identifying those portions of 'the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any,' which it believes

⁵ The complaint includes allegations that, in addition to the OE article and APS paper, some of the registered works were also copied in Taflove's book and in "other" publications. (Compl. ¶ 23; Pls.' Resp. at 4.) Those allegations are mentioned in one sentence in the facts section of plaintiffs' response, but no argument is made. *Id.* Plaintiffs' responses to defendants' interrogatories only allege copyright infringement in the APS paper and OE article. (Defs.' SOF ¶ 63.) Accordingly, plaintiffs' copyright infringement claim is limited to those two documents.

demonstrate the absence of a genuine issue of material fact.” *Celotex Corp. v. Catrett*, 477 U.S. 317, 323, 106 S. Ct. 2548, 91 L. Ed.2d 265 (1986) (citing Fed. R. Civ. P. 56(e)). Once the movant has met this burden, the non-movant “may not rest upon the mere allegations or denials of the adverse party’s pleading,” but rather “must set forth specific facts showing that there is a genuine issue for trial.” Fed. R. Civ. P. 56(e).

I must construe all facts in the light most favorable to the non-movant and draw all justifiable inferences in favor of that party. See *Anderson*, 477 U.S. at 255, 106 S. Ct. at 2505.

III.

The Copyright Act provides that “[c]opyright protection subsists ... in original works of authorship fixed in any tangible medium of expression ... from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.” 17 U.S.C. § 102(a). As a general matter, a plaintiff asserting copyright infringement must prove: “(1) ownership of a valid copyright, and (2) copying of constituent elements of the work that are original.” *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 361, 111 S. Ct. 1282, 113 L.Ed.2d 358 (1991).

Plaintiffs provide copyright registration numbers as *prima facie* evidence of copyrightability and copyright ownership of Huang’s thesis, Ho’s notebooks, Huang’s figures, and a 2002

presentation. They argue that defendants copied plaintiffs' "expression of a complicated physical phenomenon," consisting of 1) the Model formulation, 2) the related full derivation of equations, and 3) two figures.⁶ (See Pls.' Resp. 7.)

However, the Copyright Act clearly provides that "[i]n no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work" 17 U.S.C. § 102(b).⁷ Defendants contend that the items allegedly copied are unprotectable concepts, ideas, methods, procedures, processes, systems, and/or discoveries, even if contained in a copyrighted work. Additionally, defendants contend that the merger doctrine applies because there are so few ways of mathematically expressing the Model. See *Wildlife Express Corp. v. Carol Wright Sales, Inc.*, 18 F.3d 502, 508 (7th Cir. 1994) (no copyright infringement for using expression required by idea); *Applied*

⁶ Defendants figures, titled "four-level two-electron model" and "semiconductor band structure," do not appear to be direct copies of figure 2-1 of Huang's thesis, titled "Four-level two-electron scheme for semiconductor band structure." (Compare SOF Exs. D28, Fig. 1 and D30, Figs. 1,2 with SOF Ex. D3, Fig. 2-1.)

⁷ Copyright Office Circular 31 explains that copyright protection is not available for "scientific or technical methods or discoveries... mathematical principles; formulas, algorithms; or any concept, process or method of operation."

Innovations, Inc. v. Regents of the Univ. of Minn., 876 F.2d 626 (8th Cir. 1989) (noting that statistical models and mathematical principles cannot be copyrighted.) Defendants cite numerous persuasive cases in support of this argument. See *Baker v. Selden*, 101 U.S. 99, 103 (1879) ("The copyright of a work on mathematical science cannot give to the author an exclusive right to the methods of operation which he propounds, or to the diagrams which he employs to explain them, so as to prevent an engineer from using them whenever occasion requires."); *Am. Dental Ass'n v. Delta Dental Plans Ass'n*, 126 F.3d 977, (7th Cir. 1997) ("Einstein's articles laying out the special and general theories of relativity were original works even though many of the core equations, such as the famous $E=mc^2$, express 'facts' and therefore are not copyrightable."); *MiTek Holdings, Inc. v. Arce Eng'g Co.*, 89 F.3d 1548, 1556 n.19 (11th Cir. 1996) ("Were we to grant copyright protection to MiTek's user interface, which is nothing more than a process, we would be affording copyright protection to a process that is the province of patent law."); *Dimension D, LLC v. True*, No. 2:06CV113-SRW(WO), 2006 WL 106952, at * 4 (M.D. Ala. Apr. 21, 2006) (remanding case to state court after finding no evidence demonstrating the mathematical model/algorithm at issue qualified for copyright protection, citing the merger doctrine and 17 U.S.C § 102(b)). Plaintiffs contend that their Model is not a fact and therefore is protectable. To illustrate this point, they

compare the Model to a cartoon character, arguing that like Mickey Mouse, an expression of a mouse with defined personality and characteristics, the Model is only an expression of the scientific phenomenon it simulates. But Mickey Mouse is not an idea, procedure, process, system, method of operation, concept, principle, or discovery, and his characteristics and personality are not intended to realistically mimic those of a real mouse (e.g., wears clothes, owns a dog, has jobs, etc.) Simply put, Mickey Mouse does not have plaintiffs' merger doctrine or 17 U.S.C. § 102(b) problems.

Moreover, the "unique assumptions" that plaintiffs argue make their works protectable are not identified in their brief or cited evidence. (See generally Pls.' Resp. 5-8. and PSOF Ex. A, ¶¶ 30-33) (supported in large part by Ho's affidavit, which states that defendants "utilized" plaintiffs' "various writings, paragraphs, equations, and figures"; the modeling concept, the formulation, the derivation, and application of the model to various mediums); see also (Defs.' SOF Ex. D40.) (letter from Northwestern's plagiarism inquiry committee noting that "[t]he basic physics model of a four-level model is fairly standard...[t]he Pauli exclusion principle is clearly important, but is certainly not the intellectual property of any of the parties involved"). The two figures at issue consist in large part of lines, parabolas, arrows (unprotectable elements) and were described by Northwestern as "fairly conventional

diagrammatic representations.” (Compare Defs.’ SOF Exs. D28, Fig. 1 and D30, Figs. 1,2 with Defs.’ SOF Ex. D3, Fig. 2-1.; see also Defs.’ SOF Ex. D40.) Without identification of what “unique assumptions” were made or what elements of the plaintiffs’ figures, equations, and derivation are at issue, I cannot determine if that expression could be considered original and protectable in light of 17 U.S.C. 102(b) and the merger doctrine.

The cases cited by plaintiffs are not helpful. For example, plaintiffs cite to *Flick-Reedy Corp. v. Hydro-Line Mfg. Co.*, 351 F.2d 546 (7th Cir. 1965), in support of their argument that the Model formulation and derivation are protectable. But in that case, the Seventh Circuit found plaintiff’s copyright was valid as a revision and new arrangement of computations and formulae that were in the public domain - not a valid copyright of the computations and formulae themselves. *Id.* at 549-50; see also *Addison-Wesley Pub. Co. v. Brown*, 223 F. Supp. 219 (E.D.N.Y. 1963) (pre-*Feist* decision protecting plaintiffs’ textbook containing original physics homework problems); *Apple Computer Inc. v. Franklin Computer Corp.*, 714 F.2d 1240 (3rd Cir. 1983) (computer program protectable).

Plaintiffs also claim that the merger doctrine does not apply because there are numerous ways of deriving a fundamental principle and depicting the results of a scientific model. But the issue here is whether there are numerous ways of expressing plaintiffs’

Model and whether that Model is protectable in the first place. Without some evidence or legal authority suggesting that the expression copied did not merge with plaintiffs' idea, this argument fails.⁸

IV.

Next, with regard to plaintiffs' claims for false designation of origin under the Lanham Act, 15 U.S.C. § 1125, and unfair competition, defendants argue that *Dastar Corp. v. Twentieth Century Fox Film Corp.*, 539 U.S. 23, 123 S. Ct. 2041, 156 L.Ed.2d 18 (2003) effectively bars those claims. I agree. Under *Dastar*, defendants are the properly designated origin of the allegedly infringing publications, regardless of whether the original idea, formulation, equations, and figures relating to the Model were plaintiffs'. This is because the term "origin of goods" in the Lanham Act refers to "the producer of the tangible goods that are offered for sale, and not to the author of any idea, concept, or communication embodied in those goods." *Id.* at 32.

As the Seventh Circuit has explained, "[t]he right question...is whether the consumer knows who has produced the finished product. In the *Dastar* case that was *Dastar* itself, even though most of the product's economic value came from elsewhere." *Bretford Mfg., Inc., v. Smith Sys. Mfg. Corp.*, 419 F.3d 576, 581

⁸ In light of my finding that the cited works are not protected by the Copyright Act, defendants' joint authorship and limitations arguments are moot.

(7th Cir. 2005); see also *Francois v. Jack Ruch Quality Homes, Inc.*, No. 03-1419, 2006 WL 2361892, at *13 (C.D. Ill. Aug. 14, 2006) (“**Dastar** made it clear that there is no claim under the Lanham Act for copying, revising, and using a copyright-able work. Such claims exist if at all under copyright law.”)(emphasis in original). Here, the allegedly infringing publications were appropriately designated as having “originated” with defendants.

Common law unfair competition claims “rise or fall” based on the Lanham Act. See *MJ Partners Restaurant Ltd. v. Zadikoff*, 10 F. Supp. 2d 922, 929 (N.D. Ill. 1998). Therefore, because plaintiffs’ Lanham Act claim fails, their unfair competition claim fails too. Defendants’ motion is granted on Counts II and III.

V.

In Illinois, to establish a claim for conversion a plaintiff must show: 1) defendant’s unauthorized or wrongful assumption of control, dominion, or ownership over a plaintiff’s personal property; 2) plaintiff’s right in the property; 3) plaintiff’s right to immediate possession of the property; and 4) plaintiff’s demand for possession of the property. *Van Diest Supply Co. v. Shelby County State Bank*, 425 F.3d 437, 439 (7th Cir. 2005). Defendants argue that plaintiffs’ claim is not cognizable in Illinois because they do not allege conversion of physical property, but rather conversion of plaintiffs’ research ideas. *In re Thebus*, 108 Ill. 2d 255, 260, 483 N.E.2d 1258, 91 Ill. Dec. 623

(1985) (stating an action for conversion usually "lies only for personal property which is tangible, or at least represented by or connected with something tangible").

It appears that plaintiffs are really alleging conversion of intangibles (e.g., credit for their work, research concepts), but they suggest in their brief that 1) intangibles are the proper subject of a conversion claim if they are available in tangible form, and 2) this claim is also based on defendants' retention of copies of plaintiffs' notebooks and thesis. (See Compl. ¶ 42; Pls.' Opp'n. at 12.) To the extent plaintiffs argue that defendants' possession of physical copies of plaintiffs' works constitutes conversion, their claim fails as there are no allegations or evidence indicating that plaintiffs did not have copies of those materials available to them at all times. *FMC Corp. v. Capital Cities/ABC, Inc.*, 915 F.2d 300, 303-04 (7th Cir. 1990) (stating that "the possession of copies of documents-as opposed to the documents themselves-does not amount to an interference with the owner's property sufficient to constitute conversion...[t]he only rub is that someone else is using it as well").

In support of their argument that intangibles can be the subject of a conversion claim, plaintiffs cite to *Bilut v. Northwestern Univ.*, 296 Ill. App. 3d 42, 692 N.E.2d 1327 (Ill.App.Ct. 1998). In *Bilut*, the plaintiff doctoral student

brought a claim for conversion of her research ideas. She alleged that her advisor/professor refused to allow her to conduct her proposed research, supported her dismissal from the doctoral program, and "usurped her research ideas." *Id.* at 50. The *Bilut* court dismissed her conversion claim as time-barred, but noted in dicta that her research ideas were "a proper subject of conversion because the printed copy of the research constituted tangible property."⁹ Without any thoughtful analysis, plaintiffs conclude that their claim must also be viable because their research ideas were written in tangible form. But the evidence does not suggest that defendants ever prevented Ho and Huang from conducting, controlling, accessing, using, or publishing their research. Accordingly, I do not find *Bilut* persuasive here. Defendants unauthorized copying and use of plaintiffs' published works does not sustain a claim for conversion.

VI.

I also grant defendants' motion as to plaintiffs' common law fraud/misrepresentation claim (Count V). Plaintiffs' five sentence response cites caselaw unrelated to this claim and states that

⁹ The *Bilut* opinion also cites to *Conant v. Karris*, 165 Ill.App.3d 783, 117 Ill.Dec. 406, 520 N.E.2d 757 (Ill. 1987), suggesting that the research proposal in that case was confidential and/or no longer of use to plaintiff once usurped by her advisor. *Id.* (allowing claim for conversion of confidential information no longer of value to plaintiff once disclosed to third party).

there are fact issues relating to “the manner in which Chang misled Plaintiffs in obtaining copies of their protected materials that he and Taflove later used in their infringing works” that preclude summary judgment.¹⁰ But those fact issues are unrelated to the stated fraud claim, which alleges defendants used plaintiffs’ work and passed it off as their own. (See Compl. ¶¶ 43-46.) Moreover, the fraud claim as stated is not well-founded. By taking credit for plaintiffs’ work, defendants may have misled publishers or readers as to proper authorship, but they clearly did not mislead plaintiffs.

VII.

Plaintiffs’ trade secret misappropriation claim also fails because it is based on the faulty premise that the Model is a trade secret. It is undisputed that the Model was published by plaintiffs in 2001 and 2002. See *BondPro Corp. V. Siemens Power Generation, Inc.*, 463 F.3d 702, 706 (7th Cir. 2006) (“A trade secret that becomes public knowledge is no longer a trade secret.”) This fact alone dooms plaintiffs’ claim.¹¹

¹⁰ To the extent the fraud claim is based on Chang’s alleged misrepresentation to plaintiffs as to how he planned to use Ho and/or Huang’s work, they fail to explain how such a misrepresentation is actionable fraud. See *Davis v. Carter*, 452 F.3d 686, 692 (7th Cir. 2006) (court is not required to “scour a record to locate evidence supporting a party’s legal argument” nor “research and construct the parties’ arguments.”)

¹¹ Contrary to plaintiffs’ contentions, the Model’s trade secret status is not dependent on whether defendants gave plaintiffs proper attribution in later publications.

Plaintiffs also allege that in addition to the Model, defendants' publications included other "materials from Ho's copyrighted notebook." (See Pls.' Opp'n. 14). The only "evidence" supporting this statement is Ho's affidavit, which includes the following averment: "Some of the information in Defendants' OSA article and book chapter contain materials from my copyrighted notebooks that were not previously published." (*Id.* Ex. A, ¶ 32.) For obvious reasons, this unsupported, nebulous statement does not sustain plaintiffs' trade secret claim at this stage in the litigation.

VIII.

Plaintiffs' state law claims are also all preempted by the Copyright Act. "State law claims do not avoid preemption simply because they are based upon the improper use of uncopyrightable material contained in works properly subject to copyright. If the rule were otherwise, states would be free to regulate materials Congress has assigned to the public domain." *Nash v. CBS, Inc.*, 704 F. Supp. 823, 832 (N.D. Ill. 1989), *aff'd*, 899 F.2d 1537 (7th Cir. 1990) (citations omitted).

IX.

For the foregoing reasons, defendants' motion for summary judgment is granted and defendants' motion to dismiss is denied as

moot. Plaintiffs' motion to strike defendants' reply to plaintiffs' response to defendants' Rule 56.1 statement of facts is granted.

ENTER ORDER:

A handwritten signature in black ink, appearing to read "Elaine E. Bucklo", written in a cursive style.

Elaine E. Bucklo

United States District Judge

Date: January 15, 2009