

FILED
U.S. DISTRICT COURT

Brent O. Hatch (5715)
Mark F. James (5295)
HATCH, JAMES & DODGE LLP
10 West Broadway, Suite 400
Salt Lake City, Utah 84101
Telephone: (801) 363-6363
Facsimile: (801) 363-6666

Robert Silver (admitted pro hac vice) P 4: 59
Edward Normand (admitted pro hac vice)
BOIES, SCHILLER & FLEXNER LLP
333 Main Street
Armonk, New York 10504
Telephone: (914) 749-8200
Facsimile: (914) 749-8300

BY: _____
DEPUTY CLERK

Stuart H. Singer (admitted pro hac vice)
BOIES, SCHILLER & FLEXNER LLP
401 East Las Olas Boulevard – Suite 1200
Ft. Lauderdale, Florida 33301
Telephone: (954) 356-0011
Facsimile: (954) 356-0022

Stephen N. Zack (admitted pro hac vice)
BOIES, SCHILLER & FLEXNER LLP
Bank of America Tower – Suite 2800
100 Southeast Second Street
Miami, Florida 33131
Telephone: (305) 539-8400
Facsimile: (305) 539-1307

Attorneys for The SCO Group, Inc.

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF UTAH**

THE SCO GROUP, INC.

Plaintiff/Counterclaim-Defendant,

v.

INTERNATIONAL BUSINESS
MACHINES CORPORATION,

Defendant/Counterclaim-Plaintiff.

**EXHIBITS TO SCO'S
MEMORANDUM IN OPPOSITION TO
MOTION TO CONFINE SCO'S
CLAIMS TO, AND STRIKE
ALLEGATIONS IN EXCESS OF, THE
FINAL DISCLOSURES**

Case No. 2:03CV0294DAK
Honorable Dale A. Kimball
Magistrate Judge Brooke C. Wells

UNSEALED EXHIBITS Nos. 12, 13, 14, 18, 19.

Exhibit 12

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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF UTAH, CENTRAL DIVISION

SCO GROUP, INC.,
Plaintiff/Counterclaim-Defendant,
-vs-
INTERNATIONAL BUSINESS MACHINES,
CORPORATION,
Defendant/Counterclaim-Plaintiff.)

2:03-CV-294 DAK

COPY

BEFORE THE HONORABLE DALE A. KIMBALL

DATE: SEPTEMBER 15, 2004

REPORTER'S TRANSCRIPT OF PROCEEDINGS

ARGUMENT ON MOTION

Reporter: REBECCA JANKE, CSR, RMR

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A P P E A R A N C E S

FOR THE PLAINTIFF:

HATCH, JAMES & DODGE
BY: BRENT O. HATCH, ESQ.
MARK F. JAMES, ESQ.N
10 WEST BROADWAY, SUITE 400
SALT LAKE CITY, UTAH 84101

BOIES, SCHILLER & FLEXNER
BY: ROBERT SILVER, ESQ.
333 MAIN STREET
ARMONK, NEW YORK 10504

ANDREWS KURTH
BY: FREDERICK S. FREI, ESQ.
1701 PENNSYLVANIA AVENUE, NW,
SUITE 300
WASHINGTON, D.C. 20006

FOR THE DEFENDANT:

SNELL & WILMER
BY: TODD M. SHAUGHNESSY, ESQ.
CHRIS KAO, ESQ.
15 WEST SOUTH TEMPLE, SUITE 1200
SALT LAKE CITY, UTAH 84101

CRAVATH, SWAINE & MOORE
BY: EVAN R. CHESLER, ESQ.
DAVID R. MARRIOTT, ESQ.
WORLDWIDE PLAZA
825 EIGHTH AVENUE
NEW YORK, NEW YORK 10019

1 That's already in this case in all of the litigation before
2 the Magistrate Judge over those two questions. They never
3 once stood up and said, "Your Honor, the reason we
4 shouldn't be obligated to answer those questions is they
5 are not in the case. You will be expanding the complexity
6 of this case beyond what it already is by asking us to
7 produce that information."

8 They made lots of arguments, unsuccessfully, to
9 not to have to answer those questions. They never made
10 those arguments. That is the proof on which our
11 counterclaim will rely because they can't, as Mr. Marriott
12 will describe to the Court very soon, and as I'm sure Your
13 Honor knows from reading the papers, it is their failure to
14 provide that proof which is the basis for our summary
15 judgment motion on this very counterclaim. It's not adding
16 anything to the case that isn't already in the case, Your
17 Honor. It's the information we have been chasing all this
18 time.

19 What they need to do to prove their claim is very
20 simple. It's like every other copyright claim. You take
21 the copyrighted work, which they have, and you match it
22 against the allegedly infringing work, which anybody in the
23 world can download off the internet, and you see if they
24 are sufficiently similar to constitute infringement. And
25 then you litigate any defenses, if there are any, if they

1 copied protectable elements of those copyrights.

2 With the Court's permission, I would like to hand
3 up, if I may, a little booklet.

4 THE COURT: Sure, as long as everyone gets it.

5 MR. MARRIOTT: Your Honor, from the beginning of
6 this case, SCO has publicly claimed that Linux is an
7 unauthorized derivative work of UNIX and that the use of
8 Linux by anybody infringes SCO's alleged copyrights. And
9 with respect to IBM in particular, SCO has claimed that IBM
10 is responsible for dumping SCO's allegedly proprietary UNIX
11 code into the Linux operating system.

12 SCO has represented that in press releases. It
13 has sent letters to the Fortune 1000 companies, and it has
14 sent letters to every member of Congress making the point.
15 It has basically told the world, Your Honor, that if you
16 use Linux, you have infringed SCO's alleged copyrights.
17 And we have provided a listing of those allegations for
18 Your Honor at pages 2 through 4 of our book, and I won't
19 repeat those here.

20 From the beginning of the case, Your Honor, SCO
21 has publicly claimed to have substantial evidence to
22 support its allegations of copyright infringement. Its CEO
23 is on record as saying that it has done a deep dive into
24 the Linux code, that it has compared Linux to UNIX ever
25 which way but Tuesday, and it has found substantial

1 less than 300 lines of code as to which he says there is a
2 similarity between Linux, on the one hand, and UNIX on the
3 other hand.

4 However, Your Honor, Mr. Gupta's commentary about
5 that code is flawed as a matter of law. He fails
6 altogether to take the count of the controlling test of
7 this Circuit and most Circuits relating to substantial
8 similarity. That is the lynch pin of a claim for copyright
9 infringement. The test is set out in the Tenth Circuit's
10 decision in Gates Rubber, and as set out in the Gates
11 Rubber decision, Your Honor, before a Court compares two
12 works -- here Linux and UNIX -- to determine whether there
13 is substantial similarity, the Court must first filter
14 out --

15 THE COURT: The extraction, filtration and
16 comparison test?

17 MR. MARRIOTT: You've got it.

18 THE COURT: I don't know if I've got it. I know
19 how to say it.

20 MR. MARRIOTT: You said it, and I think you've
21 got it, Your Honor. You must first filter out of the
22 allegedly protected work those elements which are not
23 protectable. Mr. Gupta doesn't even attempt to filter out
24 the unprotectable elements. The only similarities
25 identified by Mr. Gupta here, Your Honor, are similarities

1 of absolutely no legal significance. They are the result
2 of Linux and UNIX both being operating systems; utilitarian
3 works written in the same computer operating system
4 language and based upon basically the same industry
5 standards and programs and practices.

6 The kinds of similarities, Your Honor, which are
7 identified by Mr. Gupta, are the very similarities that
8 Your Honor will see referenced at the end of the e-mail
9 which I handed the Court, if you will look at the last
10 paragraph. The kinds of similarities identified by
11 Mr. Gupta, Your Honor, without reading that, are
12 similarities of no legal significance. SCO recognizes
13 that.

14 We have submitted for Your Honor's review a
15 declaration of Professor Brian Kernighan. Professor
16 Kernighan is one of the leading authorities on the
17 language, the computer program language, in which Linux and
18 UNIX are written. He's one of the authors of the leading
19 text on that subject. And as explained in Professor
20 Kernighan's declaration, the less than 300 lines identified
21 by Mr. Gupta are plainly all filterable. They are ideas,
22 processes, merger material, scenes a faire material, and
23 material dictated by externalities.

24 Moreover, Your Honor, when you actually look at
25 the code identified by Mr. Gupta, it is instructive -- and

1 if the Court would permit. For one thing, Your Honor, the
2 300 or so -- less than 300, actually, lines of code
3 identified by Mr. Gupta are plainly edited and rearranged
4 and juxtaposed to give the appearance of similarity when,
5 in fact, no similarity exists. And Your Honor can see that
6 by comparing the two pieces of paper that I have provided
7 to the Court.

8 One, entitled Exhibit H, is Mr. Gupta's. That is
9 from his declaration. The other is a book we put together
10 which contains the actual files of code from which
11 Mr. Gupta has selected, juxtaposed, cherry-picked code to
12 give the impression of similarity. And if Your Honor flips
13 through the larger book, you will see that where there is
14 yellow highlighting is where Mr. Gupta says there is
15 matching code. It is that matching code that he then
16 replicates in his Exhibit H for the proposition of
17 suggesting that somehow the allegedly infringing code
18 identified by him appears continuously in files, which
19 demonstrate blatant copying.

20 Put that aside, Your Honor, entirely, if you
21 would. Look solely at Mr. Gupta's Exhibit H. It doesn't
22 require any technical experience for a non-technical type
23 like myself, Your Honor, to look at Exhibit H and see that
24 the very code which appears in the far left column and the
25 far right column, which Mr. Gupta says is substantially

1 similar, if not identical, isn't anything remotely close to
2 being substantially similar or identical.

3 And we have laid out in detail, in Professor
4 Kernighan's declaration -- or, rather, he has laid out why
5 it is that, in fact, there are here no similarities of
6 consequence. Even if, Your Honor, you were to assume that
7 Mr. Gupta had properly done a filtration analysis, as the
8 Tenth Circuit requires, and even if you were to assume that
9 the code he identifies is in fact all substantially similar
10 or identical code, which it clearly isn't, the 300 or so
11 lines of code he identifies is plainly insufficient to give
12 rise to a genuine issue of material fact with respect to a
13 finding of substantial similarity.

14 The universe of UNIX code to which SCO contends
15 it has copyright protection, Your Honor, consists of tens
16 of millions of lines of code. Mr. Gupta identifies 300.
17 And there is nothing substantial about that either
18 quantitatively, or as Professor Kernighan explains,
19 qualitatively.

20 And if that's not enough, Your Honor, the Court
21 ought to look carefully at the opposition memorandum
22 submitted by SCO in connection with IBM's motion to strike.
23 If I could refer the Court to page 11 of our little book.
24 In opposition to IBM's motion for summary judgment, SCO
25 said in its brief, and I think Mr. Gupta's declaration is

Exhibit 13

Westlaw

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(Cite as: 133 F.3d 773)

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P

United States Court of Appeals,
Tenth Circuit.
TRANSWESTERN PUBLISHING COMPANY LP,
Plaintiff-Appellant,
v.
MULTIMEDIA MARKETING ASSOCIATES, INC;
Multi-vest, a partnership; Robert
Dupriest; Larry Wibben; Dennis Hoff; Joel Alday;
Robert Holmes; Mallie
Norton; Tom Clark; Tom Raby; Robert Boone;
Shane Houston; Vernoise
Andrews; Don Lightner; J. Courtney Egger; Jeff
Allen; Multi Directories
L.L.C., Defendants-Appellees.
No. 96-6371.

Jan. 8, 1998.

Publisher of telephone directory containing both white and yellow pages brought copyright infringement action against publishers of competing directory. After hearing on plaintiff's request for permanent injunction, the United States District Court for the Western District of Oklahoma, Robin J. Cauthron, J., granted defendants' motion for judgment as matter of law, and plaintiff appealed. The Court of Appeals, Logan, Circuit Judge, held that: (1) defendant's telephone directory did not infringe copyright in plaintiff's directory when works were compared in their entirety; (2) even if only similar advertisements were compared, plaintiff did not show sufficiently original contributions to support copyright infringement claim; and (3) even if advertisements were treated as parts of collective work, copyright in entire directory did not extend to advertisements.

Affirmed.

Briscoe, Circuit Judge, filed concurring opinion.

West Headnotes

[1] Federal Courts  776
170Bk776 Most Cited Cases

[1] Federal Courts  853
170Bk853 Most Cited Cases


[1] Federal Courts  870.1

170Bk870.1 Most Cited Cases

On appeal from grant of judgment as matter of law, Court of Appeals reviews district court's findings of fact under clearly erroneous standard, by which findings of fact are clearly erroneous when they are unsupported in record, or if after review of record Court has definite and firm conviction that mistake has been made, and Court reviews de novo district court's interpretation of applicable law.


[2] Copyrights and Intellectual Property  51
99k51 Most Cited Cases

To establish copyright infringement, plaintiff must prove both ownership of valid copyright and copying of constituent elements of work that are original.

[3] Copyrights and Intellectual Property  83(3.1)

99k83(3.1) Most Cited Cases

Copying may be shown, in copyright infringement action, by establishing that defendants had access to copyrighted work and that there are probative similarities between copyrighted material and allegedly copied material.


[4] Copyrights and Intellectual Property  12(3)

99k12(3) Most Cited Cases

Factual compilation is copyrightable but facts themselves are not.

[5] Copyrights and Intellectual Property  36
99k36 Most Cited Cases

Mere fact that work is copyrighted does not mean that every element of work may be protected.

[6] Copyrights and Intellectual Property  12(3)

99k12(3) Most Cited Cases

Because copyrightability of factual compilation depends upon originality in selection, coordination or arrangement of facts as a whole work, court, in infringement action, must compare allegedly infringing work as a whole also. 17 U.S.C.A. § 101.

[7] Copyrights and Intellectual Property  59
99k59 Most Cited Cases

Defendant's telephone directory did not infringe copyright in plaintiff's directory, which was factual compilation, even if "numerous" advertisements in

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plaintiff's directory were copied to defendants' directory, because, when viewed as whole, there were many differences between directories, and no one would mistake defendants' directory for that of plaintiff. 17 U.S.C.A. § 101, 103(b).

[8] Copyrights and Intellectual Property 51

99k51 Most Cited Cases

Abstraction-filtration-comparison test used in some copyright infringement cases requires filtering out nonprotectible ideas and components and then comparing protectible elements in plaintiff's work with defendant's allegedly infringing product.

[9] Copyrights and Intellectual Property 59

99k59 Most Cited Cases

Even if court compared only similar advertisements in plaintiff's and defendants' competing telephone directories, rather than comparing works as whole, in copyright infringement action, defendants' directory did not infringe plaintiff's directory absent showing that plaintiff made original contributions to those advertisements or that, if plaintiff made original contributions, such contributions were copied by defendants.

[10] Copyrights and Intellectual Property 55

99k55 Most Cited Cases

Even if yellow pages advertisements in plaintiff publisher's telephone directory were treated not as mere compilations of facts but as parts of collective work, existence of copyright notice on plaintiff's directory was insufficient to prohibit copying of advertisement from that directory, absent copyright notice specific to advertisement itself. 17 U.S.C.A. § 404(a).

*774 James Minor Bailey, III, Ponca City, Oklahoma (Jerry J. Dunlap, II, Oklahoma City, Oklahoma, with him on the briefs) for Plaintiff-Appellant.

William S. Dorman of Dorman & Gilbert, Tulsa, Oklahoma (Mark Pordos of Eagleton & Nicholson, Oklahoma City, Oklahoma, with him on the brief) for Defendants-Appellees.

Before BRISCOE, LOGAN, and LUCERO, Circuit Judges.

LOGAN, Circuit Judge.

Plaintiff TransWestern Publishing Company LP appeals the district court's judgment denying a permanent injunction in plaintiff's copyright

infringement action against defendants Multimedia Marketing Associates, Inc.; Multi-Vest, a partnership; Multi Directories, L.L.C. and thirteen individuals (collectively "defendants"). The case stems from defendants' publication of a combined white and yellow pages telephone directory containing advertisements resembling those in plaintiff's directory. The appeal requires us to consider the law enunciated in Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340, 111 S.Ct. 1282, 113 L.Ed.2d 358 (1991), involving white pages factual information, in the context of directories containing yellow pages advertising.

*775 I

In 1995, plaintiff published a combined white and yellow pages "Ponca City Area" telephone directory which included listings for Ponca City and seventeen nearby towns and white and yellow pages advertisements. Account executives solicited advertisements and prepared ad layout sheets with customer input. Although they did not create original artwork, the account executives arranged information so that it was "pleasing to the eye." 1 App. 223-24. Plaintiff copyrighted its directory but not the individual ads.

Defendants thereafter published the "1996 Ponca City Community Directory." This directory contained listings for only eight towns, as well as white and yellow pages advertisements. A number of these advertisements were very comparable to those in the TransWestern directory. The infringement claim alleges defendants copied advertisements from plaintiff's directory.

Plaintiff obtained a preliminary injunction preventing the distribution or display of defendants' directory. At the permanent injunction hearing plaintiff introduced a single witness and several exhibits in its case in chief. The district court granted defendants' motion for judgment as a matter of law and made specific fact findings. The court noted likenesses such as their use of front and back cover advertising, comparable introductory information, and advertisements from some of the same businesses. The court then held that "business card" ads and those incorporating the advertisers' own logos or slogans were not original to plaintiff and thus not copyrightable. The court found that other ads were not substantially similar because of different type styles, sizes and shapes of the ads, and the arrangement of information.

II

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[1] We turn now to whether plaintiff established a case of copyright infringement. The district court granted defendants' motion for judgment as a matter of law after a permanent injunction hearing at which plaintiff presented its evidence in support of its claim of copyright infringement. Thus, the court made its ruling under Fed.R.Civ.P. 50(a) or 52(c). See Advisory Committee Notes to 1991 amendments (noting Rule 52(c) "parallels the revised Rule 50(a)"). We review the court's findings of fact under a clearly erroneous standard. *Id.* Findings of fact are clearly erroneous when they are unsupported in the record, or if after our review of the record we have "the definite and firm conviction that a mistake has been made." *Sanchez v. State of Colorado*, 97 F.3d 1303, 1308-09 (10th Cir.1996) (quotations and citations omitted). We review de novo the district court's interpretation of the applicable law. *Mitchell v. Maynard*, 80 F.3d 1433, 1438 (10th Cir.1996).

[2] To establish copyright infringement plaintiff must prove (1) ownership of a valid copyright and (2) "copying of constituent elements of the work that are original." *Feist*, 499 U.S. at 361, 111 S.Ct. at 1296 (white page listing information in public utility directory not copyrightable). Defendants do not seriously contest that plaintiff has a valid copyright on its directory. [FN1]

FN1. The copyright registration certificate purports to register the "Ponca City Area, OK July 1996 Telephone Directory." II App. 235-36. Defendants argue that copyright registration covers only the yellow pages portion of plaintiff's directory. At the permanent injunction hearing, however, defendants did not challenge whether the copyright registration protected the entire directory or merely the yellow pages. We assume for purposes of this opinion that plaintiff's copyright is valid as to the whole book.

[3] The second element requires proof that defendants copied plaintiff's work and that the elements copied were protected. *Country Kids 'N City Slicks, Inc. v. Sheen*, 77 F.3d 1280, 1284 (10th Cir.1996). Although the record does not establish that defendants copied plaintiff's publication, copying may be shown by "establishing that Defendants had access to the copyrighted work and that there are probative similarities between the copyrighted material and the allegedly copied material." *Id.* Defendants did not dispute their access. Although they deny appropriating component elements of

plaintiff's publication, strong similarities exist between some of plaintiff's and defendants' ads. We thus *776 examine the nature of plaintiff's directory and the scope of protection available to it.

[4][5] Plaintiff's directory is a compilation. The certificate of registration for 1995 treats it as a "derivative work or compilation" and states it is a "Revised compilation in yellow pages." II R. 236. To be copyrightable, a compilation must be "a [1] work formed by the collection and assembling of preexisting materials or of data that [2] are selected, coordinated, or arranged in such a way that [3] the resulting work as a whole constitutes an original work of authorship." 17 U.S.C. § 101; *Feist*, 499 U.S. at 357, 111 S.Ct. at 1293 (explaining tripartite structure of statute). [FN2] The directory is, at least primarily, a compilation of facts. A factual compilation is copyrightable but the facts themselves are not. *Id.* at 345, 111 S.Ct. at 1287. In *Feist*, the Supreme Court explained the difference between facts and copyrightable compilations: a compilation of facts or preexisting data is only protectible insofar as it features original selection, arrangement or coordination of facts as they appear in the "work as a whole." *Id.* at 356, 358, 111 S.Ct. at 1293, 1294; 17 U.S.C. § 101.

FN2. Because all compilations are a collection of preexisting facts or data, the first element of the definition will always be satisfied. *Key Publications, Inc. v. Chinatown Today Publ'g Enters., Inc.*, 945 F.2d 509, 513 (2d Cir.1991).

The protection for a copyrighted compilation extends only to the material *contributed by* the author of such work, as distinguished from the preexisting material employed in the work, and does not imply any exclusive right in the preexisting material. The copyright in such work is independent of, and does not affect or enlarge the scope, duration, ownership or subsistence of, any copyright protection in the preexisting material.

17 U.S.C. § 103(b) (emphasis added). "The mere fact that a work is copyrighted does not mean that every element of the work may be protected." *Feist*, 499 U.S. at 348, 111 S.Ct. at 1289. Determining "whether an infringement of a compilation copyright has occurred is particularly difficult where less than the entire work is copied," *BellSouth Advertising & Publ'g Corp. v. Donnelley Information Publ'g, Inc.*, 999 F.2d 1436, 1438 (11th Cir.1993) (en banc), especially when a competitor can take "the bulk of

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the factual material from a preexisting compilation without infringement." *Id.* at 1445. The protection available for a compilation is "thin." Feist, 499 U.S. at 349, 111 S.Ct. at 1289; see also BellSouth, 999 F.2d at 1439 (applying Feist and concluding that defendant did not appropriate "original elements" of BellSouth directory "as a whole" by preparing data base and sales leads based upon listing information and units of advertising appearing in preexisting directory). The focus is on "the selection, coordination, or arrangement of listings in the directory [which must be] sufficiently original or creative [that] the directory will be entitled to a copyright." Key Publications, Inc. v. Chinatown Today Publ'g Enters., Inc., 945 F.2d 509, 513, 516 (2d Cir.1991) (recognizing copyrightability of specialty directory but concluding no infringement by smaller competing publication that utilized "significantly different principles of [listing] selection"). See also Feist, 499 U.S. at 345-47, 111 S.Ct. at 1287-89.

[6] Although a compilation gains copyright protection with only minimal creativity in the selection and arrangement of facts, Feist's statement that the copyright is "thin" has implications when the holder sues an alleged infringer. "It would seem to follow analytically that more similarity is required when less protectible matter is at issue. Thus, if substantial similarity is the normal measure required to demonstrate infringement, 'supersubstantial' similarity must pertain when dealing with 'thin' works." 4 Melville B. Nimmer & David Nimmer, Nimmer on Copyright, § 13.03[A] at 13-28 (1997); see also Apple Computer, Inc. v. Microsoft Corp., 35 F.3d 1435, 1439 (9th Cir.1994) ("When the range of protectible and unauthorized expression is narrow, the appropriate standard for illicit copying is virtual identity."), cert. denied, 513 U.S. 1184, 115 S.Ct. 1176, 130 L.Ed.2d 1129 (1995); Jane C. Ginsburg, No "Sweat"? Copyright and Other Protection of Works of Information After Feist v. Rural Telephone, 92 Colum. L.Rev. 338, 349 (1992) ("Even if the compilation is *777 deemed original, what kind of copying will be held to infringe it? The answer [after Feist] appears to be: 'Virtually none, short of extensive verbatim copying.'"). Further, because the copyrightability of a factual compilation depends upon the originality in selection, coordination or arrangement of the facts "as a whole" work, 17 U.S.C. § 101, in an infringement action the court must compare the allegedly infringing work as a whole also.

[7] In the instant case, if we focus on the respective

directories as a whole there are many differences. The district court's opinion noted some:

The directories are very different in appearance. The Transwestern directory is approximately 5" by 7" in size and has a yellow cover. The Community Directory is larger in size and has a green cover. Both directories have advertisements on their covers; although the advertisements are different on each directory. Although similar introductory information is contained in each directory, the format, layout and content varies between the two directories. The Transwestern Directory includes [18] towns.... The Community Directory provides listings for [8 towns].

I R. 84. Plaintiff's directory is indexed; defendants' is not. Plaintiff's white pages are alphabetized with all the listings together; defendants organized their white page listings alphabetically by town. The directories use different typefaces, and defendants' directory contains significantly fewer pages. Plaintiff's directory has two columns, defendants' three in its advertising pages. The type styles are different; the headings to the business listings are distinctive. Even accepting as true plaintiff's contention that "numerous" ads in its directory have been copied to defendants' directory, no one would mistake defendants' directory for that of the plaintiff. Thus, at a thin level of comparison of the compilation "as a whole" the district court's finding of no infringement must be affirmed.

III

[8] This circuit in other contexts has applied an abstraction-filtration-comparison test in copyright infringement cases. See Country Kids, 77 F.3d at 1284-85 (wooden dolls); Gates Rubber Co. v. Bando Chemical Industries, Ltd., 9 F.3d 823, 834 (10th Cir.1993) (computer program); Autoskill v. National Educational Support Systems, Inc., 994 F.2d 1476, 1491-92 (10th Cir.1993) (computer program). That test requires filtering out nonprotectible ideas and components and then comparing protectible elements in the plaintiff's work with the defendant's allegedly infringing product. We have recognized that this test is not appropriate for every case, depending on the claims involved, the procedural posture, and the nature of the work at issue. See Mitel, Inc. v. Iqtel, Inc., 124 F.3d 1366, 1372-73 (10th Cir.1997); Gates, 9 F.3d at 834 n. 12.

The Second Circuit's decision in Key Publications is the post-Feist decision most nearly like the case before us. It involved competing yellow page directories for Chinese-American businesses in New York City. Holding that "thin" protection available

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for compilations was not meant to be "anorexic," the court stated the test as one in which the plaintiff must show "substantial similarity between those elements, and only those elements, that provide copyrightability to the alleged infringed compilation." Key Publications, 945 F.2d at 514. This seems a distillation into fewer words of the abstraction-filtration-comparison test.

The district court in *Key Publications* had found that 1,500 listings, 75%, of the 2,000 listings in the defendants' directory, were deliberately copied from the plaintiff's directory. Making a facial examination the appellate court reversed, noting substantial dissimilarities in the selection and arrangement of the directories, especially in that the defendants' directory had many fewer classified headings, had only 17% of the total number of listings in the plaintiff's directory, and 25% of its listings were not in the plaintiff's directory. *Key Publications* appears to have involved only listings, classifications, and arrangements; there was no discussion of advertisements.

[9] Plaintiff's infringement claim in the case before us is based on its contributions to the yellow page advertisements in its directory *778 that were allegedly copied by defendants. Plaintiff's employees apparently solicited those ads, yet they are fundamentally fact compilations essentially like the business listings gathered and arranged by the plaintiff in *Key Publications*. Treated as a fact compilation protection is available only to the extent the work as a whole possesses the requisite originality. But even if we ignore all elements of the two directories that are different and look only at those that are alike plaintiff loses in the case before us. Plaintiff's case founders on the lack of evidence of its creative contributions to copied material.

Plaintiff asks the court to note the similarities of the ads it attached to its complaint and those contained in its Exhibit 7 introduced at the permanent injunction hearing. But it must show its original contributions to those ads. At the permanent injunction hearing plaintiff presented one witness and seven exhibits. The exhibits were the copyright registration certificate, the two directories, three exhibits of layout sheets for advertisements plaintiff said its employee prepared—for Skinsations Tattoo Studio, TWT Heat & Air, and Smith's Home Furnishings--and Exhibit 7. Exhibit 7 was a notebook of some 600 pages, consisting of an index and pages from the respective directories showing plaintiff's ads on the left and defendants' allegedly infringing ads on the right. Only 252 pages of Exhibit 7 are excerpted in

the record on appeal; the TWT Heat & Air exhibit is not in the appellate record.

Plaintiff's witness was Timothy Dancey, one of its account executives, who also was its sole witness at the preliminary injunction hearing. On direct examination he simply identified plaintiff's exhibits and testified that with new customers they: "usually do ad copy together, figure out what size ad they want and we work out a program for them at that time," I R. 193; take into possession logos given them by customers and sometimes make logos; write down information to be placed in the ad given them by customers, sometimes themselves suggesting information to be included; and arrange the verbiage, logos and artwork provided by the customer into the advertisement using a layout sheet. *Id.* at 194-95. The witness then said he designed and created the ads on the layout sheets for Skinsations Tattoo Parlor, TWT Heat & Air, and Smith Home Furnishings.

On cross-examination the witness admitted that the artwork on the Skinsations ad was supplied by the customer and he only provided the written information; on the TWT ad he provided the Rheem logo which he admitted he probably got from someone else's ad, and he and the business owner together contributed the words on the ad, *id.* at 208-09; on the Smith ad the sentence "We're Committed to Earning Your Business" was a logo he did not provide, the picture came from the customer, and other items and logos came from clip art.

Later the following exchange took place:

Q. Are there any ads that you did the artwork on yourself, any ads in the book?

A. As far as drawing a picture?

Q. Well, contributing anything in the way of artwork.

A. Sure, on logos, on certain logos in the book.

Q. You created the logos yourself?

A. Uh-huh. When I say "logos," I mean like a name.

Q. Could you direct our attention to one such ad, please.

A. I can't think of one right now. The Paper Hanger. I wrote that in.

....

Q. I don't understand. What's the logo?

A. The block print.

Q. Huh?

A. The block print.

Q. You say "the block print"?

A. There's not a picture of anything.

Q. The block print of "The Paper Hanger"?

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A. Uh-huh.

....

A. Just the name, "The Paper Hanger." I did that on many ads.

Q. The block print right there (INDICATING)?

A. Uh-huh.

*779 Q. You call that artwork; is that right?

A. I wrote it.

Q. Okay. Is that the same in the [defendant's ad]?

A. The text is the same.

Q. What about the logo, is that the same?

A. It's set up a little different.

Q. Are there any other ads besides this Paper Hanger where you contributed the artwork yourself?

A. I remember Kay Refrigeration, I believe.

Q. Is that here?

A. It's in here someplace, I'm sure. It's really just names on some of those.

Q. Just names?

A. Uh-huh, like that one.

Q. That's primarily information, is it not?

A. That is information.

Q. Apart from the names we just referred to, the logo "The Paper Hanger," did you contribute any other artwork to any of the ads?

A. Artwork meaning pictures, no. Artwork meaning making them pleasing to the eye, yes.

Q. That would be in the way it was typed, right, the size and style of the type?

A. Either that, yes, or just saying something to catch the eye.

Q. But pictures and logos, you wouldn't have anything to do with that, would you?

A. No, I did not draw pictures.

I R. 221-24.

On redirect the witness stated that he took the information and artwork on the three ads to which he had testified and "arranged and designed it into the ad." *Id.* at 228. This summarized and quoted testimony is all of plaintiff's evidence of its "original" contributions to the ads in its directory.

Even if we credit the testimony as showing original contributions to the Skinsations, TWT, and Smith ads, there is nothing in the appellate record to show defendants copied any of those ads. There is no Skinsations ad in defendants' directory, *see* II R. 317-18; a TWT ad appears in defendants' directory, *id.* at 296, but the record does not show what plaintiff's TWT ad looked like; and the Smith Home Furnishings ad in defendants' yellow pages, *id.* at 93, bears no resemblance to the ad laid out in plaintiff's Exhibit 6, *id.* at 243-49. In the white pages of

defendants' directory there is a version of a business card ad for Smith Home Furnishings, with the same information as plaintiff's business card ad for that company--name, address, phone number, picture, and slogan--but with a significantly different configuration, placement of the information, and type style. *See id.* at 497-98.

To find original and hence protectible contributions by plaintiff to its yellow page ads the court would have to credit the vague and general testimony of the witness that he "arranged" information provided by his customers and "designed" the ads--without himself providing any of the artwork--although he did not identify how his contribution was original in any particular ad allegedly copied by defendants. Thus, even if we were to accept plaintiff's request to compare the allegedly infringing ads for their similar order and placement of information and artwork we cannot qualitatively analyze plaintiff's contribution.

At the preliminary injunction hearing, witness Dancey had testified that all the ads in plaintiff's directory were either designed by him or his predecessor "or they were given to us by the customers in our book." II R. 164. He then said fifty percent were "altered old ads that were in there where he wanted to make a change," *id.* at 165. This simply underscores the deficiencies in plaintiff's evidence. Thus, even if we were to look only to the ads defendants allegedly copied, and ignore all differences between the directories, we would have to affirm the district court's denial of the injunction.

IV

[10] By focusing its contentions for infringement on its contributions to individual advertisements in its directory, plaintiff appears to argue that the ads should not be treated as fact compilations but as unique creations. If each ad is a separate creation, akin to short stories with individual authors, *780 plaintiff's yellow pages directory would be a collective work. Plaintiff admitted its advertisers provided input into each ad, and some were given to plaintiff by their customers--thus not created by plaintiff in any sense. A collective work for copyright purposes is still a compilation, 17 U.S.C. § 101, but one "in which a number of contributions, constituting separate and independent works in themselves, are assembled into a collective whole." *Id.* So viewed there exists another barrier to plaintiff's infringement claim, 17 U.S.C. § 404(a). That section provides as follows:

A separate contribution to a collective work may bear its own notice of copyright, as provided by

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sections 401 through 403. However, a single notice applicable to the collective work as a whole is sufficient to invoke the provisions of section 401(d) or 402(d), as applicable with respect to the separate contributions it contains (*not including advertisements inserted on behalf of persons other than the owner of copyright in the collective work*), regardless of the ownership of copyright in the contributions and whether or not they have been previously published.

Id. § 404(a) (emphasis added).

In *Canfield v. Ponchatoula Times*, 759 F.2d 493 (5th Cir.1985), the court examined the effect of the parenthetical exclusion in § 404(a) in the context of one newspaper publishing an ad that had been created by another newspaper. The ad, as in the case before us, had not been separately copyrighted but the newspaper in which it appeared had been copyrighted as a whole. The court assumed the first newspaper owned the copyright to the ad, but held the effect of the parenthetical phrase was to deny protection when it was copied in another publication. "Advertisements inserted in a collective work on behalf of persons other than the collective work copyright owner are not protected by a copyright notice applicable to the work as a whole." *Id.* at 495.

[T]here is no doubt Congress intended to carve out a special exception for advertisements which would require that a separate copyright notice appear in the advertisement itself. The committee notes make clear that this exception was regarded as necessary because of the nature of advertisements which were regarded as a unique form of copyrightable material. Their uniqueness stems from the fact that advertisements are creations which are commonly published in more than one periodical and seldom display separate copyright notice. The committee notes recognize this as particularly true of advertisements published in major advertising media such as newspapers and magazines.

....

.... The delineation is not based on who owns the copyright. It does not matter whether the publisher, advertiser, or another owns the copyright. Separate notice is required for any advertisement inserted on behalf of someone other than the collective work copyright owner.

Id. at 496.

In *Canfield* the advertiser was the moving force in asking the second newspaper to publish the ad. In the case before us plaintiff asserts that many advertisers had not given defendants permission to

reproduce their ads. That is contrary to the testimony of defendants' manager at the preliminary hearing, I R. 173, and it is difficult to see why advertisers would object when defendants published ads at no charge to the advertisers. [FN3] We note that no advertiser is a party to this suit, and plaintiff's witness at the permanent injunction hearing admitted that its contracts with advertisers contained a statement, "Advertiser assumes sole responsibility for the protection of its copyright in any writing, illustration, design, map, photograph, or combination thereof included in said item of advertising." *Id.* at 226. [FN4]

[FN3]. Apparently defendants attempted to enter the area market to produce a directory that would compete with the Southwestern Bell and TransWestern directories by offering advertisers free ads. This is the same technique the instant plaintiff used to enter the Wichita, Kansas, area to produce a directory to compete there with the Southwestern Bell directory. See *Southwestern Bell Media, Inc. v. Trans Western Publishing, Inc.*, 670 F.Supp. 899 (D.Kan.1987); *id.*, 685 F.Supp. 779 (D.Kan.1988).

[FN4]. The issues of who may or must be parties to an infringement action involving an ad subject to this provision, or the provision's intended scope, need not be resolved in this case.

*781 Treating the yellow pages advertising as creations that are something more than compilations of facts, we hold that under 17 U.S.C. § 404(a), the existence of a copyright notice on plaintiff's directory is insufficient to prohibit the copying of an advertisement from that directory, absent a copyright notice specific to the advertisement itself. As the concurring opinion states, under the Berne Convention Implementation Act of 1988, copyright notice is no longer mandatory. This has no bearing on our holding regarding 17 U.S.C. § 404(a), however. Section 404(a) has always provided that copyright notice is optional on collective works. It defines the scope of protection available to collective works when they do contain a copyright notice: the notice invokes the protections of §§ 401(d) and 402(d) with respect to separate contributions but not as to advertisements inserted by someone other than the copyright owner. [FN5] Because there is no separate copyright on the ads allegedly copied, plaintiff cannot use this provision to gain protection

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for the third party ads through the existence of a copyright notice for the overall collective work.

FNS. The Berne Convention, as implemented, amended § 404(a) to add references to § § 401(d) and 402(d) after that treaty was adopted. But the amendment did not eliminate the parenthetical discussed in this Section IV. Where the overall collective work is protected by a copyright notice, § 404(a) still refuses to extend the protection afforded by that notice to ads inserted by a third party.

In this case, under § 404(a) the notice protecting the overall collective work does not extend to the ads in question. As plaintiff has failed to present evidence of its original contributions to the advertisements in question, the ads are not protectible even without the mandatory notice requirement.

V

Plaintiff also has asserted that the district court erred in finding that defendants did not copy certain ads created by plaintiff, and in concluding that plaintiff alleged infringement only as to the yellow pages portion of its directory. Our holding effectively disposes of those issues. It does not matter whether defendants copied the ads in plaintiff's directory in the absence of more evidence than was presented here of contributions of originality to ads that supposedly were copied.

As to the white pages issue, we agree with the district court that plaintiff effectively abandoned that claim by choosing not to present evidence at the permanent injunction hearing to support those allegations. The record supports the district court's legal conclusion that plaintiff based its proof at trial on the yellow pages ads only.

AFFIRMED.

BRISCOE, Circuit Judge, concurring:

I concur in the result because I agree with the majority that plaintiff failed to present sufficient evidence of its original contributions to the yellow-page advertisements at issue to allow us to properly analyze its copyright infringement claims. I write separately, however, because I disagree with several points made by the majority.

In section II of its opinion, the majority compares the

directories as a whole. This comparison is irrelevant. Although plaintiff registered its directory as a single work, it has never claimed either that the entire work is original and eligible for protection or that the entire work was copied by defendant (in fact, plaintiff has not even submitted complete copies of either directory). See, e.g., Aplt's App. I at 92 ("Plaintiff does not contend that Defendants copied its directory in its entirety."). Rather, plaintiff has maintained certain original elements of its copyrighted work, i.e., individual advertisements contained in the work, were copied by defendant without authorization from plaintiff or the advertisers. Thus, the sole focus in this case should be on the individual yellow-page advertisements.

In section III of its opinion, the majority concludes the decision in *Key Publications, Inc. v. Chinatown Today Publ'g Enters., Inc.*, 945 F.2d 509 (2d Cir.1991), "is the post-*Feist* decision most nearly like the case before us." Although the majority's conclusion may be correct, *Key Publications* is substantially different from the case at hand and, ultimately, of little assistance. The issue in *782 *Key Publications* was the copying of listings and headings from the yellow-page section of plaintiff's telephone directory. Contrary to the majority's description, I do not agree that those business listings are "essentially like" the yellow-page advertisements at issue in our case. Unlike the business listings and headings in *Key Publications*, the advertisements at issue here are individually copyrightable. Thus, comparisons of the directories as a whole (or even the entire yellow-page sections as a whole) are unnecessary in our case because the unauthorized copying of a single copyrightable ad would constitute infringement.

In section IV of its opinion, the majority concludes 17 U.S.C. § 404(a) permits copying of ads from plaintiff's directory absent a copyright notice specific to each ad. I disagree. Prior to March 1, 1989, the Copyright Act required that each copy of a work distributed to the public be marked with a copyright notice. Failure to do so would inject the work into the public domain. The Copyright Act was amended by the Berne Convention Implementation Act of 1988, which became effective March 1, 1989. Under the Berne Convention, copyright notice is optional rather than mandatory; copyright notice is no longer a prerequisite to copyright protection. See 17 U.S.C. § 401(a); see also *Norma Ribbon & Trimming, Inc. v. Little*, 51 F.3d 45 (5th Cir.1995). Thus, regardless of whether one places a copyright notice on his or her work, the work is fully and

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automatically protected under the Copyright Act from the moment it is fixed in some tangible form (assuming it is published after enactment of the Berne Convention). 17 U.S.C. § 102(a).

The key case relied upon in section IV of the majority's opinion is Canfield v. Ponchatoula Times, 759 F.2d 493 (5th Cir.1985). In Canfield, a newspaper publisher filed a copyright infringement action against a rival newspaper publisher for reprinting an advertisement that plaintiff's employees designed and printed in one of plaintiff's newspapers. The Second Circuit ultimately concluded plaintiff could not protect its asserted copyright in the advertisement because it had failed to print a separate notice of copyright along with the advertisement. Although the opinion is useful for its holding that advertisements are copyrightable, 759 F.2d at 496, it is otherwise inapplicable because it was issued prior to adoption of the Berne Convention. Under today's standards (i.e., those established by the Berne Convention amendments to the Copyright Act), a separate notice would not be required in order for the plaintiff to protect its advertisements.

The majority apparently reads § 404(a) to require separate copyright registration of any copyrightable advertisements created by the copyright owner of a collective work, but inserted on behalf of other persons. No court has ever decided this issue and I disagree that § 404(a) provides the definitive answer to the question. In analogous circumstances, several district courts have held registration of a collective work satisfies the requirements of § 411(a) for purposes of bringing an action for infringement of any of the constituent parts as long as the owner of the collective work also owns the constituent parts of the collective work. See Woods v. Universal City Studios, Inc., 920 F.Supp. 62, 64 (S.D.N.Y.1996) ("[W]here the owner of the copyright for a collective work also owns the copyrights for its constituent parts, registration of the collective work satisfies the requirements of Section 411(a) for purposes of bringing an action for infringement of any of the constituent parts."); Greenwich Film Prod., S.A. v. DRG Records, Inc., 833 F.Supp. 248, 252 (S.D.N.Y.1993) (copyright registration for motion picture was sufficient to cover musical compositions contained in sound track of picture, even though musical compositions were prepared in advance of completion of film); Howard v. Sterchi, 725 F.Supp. 1572, 1575-76 (N.D.Ga.1989) (holding designer of log homes properly registered her purported copyrights in floor plans, as independent derivative works, by registering the plan books in

which they were published). These cases are supported by the leading treatise on copyright law, which suggests separate copyright registration is not necessary where the author of a collective work is also the author of individual works contained therein. See 2 Melville B. Nimmer & David Nimmer, Nimmer on Copyright § 7.16[B][2], at 7-169 to 7-170 (1996); see *783 also 37 C.F.R. § 202.3(b)(3) (allowing copyright claimant to register as a single work a published work containing "copyrightable elements that are otherwise recognizable as self-contained works"). Ultimately, any conclusion on this issue is dicta in light of plaintiff's failure of proof.

Finally, section IV of the majority opinion makes reference to the following statement in the contracts between plaintiff and its advertisers: "Advertiser assumes sole responsibility for the protection of its *copyright* in any writing, illustration, design, map, photograph, or combination thereof included in said item of advertising." (Emphasis added.) Assuming, arguendo, that plaintiff made original contributions to the advertisements at issue, plaintiff would have been, at an absolute minimum, a joint author of those advertisements (along with those advertisers that also made original contributions to the advertisements), and would have had the right to assert its own interest in each advertisement, independent of what the advertiser chose to do.

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Westlaw

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P

United States Court of Appeals,
Tenth Circuit.
The GATES RUBBER COMPANY, a Colorado
corporation, Plaintiff-Appellee,

v.

BANDO CHEMICAL INDUSTRIES, LIMITED, a
Japanese corporation; Bando
Manufacturing of America, Inc., a Kentucky
corporation; Bando U.S.A., Inc., a
Delaware corporation; Allen Hanano, Defendants,
Bando American Inc., an Illinois corporation; Steven
R. Piderit; Ron Newman;
Denise Hanano, Defendants-Appellants.
No. 92-1256.

Oct. 19, 1993.


Owner of copyright for computer software designed to aid in selection of replacement industrial belts brought suit against competitor seeking permanent injunction from use of allegedly infringing computer program. The United States District Court for the District of Colorado, 798 F.Supp. 1499, Daniel B. Sparr, J., granted motion for permanent injunction in part and denied motion in part. Appeal was taken. The Court of Appeals, Ebel, Circuit Judge, held that: (1) "abstraction-filtration-comparison" test should be applied to determine whether copyright on computer program has been infringed; (2) in not appropriately applying test, court did not eliminate elements of program which were unprotectable under copyright law; (3) trade secret claims were not preempted by private law; and (4) trial court did not err by holding that trade secret rights of program owners had been violated.

Vacated and remanded in part; affirmed in part.

West Headnotes

[1] Copyrights and Intellectual Property  51
99k51 Most Cited Cases

In order to prevail on claim of copyright infringement, plaintiff must show ownership of valid copyright and copying by defendant of protected components of copyrighted materials. 17 U.S.C.A. § 101 et seq.

[2] Copyrights and Intellectual Property  83(1)


99k83(1) Most Cited Cases

Once presumption of copyright validity is established, through timely filing of Certificate of Registration, defendant has burden of overcoming presumption. 17 U.S.C.A. § 410(c).

[3] Copyrights and Intellectual Property  51
99k51 Most Cited Cases


[3] Copyrights and Intellectual Property  67.3
99k67.3 Most Cited Cases

Once plaintiff has shown it holds valid copyright on computer program, it must next prove defendant unlawfully appropriated protected portions of copyrighted work, which involves inquiry as to whether defendant, as factual matter, copied portions of plaintiff's program, and inquiry as to whether, as mixed issue of fact and law, those elements of program that were copied were protected expression and of such importance to copied work that appropriation was actionable. 17 U.S.C.A. § § 101 et seq., 106.

[4] Copyrights and Intellectual Property  83(7)


99k83(7) Most Cited Cases

In order to establish that alleged infringer has copied computer program, as step toward establishing copyright infringement, holder can either directly show that alleged infringer copied, or present indirect evidence showing alleged infringer had access to copyrighted program and that there were probative similarities between copyrighted material and alleged infringer's material. 17 U.S.C.A. § 101 et seq.

[5] Copyrights and Intellectual Property  83(7)

99k83(7) Most Cited Cases

Evidence that alleged infringer of computer program copyright has copied unprotectable elements of program is probative in determining whether defendant copied protectable items of copyright holder's work. 17 U.S.C.A. § 101 et seq.

[6] Copyrights and Intellectual Property  83(7)

99k83(7) Most Cited Cases

To prove factual copying of computer program, for copyright violation purposes, copyright holder must come forward with sufficient evidence that reasonable fact finder, considering together evidence

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of access and similarities between programs, can find that second work was copied from first. 17 U.S.C.A. § 101 et seq.

[7] Copyrights and Intellectual Property ↪ 10.4
99k10.4 Most Cited Cases

In order to impose liability for infringement of copyrighted computer program, court must find that alleged infringer copied protectable elements of copyright holder's program, and that those protectable elements comprised substantial part of holder's program when it is considered as whole. 17 U.S.C.A. § § 101 et seq., 102(b).

[8] Copyrights and Intellectual Property ↪ 10.4
99k10.4 Most Cited Cases

In order to determine whether there has been copyright violation of computer program, courts are to apply "Abstraction-Filtration-Comparison" test, under which program is dissected according to its varying levels of generality ("abstractions test"), each level of abstraction is examined in order to filter out those elements of program which are unprotectable, such as ideas, processes, facts, public domain information, merger material, scenes a faire, and other unprotectable elements suggested by particular facts of program under examination ("filtration test"), and remaining protectable elements are compared with allegedly infringing program, to determine whether defendants have misappropriated substantial elements of plaintiff's program ("comparison test"). 17 U.S.C.A. § § 101 et seq., 102(b).

[9] Copyrights and Intellectual Property ↪ 10.4
99k10.4 Most Cited Cases

"Abstractions test" does not in and of itself identify elements of computer program protectable by copyright; rather, it is merely one tool to utilize in accomplishing task. 17 U.S.C.A. § 101 et seq.

[10] Copyrights and Intellectual Property ↪ 10.4

99k10.4 Most Cited Cases

For purposes of applying "abstractions test" to computer program, to determine extent of copyright protection, program can often be parsed into six levels of generally declining abstraction, including main purpose, program structure or architecture, modules, algorithms, and data structures, source code, and object code. 17 U.S.C.A. § 101 et seq.

[11] Copyrights and Intellectual Property ↪ 10.4

99k10.4 Most Cited Cases

For purposes of determining whether computer program is subject to copyright, "control flow" may be defined as sequence in which modules of program perform their respective tasks. 17 U.S.C.A. § 101 et seq.

[12] Copyrights and Intellectual Property ↪ 10.4

99k10.4 Most Cited Cases

For purposes of determining extent of copyright protection of computer program, term "data flow" describes movement of information through program and sequence with which it is operated on by modules. 17 U.S.C.A. § 101 et seq.

[13] Copyrights and Intellectual Property ↪ 10.4

99k10.4 Most Cited Cases

For purposes of determining extent of copyright protection available to computer program, term "substructure or nesting" describes inner structure of module whereby one module is subsumed within another and performs part of second module's task. 17 U.S.C.A. § 101 et seq.

[14] Copyrights and Intellectual Property ↪ 10.4

99k10.4 Most Cited Cases

For purposes of determining extent of copyright protection of computer program, term "module" typically consists of operations component, identifying particular result or set of actions that may be performed, such as adding or printing data, and a data type, defining type of item that operator acts upon, such as student record or daily balance. 17 U.S.C.A. § 101 et seq.

[15] Copyrights and Intellectual Property ↪ 10.4

99k10.4 Most Cited Cases

For purposes of determining extent of copyright protection of computer program, term "algorithms" means specific series of steps that accomplish particular operation.

[16] Copyrights and Intellectual Property ↪ 10.4

99k10.4 Most Cited Cases

For purposes of determining extent of copyright protection of computer program, term "data structure" means precise representation or specification of data type that consists of basic data type grouping such as integers or characters, values,

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variables, arrays or groupings of same data type, records or groupings of different data types, and pointers or connections between records that set aside space to hold record's values. 17 U.S.C.A. § § 101 et seq., 102(b).

[17] Copyrights and Intellectual Property 10.4

99k10.4 Most Cited Cases

For purposes of determining extent of copyright protection of computer program, term "source code" means literal text of program's instructions written in particular programming language. 17 U.S.C.A. § 101 et seq.

[18] Copyrights and Intellectual Property 10.4

99k10.4 Most Cited Cases

For purposes of determining extent of copyright protection of computer program, term "object code" is literal text of computer program written in binary language through which computer directly receives its instruction. 17 U.S.C.A. § 101 et seq.

[19] Copyrights and Intellectual Property 10.4

99k10.4 Most Cited Cases

Once court has succeeded in identifying various levels of abstraction of computer program, it must filter out those elements of program that are not protected by copyright. 17 U.S.C.A. § 102(b).

[20] Copyrights and Intellectual Property 4.5

99k4.5 Most Cited Cases

Copyright protection extends only to author's original expression and not to ideas embodied in expression. 17 U.S.C.A. § 102(b).

[21] Copyrights and Intellectual Property 4.5

99k4.5 Most Cited Cases

Copyright is denied to ideas, concepts, and principles. 17 U.S.C.A. § 102(b).

[22] Copyrights and Intellectual Property 10.4

99k10.4 Most Cited Cases

Main purpose or function of computer program will always be an idea unprotected by copyright. 17 U.S.C.A. § 102(b).

[23] Copyrights and Intellectual Property 10.4

99k10.4 Most Cited Cases

Basic function or purpose of module, within

computer program, will nearly always be idea or process unprotectable by copyright. 17 U.S.C.A. § 102(b).

[24] Copyrights and Intellectual Property 10.4

99k10.4 Most Cited Cases

Source and object code, which are literal elements of computer program, will almost always be found for copyright purposes to be protectable expression of idea, rather than nonprotectable idea itself, unless doctrines of merger or scenes a faire are applicable. 17 U.S.C.A. § 102(b).

[25] Copyrights and Intellectual Property 10.4

99k10.4 Most Cited Cases

Processes used in developing computer program, as opposed to expression adopted by programmer, are not within scope of copyright protection. 17 U.S.C.A. § 102(b).

[26] Copyrights and Intellectual Property 12(2)

99k12(2) Most Cited Cases

[26] Copyrights and Intellectual Property 12(3)

99k12(3) Most Cited Cases

Facts are not protectable under copyright law, even though author's original compilation, arrangement or selection of facts may be subject of copyright. 17 U.S.C.A. § 102(b).

[27] Copyrights and Intellectual Property 12(1)

99k12(1) Most Cited Cases

Two fundamental criteria of copyright protection are originality and fixation in tangible form. 17 U.S.C.A. § 102(a).

[28] Copyrights and Intellectual Property 12(1)

99k12(1) Most Cited Cases

"Originality," in field of copyright, requires that work be independently created by author and that it possess minimal degree of creativity. 17 U.S.C.A. § 102(a).

[29] Copyrights and Intellectual Property 10.4

99k10.4 Most Cited Cases

In determining copyright infringement of computer program, court must filter out all unoriginal elements of program, including those elements found in public

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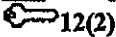
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domain. 17 U.S.C.A. § 102(a).**[30] Copyrights and Intellectual Property**  **4.5**
99k4.5 Most Cited Cases


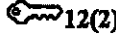
Under "merger doctrine" copyright protection is denied to expression that is inseparable from or merged with ideas, processes, or discoveries underlying expression. 17 U.S.C.A. § 102(a).

[31] Copyrights and Intellectual Property  **4.5**
99k4.5 Most Cited Cases

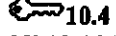
Merger doctrine is applied as prophylactic device to ensure that courts do not unwittingly grant protection to an idea by granting exclusive rights to the only, or one of only a few, means of expressing that idea. 17 U.S.C.A. § 102(a).

[32] Copyrights and Intellectual Property  **12(2)**99k12(2) Most Cited Cases

Under "scenes a faire doctrine," copyright protection is denied to those expressions of idea that are standard, stock, or common to particular topic, or that necessarily follow from common theme or setting. 17 U.S.C.A. § 102(a).

[33] Copyrights and Intellectual Property  **10.4**99k10.4 Most Cited Cases**[33] Copyrights and Intellectual Property**  **12(2)**99k12(2) Most Cited Cases

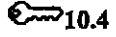
Scenes a faire doctrine excludes from copyright protection those elements of computer program that have been dictated by external factors, such as hardware standards and mechanical specifications, software standards and compatibility requirements, computer manufacturer design standards, target industry practices and demands, and computer industry programming practices. 17 U.S.C.A. § 102(a).

[34] Copyrights and Intellectual Property  **10.4**99k10.4 Most Cited Cases

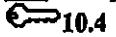
Court must decide whether protectable portions of original copyrighted computer programs that have been copied constitute substantial part of original work, a qualitative rather than purely quantitative analysis. 17 U.S.C.A. § 102(a).

[35] Copyrights and Intellectual Property  **1**
99k1 Most Cited Cases

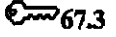
Copyright policy is meant to balance protection, which seeks to ensure fair return to authors and inventors and thereby to establish incentives for development, with dissemination, which seeks to foster learning, progress and development. U.S.C.A. Const. Art. 1, § 8, cl. 8.

[36] Copyrights and Intellectual Property  **5**
99k5 Most Cited Cases**[36] Copyrights and Intellectual Property**  **10.4**99k10.4 Most Cited Cases


Computer programs are considered "literary works" for purposes of copyright analysis. 17 U.S.C.A. § 101 et seq.

[37] Copyrights and Intellectual Property  **10.4**99k10.4 Most Cited Cases

Computer program is protectable under copyright if it is fixed in tangible medium of expression, and program is original. 17 U.S.C.A. § 102(a).

[38] Copyrights and Intellectual Property  **67.3**99k67.3 Most Cited Cases

In applying "abstraction, filtration, and comparison test" to claim of copyright infringement of computer program, copyrighted and alleged infringing programs should first be compared in their entirety without filtering out unprotected elements, in order to reveal possible pattern of copying not obvious when only certain components of program are examined. 17 U.S.C.A. § 102(a).

[39] Copyrights and Intellectual Property  **10.4**99k10.4 Most Cited Cases**[39] Copyrights and Intellectual Property**  **12(2)**99k12(2) Most Cited Cases

Formulas used in program for selecting appropriate rubber belts for industrial machinery were not subject to copyright protection; formulas had been previously published and were consequently in public domain. 17 U.S.C.A. § 102(a).

[40] Copyrights and Intellectual Property  **10.4**99k10.4 Most Cited Cases

Level of complexity of computer program to select appropriate rubber belts for industrial machinery was

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more akin to idea of program than its expression, and was not protectable under copyright law. 17 U.S.C.A. § 102(a).

[41] Copyrights and Intellectual Property

☞67.3

99k67.3 Most Cited Cases

In determining whether computer program for selecting appropriate rubber belts for different kinds of industrial machinery had been infringed, trial court should have "filtered out" from consideration "constants," consisting of invariable integers, comprising part of formulas used to perform calculations in programs; "constants" represented scientific observations of physical relationships concerning load that particular belt could carry around certain

sized gears and were consequently unprotectable facts already existing and merely observed, discovered and reported. 17 U.S.C.A. § 102(a).

[42] Copyrights and Intellectual Property

☞10.4

99k10.4 Most Cited Cases

In determining extent of copyright protection of computer program, term "menu" may mean visual screen display presenting computer operator with limited number of commands available at given stage in computer program's operation. 17 U.S.C.A. § 102(a).

[43] Copyrights and Intellectual Property

☞10.4

99k10.4 Most Cited Cases

In determining extent of copyright protection of computer program, term "sorting criteria" would ordinarily mean factors that determine how data in program is organized. 17 U.S.C.A. § 102(a).

[44] Copyrights and Intellectual Property

☞10.4

99k10.4 Most Cited Cases

Trial court considering whether copyrighted computer program for determining appropriate rubber belts for use with industrial machinery was infringed should have considered whether menus and sorting criteria forming part of program were factors to be taken into consideration in determining if there had been copying, or whether factors should have been eliminated under "filtration analysis." 17 U.S.C.A. § 102(a).

[45] Copyrights and Intellectual Property

☞10.4

99k10.4 Most Cited Cases

In determining extent of copyright of computer program, term "control flow" refers to overall sequence of actions and events in program. 17 U.S.C.A. § 102(a).

[46] Copyrights and Intellectual Property

☞10.4

99k10.4 Most Cited Cases

In connection with determination of extent that computer program is protected by copyright law, term "data flow" means sequence of actions taken on each piece of information, that is, how data travels through program. 17 U.S.C.A. § 102(a).

[47] Copyrights and Intellectual Property

☞10.4

99k10.4 Most Cited Cases

Trial court considering whether computer program for determination of appropriate rubber belts for use with industrial machinery could be copyrighted did not give proper consideration to question whether "control flow" and "data flow" elements of program were processes which could not be protected, or expression which was subject to copyright protection. 17 U.S.C.A. § 102(a).

[48] Copyrights and Intellectual Property

☞67.3

99k67.3 Most Cited Cases**[48] Copyrights and Intellectual Property** ☞8899k88 Most Cited Cases

Trial court evaluating whether copyright on computer program for selecting proper rubber belts to be used on industrial machinery had been infringed did not properly analyze whether there were similarities between modules of copyrighted and alleged infringing program; record did not indicate that modules had been compared in light of dichotomy between nonprotectable process and protectable expression of process, doctrine of merger and doctrine of scenes a faire. 17 U.S.C.A. § 102(a).

[49] Copyrights and Intellectual Property

☞10.4

99k10.4 Most Cited Cases

For purposes of determining extent of copyright protection of computer program, term "common errors or misbehaviors" refers to instances in which two programs share similar errors when not performing correctly or as intended.

[50] Copyrights and Intellectual Property

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67.3**99k67.3 Most Cited Cases**

While existence of common errors may be strong evidence of copying as factual matter, they do not assist in determining what material in computer program is protectable under copyright law. 17 U.S.C.A. § 102(a).

[51] Copyrights and Intellectual Property**10.4****99k10.4 Most Cited Cases**

Common errors per se are not protectable, although expression containing error may be protectable if it otherwise meets test for protectability. 17 U.S.C.A. § 102(a).

[52] Copyrights and Intellectual Property**99k38 Most Cited Cases**

District court considering whether computer program for determining appropriate rubber belt to use with industrial machinery was covered by copyright could not conclude that "fundamental tasks" called for in copyrighted program were protectable expression, without explaining what it perceived "fundamental tasks" to be. 17 U.S.C.A. § 102(a).

[53] Copyrights and Intellectual Property**10.4****99k10.4 Most Cited Cases**

Trial court considering extent of copyright protection of program for determining appropriate rubber belt to use with industrial machinery, was required to consider whether copyright holder had copyright on "install files," consisting of separate utility programs used to load name program from floppy disc onto hard disc, and whether that item should be filtered out of analysis of whether copyright was infringed. 17 U.S.C.A. § 102(a).

[54] States**360k18.15 Most Cited Cases****[54] Antitrust and Trade Regulation****29Tk416 Most Cited Cases**

(Formerly 382k986 Trade Regulation, 379k10(5))

State common law or statutory trade secret claim is preempted by Copyright Act, if work in question is within scope of "subject matter of copyright" as specified in Act, and rights granted under state law are equivalent to any exclusive rights within scope of federal copyright as set out in Act. 17 U.S.C.A. § 102, 103, 106, 301(b).

[55] States**360k18.3 Most Cited Cases**

Federal law will preempt state-created right if that right may be abridged by an act which, in and of itself, would infringe one of exclusive rights established by federal law.

[56] States**360k18.15 Most Cited Cases****[56] States****360k18.87 Most Cited Cases**

If state cause of action claimed to be preempted by Copyright Act requires extra element, beyond mere copying, preparation of derivative works, performance, distribution or display, then state cause of action is qualitatively different from, and not subsumed within, copyright infringement claim and federal law will not preempt state action. 17 U.S.C.A. § 301(b).

[57] Antitrust and Trade Regulation**29Tk414 Most Cited Cases**

(Formerly 382k984 Trade Regulation, 379k10(5))

To prove misappropriation of trade secret under Colorado law, plaintiff must show that he or she possessed valid trade secret, that secret was disclosed or used without consent, and that defendant knew, or should have known that trade secret was acquired by improper means. West's C.R.S.A. § 7-74-102(2).

[58] States**360k18.15 Most Cited Cases****[58] Antitrust and Trade Regulation****29Tk416 Most Cited Cases**

(Formerly 382k986 Trade Regulation, 379k10(5))

Colorado trade secret law was not preempted by federal copyright statute; state law required proof of breach of trust or confidence, element not required under Copyright Act. 17 U.S.C.A. § 101 et seq.; West's C.R.S.A. § 7-74-102(2).

[59] Federal Courts**170Bk860 Most Cited Cases****[59] Antitrust and Trade Regulation****29Tk433 Most Cited Cases**

(Formerly 382k1003 Trade Regulation, 379k28)

What constitutes trade secret is question of fact that

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will only be disturbed if clearly erroneous.

[60] Antitrust and Trade Regulation  413**29Tk413 Most Cited Cases**

(Formerly 382k984 Trade Regulation, 379k10(5))

Factors relevant in determining whether "trade secret" exists are extent to which information is known outside business, extent to which it is known to those inside business, i.e. by employees, precautions taken by holder of trade secret to guard secrecy of information, savings affected and value to holder in having information as against competitors, amount of effort or money expended in obtaining and developing information, and amount of time and expense it would take for others to acquire and duplicate information.

[61] Antitrust and Trade Regulation  420**29Tk420 Most Cited Cases**

(Formerly 382k990 Trade Regulation, 379k10(5))

Trial court did not err by making implicit finding that mathematical constants used in connection with computer program for determining appropriate rubber belts to use with industrial machines were trade secrets, even though there was some evidence that some of the constants could be "reverse engineered" through mathematical trial and error; holder of alleged trade secrets had spent in excess of 25,000 man hours and over \$500,000 developing and upgrading program of which constants were a part, program was considered to be one of best of its kind and was an efficient application and marketing tool.

[62] Antitrust and Trade Regulation  420**29Tk420 Most Cited Cases**

(Formerly 382k990 Trade Regulation, 379k10(5))

Mathematical constants used in connection with computer program for determining appropriate rubber belts to use with industrial machines retained their nature as trade secrets, even though they were inadvertently disclosed during hearing on petition for permanent injunction; under Colorado law holder of trade secret was only required to exercise reasonable efforts to maintain secrecy, counsel for trade secret holder had monitored presence of observers in courtroom, and after hearing was completed permanent injunction hearing record was placed under seal.

*829 Shelley B. Don of Don & Hiller, Denver, CO (Earl S. Wylder and Watson W. Galleher of Don & Hiller, Denver, CO, and *830 Jonathan Band and

Bryan A. Schwartz of Morrison & Foerster, Washington, DC, on the brief), for defendants-appellants.

Rodger L. Wilson, Denver, CO (Karl J. Dakin, Englewood, CO, on the brief), for plaintiff-appellee.

Morton David Goldberg, June M. Besek, David O. Carson, Jesse M. Feder of Schwab Goldberg Price & Dannay, New York City and Arthur R. Miller, of counsel, Cambridge, MA, for amici curiae.

Peter M.C. Choy, Mountain View, CA, for amicus curiae.

Before BRORBY, BARRETT, and EBEL, Circuit Judges.

EBEL, Circuit Judge.

The defendants appeal from the June 24, 1992, order of the district court in which it found that the defendants had infringed Gates' copyright on an engineering computer program and wrongfully misappropriated trade secrets. We conclude that the district court erroneously extended copyright protection to certain unprotectable elements of the computer program. We also conclude that the district court failed properly to determine the protectability of many of the elements of Gates' program which it found to have been copied by the defendants. Accordingly, we remand the copyright claims to the district court for a reconsideration of the programs in light of the test we set forth herein, which involves a determination of whether there was copying and a determination of whether the copying constitutes actionable infringement through application of the abstraction-filtration-comparison test.

Considering the trade secret claims, we conclude that Gates' claims were not preempted by federal law, that Gates made an adequate showing that certain of its mathematical constants were valuable trade secrets, and that Gates took adequate steps to protect the confidentiality of such trade secrets below and on appeal. Accordingly, we affirm those portions of the district court's opinion with respect to the trade secret claims.

FACTS

The plaintiff-appellee, Gates Rubber Co. ("Gates"), is a Colorado corporation that manufactures rubber belts for use in industrial machinery. Gates leads the industry in sales of industrial machine belts. In order

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to determine the proper rubber belt for a particular machine it is necessary to perform complicated calculations involving numerous variables. The complexity of these calculations is such that they have customarily been performed by an engineer and significant variance in outcome often resulted. In order to facilitate the efficient and accurate selection of belts, and to boost the sales of their products, Gates developed a computer program entitled "Design Flex 4.0." With this program a salesman can input a number of variables and thereby calculate the proper Gates belt for a machine. The program uses published formulas in conjunction with certain mathematical constants developed by Gates to determine belt size. Gates obtained a Certificate of Copyright Registration on its Design Flex program.

The defendant, Bando American ("Bando"), is a division of a Japanese corporation that competes with Gates in the manufacture and sale of industrial belts. Numerous Bando employees were formerly employees of Gates, including the defendants Allen Hanano (Bando's president), Ron Newman, and Steven Piderit.

Until 1988, the defendant, Steven R. Piderit, was a Gates' employee. [FN1] While at Gates, Piderit had access to Gates' Design Flex program, including its components and the design and access codes. [FN2] In 1988, Bando hired Piderit away from Gates and assigned him to develop a program that would assist *831 in the selection of the proper belts for industrial machinery. In June of 1989, Bando introduced a demonstration copy of "Chauffeur," a computer program similar to Gates' Design Flex program. The Chauffeur program was made available in March of 1990. Piderit claims to be the sole author of the Chauffeur program.

[FN1] Both Piderit and Newman signed written agreements not to reveal trade secrets and to return all materials used during their employment with Gates. Piderit however thwarted Gates' policy of requiring immediate departure from its plant upon resignation by waiting four weeks after accepting Bando's offer before informing Gates of his decision to leave.

[FN2] There was evidence that Piderit pirated a copy of the Design Flex program and brought it with him to Bando.

Gates filed this action in the U.S. District Court for the District of Colorado on January 4, 1992, alleging

unfair competition, misappropriation of trade secrets, infringement of copyright, and breach of contract. On January 28, 1992, the district court held a hearing on Gates' request for a TRO, which was denied, and ordered experts appointed. On February 26, 1992, the plaintiff filed an amended complaint expanding its claims, naming additional parties, and requesting a permanent injunction. A hearing on the permanent injunction was held on March 26, 1992. On June 24, 1992, the district court issued its opinion finding that the defendants had infringed Gates' copyright and willfully and maliciously misappropriated trade secrets. In an order dated August 12, 1992, the court amended typographical errors in its opinion, and denied the defendant's motions to make additional findings, to alter and amend the judgment, for a new trial and to stay enforcement. This appeal was filed on August 25, 1992. The appellants claim that the district court erred when it (i) extended copyright protection to facts and ideas in the Design Flex program, and (ii) granted relief on Gates' trade secret claim.

This case presents a number of issues that have never been squarely before a panel of this circuit, most notably the proper test to be applied to determine the scope of copyright protection for computer programs. In an attempt to aid the district courts in this determination and to bring clarity to this difficult area of the law, we first set forth what we consider to be the best means to determine the scope of protection. [FN3] In this first section, we seek to draw together the major issues that must be addressed and we try to organize the issues within a coherent framework that will be useable to the district courts that must address these claims in the first instance. We next briefly summarize the constitutional and statutory principles and the key judicial decisions that control and illuminate our analysis. As this analysis demonstrates, our approach is consistent with the evolving law in this area. We then apply our legal analysis to the facts in this case, finding that, in several respects, the district court erred in its application. Finally, we consider the trade secrets issues raised by the appellants. [FN4]

[FN3] The court was aided in its analysis of the copyright law concerning computer programs by briefs submitted by amicus curiae: the American Committee for Interoperable Systems; Computer and Business Equipment Manufacturers Association; the International Anticounterfeiting Coalition, Inc.; Adobe Systems, Inc.; Apple Computer, Inc.;

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Computer Associates International, Inc.; Digital Equipment Corporation, Inc.; International Business Machines Corporation; Lotus Development Corporation; Wordperfect Corporation; and Xerox Corporation.

FN4. Before us is the appellee's motion to protect trade secrets and copyrighted and confidential materials. This court, in an order dated November 25, 1992, ordered the appendices on the appeal temporarily sealed until this motion could be considered. In light of our treatment of the trade secret issues, we grant this motion. Further, the "Second Supplemental Appendix of Appellee the Gates Rubber Company" is accepted for filing and is ordered filed under seal.

DISCUSSION

I. THE COPYRIGHT INFRINGEMENT ISSUE.

A. *The Test for Determining Whether the Copyright of a Computer Program Has Been Infringed.*

[1][2] In order to prevail on a claim of copyright infringement, the plaintiff must show: (1) ownership of a valid copyright, and (2) copying by the defendant of protected components of the copyrighted material. Feist Publications v. Rural Telephone Service Co., 499 U.S. 340, 361, 111 S.Ct. 1282, 1296, 113 L.Ed.2d 358 (1991); Autoskill v. National Educational Support Systems, Inc., 994 F.2d 1476, 1487 (10th Cir.1993), *cert. denied*, 510 U.S. 916, 114 S.Ct. 307, 126 L.Ed.2d 254 (1993). A Certificate of Registration, if timely obtained, constitutes prima facie evidence of the validity of the copyright. *832 17 U.S.C. § 410(c); Autoskill, 994 F.2d at 1487. Once the presumption pursuant to 17 U.S.C. § 410(c) is established, the defendant has the burden of overcoming it. Autoskill, 994 F.2d at 1487. Williams Electronics, Inc. v. Artic International, Inc., 685 F.2d 870, 873 (3d Cir.1982). [FN5]

FN5. In the instant case, Gates presented evidence that it obtained a Certificate of Copyright Registration for the Design Flex Program. The district court held that the defendants had failed to present sufficient evidence to rebut the presumption of the copyright's validity. Gates Rubber Co. v. Bando American, Inc., 798 F.Supp. 1499, 1507 (D.Colo.1992). On appeal the defendants do not dispute that Gates held a

valid copyright on the Design Flex program.

[3] Once the plaintiff has shown that it holds a valid copyright, it must next prove that the defendant unlawfully appropriated protected portions of the copyrighted work. This question involves two separate inquiries: 1) whether the defendant, as a factual matter, copied portions of the plaintiff's program; [FN6] and 2) whether, as a mixed issue of fact and law, those elements of the program that have been copied are protected expression and of such importance to the copied work that the appropriation is actionable. 3 Melville B. Nimmer, Nimmer on Copyright § 13.01[B], at 13-8 to 13-15 (1993) (hereinafter "Nimmer"); see Arnstein v. Porter, 154 F.2d 464, 472-73 (2d Cir.1946).

FN6. Copying is used herein as a shorthand reference to any infringement of the copyright holder's exclusive rights that are set forth at 17 U.S.C. § 106. Ford Motor Co. v. Summit Motor Products, Inc., 930 F.2d 277, 291 (3d Cir.), *cert. denied* 502 U.S. 939, 112 S.Ct. 373, 116 L.Ed.2d 324 (1991). 17 U.S.C. § 106 establishes: Subject to sections 107 through 120, the owner of copyright under this title has the exclusive rights to do and to authorize any of the following:
(1) to reproduce the copyrighted work in copies ...;
(2) to prepare derivative works based upon the copyrighted work;
(3) to distribute copies ... of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending;
....
17 U.S.C. § 106 (1977 and Supp.1993).

[4][5][6] A plaintiff can establish that the defendant copied his program either through the presentation of direct evidence, or through indirect evidence that shows (1) that the defendant had access to the copyrighted program, and (2) that there are probative similarities between the copyrighted material and the allegedly copied material. [FN7] Autoskill, 994 F.2d at 1489; Atari Games Corp. v. Nintendo of America Inc., 975 F.2d 832, 837-38 (Fed.Cir.1992); Whelan Associates v. Jaslaw Dental Laboratory, Inc., 797 F.2d 1222, 1231-32 (3d Cir.1986), *cert. denied* *833479 U.S. 1031, 107 S.Ct. 877, 93 L.Ed.2d 831 (1987); Arnstein, 154 F.2d at 468; 3 Nimmer § 13.01[B], at 10-12. [FN8] Direct proof of copying is rare, Whelan, 797 F.2d at 1231; Roth Greeting Cards v. United Card Co., 429 F.2d 1106, 1110 (9th

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Cir.1970), and plaintiffs will typically rely on the indirect method of proof. Ultimately, to prove factual copying, the plaintiff must come forward with sufficient evidence that a reasonable factfinder, taking together the evidence of access and the similarities between the programs, [FN9] could find that the second work was copied from the first. [FN10]

FN7. In examining the similarities between two programs under the indirect method of proving copying it is ordinarily important to compare the whole works. Atari, Inc. v. North American Philips Consumer Electronics Corp., 672 F.2d 607, 618 (7th Cir.), cert. denied, 459 U.S. 880, 103 S.Ct. 176, 74 L.Ed.2d 145 (1982); Steven R. Englund, Note, Idea, Process, or Protected Expression?: Determining the Scope of Copyright Protection of the Structure of Computer Programs, 88 Mich.L.Rev. 866, 905-906 (1990); Anthony L. Clapes, Patrick Lynch & Mark R. Steinberg, Silicon Epics and Binary Bards: Determining the Proper Scope of Copyright Protection for Computer Programs, 34 UCLA L.Rev. 1493, 1570 (1987). We agree with the district court's conclusion that

it is far preferable, especially in an area of legal and technological sophistication as complex as this area of copyright protection, to draw upon a larger arsenal of facts in order to design or derive the appropriate legally significant facts. Once these are gathered and expert testimony is heard, the court can then analyze which portions of the program, according to the expert testimony, infringes the protected expression.

Gates Rubber Co. v. Bando American, Inc., 798 F.Supp. 1499, 1511 (D.Colo.1992).

We acknowledge that unprotectable elements of a program, even if copied verbatim, cannot serve as the basis for ultimate liability for copyright infringement. However, the copying of even unprotected elements can have a probative value in determining whether the defendant copied the plaintiff's work. Where a court first extracts all unprotected elements of a work, and only compares protected elements, it deprives itself of the use of probative, and potentially essential, information on the factual issue of copying. That is because, even if a court finds protectable elements of a program to be similar, it still must

determine whether those elements were copied from the plaintiff's work, whether the duplication can be attributed to other factors, or whether its reproduction was pure chance. The fact that non-protectable elements of the original program were also copied, although it cannot be the basis for liability, can be probative of whether protected elements were copied. That is because, in certain situations, it may be more likely that protected elements were copied if there is evidence of copying among the unprotected elements of the program.

FN8. When a plaintiff relies on the indirect method of proving copying, he merely creates an inference that the defendant appropriated portions of the plaintiff's program. The defendant can come forward with evidence of independent creation to rebut the inference of copying created by the evidence of access and factual similarity. Summit Motor, 930 F.2d at 295. In the instant case, the district court considered evidence of independent development consisting of defendant Piderit's testimony. The court found this testimony lacked credibility and concluded that in light of the other evidence presented at the hearing that "the Defendants [] failed to rebut the presumption of copying" that arose from plaintiff's proof of access and similarity.

FN9. The degree of similarity between programs necessary to give rise to the inference that copying occurred will vary from case to case. Arnstein, 154 F.2d at 469. A high degree of similarity may permit access to be inferred. See Ferguson v. National Broadcasting Co., 584 F.2d 111, 113 (5th Cir.1978); 3 Nimmer § 13.02[B], at 13-21. Conversely, where there is strong proof of access, the necessary showing of factual similarity will be relatively lower. However, we note that no matter how conclusive proof of access may be, liability may not attach without some showing of similarity.

FN10. In the instant case, the district court found that the defendants had access to Gates' computer programs and that "the Chauffeur program was copied from the Design Flex program." Gates Rubber, 798 F.Supp. at 1516. The defendants do not

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challenge those findings on appeal, although they obviously do not agree with them. Rather, the defendant's main contention on appeal is that the district court erroneously relied on the similarity of non-protectable elements of the Gates program to assess infringement liability.

Although we suggest that it will often be helpful to make an initial determination of whether the defendant copied portions of the plaintiff's program before determining whether the copying involved protectable elements under the copyright law, there may be cases where the issue of protectability can more efficiently be addressed first. The order of the analysis will depend on the individual facts and issues in each case. Of course, even if generalized copying is established in the first instance, it will ultimately still be necessary to establish copying of precisely identified protected elements of a program before copyright infringement can be established.

[7] The court's inquiry does not end with a finding that the defendant copied portions of the plaintiff's program. Liability for copyright infringement will only attach where *protected elements* of a copyrighted work are copied. Baker v. Selden, 101 U.S. 99, 101-03, 25 L.Ed. 841 (1879). "[T]he mere fact that a work is copyrighted does not mean that every element of the work may be protected." Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340, 348, 111 S.Ct. 1282, 1289, 113 L.Ed.2d 358 (1991).

The Copyright Act provides:

In 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) (Supp.1993). [FN11] Accordingly, in order to impose liability for copyright infringement, the court must find that the defendant copied protectable elements of the plaintiff's program and that those protectable elements comprise a substantial part of the plaintiff's program when it is considered as a whole. Autoskill, 994 F.2d at 1496-98; *834 Brown Bag Software v. Symantec Corp., 960 F.2d 1465, 1475-77 (9th Cir.), cert. denied, 506 U.S. 869, 113 S.Ct. 198, 121 L.Ed.2d 141 (1992); Data East USA, Inc. v. Epyx, Inc., 862 F.2d 204, 208 (9th Cir.1988).

FN11. As the 1976 House Report on this

section noted

"Section 102(b) is intended, among other things, to make clear that the expression adopted by the programmer is the copyrightable element in a computer program, and that the actual processes or methods embodied in the program are not within the scope of the copyright law."

H.R.Rep. No. 1476, 94th Cong., 2d Sess. 57 (1976), reprinted in 1976 U.S.C.C.A.N. 5659, 5670.

[8] Determining which elements of a program are protectable is a difficult task. However, an effective test can be formulated from constitutional and statutory constraints and guided by existing case law to determine the scope of copyright infringement. In substantial part, we adopt the "Abstraction-Filtration-Comparison" test which we previously approved for use in the context of a preliminary injunction ruling in Autoskill, 994 F.2d at 1487-98. See also Computer Associates International, Inc. v. Altai, Inc., 982 F.2d 693, 701-14 (2d Cir.1992); Lotus Development Corp. v. Paperback Software International, 740 F.Supp. 37 (D.Mass.1990). [FN12]

FN12. However, we note that the appropriate test to be applied and the order in which its various components are to be applied in any particular case may vary depending on the claims involved, the procedural posture of the suit, and the nature of the computer programs at issue.

First, in order to provide a framework for analysis, we conclude that a court should dissect the program according to its varying levels of generality as provided in the abstractions test. Second, poised with this framework, the court should examine each level of abstraction in order to filter out those elements of the program which are unprotectable. Filtration should eliminate from comparison the unprotectable elements of ideas, processes, facts, public domain information, merger material, *scenes a faire* material, and other unprotectable elements suggested by the particular facts of the program under examination. Third, the court should then compare the remaining protectable elements with the allegedly infringing program to determine whether the defendants have misappropriated substantial elements of the plaintiff's program.

We now proceed to examine each of these steps in greater detail.

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1. Abstraction

[9] The first step in the analysis involves dissecting the allegedly infringed program according to the abstractions test. As Judge Learned Hand wrote in Nichols v. Universal Pictures Corp., 45 F.2d 119 (1930), cert. denied, 282 U.S. 902, 51 S.Ct. 216, 75 L.Ed. 795 (1931), a case dealing with the alleged copyright infringement of a theatrical script:

Upon any work, and especially upon a play, a great number of patterns of increasing generality will fit equally well, as more and more of the incident is left out. The last may be no more than the most general statement of what the play is about, and at times might only consist of its title; but there is a point in this series of abstractions where they are no longer protected, since otherwise the playwright could prevent the use of his "ideas," to which, apart from their expression, his property is never extended.

Id. at 121. The abstractions test is especially well suited to the dissection of computer programs because the test breaks down a program in a way that parallels the typical development of a program. See Autoskill, 994 F.2d at 1491-92; Whelan, 797 F.2d at 1229-30; 3 Nimmer § 13.03[F], at 13- 102.9 to 13-102.19.

We agree with Professor Nimmer that "applying [the abstractions] test conscientiously and systematically can help a court separate ideas from expression and eliminate from the substantial similarity analysis those portions of a work that are not eligible for copyright protection." 3 Nimmer § 13.03[F] 13-102.17. However, in and of itself, the abstraction test does not identify the protectable elements of a program. Rather, it is merely one tool that can be utilized to accomplish this task. Abstraction is particularly useful in enabling a court to filter out ideas and processes from protectable expression.

[10] Application of the abstractions test will necessarily vary from case-to-case and program-to-program. Given the complexity and ever-changing nature of computer technology, we decline to set forth any strict methodology for the abstraction of computer programs. See generally Andrew H. Rosen, *Virtual Reality: Copyrightable Subject Matter and the Scope of Judicial Protection*, 33 *Jurimetrics J.* 35 (1992). Indeed, in most *835 cases we foresee that the use of experts will provide substantial guidance to the court in applying an abstractions test. However, a computer program can often be parsed into at least six levels of generally declining abstraction: (i) the main purpose, (ii) the

program structure or architecture, (iii) modules, (iv) algorithms and data structures, (v) source code, and (vi) object code. See John W.L. Ogilvie, *Defining Computer Program Parts Under Learned Hand's Abstractions Test in Software Copyright Infringement Cases*, 91 *Mich.L.Rev.* 526 (1992) (hereinafter "Ogilvie").

The main purpose of a program is a description of the program's function or what it is intended to do. See Ogilvie at 534; Altai, 982 F.2d at 697 ("ultimate function or purpose"); Whelan, 797 F.2d at 1238 ("purpose"). When defining a program's main purpose, the court must take care to describe the program's function as specifically as possible without reference to the technical aspects of the program.

[11][12][13] The program's architecture or structure is a description of how the program operates in terms of its various functions, which are performed by discrete modules, and how each of these modules interact with each other. The architecture or structure of a program is often reduced to a flowchart, which a programmer uses visually to depict the inner workings of a program. Paperback, 740 F.Supp. at 44-45. Structure exists at nearly every level of a program and can be conceived of as including control flow, data flow, and substructure or nesting. Control flow is the sequence in which the modules perform their respective tasks. See Ogilvie at 535; Whelan, 797 F.2d at 1230 (arrangement of modules); Gates Rubber, 798 F.Supp. at 1514 (sequence of events). Data flow describes the movement of information through the program and the sequence with which it is operated on by the modules. See Ogilvie at 535; Gates Rubber, 798 F.Supp. at 1514 ("described as being analogous to 'receipt' "). Substructure or nesting describes the inner structure of a module whereby one module is subsumed within another and performs part of the second module's task. Ogilvie at 535.

[14] The next level of abstraction consists of the modules. See Steven R. Englund, *Note, Idea, Process, or Protected Expression?: Determining the Scope of Copyright Protection of the Structure of Computer Programs*, 88 *Mich.L.Rev.* 866, 871, 899 (1990) (hereinafter "Englund"). A module typically consists of two components: operations and data types. An operation identifies a particular result or set of actions that may be performed. For example, operations in a calculator program might include adding or printing data. A data type defines the type of item that an operator acts upon such as a student record or a daily balance. See Ogilvie at 534-36.

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[15][16] Algorithms and data structures are more specific manifestations of operations and data types, respectively. An algorithm is a specific series of steps that accomplish a particular operation. Ogilvie at 536; see Whelan, 797 F.2d at 1229-30. Data structure is a precise representation or specification of a data type that consists of (i) basic data type groupings such as integers or characters, (ii) values, (iii) variables, (iv) arrays or groupings of the same data type, (v) records or groupings of different data types, and (vi) pointers or connections between records that set aside space to hold the record's values. Ogilvie at 536-39; see Whelan, 797 F.2d at 1230.

[17][18] The computer program is written first in a programming language, such as Pascal or Fortran, and then in a binary language consisting of zeros and ones. Source code is the literal text of a program's instructions written in a particular programming language. Trandes Corp. v. Guy F. Atkinson Co., 996 F.2d 655, 663 (4th Cir.1993); Whelan, 797 F.2d at 1230. Object code is the literal text of a computer program written in a binary language through which the computer directly receives its instructions. Autoskill, 994 F.2d at 1492 n. 18; Altai, 982 F.2d at 698.

These generalized levels of abstraction will not, of course, fit all computer codes. Ordinarily, expert testimony will be helpful to organize a particular program into various levels of abstraction. In any event, as pointed*836 out earlier, the organization of a program into abstraction levels is not an end in itself, but it is only a tool that facilitates the critical next step of filtering out unprotectable elements of the program.

2. Filtration

[19] Once a court has succeeded in identifying the various levels of abstraction of a computer program, it must filter out those elements of the program that are not protected by copyright. The Copyright Act provides that "idea[s], procedure[s], process[es], system[s], method[s] of operation, concept [s], principles, or discover[ies]" are not protectable. 17 U.S.C. § 102(b) (Supp.1993). Accordingly, the court must filter out these unprotectable elements. In order to effectuate the purposes behind the copyright laws, it is also appropriate to apply the doctrines of merger and *scenes a faire* to filter out unprotectable elements.

(a) The Idea-Expression Dichotomy

[20][21][22][23][24] One of the fundamental tenets of copyright law is that protection extends only to the author's original expression and not to the ideas embodied in that expression. 17 U.S.C. § 102(b) codifies this tenet by denying copyright to ideas, concepts and principles. Numerous cases have expounded on the idea-expression dichotomy. See e.g., Feist, 499 U.S. at 344-51, 111 S.Ct. at 1287-90 (dicta); Harper & Row Publishers, Inc. v. Nation Enterprises, 471 U.S. 539, 556-57, 105 S.Ct. 2218, 2228-29, 85 L.Ed.2d 588 (1985); Baker v. Selden, 101 U.S. 99, 104, 107, 25 L.Ed. 841 (1879); Autoskill, 994 F.2d at 1491. Distinguishing between ideas and the expression of those ideas is not an easy endeavor, and given the varying nature of computer programs it must necessarily be ad hoc. With the framework provided by the abstractions test, however, we believe that a court can adequately filter out the ideas of a program. For example, the main purpose or function of a program will always be an unprotectable idea. See Whelan, 797 F.2d at 1236, 1238; Paperback, 740 F.Supp. at 65. Likewise, each module may typically be described by its individual purpose or function, and the basic function or purpose of a module will nearly always be an unprotectable idea or process. At the other end of the abstractions spectrum, source and object code, which are the literal elements of a program, will almost always be found to be protectable expression unless the doctrines of merger and *scenes a faire* come into play. See Altai, 982 F.2d at 702; Johnson Controls, Inc. v. Phoenix Control Systems, Inc., 886 F.2d 1173, 1175 (9th Cir.1989); Whelan, 797 F.2d at 1233. The intermediate levels of abstraction, such as structure, sequence, organization, and the like, are less prone to generalizations. While the structure of one program may be unprotectable because it constitutes an idea, the organization and arrangement of another program may be expressive and thereby protectable. And, of course, within a program certain structural elements may be protectable expression while other elements are unprotectable ideas.

(b) The Process-Expression Dichotomy

[25] Although it is the idea-expression distinction that has received the primary attention in the cases construing copyright protection, the Copyright Act denies protection to other equally important program elements. When considering utilitarian works such as computer programs one of the most important of these elements is process. See Englund, 88

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Mich.L.Rev. 866, 17 U.S.C. § 102(b) denies protection to procedures, processes, systems and methods of operation. [FN13] The legislative history of the Copyright Act clarifies any ambiguity about the status of processes.

[FN13. For our purposes we consider each of these terms to refer generally to a method for achieving a particular result. For simplicity, we will refer only to "process."

Some concern has been expressed lest copyright in computer programs should extend protection to the methodology or processes adopted by the programmer, rather than merely to the "writing" expressing his ideas. Section 102(b) is intended, among other things, to make clear that the expression adopted by the programmer is the copyrightable element in a computer program, and that the actual processes or *837 methods embodied in the program are not within the scope of the copyright law.

H.R.Rep. No. 1476, 94th Cong., 2d Sess. 57 (1976), reprinted in 1976 U.S.C.C.A.N. 5659, 5670.

The Supreme Court addressed the copyrightability of a utilitarian process in Baker v. Selden, 101 U.S. 99, 25 L.Ed. 841 (1879). There, the Court considered whether the author of a book describing an accounting system could obtain protection over the system itself through copyright of the book. The Court distinguished the "art" or process from the author's explanation thereof and found the former unprotectable. Baker, 101 U.S. at 104. Other courts have similarly found processes unprotectable. See e.g., Altai, 982 F.2d at 704; Atari Games Corp. v. Nintendo of America, Inc., 975 F.2d 832, 838-39 (Fed.Cir.1992). Certain processes may be the subject of patent law protection under Title 35 of the United States Code. See Atari Games, 975 F.2d at 839-40; Englund, 88 Mich.L.Rev. at 893-94. Although processes themselves are not copyrightable, an author's description of that process, so long as it incorporates some originality, may be protectable. See Applied Innovations, Inc. v. Regents of the Univ. of Minnesota, 876 F.2d 626, 636 (8th Cir.1989); Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1250-51 (3d Cir.1983), cert. dismissed, 464 U.S. 1033, 104 S.Ct. 690, 79 L.Ed.2d 158 (1984).

Returning then to our levels of abstraction framework, we note that processes can be found at any level, except perhaps the main purpose level of abstraction. Most commonly, processes will be

found as part of the system architecture, as operations within modules, or as algorithms.

(c) Facts

[26] The Copyright Act also denies protection to discoveries. 17 U.S.C. § 102(b). The Supreme Court squarely addressed the issue of the protectability of facts in its recent opinion in Feist Publications, Inc. v. Rural Telephone Services Co., 499 U.S. 340, 111 S.Ct. 1282, 113 L.Ed.2d 358 (1991). In Feist, the Court considered the copyrightability of a telephone directory comprised merely of names, addresses, and phone numbers organized in alphabetical order. The Court rejected the notion that copyright law was meant to reward authors for the "sweat of the brow," and instead concluded that protection only extends to the original components of an author's work. As to facts, the Court found that

No one may claim originality as to facts. This is because facts do not owe their origin to an act of authorship. The distinction is one between creation and discovery: the first person to find and report a particular fact has not created the fact; he or she has merely discovered its existence.... [O]ne who discovers a fact is not its maker or originator. The discoverer merely finds and records.

499 U.S. at 347, 111 S.Ct. at 1288 (internal quotations and citations omitted). Like ideas and processes, facts themselves are not protectable; however, an author's original compilation, arrangement or selection of facts can be protected by copyright. Feist, at 348, 111 S.Ct. at 1289; Applied Innovations, 876 F.2d at 636. However, "the copyright is limited to the particular selection or arrangement. In no event may copyright extend to the facts themselves." Feist, 499 U.S. at 350-51, 111 S.Ct. at 1290. In computer programs facts may be found at a number of levels of abstraction, but, will most often be found as part of data structures or literally expressed in the source or object codes.

(d) Public Domain

[27][28][29] "The two fundamental criteria of copyright protection [are] originality and fixation in tangible form...." H.R.Rep. No. 1476, 94th Cong., 2d Sess. 51 (1976), reprinted in 1976 U.S.C.C.A.N. 5659, 5664. 17 U.S.C. § 102(a) establishes that copyright can only subsist in "original works of authorship." (emphasis added). Originality in the field of copyright requires that the work be independently created by the author and that it possesses a minimal degree of creativity. Feist, 499

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U.S. at 361, 111 S.Ct. at 1296. Accordingly, in determining copyright infringement, a court must filter out all unoriginal elements of a program, including those elements that are found in the public domain. *838 See *Comprehensive Technologies International, Inc. v. Software Artisans, Inc.*, 3 F.3d 730, 736 (4th Cir.1993); *Altai*, 982 F.2d at 710; *Atari Games*, 975 F.2d at 839; *Brown Bag Software v. Symantec Corp.*, 960 F.2d 1465, 1474-75 (9th Cir.1992), cert. denied, 506 U.S. 869, 113 S.Ct. 198, 121 L.Ed.2d 141 (1992); *E.F. Johnson Co. v. Uniden Corp. of America*, 623 F.Supp. 1485, 1499 (D.Minn.1985). Unoriginal elements of a program may be found at any level of abstraction.

Once a court has filtered out a program's ideas, processes, facts, and unoriginal elements, it has eliminated most of those elements that are unprotected based on the first principles of copyright law. However, in order to give effect to these principles, the courts have devised two additional filtration doctrines. These are the doctrines of merger and *scenes a faire*.

(e) *The Merger Doctrine*

[30][31] Under the merger doctrine, copyright protection is denied to expression that is inseparable from or merged with the ideas, processes, or discoveries underlying the expression. *Concrete Machinery Co. v. Classic Lawn Ornaments, Inc.*, 843 F.2d 600, 606-607 (1st Cir.1988); *Apple Computer, Inc. v. Microsoft Corp.*, 799 F.Supp. 1006, 1021 (N.D.Cal.1992), order clarified, 821 F.Supp. 616 (1993); Englund, 88 Mich.L.Rev. at 877. The merger doctrine is applied as a prophylactic device to ensure that courts do not unwittingly grant protection to an idea by granting exclusive rights to the only, or one of only a few, means of expressing that idea. See *Herbert Rosenthal Jewelry Corp. v. Kalpakian*, 446 F.2d 738, 742 (9th Cir.1971). If protection were granted to these expressions, it would so increase the cost of creation for others who seek to build on the work that it would impede progress in the arts. Such a result is contrary to the goals of copyright as embedded in the Constitution. See U.S. Const., art. I, § 8, cl. 8.

(f) *Scenes A Faire*

[32] Under the *scenes a faire* doctrine, we deny protection to those expressions that are standard, stock, or common to a particular topic or that necessarily follow from a common theme or setting. *Autoskill*, 994 F.2d at 1494 (citing 3 Nimmer §

13.03[B][4], at 13-70); *Atari*, 672 F.2d at 616. Granting copyright protection to the necessary incidents of an idea would effectively afford a monopoly to the first programmer to express those ideas. *Whelan*, 797 F.2d at 1236-37; *Landsberg v. Scrabble Crossword Game Players, Inc.*, 736 F.2d 485, 489 (9th Cir.), cert. denied, 469 U.S. 1037, 105 S.Ct. 513, 83 L.Ed.2d 403 (1984). Furthermore, where a particular expression is common to the treatment of a particular idea, process, or discovery, it is lacking in the originality that is the *sine qua non* for copyright protection. *Feist*, 499 U.S. at 348, 111 S.Ct. at 1289.

[33] The *scenes a faire* doctrine also excludes from protection those elements of a program that have been dictated by external factors. See *Plains Cotton Co-op Ass'n. v. Goodpasture Computer Serv., Inc.*, 807 F.2d 1256, 1262 (5th Cir.), cert. denied, 484 U.S. 821, 108 S.Ct. 80, 98 L.Ed.2d 42 (1987); *Apple Computer*, 799 F.Supp. at 1022-26. In the area of computer programs these external factors may include: hardware standards and mechanical specifications, see *Manufacturer's Technologies, Inc. v. Cams, Inc.*, 706 F.Supp. 984, 995 (D.Conn.1989), software standards and compatibility requirements, [FN14] *Sega Enterprises Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1525-27 (9th Cir.1993), computer manufacturer design standards, target industry practices and demands, see *Plains Cotton*, 807 F.2d at 1262, and computer industry programming practices, see *Apple Computer*, 799 F.Supp. at 1033. 3 Nimmer § 13.03[F][3][a]-[e], at 13-102.21 to 13-102.28.

FN14. We recognize that the *scenes a faire* doctrine may implicate the protectability of interfacing and that this topic is very sensitive and has the potential to effect widely the law of computer copyright. This appeal does not require us to determine the scope of the *scenes a faire* doctrine as it relates to interfacing and accordingly we refrain from discussing the issue.

3. *Comparison*

[34] After the court has filtered out those elements of the original program that it has found to be unprotectable, it is left with a *839 core of protected elements that can be compared to the alleged infringing program. Ultimately the court must decide whether those protectable portions of the original work that have been copied constitute a substantial part of the original work--i.e. matter that is

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significant in the plaintiff's program. See Altai, 982 F.2d at 710-11; Atari, Inc., 672 F.2d at 619; Paperback, 740 F.Supp. at 61; 3 Nimmer § 13.03[A][2], at 13-46 to 13-48. This is primarily a qualitative rather than a purely quantitative analysis, see Whelan, 797 F.2d at 1245, and must be performed on a case-by-case basis. [FN15]

FN15. A number of tests have been proposed to give guidance to courts in making this determination. They include "total concept and feel," "fundamental essence or structure," and the "iterative" tests. The "total concept and feel" test was developed in different contexts and it is not very helpful in comparing similarities among protected components of computer codes. The other tests are artificially narrow and restrictive. Instead, the comparison must necessarily be an ad hoc determination of whether the infringed portion is a significant or important part of the plaintiff's code, considered as a whole.

B. Review of Constitutional and Statutory Principles and Key Judicial Precedent.

[35] The test that we adopt today is firmly rooted in traditional principles of copyright law. The Constitution establishes an affirmative duty for Congress "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." U.S. Const. art. I, § 8, cl. 8; see Sony Corp. v. Universal City Studios, Inc., 464 U.S. 417, 428-29, 104 S.Ct. 774, 781-82, 78 L.Ed.2d 574 (1984); Mazer v. Stein, 347 U.S. 201, 219, 74 S.Ct. 460, 471, 98 L.Ed. 630 (1954). Copyright policy is meant to balance protection, which seeks to ensure a fair return to authors and inventors and thereby to establish incentives for development, with dissemination, which seeks to foster learning, progress and development.

In order to secure these goals Congress enacted The Copyright Act, 17 U.S.C. § 101 *et seq.*, which establishes that

(a) Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. Works of authorship include the following categories:

(1) literary works;

....

(6) motion pictures and other audiovisual works;

....

17 U.S.C. § 102(a) (Supp.1993).

[36][37] Computer programs are considered literary works for purposes of copyright analysis. 17 U.S.C. § 101 states:

"Literary works" are works ... expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as ... film, tapes, disks, or cards, in which they are embodied.

....

A "computer program" is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.

17 U.S.C. § 101 (1977 and Supp.1993). Atari Games Corp. v. Nintendo of America, Inc., 975 F.2d 832, 838 (Fed.Cir.1992); H.R.Rep. No. 1476, 94th Cong., 2d Sess. 54, reprinted in 1976 U.S.C.C.A.N. 5659, 5667 (The term "literary works" "also includes computer data bases, and computer programs to the extent that they incorporate authorship in the programmer's expression of original ideas, as distinguished from the ideas themselves."). A computer program is protectable under copyright if two requirements are met: (1) it is fixed in a tangible medium of expression, and (2) the program is original. 17 U.S.C. § 102(a) (Supp.1993); M. Kramer Mfg. Co. v. Andrews, 783 F.2d 421, 433 (4th Cir.1986); H.R.Rep. No. 1476, 94th Cong., 2d Sess. 51- *840 2, reprinted in 1976 U.S.C.C.A.N. 5659, 5664-65. [FN16]

FN16. There is no dispute in this appeal that computer programs may be protectable under the copyright law.

Much of the modern doctrine concerning the copyright of utilitarian works and the process-expression dichotomy owes its origins to the Supreme Court's opinion in Baker v. Selden, 101 U.S. 99, 25 L.Ed. 841 (1879), in which the Court considered the copyright of a book setting out a system of accounting. The Court held that neither the system itself nor the forms necessary to operate the system were protectable, although the author's particular expression of the system was protectable.

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

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occasion requires. The very object of publishing a book on science or the useful arts is to communicate to the world the useful knowledge which it contains. But this object would be frustrated if the knowledge could not be used without incurring the guilt of piracy of the book. And where the art it teaches cannot be used without employing the methods and diagrams used to illustrate the book, or such as are similar to them, such methods and diagrams are to be considered as necessary incidents to the art, and given therewith to the public; not given for the purpose of publication in other works explanatory of the art, but for the purpose of practical application.

Baker, 101 U.S. at 103.

One of the early attempts to apply the doctrine of copyright to computer programs came in Whelan Assoc. v. Jaslow Dental Laboratory, Inc., 797 F.2d 1222 (3d Cir.1986), cert. denied, 479 U.S. 1031, 107 S.Ct. 877, 93 L.Ed.2d 831 (1987). The Whelan court extended copyright protection to the structure, sequence and organization of a computer program even though the literal elements were not copied. 797 F.2d at 1248. Moreover, the Third Circuit attempted to establish a principle to distinguish between idea and expression. It concluded that:

[T]he line between idea and expression may be drawn with reference to the end sought to be achieved by the work in question. In other words, the purpose or function of a utilitarian work would be the work's idea, and everything that is not necessary to that purpose or function would be part of the expression of the idea.

797 F.2d at 1236 (emphasis omitted).

The Whelan court's articulation of this general rule for distinguishing idea from expression has been criticized extensively. [FN17] However, Whelan did use the limiting doctrines of merger and *scenes a faire* to restrict the scope of protection. In any event, when a program is understood to encompass more than one idea, the general principle of Whelan provides a useful means to distinguish idea from expression. At its base, Whelan is premised upon traditional principles of copyright law, and its conclusion that the structure of a program may be protectable is sound.

FN17. See Altai, 982 F.2d at 705-06 (citing cases); 3 Nimmer § 13.03[F], at 13-102.17 to 13-102.19; Englund, 88 Mich.L.Rev. 881-82. The criticisms of the Whelan analysis primarily concern the high level of abstraction at which the court chose to

separate idea from expression. The criticisms of the Whelan decision are valid when the opinion is read to imply that a computer program can have only one idea. See 3 Nimmer, § 13.03[F], at 13-102.17. Computer programs can, and nearly all do, incorporate more than one idea. When a program is analyzed under the Whelan framework with this broader concept of idea, the scope of protection afforded by the Whelan analysis is significantly curtailed.

In Lotus Development Corp. v. Paperback Software International, 740 F.Supp. 37 (D.Mass.1990), Judge Keeton, who has written extensively on the subject of software protection, considered the copyright of the Lotus 1-2-3 spreadsheet program. Like Whelan, the court concluded that the "structure, sequence and organization" of the software may be protectable. The Paperback court developed a three-part test that is a forerunner of the standard that we adopt in *841 this case. 740 F.Supp. at 59-62. First, the court formulated a conception of the program's idea based on the various abstractions that it found to describe the program. 740 F.Supp. at 60. Second, the court separated out those expressions that it found to be essential to the ideas. Finally, the court determined whether the remaining expressions were a substantial part of the copyrighted work. 740 F.Supp. at 61, 70.

[38] The Second Circuit in Computer Associates International, Inc. v. Altai, Inc., 982 F.2d 693 (2d Cir.1992), built on the case law that preceded it. The court agreed with Whelan and Paperback that copyright can protect the non-literal structures of computer programs. 982 F.2d at 702- 703. In analyzing the similarity of the computer programs before it, the Altai court utilized a three-part test that bore some similarity to the three-part test in Paperback. The Altai court articulated its test as an "Abstraction-Filtration-Comparison" test. Under the first prong the court dissected the program and identified the various levels of abstraction in the program. Altai, 982 F.2d at 707. Under the second prong, the court examined the separate elements within the program and eliminated those elements that it found to be either (1) ideas, (2) in the public domain, (3) required by factors external to the program, or (4) dictated by efficiency concerns such that the idea and expression were inseparable. Altai, 982 F.2d at 707-710. Those unprotectable elements were then filtered out before the two programs were compared. Finally, in the third prong, the court examined the remaining "core of protectable expression" to determine whether the defendant's

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program misappropriated substantial portions of the plaintiff's program. Altai, 982 F.2d at 710-711. We accept this basic three-part analysis and seek only to elaborate upon the various steps and to clarify the role of the abstraction test. We suggest that a court will often be assisted in determining the factual issue of copying if both programs are first compared in their entirety without filtering out the unprotected elements. Such a preliminary step does not obviate the ultimate need to compare just the protected elements of the copyrighted program with the alleged infringing program. However, an initial holistic comparison may reveal a pattern of copying that is not obvious when only certain components are examined.

The Supreme Court's most recent pronouncements in the area of copyright law came in Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340, 111 S.Ct. 1282, 113 L.Ed.2d 358 (1991). Although Feist concerned the protectability of telephone directories rather than computer programs, the Court clarified several principles of copyright law applicable to the area of computers. The Court held that facts are not copyrightable regardless of the effort the author undertook to discover or compile them. In doing so the court rejected the "sweat of the brow" doctrine, which maintained that copyright was meant to protect and reward the efforts of an author. The court established that it is originality, not effort, that is the basis of copyright protection. However, the Court concluded that the original organization, selection, or arrangement in a work that is comprised exclusively of unprotectable facts could nevertheless be protected.

A panel of this circuit recently considered computer program copyright infringement in Autoskill, Inc. v. National Educational Support Systems, Inc., 994 F.2d 1476 (10th Cir.1993), cert. denied, 510 U.S. 916, 114 S.Ct. 307, 126 L.Ed.2d 254 (1993). We upheld the grant of a preliminary injunction against the developers of a program designed to test and train individuals with reading deficiencies. Because the case involved a preliminary injunction, we only reviewed the district court's ruling to determine if the plaintiff had established a prima facie case with reasonable probability of success, and we expressly refrained from dictating a precise test for determining copyright infringement. Albeit, we affirmed the district court's application of the "Abstraction-Filtration-Comparison" test and application of the doctrines of merger, *scenes a faire*, and public domain.

We find in these and other cases that have considered the copyrightability of computer programs that there has begun to be developed a coherent approach to the protectability analysis. The approach that we outline *842 today is consistent with this evolving approach to the copyright protection of computer programs.

C. Applying the Abstraction-Filtration-Comparison Test to the Computer Programs at Issue in This Case.

The district court undertook an analysis similar to that which we set forth today. First, it determined whether, as a factual matter, the Chauffeur program had been copied from the Design Flex program. [FN18] The court initially found that the defendants had access to the Design Flex program. It then considered the testimony of the expert witnesses and identified a number of similarities between the two programs. The court concluded that "the only explanation regarding the constants, the install files, and the overall data flow and presentation, is that the Chauffeur program was copied from the Design Flex program." Gates Rubber Co. v. Bando American, Inc., 798 F.Supp. 1499, 1516 (D.Colo.1992).

[FN18] The court attempted to fit its analysis into the rubric of the "extrinsic-intrinsic" test. However, that effort largely overlaps the "abstraction-filtration-comparison" test we adopt today and it merely adds confusion to the existing plethora of terminology. For purposes of addressing the issue of copyright infringement of computer programs, we think it is better simply to use the terminology addressed in our opinion.

Next, the court applied the abstractions test to identify "unprotectable ideas." The court dissected the program and considered whether certain of the elements more closely approximated idea or expression. The court concluded that the merger doctrine and the *scenes a faire* doctrine were inapplicable. Finally, the court evaluated what it regarded as the protectable elements and determined that they were sufficiently significant to the Design Flex program to conclude that the defendants had infringed on Gates' copyright in the Design Flex program when it copied such elements. Gates Rubber, 798 F.Supp. at 1519.

[39][40] The copyright issues on appeal all revolve around whether the district court erroneously extended copyright protection to unprotectable elements of the Design Flex program. The

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appellants argue that the court failed to consider whether three of the elements of the Design Flex program were protectable, and that it applied the wrong legal standard in protecting certain elements of the Design Flex program. The appellants argue that if a proper filtration analysis was conducted, the Chauffeur program would not be found to have infringed any protectable elements of the Design Flex program.

The district court ultimately concluded that the defendants had misappropriated ten elements of the Design Flex program that were protected by Gates' copyright. They included: menus, constants, sorting criteria, control flow, data flow, the engineering calculation module, the design module, common errors, fundamental tasks, and install files. We conclude that the district court failed to undertake a proper filtration analysis with respect to several elements and that it erroneously found other elements to be protectable. Accordingly, we remand for further consideration by the district court. [FN19]

[FN19]. We note that the court correctly found a number of the elements present in both the *Design Flex* and *Chauffeur* programs to be unprotectable. It found the formulas used in the program to have been previously published and therefore in the public domain, and the level of complexity of the program to be more akin to the idea of the program than its expression. *Gates Rubber*, 798 F.Supp. at 1518-19.

Constants

[41] Constants are the invariable integers that comprise part of the formulas used to perform the calculations in the programs. The district court failed to consider whether the constants were unprotectable processes or facts or whether they were subject to the merger doctrine. In failing to undergo the filtration process, the court skipped an essential step in the copyright infringement analysis and as a result extended copyright protection to an unprotectable element of Design Flex.

The record reveals that these constants are facts that are unprotectable under copyright law. The constants in the Design Flex program represent scientific observations of physical relationships concerning the load that a particular belt can carry around certain *843 sized gears at certain speeds given a number of other variables. These relationships are not invented or created; they already

exist and are merely observed, discovered and recorded. Such a discovery does not give rise to copyright protection. See *Feist*, 499 U.S. at 347, 111 S.Ct. at 1288 ("[F]acts do not owe their origin to an act of authorship. The distinction is one between creation and discovery: the first person to find and report a particular fact has not created the fact; he or she has merely discovered its existence.").

Gates claims that the constants should be protected because it spent thousands of hours testing the relationships and because engineers ultimately had to determine the best figure to represent the test results. [FN20] However, this argument amounts to an assertion of the "sweat of the brow" doctrine which has been rejected by the Supreme Court. *Feist*, 499 U.S. at 353-54, 111 S.Ct. at 1291-92.

[FN20]. As Gates explained in its submission to this court:

The engineering constants were derived by Gates based upon a large number of tests. The result of each test was plotted on a graph so that it could be compared with other results. Once all results had been collected, the constant was created by comparing and interpreting all results and determining which result best typified the group. The designated constant is representative of the group in the opinion of the engineer making the determination. Aplee.Br. at 32. Gates mischaracterizes the derivation of the constants as having been "created."

Accordingly, while the constants were probative of the factual question whether the defendants copied from the Design Flex program, [FN21] they were unprotectable and therefore should have been filtered out before the district court addressed the ultimate question of whether the defendants infringed on Gates' copyright. Instead, the court relied heavily on the similarity of the constants in the two programs when it concluded that *Chauffeur* infringed on Gates' copyright. It noted that the constants "lie at the heart of the dispute," and gave "special regard to the mathematical constants" in finding that the defendants had violated Gates' copyright. *Gates Rubber*, 798 F.Supp. at 1518-19. Because of the court's emphasis on the constants in its reasoning, and our finding that the constants are unprotectable facts, we remand for the district court to consider whether the remaining protectable elements found to have been copied are such a substantial part of the Design Flex program that their misappropriation constitutes

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copyright infringement.

FN21. The district court has found that the constants were trade secrets belonging to Gates, and in Part II of this opinion we uphold that finding. Thus, the fact that Bando used these constants in its program is strong evidence on the factual issue of copying.

Menus and Sorting Criteria

[42][43][44] These terms are not defined in the district court opinion. However, menus may mean the visual screen displays that present a computer operator with a limited number of commands available at a given stage in the computer program's operation. Lotus Development Corp. v. Borland International, Inc., 799 F.Supp. 203, 206 (D.Mass.1992). Sorting criteria would ordinarily mean the factors that determine how the data in the program is organized. The district court failed to undertake a proper filtration analysis with respect to the menus and sorting criteria. Because the record before us is ambiguous and incomplete with regard to these terms, we are unable to determine on appeal whether these elements are protectable.

The defendants claim that the menus and the sorting criteria are visual components of the programs as to which Gates has waived all claims of infringement. At trial, counsel for Gates stated that the "plaintiff is willing to stipulate that we are making no claim as to trade secret or copyright as to the screens of these computer programs ..." Appt.Apx. at 266. When asked about its claims concerning the menus and sorting criteria at oral argument in this appeal, however, Gates asserted that it had only waived its claims concerning the *visual* screen displays, and that it maintained a copyright claim on the written elements of the program that created those displays.

The district court failed to clarify whether it was referring to the visual screen displays *844 or some other aspect of the program when it discussed the menus and sorting criteria, and it failed to address whether the visual screen display can be separated from the program generating the visual screen display for purposes of the stipulation. Accordingly, we remand for a clarification of the terms "menu" and "sorting criteria"; for a determination of whether Gates has waived its infringement claims with respect to these elements; and for a determination of the protectability of such elements if Gates is determined not to have waived its infringement claim with regard

to them.

Control and Data Flow

[45][46] Control flow refers to the overall sequence of actions and events in a program. Data flow is the sequence of actions taken on each piece of information, that is, how the data travels through the program. The district court found that "the flow of these two types of information are closer to the expression of how the task is performed than the idea of undertaking calculation of belts and drives by use of a computer program." Gates Rubber, 798 F.Supp. at 1518. The defendants object that this conclusion is erroneously predicated on the dicta in Whelan that each program has only one idea. See Whelan, 797 F.2d at 1236. They assert that the control and data flow elements occur at such high levels of abstraction that they are inappropriate for copyright protection.

[47] A fair reading of the district court opinion suggests that the court recognized that a computer program may contain more than one idea, and that unprotected ideas may be found throughout the program. However, we are more concerned by the district court's failure to examine the control and data flow in light of the process-expression dichotomy. Again, the district court failed to define exactly what it meant by control flow and data flow and the record is unclear. [FN22] We remand for clarification of the terms "control flow" and "data flow" and for reconsideration of these elements in light of the idea-expression and process-expression dichotomies as they have been set forth in this opinion.

FN22. The district court merely summarized the testimony of one of the experts who found that several elements of the programs were similar including: "data flow, which he described as being analogous to 'recipe;' [and] control flow which is the sequence of events." Gates Rubber, 798 F.Supp. at 1514-15.

Engineering Calculation and Design Modules

[48] The program performs its calculations and selects the proper belt through a series of operating instructions contained in modules. The district court concluded that:

The modules of the program were also found to be substantially similar. These modules, like chapters of a novel or scenes from a play, performed particular functions--here the engineering calculations and the design aspect of the program

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(containing the V-belt design algorithms). Concerning the former module, it was noted that behavior was similar, and with the latter the similarity concerned overall structure and organization. With regard to the former module, this falls closer to the expression range because, although the pure engineering aspect in a broad sense may be more likely to be not protected, the relevant engineering modules in the two programs contain *particular elements which perform in similar manners*. The latter module is somewhat more difficult as it involves algorithms, or procedures for solving given types of mathematical problems. The Court here rejects the argument that while the remaining portion [of the program] is properly protected under copyright law, the algorithms, as a "process" can only be covered by patent law. Such a holding would tend to fragment further the rather tenuous continuity found in copyright law concerning computer programs. This conclusion is supported by the Whelan decision, 797 F.2d at 1229, Gates Rubber, 798 F.Supp. at 1518. (emphasis added).

The district court identified two modules—the engineering module and the design module—and it found them to be protected for different reasons. The appellant contests this finding, asserting that calculation module, design module, and engineering module *845 are just different names for the same module. Gates has failed to brief this issue. The expert testimony casts doubt on the district court's interpretation that the engineering module and the design module are two separate modules; however, the record is not sufficiently clear to resolve the dispute.

The district court found that the engineering module was expression rather than idea because of "particular elements which perform in similar manners." Gates Rubber, 798 F.Supp. at 1518. However, the district court failed to identify those "particular elements" upon which it based its decision, and it failed to analyze with any particularity whether those elements were ideas, processes, or facts. If, as the district court seems to suggest, the algorithms are "process," then they would not be protectable under copyright law. There remains the possibility that they are expressions, but, the court will then need to address the merger doctrine. Further, defendants have drawn our attention to evidence that was before the district court that tends to show that certain module functions were standard in the industry. There is no indication that the district court analyzed those components of

the module under the *scenes a faire* doctrine. Accordingly, we remand for clarification of the district court's analysis and consideration of the modules in light of the process-expression dichotomy, merger and *scenes a faire* doctrines. Unless the district court provides us with sufficient detail to understand its ruling, we are unable to provide meaningful review of this finding.

Common Errors

[49] Common errors or misbehaviors are instances in which the two programs share similar errors when not performing correctly or as intended. See Atari Games Corp. v. Nintendo of America, 975 F.2d 832, 845 (Fed.Cir.1992); M. Kramer Manufacturing Co. v. Andrews, 783 F.2d 421, 446 (4th Cir.1986). The experts in the instant case identified two such common errors. First, both programs identify that it is impossible to compute a maximum center distance that is less than a minimum center distance, but both programs attempt to do so anyway. Second, both programs will jump to the wrong menu if the cursor happens to be over a certain character during one of the input sequences.

[50][51] While common errors may often be strong evidence of copying as a factual matter, [FN23] they do not assist in determining what material is protectable under copyright law. BellSouth Advertising & Publishing Corp. v. Donnelley Information Publishing, Inc., 999 F.2d 1436 (11th Cir.1993). Relying on several cases that have held that "common errors are the strongest evidence of copying," Gates argues that the common errors should be considered protectable." Aplee.Br. at 33. See Atari Games, 975 F.2d at 845; M. Kramer, 783 at 446; E.F. Johnson Co. v. Uniden Corp. of America, 623 F.Supp. 1485, 1496 (D.Minn.1985). However, none of the cases cited by Gates held that the actual misbehavior or faulty operation of the computer was protected. Rather, the cases stand for the limited proposition that evidence that two programs contain the same unnecessary or defective textual instructions is probative on the issue of copying. None of the cases cited considered the protectability of those instructions. Errors per se are not protectable, although the expression containing the error may be protectable if it otherwise meets the test for protectability set forth in this opinion. That analysis is lacking here. Thus, it is necessary for us to remand on this issue.

[FN23] In fact, common errors are not always probative of copying. For example, on the

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record before us, the testimony of the expert Dr. Dorn argued that the errors resulted from different sources in the programs.

Fundamental Tasks

[52] We normally would associate the term "fundamental tasks" with the highest level of abstraction—that is, the ideas or purposes underlying a program. In the instant case, the district court found the fundamental tasks of the Design Flex program to be protectable expression, but it failed to explain what it thought the fundamental tasks of the Design Flex program were. The district court stated that

*846 [a]lthough "fundamental tasks" may in a broader sense merely describe what are necessary means to effect a particular end, the term here is more specific due to the types of tasks which were available to achieve the particular end of designing belts and drives.

Gates Rubber, 798 F.Supp. at 1519. This discussion suggests the district court held a different understanding of the term "fundamental tasks" than what we would normally understand it to mean. However, we do not understand what the district court meant, nor do we have the benefit of the district court analysis beyond its mere conclusion that the merger doctrine is not applicable. Accordingly, we must remand for further analysis of this element as well.

Install Files

[53] The install files here are separate utility programs that are used to load the program from a floppy disk onto a hard disk. They are part of the Disk Operating System and apparently are not part of the Design Flex program. Accordingly, it is not clear that Gates has a copyright claim on the install files. The district court failed to make adequate findings on this element to enable us to determine if the install files were covered by Gate's copyright and it failed to engage in a filtration analysis as to this element. Accordingly, we remand for a determination of whether Gates held a copyright on the install files and for a reconsideration of the install files in light of the test we have set forth herein. [FN24]

FN24. Except as stated above, we find no error in the remaining portions of the district court's analysis of Gates' copyright claim.

II. THE TRADE SECRET ISSUE.

The district court concluded that Bando had misappropriated trade secrets belonging to Gates and ordered Bando to "return any and all information containing the constants used in either the Chauffeur program or the Design Flex program ... [and] restrained [them] from further use of these constants." *Gates Rubber*, 798 F.Supp. at 1523. Bando appeals this order and the underlying finding of trade secret misappropriation alleging that: (1) the state law misappropriation claim is preempted by 17 U.S.C. § 301, (2) the constants have no competitive economic value and are therefore not appropriately considered trade secrets, and (3) the disclosure of the constants during the course of the trial, in open court, deprived them of their status as trade secrets. Aplt.Br. at 14.

A. Federal Preemption of the Trade Secret Claims

[54] Bando contends that the district court incorrectly considered Gates' state law misappropriation claim because the claim was preempted by 17 U.S.C. § 301. Section 301(a) provides that:

(a) On and after January 1, 1978, all legal or equitable rights that are equivalent to any of the exclusive rights within the general scope of copyright as specified by Section 106 in works of authorship that are fixed in a tangible medium of expression and come within the subject matter of copyright as specified by sections 102 and 103, whether created before or after that date and whether published or unpublished, are governed exclusively by this title. Thereafter, no person is entitled to any such right or equivalent right in any such work under the common law or statutes of any State.

17 U.S.C. § 301(a) (emphasis added). However, § 301(a) is qualified by § 301(b), which provides in relevant part:

(b) Nothing in this title annuls or limits any rights or remedies under the common law or statutes of any State with respect to--

- (1) subject matter that does not come within the subject matter of copyright as specified by sections 102 and 103, including works of authorship not fixed in any tangible medium of expression; or
- (2) any cause of action arising from undertakings commenced before January 1, 1978;
- (3) activities violating legal or equitable rights that are not equivalent to any of the *847 exclusive rights within the general scope of copyright as specified by section 106; ...

....
17 U.S.C. § 301(b) (Supp.1993).

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Thus, a state common law or statutory claim is preempted by Section 301 if: "(1) the work is within the scope of the 'subject matter of copyright' as specified in 17 U.S.C. § § 102 and 103; and (2) the rights granted under state law are equivalent to any exclusive rights within the scope of federal copyright as set out in 17 U.S.C. § 106." Ehat v. Tanner, 780 F.2d 876, 878 (10th Cir.1985), cert. denied, 479 U.S. 820, 107 S.Ct. 86, 93 L.Ed.2d 39 (1986) (citing Harper & Row Publishers, Inc. v. Nation Enterprises, 723 F.2d 195, 199-200 (2d Cir.1983), rev'd on other grounds, 471 U.S. 539, 105 S.Ct. 2218, 85 L.Ed.2d 588 (1985)).

In its amended complaint, Gates alleged that "the use of the proprietary data, engineering formula, and the code of the Design Flex and the Life in Hours computer programs constitute a misappropriation of the trade secret [sic] of The Gates Rubber Company as stated in the Colorado Uniform Trade Secrets Act, C.R.S. 7-74-102(2)." Aplt.Apx. at 8. The parties do not dispute that the computer programs at issue in this case fall within the "subject matter of copyright" as specified by 17 U.S.C. § § 102 and 103. Accordingly, the question before us is whether the rights granted by those provisions of the Colorado Uniform Trade Secrets Act, Colo.Rev.Stat. 7-74-102(2), upon which Gates relies, are equivalent to any of the exclusive rights granted by the Copyright Act, 17 U.S.C. § § 102-103.

[55][56] Section 106 of the Copyright Act grants to the copyright owner the exclusive rights to: (i) reproduce the copyrighted work; (ii) prepare derivative works; (iii) distribute copies of the work; (iv) perform the work publicly; and (v) display the work publicly. 17 U.S.C. § 106 (1977 and Supp.1993). In order to determine whether Gates' misappropriation claim asserts rights equivalent to those delineated in Section 106, we refer to the elements of the state law cause of action. Federal law will preempt "a state-created right if that right may be abridged by an act which, in and of itself, would infringe one of the exclusive rights" established by federal law. G.S. Rasmussen & Assoc. v. Kalitta Flying Service, Inc., 958 F.2d 896, 904 (9th Cir.1992), cert. denied, 508 U.S. 959, 113 S.Ct. 2927, 124 L.Ed.2d 678 (1993). However, if a state cause of action requires an extra element, beyond mere copying, preparation of derivative works, performance, distribution or display, then the state cause of action is qualitatively different from, and not subsumed within, a copyright infringement claim and federal law will not preempt the state action. Computer Associates International, Inc. v. Altai, Inc.,

982 F.2d 693, 716 (2nd Cir.1992).

[57][58] Under Colorado law, to prove misappropriation of a trade secret, a plaintiff must show: (i) that he or she possessed a valid trade secret, (ii) that the trade secret was disclosed or used without consent, and (iii) that the defendant knew, or should have known, that the trade secret was acquired by improper means. [FN25] The breach of a duty of trust or confidence "is the gravamen of such trade secret claims and supplies the 'extra *848 element' that qualitatively distinguishes such trade secret causes of action from claims for copyright infringement that are based solely on copying." [FN26] Computer Associates International, Inc. v. Altai, Inc., 982 F.2d 693, 717 (2nd Cir.1992); Trandes Corp. v. Guy F. Atkinson Co., 996 F.2d 655, 660 (4th Cir.1993); S.O.S., Inc. v. Payday, Inc., 886 F.2d 1081, 1090 n. 13 (9th Cir.1989); Restatement (First) of Torts § 757 cmt. a (1939). Because Gates' claim for trade secret misappropriation under the Colorado Uniform Trade Secrets Act requires proof of a breach of trust or confidence--proof that is not required under the Copyright Act--Gates' state law claims are not preempted by federal law.

FN25. The Colorado Uniform Trade Secrets Act provides for damages and injunctive relief for misappropriation of trade secrets. Colo.Rev.Stat. 7-74-103 and 7-74-104. Misappropriation is defined as:

(a) Acquisition of a trade secret of another by a person who knows or who has reason to know that the trade secret was acquired by improper means; or
 (b) Disclosure or use of a trade secret of another without express or implied consent by a person who: (I) Used improper means to acquire knowledge of the trade secret; or (II) At the time of the disclosure or use, knew or had reason to know that his knowledge of the trade secret was:
 (A) Derived from or through a person who had utilized improper means to acquire it;
 (B) Acquired under circumstances giving rise to a duty to maintain its secrecy or limit its use; or
 (C) Derived from or through a person who owed a duty to the person seeking relief to maintain its secrecy or limit its use; or
 (III) Before a material change of his position, knew or had reason to know that it was a trade secret and that knowledge of it had been acquired by accident or mistake. Colo.Rev.Stat. 7-74-102(2).

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FN26. In its complaint, Gates alleges that (i) Bando officials knew that they possessed trade secrets belonging to Gates and that the trade secrets were used in the development of their computer programs, (ii) that the trade secrets were used in violation of Gates' rights and as a means of unfair competition, (iii) that the trade secrets were obtained in violation of confidentiality agreements, and (iv) the use of the trade secrets constituted a misappropriation under Colorado law. Amended Complaint, Aplt. Apx at 6-8.

The appellants suggest that this court's opinion in *Ehat v. Tanner*, 780 F.2d 876 (10th Cir.1985), cert. denied, 479 U.S. 820, 107 S.Ct. 86, 93 L.Ed.2d 39 (1986), compels a different result. We disagree. The cause of action in *Ehat* sought damages for the reproduction and distribution of copyrighted notes from individuals who had no part in the misappropriation of the materials. Moreover, it was not necessary under the common law claims asserted in *Ehat* that the plaintiff show a breach of trust or confidence.

B. The Economic Value of the Constants

The appellants claim that the district court erred when it failed to set forth the elements of a trade secret claim and make specific findings as to each element. Further, the appellants argue that if the court had engaged in this analysis the constants would not have been found to be trade secrets because they had no competitive economic value.

[59][60][61] What constitutes a trade secret is a question of fact that will only be disturbed if clearly erroneous. *Network Communications v. Boor-Crepeau*, 790 P.2d 901, 902 (Colo.App.1990). Recognizing that the term "trade secret" defies exact definition, the Colorado courts have enunciated a number of factors that are relevant in determining whether a trade secret exists. They include:

- 1) the extent to which the information is known outside the business;
- 2) the extent to which it is known to those inside the business, i.e., by the employees;
- 3) the precautions taken by the holder of the trade secret to guard the secrecy of the information;
- 4) the savings effected and the value of the holder in having the information as against competitors;
- 5) the amount of effort or money expended in obtaining and developing the information; and
- 6) the amount of time and expense it would take

for others to acquire and duplicate the information. *Colorado Supply Co. v. Stewart*, 797 P.2d 1303, 1306 (Colo.App.1990), cert. denied (Oct. 7, 1991). We are unable to find that the district court erred in its implicit finding that the constants were trade secrets and that they were misappropriated. There is evidence that Gates spent in excess of 25,000 man hours and over \$500,000 developing and upgrading the Design Flex program. The program was considered to be one of the best of its kind and was an efficient application and marketing tool. Gates took extensive measures to protect the program and, in particular, the constants. Although there is some evidence that some of the constants might be "reverse engineered" through mathematical trial and error, that fact alone does not deprive the constants of their status as trade secrets.

C. Disclosure of the Trade Secrets at Trial

[62] The defendants note that the numerical constants were revealed during the course of the permanent injunction hearing. They contend that as a result of these disclosures the constants lost their status as trade secrets and therefore it was inappropriate for *849 the district court to issue a permanent injunction.

Although the constants were disclosed at the permanent injunction hearing, we conclude that as a result of Gates' post-hearing measures to protect the confidentiality of the constants, they retained their status as trade secrets. Gates evidenced a continuing intent to maintain the secrecy of the constants. Under Colorado law, the holder of a trade secret is only required to exercise reasonable efforts to maintain its secrecy. See *Colorado Supply*, 797 P.2d at 1306; *Network Telecommunications*, 790 P.2d at 902. The record indicates that counsel for Gates monitored the presence of observers in the courtroom. Furthermore, after the hearing was completed, Gates had the permanent injunction hearing record placed under seal. Similarly, Gates has moved to place certain exhibits on appeal under seal. We conclude that Gates' post-hearing measures, including sealing the record, were adequate to maintain the secrecy of the constants under the facts of this case. Compare *Littlejohn v. BIC Corp.*, 851 F.2d 673, 680 (3d Cir.1988) (failure to seek an order sealing record constitutes waiver of confidentiality interests).

The defendants point out that the record was not sealed until this appeal had already been instituted and the defendants had filed their opening brief.

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However, there has been no evidence that a competitor had access to or learned of the constants during the period after the hearing and before the record was sealed. As the case comes before us, the record has been sealed and Bando has been permanently enjoined from using or disclosing these constraints. Absent a showing that the constants were published outside the court records, we conclude that Gates' inadvertent and inconsequential disclosure of the constants at trial and delay in sealing the record, are inadequate to deprive the constants of their status as trade secrets.

CONCLUSION

The district court failed adequately to filter those portions of the Design Flex program that it found to have been misappropriated. Thus, the court did not eliminate those elements that are unprotectable under copyright law. As a result, the court relied on unprotectable elements within the Gates program in determining that the defendants had infringed Gates' copyright. Other elements were inadequately described and analyzed to permit us to review the district court's determination of protectability. Accordingly, we VACATE the finding of copyright infringement and REMAND for reconsideration of the copyright infringement claim in light of this opinion.

We conclude that Gates' trade secret claims are not preempted by federal law, that Gates made an adequate showing that the trade secrets were valuable, and that Gates took adequate steps to protect the confidentiality of the trade secrets below and on appeal. Accordingly, that portion of the district court's opinion concerning the trade secret claim is AFFIRMED.

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