

**COMMENT*****Scanning Into The Future Of Copyrightable Images: Computer-based Image Processing Poses A Present Threat******BY Benjamin R. Seecof*** †**table of Contents**

I. Introduction 372

II. The TechnologY 373

III. Copyright and Ethical Problems: a Focus on Publishing and Computers 377

A. Publishing 377

B. Computers 378

C. Injury to Photographers 380

IV. The Traditional Approach to Copyright Infringement AND ITS APPLICATION TO IMAGE PROCESSING 380

A. The Traditional Approach to Copyright Infringement 380

B. Application of the Traditional Approach to Infringement Through Image Processing 384

C. The Fair Use Exception 389

V. A Proposed New Court Approach to Copyright Infringement of Still Images 392

A. Access 392

B. Professor Cohen's Approach 392

C. Modifying Cohen's Approach for Image Processing 393

D. Justifying the New Approach: Why It Will Work 394

E. A Hypothetical Example 395

VI. Image Processing Compared With Digital Sampling 397

VII. The NEED FOR a National Registry To Collect Royalties AND PROTECT ARTISTS 398

VIII. Conclusion 399

**I. Introduction**

Traditionally, infringing upon copyrighted photographs and drawings was an easy task. An infringer hired a competent artist or photographer to recreate the image, and then the unlicensed copy was put to use. Today, swiftly advancing computer technology is making traditional processes for infringement seem slow and laborious. This new computer technology, namely digital scanning and image processing, has created a need to refine the tests for copyright infringement.

Digital scanning and image processing in the computer graphics and photography industries parallels digital sound sampling in the music industry. The inadequacy of current copyright law to protect still images and the lack of photograph infringement cases should be addressed by a plaintiff-oriented approach to copyright infringement lawsuits, providing still images actual protection and encouraging artists to protect their images. Image processing technology has made extra-judicial protection necessary for artists, both to enable people to use artists' work without infringing copyrights and to compensate artists for the use of their work.

Section II of this comment provides an introduction to the relevant computer technology and its capabilities, costs, and applications. Section III presents the copyright and ethical problems that have arisen and are expected to arise with the use of this technology. Then in Section IV, the traditional approach to determining copyright infringement is discussed. This section reviews the applicability of the traditional approach to the problem of infringement through digital scanning and image processing, followed by a discussion of the fair use exception. Section V proposes a change in the traditional approach that would compensate for the increased infringement potential of this new technology. Section VI compares image processing and digital music sampling. Finally in Section VII, this author suggests that artists organize a national registry, similar to those in the music industry, in order to protect their work and collect royalties.

## **II. The Technology**

Image-processing is "the alteration and analysis of a picture for such purposes as enhancement and recognition."<sup>1</sup> Image processing products and their functions fall into four major categories: electronic photography cameras (input or image capturing devices), playback and recording systems (processing devices such as computers), still-image printers (output devices), and image transmission systems (for communication between processing devices).<sup>2</sup>

In order to process images, an image must first exist. Although images can be created on computers without any outside source,<sup>3</sup> this Comment will focus solely on the capture and alteration of existing images. Most often, an image (usually a photograph) is inputted to a computer for processing by using an electronic camera which digitally scans the image.<sup>4</sup> To scan is "to digitize, or convert, a real-world image, such as a photograph or text, into ... data on a computer. The resulting digital image is also called a scan."<sup>5</sup> Electronic cameras, or scanners, come in several forms, including laser scanners,<sup>6</sup> CCD cameras,<sup>7</sup> and fax machines.<sup>8</sup>

An important feature of scanning devices is the degree of resolution they achieve in the copies they make. This resolution is expressed in the number of component parts, or pixels, into which an image is divided<sup>9</sup> -the more pixels, the finer the detail in the picture.<sup>10</sup>

Once an image has been digitized through the scanning process, a computer can manipulate the image.<sup>11</sup> Computer memory, computer disk, magnetic tape, and other common means electronically store the digitized image.<sup>12</sup> Once stored, the memory of the computer must contain the proper image processing program in order to process the image. Such programs are quite common. "Systems for image processing range over almost all of the computer field-from Apples and IBM Personal Computers (PCs), through small minicomputers, to mainframe installations."<sup>13</sup>

The extent to which an image can be manipulated during storage depends on the type of image processing program that is used. "[S]oftware lets users ... electronically process in much the same way one might in a conventional darkroom-but without the time and materials."<sup>14</sup> Undoubtedly, such programs put a new face on photography, and go beyond darkroom capabilities.<sup>15</sup>

What can a typical image processing program do? In general, such programs can crop, retouch, cut and paste, change contrast, change brightness, outline, distort elements of an image, rotate an image, blur an image, sharpen or enhance edges, airbrush, smooth textures, add textures, change from positive to negative (and vice versa), highlight, enlarge, reduce, change tint, posterize (to group similar gray values), alter threshold (to change all grays to either black or white), merge two images, or change an image's background.<sup>16</sup>

These possible manipulations result from a computer's ability to take each pixel in an image and individually recolor, reorganize, alter, or combine it with another pixel to enhance the image or form an entirely new image.<sup>17</sup> Many computer programs can manipulate 256 levels of gray.<sup>18</sup> In order to alter color, some programs have a "palette" of 16.7 million colors from which to choose.<sup>19</sup>

Certain procedures are easier than others. For instance, eliminating an object in the background of a photograph is a simple process.<sup>20</sup> Wholesale operations such as enlarging, reducing, or changing an image from positive to negative are also categorized as "easy." On

the other end of the scale, pixel-by-pixel manipulation is relatively time consuming. Yet a computer's ability to alter a photograph's smallest elements can create the most unique and radical effects.<sup>21</sup> For example, a person's eyes, closed in the photograph, can be opened, and his or her eye color changed.<sup>22</sup>

Once scanned, processed, and then reprinted, alterations made to a photo can be undetectable.<sup>23</sup> Arguably, if a copy has enough alterations, its source material will be unidentifiable. Image processing produces extremely accurate and realistic copies.<sup>24</sup> National magazines have used image processing to alter photographs which their readers would assume were unchanged. *National Geographic Magazine*, for instance, manipulated the pyramids in the background of a photograph of Egypt so that all the pyramids would fit on the magazine's cover.<sup>25</sup>

Once an image has been scanned, stored, and manipulated, it can be outputted to a variety of media. These include digital cameras,<sup>26</sup> printers,<sup>27</sup> photographic prints,<sup>28</sup> slide negatives,<sup>29</sup> transparencies for overhead projectors,<sup>30</sup> lithographs,<sup>31</sup> and silkscreens.<sup>32</sup>

Output can also take the form of transmission to another system.<sup>33</sup> This type of intersystem communication is usually accomplished via phone lines using standard modem communication software.<sup>34</sup>

The cost of digital scanning and image processing technology has decreased significantly and is expected to continue falling. Fax machines cost one fifth what they did five years ago.<sup>35</sup> Today, consumers can purchase an advanced scanner for around \$2000.<sup>36</sup> Memory chips cost one thirtieth of what they did in 1980 and have much greater capacity.<sup>37</sup> This additional storage capacity translates into an ability to store larger numbers of more detailed pictures.<sup>38</sup> Image processing programs for home computers cost in the neighborhood of \$500.<sup>39</sup> Electronic publishing systems have become so cheap that small businesses can economically produce their own advertisements.<sup>40</sup> In 1988, the value of shipments of hardware and software used in computer graphics systems reached \$9.1 billion. Such shipments are expected to grow to \$27 billion by 1993.<sup>41</sup> Image processing systems are also becoming more powerful; today a \$7,000 personal computer with software can outperform a \$100,000 graphics workstation from 1980.<sup>42</sup>

In addition to the low cost and ease of manipulating scanned images, scanners can process images with remarkable speed. State-of-the-art scanners can scan 120 office documents per minute.<sup>43</sup> Within six hours, one can convert a photo into a full size billboard.<sup>44</sup> Recording photographic subjects directly in digital form using a special camera, rather than scanning an intermediary photographic print, could soon be viable.<sup>45</sup>

### **III. Copyright and Ethical Problems: A Focus on Publishing and Computers**

The publishing industry and the computer industry are breeding most of the copyright problems based on image processing. Publishers and computer hackers alike are grappling with the legal and ethical difficulties posed by image processing, often at the expense and distress of photographers and other image producers.

#### **A. Publishing**

Traditionally, readers trusted magazines to use unaltered photographs. With the changes in technology, however, publishers can alter any photograph available to them. Responding to criticism for moving pyramids on its cover,<sup>46</sup> *National Geographic Magazine's* editor maintained that the alteration merely established a new point of view from which the photo could have been taken.<sup>47</sup> The news industry, as a source of documentary images, generally agrees that "[e]lectronic manipulation is acceptable only in efforts to improve design elements, as seen in the *National Geographic* example, but not to [re]arrange actual events."<sup>48</sup> Other than this position, very little agreement exists as to what ethical standards press photographers should use.<sup>49</sup> Moreover, the advertising industry has implemented fewer and less rigorous ethical restraints on scanning and image processing than the news industry.<sup>50</sup>

#### **B. Computers**

##### *1. Electronic Bulletin boards and Information Services*

Unauthorized use of images is now commonplace in the desktop publishing industry.<sup>51</sup> One writer humorously defined copyright in a personal computing magazine: "Copyright, n. The indisputable common-law privilege held since time immemorial by owners of optical scanners to reproduce anything they can get their hands on as clip art."<sup>52</sup> Computer bulletin boards and information services enable personal computer users with modems to send (upload) and retrieve (download) images (clip art) to and from these services' computers. Knowing that copyright infringement is taking place, the computer services post warnings to subscribers that submission or

use of copyrighted material is illegal and should not be done without the appropriate permission.<sup>53</sup>

Beyond warnings, these computer services generally take two approaches to copyright infringement. First, some conference services do not enforce the warnings and do not monitor the system for copyrighted images. They argue that the service "is a common carrier, like the phone company, and as such is not responsible for the content it carries."<sup>54</sup> Second, conference services that publish images as well as carry them monitor their services as best they can, but often find it impossible to recognize copyrighted material. These systems operators contend "that they could not purge the graphic files and remain competitive."<sup>55</sup> In response to magazine complaints about infringements taking place, some services argue that "because no one can mistake a scanned copy for an original, the copyright holder is not hurt."<sup>56</sup> At best, the argument is weak, and considering the capabilities of image processors, this position would likely fail if maintained as a defense.<sup>57</sup> Other services hope to use the fair use exception to avoid liability.<sup>58</sup>

## *2. Individual Users*

Computer users are engaging in unauthorized use of image processing because the computer industry lacks standards to guide them.<sup>59</sup> The industry needs and wants guidelines, as evidenced by trade magazine articles that attempt to tackle the problem.<sup>60</sup> These magazines provide inconclusive advice and discussion about this dilemma.<sup>61</sup>

In the meantime, computer users stumble along. Many small businesses create their own advertisements by using desktop publishing programs to manipulate scanned images.<sup>62</sup> In some cases the computer manuals for these programs demonstrate cut and paste techniques without warning the reader about possible copyright infringement.<sup>63</sup>

### **C. Injury to Photographers**

While computer users and photographers debate who owns the copyright to composite or altered images,<sup>64</sup> photographers are also voicing other concerns. For instance, the American Society of Magazine Photographers is concerned about its members' financial stake in processed images and about the integrity of those images.<sup>65</sup> As the copyright holders, photographers do not want anyone else to tamper with their images for either commercial or aesthetic reasons.<sup>66</sup> Other photographers hypothesize that digitizing to create as well as to infringe upon images could make photography unprofitable. In addition, the art of photography could lose its outstanding and creative people, resulting in reused, boring images without individual creative spark.<sup>67</sup>

## **IV. The Traditional Approach to Copyright Infringement and Its Application to Image Processing**

### **A. The Traditional Approach to Copyright Infringement**

The traditional court approach to copyright infringement actions is helpful in determining how copyright concepts will be applied to copying through image processing technology.

Courts have traditionally required three elements in a copyright infringement case.<sup>68</sup> First, the plaintiff must prove that the defendant had access to the plaintiff's work.<sup>69</sup> Second, the material at issue must be copyrightable material.<sup>70</sup> Copyright law protects only the expressions of ideas, not the ideas themselves.<sup>71</sup> Thus, the plaintiff must show that the material was an expression, not just an idea.<sup>72</sup> Third, the plaintiff must prove that the two expressions are substantially similar, with the trier of fact acting as an ordinary observer.<sup>73</sup> If the similarity exists, the defendant can still escape liability if the trier of fact finds that he or she fairly used the material.<sup>74</sup>

#### *1. Copyrightability of Still Images*

Photographs and other images (e.g. drawings, paintings, lithographs) are copyrightable.<sup>75</sup> The concept of originality figures heavily in determining the differences between idea and expression in photographs.<sup>76</sup> Slavish copying of a photograph (e.g. xeroxes, photographs of photographs, or microfilm) is not considered original, so a work produced by one of these methods is not copyrightable.<sup>77</sup> Although every photograph could be considered an "original," for purposes of copyright, courts do not consider it original to reproduce a photograph by copying the technique and subject. The copyist is liable for infringement if a court cannot find any distinguishable variation from the original.<sup>78</sup> Generally a copyright on a photograph gives rights to all the copyrightable original elements. These elements include angle, perspective, choice of lens, and color patterns, but not the subject unless the subject itself is copyrightable.<sup>79</sup>

#### *2. Substantial Similarity*

The determination of similarity between two works necessarily involves an attempt to grasp the difference between idea and expression.<sup>80</sup> This dichotomy is ambiguous.<sup>81</sup> It often involves determining the point at which a work embodying a common theme (an idea) rises to a level of originality at which it becomes an expression of that theme.<sup>82</sup>

Substantial similarity is also a rather amorphous concept.<sup>83</sup> Generally, similarity between two works is of two types. The first type, "comprehensive non-literal similarity,"<sup>84</sup> occurs when the structure or overall pattern of two works is the same. This similarity is likened to paraphrasing; no single element is *exactly* the same. It means that an "immaterial variation" does not justify allowing an infringer to escape liability.<sup>85</sup> Liability exists for comprehensive non-literal similarity.

The other type of similarity is "fragmented literal similarity," which describes a similarity in detail but not in overarching concept.<sup>86</sup> This situation occurs where some parts of the alleged copy are exactly the same (or nearly so). Liability turns on whether the copying was material, involved a substantial portion of the plaintiff's work, or both. Courts and commentators often use the doctrine of fair use to describe this type of value judgment.<sup>87</sup>

Ordinarily, the presence of dissimilar material in a defendant's work does not immunize him or her from liability for infringement unless the material indicates that the plaintiff's material is of minimal import quantitatively, qualitatively, or both.<sup>88</sup>

### *3. Traditional Approaches to Substantial Similarity*

Courts have approached the question of substantial similarity in several ways. In most instances courts use the "ordinary observer" test, in which the spontaneous and immediate reaction of a lay observer, without aid or suggestion, determines whether substantial similarity exists.<sup>89</sup>

Courts also use the pattern test, where the original and alleged copy are dissected to determine individual points of similarity. The trier of fact compares these points and, based on that comparison, determines whether substantial similarity exists.<sup>90</sup>

### *4. The Fair Use Exception*

The doctrine of fair use allows the trier of fact to find that the maker of a similar copy is not liable when (1) the similarity to the original is not substantial or (2) the defendant's work fulfills a different function from that of the plaintiff's.<sup>91</sup> The court weighs four factors in determining function. First, the court decides if the defendant used the material for a non-profit/educational or commercial purpose.<sup>92</sup> Second, the court must determine the nature of the material.<sup>93</sup> For example, a textbook prepared for a school market could not properly be copied for school use. Third, the court considers the amount and substantiality of the portion copied.<sup>94</sup> Lastly, the effect of the defendant's work on the plaintiff's potential market must be evaluated.<sup>95</sup> These four factors may be weighed independently,<sup>96</sup> and the most important factor is the last-impact on the plaintiff's market.<sup>97</sup>

### *5. Traditional Approaches to Proving Copyright Infringement*

The traditional three-step approach to proving copyright infringement is problematic. For instance, an ordinary observer lacks standards as to whether he or she should compare the works as whole, look to important parts, or look to the value of material copied.<sup>98</sup> In addition, the three-step approach fails to distinguish between the issue of copying and that of misappropriation or fair use.<sup>99</sup> Furthermore, the traditional approach requires duplicative determinations of substantial similarity, first for infringement and then for fair use.<sup>100</sup>

Several courts have recognized and attempted to address the problems with the traditional approach to proving copyright infringement. In *Arnstein v. Porter*,<sup>101</sup> using an analysis of substantial similarity under the traditional approach, the court attempted to overcome several of the problems in determining substantial similarity.<sup>102</sup> *Arnstein* used a two-step approach to determine substantial similarity. First, the court determined whether the defendant's work copied the plaintiff's work.<sup>103</sup> The court then did a critical analysis which probably included evaluating the idea/expression dichotomy, not an ordinary observer test.<sup>104</sup> Under the *Arnstein* approach, if the defendant's work is a copy, the court then applies the ordinary observer test to determine whether the copying constituted an improper appropriation (a theft of value beyond fair use).<sup>105</sup>

Another case, *Sid & Marty Krofft Television Productions, Inc. v. McDonald's Corp.*,<sup>106</sup> which referred to the *Arnstein*<sup>107</sup> approach, used a different two-step approach. The first step, an "extrinsic test," required a comparison of specific criteria such as subject matter, setting, type of artwork, and materials used in the works.<sup>108</sup> The second step, an "intrinsic test," used the ordinary observer approach

to evaluate whether the similarities in expression justified holding the defendant liable.<sup>109</sup> This test is limited because it does not involve a critical analysis of the idea/expression dichotomy to determine whether substantial similarity exists.<sup>110</sup> Accordingly, the court probably misinterpreted *Arnstein*. The confusing overlap of substantial similarity and fair use also continued to exist in *Krofft* as it had in *Arnstein*.<sup>111</sup>

## **B. Application of the Traditional Approach to Infringement Through Image Processing**

The traditional approach to determining substantial similarity, when applied to image processing cases, presents two problems. First, the approach lacks the sophistication to identify the changes made and decide whether those changes eliminate substantial similarity. Second, the approach cannot cope with the speed and ease that image processing lends to the task of infringing still images.

Because an infringer using image processing can steal small fragments of the original, the ordinary observer is easily fooled.<sup>112</sup> Theoretically, a copyright gives actual protection to the copyright holder against theft of the fruits of his or her labor. An audience's impression that the works are or are not similar does not necessarily accomplish this goal.<sup>113</sup> This test also fails to adequately distinguish between idea and expression and to evaluate specific details in a work.<sup>114</sup> One solution would be to limit the ordinary observer test to determining whether fair use exists.<sup>115</sup> That is, since the fair use doctrine requires a value judgment in evaluating whether the defendant misappropriated the expression, an ordinary observer could make the value judgment.

### *1. Problem #1: The Undetectability of Changes-Embracing the Capabilities of Image Processors Using Existing Case Law*

#### *a. The Pattern Test*

Because of an image processor's ability to make subtle pixel-by-pixel changes, the average person cannot detect the changes.<sup>116</sup> As a result, a defendant who steals small fragments of the plaintiff's work may escape the ordinary observer test undetected. Therefore, courts are probably not justified in using the ordinary observer test for determining substantial similarity.

Alternatively, courts could use the pattern test and compare the individual elements of the images.<sup>117</sup> Courts could justify the use of this approach because copyrightability of photographs is based on individual elements such as angle and perspective.<sup>118</sup> This alternative test takes into account the subtle alterations created through image processing.

#### *b. Substantial Similarity in Still Images*

In comparing images, courts will encounter the problem of determining the extent to which an image can copy the expression from an original without crossing the threshold to infringement.

Fortunately, some case law exists for those who wish to protect against image processors. In *Franklin Mint Corp. v. National Wildlife Art Exchange*<sup>119</sup> the court stated that copyright confers "the sole right to reproduce the work and to control all the channels through which ... [the] work, or any fragments of ... [the] work reach the market."<sup>120</sup> Applied to still images, "fragments" that are copied, no matter how small, can cause infringement.

However no such copying of fragments was found in *Franklin*. In that case, the plaintiff alleged that the defendant had made a copy of a scientific-style painting of a bird. The pictures were *very* similar, but no fragment was exactly the same. The court found that an "artist who produces a rendition with *photograph-like* clarity and accuracy may be hard pressed to prove unlawful copying by another who uses the same subject matter and the same technique."<sup>121</sup> The court concluded that the plaintiff's copyright was "weak" because artists possess so few ways to expressively paint a bird's anatomy. Thus, where the subject matter is limited in options for expression, a defendant can escape liability unless actual copying of a fragment can be proven.

*Edwards v. Ruffner*<sup>122</sup> involved a similar situation. The subject of the photographs was uncomplicated (a ballerina's feet in the fifth position). The court did not hold the defendant liable because the defendant had not reproduced any part of the protectable expression, such as angle or costuming.

Other cases may help plaintiffs impose liability on defendants who steal fragments of the plaintiff's work that make up only a small part of the defendant's work, such as *Foreign Car Parts, Inc. v. Auto World, Inc.*<sup>123</sup> and *Hedeman Products Corp. v. Tap-Rite Products Corp.*<sup>124</sup> Both cases involved defendant's use of plaintiff's material as a part of defendant's multi-page products catalog. In *Foreign Car Parts*, although plaintiff's material appeared on only one page of the catalog, the court held that the defendant had

infringed.<sup>125</sup> In *Hedeman*, the court applied a test for the substantiality and materiality of the infringement to each component part of the catalog, not the catalog as a whole. This test questioned whether the defendant took the work at issue from the copyrighted source. Slight differences did not constitute a defense.<sup>126</sup> Similarly, in *Lynn Goldsmith v. Peter Max*,<sup>127</sup> the defendant had cut up a photograph of Mick Jagger and incorporated pieces of the photograph into an acrylic painting. The court noted that, had the plaintiff's copyright been valid, it may have held the defendant liable for infringement.<sup>128</sup>

The preceding line of cases does not consider situations where a defendant's copy involves different subject matter or an area where many possibilities for expression exist. Therefore, these cases do not provide adequate guidelines regarding the extent to which an image processor can copy without infringing on the artist's copyright. If there is no copying, there can be no infringement.<sup>129</sup> But how big is an infringing fragment? One pixel? Two pixels? This undoubtedly depends on both the fragment's recognizability and the outcome of an evaluation under the idea/expression test. Although undecided, courts will probably protect any small piece that a plaintiff can identify as coming from his or her photograph.

### *c. Case Law Analogous to Image Processor Functions*

Court decisions in similar situations provide some indications about how courts may treat image processing cases. Photographic reproductions of portions of a copyrighted work, as can be performed by computer cut and paste, constitute infringement.<sup>130</sup> For those who may conglomerate stolen images to create an advertisement or catalog (e.g., small businesses), precedent exists for making substantial similarity comparisons of these component images individually.<sup>131</sup>

The tests for originality and infringement are different.<sup>132</sup> However, in determining what types of image processing prevent works from being substantially similar, courts may look at factors that have been considered in the context of deciding whether a derivative work is copyrightable. Enlargement or reduction, for instance, does not result in an "original" product even though it involves the effort of artistic scaling.<sup>133</sup> Adding colors to a black and white photograph, another image processing capability, may create a copyrightable work depending on the extent and complexity of the colorization.<sup>134</sup> Similarly, those who colorize films using a complicated process with extensive color additions can copyright the film.<sup>135</sup> However, one cannot copyright a film by changing it from color to black and white.<sup>136</sup>

Great time and effort expended in copying an artwork does not necessarily make the result copyrightable.<sup>137</sup> The real test is whether the artist used independent effort—preferably great independent skill beyond physical skill or training.<sup>138</sup> Courts could use this test to distinguish between "easy" image processing (inverting an image or changing a color image to black and white), and, on the other end of the scale, "hard" image processing (pixel-by-pixel manipulation or colorizing an image).<sup>139</sup> While extensive "hard" image processing may produce an independently copyrightable image by underhandedly building on and infringing another image beyond the point of detection, courts can also consider the "tone and mood" of a photograph in determining substantial similarity.<sup>140</sup>

### *2. Problem #2: The Ease and Speed of Copying*

A second problem facing the use of the traditional method of analysis is related to the quantity of alterations and the speed with which they can be made.<sup>141</sup> These two factors permit the production of numerous sophisticated altered copies, making multiple determinations of substantial similarity cumbersome. As discussed, the traditional approach often involves two determinations of substantial similarity: one for whether the defendant copied, and the other for whether his or her copy was a fair use.<sup>142</sup>

## **C. The Fair Use Exception**

### *1. Applicability to Image Processing*

A defendant found to have copied will attempt to escape liability by claiming fair use.<sup>143</sup> Currently, no precedent clearly defines how material or substantial a stolen fragment must be to constitute infringement.<sup>144</sup> Considering that most still images are two dimensional, fixed to paper or canvas, and do not exceed the size of a large painting, one could argue that the copyrighted material is much more condensed than that in a book or film, for instance. Given that comparison, an artist should be able to protect even a small portion of his or her work. Such protection would deter unauthorized image processing.

### *2. Markets and Impact on Markets*

The most important consideration in evaluating fair use of copyrighted material focuses on the impact of the infringement on the

material's markets.<sup>145</sup> Presumably the same markets exist for processed images as exist for the unprocessed originals, including posters, magazines, books, art shows, art galleries, museums, television, and film.

It is important to emphasize that banks,<sup>146</sup> manufacturers,<sup>147</sup> doctors,<sup>148</sup> movie makers,<sup>149</sup> law enforcement agencies,<sup>150</sup> scientists,<sup>151</sup> businessmen,<sup>152</sup> lawyers,<sup>153</sup> and publishers<sup>154</sup> engage in widespread use of image processing technology. Commentators predict that, within the next five years, large companies will use this technology for presentations, archives, artwork and advertising files, communication systems, and security in 20 to 25 percent of their facilities.<sup>155</sup> For the most part, these uses do not create problems of copyright infringement. In the publishing and computer industries, however, many ordinary situations breed problems.<sup>156</sup>

A plaintiff must prove the effect of an unauthorized use of an image. Even when a plaintiff cannot prove conclusively the impact of the infringement, he or she can establish that the processed copy devalued the original. Because of the copy, the plaintiff may not be able to market the copy for image processing. Perhaps artists do not recognize the existence of a large future electronic market for images and that "unauthorized distribution deprives the copyright holder of any future gain through the electronic media."<sup>157</sup> Newspapers are finding that using images from electronic stock houses is cheaper than sending a staff photographer to take similar pictures. The proliferation of these stock houses indicates that newspapers desire greater access to these stock images.<sup>158</sup> National and international sales of image processing equipment ranges into the billions of dollars.<sup>159</sup> One million desk top publishing systems are currently in use.<sup>160</sup> The people spending money on this equipment will need images to process.

Other potential markets for images include consumer information networks and electronic services, which make innumerable files (including digitized images) available to subscribers.<sup>161</sup> Presently, those who access these services show no limit to the types of images that are desirable.<sup>162</sup> These networks often use a copyright holder's image illegally and without compensation.<sup>163</sup> This free access to an image affects the copyright holder's ability to market the image to electronic stock houses.

Widespread distribution may also "wear out" an image. Abuse of images by unlicensed scanning, processing, and electronic distribution could make photography unprofitable.<sup>164</sup> Licensed electronic distribution, on the other hand, could create a profitable market for images, encouraging photography. Electronic use of scanned images could affect a copyright holder's print market as well,<sup>165</sup> extending even to unlicensed use in T-shirt making.<sup>166</sup>

A court will weigh all the factors considered in a fair use analysis.<sup>167</sup> However, evidence that an illegally obtained copy affects the plaintiff's market should weigh heavily against a defendant's claim of fair use.

## **V. A Proposed New Court Approach to Copyright Infringement of Still Images**

### **A. Access**

Digital scanning technology poses a unique problem. An infringer only needs to have an original for a few minutes to successfully copy it. Additionally, the prevalence of image processing and the inability to detect its use in making copies makes image processing a potential hidden danger in all suits over still images. The issue is one of proof. For purposes of this Comment, I will assume access.

### **B. Professor Cohen's Approach**

Courts have not resolved the problems of determining substantial similarity. Professor Amy Cohen, however, has proposed a new two-step test, revising the traditional approach of courts.<sup>168</sup>

The first step requires a determination of proof of copying.<sup>169</sup> This step focuses solely on specific similarities between the works and whether or not these similarities constitute ideas or expressions.<sup>170</sup> In other words, the trier of fact makes a determination of substantial similarity and does not consider the quantity of material copied.<sup>171</sup>

If similarities exist, the trier of fact then determines whether they are the result of copying. The degree to which similarities between the works indicates that copying occurred depends on several factors, including the type of subject (there is not much room for variation in a photograph of a famous subject, thus many similarities would have to be shown),<sup>172</sup> the extent of duplication of errors,<sup>173</sup> and whether the similarities are verbatim (there is little chance that verbatim errors are not copied).<sup>174</sup> The trier of fact also considers the defendant's access to the work. For instance, one can infer access from strikingly similar aspects. A positive determination of copying creates a *prima facie* case of infringement.<sup>175</sup>

The Ninth Circuit recently adopted an objective test of similarity of expression and idea as it pertained to literary works. In *Shaw v. Lindheim*,<sup>176</sup> the court changed the *Krofft* test for literary works so that an objective analysis of expression was included with an objective analysis of idea. Furthermore, *Shaw* identified eight objective components of expression which compose literary works.<sup>177</sup>

Once the plaintiff establishes a prima facie case of infringement under Cohen's test, the second step requires an analysis of the justification offered for the copying which parallels the fair use analysis. The burden shifts to the defendant to prove justification. This analysis starts with the extent of the similarities found in step one.<sup>178</sup> The trier of fact must then make a subjective determination<sup>179</sup> of the extent of the injuries and consider the factors governing fair use.<sup>180</sup> This determination weighs the purpose and character of the defendant's use, the nature of the copyrighted work, the social desirability of defendant's use, and the effect on the market for, or value of, the plaintiff's work.<sup>181</sup>

### **C. Modifying Cohen's Approach for Image Processing**

Cohen's approach to determining substantial similarity does not adequately deal with image processing. However, a new approach to copyright infringement for still images could utilize the Cohen approach in a modified form. This proposed approach divides Cohen's first step into two parts, essentially adding an initial question to be asked prior to entering Cohen's proof of copying analysis.

The new first part would require the trier to determine whether, in comparing the two images, an ordinary observer would find that any part of the defendant's image is a copy of the plaintiff's image. This approach uses the ordinary observer test in its most basic sense, without explanation of idea or expression or a prolonged dissection of the photograph. "Copy" is defined as any similarity between the images which appears to be exact or nearly exact.

The new second part of this first step would retain Cohen's proof of copying analysis (i.e. all of her first step). However, the modified test would require the burden of proof for the copying analysis to shift if the plaintiff prevailed on the first step. Thus, the defendant must prove that he or she did not copy.

The second step in this new approach remains as Cohen proposed. If a *prima facie* case of copying results from step one, then the defendant must show justification for the copying.

### **D. Justifying the New Approach: Why it Will Work**

Adding an initial ordinary observer test to Cohen's approach is not an insignificant modification. Many implications result.

First, as proposed, the ordinary observer does not compare the images as balanced wholes, but is allowed to find similarity in parts of the images. This prevents those who steal small but identifiable parts of an image from escaping the effect of this initial test.

Second, as proposed, the ordinary observer would make a positive initial finding of similarity only if the similarity is exact or nearly so. This allows defendants with photographs which fall into the comprehensive nonliteral similarity category to escape the test without the burden of proof shifting to them. In other words, defendants would not lose any of the protections that copyright law currently affords them.

Once the trier of fact decides that the defendant made an "exact" copy of an element or elements of a plaintiff's photograph, the defendant will have the burden of proving that he or she did not infringe. Defendants with photographs in the fragmented literal similarity category should usually fail this initial test. This may result in more defendants bearing the burden of proof than may deserve. However, those defendants who fail to pass the initial test because their subject is famous or popular should not be adversely affected. In such a case, the following proposed step-the detailed substantial similarity determination with an explanation of the idea/expression dichotomy (Cohen's step one)-will prevent a miscarriage of justice.

The proposed initial ordinary observer test targets only those who have used an image processor without troubling to completely disguise their sophisticated pixel-by-pixel manipulation, no matter how small the theft. However, this applies equally to those who use a camera, pen, or paintbrush to steal expression.<sup>182</sup>

In cases where the defendant stole an apparently insignificant part, this test does nothing to prejudice the defendant's ability to argue that he or she did not copy, although it forces the defendant to make that affirmative argument. Of course, the defendant may also argue fair use. The burden of proof remains with the defendant to prove fair use.

Shifting the burden of proof where the trier finds obvious copying, even if minute, is justifiable. Few cases result from photograph infringements because litigation is not currently viable, not because infringement does not exist. It is very tempting to steal copyrighted images.<sup>183</sup> The cost and trouble of suing individual infringers protects infringers.<sup>184</sup> With insufficient protection for a photographer's work in a mass infringement context, photographers lack economic incentive to enter or remain in the profession.<sup>185</sup> Therefore, shifting the burden of proof, in cases where copying is patently obvious, makes it easier for a plaintiff to protect his or her rights. Otherwise, image processing will greatly reduce the value of copyrighting an image.

Additional reasons justify the proposed new approach. Initially, the capabilities of image processors made substantial similarity determinations complex,<sup>186</sup> and Cohen's approach avoids duplicative determinations of substantial similarity.<sup>187</sup> It streamlines the litigation process to allow for more lawsuits. Furthermore, the suggested addition to Cohen's test addresses the problem of the ease, quantity, and quickness with which those seeking to infringe a copyrighted image can do so with an image processor.

### **E. A Hypothetical Example**

A hypothetical situation illustrates more clearly the need for an approach beyond that of Cohen. My hypothetical consists of three photographs, one original and two copies. The location of all three photos is Tienamen Square in China. I assume that the plaintiff can easily prove access and that the copies have been scanned and processed. Copying is the issue.

The original photograph shows a student with a distinctive face and a soldier with a distinctive face. The soldier is bayoneting the student with his rifle. The background in the square includes other students, other soldiers, tanks, and smoke. This photo contains news value.

The first copy shows the same soldier bayoneting the same student. In the background of this photograph, however, all the smoke, tanks and other students and soldiers have been processed out to give the appearance of an otherwise empty square. Crying children in choir robes have been inserted by cut and paste, creating a symbolic and surreal new photograph. The photograph has lost its news value.

The second copy shows a student and soldier whose faces have been changed using sophisticated pixel-by-pixel manipulation of the original image. Additionally, the technician processed the bayonet out of the photograph, thus giving the appearance that the soldier is shooting the student at close range. The background in the square is the same as in the original except that it has been subtly altered to add or remove some students, soldiers, tanks, and smoke. The photograph retains its news value.

When the proposed new test is applied to the hypothetical, the first copy described above would run afoul of part one of step one. The obvious copying of part of the original photograph (the soldier and student with their poses exactly the same) would shift the burden on the defendant to prove he or she did not copy. The first copy communicates a distinctly different concept than the original (symbolic versus documentary), but the expression is the same (the original photographer's timing, choice of subjects, angle, etc.). This copy illustrates fragmented literal similarity. Moreover, because relatively simple image processing could produce this photograph, the infringer produced the copy rather easily.

The defendant will probably also lose at step two because the extent of similarities outweighs the distinctions. This copy probably fills a potential market for the photo, making it a poor candidate for the fair-use exception.

The second copy probably elicits a "no" answer from the question in part one of step one because nothing is exactly the same between the photographs. This copy embodies a comprehensive non-literal similarity. The defendant can argue that the plaintiff cannot protect the idea of photographing student protests and that individual expressive components of the copy are different from the plaintiff's original. Here the dissimilarity results from the defendant's "hard"<sup>188</sup> (pixel-by-pixel), albeit underhanded, image processing. This perhaps translates into independent original effort. But, while computerized equipment enables the defendant to "piggyback" upon the plaintiff at will, the defendant should produce something sufficiently "original" to pass an exacting ordinary observer test. This puts would-be infringers to the task of making a large number of "hard" changes to escape liability for image theft. The number of changes necessary will rise in proportion to the uniqueness of the plaintiff's image. For this second photograph, because of the infamy of the plaintiff's subject, the test requires many exacting similarities in order to prove infringement.

Step two presents problems for both the plaintiff and the defendant. The defendant is impacting the plaintiff's market, but, on the other hand, the extent of the similarity between the defendant's and the plaintiff's photographs is small.

The maker of the first copy is easily caught under the new test. However, it is difficult to prove, even with the new test, that the second copy resulted from infringement. The new test forces the defendant to substantially alter the details of the photograph. The defendant

ultimately steals mostly idea elements, even though his or her action is underhanded. The defendant knows that if he or she processes the plaintiff's expressive elements out of the infringing photograph, the plaintiff's loss of elements protected by copyright is minimized.

The hypothetical situation illustrates that computer image processing technology provides new opportunities for copyright infringement and presents new challenges to legal procedures, especially to insure the protection of original work.

## **VI. Image Processing Compared With Digital Sampling**

Digital scanning and image processing are the still image equivalents to digital sound sampling in music. "Digital sound sampling is a technique by which distinctive vocal or instrumental sounds may be recorded, analyzed and then played back to perform a song never actually executed by the original musician."<sup>189</sup> The music industry often uses sampling to increase artistic flexibility and eliminate the need for back-up musicians.<sup>190</sup> However, digital sampling in the music field results in more copyright infringements, more privacy for infringers, and more public acceptance of unauthorized copying.<sup>191</sup> Image processing has the same effect on the use of still images.

Digital music sampling, like digital scanning and image processing, uses affordable digital technology.<sup>192</sup> The sampling is done using digital audio tape machines (DATs).<sup>193</sup> Unlike still images, however, special codes can be integrated into songs. Pending legislation would incorporate into DATs an electronic computer chip which recognizes these special codes and prevents sampling from encoded songs.<sup>194</sup> Still images cannot be so encoded because the public generally does not access still images in digital form, and after they have been digitized and processed, they are usually outputted to a non-digital form.

Another important parallel between digital sampling and image processing is the problem of determining how much of a taking is a substantial or material theft. Courts have found as little as a six-note taking substantial.<sup>195</sup> This inquiry necessarily involves qualitative as well as quantitative weighing.<sup>196</sup> A California district court established that sampled sounds must be recognizable as being from the same performance that is carrying copyright protection.<sup>197</sup> This standard is transferred easily to the arena of image processing. It is probably unnecessary, however, due to the fact that an observer would not be able to find copying in a small stolen fragment of an image if it were not recognizable as being from the copyrighted source.

The threat that DATs have posed to music copyrights parallels the threat image processing and digital scanning pose to still-image copyrights.

## **VII. THE NEED FOR a National Registry to Collect Royalties AND PROTECT ARTISTS**

Two organizations, the American Society for Composers, Authors and Publishers (ASCAP) and Broadcast Music Inc. (BMI), exist to license performances of their members' copyrighted material and distribute the collected royalties to those members. ASCAP currently has 45,000 members.<sup>198</sup> ASCAP and BMI keep track of the multitude of songs their registered members own and make big business out of collecting and distributing royalties for them. BMI claimed a gross income of approximately 250 million dollars in 1988.<sup>199</sup>

For publishers, a Copyright Clearing Center functions like ASCAP to monitor photocopying of copyrighted works and collect royalties.<sup>200</sup> This organization, formed in 1977, now represents 1,400 publishing organizations and their 110,000 publications.<sup>201</sup> For the month of June, 1988, the Center distributed one million dollars in royalties to its members.<sup>202</sup>

Computer users who want to digitize and process images have suggested that ASCAP and BMI "could be good models for the [graphic arts] industry to follow."<sup>203</sup> The fact that those who are potentially responsible for most of the copyright infringement through image processing are calling for an artists' organization makes the great urgency of the situation apparent.<sup>204</sup> In the absence of an organization to collect royalties, image processors are forced to steal images for want of someone to compensate for the use of those images.

Photography, painting, and graphic design are professions. As professionals, artists and their works are easily recognized and can be registered to form an organization like ASCAP, BMI, or the Copyright Clearing Center. The existence of ASCAP-type organizations proves their economic viability. Artists need an organization for the licensing of still images to allow them to profit fully from their works.

## **VIII. Conclusion**

Courts need to modify copyright law to confront technological advances. The ordinary observer test, in its new proposed form that burdens copyright infringers with the problems of proof, would protect original work by providing some counterbalance to new,

powerful and threatening computer technology. This proposal calls for the abandonment of the ordinary observer test to determine copying in an image and advocates a more critical comparison of expressive elements. Courts must streamline the traditional approach to copyright infringement determinations by eliminating duplicative legal determinations. Without change, computers will outstrip courts' ability to judiciously handle copyright infringement suits involving images. Because image processing and digital scanning have the potential to upset continued profitable still image production in much the same way that digital sampling has upset the music industry, it has become imperative for artists to form an artists' organization to register and collect royalties for still images.

---

†1990 Benjamin R. Seecof

† Candidate for J.D. 1990, University of California, Hastings College of the Law; B.A. Media, 1988, University of California, San Diego, Revelle College. This Comment received Second Prize in the 1989 High Technology Law Journal Comment Competition. The competition was sponsored by the law firms of Cooley Godward Castro Huddleson & Tatum, Fenwick, Davis & West, Ware & Freidenrich, and Wilson, Sonsini, Goodrich & Rosati. The author would like to thank Mark Seecof for his inspiration and to express appreciation for the editorial work of Susan Roeder, Rick Friess, Robert Seecof, Virginia Lyons and the High Technology Law Journal staff.

1. Spalding & Dawson, *Finding the Titanic*, BYTE, Mar. 1986, at 96, 110.
2. Birkmaier, *SV High and Low*, AUDIO-VISUAL COMM., Mar. 1989, at 28, 28.
3. A computer user may create an image from "scratch" by using the computer program to directly generate each element of his or her art work. Hanselman & Gordon, *New Library of Software Packages Advances Image Processing*, GRAPHIC ARTS MONTHLY, Mar. 1985, at 116, 116.
4. Abernathy & Weiss, *Gray Expectations*, MACUSER, June 1989, at 170, 170.
5. *Id.* Basically, a scanner records a two dimensional image in computer memory using the same technology that a digital audio tape uses to record sound. *See infra* text accompanying notes 188-195.
6. Streano, *Retouching History?*, PUB. REL. J., Mar. 1986, at 8, 8; Garneau, *Laser-based Electronic Cameras: Some Newspapers Praise Them, Others Can't Afford Them*, EDITOR & PUBLISHER, Nov. 5, 1988, at 18P.
7. One Kodak CCD (charge-coupled device) has a resolution of 1.4 million picture elements (pixels). Galluzzo, *Kodak Breaks Million Pixel Barrier with New Image Sensor*, MODERN PHOTOGRAPHY, Sept. 1986, at 28. A CCD is a device which produces an electrical voltage in relation to the type and amount of light striking it. *Id.*
8. Fax machines use scanners to capture and convert images to digital signals and then send those images over telephone lines to a computer or another fax machine. Fitzpatrick, *Facts About Fax*, 43 J.AM. SOC'Y CLU & CHFC 15, 15 (1989).
9. "Resolution-the maximum number of pixels that a scanner can fit into an inch. The higher the resolution, the more fine details you can see in an image." This is usually expressed in dots per inch (dpi), where a dot is the equivalent of a pixel. Abernathy & Weiss, *supra* note 4, at 170. "Resolution: In image processing, the number of bits of accuracy or number of gray levels that can be represented in a pixel; for example, 8 bits = 256 levels, 6 bit = 64 levels." Spalding & Dawson, *supra* note 1, at 110. "Pixel: The smallest unit of storage in a digital image...." *Id.*
10. Pixels number in the millions, depending on the system, and each pixel element can be individually signaled for color and brightness. Streano, *supra* note 6, at 8.
11. Video images may also be digitized for computer using an imaging board. Spiegelman, *AST Board Eases Process of Bringing Images from Video Camera to Mac II*, PC WEEK, Aug. 15, 1988, at 18.
12. *See* Hanselman & Gordon, *supra* note 3, at 116.

13. Star, *Introduction to Image Processing*, BYTE, Feb. 1985, at 163, 164. The capabilities of these programs will be discussed *infra* at text accompanying notes 16-25.

14. Hanselman & Gordon, *supra* note 3, at 118.

15. *Id.*; Antonoff, *Image Capture for Business*, PERSONAL COMPUTING, Apr. 27, 1990, at 101, 101-102.

16. Hanselman & Gordon, *supra* note 3; Thompson, *Industrial-Strength Color Processing*, BYTE, Apr. 1989, at 97; Dawson, *Doing It Digitally*, AUDIO-VISUAL COMM., Feb. 1988, at 19; XEROX- IMAGING; (XRX) *Xerox Imaging Systems to Market Electronic Darkroom for Desktop Publishing on IBM PC and PS/2 Platforms*, BUS. WIRE, Sept. 12, 1989; Sussman, *Graphics Software Traces Scanned Objects*, PC WEEK, Mar. 1, 1988, at 19; Fiderio, *The Electronic Darkroom*, BYTE, Mar. 1989, at 104; Streano, *supra* note 6; Brand, Kelly & Kinney, *Digital Retouching*, WHOLE EARTH REV., July 1985, at 42.

17. Streano, *supra* note 6, at 8; *see also* Brand, Kelly & Kinney, *supra* note 16.

18. Hanselman and Gordon, *supra* note 3, at 118.

19. Spiegelman, *supra* note 11; Picarille, *Color Highlights Graphics Show: New Releases Allow Color Separations*, Video Imaging, PC WEEK, Apr. 24, 1989, at 23, 30.

20. Streano, *supra* note 6, at 8; Reveaux, *I Second That Emulsion*, MACUSER, Jan. 1989, at 201, 202; Brand, Kelly & Kinney, *supra* note 16, at 42.

21. *See, e.g.*, Hanselman & Gordon, *supra* note 3, at 118.

22. Streano, *supra* note 6, at 8. A photograph in the *San Jose Mercury News* appeared to show Michael Dukakis surrounded by George Bush, Jesse Jackson, and Ronald Reagan at a dais displaying a Dukakis-Bush campaign poster. The photograph had been altered. Heads had been brought in from other photographs, the poster's lettering had been reversed and changed, Dukakis' watch had been moved, and his daughter's and wife's jacket colors switched. Rosenberg, *Computers, Photographs and Ethics*, EDITOR & PUBLISHER, Apr. 8, 1989, at 40, 40.

23. Streano, *supra* note 6, at 8; *see also* Brand, Kelly & Kinney, *supra* note 16.

24. Brand, Kelly & Kinney, *supra* note 16. Photorealistic models can be created on a computer. Brown & Verity, *The Graphics Revolution*, BUS. WEEK, Nov. 28, 1988, at 142, 143. Computers can be programmed to put correct shadows, calculated from an imaginary light source, into images. Sherman, *The Latest Generation of Computers Can Generate Images that Will Help Us in Future Generations*, MODERN PHOTOGRAPHY, Jan. 1985, at 20, 21.

Recently in Los Angeles, a man was accused of creating \$100 million worth of fake art, including fake Renoirs, and bilking art investors out of millions. It is possible to spot such a fake, but "it often takes an expert who's been around for 30 years to determine ... whether a color sequence is wrong." Some of the fakes were "produced with sophisticated and costly laser scanning equipment that can 'duplicate prints with a margin of error that is very slim.'" Sahagun & Woodyard, *Art Fraud Suspect's Bail Cut*, L.A. Times, Sept. 30, 1989, § 2 (Metro), at 3, col. 2. It seems this scanning equipment, even though costly, was put to profitable use. The scanned images were transferred to a lithograph plate or silkscreen process after they were scanned. *Id.*

25. Brand, Kelly & Kinney, *supra* note 16, at 43. (The pyramids were moved in the Feb. 1982 edition of *National Geographic Magazine*). In *National Geographic Magazine*, April 1982, a hat was added to the person on the cover. *Id.* In December 1983, *PopularScience* substituted the background from one photo for the background of the cover photograph. *Id.* at 46. In *The New York Times Magazine*, April 1983, a technician electronically filled a photograph with shrubbery. The *New York Times* claimed it did not notice until later. *Id.* In the cover photo of one issue of *Rolling Stone Magazine*, Miami Vice's Don Johnson's pistol and shoulder holster were electronically removed. Seymour, *Let Me Scan Just This One Picture*, PC, Jan. 12, 1988, at 77, 77.

26. Birkmaier, *supra* note 2, at 37.

27. *Id.*

28. Picarille, *supra* note 19, at 30.
29. *Id.*
30. *Id.*
31. Sahagun & Woodyard, *supra* note 24.
32. *Id.*
33. Hanselman & Gordon, *supra* note 3, at 122.
34. Rosenburg, *Digital Transmission of Photos*, EDITOR & PUBLISHER, Nov. 5, 1988, at 14P.
35. Fitzpatrick, *supra* note 8, at 15.
36. Abernathy & Weiss, *supra* note 4, at 172.
37. Brown & Verity, *supra* note 24, at 144.
38. *Id.*
39. MacVision software was introduced at \$399. Miley, *Big Frame Hunters*, MACUSER, Mar. 1989, at 35, 35. GraphistPaint II was priced at \$495. Martinez, *GraphistPaint II*, MACUSER, Apr. 1989, at 45, 45. Picture Publisher was priced at \$595. Thompson, *supra* note 16, at 97. PhotoMac was priced at \$695. Fiderio, *supra* note 16, at 105. Image Studio 1.5 was priced at \$495. Reveaux, *supra* note 20, at 208. Digital Darkroom 1.0 was priced at \$295. *Id.*
40. Hammonds, *These Desktops are Rewriting the Book on Publishing*, BUS. WEEK, Nov. 28, 1988, at 142, 142.
41. Brown & Verity, *supra* note 24, at 143.
42. *Id.* at 144.
43. *Kodak Unveils New Products for the Imaging System of Today...and Tomorrow*, BUS.WIRE, June 13, 1989.
44. *Putting Byte into Billboards*, TIME, May 11, 1987, at 57, 57.
45. Hammonds, *supra* note 40, at 156.
46. *See supra* text accompanying note 25.
47. Streano, *supra* note 6, at 8.
48. *Id.*
49. "The National Press Photographers Association conference was concerned with technical aspects, ethical questions and managerial ... impact of computerized handling of photography. For its consideration of technology and ethics, the meeting probably produced no more agreement on ethical standards than now exists on technical standards." Rosenburg, *supra* note 34, at 40.
50. Streano, *supra* note 6, at 8. Legal remedies exist for false advertising and unfair competition. However, these only serve as outer boundaries in delineating ethical considerations and are only available if the harmed party is willing to resort to litigation.

51. Seymour, *supra* note 25.

52. Shapiro, *The Devils Desktop Publishing Dictionary*, MACWEEK, Oct. 25, 1988, at 102. "Clip art", prior to the computer age, referred to art that graphic artists clipped out of printed sources with scissors for use in their own artwork. In the computer context, clip art is a variation of the same thing except the artwork first must be digitized. A large market exists for selling volumes of digitized images on computer disk or "clip-art packages" for use in desktop publishing. Raskin, *PC-based Clip Art: Instant Images*, PC MAGAZINE, Oct. 17, 1989, at 149.

53. Shapiro, *Copywrongs on Consumer Info Networks? Posting of Scanned Images on Electronic Services Infringes Copyrights*, MACWEEK, Aug. 30, 1988, at 20, 20.

DIALOG is an accessible computer database which contains TRADEMARKSCAN (graphic representations of trademarks digitized from the *Official Gazette of the U.S. Patent and Trademark Office* available with accompanying text of applications and registrations). Chadwick, *Dialog Comments on Imaging Capabilities: An Interview with Fred Zappert*, ONLINE, May 1989, at 28; Thompson, *DIALOGLINK and TRADEMARKSCAN-Federal: Pioneers in Online Images*, ONLINE, May 1989, at 15. Using TRADEMARKSCAN, "[b]usiness users can compile and monitor portfolios of their own and competitors' trademarks." *Id.* at 21. Obviously, users can also use it to steal or infringe trademarks!

54. Shapiro, *supra* note 53, at 20.

55. *Id.* at 23.

56. *Id.*

57. *Id.*

58. *Id.* In short, the fair use doctrine allows a defendant who has copied a work to escape liability if he has not copied a substantial portion of the work or if his copy fulfills a different function from that of the plaintiff's work. For a more detailed discussion of the fair use doctrine, see *infra* text accompanying notes 91-97.

59. See Rosenthal, *Use an Image, Prepare for a Shootout*, MACWEEK, June 13, 1989, at 16.

60. See, e.g., *id.*; Seymour, *supra* note 25; Shapiro, *supra* note 53.

61. Compare Coale, *Setting up Shop*, MAC USER, Oct. 1988, at 275, 279 (recommending use of a scanner) with Rosenthal, *supra* note 59, at 16 (warning of danger of using scanned images). Computer pornographers, although faced with the very sensitive issue of distributing obscene material, are "far more concerned about the copyright violations involved in the scanning and distribution of nudes [than in the pornography issue]." Lander, *It Was Bound to Happen: Sex Enters Computer Age*, NEWSDAY, Feb. 26, 1989, at 75.

62. Hammonds, *supra* note 40, at 154.

63. Beamer, *OmniPage makes OCR a Snap*, MACWEEK, Nov. 22, 1988, at 42.

64. See Streano, *supra* note 6, at 10.

65. Seymour, *supra* note 25, at 77-78.

66. Shapiro, *More on Copyright*, MACWEEK, Oct. 11, 1988, at 27, 27. Authors of visual works have also attempted to preserve the integrity of their works even where they no longer hold the copyright. For example, the Director's Guild maintains, and a federal report found, that alteration and colorization of films has adverse effects on films and injures the reputation of directors. Honan, *Federal Report Criticizes the Coloring of Films*, N.Y. Times, Mar. 16, 1989, Business, at C22, col. 1. This problem is known as the "moral rights issue" and has been a growing issue in art in recent years. Artists claim to hold the moral rights of paternity and integrity in the work that they create. Artists, when they do not own or have sold the copyright to their creations, often seek to assert these moral rights when those creations are threatened with alteration. See generally Verbit, *Moral Rights and Section 43(a) of the Lanham Act: Oasis or Illusion?*, 9 COMM/ENT L. J. 383 (1987).

67. Streano, *supra* note 6, at 10.
68. See Cohen, *Masking Copyright Decisionmaking: The Meaninglessness of Substantial Similarity*, 20 U.C. DAVIS L. REV. 719, 728 (1987).
69. Gaste v. Kaiserman, 863 F.2d 1061, 1066 (2d Cir. 1988) ("Because copiers are rarely caught red-handed, copying has traditionally been proven circumstantially by proof of access and substantial similarity."); see Cohen *supra* note 68, at 728.
70. Cohen, *supra* note 68, at 728.
71. 17 U.S.C. § 103 (1988); M. NIMMER, NIMMER ON COPYRIGHT, § 13.03[A] (1988). For further discussion, see *infra* text accompanying notes 80-82.
72. Cohen, *supra* note 68, at 730.
73. M. NIMMER, *supra* note 71, § 13.03[A]; see also Cohen, *supra* note 68, at 731.
74. 17 U.S.C. § 107 (1988); see also Cohen, *supra* note 68, at 731.
75. 17 U.S.C. § 103 (1988); Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53 (1884).
76. M. NIMMER, *supra* note 71, § 2.08 [E][1].
77. Gracen v. Bradford Exchange, 698 F.2d 300, 305 (7th Cir. 1983); M. NIMMER, *supra* note 71, § 2.08[E].
78. Time Inc. v. Bernard Geis Assoc., 293 F. Supp. 130 (S.D.N.Y. 1968) (a sketch of the subject photograph would have been an infringing copy except that it was judged a fair use).
79. M. NIMMER, *supra* note 71, §§ 8.01[D], 2.18[H][2]; see also *Burrow-Giles Lithographic*, 111 U.S. at 60; Pagano v. Chas. Beseler Co., 234 F. 963, 964 (S.D.N.Y. 1916); Edison v. Lubin, Pa., 122 F. 240, 242 (C.C.A.Pa. 1903); *Bernard Geis Assoc.*, 293 F. Supp. at 143.
80. M. NIMMER, *supra* note 71, § 13.03[A].
81. *Id.*
82. *Id.*
83. *Id.*
84. *Id.* § 13.03[A][1]; see also *Sheldon v. Metro-Goldwyn Pictures, Corp.*, 81 F.2d 49 (2d Cir. 1936) (judging substantial similarity with respect to the whole of the copied portions, including non-copyrightable elements).
85. *Nichols v. Universal Pictures, Corp.*, 45 F.2d 119, 121 (2d Cir. 1930); M. NIMMER, *supra* note 71, § 13.03[A][1].
86. M. NIMMER, *supra* note 71, § 13.03[A][2]; see also *Alexander v. Haley*, 460 F. Supp. 40 (S.D.N.Y. 1978) (trial court excluded scenes common to depictions of slavery, and once these scenes were eliminated found the works were not substantially similar).
87. M. NIMMER, *supra* note 71, § 13.03[A][2].
88. *Id.* § 13.03[B]; see *Sheldon*, 81 F.2d at 56 ("no plagiarist can excuse the wrong by showing how much of his work he did not pirate").

89. M. NIMMER, *supra* note 71, § 13.03 [E][1].
90. Chafee, *Reflections on the Law of Copyright*, 45 COLUM. L. REV. 503, 513 (1945).
91. 17 U.S.C. § 107 (1988); *see also* M. NIMMER, *supra* note 71, §§ 13.05 [A], [B].
92. 17 U.S.C. § 107 (1988).
93. *Id.*
94. *Id.*
95. *Id.*
96. *Hustler Magazine v. Haberman*, 626 F. Supp. 201 (D. Mass. 1986).
97. M. NIMMER, *supra* note 71, § 13.05 [A][4]; *Harper & Row v. Nation Enters.*, 471 U.S. 539 (1985); *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417 (1984).
98. Cohen, *supra* note 68, at 741-49.
99. *Id.*
100. *Id.* at 735-47.
101. 154 F.2d 464 (2d Cir. 1946).
102. *Id.*; *see* M. NIMMER, *supra* note 71, § 13.03 [E][3]; Cohen, *supra* note 68, at 731.
103. *Arnstein*, 154 F.2d at 468-70; *see* M. NIMMER, *supra* note 71, § 13.03 [E][3]; Cohen, *supra* note 68, at 731.
104. *Arnstein*, 154 F.2d at 472-73; *see* M. NIMMER, *supra* note 71, § 13.03 [E][3]; Cohen, *supra* note 68, at 731.
105. *See* M. NIMMER, *supra* note 71, § 13.03 [E][3]; Cohen, *supra* note 68, at 732.
106. 562 F.2d 1157 (9th Cir. 1977).
107. *Krofft*, 562 F.2d 1164; *see* M. NIMMER, *supra* note 71, § 13.03 [E][3].
108. *Krofft*, 562 F.2d 1164; *see* M. NIMMER, *supra* note 71, § 13.03 [E][3].
109. *Krofft*, 562 F.2d 1164; *see* M. NIMMER, *supra* note 71, § 13.03 [E][3].
110. Cohen, *supra* note 68, at 755.
111. *Id.* at 757.
112. M. NIMMER, *supra* note 71, § 13.03 [E][2].
113. *Id.*
114. Cohen, *supra* note 68, at 739.

115. *Id.* at 737 & n.66.
116. *See supra* text accompanying notes 16-25.
117. *See supra* text accompanying note 90.
118. *See supra* text accompanying notes 75-79.
119. 575 F.2d 62 (3d Cir. 1978).
120. *Id.* at 64 (quoting Chafee, *supra* note 90, at 505).
121. *Id.* at 66 (emphasis added).
122. 623 F. Supp. 511 (S.D.N.Y. 1985).
123. 366 F. Supp. 977 (M.D. Pa. 1973).
124. 228 F. Supp. 630 (D.N.J. 1964).
125. *Foreign Car Parts*, 366 F. Supp. at 977.
126. *Hedeman*, 228 F. Supp. at 631.
127. 213 U.S.P.Q. 1008 (S.D.N.Y. 1981); 1978-81 Copr.L.Dec. ¶ 25,248.
128. Related questions of fair use are discussed *infra* at text accompanying note 143.
129. *Mazer v. Stein*, 347 U.S. 201, 218 (1954).
130. *Sub-contractors Register v. McGovern's Contractors and Builders Manual*, 69 F. Supp. 507, 510 (S.D.N.Y. 1946).
131. "In mail-order catalog copyright infringement actions, the court must look not to the substantial similarity of the entire catalog, but at the substantial similarity of the very small amount of protectable parts." *Haan Crafts Corp. v. Craft Masters, Inc.*, 683 F. Supp. 1234, 1243 (N.D. Ind. 1988).
132. *See, e.g., Sargent v. Am. Greetings Corp.*, 588 F. Supp. 912, 918 (N.D. Ohio 1984). "A work which makes non-trivial contributions to an existing one may be copyrighted as a derivative work and yet, because it retains the "same aesthetic appeal" as the original, render the holder liable for infringement of the original copyright." *Id.*
133. *L. Batlin & Son, Inc. v. Snyder*, 536 F.2d 486, 491 (2d Cir. 1976).
134. *Compare Sargent*, 588 F. Supp. at 919 (whether plaintiff's coloring of defendant's line drawings was itself entitled to copyright protection presented a genuine issue of fact) *with Hearn v. Meyer*, 664 F. Supp. 832 (plaintiff's coloring of well-known public domain images not independently copyrightable).
135. 52 Fed. Reg. 23,443 (1987) (to be codified at 37 C.F.R. § 202) (proposed June 22, 1987).
136. *Storm v. Kennington, Ltd., Inc.*, 223 U.S.P.Q. 790 (N.D. Cal. 1984).
137. *Hearn*, 664 F. Supp. at 839. Note that time is not an overwhelming factor in image processing.

138. *Sargent* 588 F. Supp. at 919; M. NIMMER, *supra* note 71, § 2.08[C][2].

139. In *Hearn*, the court found that huge amounts of time, effort, and craft did not constitute originality. *Hearn*, 664 F. Supp. at 839.

140. *Kisch v. Ammirati & Puris, Inc.*, 657 F. Supp. 380, 384 (S.D.N.Y. 1987).

141. *See supra* text accompanying notes 16-25, 43-45.

142. *See supra* text accompanying note 100.

143. *See supra* text accompanying notes 91-97.

144. *See supra* text accompanying notes 123-129.

145. *See supra* text accompanying notes 91-97.

146. Banks scan, store, transfer, and electronically compare signatures. *Signature Verification Products*, COMPUTERS IN BANKING, May 1989, at 96; *Database Incorporates Photos, Text*, PC WEEK, Mar. 1, 1988, at 28. A fax of a signature can be sent to a remote computer and compared with another signature in order to verify it for contracts, checks, or other documents. Fitzpatrick, *supra* note 8, at 15. Banks handle checks electronically after scanning them. Kantrow, *Electronic Check Handling Seen for 90's: Poll Finds 86% of Bankers Interested in Image Processing*, AM. BANKER, Apr. 19, 1989, at 6. Many financial institutions scan credit receipts to prevent fraud and improve billing. Brown & Verity, *supra* note 24, at 145. Moran, *Bank Finds Imaging System Pays Its Way*, COMPUTERWORLD, May 1, 1989, at 25.

147. Manufacturers scan and combine images into text files and then they can transfer the combined files between computers for parts inventories and quality control. *Database Incorporates Photos, Text, supra* note 146. Technicians using electronic access to engineer drawings can improve worker productivity. Brown & Verity, *supra* note 24, at 145.

148. *Database Incorporates Photos, Text, supra* note 146.

149. Future actors will be able to move in front of computer generated landscapes. Kemp, *Personal FX*, DISCOVER, Nov. 1988, at 74, 74. Film colorization is another use for image processing. *Id.* at 76. In film and video studios producers use scanning techniques to animate cartoons and models, manipulate live action, and create special effects. In time computers will be programmed to make feature length films. Brown & Verity, *supra* note 24, at 143.

150. Police can digitize and manipulate mug shots for viewing by victims. Housman, *Boston Police Take Mug Books Electronic*, PC-COMPUTING, Sept. 1989. They also scan and electronically compare fingerprints. Jovanovitch, *Matching Technology to Police Needs*, N.Y. Times, Aug. 13, 1989, § 12, at 23, col. 1.

151. Scientists can decipher ancient writings through image processing. Stoll, *Scholars Use PCs to Decipher Ancient Writings*, PC WEEK, May 6, 1986, at 170. Researchers digitized and then enhanced degraded photographs to help locate the Titanic. Spalding & Dawson, *supra* note 1, at 102.

152. Antonoff, *supra* note 15. Digital scanning is used to create electronic filing cabinets in offices. Brown & Verity, *supra* note 24, at 144.

153. *Fast Document Retrieval*, PC WEEK, Aug. 28, 1989, at 76. Tangentially-"Photography has no place in ... any ... courtroom. For that matter, neither does film, videotape, or audio tape, in case [a party] plans to introduce in evidence other media susceptible to digital retouching." Brand, Kelly & Kinney, *supra* note 16, at 42.

154. *Color Systems for Design and Production*, THE SEYBOLD REP. ON PUBLISHING SYSTEMS, May 23, 1988, at 4. Image processing has made color proofing, previously a problem in newspaper publishing, easy because the photos are digitally stored and are easily adjusted and previewed. Esler, *Color Proofing*, GRAPHIC ARTS MONTHLY, Feb. 1989, at 44; *DDCP System: A Preview*, GRAPHIC ARTS MONTHLY, AND THE PRINTING INDUSTRY, Feb. 1989, at 90; Rosenberg, *Digital Color Proofing*, EDITOR & PUBLISHER, Sept 24, 1988, at 32C. Publishers use image scanning for newsgathering by digitizing photos and transmitting them all

over the world. Miller, *A Letter from the Publisher*, TIME, Sept. 7, 1987, at 4; Sharbutt, *Shots Seen 'Round World Via Phone Line*, L. A. Times, June 7, 1989, pt. 6 (Calendar), at 1, col. 6.

155. *Electronic Still Imaging to Gross \$540M in 1992*, EDN, July 7, 1988, at 315, 315.

156. *See supra* text accompanying notes 46-67.

157. Shapiro, *supra* note 66, at 27.

158. Rosenberg, *Servicing the Photo Customer*, EDITOR & PUBLISHER, Apr. 8, 1989, at 58, 58. Electronic stock photo agencies sell digitized photos. A low resolution version of the image (with the name of the photographer) is transmitted to the consumer as a preview; the agency transmits a high resolution image once the consumer has bought rights to the image. Streano, *supra* note 6, at 9.

159. Brown & Verity, *supra* note 24, at 143. 1988 shipments of hardware and software used in computer graphics systems equaled \$9.1 billion, and are expected to grow to \$27 billion by 1993. *Id.* Identified markets for images include real estate, retail, publishing, corporate, law enforcement, consumer, and government. The international market for still imaging equipment (equipment which processes and produces electronic still images) was estimated at \$68.5 million in 1988, and predicted to grow to \$542.6 million in 1992. *Electronic Still Imaging to Gross \$540M in 1992*, *supra* note 155, at 315. Combined U.S. sales of image processing equipment are estimated to grow from \$1.02 billion in 1988 to \$1.58 billion in 1990. Lineback, *How Long Will It Take Image Processing to Blast Off*, ELECTRONICS, Feb. 19, 1987, at 65, 66; *see also supra* text accompanying notes 145-154.

160. Hammonds, *supra* note 40, at 154.

161. *See supra* text accompanying note 53.

162. Images from copyrighted and trademarked sources, ranging from M.C. Escher illustrations or *Sports Illustrated* and *Playboy Magazine* photographs to trademarked images of Mickey Mouse and Jessica Rabbit, show up on these networks. Shapiro, *supra* note 53, at 20.

163. *See supra* text accompanying notes 53-58.

164. Streano, *supra* note 6, at 10.

165. There is a large market for computer games, including computer pornography. One example is MacPlaymate, a computer game where the player can have simulated sex with a computer image. *Playboy Magazine* is currently suing the makers of this game for trademark infringement over the game's name, rather than suing over its content. Lander, *supra* note 61. However, it is possible that a person would buy the game rather than the magazine where the images were the same, making a copyright infringement action a real possibility.

166. Antonoff, *Not for Lasers Only*, PERSONAL COMPUTING, Aug. 1989, at 59, 62.

167. *See supra* text accompanying notes 91-97.

168. Cohen, *supra* note 68.

169. *Id.* at 758.

170. *Id.*

171. *Id.*

172. *Id.* at 759 & n.137.

173. *Id.* at 759 & n.139.

174. *Id.* at 759 & n.138.

175. *Id.* at 760.

176. 908 F.2d 531 (9th Cir. 1990).

177. *Id.* at 539.

178. Cohen, *supra* note 68, at 760.

179. *Id.* at 761.

180. *Id.* at 762.

181. Harper & Row v. Nation Enters., 471 U.S. 539; Sony Corp. of Am. v. Universal City Studios, 464 U.S. 417 (1984); *see also* Cohen, *supra* note 68, at 763 & nn. 149-52.

182. Remember, this test needs to apply equally because of the inability to tell when an infringing image is result of image processing.

183. Seymour, *supra* note 25, at 77.

184. *See* Shapiro, *supra* note 53, at 27.

185. *See* Streano, *supra* note 6, at 10. Digital scanning is already in the process of overrunning the typeface industry. Typeface fonts can be scanned, but since typefaces are not given copyright protection, typeface developers have watched horrified as their huge collections of typefaces, which were their advantage in business, have been speedily scanned by computer users. Bower, *Users in Control of Digitized Fonts*, MACWEEK, Feb. 14, 1989, at 58.

186. *See supra* text accompanying notes 116-140.

187. Cohen, *supra* note 68, at 761.

188. *See supra* text accompanying notes 20-22.

189. Note, *Digital Sound Sampling, Copyright and Publicity: Protecting Against the Electronic Appropriation of Sounds*, 87 COLUM. L. REV. 1723, 1725 (1987).

190. Fleischmann, *The Impact of Digital Technology on Copyright Law*, 23 NEW ENG. L. REV. 45, 55-56 (1988).

191. *Id.* at 46.

192. *Id.* at 56. Compact disc sales (digital recordings) have recently surpassed sales of analog phonograph records. *Id.* at 46.

193. *Id.* at 46.

194. Kawamura, *Digital Audio Tape Technology: A Formidable Challenge to the American Copyright System*, 4 AMER. U. J. INT'L. L. & POL'Y. 409, 411 & n.12 (1989).

195. Baxter v. MCA, Inc., 812 F.2d 421, 425 (9th Cir. 1987).

196. Comment, *Digital Sampling: Old-Fashioned Piracy Dressed Up in Sleek New Technology*, 8 LOY. ENT. L.J. 297, 323 (1988).

197. *United States v. Taxe*, 380 F. Supp. 1010, 1017 (C.D. Cal. 1974), *aff'd in relevant part* 540 F.2d 961 (9th Cir. 1976), *cert. denied*, 429 U.S. 1040 (1977).
198. Kozinn, *A Concert in Honor of ASCAP*, N.Y. Times, Oct. 29, 1989, § 1, pt. 2, at 66, col. 1.
199. Wheelock, *Dance and Exercise Studios Paying the Piper*, L.A. Times, Sept. 17, 1989, Calendar, at 56.
200. Schroeder, *Music Licensing Firm Pressing Copyright Law*, ST. LOUIS BUS. J., Oct. 17, 1988, at 21A.
201. *Id.*
202. *Id.*
203. Shapiro, *supra* note 53, at 20; *see also* Rosenthal, *supra* note 59.
204. *See* Rosenthal, *supra* note 59.