

Protecting Display Intellectual Property

Patents are a powerful tool for protecting display intellectual property, but they are not the only tool and they are not always the best one.

by Charles L. Miller

IN VIEW OF THE COSTS that can be associated with the research and development of display technologies, it is important for companies to adequately protect their intellectual property (IP). Failure to do so can put a company at a severe competitive disadvantage. Knowing what types of inventions are patentable and what rights are – and are not – provided by a patent is an important step in adequately protecting IP (Fig. 1).

There are almost no limits as to the subject matter that can be patented. The patent statute specifies that any person who “invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent.” While there are differences between what is considered a process, machine, manufacture, or composition of matter, the more important point is that these classes taken together include practically everything that is made by man, processes for using the products, and processes for making the products.

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The most notable exceptions are naturally occurring elements and perpetual-motion machines. The discovery of a new naturally occurring birefringent material would not be patentable, but the use of that same birefringent material in a display device possibly would be patentable.

Assume that someone develops a new technology for making and applying a new alignment layer for use in a liquid-crystal display (LCD). The inventor may procure one or more patents that cover the machine used to manufacture the alignment layer, the method used by the machine during the manufacturing process, the composition of the alignment layer, an LCD that uses the alignment layer, and the process of applying the alignment layer to a substrate.

The decision regarding what to patent is generally a business decision. According to the 2001 “Report of Economic Survey” published by the American Intellectual Property Law Association, the average cost of preparing a relatively complex electrical patent application is approximately \$10,000, and Government fees and prosecution costs add to the overall cost.

A company should consider the activities of its competitors and the ease with which competitors can design around a potential patent. In the example given above, if the process of applying the alignment layer to the substrate is novel, but does not provide any advantages over prior methods, it might be prudent to devote limited resources to patenting other inventions. A competitor faced with the choice between paying royalties to license a

patent or using a prior application method has no reason to pay the royalties unless the patented method offers suitable advantages over the prior-art method that might not require a license.

Patentability Requirements

While almost anything is capable of being patented, there are limitations to ensure that the Government does not grant patents for processes, machines, articles of manufacture, or compositions of matter that are already in the public domain. A fundamental goal of the patent system is to encourage the development of new processes, machines, articles of manufacture, and compositions of matter by granting inventors the right to exclude others from practicing the invention for a limited time. When something is already in the public domain, granting a patent only limits competition while providing no benefit.

In order for an invention to be patentable, the invention must be novel. Among other limitations, the patent law provides that an invention cannot be patented if “(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent,” or “(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country more than one year prior to the application for patent in the United States” The second section cited above is the basis of the familiar 1-year grace period in the United States.

In the United States, inventors have a 1-year grace period to obtain a patent after publicly using or selling an invention. After

1 year, any sale, public use, or publication of the invention will put the invention in the public domain and prevent obtaining a patent.

It is important to note that most foreign countries do not have a grace period for filing patent applications. The disclosure of an invention in a trade publication might not be the basis of preventing one from obtaining a patent in the United States. However, the same disclosure could prevent one from obtaining a patent in most other countries.


Even if an invention is truly novel, the inventor will not be granted a patent if the differences between the subject matter sought to be patented and the prior art are such that "the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains." There is often no bright line separating patentable subject matter from "obvious" subject matter. In general, one must determine if there is some teaching or suggestion in the prior art for making a modification. For example, assume that an inventor is the first person to apply an antireflective film to a prior-art display. While the combination of an antireflective film with the display might be novel, the combination is likely obvious because one skilled in the art would likely have been motivated to apply an antireflective film to a display in order to reduce glare.

Of course, there are exceptions. If the combination of the antireflective film and the display produce unexpected results, such as a dramatically improved contrast ratio, the combination might be patentable. It is generally advisable to consult a patent attorney when one invents or discovers a novel process, machine, manufacture, or composition of matter so that the patent attorney can assist in determining whether the invention or discovery would likely be considered obvious.

The Bundle of Patent Rights

A patent entitles the owner to prohibit others from engaging in certain activities. In particular, the statute gives the owner "the right to exclude others from making, using, offering for sale, or selling" the invention in the United States or "importing" the invention into the United States. These rights can be enforced against an infringer by bringing an appropriate action in a United States District Court. The scope of the patent grant is defined by the claims that appear at the end of the patent.

There is a common misconception that a patent gives the owner the right to manufacture a product described in the patent. A



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United States Patent [19]

Hirata et al.

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[54] **LIQUID CRYSTAL DISPLAY APPARATUS HAVING PLURAL REGIONS OF DIFFERENT ALIGNING CONDITIONS AND METHOD FOR PRODUCING THE SAME**

5,303,076 4/1994 Okada et al. 359/78
5,309,264 5/1994 Lien et al. 359/87

(List continued on next page.)

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[52] **U.S. Cl.** 349/136; 349/129

[58] **Field of Search** 359/75, 76; 349/136, 349/129

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[57] **ABSTRACT**

A liquid crystal display apparatus of the invention includes a pair of substrates and a liquid crystal layer sandwiched between the pair of substrates with alignment films formed at interfaces between the liquid crystal layer and the respective substrates. The alignment films regulate aligning conditions of liquid crystal in the liquid crystal layer. In the liquid crystal display apparatus, the liquid crystal layer includes two or more liquid crystal layer regions of different aligning conditions, and at least one of the alignment films has surface tensions which are different from each other in surface regions thereof corresponding to the respective liquid crystal layer regions of different aligning conditions.

34 Claims, 23 Drawing Sheets

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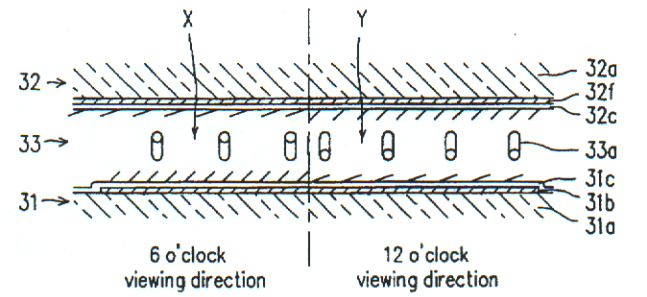


Fig. 1: This front page of a Sharp Corp. patent for a multiple-alignment LCD and a method for manufacturing it is representative of many U.S. display patents.



Pioneer

Fig. 2: Several technologies in Pioneer's PDP-503CMX and PDP-433CMX PDPs – which some analysts say represent the state of the art in plasma displays – may be patentable or protectable as trade secrets.

patent does not provide one with the right to make, use, offer for sale, sell, or import the invention. It is worth repeating that a patent only provides the right to *exclude* others from making, using, offering for sale, selling, or importing the invention.

This can be particularly important when a patent is drawn to an improvement over subject matter claimed in a previous patent. For example, assume that a first patent includes claims that cover a method of depositing an electrode layer. Another inventor may obtain a second patent that improves upon the first method by including a step of depositing the electrode layer while maintaining the substrate at a certain temperature. Moreover, a third inventor may obtain a patent that improves upon the first and second methods by including a step of depositing the electrode layer at a specific angle to the substrate.

Even though he owns a patent that covers the core method, the owner of the first patent would infringe the second and third patents if, in addition to using the method disclosed in the first patent, his process deposits the electrode layer while maintaining the substrate at the temperature specified in the second patent and at the angle specified in the third patent. Similarly, the owner of the second patent would infringe the broader first patent that covers the core method even when the owner

of the second used the exact method described in the second patent.

This example illustrates why it can be important to obtain patents that cover improvements to processes practiced by competitors. In particular, by obtaining patents that cover improvements to the process covered by the first patent, the owners of the second and third patents have bargaining power that can be used to obtain licenses to the first patent. More specifically, the owner of the second patent may agree not to exclude the owner of the first patent from depositing the electrode layer while maintaining the substrate at the specified temperature in exchange for the owner of the first patent's agreeing not to exclude the owner of the second patent from using the core method covered by the first patent.

Patent It or Just Keep It Secret?

When deciding whether to patent an invention, the benefits of maintaining an invention as a trade secret should also be considered (Fig. 2). Trade secrets include information that is used in a business that provides a competitive advantage by not being generally known. The owner of the trade secret must take reasonable security measures to maintain the invention as a secret.

One of the advantages of maintaining an invention as a trade secret is that it is possible

for a trade secret to exist long after a patent would have expired. With few exceptions, patents expire 20 years after they are filed. The formula of the Coca-Cola® brand soft drink is a trade-secret success story. The formula has remained unknown to competitors long after a patent, which would have had to disclose the formula, would have expired.

Certain display-manufacturing methods may be good candidates for trade-secret protection. A key consideration is whether the method could be determined by reverse-engineering a display. Absent some contractual arrangement, competitors are generally free to purchase and reverse-engineer each other's displays.

Assume that a manufacturer has developed a patentable method for filling a display with twisted-nematic liquid-crystal material and that the method would not be apparent from examining a display. The manufacturer would effectively obtain the same rights to exclude others by keeping the method secret. Moreover, if the manufacturing method is not apparent from examining a display, even if the manufacturer obtains a patent it can be expensive and might require legal proceedings to determine whether competitors are actually using the method covered by the patent.

One of the risks associated with not obtaining patent protection for an invention is that a competitor will independently develop the subject matter of an invention. If the process is truly independent, an action for misappropriation of trade secrets would not be available. In contrast, competitors cannot avoid infringing a patent by showing that they independently developed the invention. When in doubt, consult your friendly patent attorney. ■

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