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## Intellectual Property - 101

Hi, and welcome to this first *IP 101* of the CE Magazine. *IP 101* is where we take a look at the world of Intellectual Property, patents, trademarks and copyrights. This month I'm going to be your guide, although we will also be featuring occasional columns from patent lawyers and other IP professionals - *Ed*.

### Published Patent Applications

#### What are they? Why are they useful?

In this month's column I'm going to talk a bit about Published patent applications and answer a few questions that some of you may have about them. Let's start with a quick reprise of how the patent system works.

In order to obtain the grant of a patent, a person or more commonly an organization, must file an application at a patent office with jurisdiction to grant a patent in the relevant geographic area. This is often be a national patent office but could be a regional body, such as the European Patent Office. Once the patent specification complies with the laws of the office concerned, a patent may be granted for the invention described and claimed by the specification.

The process of "negotiating" or "arguing" with a patent office for the grant of a patent, and interaction with a patent office with regard to a patent after its grant is known as *patent prosecution*. This is distinct from *patent litigation* that relates to legal proceedings for infringement of a patent after it is granted. There is normally a lengthy waiting period before the patent will be *prosecuted* by the relevant patent office.

#### Publication

Patent applications are generally published 18 months after the earliest priority date of the application. Prior to that publication the application is confidential to the patent office. After publication, depending upon local rules, certain parts of the application file may remain confidential, but it is common for all communications between an Applicant and the patent office to be publicly available.

The publication of a patent application marks the date at which it is publicly available and therefore at which it forms full prior art for other patent applications worldwide. It also establishes an starting date from which the holder can claim back-royalties, assuming that a patent is eventually granted.

#### Search and examination

The search and examination phases constitute the main part of the prosecution of a patent application leading to grant or refusal.

A search is conducted by the patent office for any prior art that is relevant to the application in question and the results of that search are notified to the applicant in a search report. The examiner conducting the search classifies the cited documents according to their relevance with regard to novelty, inventive step, or background art; he may also indicate which claims they are relevant to. The patent office can

provide a preliminary, non-binding, opinion on patentability, to indicate to the applicant its views on the patentability in order to allow the applicant to decide how to proceed at an early stage.

The search report is typically published with the patent application, 18 months after the earliest priority date, or if it is not available at that time it is published as soon as it is available. In the US it is typical for the search report and prosecution to be delayed for at least a year, although it is possible to pay additional fees to accelerate the prosecution of an application. In Europe the initial outcome of prosecution - that is the opinion of the examiner - is expected after 24 months.

Invariably many applications are initially rejected, in part, or in their entirety by the examiner and a detailed negotiation process ensues during which the applicant (or their agent/attorney) will attempt to persuade the examiner of the novelty and non-obviousness of the underlying invention in relation to any prior art documents uncovered during the search phase.

As this phase can continue for quite a few years it is important that a provisional description of the underlying invention is published so that (i) the public have access to this knowledge and (ii) the inventor, or their organization, make it known that they are claiming rights over the described invention (i.e. *patent pending*).

### Why are Patent Applications Useful?

Now normally as a practicing CE engineer the main exposure you will have to patents from outside your own organization is when you are provided with a *granted patent* and asked to design a system which does not infringe this patent, which is most likely owned by a market competitor. Thus *patent applications* tend to be a bit of a mystery to many engineers and academics. Engineers often ask me if they risk infringing by using a technique which is documented in a patent application.

There isn't a simple answer to this. Typically I'll have to review the application and, ideally the public record of the prosecution process that documents any office actions issued by the patent office and any formal written responses from the applicant or their attorneys. These communications will often guide you as to the scope of the final claims that an applicant will be granted, but it is impossible to be definitive until a patent is allowed by the patent office and a final set of claims is agreed.

Bottom line is that patent applications only provide an indication as to the IP aspirations of a company. However that piece of information is, of itself a very useful nugget that is helpful in strategic product and operational planning activities.

Typically, if I want to know if a company is currently a market or commercial threat then I will study their portfolio of granted patents; if I want to know if they *are likely to become* a threat to our strategy in an emerging market segment I'll go and study their portfolio of patent applications - this tells me where their R&D focus was 18-24 months ago and is strongly indicative of where their strategic product development process is likely to be today. And in the CE sector where everything moves at a breakneck pace it is very important to understand where the short-term strategic focus of your nearest competitors lies.

But it is much easier to explain what I mean by taking some practical examples, so lets take a look at some of the major corporations in the CE sector and do a quick spot check on some of their latest patent applications. This is an interesting exercise to undertake as it gives us a window into the future of CE over the next 18-24 months!

## What is Apple Patenting?

As a leading corporation in the CE sector Apple is working on a wide range of emerging technologies; the examples cited here are a small selection from many dozens of recent patents applications published by the patent office. If you are interested in reading more there is actually a website dedicated to the latest innovations from apple: <http://www.patentlyapple.com/>

### US 2011/0164029 July 7th 2011 - Working with 3D Objects

Lets start with the idea of extending the "touch interface" of tablets such as the iPad into the third dimension. This idea is nicely illustrated by the key figures below, taken from this recently published patent application.

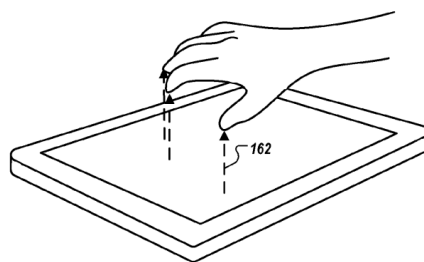


FIG. 2B

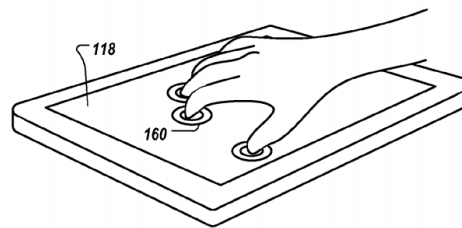


FIG. 2A

The hand starts with its fingers selecting multiple points on the tablet devices, a typical 2D multi-touch interface as shown in the first figure. However, in the next we see the hand rising above the tablet. This is possible because of much

recent research into 3D gesture interfaces; these may be analyzed either by imaging devices embedded in the tablet, or alternatively by local sensing techniques.

The patent then shows a number of different techniques to construct different 3D shapes by either pinching your fingers together, to create a pyramid, or maintaining them at an equi-distant spacing, creating a cube, or causing them to diverge.

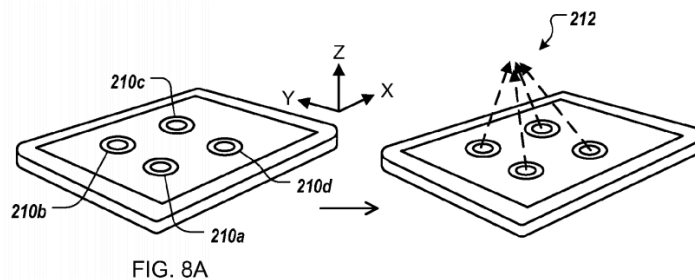


FIG. 8A

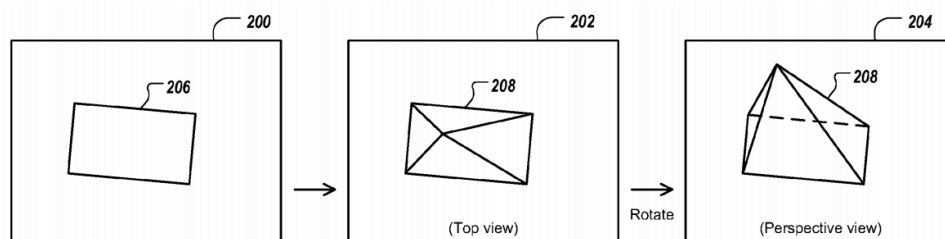


FIG. 8B

Finally we see the resulting 3D shape which can be used in CAD systems and other apps which need to provide a simple, intuitive UI for complex 3D creation and visualization.

This patent application looks like a very interesting step forward in 3D UI technology, assuming that the engineering can make it work.

## US 2011/0163944 July 7th 2011 - Intuitive, Gesture-Based Communications with Physics Metaphors

Now for something really cool!

Imagine you were viewing all of your recent photos as thumbnails on your smartphone, and you decided that you'd like to load them all onto your tablet computer. Today you'd have to start selecting the images, or if you are lucky you'd have a "select all" option. Then you'd have to make sure that your phone is connected to your tablet. Finally you'd have to drag all of those selected images to the icon representing the tablet device. OK, its not really a lot of work with a modern touch interface, but what if there was a nicer and cooler way to do it!

Well according to this recently published patent application there is! Remember that both your smartphone and tablet can sense motion and position so why not have a UI which uses these capabilities?

This is nicely illustrated in the figures below: first you "shake-up" your thumbnail images (or folders of images); then you turn your smartphone and literally "pour" these images "into" your tablet computer! What a nice use of the sensing capabilities of your handheld device!

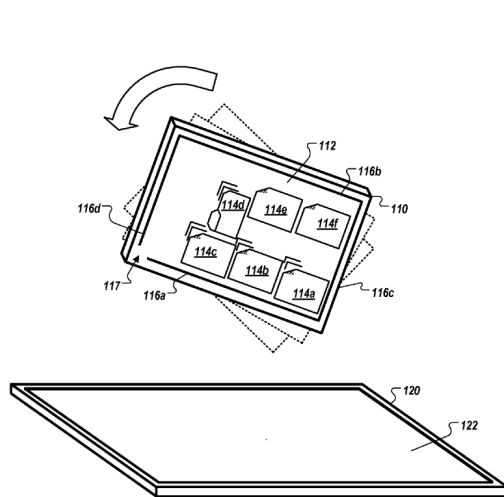


FIG. 1B

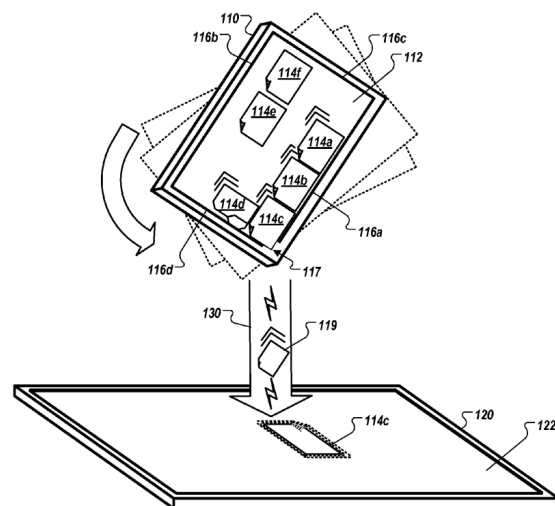


FIG. 1C

## US 2011/0199479 August 18th 2011 - Augmented Reality Maps

Our last example of a recent patent application is of enhanced mapping from your smartphone. In this case the position sensing abilities of the handheld are directed to

augment the mapping functions of the device.

In particular the device can be pointed in a specific direction as shown in our first figure, and the scene can

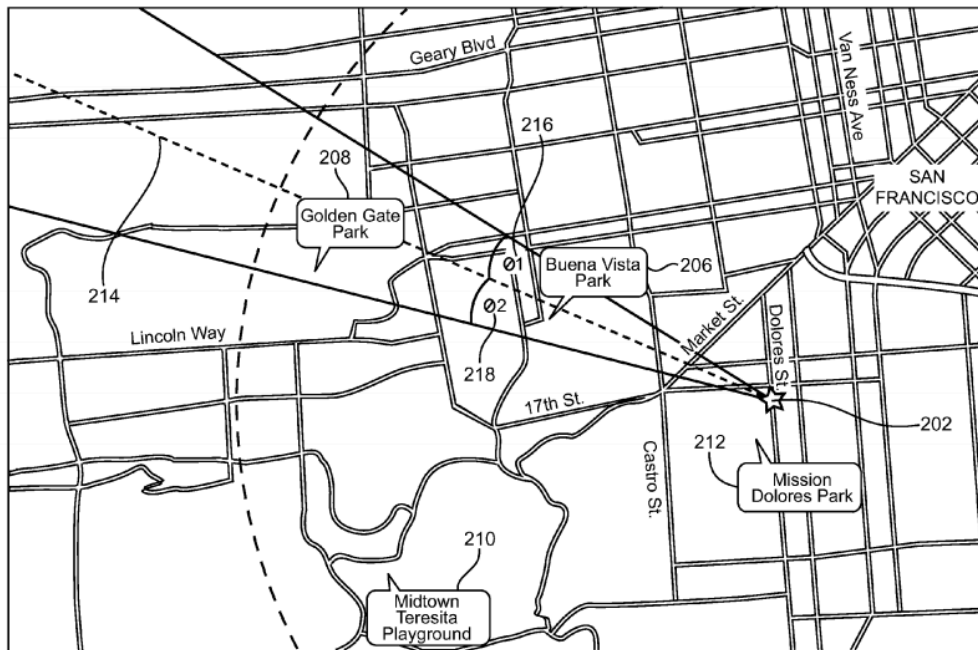


FIG. 2

be imaged on the screen of the smartphone as shown in the second diagram. But as we also have mapping information from a back-end application, somewhere "in the cloud", it is

possible to superimpose route information and highlight key waypoints on the "real world" scene which is imaged by the device.

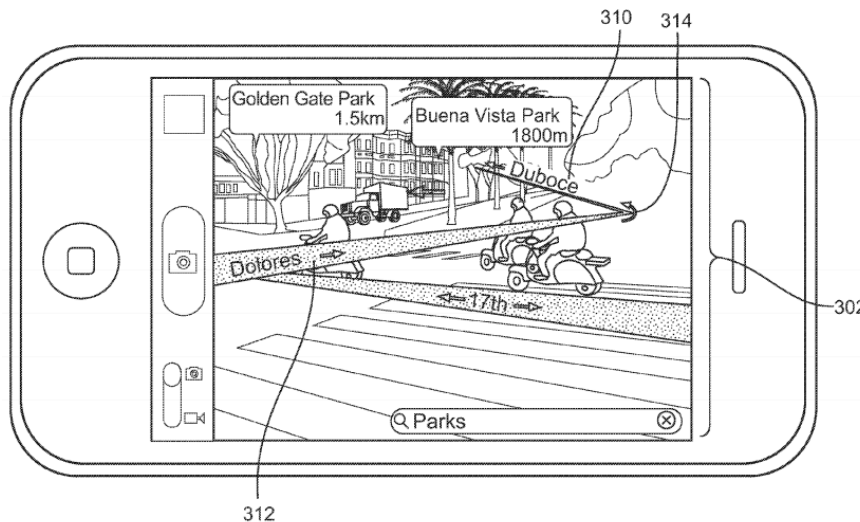


FIG. 3

our handheld devices, coupled with large information stores, will enable a new generation of augmented reality services and applications. And handheld imaging devices will be a key enabler of these new services.

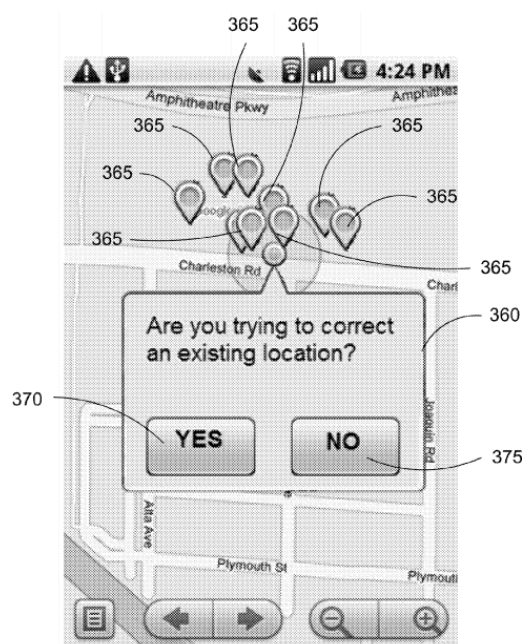
This patent is a good example of how new imaging capabilities in



## And some recent IP from Google?

It would not be fair to allow just one company to dominate this first IP column so I also took a look at some recent published applications from that other tech giant, Google. As time was short - your editor has been a busy boy pulling this first issue together - I only found one interesting applications I wanted to share with you; perhaps I'll have time to find a few more for next issue.

### US 2011/0238735 September 29th 2011 - Trusted Maps: Updating Map Locations using Trust-Based Social Graphs



Again I am picking an application that I feel is both interesting and helps solve a common problem that we can all relate to. In this case it is the problem of the incorrectly marked location on a "cloud based" map. These maps have become an essential tool for travelers, enabling a level of planning which could not be envisaged even 10 year ago. But today we can hardly move outside our front door without using them!

However there is one annoying problem which I occasionally come across - that of the incorrectly marked location. It may be a guest-house, or a restaurant, or a specialist antique shop, but when you arrive at the location marked on the map it isn't there! A variation on this is when several people

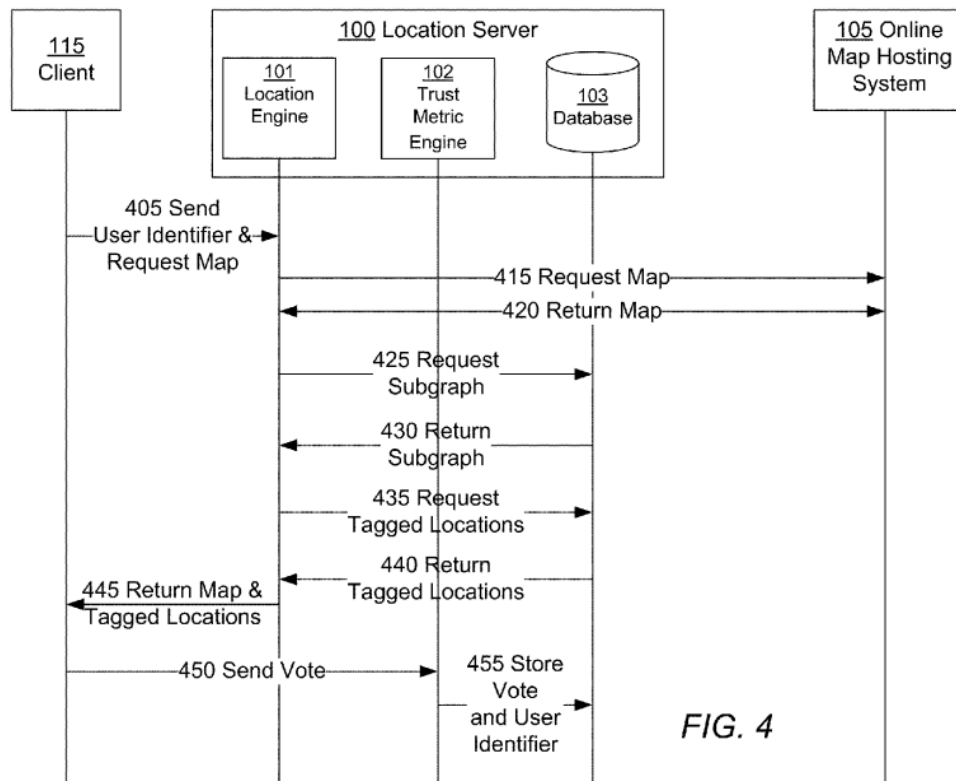
mark the same location at different point on the map. Sometimes they are trying to correct the error introduced by another user, but the nett result is confusing.

So here is a great idea - use the social networking technique of "user trust" to decide who has provided the most reliable corrections and updates to map locations! The concept of trust in various social networks and other web services, especially online auctions where many of the participants do not have a regular presence, is well-known, but it has not generally been applied to collective information gathering such as for mapping software.

## Concluding Remarks

I hope you've enjoyed this, our first IP column of the CE Magazine. I hope you are a better understanding of what a *published* Patent Application means and that you've enjoyed my mini-review of some recently published applications. You can see how these applications tell us a story of what new technologies we can expect over the next 18-24 months. These applications are public domain and you can access and search them online yourself.

If you did find this glimpse into the future interesting do let me know at [cesmagazine@ieee.org](mailto:cesmagazine@ieee.org). Also, if you are interested in contributing to a future IP



*FIG. 4*