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A microscopic image of DNA, showing several blue, textured, branching structures against a lighter blue background. The DNA strands are the central focus, with others visible in the foreground and background, creating a sense of depth.

# A revival in the making

The reinvention of  
human gene therapy

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IP review summer 2018



# Welcome to the Summer 2018 edition of IP Review

First of all, I would like to thank Matthew Howell for his efforts in editing the IP Review over the last four years. Matthew has now passed the editor's reins over to me and I hope to do as good a job as him in putting together a broad variety of articles that you will find both interesting and informative.

In this issue, we continue the theme of focusing on emerging technologies. We have the second part of our review of augmented reality, this time focusing on how innovators can maximise their chances of obtaining patents in this area. We also delve into the competition between hydrogen-fuel cells and batteries as the future power source in modern transport. Further, we have a look at the recent success of gene therapy in the treatment of genetic diseases, an old concept only now coming to fruition.

Looking more at the practicalities of patent procedure, we have an article on the efforts of the European Patent Office (EPO) to speed up examination and the knock-on effects this could have on applicants.

Add to this a recap on correctly claiming priority, an age old issue but one which still catches people out, as demonstrated in the recent EPO decision relating to the high profile gene-editing technology CRISPR. There is also a piece on an innovative way of analysing patent data, in this case looking at 'forward-citation' searching.

Finally, on the trade mark side, we find out that trolling is not restricted to patents.

I hope you enjoy the issue and look forward to hearing your thoughts.



Justin Wilson  
Editor



# The reinvention of human gene therapy

The concept of gene therapy has been around for over 25 years. At its inception, it was hailed as a powerful new technique for treating previously incurable genetic disorders. Unfortunately, the initial hype did not materialise into approved medicines and the field went out of favour, with many biotech companies looking for alternative therapies for human disease. However, in recent years, there appears to have been a revival with a number of approved medicines on the market and more in the pipeline.

Gene therapy is a technique in which a correcting gene is delivered to a patient in order to treat or prevent disease. In many instances, this gene replaces a defective gene which is the underlying cause of the disease. For example, some forms of haemophilia are the result of a mutation in a single gene which causes a key protein in

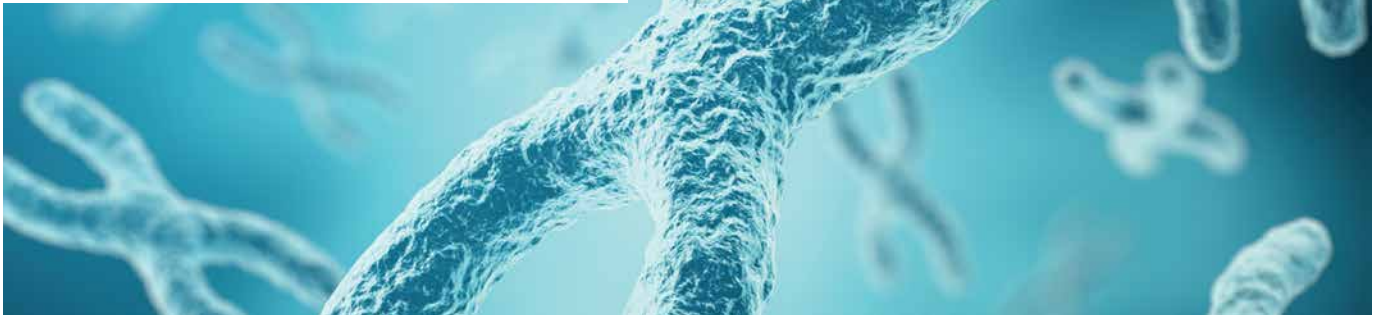
the blood clotting system not to work correctly.

The first gene therapy trial was approved in 1990. The therapy was given to two children who had severe combined immunodeficiency (SCID) which was caused by a defect in the gene encoding the enzyme adenosine deaminase (ADA). This gene therapy

sought to insert a correct version of the ADA gene so that the children's immune system could work effectively. Whilst it was shown that the functional ADA enzyme was present in the children following treatment, unfortunately, the level of ADA was too low to show a clinical benefit in treating the SCID.



## ...The reinvention of human gene therapy



In the following years, the number of gene therapy trials grew rapidly. However, that all changed in October 1999 when an 18-year-old volunteer died from multiple organ failure after being administered a gene therapy to treat a genetic disease of his liver. His body experienced a severe immune reaction to the virus being used to carry the replacement gene into his body (referred to as a viral vector) which brought about the multiple organ failure. This tragedy dampened the enthusiasm around gene therapy and led to much stricter controls for researchers wishing to carry out human trials.

In 2003, a further significant set-back occurred when a French patient, being treated for an immune disorder, developed a leukaemia-like condition as a direct result of the gene therapy treatment. The viral vector used in the therapy caused an unexpected mutation in an otherwise healthy gene which triggered the onset of the leukaemia in the patient.

In addition to these unfortunate developments, there were problems getting different gene therapies to work effectively. For example, whilst researchers showed it was possible to deliver replacement genes to patients using gene therapy, it was very difficult to get the gene to function at a sufficiently high level so as to have a therapeutic effect on the disease.

All these factors resulted in much of the research in this area being halted, especially by the big pharmaceutical companies. This left mostly academic researchers to progress the field during the 2000s. This is illustrated in Figure 1 below which shows the number of clinical trials approved year by year for gene therapies. As can be seen, the number of trials being approved peaked in 1999, after which there was a decline until 2003.

However, with no further commercial successes, it was not long before the trials declined in number, bottoming out in 2011 to their lowest level since 1998.

These trends are also supported by the number of gene therapy related patent applications being filed. As shown in Figure 2, the number increased rapidly between 1990 and 2000, after which there was a sharp decrease until 2003.

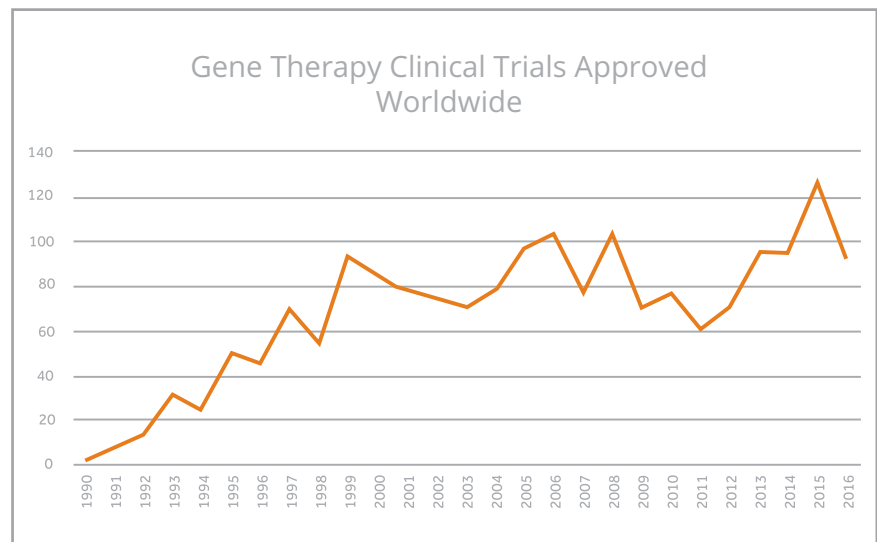


Figure 1

In 2003, the first commercial gene therapy product Gendicine received a marketing authorisation in China for the treatment of cancers caused by a mutation in the p53 gene which suppresses tumour formation. This authorisation may have reinvigorated research into gene therapies as the number of clinical trials being approved again started to rise.

In 2004, possibly following the authorisation of Gendicine, there was a rise in the number of patent applications filed. However, after this, the numbers again declined such that between 2006 and 2014 the number was around or just below 400 per year, less than half that seen during the peak in 2000. This shows that far less innovation was occurring in the

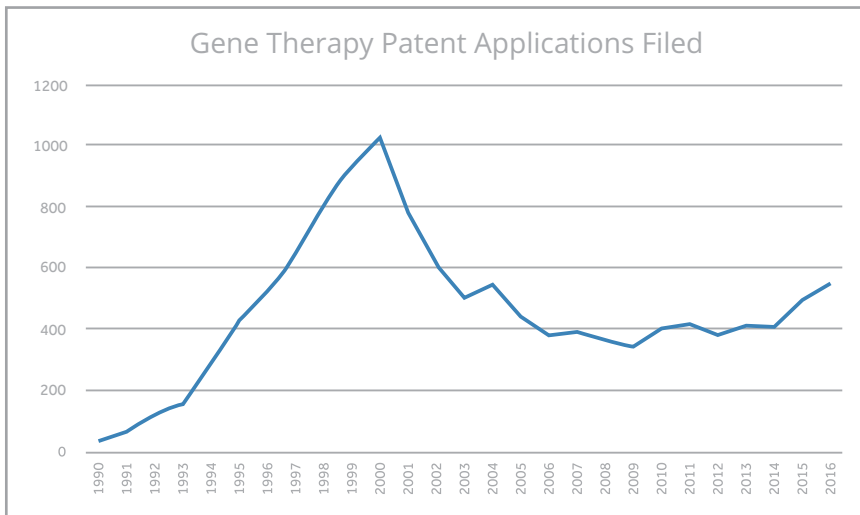


Figure 2

field, likely due to a significant drop in research and development.

Encouragingly, things started to change for the better in 2012. The Dutch company uniQure obtained the first European marketing authorisation for their gene therapy product Glybera for the treatment of lipoprotein lipase deficiency, a rare inherited disorder which can cause severe pancreatitis. This helped to prove the concept that gene therapy works and can be taken to the market, although Glybera itself was never a commercial success. This is perhaps partly due to very low patient numbers (about 1-2 in 1,000,000 people are affected with the disease) and the large price tag of about €1 million.

With Glybera demonstrating that it could be done, there was a big jump in clinical trial approvals from 2012 to 2015 to the highest ever level (as shown in Figure 1), showing there was renewed interest in gene therapies. Further, for the first time since the late 1990s, there was a significant increase in patent filings from 2014 to 2016, showing that innovation in this area is on the increase as biotech companies once again believe it has legitimate commercial potential.

Since then, Strimvelis, GlaxoSmithKline's gene therapy product for ADA-SCID (the same condition treated in the first ever gene therapy clinical trial in 1990) received a marketing authorisation in 2016 in Europe.

Following this, Spark Therapeutics' gene therapy product Luxturna was granted the first US marketing authorisation towards the end of 2017 for the treatment of an inherited form of vision loss that may result in blindness.

There have also been authorisations to allow the commercial use of CAR-T cells in Europe and the US. CAR-T cells are a type of immune cell engineered to detect and destroy cancer cells. Although these are not true gene therapy products, the production of these cells uses a gene transfer technique similar to gene therapy.

Although only three gene therapy products and two CAR-T cellular products have received marketing authorisations in the US or Europe to date, a whole raft of further products are being developed for a range of diseases, some of which are more

commonplace, such as haemophilia and sickle-cell disease. They are expected to be granted marketing authorisations over the next few years with estimates of there being two in 2018, up to 10 in 2019 and possibly as many as 13 in 2020.

This surge in commercial development and success of new gene and cell therapies is on the back of a large increase in investment. Figure 3 below illustrates the increasing annual global investment into gene and cell therapy companies since 2013, with a jump from \$3.3 billion in 2016 to \$4.2 billion in 2017. This increase in investment also seems to correlate with the increase in patent filings in this period. Patent filing data is not yet completely available for 2017 but it will be interesting to see if the upward trend continues in line with investment and as the field continues to grow.

At the end of 2017, there were almost 2,000 gene therapy clinical trials ongoing, including about 100 trials in pivotal Phase 2/3 or Phase 3 studies. Remarkably, gene therapy is now the second largest class of drugs being developed, bigger than antibodies and only behind more traditional New Chemical Entities (NCEs). Therefore, it seems that gene therapy is finally fulfilling its early promise.



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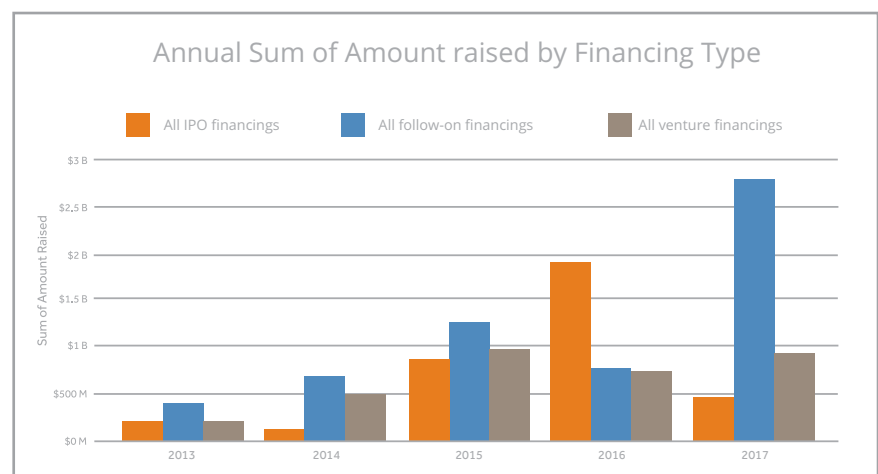


Figure 3

# European examination: the clock is ticking...

In what promises to be a major shake-up for patent examination, the European Patent Office (EPO) is aiming to shorten substantive examination to an average of 12 months by 2020 from an average of 30 months in 2016. Is this feasible, how will it work in practice and what can applicants do now to prepare?

## Why is the EPO doing this?

To remain competitive. As with other major patent offices around the globe, the EPO has been troubled with escalating pendency times over the past decade. These delays increase application costs due to spiralling annual renewal fees and frustrate applicants seeking legal clarity over their inventions. This ultimately weakens the competitiveness of the EPO versus national patent offices across Europe, where pendency times and renewal fees can be more attractive. Never one to rest on its laurels, the EPO has launched a series of streamlining initiatives under the banner of 'early certainty' over the past five years, and substantive examination is next to receive the efficiency treatment.

## Is this target feasible?

Yes, but it won't be easy. Reducing the average examination time by 60% over

four years looks suspiciously like blue-sky thinking, given the record number of applications filed in recent years and the limited number of Examiners available. But the EPO has a track record of achieving ambitious productivity goals. The first 'early certainty' initiative reduced the average time taken to issue prior art searches to 4.9 months, against a target of 6 months that was widely viewed as overly ambitious. More recently, the EPO is well on its way to reducing the time taken for most post-grant oppositions to 15 months, down from 26 months in 2016. In terms of examination, there has already been a 45% increase in applications being granted since 2015. It would take a brave person to bet against the EPO succeeding again.

## How will the EPO achieve this?

The number of EPO Examiners has been gradually increasing, rising from 3,600 in 2007 to 4,300 in 2016. But hiring more Examiners and asking them to work harder will only get the EPO so far. The main weapons in the productivity arsenal

are a series of internal policy changes that will have profound implications for applicants.

An EPO examination report typically allows four months in which to respond, extendible to six months by right. A summons to attend oral proceedings, normally the final opportunity for applicants to make their case during examination, is issued four to six months before the date of the oral proceedings. From this, it is feasible to hit the 12-month target by issuing a summons to attend oral proceedings as the second examination report during examination. In fact, the EPO has authorised Examiners to issue a summons to attend oral proceedings as the first examination report. This is in stark contrast to the previous system, which would often see Examiners issue three to four regular examination reports before running out of patience and issuing a summons to attend oral proceedings.

Applicants and Examiners are also being encouraged to shorten examination



through amicable means. The EPO is proactively reminding applicants that partial/full refunds of the examination fee are available for withdrawing their application before certain milestones - a 100% refund is available for withdrawal before examination begins and a 50% refund is available for withdrawal before a response is filed to the first examination report. Examiners are also increasingly telephoning applicants to suggest ways of overcoming objections, rather than issuing a full examination report.

### What can applicants do to prepare?

The EPO has been gradually implementing these policies over the past 12 months, but it is clear that the next 24 months will see a major acceleration for the EPO to meet its target. This means that pending applications and all new applications will be processed under the strictest implementation of the new policies.

For applications already under EPO examination, applicants should be mindful of the increased risk of being summoned to attend oral proceedings as the next examination report. If a regular examination report is issued, applicants may wish to take more decisive action to overcome outstanding objections rather than face a summons, such as by taking a conservative approach to claim amendments or telephoning the Examiner to gauge their likely reaction to an intended response strategy. For pending applications awaiting EPO examination, applicants can prepare for the increasingly time-constrained examination procedure by filing more

decisive responses before examination begins. All EPO applications receive an initial view on patentability before examination, which provides applicants with an opportunity to pre-emptively overcome anticipated examination objections. In the past, pre-examination responses were often used to try ambitious response strategies, safe in the knowledge that more conservative strategies could be adopted during examination if the initial strategies fail. This could now run the risk of a summons to oral proceedings being issued whilst the application is bogged down in formal objections under the new system, such as objections raised due to the notoriously strict approach of the EPO towards claim amendments, rather than progressing to more subjective issues like inventive step.

For applications yet to be filed, applicants may wish to amend their patent specifications before filing to add more EPO-specific basis for possible future amendments. This would help to avoid delays encountered when claim amendments are rejected due to the strict approach of the EPO mentioned above, as can often occur for applications originating from outside Europe where the hurdles associated with claim amendments are often lower.

### Can applicants resist the increase in speed?

At present, it is possible to slow down the pace of examination by obtaining extensions of time and only partially addressing objections raised in examination reports. Under the new system, the EPO may require justification

for granting extensions of time so this option may be restricted depending on the circumstances under which extensions will be granted. Further, only partially addressing objections raised in an examination report may be less attractive as it could increase the risk of provoking a summons to attend oral proceedings. Therefore, it may be much more difficult to stretch out examination.

However, the EPO is considering whether to allow applicants to formally defer examination for a period of three years, following intense lobbying from the biotechnology and pharmaceutical sectors. This proposal seems likely to come into force, with a more formal decision expected in the second half of 2018. The proposed system would not achieve an outright three-year hiatus, however, because it looks likely that interested third parties would be able to initiate examination by writing to the EPO to raise their own objections against an application (an existing mechanism known as 'third party observations'). Further, this will not affect the 12 month target when examination does eventually start.

Given the changes happening at the EPO, it seems likely that applicants will have to be more flexible in their prosecution strategy to complete examination within the 12 month target. In addition, having more proactive engagement with the Examiner can only help to resolve issues more quickly.



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# Patents



## The power of forward citations

Patents can teach you about the inventions they describe. However, patent metrics can tell you a lot more. One powerful patent metric is forward citations. Forward citations can allow you to gauge the potential value of your patent portfolio, and give you insight on new competitors.

### Master vs Improvement

To understand what forward citations are, and how they can be used, it is first important to fully understand the concept of Master Patents and Improvement Patents.

A patent gives you the right to stop others doing what the patent covers. For this reason, patents are often described as 'negative rights'. Anyone else who is doing what the patent covers is infringing, and you have the right to stop them.

The scope of a patent is a bit like territory within a new piece of land. Figures 1a and 1b give a couple of examples.

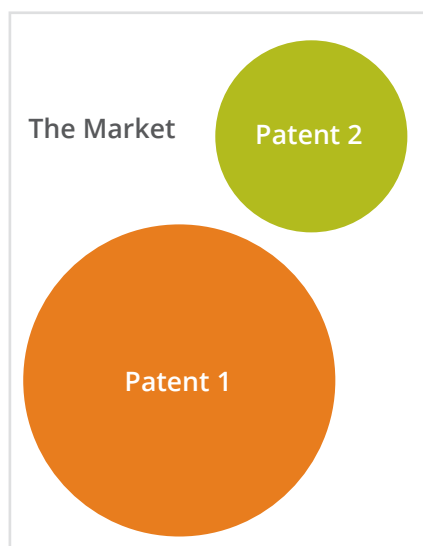


Figure 1a

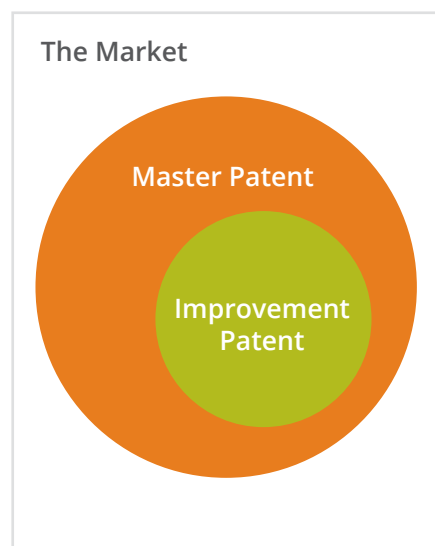


Figure 1b



Looking at Figure 1a: you might own Patent 1 and a competitor might own Patent 2. Both are in the same market, but cover completely different territory. However, this is not always the case: Figure 1b shows the situation where an Improvement Patent is within the territory of an earlier Master Patent. This can happen if the Improvement Patent covers an inventive improvement on a generic invention covered by the Master Patent. So for example the Master Patent covers a mouse trap, and the Improvement Patent covers a better mouse trap.

In this case, the owner of the Improvement Patent cannot sell the better mouse trap because it would infringe the Master Patent - i.e. it falls within the territory of the Master Patent. The opposite is also true: the owner of the Master Patent cannot sell the better mouse trap either since it falls within the territory of the Improvement Patent.

## Forward citations?

When you read the word "citation" you may be thinking of a backward citation. This is when you are writing something and reference a previous work. Figure 2 illustrates this point. When a patent office examines your patent application, they will find previously published documents usually in the same technical field. These documents are called 'prior art'. In order to get the patent application granted, you must persuade the patent office that your invention is new and clever, compared with the cited 'prior art'.

During this process the patent office focuses their searching on the claims of your patent application. The claims define the invention - i.e. they map out the territory shown in figures 1a and 1b. The "description" of your patent, on the other hand, gives a detailed example of your invention with all the bells and whistles.

Figure 2 shows how prior art is being cited against the claims in your patent. This information is stored and publically accessible.

Forward citations are the opposite of backward citations. So looking again at Figure 2: an Improvement Patent cites the description of your patent. This is a forward citation.

It's all a matter of perspective. From your perspective, the prior art is a backwards citation and the Improvement Patent is a forward citation.

## Feel the power of forward citations

### Competitors

Citations can be used to understand the competitive landscape of the market sector the invention, and by extension your business, is in.

Backwards citations tell a story of the past and how the innovation in that market sector has grown. Known competitors inhabit this space, so backward citations might not be very helpful if you are already aware of them. Sometimes prior art patent holders might have even gone out of business!

Forward citations however, might tell you about a new (previously unknown) competitor; or new activity of a known competitor.

Information about competitor activities might benefit your business strategy. The Improvement Patent from Figure 1b might be a new patent application which has cited your existing patent (which now has the exulted title of 'Master Patent'). Knowledge of the Improvement Patent might lead you to licence, cross-licence, or even sell your Master Patent to the new competitor. Alternatively, you may put them on notice.

### Patent valuation

Consider this scenario: a competitor has approached your business and wants a licence to your patent. How much do you licence it for?

As you can imagine there are lots of indicators you could use for this task; however, knowing if this competitor has cited your patent gives you an indication of whether they need your patent.

The sheer number of forward citations can also be a strong indicator of value. If there are a lot of forward citations, there may well be a lot of demand for your invention from competitors.

Consider another scenario: you own a large portfolio of patents and want to rank them in order of commercial value and abandon the bottom 10% to save money. Forward citations - normalised for age - can be a helpful metric to help with this daunting task.

### Search tools

A number of free search tools are available to look for forward citations. However, they can generally only return citations linked to a single patent.

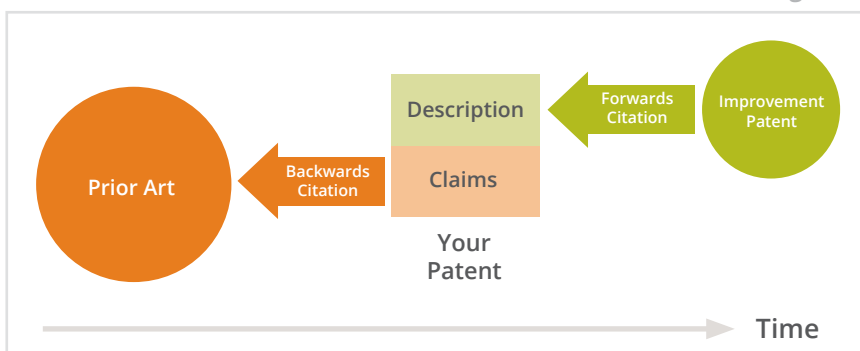
Withers & Rogers can provide you with a search which returns all forward citations (from within a limited period) which cite a patent in the name of your business.

We can set up regular alerts which notify you immediately when one of your patents has been cited by a competitor. In the alert, you can receive extra information analysing the strength of the opportunity, or the legal status of the Improvement Patent.

Forward citations can, if fully utilised, be incredibly useful for any business. Forward citations can clarify the competition and potential patent value. Finally, there are tools available that can easily help you or your business take advantage of your patent portfolio.

Contact your Withers & Rogers Attorney for more information on how we can use forward citations to advance your business interests.

Figure 2



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## Clean Tech



# Hydrogen fuel cells vs. rechargeable batteries

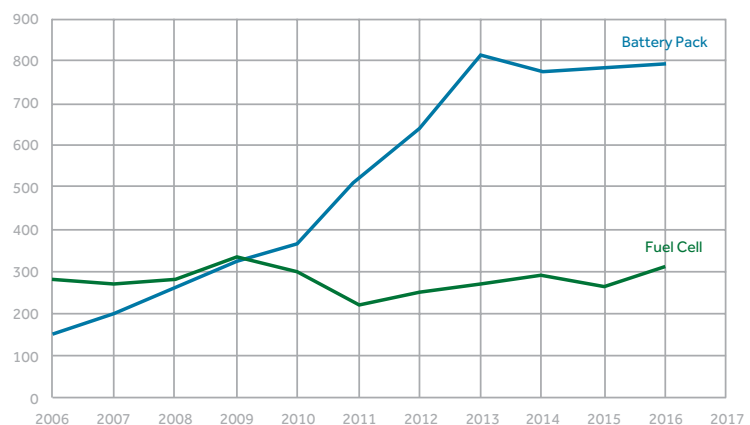
- which will power vehicles in the future?

The worldwide need to reduce CO<sub>2</sub> emissions and improve air quality is accelerating the international development of vehicles powered by hydrogen fuel cells and rechargeable batteries.

Here in the UK, the Government has published the Clean Air Plan and is proposing to ban the sale of all new petrol and diesel cars and vans from 2040. Hence, there is a genuine local urgency for alternative-powered vehicles.

Having mapped European patent filings for alternative-powered vehicles, we have found that innovation in hydrogen fuel cell powered vehicles has resulted in a steady stream of approximately 200 to 300

Comparison Fuel Cell vs Battery Pack Families filed in B60L





Alstom Coradia iLint hydrogen powered train and (c) Alstom / Michael Wittwer

European patent application filings each year. In direct contrast, the development of rechargeable battery powered vehicles has grown rapidly, and since 2013 approximately 800 European patent applications have been filed each year.

Does this mean that rechargeable batteries are better suited to powering vehicles than hydrogen fuel cells?

The trend in patent filings seems to be mirrored by the current sales numbers and increased consumer perception in the automotive sector. Last year, the number of battery powered cars on the roads worldwide rose to a record high of two million, according to research by the International Energy Agency.

In the UK, we are becoming familiar with battery powered car brands such as Tesla, Lucid and Faraday. Many of the major car manufacturers have introduced their own versions of battery powered cars as well. Rechargeable batteries are also used in the rail sector and Bombardier's Talent 3 EMU is a battery powered train suitable for short distances, for example in tunnels where overhead cables are difficult to install.

For hydrogen fuel cell technology, the main barriers to market have been the supply of hydrogen fuel and infrastructure requirements. The hydrogen fuel is obtained from water using an electrolysis process. Whilst hydrogen is available in abundance, the electrolysis process requires electrical power and this is

currently inefficient. However, wind farms are now increasingly being used to power electrolysis plants, so no CO<sub>2</sub> is produced when generating the hydrogen fuel in this way. Also, the Israel Institute of Technology has recently found a way of improving the efficiency of the electrolysis process by up to 100%. With the formation of the Hydrogen Council in 2017, the energy and transport industries are working together to see hydrogen technology play an essential role in global energy needs and they have pledged to invest 10 billion euros in hydrogen technologies and infrastructure over the next five years.

Indeed, with 8,000 worldwide patents related to hydrogen technology, it seems that Toyota are committed to the commercialisation of this particular type of alternative power and it has recently launched the hydrogen powered Mira car.

It is recognised that hydrogen fuel cells offer certain advantages over their rechargeable battery counterparts. For example, hydrogen has a much higher energy density, which gives a hydrogen powered vehicle a longer distance range. This higher energy density also means that hydrogen fuel cells are particularly well suited for powering heavier vehicles such as trains, buses and lorries. Consistent with this, ITM Power, who develop local hydrogen generating systems, have reported a strong order book linked to international growth in hydrogen powered buses and trains.

Just over a year ago, Alstom introduced the new Coradia iLint train, marketed as the world's first "zero-emission" hydrogen powered train. The iLint is intended to run on non-electrified tracks at 140 km/h, with a 600 to 800 km/tank load autonomy, and accommodate up to 300 passengers. A total of 14 fuel cell trains have already been commissioned by the Local Transport Authority of Lower Saxony in Germany and are scheduled to convey travellers between Cuxhaven, Bremerhaven, Bremervörde and Buxtehude from December 2021.

Without a doubt, the need to find alternatives to the internal combustion engine will continue to spur on innovation. Although battery powered vehicles have taken an initial lead, it seems that hydrogen power has advantages and there is a commitment to utilising it effectively for vehicles. So, returning to the original question of hydrogen fuel cells vs. rechargeable batteries, it seems that both hydrogen fuel cell and rechargeable battery technology will become mainstream power sources for transportation.



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## Patents



# Priority: lessons to be learnt

In recent months, the issue of priority at the European Patent Office has been brought to the forefront of people's minds in light of the high profile decision to revoke a patent covering the gene editing technology CRISPR.

When a patent is filed in a country that is a signatory of the Paris Convention or a member of the World Trade Organisation, the Applicant, or their successor in title, may, within twelve months, apply for protection in all the other member countries. This is known as the right to claim priority. This allows the later applications to be treated as if they were filed on the same day as the initial application for the purpose of determining relevant prior art and for assessing patentability.

This right to claim priority is enjoyed by the Applicant who filed the

initial application, whether this is a natural person or an entity with legal personality (e.g. a corporation). Where the Applicant is multiple persons, they are generally treated as each owning a share of an indivisible legal right.

In view of the fact the right to claim priority is an indivisible right, it is a principle of European case law that, in the situation where an initial application has multiple joint Applicants, a later application has to name all the Applicants of the initial application to enjoy a valid claim to priority from the initial application.

Alternatively, if the Applicant of the later application is not the person who filed the initial application, the Applicant must be that person's successor in title when the later application is filed. In practice, this means that an assignment from the Applicant of the initial application to his successor must take place before the filing date of the later priority claiming application.

In the case of the CRISPR decision, the CRISPR gene editing technology provides a cheap, efficient and easy way to precisely edit DNA. As such, the patents and applications directed to this technology have received much attention and are of high value.

It is very important to make sure you have the proper priority chain of title in place at the appropriate time because it is not possible to retroactively correct any errors.



The patent in question, EP2771468, was granted to the Broad Institute, MIT and Harvard University and was revoked after the filing of nine oppositions. This European application was filed naming Broad, MIT and Harvard University as Applicants and claimed priority from twelve US provisional applications, some of which named the inventors as Applicants.

There were four US provisional applications at issue before the European Patent Office but we need only consider one by way of example. The earliest US provisional application named only inventors as applicants, as was traditional practice in the US. All but one of these inventors were employees of, and had assigned their rights to, Broad, MIT, or Harvard. Therefore, these inventors had assigned their right to claim priority.

However, one inventor, Marraffini, was (and still is) a researcher at Rockefeller University. The European Patent Office considered that he was a joint Applicant, and he was therefore a joint holder of the right to claim priority from that application. Marraffini did not appear as an Applicant on the later European application, and no evidence was submitted to the proceedings that he had assigned his rights to The Broad Institute before the filing date of the European application.

As a result, the European Patent Office held that the right to claim priority in respect of this provisional

application had not been correctly assigned from the inventors named on the provisional application to the Applicants named on the European application. Therefore, the priority claim was considered invalid and the Applicants of the European application were not entitled to claim the filing date of the earliest US provisional application. Consequently, the claims of the patent were found to lack novelty over a number of documents which, as a result of the invalid priority claim, became relevant prior art, including the Applicant's own disclosures. Accordingly, the European Patent Office revoked the patent.

In view of recent case law of the European Patent Office, for example T0577/11, the decision was not a surprise to many. Furthermore, the UK courts reached the same conclusion in *Edwards Lifesciences AG v Cook Biotech Inc* [2009] EWHC 1304.

Following the decision, The Broad Institute immediately released a statement indicating that they intend to appeal the decision. It will therefore be some time before this story reaches its conclusion and the Appeal will be followed closely.

In the meantime, there are some practical points to follow to ensure that the right to claim priority is not compromised:

- Remember that the right to claim priority from an initial application is

a separate and distinct right from ownership rights in any invention(s) that may be disclosed in the application and/or patent rights ultimately granted in respect of such invention(s).

- All Applicants identified in an initial application must either be named on the later application, or have assigned their share of the right to claim priority to one or more of the Applicants named on the later application.

- If there is to be any change to the Applicant(s) between the initial application and the later application, it is imperative that the right to claim priority be transferred, via a written legal document, prior to filing the later application.

- If this is not possible, then it is advisable to name all the Applicants of the initial application (or applications, in the case of multiple priority claims) on the later application. It is always possible to transfer ownership of the application after filing.

It is very important to make sure you have the proper priority chain of title in place at the appropriate time because it is not possible to retroactively correct any errors, as was shown the hard way in the recent CRISPR case.



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## Augmented Reality

# Augmented reality: IP protection

The drive for augmented reality (AR) has given rise to a breadth of new technologies, especially in the areas of image processing, data processing, optics and communications.

As you may have seen from our article in the previous edition of the IP Review, AR technologies can be grouped into handheld AR, which is a key space for AR content developers, and head-mounted displays (HMDs). With increasing amounts of investment and public interest in AR, there comes the need to protect sufficiently the intellectual property (IP) in the technologies being developed to ensure a return on R&D investment costs. In this second article, we will take a closer look at how current patent applicants have been navigating the patent system to seek protection for handheld AR content and HMD technology.

### Handheld AR content

The space of AR content is growing rapidly, especially since smartphones became AR enabled. Because this is an area of significant expansion, overlaps between the concepts and ideas of different inventors can be expected. Additionally, since most AR content is embodied as software or as a computer program, AR content developers seeking

intellectual property ownership will most likely have to navigate around patentability exclusions which exist for computer related inventions, methods of gaming and abstract ideas, especially in the US and Europe.

Niantic, Inc. found themselves facing these problems of originality and patentability exclusions when pursuing their US patent application for "Linking Real World Activities with a Parallel Reality Game" [1]. Niantic initially claimed "a computer-implemented method for providing a parallel reality game". Paraphrasing their claim, this involved: hosting a virtual world on a game server with a geography that parallels the real world so that a user can navigate the virtual world by moving in the real world; and introducing game elements [i.e. Pokémon] linked to the real world into the virtual world and modifying these game elements based on player interactions. In other words, this describes the player interactions taking place in Pokémon GO, where a player would view and interact with game features linked to the real world from the

virtual world using their smartphone. Firstly, the claim was rejected for relating to an abstract idea - a direct exclusion from patentability under US law. The patent examiner particularly contended that the claim related to using a computer to perform a series of mental steps that can be regularly performed by a human, and the claimed computer elements of the claim such as a "game server" do not add meaningful technical contributions since they perform conventional and generic tasks. Secondly, the Examiner contended that the invention was fully disclosed in and thereby anticipated by existing prior art patent publications, including one from Microsoft [2]. Microsoft's publication related to "combining real-world actions and virtual actions in a gaming environment", which particularly involved users travelling to specific locations to complete virtual location-based tasks to gain rewards. This effectively highlights an overlap between Niantic's broad claim to location-based parallel reality games and existing similar concepts that could fall within that claim. However, Niantic's specific implementation of a



parallel reality game became a point for establishing novelty over the prior art. They stepped away from the broad concept of simply interacting with game elements in a parallel reality game, and instead limited the claim to specify that game elements are introduced to certain locations in the virtual world based on requests made by external real-world sponsors.

Whilst the first objection that the initially-claimed invention is an unpatentable abstract idea may seem unwarranted on the surface, the patent examiner's thoughts can find sympathy if the direct language of the initial claim is considered. The initial claim lacked any indication as to the technical mechanisms that would allow for modifications and interactions with the virtual world to take place, whilst merely stating that such steps occur. Hence, in the patent examiner's eyes, the claim only presented an idea or abstract concept of parallel-reality gaming, rather than a tangible invention that could execute this idea. In addition to the above amendments made to establish novelty, Niantic made amendments to ensure that each feature or step of the claim was linked to a technical component of the system. As an overall result, they were able to argue that their new claim solved a technical problem which led to improvements in how virtual elements can be placed in a virtual world, and therefore the new claim should be considered as both non-abstract and technical.

Considering what happened to Niantic's application, it is increasingly important to ensure that AR content developers file patent applications with a clear technical advantage or contribution to the AR field in mind, whilst containing enough technical content and implementation details to establish novelty over similar or overlapping ideas. From the perspective of patentability exclusions, although only the US Patent Office's abstract idea exclusion was discussed above, the European and UK Patent Offices have similar attitudes where they require for there to be a technical advantage or contribution by the invention for it to be patentable as a computer program or method of gaming.

## HMDs

HMD developers can gain IP protection for a number of aspects that complete

a HMD package. Firstly, we have seen patent applications directed towards the more fundamental operations and mechanical aspects of HMDs. For example, Daqri successfully made claim to a novel HMD with a retractable display, albeit after having to amend their claim to distinguish their HMD over a combat weapon-site helmet by explicitly claiming its application for more commercial AR [3]. Magic Leap may find success in protecting HMDs that use light field technology as opposed to "conventional" screen overlays [4].

However, novelty could fast become an issue when attempting to claim the more "conventional" fundamental aspects of HMDs. For example, Microsoft currently have a US patent pending for a Mixed Reality Display Device [5] which broadly attempts to claim a HMD that comprises a display, lens system and a curved Fresnel combiner. As expected for such a broad claim, the US Patent Office has found there to be a significant overlap with existing HMD technologies and has cited several patent publications that are believed to be relevant, including Google's "eyepiece for see-through head wearable display" which uses Fresnel reflections to guide the display light [6].

HMD developers may therefore find more value in claiming patent protection in more low-level functional or application specific features with respect to their use with HMDs. For example, Daqri have successfully made claim to a HMD comprising conventional features, and additionally memory storing instructions that can be executed to interpret visual gestures of a user in a specific technical way [7]. Similarly, Microsoft have successfully claimed for a HMD with conventional components, with the processors configured to detect and feedback emotions of a user [8]. In such cases, it could be tempting to abstract the claimed features away from HMDs in order to gain broader protection, e.g. for interpreting visual gesture or detect emotions not necessarily with a HMD. However, this may open the claimed invention up to citations of prior-art that may not be related to HMDs or even AR technology. However, as we have seen above, there is a risk of abstracting the idea too far and landing in the patentability exclusion zone.

IP protection for HMDs does not end with patents. Undoubtedly, the aesthetics of HMDs are almost of parallel importance to their technical performance, since this will be a determining factor of their success when they hit the marketplace. In this respect, there are plenty of registered designs being filed for HMDs, including by Magic Leap and Daqri who have registered 10 and 5 US designs, respectively. The term of registered design protection often exceeds the term of a patent, therefore can be a strong way to protect the aesthetic appearance and non-functional aspects of HMDs.



Overall, HMD developers can gain a package of IP protection to compensate for both the technical and aesthetic aspects of HMDs through a combination of patent and design protection. Where it might become difficult to establish novelty over the more fundamental technology in HMDs, developers can find value in claiming more functional or application specific features, where the claimed features are grounded in HMD hardware.

### References

- [1] US Patent Publication No. US9669296(B1), Niantic
- [2] US Patent Publication No. US2011/0319148 (A1), Microsoft
- [3] US Patent Publication No. US9625724 (B2), Daqri
- [4] US Patent Publication No. US2017293141 (A1), Magic Leap
- [5] US Patent Publication No. US2018003972 (A1), Microsoft
- [6] US Patent Publication No. US2016131907 (A1), Google
- [7] US Patent Publication No. US9652047 (B2), Daqri
- [8] US Patent Publication No. US9824698 (B2), Microsoft



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## Trade Marks



# The rise of the trade mark troll

The spectre of patent trolls has been around since the late 1990s. However, whilst this trolling behaviour is most well-known for patents, it can also affect companies and their trade marks.

One example of this is Michael Gleissner, a German-born entrepreneur, who is thought to own over 1,000 UK company names which have been listed as the applicant on thousands of trade mark applications filed all over the world. In particular, Gleissner has successfully registered popular English forenames, such as ELIZABETH, JOHN and PETER. Subsequently, Gleissner has sought to 'block' trade mark applications that include these names by filing oppositions and seeking a cost award in his favour.

The UK Intellectual Property Office (UKIPO) has become wise to this sort of behaviour and, for example, has refused to register the name ALEXANDER for Gleissner as a trade mark. It was found to be in 'bad faith' as the absence of any sound business reason to use the mark amounted to an abuse of the legal system.

Further, the UKIPO has also dismissed actions by Gleissner to cancel other companies' trade marks on the basis of non-use, again as these actions were in bad faith.

The UKIPO's tough stance is good news for brand owners as it is helping to prevent abuse of the UK trade mark system. However, it seems that it is still possible for third parties to attack brands for financial gain, especially as no equivalent approach has been taken by the EU Intellectual Property Office.

For example, Michael Gleissner filed eight non-use revocation actions against several

British Airways trade marks, including B.A. and CONCORDE. One of British Airways' marks was completely cancelled and six of the marks were partially cancelled, meaning Gleissner's action against British Airways was successful. Further, in this kind of situation, a tactic that has been used by trolls is to subsequently file trade mark applications corresponding to the revoked marks to arguably 'steal' a registered mark by re-filing it as their own.

It is worrying for brand owners that a third party can file non-use revocations and sit back while the burden of proof falls on the brand owner to compile evidence to demonstrate use of the mark in question. It is rare to see such actions but there are still third parties who possess the financial means to bully trade mark owners for material gain.

Overall, putting a stop to trolling behaviour is difficult. However, there may be steps that brand owners can take to mitigate against such threats:

- If you find yourself on the receiving end of a non-use action, we recommend re-filing your trade mark for the goods and/or services under attack.
- Furthermore, we would also advise trade mark, domain name and company name watches so that the registration of any blocking trade marks can be identified and potentially challenged.



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