

A good day for Ms. Schönefeld-Schnuck

The European Patent Office revokes Oerlikon's thin-film module patent



Institut de Microtechnique IMT

▲ In the 1990s, researchers Arvind Shah and Johannes Meier (right) contributed to the development of micromorphous solar cells at the Institute of Microtechnology at the University of Neuchâtel (this photograph is from 2003). Unfortunately, at least for Oerlikon, one of the members of Meier's group published research results in his dissertation back in 1995.

o Highlights

- Last year, Swiss company Oerlikon Solar launched a patent infringement lawsuit against a customer of its main competitor, Applied Materials
- The patent is considered the key to Oerlikon's promising micromorphous module technology
- For now, silicon thin-film module manufacturers can breathe a sigh of relief: the patent has been revoked

On March 31, 2009, in hall 1,113 at the Berlin branch of the European Patent Office (EPO) nearly 50 people filled the room – an unusually high attendance. The session was an important one: the schedule included a hearing over objections to patent EP 0871 979 B1 held by the Swiss University of Neuchâtel (see PI 8/2008, p. 50). Hidden behind this cold string of numbers was a controversy that could threaten the very existence of some PV companies.

The patent mentioned above covers thin-film modules made of micromorphous silicon, as well as the manner in which they are manufactured. Micromorphous modules are considered a promising technology with significant potential for improved efficiency. Turnkey production lines are already available for purchase. Swiss company Oerlikon Solar AG secured the exclusive rights to this technology. But several parties raised objections to the patent – among them thin-film pioneer Kaneka Corp., the world's largest cell manufacturer Q-Cells SE and thin-film module start-up Sunfilm AG. Another challenge came from Sabine Schönefeld-Schnuck, who is believed to be acting on behalf of Applied Materials Inc. Applied Materials supplied the production system to Sunfilm – and it is Oerlikon Solar's archrival.

These types of patent challenges can be raised within a 9-month period and are a typical weapon in the battle to secure creatorship for processes or products. But, until now, patent lawsuits have been rare in the PV industry. This one is particularly unusual, since the EPO hadn't even made its decision about the various objections to the patent. Oerlikon was unwilling to wait for the EPO's decision. In June 2008, the

company filed a lawsuit against Sunfilm at the Dusseldorf district court for patent infringement, which it then announced to the public in a press release. Confirmation of Oerlikon's patent, which the EPO initially approved on June 14, 2006, would essentially give the Swiss company a monopoly on micromorphous technology in Europe. Naturally, if that happened, the Oerlikon Group, whose only promising business is PV, would be on cloud nine. Therefore, it was no surprise to see all of the major silicon thin-film module manufacturer's patent lawyers at the EPO hearing. It took a solid 7 hours before chairperson Andre Werner concluded the hearing with the following words: Patent EP 0871 979 B1 is revoked. Relief was clearly visible on the faces of the majority of listeners in the hall.

And Applied Materials ensured the decision was immediately heard worldwide. Within a few hours, the company, which is listed on the stock exchange and located in Santa Clara, California, issued a short and crisp press release: »The EPO panel ruled that the Neuchâtel patent is invalid in its entirety and accordingly revoked the patent.«

An overlooked PhD dissertation

The basis for the EPO's decision was a dissertation submitted back in the 1990s, which was discovered by Sabine Schönefeld-Schnuck's patent lawyer Frank Peterreins of US firm Fisch & Richardson PC in the library in Neuchâtel. The PhD thesis, written by Roger Sylvain Flückiger, carries the title: Microcrystalline silicon thin films deposited by VHF plasmas for solar cell applica-

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Value can be calculated

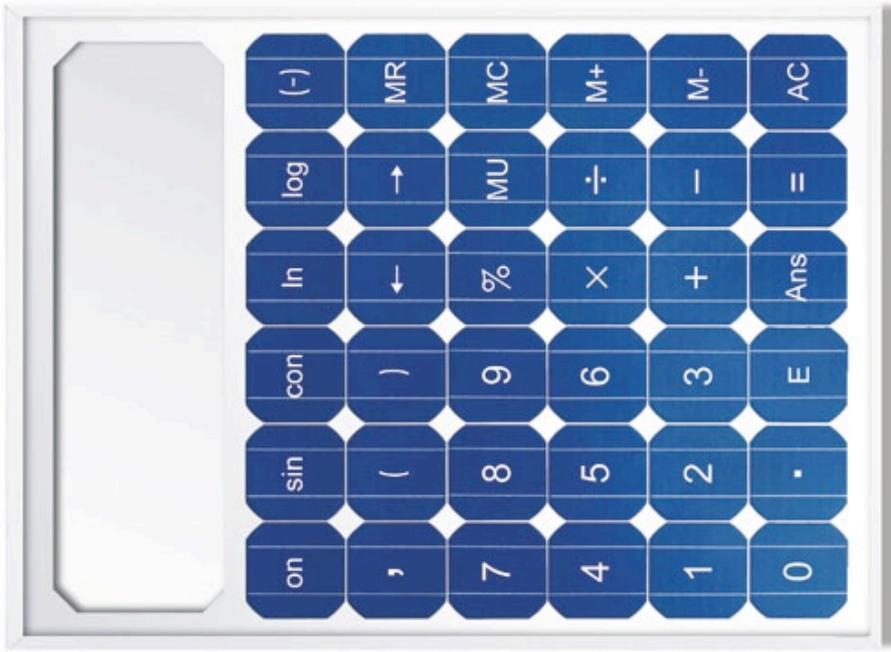
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- Solar cell efficiency
- Output power
- Product categories
- Product quality
- Service
- Clients' return
- Clients' competitive advantages
- ...

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- Solar cells required for components
- Module installation area
- Logistic cost
- BOS cost
- Labor cost
- Land cost
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▲ Oerlikon's CEO Jeannine Sargent intends to take the revocation of patent EP 0871 979 B1 to the European Patent Office's board of appeals.

tions. This scientific work, which was produced by the research group under Johannes Meier at the University of Neuchâtel, describes the production of a micromorphous solar cell with 2×10^{19} oxygen atoms per cm^3 in November 1995. The patents held by Kroll and Meier also specify modules with a particular maximum quantity of oxygen atoms in the intrinsic microcrystalline silicon layer: less than 2×10^{19} oxygen atoms per cm^3 . This intrinsic layer, which separates the positive- and negative-doped layers, is not only a part of the cell used in Oerlikon's micromorphous technology, but is also a commonly used layer in silicon tandem thin-film modules. The application for the patent by Kroll and Meier – today, the latter is CTO at Oerlikon Solar – was submitted for at the end of October 1996. Thus, Flückiger's dissertation was submitted almost a year prior. Kroll and Meier showed no inventive step in the case of EP 0871 979 B1, concluded EPO chairperson Werner, stating that the dissertation makes patentability impossible.

The attempt by the University of Neuchâtel's lawyer to prove an inventive step on the part of Meier and Kroll by altering the interpretation of terminology was unsuccessful. Even the simultaneous Japanese translator was speechless. The lawyer also failed when trying to retroactively redefine the meaning of the intrinsic layer: according to the redefinition, the intrinsic layer, with the aforementioned oxygen atom

concentration, is produced due to the purity of the process gases and not the compensation of electrical charges.

It took Oerlikon a day longer than Applied Materials to issue a statement. »We are convinced of our patent's validity and therefore the University of Neuchâtel will appeal the decision,« said Christophe Ballif, director of the university's PV laboratory. Oerlikon CEO Jeannine Sargent agreed with Ballif: »Oerlikon Solar disagrees strongly with the decision of the EPO. The validity of the patent remains in force pending a final decision regarding University of Neuchâtel's appeal.« Legal experts agree with the latter statement: »According to the law, the patent is revoked, but that won't be legally binding until the appeal is rejected or if it isn't submitted,« says patent expert Jan Stütz. Thus, the fight moves to the next round.

On the civil law front, the Dusseldorf district court hadn't come to a decision on the case of Oerlikon vs. Sunfilm when we went to print. It's reasonable to assume that the judge in this case will be influenced to a certain degree by the EPO's decision. If the lawsuit is heard and rejected, then the path would be free for micromorphous silicon thin-film module companies – assuming the companies are able to produce them cost-effectively. ●

Text Olga Papathanasiou