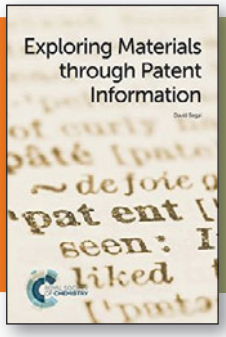


Exploring Materials through Patent Information

David Segal

Royal Society of Chemistry, 2014
266 pages, $38.90
ISBN 978-1-78262-112-6

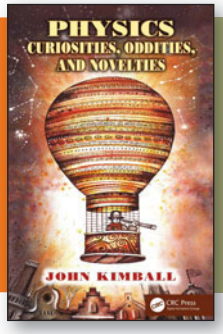
This book does exactly as its title proposes and describes several classes of materials in terms of patents that have been awarded toward their practical application. Following a good introduction about patents in general, how to file one, and how to research them, Segal provides a credible patent history for a range of materials: light-emitting diodes (LEDs), including quantum dots, organic LEDs, and liquid-crystal displays, three-dimensional printing, health care, block copolymers, aerogels, ionic liquids, flame retardants, graphene, hydrogels, and superhydrophobic materials. The chapters first describe the fundamentals of each technology, and then describe how specific patents improved upon the technology.

I found it very unusual to read a "patent history" of a material instead of learning its history from academic literature. For instance, Segal devotes four chapters to LED technology. His approach is to give a brief technological background to LEDs, referencing a few papers in the literature, and then to give the historical case for the patents toward LED commercialization. To Segal's credit, his approach was almost the same as Dr. Hiroshi Amano's, one of the 2014 Nobel laureates for blue LEDs, but more technology driven.

The book left me wondering how Segal identified which patents were critical to a material's development. While writing a material's history from published literature, it is relatively easy to link key papers through their numbers of citations, but such lists do not seem to exist for the materials described in the book. Did he somehow know that these patents were licensed? While his motivation to write the book is to encourage researchers to delve into the patent literature to assist their research, it is not clear how one goes into a search engine and finds out which technology patents are key, as Segal was able to do.

Despite my confusion about how the key patents were selected from patent databases, this book certainly fills a gap in the literature about how patents play a crucial role in a material's history and development, and would be useful to anyone researching or seeking to file a patent in the topical areas covered in the book. It would also be invaluable to any materials scientist who is interested in patent law or students interested in becoming patent lawyers, because it shows, to some degree, how materials development goes hand in hand with patents. The introduction is also valuable to the general reader because it describes the patent process and how to search the patent literature. The book could be used as a patent history for the specific materials covered, but not as a blueprint for how one would fin d or develop a patent history for other materials.

Reviewer: Karen Swider Lyons *researches fuel-cell and battery materials and their integration into naval systems in Alexandria, Va., USA.*



Physics, Curiosities, Oddities, and Novelties

John Kimball

CRC Press, 2015
380 pages, $34.95
ISBN 978-1-4665-7635-3

Galileo Galilei (1564–1641) stated, "The book (of nature) is written in mathematical language." John Kimball has tried the impossible: Summarizing the whole of physics in 380 pages and 207 figures almost without using the "language of nature," mathematics. The topics range from Newton's laws of movement to Einstein's theory of relativity, to Maxwell's electrodynamics, to Planck's quantum physics, leading to tunneling phenomena and dark energy. Is this possible? My answer is yes and no. The author explains everything in plain, well-understandable words. However, all physicists know that quantum mechanics and relativity cannot be described using words alone—many of these facts are immediately clear using appropriate mathematics. However, Kimball is not the first one to fall into this trap; he has famous predecessors (e.g., Einstein's popular explanation of simultaneity in his special relativity is also unclear). Knowing these problems, I have to say that this author did a great job. I cannot imagine a better explanation of the whole of physics in plain text. Certainly, other physicists may have problems with the way he introduces physical laws (e.g., he introduces the concept of entropy according to Shannon from the side of information theory). Personally, in an elementary introduction, I would prefer the "older" Boltzmann approach. Without mathematics, the descriptions of these connections are nearly impossible, but Kimball selected a great compromise. The sections on the latest developments in physics are very short, but clear and full of information. In this context, the description of particle physics using Feynman diagrams and quantum electrodynamics