

Merged with a Semiconductor-Patent Firm

March 1, 2007

RYUKA merged with a patent firm, Hayashi & Associates that had been specialized in semiconductors, on March 1, 2007.

The founder of Hayashi & Associates, Mr. Shigenori Hayashi, had been a researcher at Semiconductor Energy Laboratory Co., Ltd. (SEL) from 1986 to 1995. 68 Japanese patents and 57 US patents naming Mr. Hayashi as an inventor have been granted as of April 2007, through his work at SEL that included the following published technologies and news, for example.

- **Ultraviolet Source for CVD**

- Improved the strength and lifetime of vacuum ultraviolet sources used for photo-excited chemical vapor deposition (CVD).
- Developed high-strength vacuum ultraviolet sources, which were mounted on SEL's photo-excited CVD apparatuses called hv-2.
- Developed measuring apparatuses for the intensity of vacuum ultraviolet ray during the course of the research.

- **Plasma CVD Applications**

- Developed processes for forming diamond like carbon (DLC) films by means of positive column plasma which was the technology unique to SEL.
- Applied DLC technology to form protective films for organic photoconductor (OPC) for use in copier engines and developed apparatuses for forming OPC protective films (DLC films) for Richo Co., Ltd.

- **Atmospheric Pressure Glow Discharge**

- Researched application of atmospheric pressure glow discharge to the wafer fabrication process with Professor, Hideomi Koinuma of Tokyo Institute of Technology, and developed experimental atmospheric pressure glow discharge apparatuses.

- **TFT for liquid crystal displays (LCDs)**

- Developed a process for fabricating thin film transistors (TFTs) and analyzed their reliabilities.
- Researched properties of silicon activated layers, which determine the success

of high-mobility TFTs.

- Dispatched to Giant Electronics Technology Co., Ltd., which is a project launched under the initiative of the Ministry of Economy, Trade and Industry (then Ministry of International Trade and Industry) to develop large-screen LCD panels.

- **Patent licensing**

- Visited potential licensees with Mr. Shunpei Yamazaki, the president of SEL, explained technologies of SEL patents, and achieved great success.

- Testified at trials as a technical expert, and prepared experimental result certificates.

Recognizing significances of patents at SEL, Mr. Hayashi moved to a patent law firm in 1995 and worked as a technical specialist and an associate until founding Hayashi & Associates in 2001. His practice focused on the patent prosecution in the following fields.

- **Semiconductors:**

DRAMs, manufacturing processes of CPUs for large-sized general purpose devices, GaAs/GaN compound semiconductor devices and wafer fabrication processes, and the like.

- **Computer Systems:**

CPU cores, computer hardware including bus systems and pipeline control systems, hard disk devices, magnet-optical disk devices, MRAM memory elements, nano devices, and the like.

- **Computer Software:**

TCP/IP networks, various applications through the use of the Internet, GUIs, protocols of various types, character recognition, voice recognition, data mining, natural language processing, and the like.

- **Inorganic Materials:**

Activated carbon and use of activated carbon.

In 2007, Hayashi & Associates merged with RYUKA for the growth and globalization. We would like to maximize this opportunity to improve our services for our clients. Should you have any question, please contact me at cases_to_jp@ryuka.com.

Thank you.

Akihiro Ryuka