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Patent protection in era of Industry 4.0

By Ivy Chin, Lee and Li

Industry 4.0 introduces the concept of a “smart factory”, in which cyber-physical systems monitor the physical processes of the factory and make decentralized decisions, thereby upgrading manufacturing capabilities and improving business models.

Smart factories may be more adaptable and resource-efficient than traditional ones because the former can automatically collect information, such as information from customers or suppliers, and on environmental conditions, and can optimize production lines.

These elements must be present in order to be considered a smart factory: (1) a fast, secure network system; (2) standardized data formats; (3) embedded digital product memories for mass customization; (4) smart sensors for capturing context information; (5) communication between machines and products through the factory’s internet system; and (6) decentralized item-level production control.

These six elements involve the development of hardware devices, the standardization of data formats or communication processes, the design of computer programs for production control, the development of software for collecting and processing bulk data, and the application of artificial intelligence.

Technology-related IP may be protected via trade secrets, copyrights or patents, with patents the most aggressive instrument. In Taiwan and mainland China, there are three types of patents: invention patents, utility model patents and design patents. Only invention patents can protect inventions related to computer program processes.

As a result of the 1 April 2017 amendment, the Chinese Patent Examination Guidelines now provide that if a claim is directed to a method or rules for mental activities, and includes a technical feature(s), the claim should not be excluded from patentability under article 25 of the Patent Act, which stipulates that an invention that merely relates to rules for mental activities is not patentable. That is, software-related inventions and production control processes may be patentable if they have a technical feature.

The China guidelines further indicate that an invention related to a computer process is patentable if it meets the following requirements: (1) the objective of the invention is to solve a technical problem; (2) the computing process operating on the computer for controlling the internal or external devices implements a technical means that is in conformity with the laws of nature; and (3) the technical effect achieved by the invention is in conformity with the laws of nature. Therefore, inventions that merely relate to data formats may not be patentable.

Taiwan amended its patent examination guidelines in 2014 to provide patent protection to computer program-related inventions, and business method-related inventions under certain circumstances. The relevant provisions are listed below.

- The computer program-related invention seeking patent protection cannot be source codes or object codes, both of which can be protected by way of copyright.
- The computer program-related invention seeking patent protection must have a technical character and must be able to solve a technical problem(s).
- A computer program-related invention that implements a business method cannot be deemed to be unpatentable subject matter merely on the grounds that it is related to the business method.
- Neither a mere presentation of information nor a simple use of a computer is patentable subject matter.

A mere presentation of information, such as a data format or the arrangement of a graphical user interface, is unpatentable subject matter because it is not a creation of technical ideas. However, a mere

presentation of information is patentable if it can, upon interaction with computer algorithms, produce a technical effect, such as providing a more efficient human-machine interface by increasing the precision of the input device or reducing the complexity in operating the computer.

A simple use of a computer refers to the replacement of human work by a computer, and if that use merely provides obvious advantages such as higher computing speed, higher accuracy, or handling more data, it does not have a technical character. Nevertheless, a computer software-related invention is not considered a simple use of a computer if it can overcome a technical problem and can produce a technical effect, such as enhancing data security, increasing system efficiency, or strengthening the system, and thus is patentable subject matter.

Industry 4.0 has led to significant industrial changes around the world, and in response to these changes many multinational companies have heavily invested in research and development to build up their own smart factories. Computer program-related technology plays a major role in the development of Industry 4.0, and different jurisdictions have different requirements for obtaining patent protection for this type of technology.

In order to obtain comprehensive patent protection, patent prosecution strategies should be formulated with assistance of intellectual property experts based on the law of the jurisdictions in which patent protection is to be sought.

IVY CHIN is a counselor at Lee and Li Attorneys-at-Law in Taipei