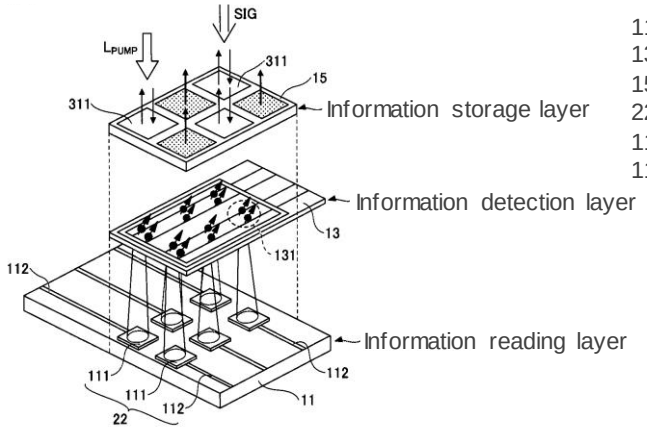
Tohoku Univ. Technology

Optical spin device, its operation method and information storage device

Able to keep non-volatile magnetic information and to operate at high-speed with low power consumption



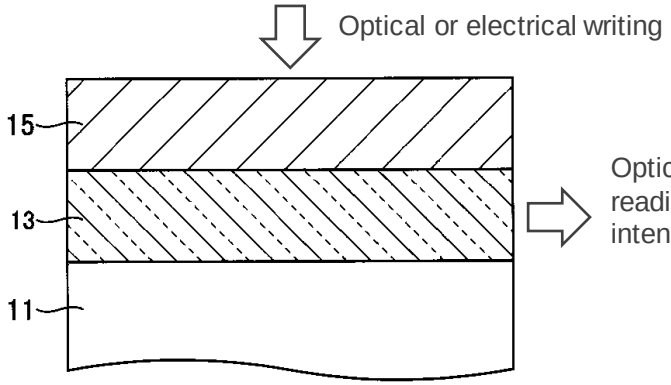
11. Substrate
13. Spin defect layer
15. Magnetic material layer
22. Photodetector layer
111. Photodiode
112. Wiring

Overview

Currently, further improvement of memory storage density is required with the information society development. The magnetoresistive random-access memory (MRAM), which can record information non-volatilely for a long time, is expected to replace semiconductor memory as the next-generation memory. However, the performance is lower than semiconductor memory in term of power consumption, operating speed and signal delay, and has a low compatibility with optical information technology.

This invention is able to provide an optical spin device that can store information non-volatilely and operate at high speed with low power consumption, and to provide an information storage device using this device. This invention has a magnetic material layer and a spin defect layer. It can store magnetic information non-volatilely and can operate at high speed with low power consumption. In addition, the information storage device equipped with this optical spin device is able to write and read information at high speed and high sensitivity, and is highly compatible with optical information technology, which is expected to develop rapidly in the future.

Using light and electron spin reduces significantly power consumption and increases writing speed



11. Substrate
13. Spin defect layer
15. Magnetic material layer

Product Application

- ☐ Information storage device
- ☐ Memory

Related Works

IP Data

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