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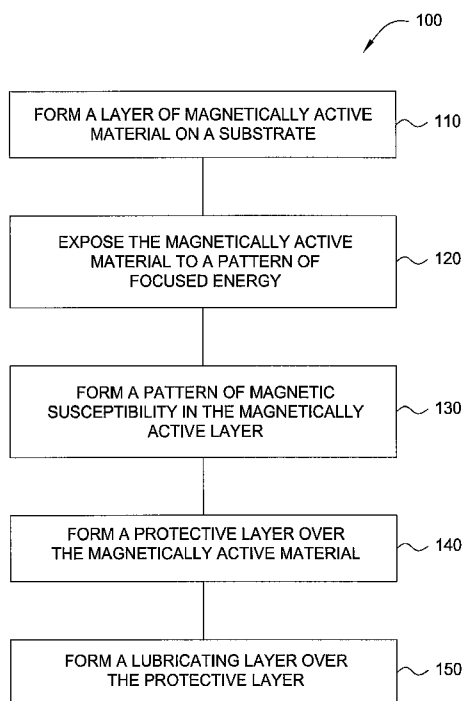
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[Continued on next page]

(54) Title: HDD PATTERN APPARATUS USING LASER, E-BEAM, OR FOCUSED ION BEAM



(57) Abstract: A method and apparatus for manufacturing magnetic storage media is provided. A structural substrate is coated with a magnetically active material, and a magnetic pattern is formed in the magnetically active material by treating portions of the material with energy from a laser, e-beam, or focused ion beam. The beam may be divided into a packet of beamlets by passing the beam through a divider, which may be a diffraction grating for laser energy, a thin film single crystal for electrons, or a perforated plate for ions, or the beam may be generated by an array of emitters. The beamlets are then focused to a desired dimension and distribution by optics or electric fields. The resulting beam packet may be shaped further by passing through an aperture of any desired shape. The resulting beam may be applied sequentially to exposure zones to treat an entire substrate or plurality of substrates.

FIG. 1

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According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC: G11B; B05D; H01J; B44C; B05B; H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) &amp; Keywords:beam, laser, magnetic\*, hard disk, pattern, lens

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Y	US 2006-0044946 A1 (GAVIN NICHOLAS PHILLIPS) 02 March 2006	1-7
X	See abstract; paragraphs [0026], [0036]-[0038]; figures 1, 3; claim 1	8-10
A		11-15
Y	US 2004-0259036 A1 (CLAUDE CHAPPERT et al.) 23 December 2004	1-7
A	See abstract; paragraphs [0085]-[0093]; claims 12-15	8-15
A	US 2001-0048568 A1 (HIROYUKI IKEDA et al.) 06 December 2001	1-15
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A	US 6365061 B1 (LEWIS S. DAMER et al.) 02 April 2002	1-15
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A	US 7153366 B1 (HONG CHEN et al.) 26 December 2006	1-15
	See abstract; col.3 lines 29 - col.5 lines 43; figure 2	

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

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