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(54) **Title**: MODIFICATION OF MAGNETIC PROPERTIES OF FILMS USING ION AND NEUTRAL BEAM IMPLANTATION

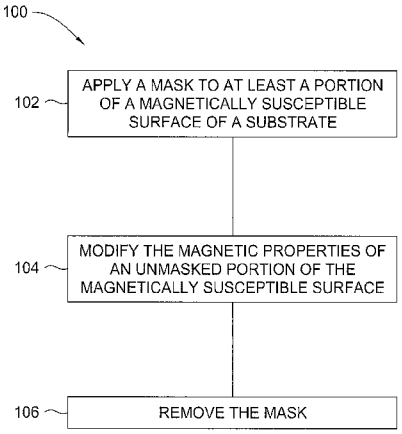

FIG. 1A

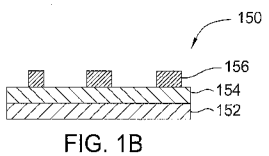

FIG. 1B

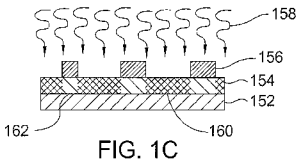

FIG. 1C

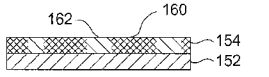

FIG. 1D

(57) **Abstract**: Methods and apparatus for forming substrates having magnetically patterned surfaces is provided. A magnetic layer comprising one or more materials having magnetic properties is formed on the substrate. The magnetic layer is subjected to a patterning process in which selected portions of the surface of the magnetic layer are altered such that the altered portions have different magnetic properties from the non-altered portions without changing the topography of the substrate. A protective layer and a lubricant layer are deposited over the patterned magnetic layer. The patterning is accomplished through a number of alternative processes that expose substrates to energy of varying forms.

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