

LICENSING OPPORTUNITY

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Patents status

US, pending
"Methods and apparatus for patterning a surface"

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Methods and apparatus for patterning a surface

The present invention relates to the field of surface patterning. Electron beam lithography has successfully been employed in a variety of industrial applications to fabricate very small structures. Effective lithography is often slow and expensive for many applications. Other lithography techniques, such as the alkane thiols based, have several limitations. The main limitation is the adaptation of the laboratory technique to industrial applications due to difficulties encountered while trying to achieve simultaneous control of multiple time-dependent, or rate dependent, processes.

The invention is providing methods and apparatus for patterning surfaces, based on thioethers absorbed on surfaces, that overcome drawbacks associated with prior art techniques. The methods of the present invention have several advantages over the prior art techniques. First, no mass is actually transferred from the conducting stamp to surface. Second there is no need to optimize a rate of ink-substrate reaction relative to diffusion and flow of ink on the substrate. Third, since the thioether is multivalently bound to the substrate, its rate of surface diffusion after pattern transfer is exceedingly low. Finally the properties of the stamp may be optimized independently of considerations about interactions with the thioether.

Main advantages

- No mass transfer from stamp to surface.
- No need for ink flow rate optimization.
- No surface diffusion of coating material since the material covers the entire surface.
- No need taking into consideration of surface-stamp interactions when optimizing the stamp.

Potential Commercial Applications

- Easy industrial scaling up of the patterning technique due to absence of multiple time and rate dependent interacting processes.
- Can be adapted for use in an etching or deposition process.