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**Colburn et al.**

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(54) **GRATINGS WITH VARIABLE ETCH HEIGHTS FOR WAVEGUIDE DISPLAYS**

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| ***G02B 6/34*** | (2006.01) |
| ***G02B 5/18*** | (2006.01) |
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CPC ..... ***G02B 6/124*** (2013.01); ***G02B 5/1857*** (2013.01); ***G02B 5/1861*** (2013.01); ***G02B 27/0172*** (2013.01); ***G02B 27/42*** (2013.01); ***H01J 37/3056*** (2013.01); ***H01L 21/0274*** (2013.01); *G02B 2006/12107* (2013.01); *H01J 2237/0812* (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

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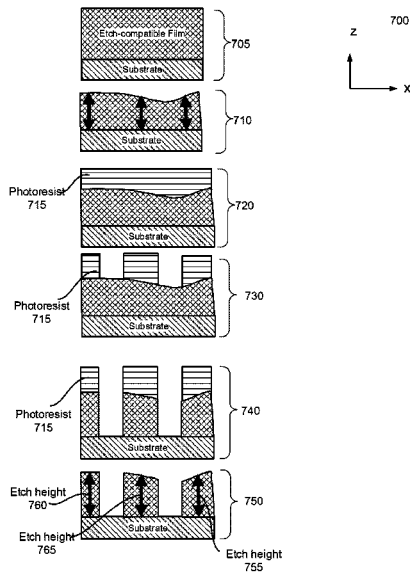
(57) **ABSTRACT**

A manufacturing system performs a deposition of an etch-compatible film over a substrate. The etch-compatible film includes a first surface and a second surface opposite to the first surface. The manufacturing system performs a partial removal of the etch-compatible film to create a surface profile on the first surface with a plurality of etch heights relative to the substrate. The manufacturing system performs a lithographic patterning of a photoresist deposited over the created profile in the etch-compatible film to obtain the plurality of etch heights and one or more duty cycles corresponding to the etch-compatible film deposited over the substrate.

**21 Claims, 15 Drawing Sheets**