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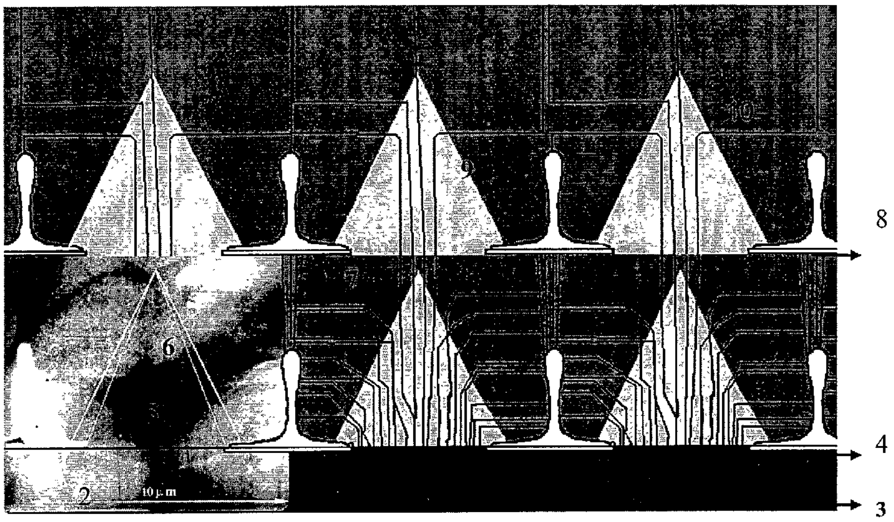
Declaration under Rule 4.17:
— *of inventorship (Rule 4.17(iv)) for US only*

[Continued on next page]

(54) Title: MANUFACTURING GALLIUM NITRIDE SUBSTRATES BY LATERAL OVERGROWTH THROUGH MASKS AND DEVICES FABRICATED THEREOF



(57) **Abstract:** Gallium nitride substrates are grown by epitaxial lateral overgrowth using multiple steps. On a masked substrate having openings areas, selective growth produces first triangular stripes in which most of the threading dislocations are bent at 90°. In a second step, growth conditions are changed to increase the lateral growth rate and produce a flat (0001) surface. At this stage the density of dislocations on the surface is <5x107cm 2. Dislocations are primarily located at the coalescence region between two laterally grown facets pinching off together. To further decrease the dislocation density a second masking step is achieved, with the openings exactly located above the first ones. Threading dislocations (TDs) of the coalescence region do not propagate in the top layer. Therefore the density of dislocations is lowered below <lxl07cm lover the entire surface.

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7   H01L21/20   C30B29/40   H01S5/00

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B. FIELDS SEARCHED

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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