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(72) Inventors:
• **Rovira Más, Francisco**
46022 Valencia (ES)
• **Cuenca Cuenca, Andrés**
46022 Valencia (ES)
• **Sáiz Rubio, Verónica**
46022 Valencia (ES)

(71) Applicant: **Universitat Politècnica de València**
46022 Valencia (ES)

(74) Representative: **Manuel Illescas y Asociados, S.L.**
C/ Príncipe de Vergara 197, Oficina 1ªA
28002 Madrid (ES)

(54) **METHOD, SYSTEM AND ROBOT FOR AUTONOMOUS NAVIGATION THEREOF BETWEEN TWO ROWS OF PLANTS**

(57) A method, system and robot for autonomous navigation thereof between two rows of plants, wherein said robot comprises two or more sensing devices, sensor A and sensor B, mounted thereon and moves forward along an axis parallel to the rows of plants, being autonomously steered by exerting angular corrections to place the robot as close as possible to the centerline between the rows of plants, wherein each sensing device is a device which detects electromagnetic waves or detects sound waves, and wherein said method and said system comprises the following:

- (i) defining a two-dimensional grid of square cells in said plane;
- (ii) dividing the two-dimensional grid of square cells into $I_G \cdot J_G$ groups of cells;
- (iii) obtaining a maximum of k data points using sensor A and a maximum of m data points using sensor B;
- (iv) converting each data point into a discretized data point;
- (v) calculating a fusion function value for each cell (h,v)

of said two-dimensional grid;

(vi) calculating for each group of cells (i,j) (om_{ij}):

(a) the cumulative total of fusion function values, $CUM_{ij}(h)$; and

(b) the sum of all cumulative totals of fusion function values, SUM_{ij} ;

wherein when:

- $SUM_{ij} \geq ||0.4 \cdot \overline{OM}||$ said group of cells is classified as high-activated; and

- $SUM_{ij} \geq ||0.2 \cdot \overline{OM}||$ and $< ||0.4 \cdot \overline{OM}||$ said sub-volume is classified as low-activated,

wherein $\overline{OM}$ is the maximum SUM_{ij} value determined for any group of cells (i,j) (om_{ij});

(vii) moving the robot:

(a) by turning right; or

(b) by turning left; or

(c) forward without turning,

depending on whether each group of cells is low-activated, high-activated or not activated.

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Figure 2

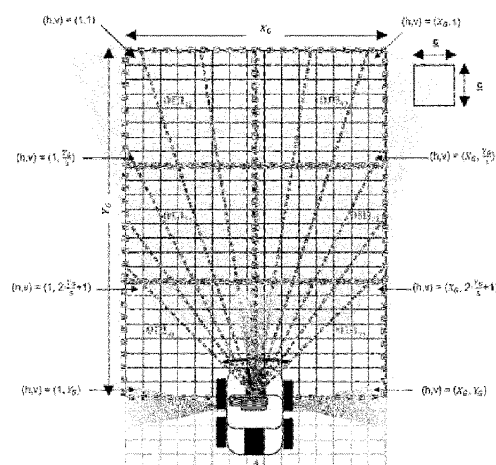


Figure 3

