CLAIMS

1) Method for producing a three-dimensional object in layers by means of a stereolithography machine (1) of the type comprising:

- a container (2) for containing a liquid substance (3) suited to be solidified through exposure to predefined radiation (4);
- means (5) for emitting said predefined radiation (4), suited to selectively irradiate a layer (6) of said liquid substance (3) having a predefined thickness and arranged adjacent to the bottom (2a) of said container (2) in order to solidify it;
- a supporting surface (6a, 7a) for said solidified layer (6'), facing the bottom (2a) of said container (2);
- actuator means (8) suited to move said supporting surface (6a, 7a) with respect to said bottom (2a) at least according to a direction (Z) perpendicular to said bottom (2a);

said method comprising the following operations:

- moving said supporting surface (6a, 7a) near said bottom (2a) through a mutual positioning movement (11; 11'), in such a way as to arrange it in contact with said layer (6) of liquid substance in a predefined operating position (17);
- with said supporting surface (6a, 7a) in said operating position (17), selectively irradiating said layer (6) in such a way as to solidify it,

**characterized in that** said positioning movement (11; 11') comprises a plurality of approaching moves (12, 12a, 12b, 12c) having corresponding predefined lengths (13, 13a, 13b, 13c), spaced by corresponding intermediate stops (14, 14a, 14b) for corresponding predefined time intervals (15, 15a, 15b), said intermediate stops (14, 14a, 14b) being carried out when said supporting surface (6a, 7a) is at least partially immersed in said liquid substance (3).

2) Method according to claim 1, **characterized in that** the value of at least one parameter selected among the lengths (13, 13a, 13b, 13c) of said approaching moves (12, 12a, 12b, 12c), the number of said intermediate stops (14, 14a, 14b) and the corresponding time intervals (15, 15a, 15b) is determined before starting said positioning movement (11; 11').

3) Method according to claim 2, **characterized in that** the values of said selected parameters (13, 13a, 13b, 13c, 14, 14a, 14b, 15, 15a, 15b) are calculated as a function of the surface area of said supporting surface (6a, 7a).

4) Method according to claim 3, **characterized in that** the values of said selected parameters (13, 13a, 13b, 13c, 14, 14a, 14b, 15, 15a, 15b) are calculated as a function of the ratio between said surface area and the perimeter of said supporting surface (6a, 7a).

5) Method according to any one of claims 3 or 4, **characterized in that** said calculation of said selected parameters (13, 13a, 13b, 13c, 14, 14a, 14b, 15, 15a, 15b) comprises the following operations:

- dividing said surface area of said supporting surface (6a, 7a) into a plurality of cells;
- assigning each cell a weight proportional to the number of cells adjacent to said cell;
- summing up said weights in order to obtain a shape parameter;
- calculating the values of said selected parameters (13, 13a, 13b, 13c, 14, 14a, 14b, 15, 15a, 15b) according to said shape parameter.

6) Method according to any of the preceding claims, **characterized in that** the approaching moves (12a, 12b, 12c) following the first one of said intermediate stops (14) have respective lengths (13a, 13b, 13c) that are equal to each other.

7) Method according to any of the preceding claims, **characterized in that** said supporting surface (6a) belongs to said solidified layer (6') of said three-dimensional object.

8) Method according to any of the claims from 1 to 6, **characterized in that** said supporting surface (7a) belongs to a modelling plate (7) belonging to said actuator means (8).

9) Method according to any of the preceding claims, **characterized in that** the last one of said approaching moves (12c) is such as to move said supporting surface (6a, 7a) beyond said operating position (17), said positioning movement (11') ending with a receding move (12d) of said supporting surface (6a, 7a) away from said bottom (2a).

10) IT programming product comprising a data support provided with software portions configured so that, when executed on a programmable device, they make said programmable device configured so as to control a stereolithography machine (1) according to the method claimed in any of the claims from 1 to 9.

11) Stereolithography machine (1) comprising:

- a container (2) for containing a liquid substance (3) suited to be solidified through exposure to predefined radiation (4);
- means (5) for emitting said predefined radiation (4), suited to selectively irradiate a layer (6) of said liquid substance (3) having a predefined thickness and arranged adjacent to the bottom (2a) of said container (2) in order to solidify it;
- actuator means (8) suited to move said solidified layer (6') with respect to said bottom (2a) according to a direction (Z) perpendicular to said bottom (2a),

**characterized in that** it comprises a logic control unit (9) operatively connected to said emitting means (5) and to said actuator means (8), said logic control unit (9) being a programmable device loaded with an IT programming product according to claim 10.

CLAIMS

1) A method for producing a three-dimensional object in layers by means of a stereolithography machine of the type comprising:

- a container for containing a liquid substance to be solidified through exposure to predefined radiation;
- means for emitting said predefined radiation, to selectively irradiate a layer of said liquid substance having a predefined thickness and arranged adjacent to a bottom of said container in order to solidify it;
- a supporting surface for said solidified layer, facing the bottom of said container;
- actuator means to move said supporting surface with respect to said bottom at least according to a direction perpendicular to said bottom;

said method comprising the following steps:

- moving said supporting surface near said bottom through a mutual positioning movement, in such a way as to arrange it in contact with said layer of liquid substance in a predefined operating position;
- with said supporting surface in said operating position, selectively irradiating said layer to solidify said layer,

wherein said positioning movement comprises a plurality of approaching moves having corresponding predefined lengths, spaced by corresponding intermediate stops for corresponding predefined time intervals, said intermediate stops being carried out when said supporting surface is at least partially immersed in said liquid substance.

2) The method according to claim 1, wherein a value of at least one parameter selected among said predefined lengths of said approaching moves, the number of said intermediate stops and the corresponding time intervals is determined before starting said positioning movement.

3) The method according to claim 2, wherein the values of said selected parameters are calculated as a function of a surface area of said supporting surface.

4) The method according to claim 3, wherein the values of said selected parameters are calculated as a function of the ratio between said surface area and a perimeter of said supporting surface.

5) The method according to claim 3 or 4, wherein said calculation of said selected parameters comprises the following steps:

- dividing said surface area of said supporting surface into a plurality of cells;
- assigning each cell a weight proportional to the number of cells adjacent to said cell;
- summing up said weights in order to obtain a shape parameter; and
- calculating the values of said selected parameters according to said shape parameter.

6) The method according to any one of claims 1 to 5, wherein the approaching moves following the first one of said intermediate stops have respective lengths that are equal to each other.

7) The method according to any one of claims 1 to 6, wherein said supporting surface belongs to said solidified layer of said three-dimensional object.

8) The method according to any one of claims 1 to 6, wherein said supporting surface belongs to a modelling plate belonging to said actuator means.

9) The method according to any one of claims 1 to 8, wherein a last one of said approaching moves is such as to move said supporting surface beyond said operating position, said positioning movement ending with a receding move of said supporting surface away from said bottom.

10) The method according to any one of claims 1 to 9, wherein the number of said intermediate stops is between one and twenty, said predefined lengths of each of said intermediate approaching moves is between 5 and 200 micron, and the duration of said time intervals is between 0.01 seconds and 1 second.

11) An IT programming product comprising a data support provided with software portions configured so that, when executed on a programmable device, they make said programmable device configured so as to control a stereolithography machine according to the method as claimed in any one of the claims 1 to 10.

12) A stereolithography machine comprising:

- a container for containing a liquid substance to be solidified through exposure to predefined radiation;
- means for emitting said predefined radiation, to selectively irradiate a layer of said liquid substance having a predefined thickness and arranged adjacent to a bottom of said container in order to solidify it;
- actuator means to move said solidified layer with respect to said bottom according to a direction perpendicular to said bottom,

wherein said stereolithography machine further comprises a logic control unit operatively connected to said emitting means and to said actuator means, said logic control unit being a programmable device loaded with the IT programming product according to claim 11.