

CLAIMS

What is claimed is:

1. A computer-implemented method of creating a recipe for a manufacturing tool, the method comprising:
 - obtaining design data comprising basic elements and hierarchical levels corresponding to the basic elements;
 - selecting one or more basic elements of interest;
 - generating one or more sets of simple array cells corresponding to a level of interest;
 - and
 - identifying, using said one or more sets of simple array cells, a plurality of periodical areas in level-of-interest coordinates to enable automated recipe creation, said periodical areas identified with respect to one or more basic elements.
2. The method of Claim 1 wherein the set of simple array cells corresponding to the level of interest comprises at least one simple array cell comprising a plurality of simple arrays, each simple array corresponding to a different basic cell.
3. The method of Claim 1 wherein the set of simple array cells corresponding to the level of interest comprises at least two simple array cells each corresponding to a different basic cell.
4. The method of Claim 1 further comprising identifying periodical areas corresponding to overlapping periodical areas generated with respect to different basic cells.

5. The method of Claim 1 further comprising generating periodicity values characterizing the identified periodical areas.
6. The method of Claim 5 further comprising processing the generated periodicity values to generate parameters for cell-to-cell inspection, wherein the processing is provided in accordance with at least one criterion selected from a group comprising: scale-factor characterizing relationship between design data and a given specimen, a given manufacturing tool, and a given manufacturing process.
7. The method of Claim 1 further comprising filtering the generated plurality of periodical areas, wherein the filtering is provided in accordance with at least one criterion selected from a group comprising: a size-related criterion, a manufacturing tool related criterion, and a manufacturing process related criterion.
8. A system comprising:
- a memory;
 - a processing device coupled to the memory;
 - a design data module executed from the memory by the processing device to obtain design data comprising basic elements and hierarchical levels corresponding to the basic elements;
 - a generator of simple array cells coupled to the design data module and executed from the memory by the processing device to generate one or more sets of simple array cells corresponding to a level of interest;
 - a identifier of periodical areas coupled to the design data module and to the generator of simple array cells, and executed from the memory by the processing device to identify,

using said one or more sets of simple array cells, a plurality of periodical areas in level-of-interest coordinates to enable automated recipe creation, said periodical areas identified with respect to one or more basic elements.

9. The system of Claim 8 wherein the generator of simple array cells is configured to generate at least one simple array cell comprising a plurality of simple arrays, each simple array cell corresponding to a different basic cell.

10. The system of Claim 8 wherein the generator of simple array cells is configured to generate at least two simple array cells each corresponding to a different basic cell.

11. The system of Claim 8 wherein the identifier of periodical areas further comprises an overlapping module executed from the memory by the processing device to identify periodical areas corresponding to overlapping periodical areas generated with respect to different basic cells.

12. The system of Claim 8 wherein the identifier of periodical areas is further configured to generate periodicity values characterizing the generated periodical areas.

13. The system of Claim 12 further configured to generate real-size parameters for cell-to-cell inspection in accordance with the generated periodicity values, wherein the generation is provided in accordance with at least one criterion selected from a group

comprising: scale-factor characterizing relationship between design data and a given specimen, a given manufacturing tool, and a given manufacturing process.

14. The system of Claim 8 further comprising a filtering module executed from the memory by the processing device to filter the identified plurality of periodical areas, wherein the filtering is provided, at least, in accordance with a size-related criterion.

15. A non-transitory computer readable medium including instructions that, when executed by a processing system, cause the processing system to perform a method comprising:

obtaining, by the computer, design data comprising basic elements and hierarchical levels corresponding to the basic elements;

selecting one or more basic elements of interest;

generating one or more sets of simple array cells corresponding to a level of interest; and

identifying, using said one or more sets of simple array cells, a plurality of periodical areas in level-of-interest coordinates to enable automated recipe creation, said periodical areas identified with respect to one or more basic elements.

16. The non-transitory computer readable medium of claim 15, wherein the set of simple array cells corresponding to the level of interest comprises at least one simple array cell comprising a plurality of simple arrays, each simple array corresponding to a different basic cell.

17. The non-transitory computer readable medium of claim 15, wherein the set of simple array cells corresponding to the level of interest comprises at least two simple array cells each corresponding to a different basic cell.

18. The non-transitory computer readable medium of claim 15, further comprising identifying periodical areas corresponding to overlapping periodical areas generated with respect to different basic cells.

19. The non-transitory computer readable medium of claim 15, further comprising generating periodicity values characterizing the identified periodical areas.

20. The non-transitory computer readable medium of claim 15 further comprising processing the generated periodicity values to generate parameters for cell-to-cell inspection, wherein the processing is provided in accordance with at least one criterion selected from a group comprising: scale-factor characterizing relationship between design data and a given specimen, a given manufacturing tool, and a given manufacturing process.

CLAIMS

1. A computer-implemented method of creating a recipe for inspecting a specimen, the method comprising:

directly deriving, from design data library usable for manufacturing the specimen, data informative of basic elements and hierarchical levels thereof, the derived data representing design data;

upon selecting among the basic elements one or more basic element of interest, identifying therebetween at least one basic element that cannot be decomposed in any other basic elements among the selected basic elements, thus giving rise to at least one basic cell characterized by respective hierarchical level;

processing the design data to extract location information and periodicity values characterizing one or more areas being, in coordinates of a top hierarchical level, periodical with respect to the at least one basic cell, wherein extracting the periodicity values is provided with no need in obtaining data from an image of the specimen; and

processing the location information and the extracted periodicity values to generate real-size parameters for cell-to-cell inspection, thereby enabling automated creation of recipe for inspecting the specimen.

2. The method of claim 1, wherein processing the design data to extract the location information and the periodicity values comprises:

generating at least one set of simple array cells, the set corresponding to the top hierarchical level, wherein each simple array cell comprises a repetitive pattern area with respect to the basic cell; and

using said at least one set of simple array cells for identifying the one or more areas being, in coordinates of the top hierarchical level, periodical with respect to the at least one basic cell.

3. The method of claim 2, wherein the at least one set of simple array cells comprises at least two simple array cells each corresponding to a different basic cell.

4. The method of claim 2, further comprising identifying in coordinates of the top hierarchical level at least one first area being periodical with respect to a first basic cell and at least one second area overlapping with the at least one first area and being periodical with respect to a second basic cell, wherein generating real-size parameters for cell-to-cell inspection is provided based, at least, on periodicity values characterizing the at least one first area, periodicity values characterizing the at least one second area and parameters characterizing overlapping between the at least one first area and the at least one second area.
5. The method of claim 4 wherein the second basic cell is different from the first basic cell.
6. The method of claim 2, wherein the at least one set of simple array cells comprises at least one simple array cell characterized by hierarchical level lower than the top hierarchical level and by coordinates transformed to coordinates of the top hierarchical level.
7. The method of claim 2, wherein generating the at least one, corresponding to the top hierarchical level, set of simple array cells comprises traversing design data up to the top hierarchical level and generating for each traversed hierarchical level a set of corresponding simple array cells using a respective set generated at a previous hierarchical level, wherein at each given hierarchal level, set of corresponding simple array cells is generated by analyzing, merely, insertions of the basic cells from respective set of simple array cells generated for previous hierarchical level.
8. The method of claim 1, wherein processing the extracted periodicity values to generate real-size parameters for cell-to-cell inspection is provided in accordance with at least one criterion selected from a group constituted by: scale-factor characterizing relationship between design data and a given specimen, a given manufacturing tool, and a given manufacturing process.
9. The method of claim 1, wherein the design data usable for manufacturing the specimen are provided in GDSII format or OASIS format.

10. A system capable of creating a recipe for inspecting a specimen, the system comprising:
a memory storing design data library usable for manufacturing the specimen;
a processing device operatively coupled to the memory and configured to:
 directly derive, from the design data library, data informative of basic elements and hierarchical levels thereof, the derived data representing design data;
 enable selecting among the basic elements one or more basic element of interest;
 identify among the selected elements at least one basic element that cannot be decomposed in any other selected basic elements, thus giving rise to at least one basic cell characterized by respective hierarchical level;
 process the design data to extract location information and periodicity values characterizing one or more areas being, in coordinates of a top hierarchical level, periodical with respect to the at least one basic cell, wherein extracting the periodicity values is provided with no need in obtaining data from an image of the specimen; and
 process the extracted location information and periodicity values to generate real-size parameters for cell-to-cell inspection, thereby enabling automated creation of recipe for inspecting the specimen.
11. The system of claim 10, wherein the processing device is configured to process the design data to extract the location information and the periodicity values comprising:
 generating at least one set of simple array cells, the set corresponding to the top hierarchical level, wherein each simple array cell comprises a repetitive pattern area with respect to the basic cell; and
 using said at least one set of simple array cells for identifying the one or more areas being, in coordinates of the top hierarchical level, periodical with respect to the at least one basic cell.
12. The system of claim 11, wherein the at least one set of simple array cells comprises at least one simple array cell characterized by hierarchical level lower than the top hierarchical level and by coordinates transformed to coordinates of the top hierarchical level.

13. The system of claim 11, wherein the at least one set of simple array cells comprises at least two simple array cells each corresponding to a different basic cell.

14. The system of claim 11, wherein the processing device is further configured to identify in coordinates of the top hierarchical level at least one first area being periodical with respect to a first basic cell and at least one second area overlapping with the at least one first area and being, in coordinates of the top hierarchical level, periodical with respect to a second basic cell, and wherein the processing device is further configured to generate real-size parameters for cell-to-cell inspection based, at least, on periodicity values characterizing the at least one first area, periodicity values characterizing the at least one second area and parameters characterizing overlapping between the at least one first area and the at least one second area.

15. The system of claim 10, wherein processing device is configured to process the extracted periodicity values to generate real-size parameters for cell-to-cell inspection in accordance with at least one criterion selected from a group constituted by: scale-factor characterizing relationship between design data and a given specimen, a given manufacturing tool, and a given manufacturing process.

16. A non-transitory computer readable medium including instructions that, when executed by a computer, cause the computer to perform a method of creating a recipe for inspecting a specimen, the method comprising:

- directly deriving, from design data library usable for manufacturing the specimen, data informative of basic elements and hierarchical levels thereof, the derived data representing design data;

- upon selecting among the basic elements one or more basic element of interest, identifying therebetween at least one basic element that cannot be decomposed in any other basic elements among the selected basic elements, thus giving rise to at least one basic cell characterized by respective hierarchical level;

- processing the design data to extract location information and periodicity values characterizing one or more areas being, in coordinates of a top hierarchical level, periodical with

respect to the at least one basic cell, wherein extracting the periodicity values is provided with no need in obtaining data from an image of the specimen; and

processing the extracted location information and periodicity values to generate real-size parameters for cell-to-cell inspection, thereby enabling automated creation of recipe for inspecting the specimen.

17. The non-transitory computer readable medium of claim 16, wherein processing the design data to extract the location information and the periodicity values comprises:

generating at least one set of simple array cells, the set corresponding to the top hierarchical level, wherein each simple array cell comprises a repetitive pattern area with respect to the basic cell; and

using said at least one set of simple array cells for identifying the one or more areas being, in coordinates of the top hierarchical level, periodical with respect to the at least one basic cell.

18. The non-transitory computer readable medium of claim 17, wherein the at least one set of simple array cells comprises at least one simple array cell characterized by hierarchical level lower than the top hierarchical level and by coordinates transformed to coordinates of the top hierarchical level.

19. The non-transitory computer readable medium of claim 17, wherein the at least one set of simple array cells comprises at least two simple array cells each corresponding to a different basic cell.

20. The non-transitory computer readable medium of claim 17, further comprising identifying at least one first area being, in coordinates of the top hierarchical level, periodical with respect to a first basic cell and at least one second area overlapping with the at least one first area and being, in coordinates of the top hierarchical level, periodical with respect to a second basic cell, wherein generating real-size parameters for cell-to-cell inspection is provided based, at least, on periodicity values characterizing the at least one first area, periodicity values

characterizing the at least one second area and parameters characterizing overlapping between the at least one first area and the at least one second area.