Title: SELF-ASSEMBLED CIRCUITS AND CIRCUIT PATTERNS

FIG. 2

shows the use of a binary counter to self-assemble a demultiplexer. Logic levels for an example input-output pair are shown: only the row that matches the input pattern is set to "1". To make a pattern with \( N \) rows, \( 10 + \log N \) tiles are used.

Abstract: A self-assembly method for circuit patterns includes generating a set of tiles, each of the tiles corresponding to a segment of molecules, the set of tiles comprising a set of rule tiles and a set of boundary tiles, each tile having one or more binding regions; assigning a label from a set of labels to each binding region; self-interacting, with attractive forces, one or more of the tiles with one or more other tiles among the set of tiles; associating using selective interaction of at least one boundary tile from the set of boundary tiles with at least one rules tile from the set of rules tiles based upon at least a label from the one boundary tile and at label from the one rules tiles; and bonding at least one binding region of the one boundary tile with at least one binding region of the one rules tile.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC: G01N 33/48(2006.01)

USPC: 702/19
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S.: 702/19

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>54-83</td>
</tr>
<tr>
<td>Y</td>
<td>US 3,792,355 (MIYATA et al) Feb 12 1974, Col. 2 and Col. 3</td>
<td>54-86</td>
</tr>
</tbody>
</table>

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
  "A" document defining the general state of the art which is not considered to be of particular relevance
  "E" earlier application or patent published on or after the international filing date
  "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  "O" document referring to an oral disclosure, use, exhibition or other means
  "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search
19 February 2008 (19.02.2008)

Date of mailing of the international search report
08 APR 2008

Authorized officer
Marjorie Herr

Telephone No. (571)272-0500

Form PCT/ISA/210 (second sheet) (April 2007)
Continuation of B. FIELDS SEARCHED Item 3:
Google Scholar, EAST

Search terms: matrix, assembly, DNA, circuit, Hadamard