Abstract: The evacuation properties of an abrasive disk are improved by forming its apertures to exhibit a configuration that will direct process fluids onto or away from a workpiece (or contact) interface through capillary action, surface tension/affinity, and/or boundary layer pump actions. The capillary action is accomplished by modifying the geometries of the apertures to form capillary tubes, where the orientation and lift angle of the capillary tubes is controlled to improve the flow of relatively thin layers of liquids. The surface tension/affinity between a liquid material and the abrasive disk is controlled by modifying the through-hole apertures to exhibit a serrated inner surface, which will decrease the attraction between the material of the abrasive disk and the process liquid. A plurality of apertured disks may be stacked, and their respective apertures properly arranged on each surface, to create a Tesla pump such that the kinetic energy associated with rotation of the disk assembly will preferentially bias both the vertical and tangential flow of liquids between the working surface and the disk assembly.
INTERNATIONAL SEARCH REPORT  

International application No.  
PCT/US2010/039104

A. CLASSIFICATION OF SUBJECT MATTER  

B24D 7/00(2006.01)i, B24D 7/02(2006.01)i, B24D 3/34(2006.01)i, B24D 99/00(2010.01)i  

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)  
B24D 7/00; B24D 5/00; B24B 37/00; B24D 3/00; B24D 11/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
Korean utility models and applications for utility models  
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
eKOMPASS(KIPO internal) & Keywords: abrasive, disk substrate, apertures, bias, fluid

C. DOCUMENTS CONSIDERED TO BE RELEVANT  

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<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
<td>A</td>
<td>KR 10-0862130 B1 (KABUSHIKI KAISHA TOSHIBA) 09 October 2008 see page 4, line 35 - page 7, line 1 and figure 1.</td>
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☐ 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 but published on or after the international filing date  
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"P" document published prior to the international filing date but later than the priority date claimed  
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"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  
28 JANUARY 2011 (28.01.2011)

Name and mailing address of the ISA/KR  
Korean Intellectual Property Office  
Government Complex-Daejeon, 139 Seous-ro, Seogu, Daejeon 302-701, Republic of Korea  
Facsimile No. 82-42-472-7140

Date of mailing of the international search report  
08 FEBRUARY 2011 (08.02.2011)

Authorized officer  
KIM, DONG JIN  
Telephone No. 82-42-481-5415

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