Title: LOW PRESSURE MIXING SYSTEM FOR DESALTING HYDROCARBONS

Abstract: A method and system for reducing the salt content of a crude oil stream includes using a quill to disperse a water stream into the crude oil and then routing the mixed oil/water stream through a plurality of mixing stages. The water stream may include a wash water that has been preconditioned with recycled effluent water. Each mixing stage increases the homogeneity of the mixed oil/water stream. The first and third mixing stages are preferably lower pressure stages relative to the second mixing stage, which provides pressure effective for flowing the mixed oil/water stream through the third and fourth mixing stages. Upon exiting the fourth mixing stage, the mixed oil/water stream is electrostatically treated in a dual frequency separator vessel or a dual polarity separator vessel.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - C10G 17/00; B01D 11/00 (2009.01)
USPC - 210/634; 208/251R
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)
IPC (8) - C10G 17/00; B01D 11/00 (2009.01)
USPC - 210/634; 208/251R

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)
PUBWEST (PGP,B,USPT,USOC,EPAB,JPAB) Terms - emulsifier homogenizer mixer valve shear static oil water desalter fourth in-line
Google - oil desalter emulsifier static-mix valve; emulsifier static-mixer valve in-line; static mixing system for desalting hydrocarbons;
oil desalter mixing; in-line oil water homogenizer

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>Y</td>
<td>US 6,887,284 B1 (HUDSON) 03 May 2005 (03.05.2005), col 3, In 48-67; col 5, In 3-36; col 5, In 08 to col 6, In 2; col 6, In 38-56; col 7, In 4-14</td>
<td>1-19</td>
</tr>
<tr>
<td>Y</td>
<td>US 5,882,506 A (OHSOL, ET AL) 16 March 1999 (16.03.1999), col 9, In 29-32; col 5, In 60-62; col 9, In 29-32</td>
<td>6-7, 10, 12, 19</td>
</tr>
</tbody>
</table>

[ ] Further documents are listed in the continuation of Box C.

* 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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  "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
06 May 2009 (06.05.2009)

Date of mailing of the international search report
26 MAY 2009

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