Abstract: A process for reducing iron ore particles in a moving bed reduction reactor comprising an upper reduction zone and a lower discharge zone, wherein the coke oven gas, preferably forming all the make-up for the reducing gas circulating through and reacting in said reduction zone, is first fed to said discharge (cooling) zone and thereafter said coke oven gas, conditioned by the DRI in the lower zone, is withdrawn from the reactor and fed preferably into the recycled reducing gas for injection into the reduction zone of the reactor. Heavy hydrocarbons and other components of coke oven gas which may otherwise cause fouling, corrosion, or deposits in the direct reduction plant are removed from coke oven gas by catalytic and/or adsorptive action of the DRI present in said lower zone, before being externally transferred to the reduction zone of the reduction reactor.
as to the applicant’s entitlement to claim the priority of the earlier application (Rule 4.17(iii)) before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

Published: with international search report

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INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
   IPC(8) - C21B 7/00, C21C 5/00 (2008.04)
   USPC - 266/156
   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)
   USPC 266/156

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(USPT,PGPB,EPAB,JPAB); Google; Google patents

Search Terms: direct reduced iron, reactor, hydrogen, carbon monoxide, methane, oxygen, recycle, gas heater, normal cubic meters

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>X</td>
<td>US 6,027,545 A (Villarreal-Trevino) 22 February 2000 (22.02.2000) figs. 4 and 5; col 1, In 12-18; col 5, In 52-62; col 6, In 48-58; col 7, In 10-14</td>
<td>1-4</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
  "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

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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
   09 October 2008 (09.10.2008)

Date of mailing of the international search report
   23 OCT 2008

Name and mailing address of the ISA/US
   Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
   P.O. Box 1450, Alexandria, Virginia 22313-1450
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Authorized officer: Lee W. Young
   PCT Helpdesk: 571-272-4300
   PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (April 2007)
### Box No. II  Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.☐ Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2.☐ Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3.☒ Claims Nos.: 5-8 because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

### Box No. III  Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1.☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2.☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3.☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4.☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.

### Remark on Protest

☐ The additional search fees were accompanied by the applicant’s protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant’s protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.