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Preheating method of steel strips.

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A method of preheating steel strips in continuous heat-treatment using a heating zone including radiant tubes comprises a combination of first and second preheating stages. In the first preheating stage, visible heat contained in burned waste gas

from the heating zone is heat-exchanged with a gas to recover part of the visible heat into the gas which is directed to a steel strip. In the second preheating stage, a heat medium is heated in a heating device and supplied and circulated into rolls. The steel strip

is wound about the rolls to pass thereon in a non-oxidizing atmosphere. In this manner, the steel strip is preheated progressively to higher temperature to achieve high temperature preheating without causing serpentine movement of the steel strip, thereby compacting the heating installation and improving the production efficiency.



| DOCUMENTS CONSIDERED TO BE RELEVANT   |   |   |  |
|---|---|---|--|
| Category  | Citation of document with indication, where appropriate, of relevant passages   | Relevant to claim   | CLASSIFICATION OF THE APPLICATION (Int. Cl. 4) |
| D,A   | CHEMICAL ABSTRACTS, vol. 103, 9th December 1985, page 219, abstract no. 199435u, Columbus, Ohio, US; & JP-A-60 135 530 (KAWASAKI STEEL CORP.; MITSUBISHI HEAVY INDUSTRIES, LTD) 18-07-1985<br>--- | 1   | C 21 D 9/56<br>C 21 D 1/34                     |
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| A   | EP-A-0 078 446 (ITALIMPIANTI)<br>* Claims 1-4; figure 2 *<br>-----  | 1   |  |
|   |   |   | TECHNICAL FIELDS SEARCHED (Int. Cl. 4)         |
|   |   |   | C 21 D<br>F 27 B<br>F 27 D                     |
| The present search report has been drawn up for all claims  |   |   |  |
| Place of search<br>THE HAGUE  |   | Date of completion of the search<br>21-04-1988  | Examiner<br>GREGG N.R.                         |
| CATEGORY OF CITED DOCUMENTS   |   |   |  |
| X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |   | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>-----<br>& : member of the same patent family, corresponding document |  |