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(54) Method and apparatus for heat treating steel.

(57) A process is provided for heat treating steel in which each segment of a piece of steel is quenched in a quenching zone, such as inflow chamber (20) by directing the flow of a sufficient amount of a cooling medium against a surface of each segment to lower the temperature of the segment to a desired temperature while vaporizing substantially all of the cooling medium to create a vapor blanket around at least one surface of each segment so cooled. In one embodiment, steel pipe (16) is heated above its critical transformation temperature in a furnace (11) and then each longitudinal segment of the pipe (16) is sequentially quenched by substantially simultaneously sending a sufficient amount of water against the inside and outside surfaces of each segment to reduce the temperature of the segment to within a predetermined range while vaporizing substantially all of the water to create a steam blanket around the segment. The steam blanket is then maintained on at least the inside surface of each segment in order to control the temperature change of each segment until the pipe (16) is subjected to further processing. An apparatus for heat treating a steel pipe (16) is also provided including a preheater, such as furnace (11) for heating the steel pipe (16); feeding means, such as rollers (76) adapted to feed the steel pipe at a variable rate from the preheater, such as furnace (11); a flow chamber (20) into which the steel pipe (16) is fed, the flow chamber (20) being adapted to bring a cooling medium into contact with the outer surface of a segment of the steel pipe (16); and an internal feeder (40) having an outside diameter less than that of the steel pipe (16) and adapted to direct a cooling medium against a contoured surface of a plug (50). The plug (50) is of sufficient size to slidably seal the inside cross section of the steel pipe (16) as it passes into the flow chamber (20).

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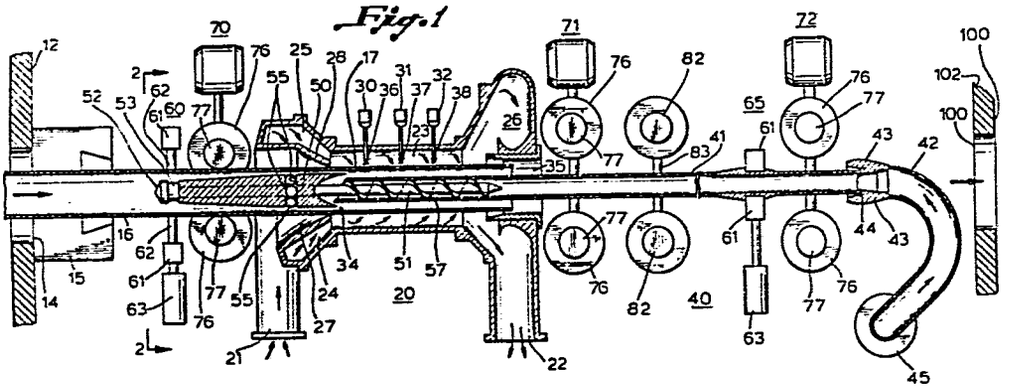
Fig.1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EUROPEAN SEARCH REPORT

Application number

EP 83 10 1028

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. ³)
A	US-A-4 056 412 (Y. FUJII et al.)		C 21 D 9/08 C 21 D 1/667
A	US-A-3 997 376 (K.H. HEMSATH et al.)		
A,D	US-A-3 877 685 (L.E. FRANCESCHINA et al.)		
A,D	US-A-3 294 599 (R.A. HUSEBY)		
A,D	US-A-2 307 694 (S. MALKE)		
A	FR-A-2 302 340 (C.R.M.)		TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
A	FR-A-2 085 014 (A.O. SMITH CORP.)		C 21 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20-01-1984	MOLLET G.H.J.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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