



Europäisches Patentamt  
European Patent Office  
Office européen des brevets

19

11 Publication number:

0 148 454  
A3

12

EUROPEAN PATENT APPLICATION

21 Application number: 84115488.3

51 Int. Cl.<sup>4</sup>: B 21 D 39/06  
B 21 D 39/20

22 Date of filing: 14.12.84

30 Priority: 30.12.83 US 567102  
30.12.83 US 567104  
30.12.83 US 567107

43 Date of publication of application:  
17.07.85 Bulletin 85/29

88 Date of deferred publication of search report: 06.11.85

84 Designated Contracting States:  
BE CH DE FR GB IT LI SE

71 Applicant: WESTINGHOUSE ELECTRIC CORPORATION  
Westinghouse Building Gateway Center  
Pittsburgh Pennsylvania 15235(US)

72 Inventor: Sinha, Susanta  
110 Summerhill Lane  
Trafford Pennsylvania 15085(US)

72 Inventor: Brown, Philip Stoel  
1713 Orangehill Way  
Brandon Florida 33511(US)

72 Inventor: Harman, Douglas Gray  
P.O. Box 1141  
Gulf Breeze Florida 33561(US)

72 Inventor: Keller, Harold Thomas  
5484 Wolfe Drive  
Pittsburgh Pennsylvania 15236(US)

72 Inventor: Olechovsky, David Francis  
269 Colt Drive  
North Huntingdon Pennsylvania 15642(US)

72 Inventor: Cheng, Wenche W.  
159 Kilbuck Drive  
Monroeville Pennsylvania 15146(US)

72 Inventor: Castner, Raymond Paul  
1154 LaSalle Road  
Monroeville Pennsylvania 15146(US)

72 Inventor: Costlow, Annette Marie  
Apartment A-2 650 Center Road  
Pittsburgh Pennsylvania 15239(US)

72 Inventor: Chizmar, David Andrew  
Pfeffer Road R.D. No. 2, Box 248-J  
Export Pennsylvania 15632(US)

72 Inventor: Cooper, Frank William  
115 Himalaya Road  
Monroeville Pennsylvania 15146(US)

74 Representative: Patentanwälte Dipl.-Ing. R. Holzer  
Dipl.-Ing. (FH) W. Gallo  
Philippine-Welser-Strasse 14  
D-8900 Augsburg(DE)

EP 0 148 454 A3

54 Improved mandrel having an Eddy Current probe.

57 An improved fluid mandrel having an eddy current probe generally comprises a probe body which is detachably connectable to the bottom of a fluid mandrel on one end, and a source of hydraulic fluid on the other end. The probe body includes a pair of sensing coils which are separated along the longitudinal axis of the body by a distance approximately equal to the thickness of the metallic structure desired to be detected. The invention finds application in performing expansions which eliminate the clearance, e.g., by interference fit, between heat exchange tubes extending through the baffle plates in nuclear steam generators; the sensing coils of the probe are longitudinally spaced the same distance as

the thickness of the baffle plates in order to generate a sharp and unambiguous electronic signal indicative of the relative positions of the mandrel and the baffle plate. Also disclosed is a method of controlling the expansion swaging force considering the tube material properties.

/...

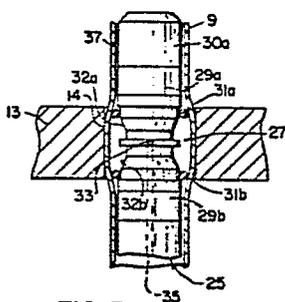


FIG. 3



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)
A	EP-A-0 004 864 (WESTINGHOUSE)  * Claims 1,3,5; figure 1, reference no. 33 *	1, 4, 8, 10-12	B 21 D 39/06 B 21 D 39/20
A	EP-A-0 055 101 (HASKEL)  * Claims 1,2,12; figure 2 *	1, 4, 16, 17, 18	
A	GB-A-2 069 387 (NORTHERN ENGINEERING)  * Figure 1, reference no. 30 *	1, 5	
A	EP-A-0 066 871 (HASKEL)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 21 D 39/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 04-07-1985	Examiner SCHLAITZ J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  &amp; : member of the same patent family, corresponding document</p>			