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(54) **Expanded flow range edge flow control valve for use in a paper machine headbox**

(57) Edge flow control valves located within edge flow tubes of a tube bank in a headbox can be adjusted to optimize fiber orientation of paper produced in a papermaking process. The present invention uses a chamfer at the inlet of edge flow tubes in order to increase maximum flow of pulp through the edge tube and edge valve. The minimum flow range is not changed, therefore, the essential flow range of pulp through the edge flow valve is increased. Laboratory tests have shown at least a 15 percent increase in maximum flow while not changing the minimum flow. Using a chamfer tool with a stop collar to control the depth of the cut, a chamfer is provided at the inlet of each edge flow tube for optimum performance. According to the present invention, paper produced in a papermaking process will have an improved fiber orientation when more flow at the edges of a headbox is needed.

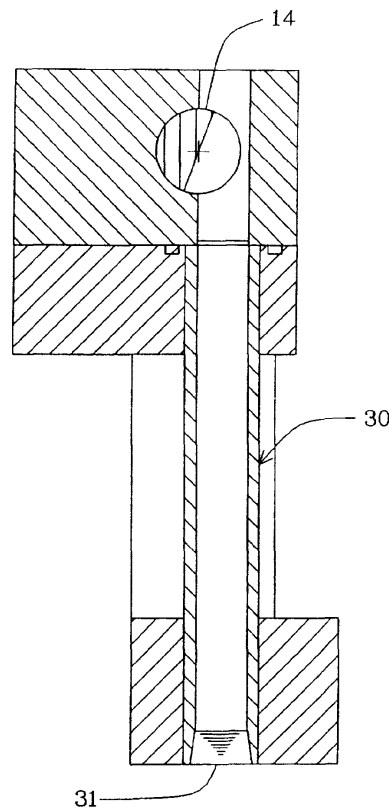


Fig. 8



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EUROPEAN SEARCH REPORT

Application Number
EP 99 63 0015

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.6)
Y	EP 0 595 325 A (MITSUBISHI HEAVY IND LTD) 4 May 1994 (1994-05-04) * abstract; figures * * page 9, line 6 - line 58 * ---	1-3	D21F1/02 D21F1/06
Y	US 4 016 033 A (SCHIEL CHRISTIAN ET AL) 5 April 1977 (1977-04-05) * column 5, line 58 - column 6, line 10; figures * ---	1-3	
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A	US 5 147 509 A (KURAGASAKI MUTSUO ET AL) 15 September 1992 (1992-09-15) * abstract; figures * * column 1, line 61 - column 2, line 33 * -----	1-3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			D21F
-The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 December 1999	Examiner Helpiö, T
<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</p> <p>& : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 82 (P04C01)



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-3



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**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-3

A headbox assembly

2. Claims: 4-11

A method of manufacturing a chamfered edge orifice inlet

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 63 0015

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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17-12-1999

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