



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11)

**EP 1 418 265 A3**

(12)

## EUROPEAN PATENT APPLICATION

(88) Date of publication A3:  
**11.05.2005 Bulletin 2005/19**

(51) Int Cl.7: **D06B 23/22, F28D 15/02**

(43) Date of publication A2:  
**12.05.2004 Bulletin 2004/20**

(21) Application number: **03024903.1**

(22) Date of filing: **28.10.2003**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IT LI LU MC NL PT RO SE SI SK TR**  
Designated Extension States:  
**AL LT LV MK**

(71) Applicant: **Teng, Chin Lin**  
**Yonghe City, Taipei County 234, Taiwan (TW)**

(72) Inventor: **Yuan, Teng Sheng**  
**Yonghe City Taipei County 234 (TW)**

(30) Priority: **29.10.2002 CN 02261078**

(74) Representative: **Kador & Partner**  
**Corneliusstrasse 15**  
**80469 München (DE)**

### (54) Heat exchanger for a dyeing machine

(57) A heat exchanging apparatus for increasing/decreasing dye temperature of a gas-liquid dyeing machine, including a heat exchanger (10) installed between the inlet (31) and outlet (32) of the dye-circulating pipe (30) of the dyeing machine (20). At least one partitioning layer (11) is disposed in an interior of the heat exchanger (10) to partition the interior into a gas flowing space (13) and a dye flowing space (12). The dye flowing space (12) has a dye inlet (121) and a dye outlet (122) which are respectively connected to the dye outlet (32) and dye inlet (31) of the dyeing machine (20). The

gas flowing space (13) has a gas inlet (131) and a gas outlet (132). The gas inlet (131) is connected to a cold air source (40) and a steam source (50). The gas outlet (132) is connected to a water condenser (60). Multiple tubular vacuum thermally conductive elements (14) are inserted on the partitioning layer (11). Each thermally conductive element (14) has two ends which respectively extend into the gas flowing space (13) and the dye flowing space (12). By means of the high efficiency heat exchange of the vacuum thermally conductive elements (14), the temperature of the circulated dye can be quickly increased/decreased and more stably controlled.

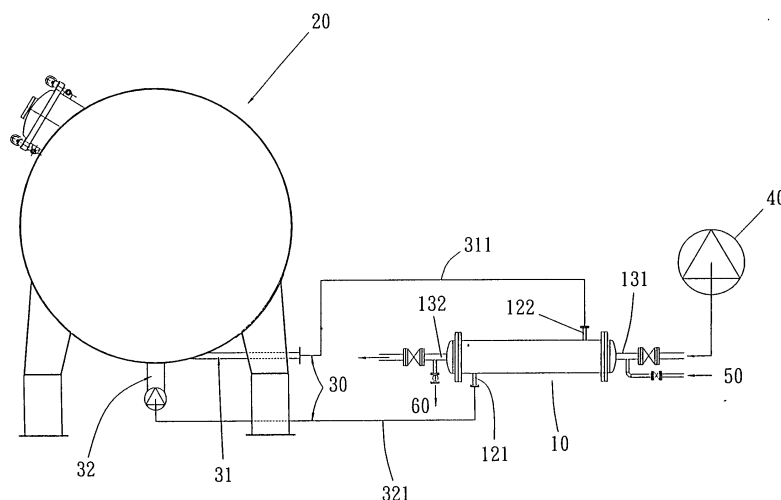


Fig. 1

EP 1 418 265 A3



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 03 02 4903

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.7)
X	GB 2 013 863 A (STEIN SURFACE Z.A.I.DU BOIS DE L'ÉPINE) 15 August 1979 (1979-08-15) * claims 1,2; figures 1-3 *	1,4	D06B23/22 F28D15/02
X	GB 2 024 401 A (FUNKE WARMEAUSTAUSCHER APPARATEBAU KG) 9 January 1980 (1980-01-09) * the whole document *	1,4	
A	CH 593 470 A (SCHULTHESS, AD. & CO. AG) 30 November 1977 (1977-11-30) * the whole document *	1,2	
A	CH 589 742 B (MASCHINENFABRIK AD. SCHULTHESS & CO AG) 15 July 1977 (1977-07-15) * the whole document *	1,2	
A	FR 2 259 932 A (BRUCKNER APPARATEBAU GMBH) 29 August 1975 (1975-08-29)		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			D06B F28F F28D
Place of search		Date of completion of the search	Examiner
The Hague		23 March 2005	D'Hulster, E
<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>&amp; : member of the same patent family, corresponding document</p>			

1  
EPO FORM 1503 03.82 (P04C01)

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

EP 03 02 4903

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  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-03-2005

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
GB 2013863	A	15-08-1979	FR	2415787 A1		24-08-1979
			AT	361951 B		10-04-1981
			AT	56779 A		15-09-1980
			DE	2903076 A1		02-08-1979
			ES	477188 A1		16-07-1979
			IT	1117577 B		17-02-1986
			SE	7900582 A		28-07-1979
-----						
GB 2024401	A	09-01-1980	DE	2829121 A1		17-01-1980
			FR	2430586 A1		01-02-1980
			IT	1122007 B		23-04-1986
			JP	55038492 A		17-03-1980
-----						
CH 593470	A	30-11-1977	CH	593470 A5		30-11-1977
-----						
CH 589742	B	15-07-1977	CH	589742 B5		15-07-1977
			CH	904475 A		31-12-1976
-----						
FR 2259932	A	29-08-1975	BE	824993 A1		15-05-1975
			FR	2259932 A1		29-08-1975
			IT	1031295 B		30-04-1979
-----						