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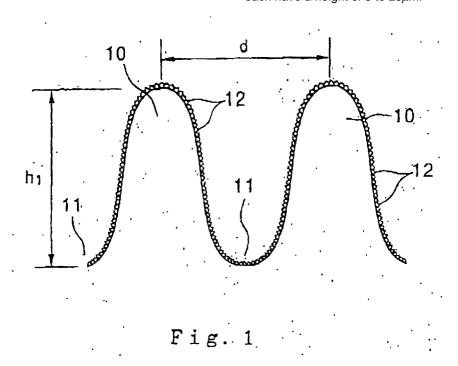
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(54) Sheet feed roller

(57) A less expensive sheet feed roller of a nonground surface type for use as a pickup roller or a sheet feeding roller in a sheet feeder. The sheed heed roller is virtually free from adhesion of paper dust during use thereby providing an excellent friction coefficient sustainability. The sheet feed roller comprises a roller body and a shaft extending axially through the roller body, the roller body having a textured roller surface comprising a multiplicity of is land portions (10) and a sea portion (11) recessed from the island portions, the island portions and the sea portion each having a multiplicity of fine projections (12). The ratio S_1/S_2 of the total area S_1 of the island portions to the area S_2 of the sea portion preferably is 0.25 to 0.70. The fine projections preferably each have a height of 3 to $25\mu m$.





EUROPEAN SEARCH REPORT

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	DOCUMENTS CONSIDE	RED TO BE RELEVANT			
Category	Citation of document with income of relevant passa		Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)	
X	PATENT ABSTRACTS OF vol. 010, no. 227 (M 7 August 1986 (1986- & JP 61 060558 A (MU 28 March 1986 (1986- * abstract *	1	B65H27/00		
X	US 6 077 207 A (YOKO 20 June 2000 (2000-0 * column 1, line 6 - figures *	1			
X	PATENT ABSTRACTS OF vol. 1999, no. 02, 26 February 1999 (19 -& JP 10 291677 A (H 4 November 1998 (199 * abstract; figure 3	999-02-26) HARADA KOGYO:KK), 98-11-04)	1		
X	PATENT ABSTRACTS OF vol. 1996, no. 07, 31 July 1996 (1996-0 -& JP 08 073094 A (F 19 March 1996 (1996- * abstract; figures	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65H		
X	US 4 165 251 A (TSU) 21 August 1979 (1979 * column 3, line 50	. 1			
Х	PATENT ABSTRACTS OF vol. 2000, no. 10, 17 November 2000 (20 -& JP 2000 191200 A LTD), 11 July 2000 (* abstract; figure 4	000-11-17) (FUJI PHOTO FILM CO (2000-07-11)	1		
		-/			
	The present search report has b	een drawn up for all claims			
	Place of search THE HAGUE	Date of completion of the search 8 March 2004	Ler	examiner nmen, R	
CATEGORY OF CITED DOCUMENTS 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		E : earlier patent after the filing er D : document cite L : document cite	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 8: member of the same patent family, corresponding		



EUROPEAN SEARCH REPORT

Application Number EP 01 12 4694

Category	Citation of document with indicatio of relevant passages	n, where appropriate,	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
D,X	PATENT ABSTRACTS OF JAPA vol. 1996, no. 08, 30 August 1996 (1996-08 & JP 08 108591 A (SUMITO LTD), 30 April 1996 (199 * abstract *	-30) DMO RUBBER IND	1	
				TECHNICAL FIELDS SEARCHED (Int.CI.7)
	The present search report has been dr			
Place of search THE HAGUE		Date of completion of the search 8 March 2004	Examiner men, R	
X : part Y : part doc A : tech	CATEGORY OF CITED DOCUMENTS Iticularly relevant if taken alone Iticularly relevant if combined with another ument of the same category nological background written disclosure	T: theory or princip E: earlier patent d after the filling d D: document cited L: document cited	ple underlying the i ocument, but publicate I in the application for other reasons	nvention shed on, or

EPO FORM 1503 03.82 (P04C01)

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

EP 01 12 4694

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.

08-03-2004

	Patent document cited in search repo	rt	Publication date		Patent fam member(s		Publication date
JP	61060558	Α	28-03-1986	NONE			
US	6077207	Α	20-06-2000	JP JP	2952224 11165930		20-09-1999 22-06-1999
JP	10291677	A	04-11-1998	JP	3026773	B2	27-03-2000
JP	08073094	Α	19-03-1996	NONE			
US	4165251	Α	21-08-1979	JP JP JP JP JP DE GB	1210340 53065733 58045699 1210341 53076029 58045700 2751862 1595436	A B C A B A1	12-06-1984 12-06-1978 12-10-1983 12-06-1984 06-07-1978 12-10-1983 01-06-1978 12-08-1981
JP	2000191200	Α	11-07-2000	NONE			
JP	08108591 0	Α		NONE			

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82