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(24) 2002 06 12

(21) 10 - 1999 - 7004211 (65) 2000 - 0053234
(22) 1999 05 12 (43) 2000 08 25
1999 05 12
(86) PCT/US1997/21062 (87) WO 1998/21407
(86) 1997 11 14 (87) 1998 05 22

(30) 08/748,872 1996 11 14 (US)

(73)

45202

1

(72)

45069

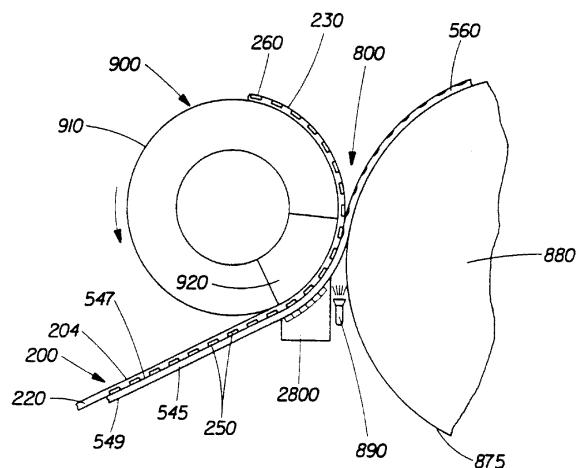
6512

(74)

(54)

가

가



(bulk)

(smoothness)

가

가 rgan)	가 1976	가 11	가 30	가 (Trokhan)	가 1980	가 3	가 4	가 3,994,771	가 4,191,609	가 (Mo
1987	1	20						4,637,859	4,637,859	

4,637,859

가

가
4,637,859

(Yankee dryer drum)

가
 가
 4,637,859
 ,
 4,637,859
 ,
 (consistenc
 y)

ki)	1995	6	29	가	1993	12	20	9	,	(Ampuls
8 ;				가	1994	6	29	WO 9		WO 95/1754
6/00812 ; (Phan)				가	1994	6	29			
WO 96/00814 ; 1996	9	17		5,549,790				5,556,509	; 1996	8 27
			가							

4,326,000 ; 4,000,237 ; 3,903,342

(press nip)

가

가	가	가	가	가	가	가	가	가	가	가
가	가	가	가	가	가	가	가	가	가	가
creping)										

가

()

가 , ,
가

1 5 , (20) 1 (22) 2 (24) , (30) . (30) (22)
 (20) (K) (32) , (30) (24) (34)

, (20) (30) (50) .
 (50) (P) 가 , (30) (32) . (50)
 (22) (52) (50) (24) (54) . (P)
 (K) . , P/K 1.5 . 3 , P 0.3mm ,
 0.40mm K 0.25mm , 0.20mm .

2 , (30) (50) (crepe ridge) (35) , (55) 1 .
가 , (50) .

(30) 4,637,859
(50) , 4,637,859
, (50) 4,637,859

$$(50) \quad (30) \quad . \quad (30) \quad (23) \quad (32, 34) \quad (23) \quad . \quad (23) \quad (30)$$

가 (25) , 가 (25) (24) (23) , (23) , (23) , (23) , (25) (54)

, 1 2 (20) (30), (50)
, , 가 , 4,637,859
(24) 가 .

, (20) (smoothness) 가 1.15 , 1.20 , 1.25
 , 1.30 , 가 1.40 ,
 (24) .

(22) , (20) (24) 900 , 850 가
 900, 1,000 .

가 . ,

, (20) , 4,637,859 1.07
 993 1,065 .

(20) 가 (24) , (30)
 . (50) ,
 가 , (20)

, 2 (24) (20) , , 2
 (20) (24) , (22) .
 가 , , 가

2 9d 2 (20) , , ,

(20) 7 /m² 70 /m² (20) 0.1mm,
 0.2mm 가 , 0.12 /cm³() 가

, 1 2 (20) 20 / (20) 가 , ,

8a 8b 1 2 (200) (220) (web patterning layer) (250) (200)
 (200) (200) 1 (202) 1 (202) 2 (204) 1 (202) 1 (200)
 1 (202) 8a

8a 8b , 1 (231) (232) 1 (230) (220) 1 (230) 1 (230) 1

8a 8b , 2 (250) (250) . 1 (231) 2 (261)
 (250) 2 (261) (200) (260) . (260) (230) (260, 230) (230)
 , (231, 261) , (260) (230) (260)

0.00mm(0.0mil) 0.20mm(8.0mil) , ,
 mm(4.0mil) (24) , 0.15mm(6.0mil) , 0.10
 , 가 0.05mm(2.0mil) . (220) ,
 (260) , (250) 8a , , (260) 8c

(250) , (250) 1 (230)
 (230) , (250) 가 1 (230) 1
 , (220) , (200) 가 , , (220) 가

(220) (244)
 (240) (240) 9,000
 3 20 (denier) 가

(220) 가 , , (220)
 1 (230) , 2 (232) (232)
 (220) 1 (230) (220) 1 (230)
 0) , 2 (232) 가 , 1 (230) 1 (230)

(220) 2mm 가 , (220) 2mm 5mm
 가

1996 1 11 WO 96/00812 , 1996 8 22
 WO 96/25555 1996 8 22
 22
 ; 1996 4 30 / WO 96/25547 ; 1996 8
 996 6 28 08/640,452 ; 1
 08/672,293

(220) 200 ft³ / (standard cubic feet per minute)(scfm) 가 ,
 scfm 1.27cm(0.5 ft³) 가 929cm²(1ft²)
 . , (220) 5 200s
 cfm, 100scfm 가 .

(Appleton Mills Company)

Amflex 2 Press Felt	.	(220) 3mm	, 1,400 /m ²	, 30scfm
가 , 3	.	4		가
(weave)		(240) 1 (230) 3		1 (230)
10 15	.			

8a (200) (270) 가
 260) (250) . (270) , , 가
 (- 8 MD) , , , (260)

8a	(200)	(200)	5%	75%	
(200)	25%	50%	.	.	,

(20) 9a, 9b 9c . . 9a , ,
 (20) (542) (543) . . (500) , ,
 (542) (Fourdrinier wire) . . (542)

(hardwood pulp) (softwood pulp) 가
 (eucalyptus) 가 . 가 1.00mm
 가 2.5mm , ,

312,522	(Phan)	1994 1 18 가	5,279,767	1994 5 14 가	5,312,522
---------	--------	----------------	-----------	----------------	-----------

(20)) (Tallow Dimethyl Ammonium Chloride) Witco Company 가 ADOGEN 가 DiEster Di(가 .

(543) ,
0.1% 0.3% , , ,
% 100

(543) 9a . , (542) , (543)

(542) 1 2

, , . (543)
(502) (542) , (200) .

(20) [9b (545)] (543) (542) (200)
 (200) 5% 20% 1 (202)

(200) (545) 1 (547) (200) (202)
 (545) (260) . (230)
 2 (549) . 9b ,
 (200) (260) (230) . (200)
 2 . (260) (230)

(543) 가 (543) (543) (2)
00) (600) (542) (200) 가 9a
가 (620)

(545) 가 (9a MD) (900) 가 (880)
 (875) (800) 9c , (steam hood)(2800) (800)
 (545) (547) (900) (920)
 (2800) (545) (549)

(2800)	(920)		(920)	(545)	
(220)	(2800)		(545)	(220)	가
	(220)	,	(220)	(900)	

(2800) 15psi (920) 2.54cm 38.1cm (1 15) 136 (0.3)

inchester Roll Products Measurex - Devron Company D5A

가 (200) (800), 9c (549) (875), (545)
가 (875) (890) (875)

Hercules Co
Company CREPTROL
가 (880) 45%
40%, CREPTROL

가 (800) , 가 (875) (545) 가
 (900) (web imprinting layer) (250) (220)
 (boiling water)

, 2 (549) 가 (875) ,
 (545) 2
 . , 2 (549) (875)
 , 가 3.63kg/278.7m²(8 /3000ft²), 4.536kg/278.
 7m²(10 /3000ft²) 50% 30%
 90%, 95% (880)
 1371.6m/ (4,500ft/), 1524m/ (5,000ft/)
 11

, 3.63kg/278.7m²(8 /3000ft²), 4.536kg/278.7m²(10
 /3000ft²) (545) 1371.6m/ (4,500ft/), 1524m/ (5,000
 0ft/), 가 1828.8m/ (6,000ft/), 25%
 [가 (880)] , 30% , 95% [가
] .

, 4,637,859 가 4.536kg/278.7m²(10 /3,000
 ft²) 1066.8m/ (3,500ft/) 30% 90%
 60% 70% , 4,637,859
 , 914.4m/ (3,000ft/)

(20) 9a (545) (1000)
 (875) 가 , , (250) (1000) (1000)
 (545) 가 , , (1000) (875)
 1 1 , , 25° 가 , 81°

2 (20) (30) (50) (50) 가 , (50)
 (30) (30)

, (,)(200) 8c (250) 8c
 220) (260) (260) ,
 , (230) (260)

, (200) 14a 15c ,
 oraminous background element) (200) (1220) (250) (250) 14a

(f)

242)	(270) 가	(1241)	.	(260)	.	(1220) 가	(1)
14a	14b , 1 (1231) (knuckle surface) (1230) (14a (250) (261)	1) (260)	.	1 (1241, 1242) (1241, 1242) (1230) (1220)	.	.	.
1	2 (1231) (261) (260) , (260)	(260) (1230)	.	가 (1230), (1230) (260)	(200)	,	(1231, 261)
ii)	0.00mm(0.0mil) (24)	.	.	0.125mm(5.0mil) , 0.10mm(4.0mil)	.	,	0.05mm(2.0m)
14a	14b 10 (30) (270) (70)	(200) (20) (260)	10 (50) (50)	13 (30) (50) (70)	.	.	.
11	, P 0.10mm	0.35mm	.	0.44mm	.	K 0.20mm	.
15a 9a	15c 9c (545) (549)	(200) (200) 15b	1 (543) .	10 (20) (543) , 1 (547)	(20) (543) (260) (1230)	.	.
9a	9c (549)	, (545) (545) 가 (545)	(200) (200) (200)	(200) 가 (200)	(650) 가 (545)	.	.
	(650) 5,247,930	(545)	30% ,	70% (Sisson)	.	3,303,576	(Ensign)
880)	(545) (890)	(200) (260)	(900) (1230)	가 (800) (549)	(880) (800)	(800) (545)	(
	(875)	.	.	가	.	가	.

16 (20) , 3
301, 302, 303) . 8a, 8b 9a, 9c
14a, 14b 15a 15c .

(542) 9a ,
4,300,981 1996 10 24 3,994,771 ,

16 , (542) (22) 가 (301, 302, 303) . 1 (301) . 2 (302) . 2 (301) 3mm 2 (2) 4) . 2 (302) 1.5mm

3 (303) 1 (301) 2 (302) . . 3
(310) . . 3 11 가

, (50) 3
OGEN 가 , 3 (303) ,
(310) 3 (303) ,

, (301, 302) , 3 (303)
 . , (301, 302) , 3
 (303)

4,225,382 가 . (Kearney)

%

1

14a, 14b 15a 15c 3

NSK 3 % 가 (repulper) .2 %

(,
0080) 가 0.2 % National Starch and Chemical Corporation
0.002]. NSK NSK 가 [0.2%
가 . (, ADOGEN 442) 2 %
가 . 0.2%
National starch 78 -
3 % 0.1 %

3 (1=100% NSK; 2=100% ; 3=100%)
NSK
3

) 110 가 95 가 5 2.54cm((5 - shed, satin weav
e)

0) (200) . 8%
2.54cm() 68 가 (200) (1220)
, 가 51 가 40.64cm(16)
0.22mm , 가 0.29mm
Appleton Wire Company

0) (250) (260) (200)
30% 40% . (1231) (260)
(261) 0.0254mm(0.001)

15b , 2 (549) 가 (200) (200) (545)
가 65% 가 가 (600, 620, 650)

(800) (900) (250) (1230) (545) 1
(547) (547) . (800) 400psi
2 (549) (880) (875)

25 ° (875) (1000) 90% 100% 가 .
0ft/) . 81 ° ; 244m/ (80
200m/ (650ft/)

28.5 /m² (17.5 /3000ft²) 3 가 , 0.02 % , 0.01 %

: 28.5 /m² (17.5 /3000ft²)

: 0.0136 (13.6mil)

: 0.08 /cm³

(22) : 890

(24) : 1070

: 1.20

2:

14a,	14b	15c	15c	2
------	-----	-----	-----	---

NSK 3 %	American Cyanamid Company	2% (,
NSK	가 NSK	PAREZ 750)	0.2 %
		. 2%	, 3 %
Witco Corporation	ADOGEN 442)	0.1 %	
가 .		0.2%	

2 (542)	(1=100% NSK/ NSK)	2= 100%)	5	2.54cm() 100
가 .	95	가 .		
(260)	8% (250)	(200)		(1220)

(260) 2.54cm()	40.65cm(16)	8% (549) (547)	8% (545)	(200) (549) (547) (1230)
1220) 2.54cm()	79	가 .	67	3
	, 가 .		0.18mm , 가 .	0.21mm .
			Appleton Wire Company	

(250) (1230)	(200) (1231)	30% (260)	40% (261)	0.0254mm(1mil) (260) 0.001 (88)
--------------	--------------	-----------	-----------	---------------------------------

(545) 0)	가 .	가 65% (800)		, (600, 620, 650) (800) (88)
(260) 2 (549)	(1230)	(545) 1 (547)	(547) (880)	(875) (800)
		400psi		

° 가 (1000) 90% 100% 가 . 25
 ° 81 ° . . .
 00ft/) 200m/ (650ft/) . .
 244m/ (8

2 가 , 0.02% 0.01% 20.8 /m² (12.8 /3000ft²)

2 , , ,

: 20.8 /m² (12.8 /3000ft²)

: 11.4mil

: 0.07 /cm³

(22) : 850

(24) : 1006

: 1.18

3 :

2	,	3	8a,	8b	9a	9c
---	---	---	-----	----	----	----

2% (, al Starch 78 - 0080)	3 % 0.2 % 1 %	가 National Starch and Chemical Corporation NSK Witco Corporation 가 .	가 NSK ADOGEN 442) 0.2%	Nation . 2% 0.
--------------------------------	---------------------	--	---------------------------------	----------------------

3 0%)	(3 NSK 5	1=100% NSK; 2=100% 2.54cm() 110 가 . 95 가 .	;	3=10
--------	-----------------	--	---	------

(250)	8% (200)	;	(220)
-------	-------------	---	-------

(220) (220) (220) 1,436 /m ²	Appleton Mills 3 , 3mm	10 40scfm	15 Amflex 2 Press Felt
---	---------------------------	--------------	---------------------------

$$(250) \quad (200) \quad 30\% \quad 40\% \\ (260) \quad . \quad (260) \quad (2610) \quad (230) \quad (231) \quad 0.127\text{mm}(0.005) \quad .$$

(200) . 50.8cm(20) (549) 가 (200)

가 25% 가 (620) (900) (880)
 , (545) (2800) . (800)

(545) (200) (900) (880) 400psi
 (800) (545) (547) (260)

 90% 가
 25 ° 가 81 °
 244m/ (800ft/) 200m/ (650ft/)

3 2 . 2 1.
0% 0.1% . .

: 15.9 /m² (9.8 /3000 ft²)

: 6mil

: 0.10 /cm³

(22) : 740

(24) : 960

: 1.30

4

8a, 8b 9c 9c

PAREZ 750) 0.1 % . 2% 가 NSK
 0.2% . , 3 % . 2%
 (ADOGEN 442) 0.1 % . 2% 가 .
 0.2%

2 (1 = 100% NSK / 2 = 100% NSK)
5 . 2.54cm
() 100 가 95 가 .

(220)

(250)	(200)					
(220)		Appleton Mills		Amflex 2 Press Felt		
(250)	(260)		(250)	(200)		
35%			1			0.127mm
(0.005)						

50.8cm(20)	(200)	1			(545)	
가	가	.		가 25%		가
(900)		(545)		(200)		(2800)
400psi		(880)		(800)		(545)
가	,	(880)	(875)		(880)	
;	90%	가		25 °		가 81 °
00m/ (650ft/)				244m/ (800ft/)		2

2				20.5 /m ² (12.6 /3000ft ²)		
가 , 0.2 %		0.1 %				
2	,	,	,			

: 20.5 /m² (12.6 /3000 ft²)

: 8.8mil

: 0.092 /cm³

(22) : 890

(24) : 1050 : 1.18

:

8a,	8b	9a	9c			2
-----	----	----	----	--	--	---

3 %				2%		
, %	NSK		American Cyanamid Corporation		PAREZ 750)	0.2
, 3 %		가	NSK			
				2%	0.2%	
			ADOGEN 442)	0.1	%	
		가		0.2%		

2 (1=100% NSK; 2= 100% NSK) .

() 100 가 95 가

(220)				Appleton Mills		Amflex 2 Press Felt	.
(250)	(220)	6.45cm ² ()	69			(270)
	(260)	.		(250)	(200)		
35%	.		(260)	1	(230)	0.127mm(0.005)

(200) (545) . 50.8cm(20)

가 30% 가 60 P& J
 가 (545) (200) (800) (900) (880)
 (910) (545) 400psi

2 . 20.3 /m²(12.5 /3000ft²)
가 , 0.2 % 0.1 % . 2 ,

(30) (23), (30) (50) (microtomed c
ross-section) 3 ,
(23) (50) (P) (30) (K)

25.4cm x 5.1cm(1 x 2) 10
10 , () 가

Hercules, Inc. (stapling) Merigraph photopolymer

$$(\quad , \quad 4) \qquad \qquad (\quad , \quad 3) \qquad \qquad \text{. . .} \qquad \qquad (20)$$

American Optical Company 860
가

(, 30 50)

60
(P, K) 가 .

(ligh

t transmission microscope) 40 3 1 2 . Hewlett

Packard ScanJet IIC

Deskjet II 1.6

125 100%

Laser Writer NT, NTX

Macintosh IICi

Engineered Software PowerDraw 6.0

CAD

P

3 , (30, 50) (K, P)

(50) 가 Power Draw

(50) (P) ().

, (50) (30) (30) (K) 2 K

(50) (50)

3 , (K) 2 (50)

(30)

10 , (30) (30) (50) (50) (50) , (23)

(30) 50 , , , (23) 50 (50) 13

(50) , , (50) (30)

(Ampulsky)

(surface smoothness) 1991 TAPPI Book 1 19

(physiological surface smoothness : PSS)

PSS

PSS (Spende

I) 4,959,125 , (Ampulski) 5,059,282

(importing) , , () 10 SAS
 10 National Instruments 가 LABVIEW
 vi ' Amp Spectrum Mag Vrms' LABVIEW
 10

LABVIEW 0.000246, 0.000485, 0.00756, 0.062997
 SAS 0.0039, 0.0077, 0.120, 1.0

PSS

10 10 PSS
 가 ,

2 48% 52% 21.7 23.9 (71 75) 241 - 10
 12 8.9cm x 8.9cm(3.5 x 3.5)
 Thwing - Albert Alfa Hydraulic Pressure Sample Cutter 6
 23.9 (71 75) 48% 52% 가 15 21.7

, 12 Sartorius Instrument Company A200S 79.04cm²(12.
 25) 1 () 27.9m²(3,000ft²) ()

12 () x 3,000 x 144 in²/ft²²

(453.6 /) x (12) x (12.25 in⁻²)

$$: (/3,000ft^2) = 12 () \times 6.48$$

1984 9 4

4,469,735

(bulk density):

(absorbent capacity):

4,469,735

1 (231) (260) (261) 1.3mm² 3mm
 I Products (stylus) Federal Products Company Federa
 (EMD - 4320 W1) 432B - 81)
 2 (shim)
 1 (230)

0.24 /mm² 3

14b (1231, 261)

(57)

1.

1 2 1 2 ; , ; , ;

가 ; , ; , ;

1 10% 60% (surface smoothness ratio) 가 1.15

20% 60% 가 , 2 가 가

가 가

2.

1 ,

가

3.

2

가

4.

2

가

1

1 2 , ;

2 가 1.15 ;

1

가

가

5.

6.

7.

8.

9.

10.

4

가

11.

10

가

12.

2

1

13.

14.

13 ,
1
2
가 0.015mm(6.0mil)

15.

14 ,
1 2 0.05mm(2.0mil)

16.

14

,

가

17.

16

,

가

,

18.

,

,

1

,

2

,

1

2

가 0.15mm(6.0mil)

19.

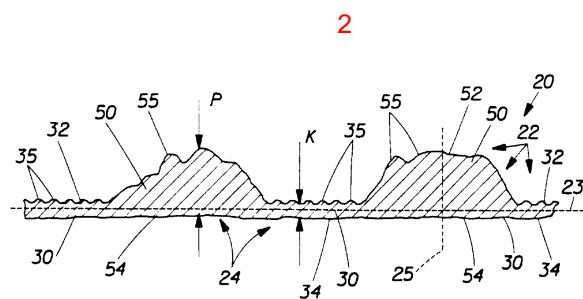
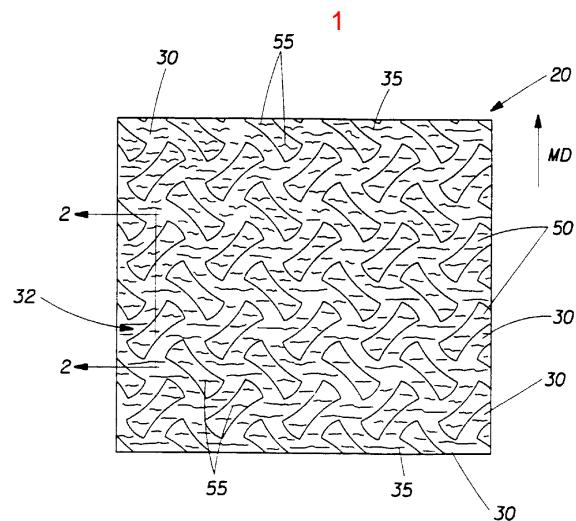
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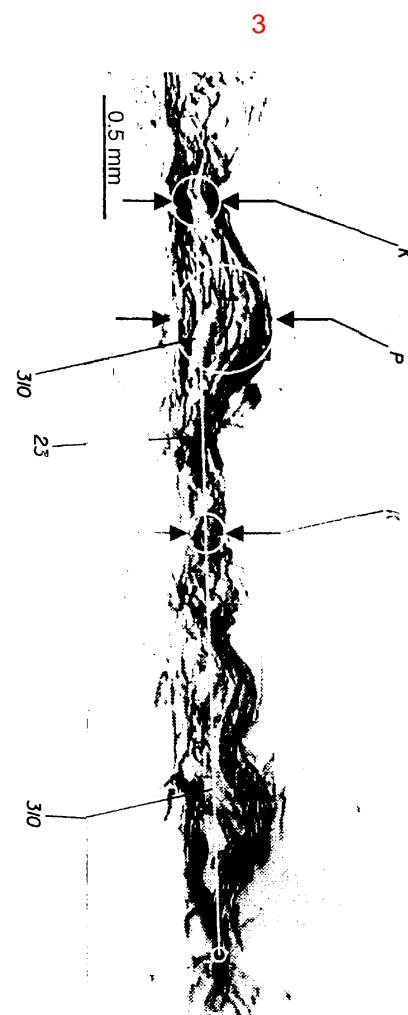
,

1

2

0.05mm(2.0mil)





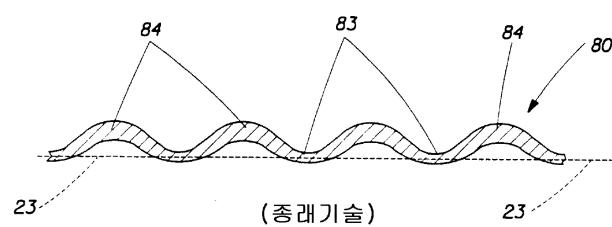
4



5

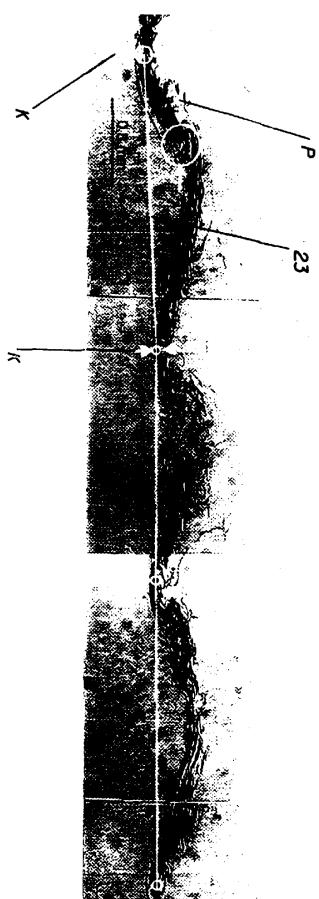


6



(종래 기술)

7a



(종래기술)

7b



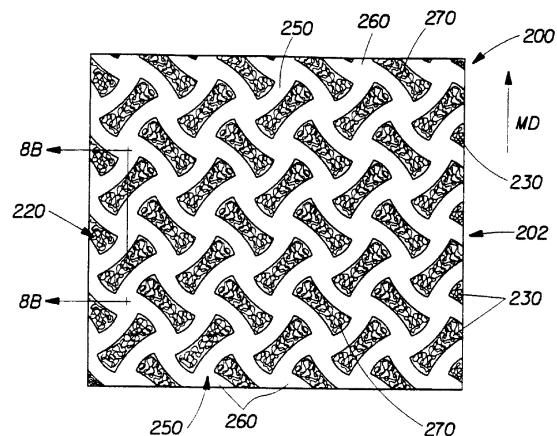
(종래기술)

7c

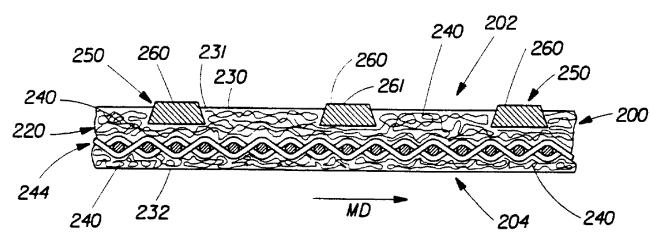


(종래기술)

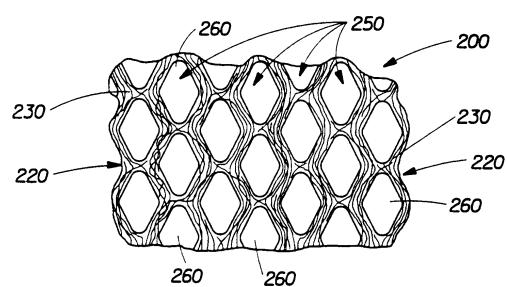
8a



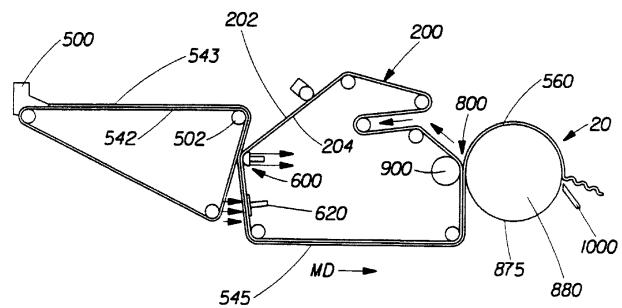
8b



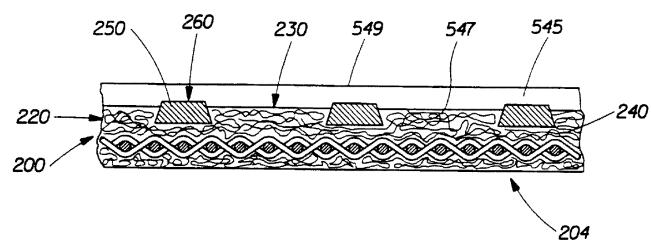
8c



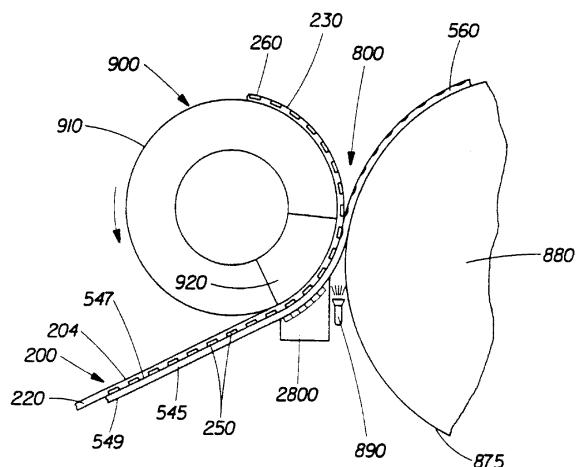
9a



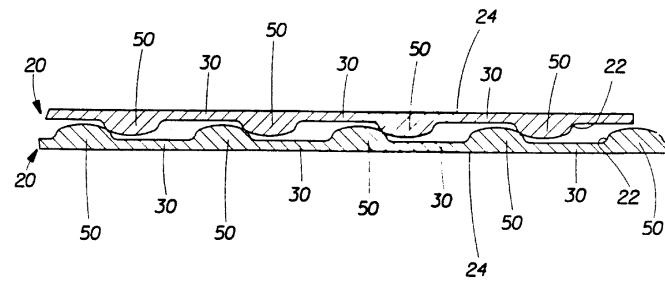
9b



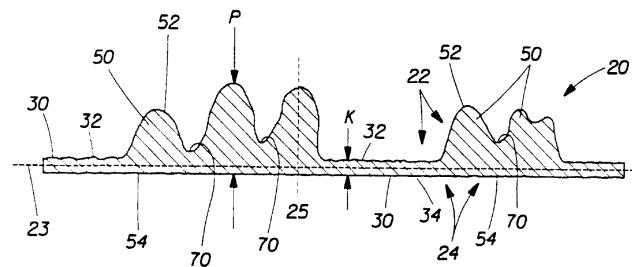
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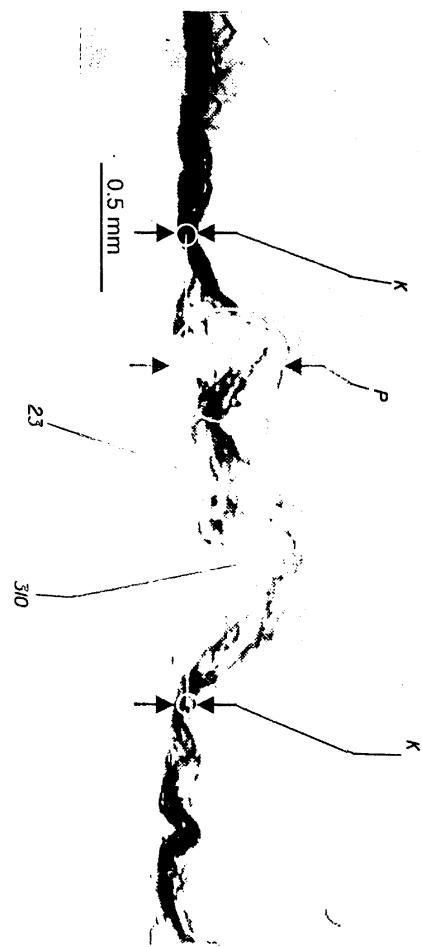
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10



11



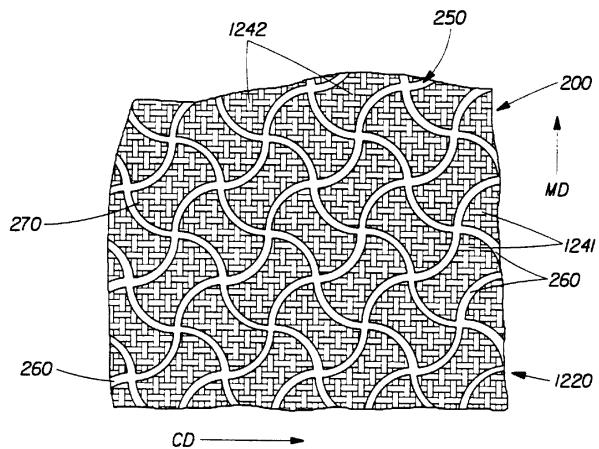
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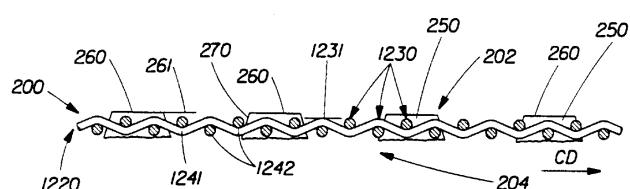
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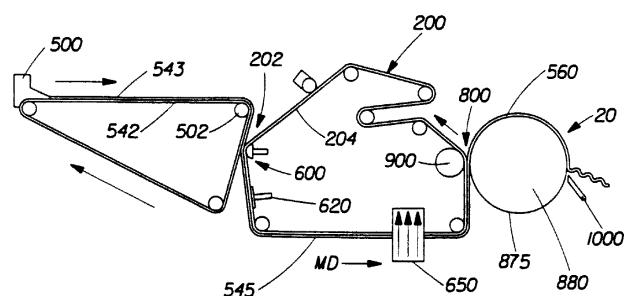
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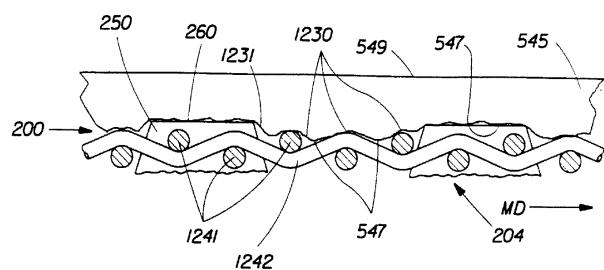
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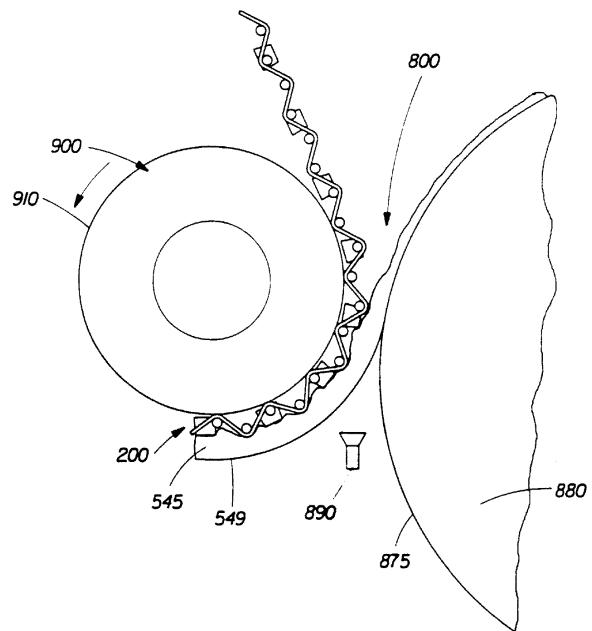
15a



15b



15c



16

