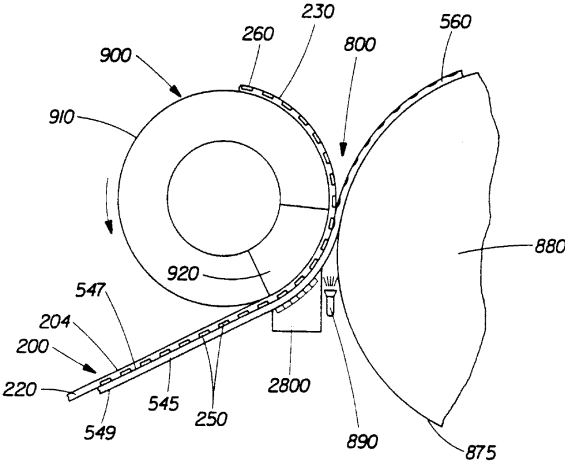


가

가



(bulk)

(smoothness)

가

가

가

가

가 rgan) 가 1976 11 30 가 (Trokhan) 1980 3 4 3,994,771 가 4,191,609 가 (Mo

가

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)

가 (Ampuls
 ki) 1995 6 29 1993 12 20 WO 95/1754
 8 ; 1996 1 11 1994 6 29 WO 9
 6/00812 ; (Phan) 1996 1 11 1994 6 29
 WO 96/00814 ; 1996 9 17 5,556,509 ; 1996 8 27
 5,549,790 가

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

가 가
 가
 (press nip)

가 가
 가 가
 , 가
 가 가
 가 가
 가 가
 (creping) 가 가
 가 가
 (softness) 가 (flexibility)

가

()

2 가 가

가 , 가
가
.

가

(wetlaid paper web)

2 , 가 1 2 , 1
; 1 2
1 2
; 10% 60% 1
2 가 가
가 가
가 .

(fiber debonding agent)

0.15mm(6.0mil) , 1 2
0.05mm(2.0mil) .
 ,
 .

1 1 , 1
 , .

2 1 2 - 2 1 ,
 .

3 1 2 .

4 1 2 1 .

5 1 2 2 .

6 4,637,859 .

7a 4,637,859 .

7b 4,637,859 .

7c 7b .

8a 1 2 , .

8b 8a 8b - 8b 8a .

8c , .

9a 8a 8b .

9b 8b 1 2 8b .

9c 8b ,
1 2 .

9d 2 2 2 , 2
, .

10 , .

11 10 .

12 10 1 .

13 10 2 .

14a 10 , .

14b 14 .

15a 14a 14b .

15b 14b 1 2 14
b .

15c 14b ,
1 2 .

16 .

1 2 (20) 3 5 1 2
, 6 7a 7c 4,637,859

1 5 (20) 1 (22) 2 (24) 가 (22)

(20) (K) (30) (34)

(32) (30)

(20) (30) (50)

(50) (P) 가 (30) (32) (50) (50)

(22) (K) (52) (50) (24) (54) (P)

(K) , P/K 1.5 3 , P 0.3mm

0.40mm K 0.25mm 0.20mm

2 (30) (50) 1

(crepe ridge) (35) 가

(50) (55)

(30) 4,637,859

(50) 4,637,859

(50) 4,637,859

(50) (30) (30) (23)

(2) (23) (32, 34) (30)

2 (30) (23)

(30) (50) (23)

가 (25) (50) 가 (25) (54)

(23) , 가 (25) (24) (23)

(P, K) (23) (50) (30)

1 2 4,637,859 6 (80)

(84) 6 (84) (83) 4,637,859 (83)

(84) 6 (23) 4,637,859 6

7a 7b 7c

1 2 (20) (30) (50)

(24) 가 4,637,859

, (20) (smoothness) 가 1.15 , 1.20 , 1.25
 , 1.30 , 가 1.40 , (22)
 (24) .

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

가 . , .

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

(20) 가 (24) , (30)
 . 가 (50) , (20)

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

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

8a 8b , 1 (220) 1 (230) 1 (230) 1
 (231) . 1 (230) . (220) 2
 (232) .

8a 8b , 2 (250) (220)
 (250) 2 (261) (260) 1 (231) 2 (261)
 가 (200) (260, 230)
 , (231, 261) , (260) (230) (230)
 (260)

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

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

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

(220) 가 (220)
 1 (230) , 2 (232)
 (220) 1 (230)
 (220) 2 (232) (220) 1 (23
 0) 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 WO 96/25547 ; 1996 8
 22 , 08/701,600
 ; 1996 4 30 / , 08/640,452 ; 1
 996 6 28 ,
 08/672,293

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

(220) 800 /m² 2,000 /m² , 0.35 /cm³ 0.45 /cm³ (
) 가 . (200) (220)

(220) (Appleton Mills Company)
 Amflex 2 Press Felt . (220) 3mm , 1,400 /m² , 30scfm
 가 , 3 가 4 가
 (weave) 10 15 가 . (240) 1 (230) 3 1 (230)

8a (200) (270)가 (
 260) (250) . (270) , , 가
 (8 MD) , , (260)
 8a (200) 5% 75% ,
 (200) 25% 50% .

8a , (260) (200) 6.54cm²(1) 700
 (270) 가 , 8a 6.54cm²
 (1) 10 400 (270) . (270) 1987 1 20
 4,637,859 가 (MD) 가 (CD)
 가 , (270) , 가 가
 가 가 (270) 가 가 가
 (270)

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

, 가 , , (CTMP) .

(Kraft), .

가 .

(hardwood pulp) (softwood pulp) 가 .

() 가 1.00mm ,

(eucalyptus) 가 ,

가 2.5mm 가 . ,

,

,

s Inc. 가 Hercule

KYMENE 557H N

ational Starch Chemical Corporation NATIONAL STARCH 78 - 0080

ACCO 711

American Cyanamid Company

,

가

가 .

(310)(16)가

,

가

가

(Phan) 1994 1 18 5,279,767

가 1994 5 14 5,

312,522 5,279,767 5,312,522 .

(20)

(Tallow Dimethyl Ammonium Chloride) DiEster Di(

Witco Company 가 ADOGEN 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%

(200) (545) 1 (547) (200) (202)

(545) (260) (230)

2 (549) 9b ,

(200) (260) (230) 가 (200)

2 , (260) (230)

(543) 가 (543) (2

00) (600) (542) (200) (543) 9a

가 (620) 가

(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) (220) (900)

(2800) 15psi 454 (1) 136 (0.3)

(920) 2.54cm 38.1cm(1 15) ,

(240) 7.72cm 30.48cm(3 12) (900) W

inchester Roll Products (2800)

Measurex - Devron Company D5A

(920) () (920) (900) (910)
 (910) 가 (200)가 (2800) (240) (91
 0) 9c (920) (200) (204) (800)
 (200)가 (900) (204) (920)
 (200)가 (900) (204)

가 9c (545)
 (200) (800) 2 (549) (875)
 가 (875) (890) (875)

Hercules Co
 mpany CREPTROL
 가 (880) 45%
 . 40% , CREPTROL

가 [(875)]
 (875) (875)
 (875) (500)
 0.91kg 1.8kg(2 4) (880)

가 (800) (200) (900) (920) (200)
 (240) , 가 (900) (875) (800) ()
 200) (200) (250) (260) (545)
 1 (547) 2 (549) , 2 (549)
 가 (800) (875) 가
 , 2 (549) (875) 2
 (549) 가 (800) (875) 가
 , 2 (549) (875) 1 (547) , 2 (549)
 . (545)가 (875) (260) (545) 20% 60%

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

, 2 (549) 가 (875) ,
 (545) 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/)
 (545) 1371.6m/ (4,500ft/), 1524m/ (5,00
 0ft/), 가 1828.8m/ (6,000ft/) , 30% , 25%
 [가 (880)] 90%, 95%[가
 .
 , 4,637,859 4.536kg/278.7m²(10 /3,000
 ft²) 가 30% 90%
 1066.8m/ (3,500ft/) , 4,637,859
 60% 70%
 , 4,637,859
 , 914.4m/ (3,000ft/) .
 (20) , 9a (545) (1000)
 (875) 가 . (1000)
 (545) , (250)
 가 , (1000) (875)
 1 , 1 , 2
 , 25 ° 가 , 81 °
 .
 2 (20) (30) (50) 가 .
 (30) (50) , (50)
 (30) .
 , (,) (200) 8c (f
 220) (260) (250) 8c
 , (230) (260) .
 .
 , (200) (f
 oraminous background element) . 14a 15c ,
 (200) (1220) (250) . (250) 14a

(270) (260) (1220) 가 (1
242) 가 (1241) .

14a 14b , 1 (1231) 1 (1241, 1242)
(knuckle surface) (1230) . (1241, 1242)
(14a) (1230)
2 (250) (1220) (250) 2
(261) (260) .

1 (1231) 2 (261) 가 (200)
 . (260) (1230) , (1231, 261)
 . , (260) (1230) , (1230) (260) .

0.00mm(0.0mil) 0.125mm(5.0mil) . ,
(24) 0.10mm(4.0mil) , 0.05mm(2.0m
il) , 가 0.025mm(1.0mil) .

14a 14b (200) 10 13
 . 10 , (20) (260) (30) ,
(30) (50) (50) (260)
(270) (50) (70)
(70) (1230) (1230) .

11 , P 0.35mm , 0.44mm . K 0.20mm ,
0.10mm .

15a 15c (200) 10 (20)
9a 9c , 1 2 (543) (542)
(200) . (543) (200) (200)
(545) . 15b , 1 (547) (260) (1230) , 2
(549) .

9a 9c , (545) (200) (650) ,
(545)가 (200) 가 가 (545) . 가
(549) (545) (200) .

(650) (545) 30% 70% .
(Sisson) 3,303,576 (Ensign)
5,247,930 .

(545) (200) (900) (880) (800)
(260) (1230) 가 (800) (545)
(890) (549) 가 (880)
880) (875) .

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

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

가 ,

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

3 (303) 1 (301) 2 (302) 3 가 3 3 11

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

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

(Kearney)

4,225,382 가

% .

1:

14a, 14b 15a 15c 3 .

NSK 3 % 가 (repulper) . 2 %

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

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

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

8%
(200) . (1220) (25
0) . (200) 40.64cm(16)
2.54cm() 68 가 51 가 5
, 가 0.22mm , 가 0.29mm .
Appleton Wire Company .

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

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

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

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

3
28.5 /m²(17.5 /3000ft²) 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 % . 2% (,
 American Cyanamid Company PAREZ 750) 0.2 %
 NSK 가 . NSK 0.2% , 3 %
 . 2% (,
 Witco Corporation ADOGEN 442) 0.1 %
 가 . 0.2% .

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

8% (1220)
 (260) (250) (200) .

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

(250) (200) 30% 40% (260)
 . (1230) (1231) (260) (261) 0.0254mm(1mil 0.001)
 .
 (545) 가 가 65% 가 , (600, 620, 650)
 . (800) (88
 0) (800) .
 (260) (1230) (545) 1 (547) (547)
 2 (549) (880) (875) . (800)
 400psi .

° 가 (1000) 90% 100% 가 . 25
 00ft/) 81 ° 244m/ (8
 200m/ (650ft/)
 가 2 , 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
 (NSK) 3 % 가
 2% (, National Starch and Chemical Corporation Nation
 al Starch 78 - 0080) 0.2 % NSK 가 . NSK
 0.2% , 3 % 가 . 2%
 (, Witco Corporation ADOGEN 442) 0.
 1 % 가 . 0.2%
 3 (1=100% NSK; 2=100% ; 3=10
 0%) NSK 3
 2.54cm() 110 가 95 가
 5
 8% (220)
 (250) (200)
 (220) Appleton Mills Amflex 2 Press Felt
 (220) 3 10 15
 (220) 1,436 /m² , 3mm , 30 40scfm

(260) (250) (200) 30% 40%
 (260) (260) (2610) (230) (231) 0.127mm(0.005) .

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

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

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

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

() 100 가 95 가 . 5 2.54cm

8% (220)
 (250) (200) .
 (220) Appleton Mills Amflex 2 Press Felt .
 (250) (260) (250) (200)
 35% (260) 1 (230) 0.127mm
 (0.005) .

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

2 20.5 /m²(12.6 /3000ft²)
 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% (.
 , American Cyanamid Coporation PAREZ 750) 0.2
 % NSK 가 . NSK 0.2% .
 , 3 % . 2% (,
 Witco Corporation ADOGEN 442) 0.1 %
 가 0.2% .

2 (1=100% NSK; 2= 100%)
 NSK
 5 2.54cm
 () 100 가 95 가
 8% (220)
 (250) (200)
 (220) Appleton Mills Amflex 2 Press Felt
 (250) (220) 6.45cm²() 69 (270)
 (260) (250) (200)
 35% (260) 1 (230) 0.127mm(0.005)
 (200) (545) 50.8cm(20)
 가 30% 가 가
 가 (545) (200) (800) (900) 60 P & J
 (910) (545) 400psi (880)
 (875)
 (880) 가 90%
 가 20 ° 가 76 ° ;
 1372m/ (4500ft/) 1125m/ (3690ft/)
 2 20.3 /m²(12.5 /3000ft²)
 가 , 0.2 % 0.1 % ,
 :
 (30) (23) , (30) (50) (microtomed c
 ross - section)
 (23) (50) (P) (30) (K) 3 ,
 25.4cm x 5.1cm(1 x 2) 10
 10 , () 가
 (stapling)
 Hercules, Inc. Merigraph photopolymer
 가 , (20)
 (, 4) (, 3)
 American Optical Company 860
 가

(P, K) , 60 가 .

(high

t transmission microscope) 40 .

3 1 2 .Hewlett

Packard ScanJet IIC

Deskjet II 1.6 . 100%

125 .

Laser Writer NT, NTX

Macintosh IICi

Engineered Software PowerDraw 6.0

CAD

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

(50) 가 Power Draw P

(50) (P) (

).

, (50) (30) 가 K

(50) (30) (K) 2

3 , (K) 2 (50)

(30)

10 , (30) (50)

(30) , (23)

25% (50)

, 10 , (50)

(30) 50 , (23) 50 13

(50) , (50) (30)

:

(surface smoothness)

1991 (Ampulsky)

TAPPI Book 1 19

(physiological surface smoothness : PSS)

PSS

(Spende

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

PSS

(importing) , () 10 SAS
National Instruments 가 LABVIEW
10
' Amp Spectrum Mag Vrms ' LABVIEW
vi ' 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)
12 8.9cm x 8.9cm(3.5 x 3.5) 241 - 10
Thwing - Albert Alfa Hydraulic Pressure Sample Cutter 6
, 2 6 12 가 15 21.7
23.9 (71 75) 48% 52%

, 12
Sartorius Instrument Company A200S 79.04cm²(12.
25) 1

() 27.9m²(3,000ft²) ()

12 () x 3,000 x 144 in²/ft²

(453.6 /) x (12) x (12.25 in²)

: (/3,000ft²) = 12 () x 6.48

:

1984 9 4

4,469,735

(bulk density):

(absorbent capacity):

4,469,735

:

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

14b (1231, 261)

(57)

1.

,

;

;

,

1

2

,

;

1

2

,

1

2

,

;

가

;

1

2

,

;

,

1

1 10% 60%
 surface smoothness ratio)가 1.15

;

20%

60%

가

,

2

가 가

,

;

가 가

.

2.

1 ,

가

.

3.

2 ,

가 ,

.

4.

,

;

;

, 1

2 , ;

1 2 2 , ,

1 1 2 2 ,

;

가 ;

, 1

1 2 , ;

2 1

가 1.15 ;

2 가 ;

가 ;

가

.

5.

6.

7.

8.

9.

10.

4 ,

가

.

11.

10 ,

가

,

.

12.

,

;

;

2

,

;

,

1

1 2 ,
1 2 ,
;
;
가 ;
;
가
1 , 2 , 가
,
2 ;
가 ;
가
.
13.
12 ,
;
가
.
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.

18

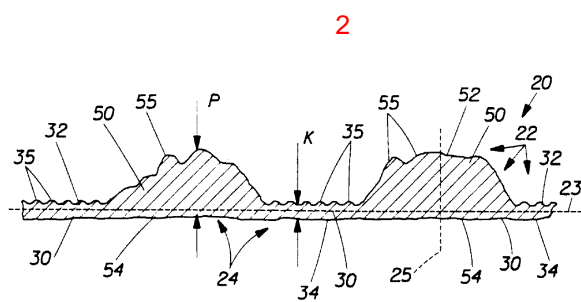
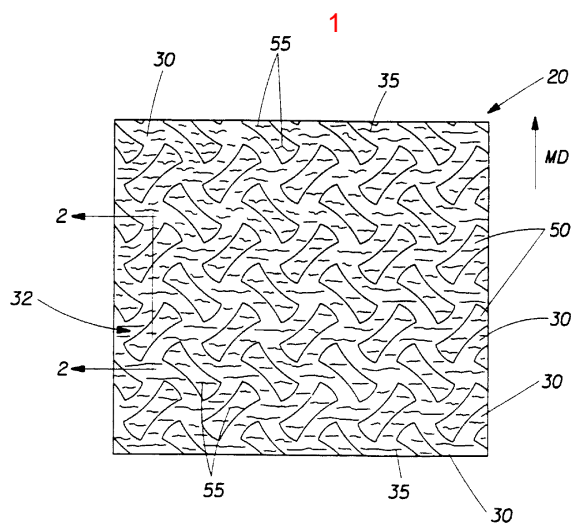
,

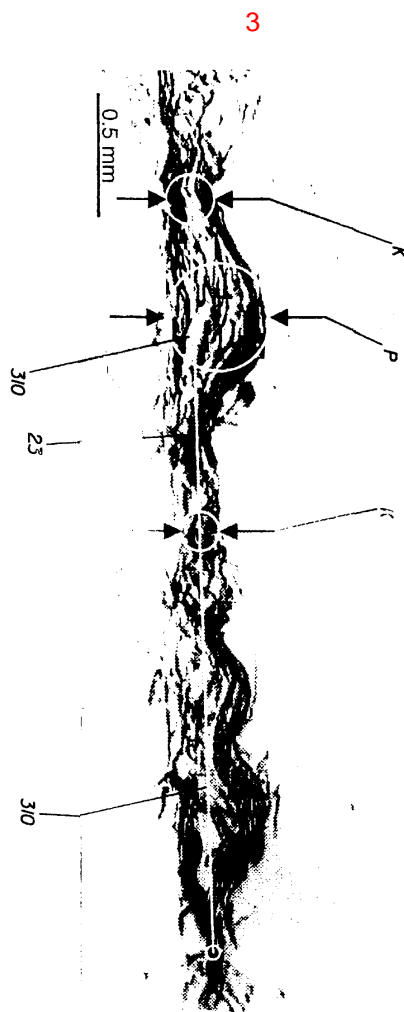
1

2

0.05mm(2.0mil)

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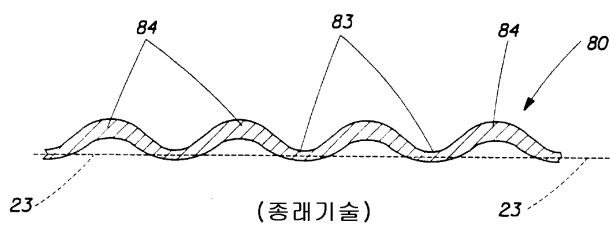
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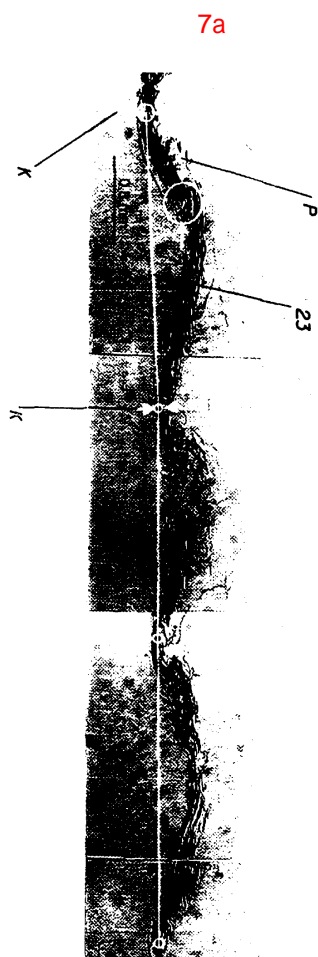


5



6





(종래기술)

7b



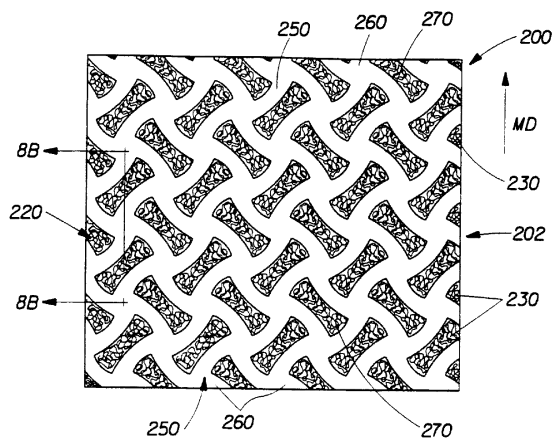
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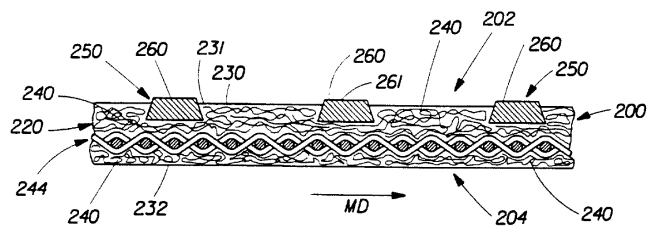


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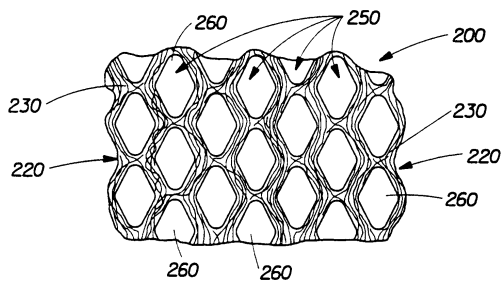
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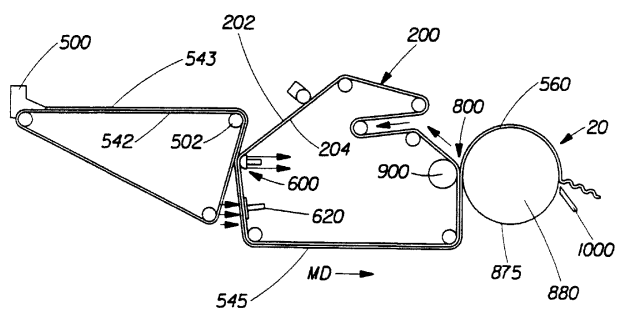
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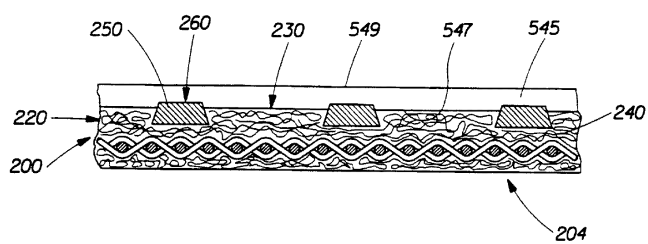
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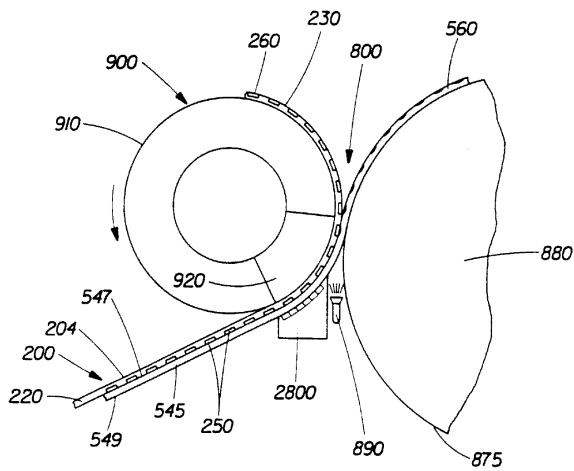
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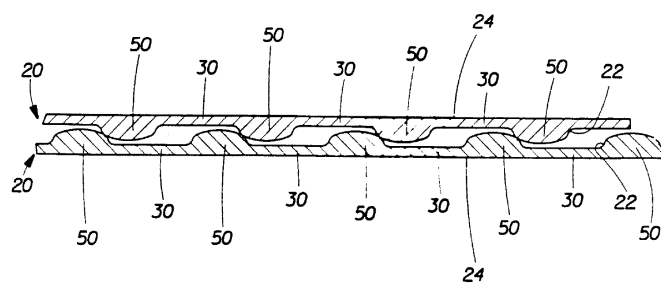
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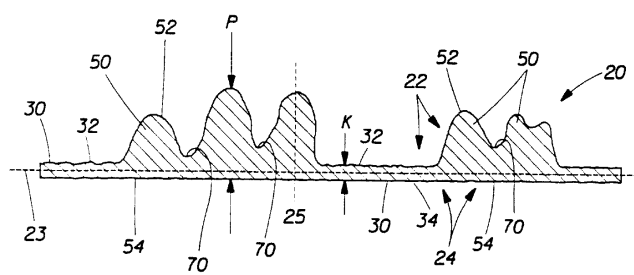
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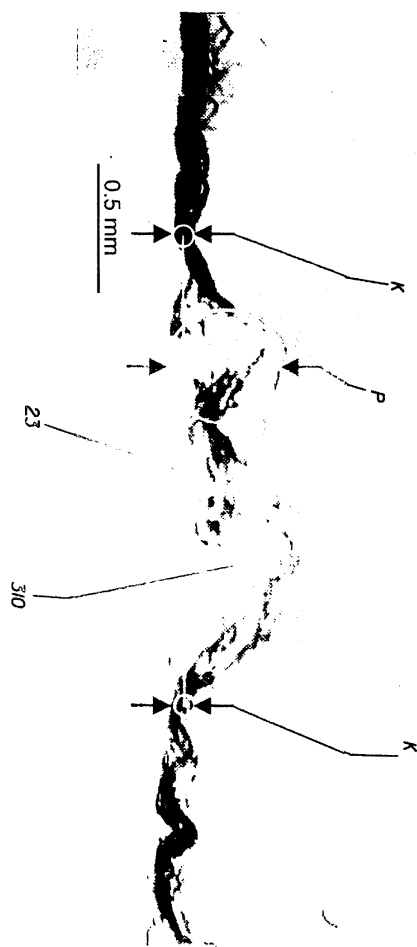
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10



11



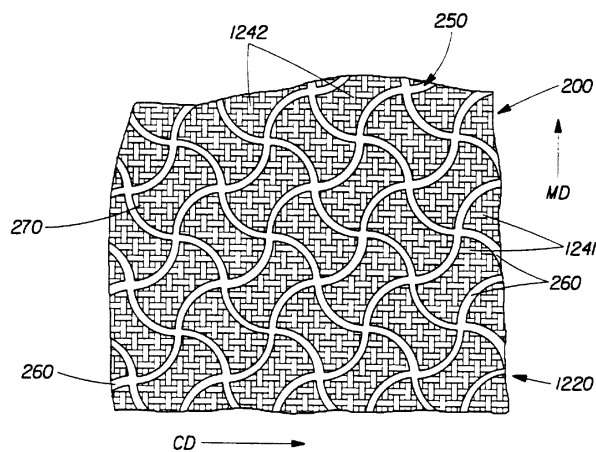
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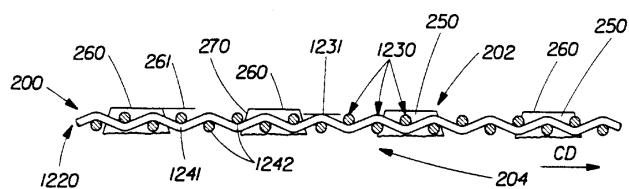
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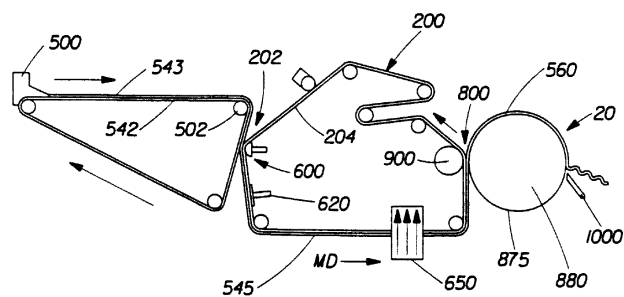
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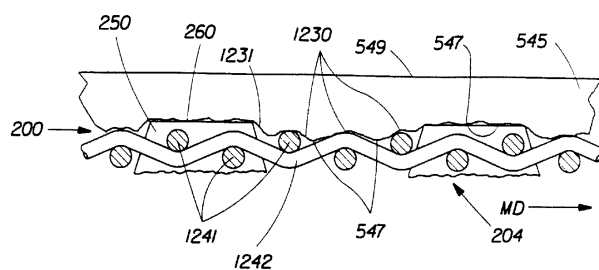
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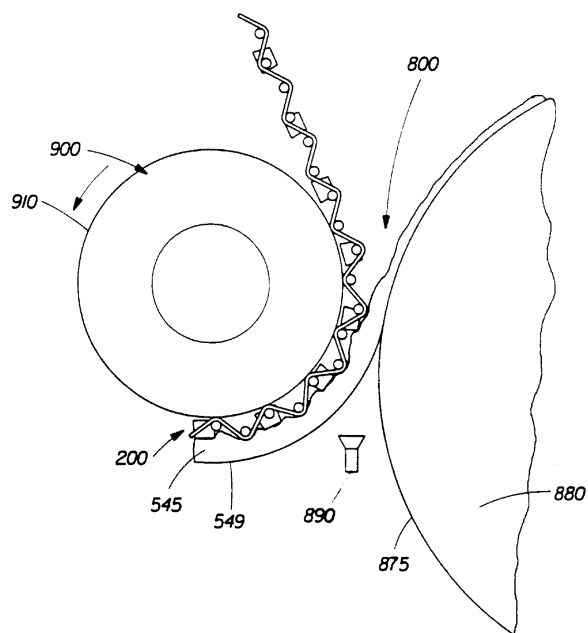
15a



15b



15c



16

