FIG. 1
PRIOR ART

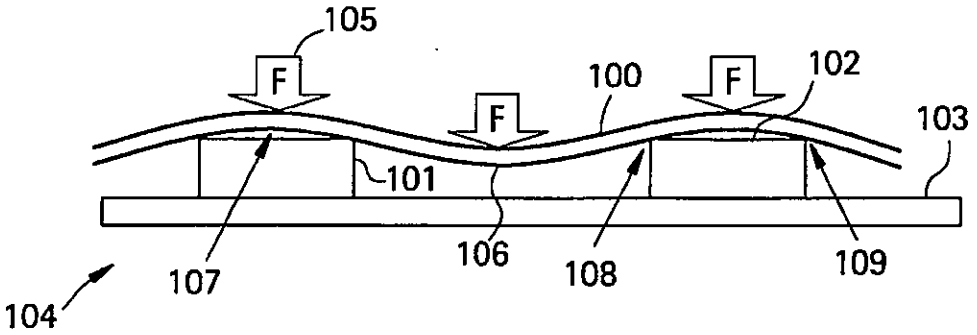


FIG. 2

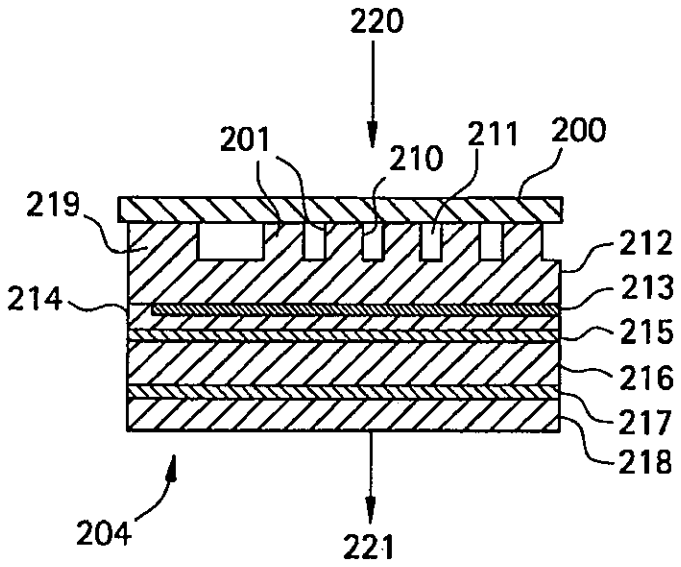


FIG. 3

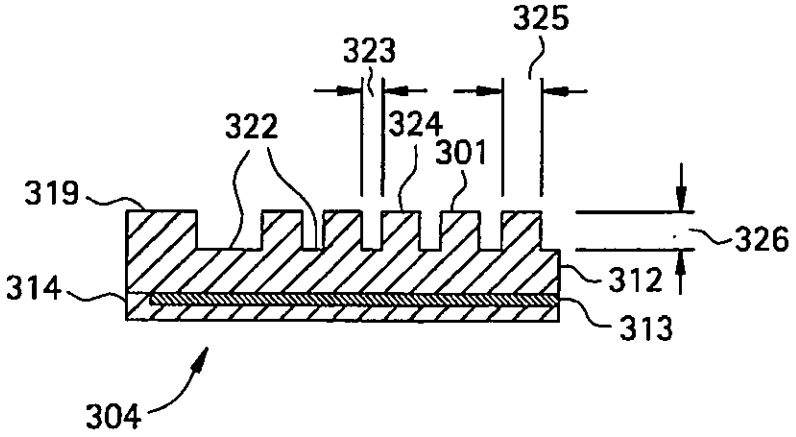


FIG. 4

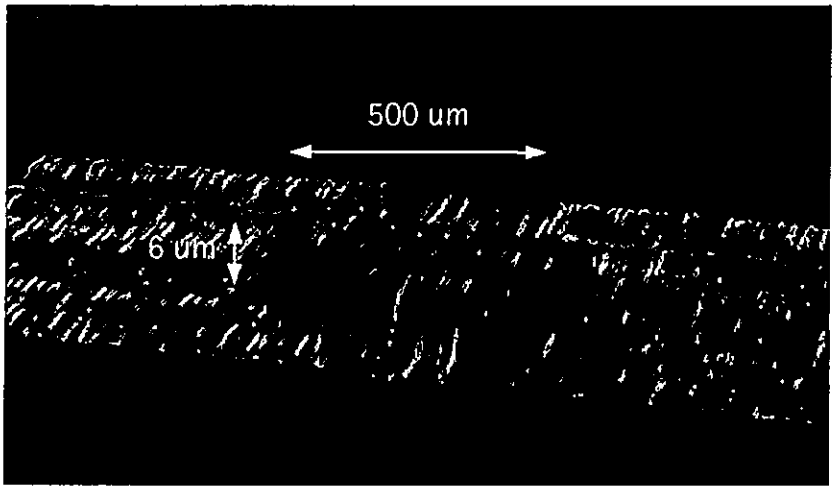


FIG. 5A

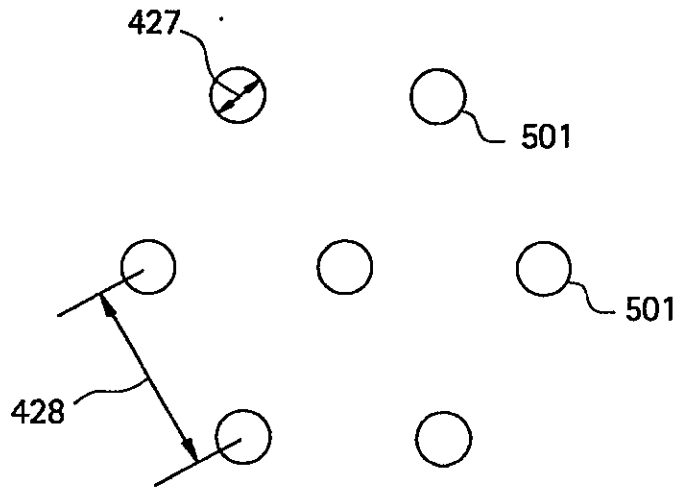

427
501
501
428

FIG. 5B

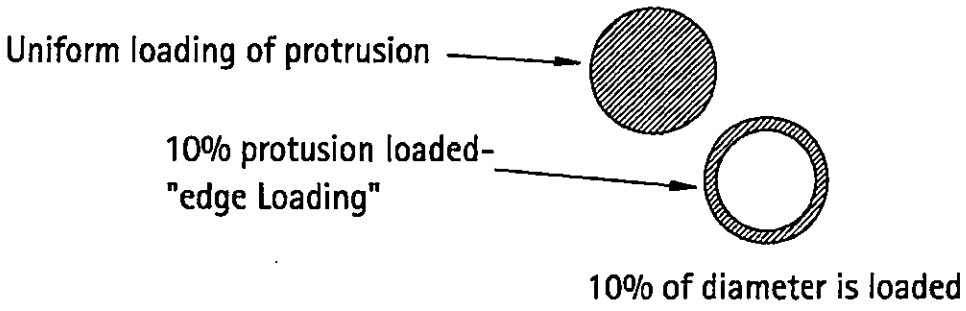

Uniform loading of protrusion
10% protusion loaded-
"edge Loading"
10% of diameter is loaded

FIG. 6

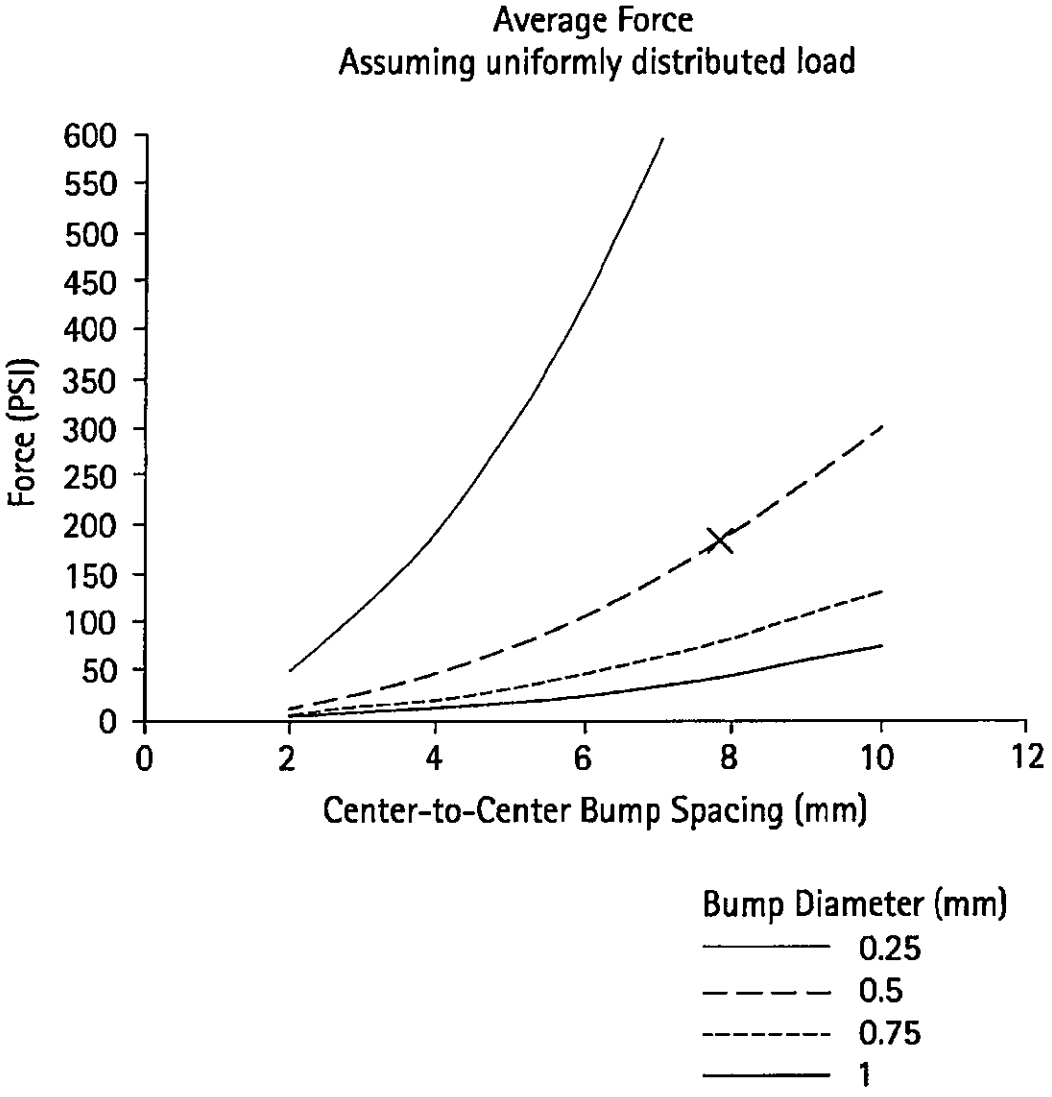

Average Force
Assuming uniformly distributed load
Force (PSI)
600
550
500
450
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
Center-to-Center Bump Spacing (mm)
Bump Diameter (mm)
0.25
0.5
0.75
1

FIG. 7

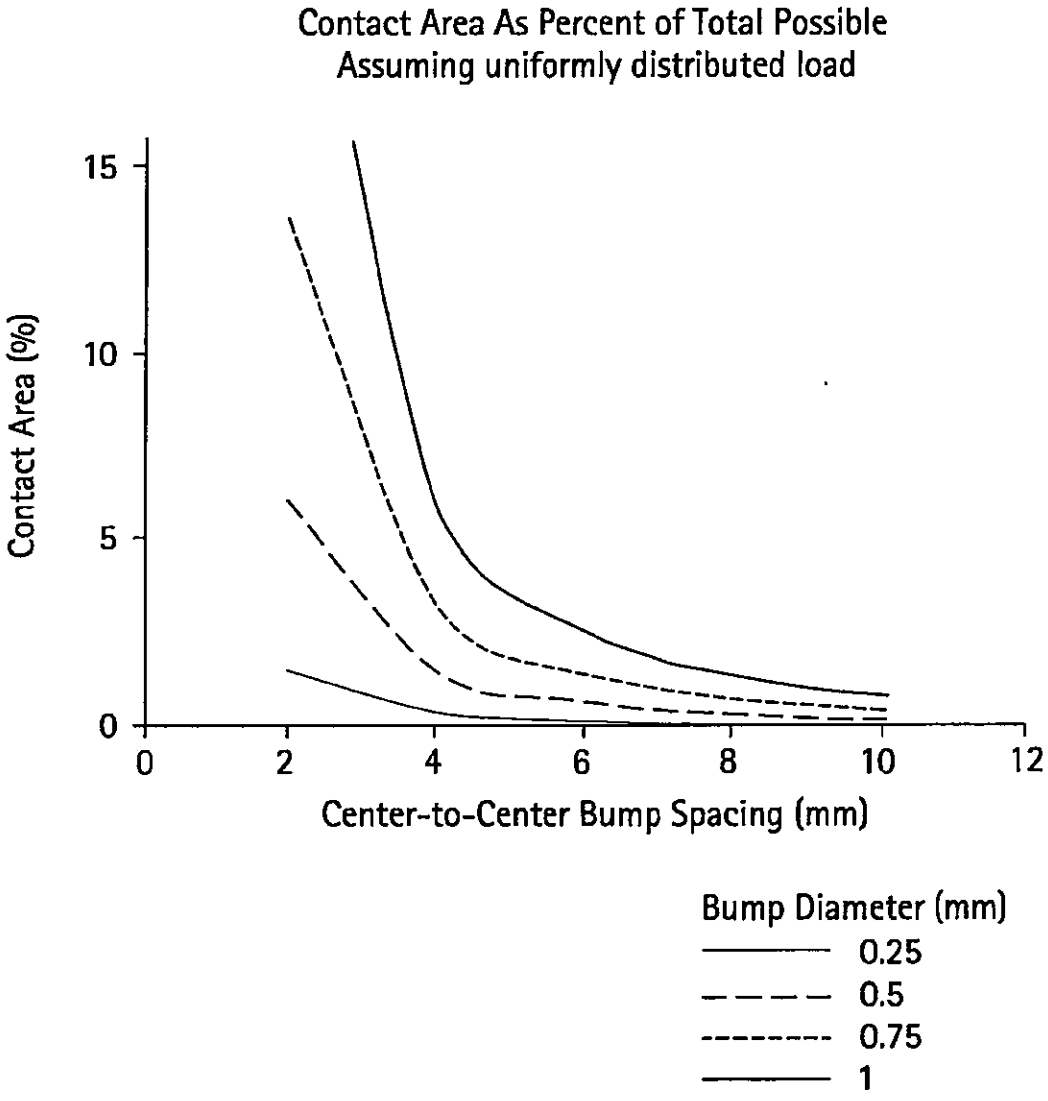

Contact Area As Percent of Total Possible
Assuming uniformly distributed load
Contact Area (%)
15
10
5
0
0
2
4
6
8
10
12
Center-to-Center Bump Spacing (mm)
Bump Diameter (mm)
0.25
0.5
0.75
1

FIG. 8

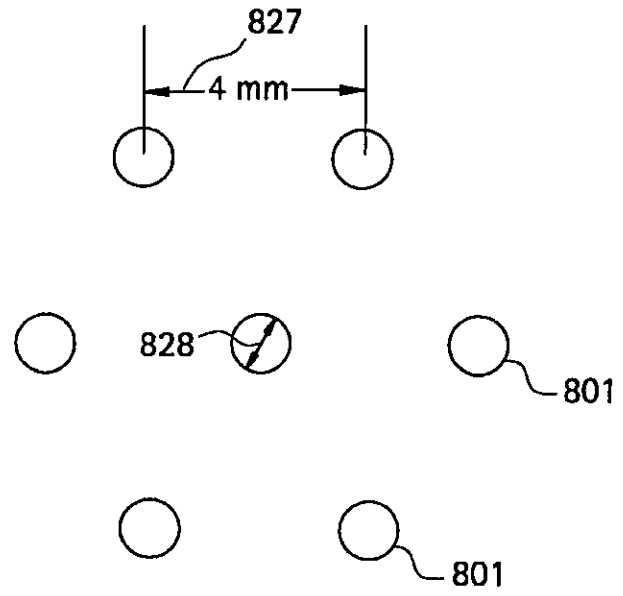


FIG. 9A

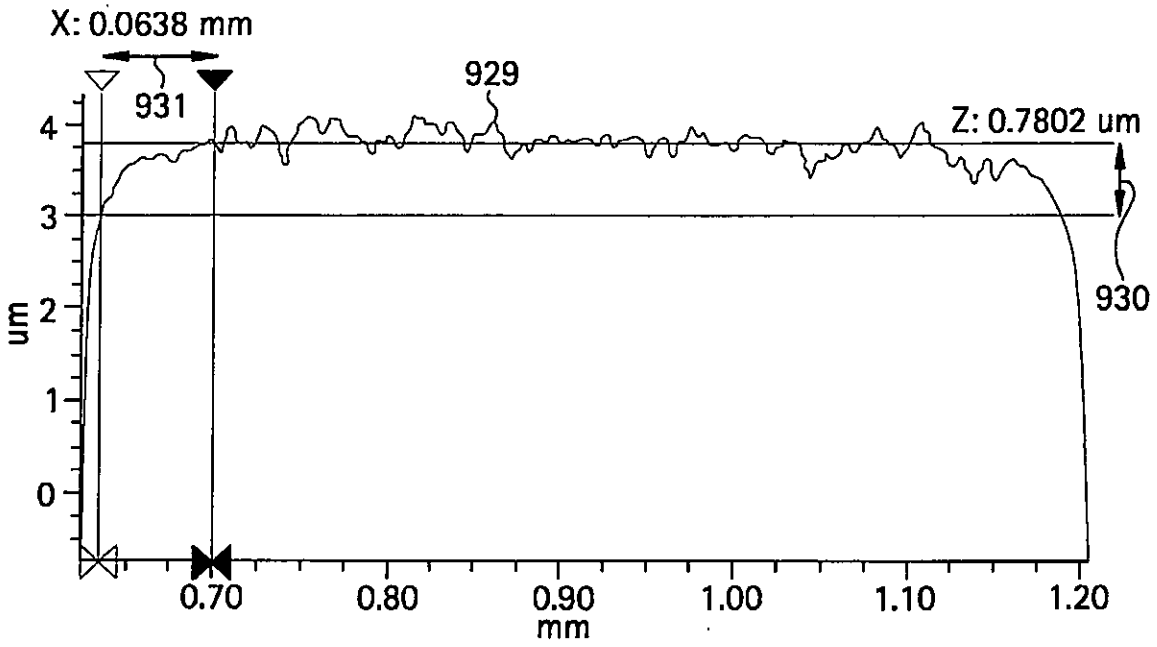

X: 0.0638 mm
931
929
Z: 0.7802 um
930
um
4
3
2
1
0
0.70
0.80
0.90
1.00
1.10
1.20
mm

FIG. 9B

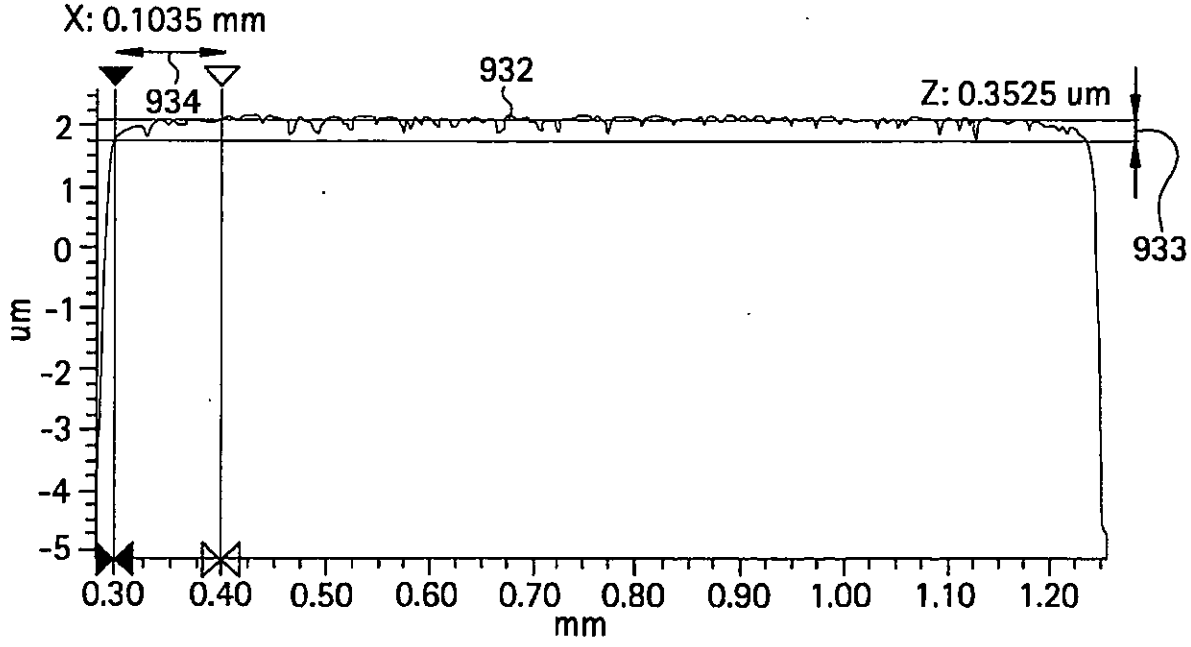

X: 0.1035 mm
934
932
Z: 0.3525 um
933
um
2
1
0
-1
-2
-3
-4
-5
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10
1.20
mm

FIG. 10A

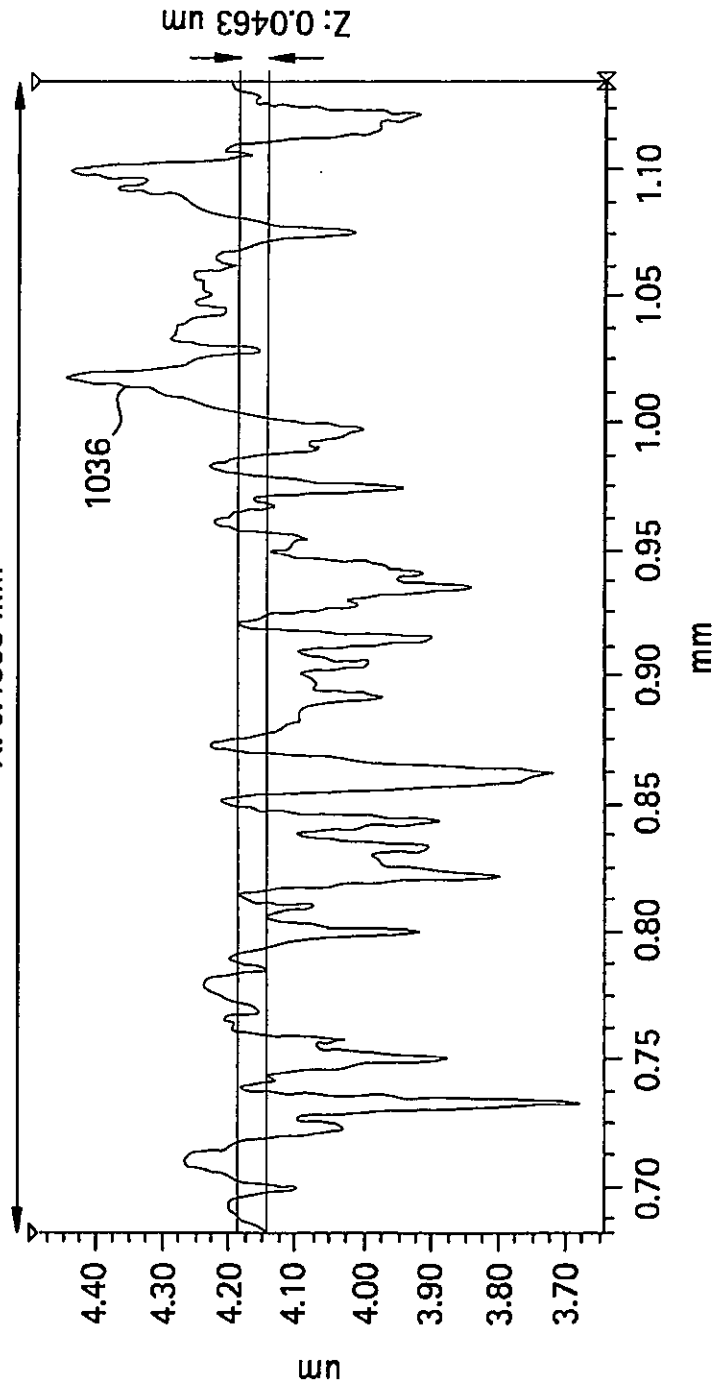
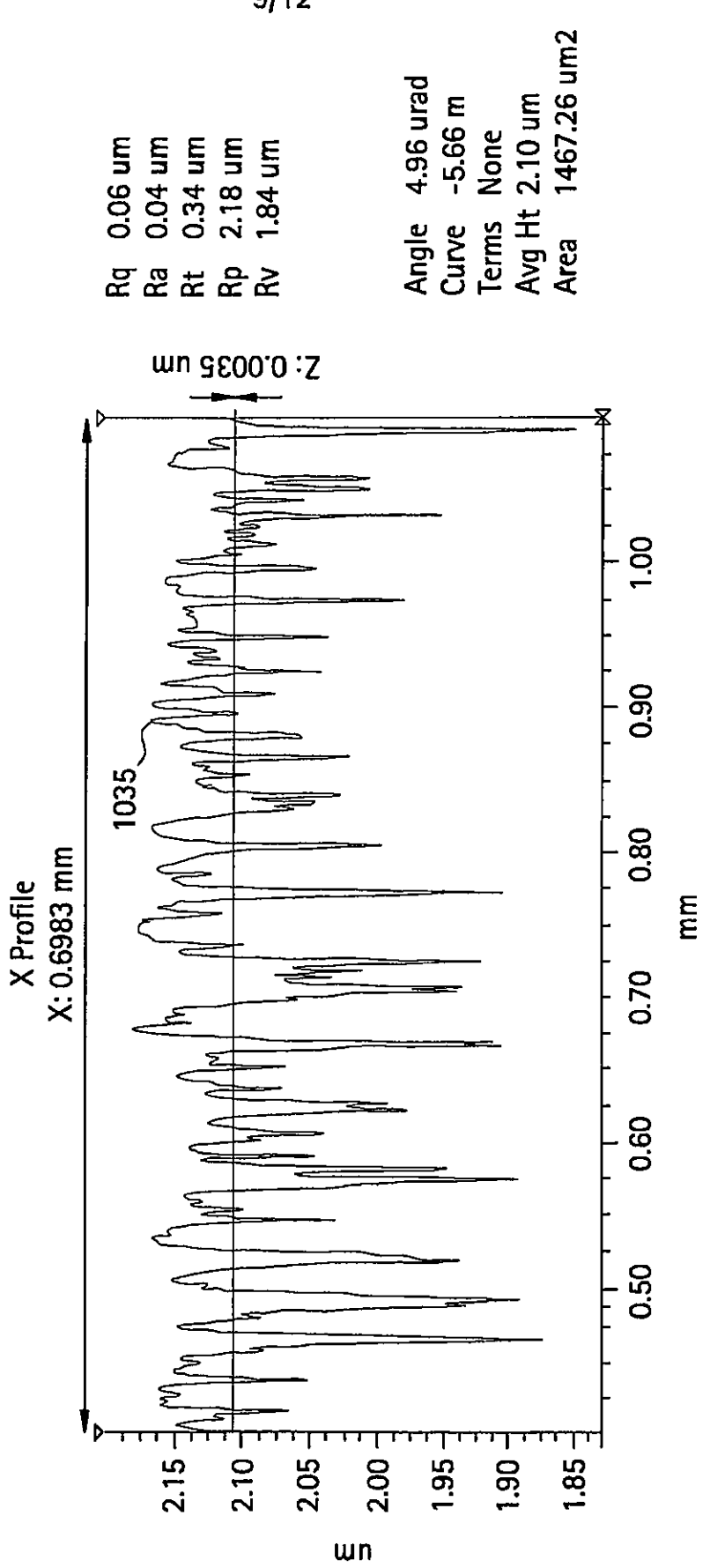

X Profile
X: 0.4533 mm
Z: 0.0463 um
Rq 0.13 um
Ra 0.10 um
Rt 0.76 um
Rp 4.44 um
Rv 3.68 um
Angle 102.18 urad
Curve 0.21 m
Terms None
Avg Ht 4.12 um
Area 1867.14 um2
1036
um
4.40
4.30
4.20
4.10
4.00
3.90
3.80
3.70
mm
0.70
0.75
0.80
0.85
0.90
0.95
1.00
1.05
1.10

FIG. 10B


X Profile
X: 0.6983 mm
Z: 0.0035 um
Rq 0.06 um
Ra 0.04 um
Rt 0.34 um
Rp 2.18 um
Rv 1.84 um
Angle 4.96 urad
Curve -5.66 m
Terms None
Avg Ht 2.10 um
Area 1467.26 um2
1035
um
2.15
2.10
2.05
2.00
1.95
1.90
1.85
mm
0.50
0.60
0.70
0.80
0.90
1.00

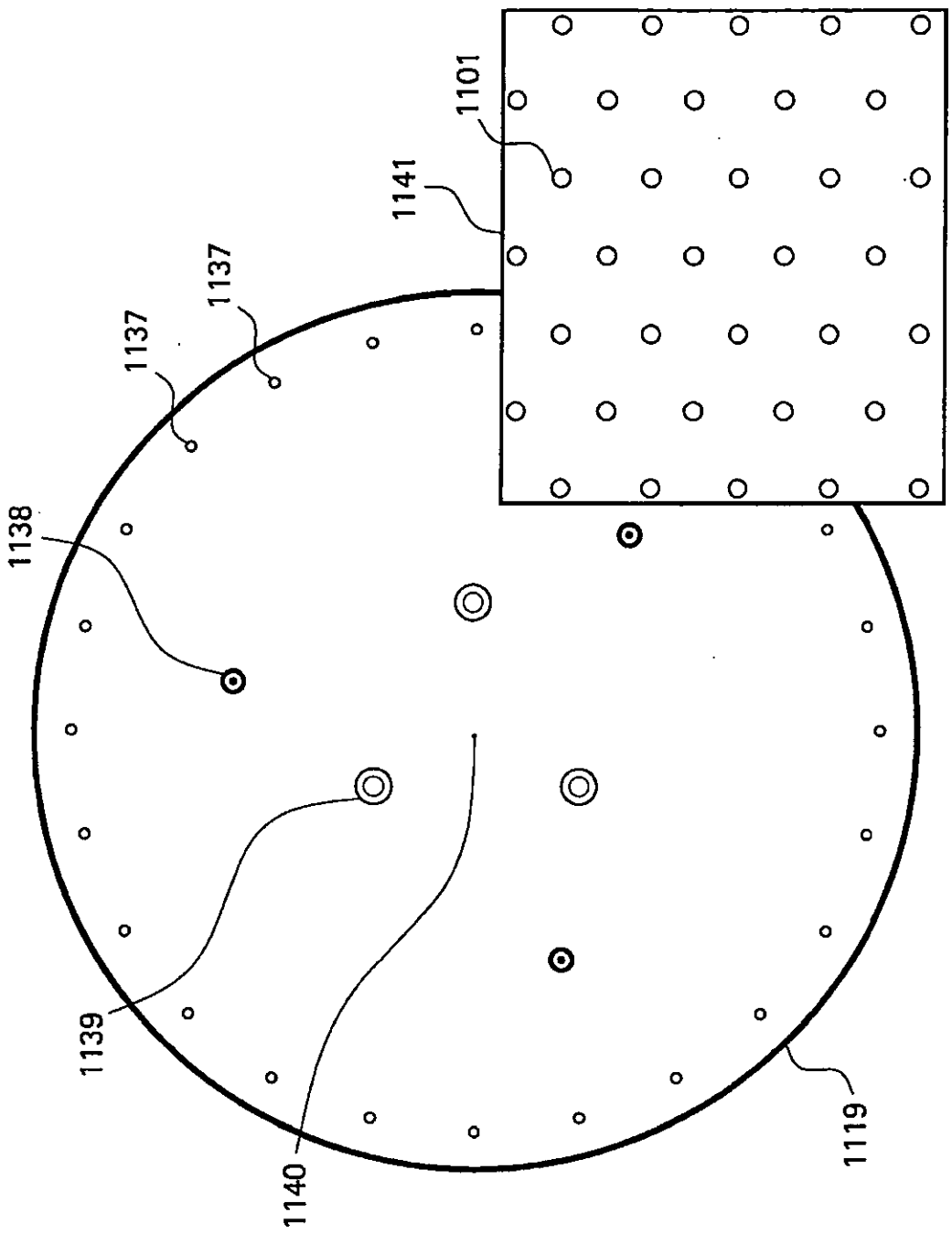


FIG. 11

FIG. 12

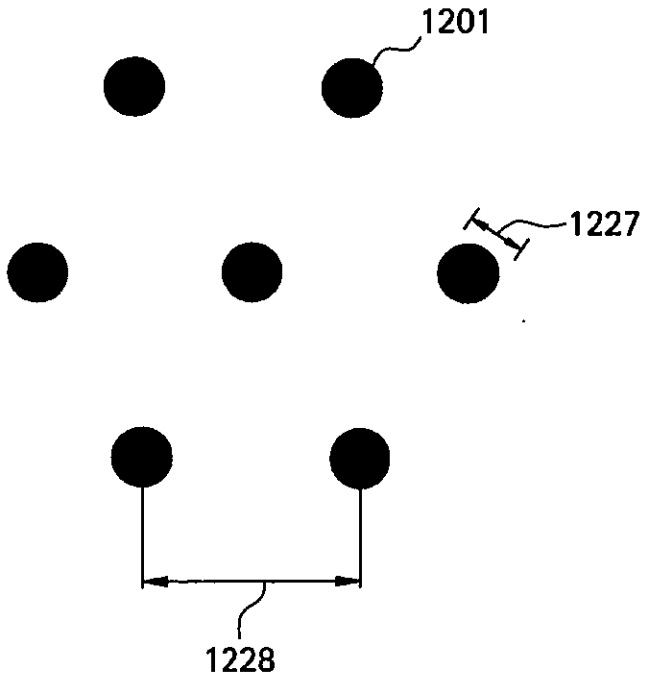


FIG. 13

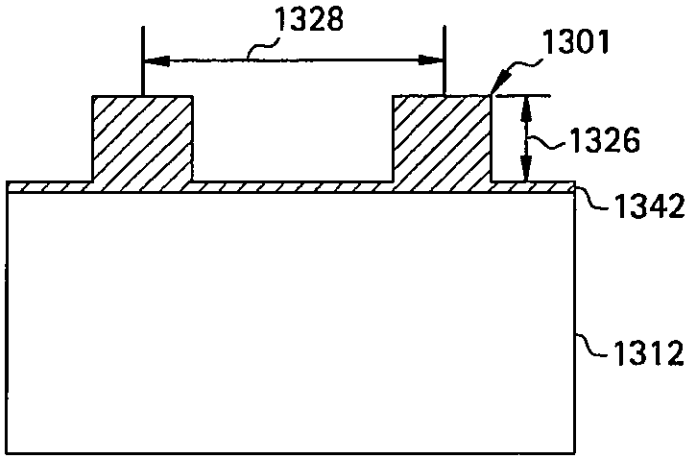


FIG. 14

