Fig. 1

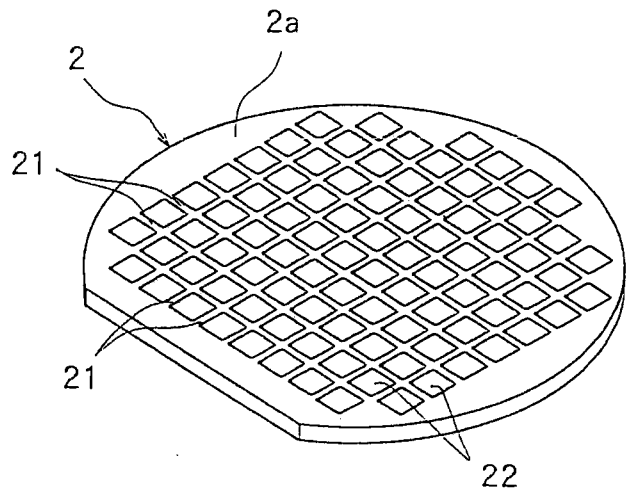


Fig. 2

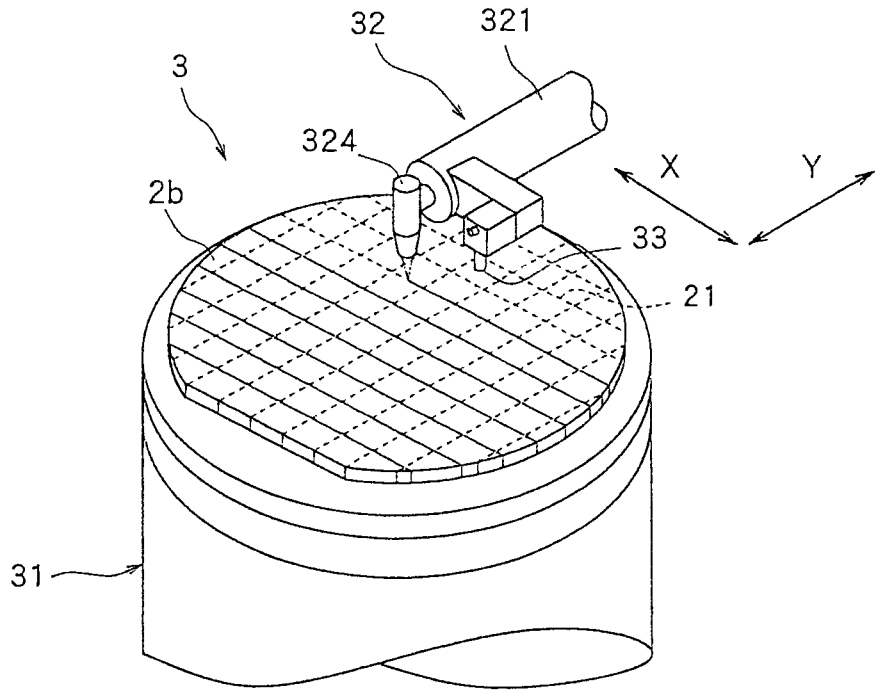


Fig. 3

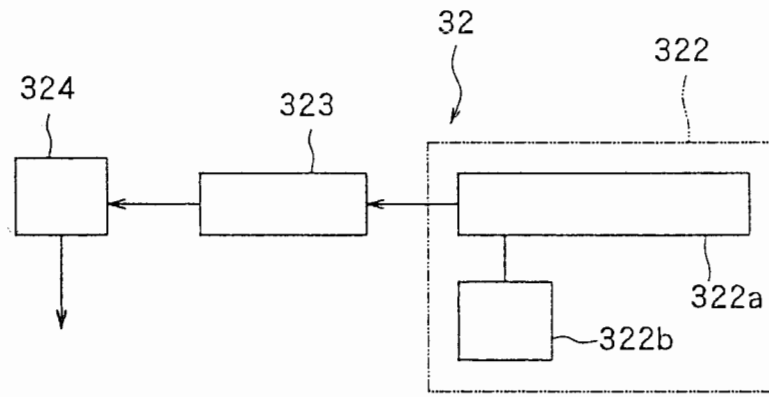


Fig. 4

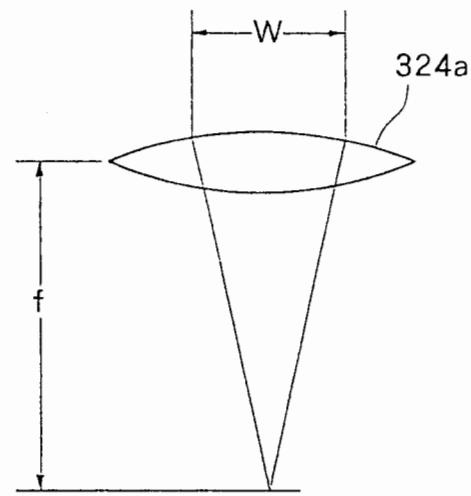


Fig. 5

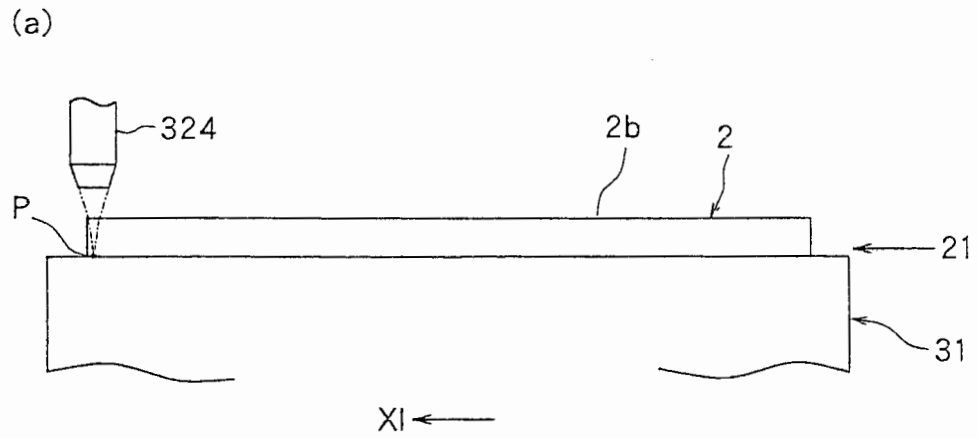


Fig. 6

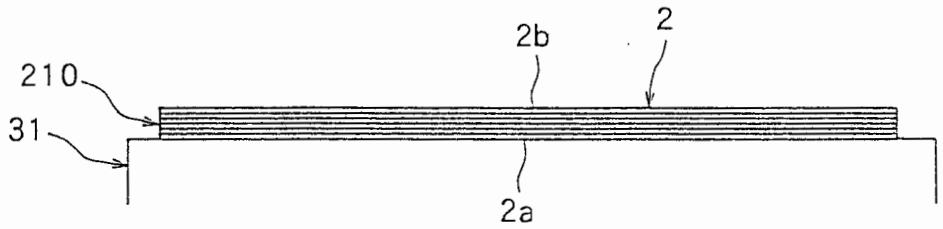


Fig. 7

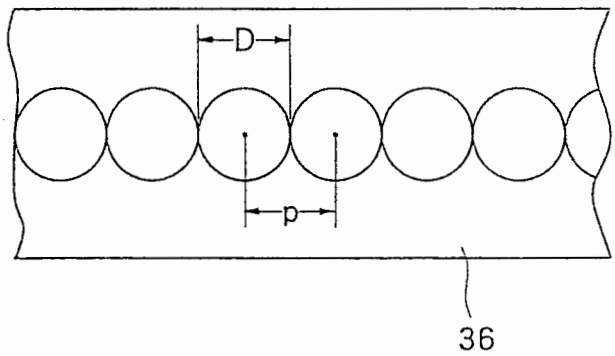


Fig. 8

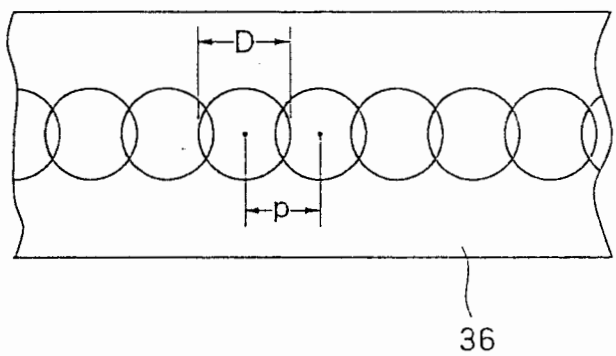


Fig. 9

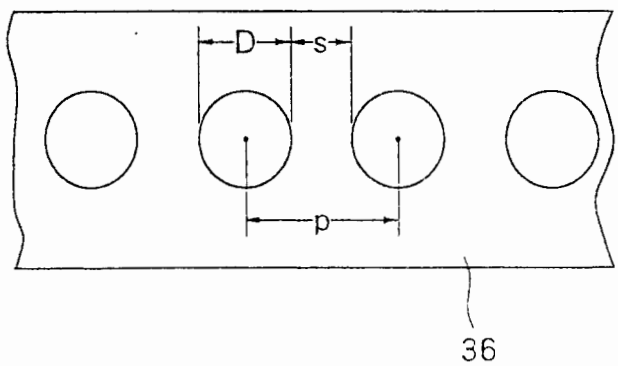


Fig. 10

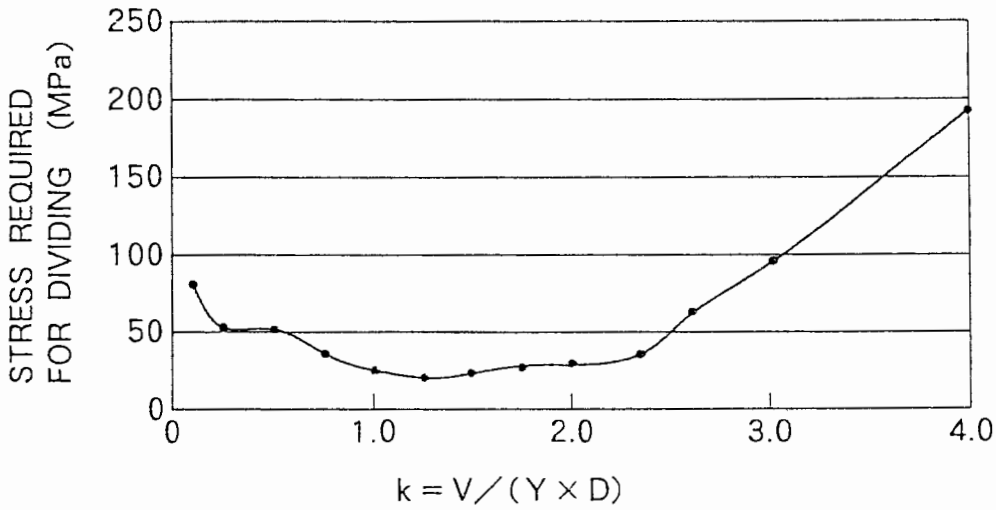

STRESS REQUIRED FOR DIVIDING (MPa)
250
200
150
100
50
0
0
1.0
2.0
3.0
4.0
k = V / (Y × D)

Fig. 11

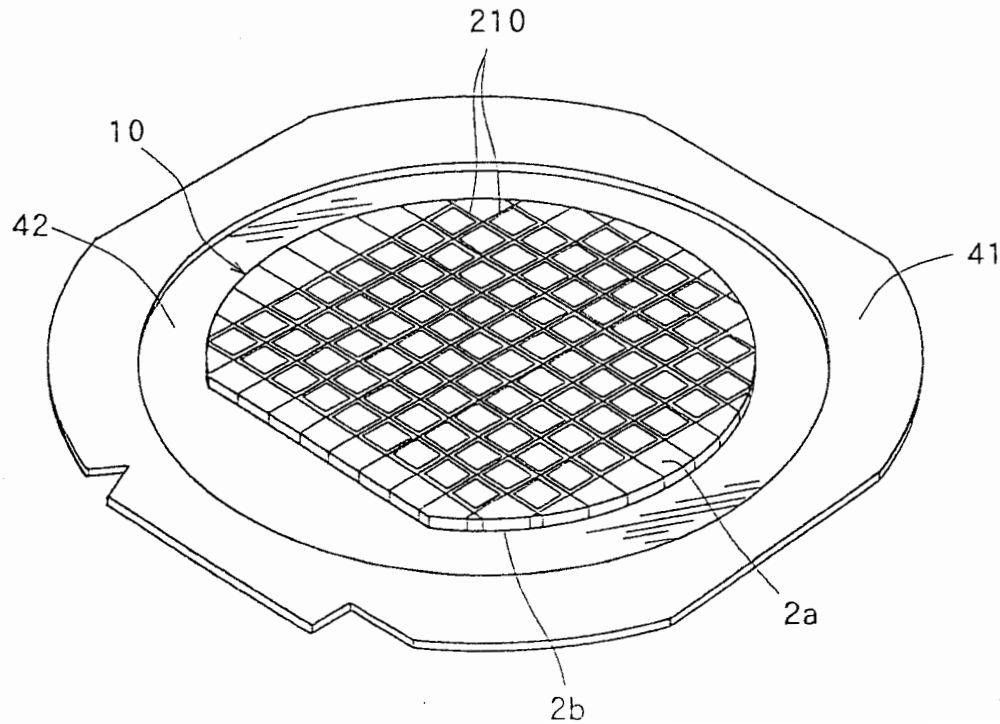

210
10
42
41
2a
2b

Fig. 12

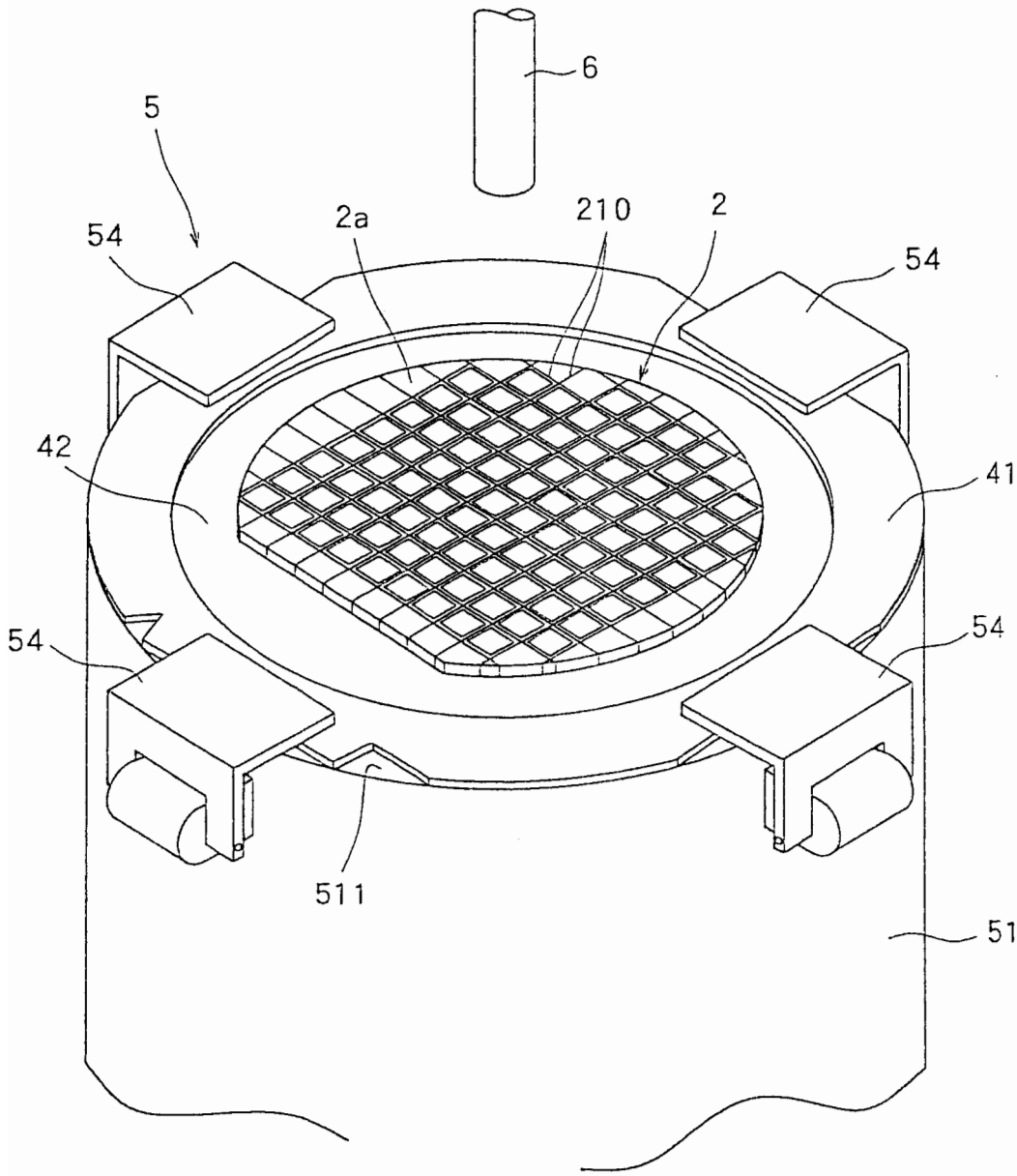
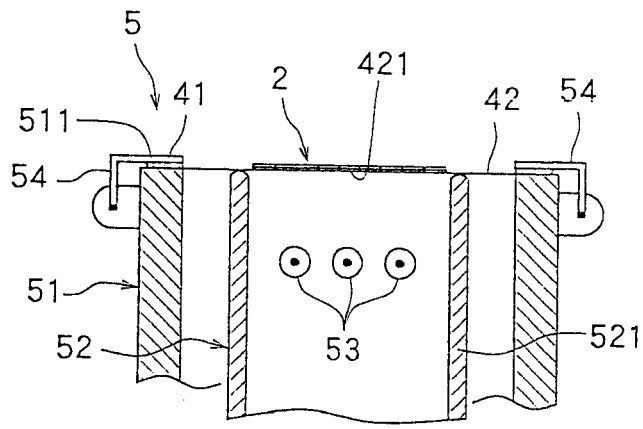


Fig. 13

(a)



(b)

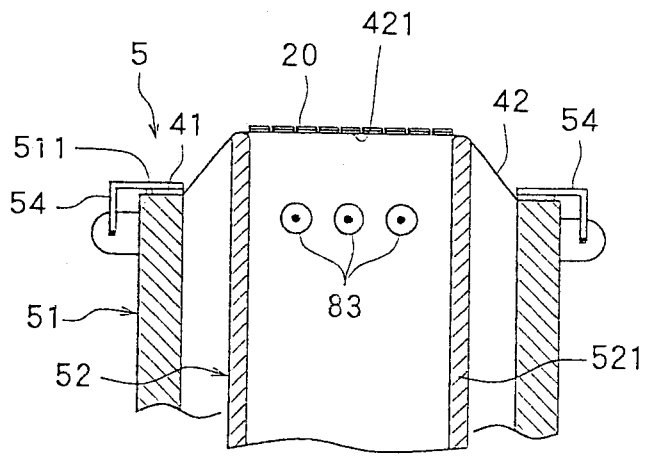


Fig. 14

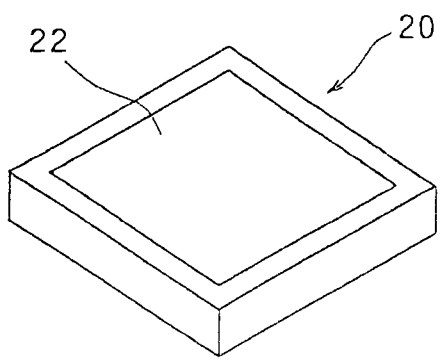


Fig. 15

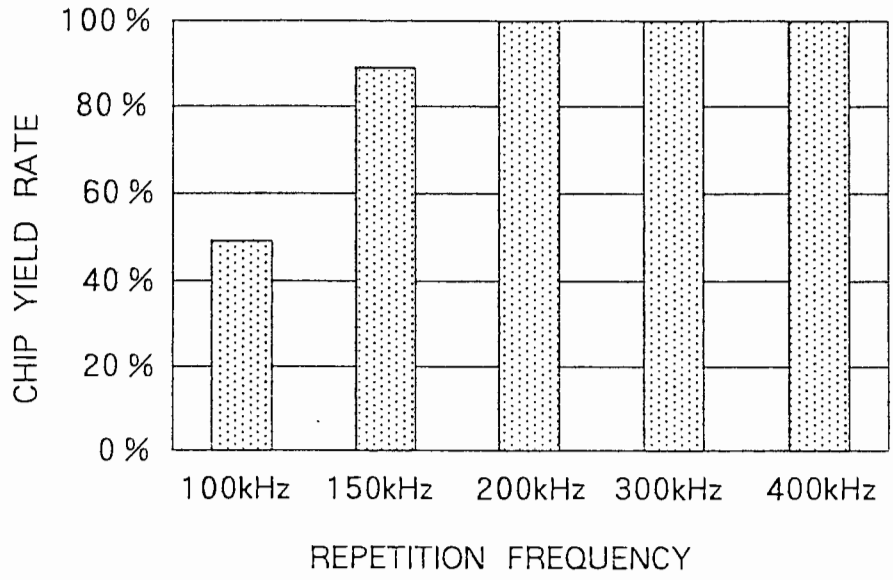
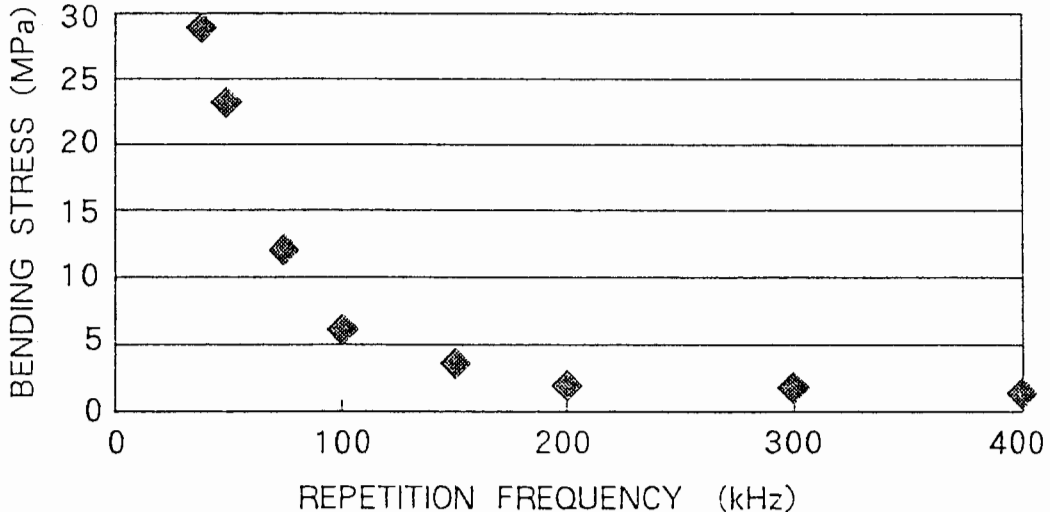

100 %
80 %
60 %
40 %
20 %
0 %
CHIP YIELD RATE
100kHz
150kHz
200kHz
300kHz
400kHz
REPETITION FREQUENCY

Fig. 16


30
25
20
15
10
5
0
BENDING STRESS (MPa)
0
100
200
300
400
REPETITION FREQUENCY (kHz)