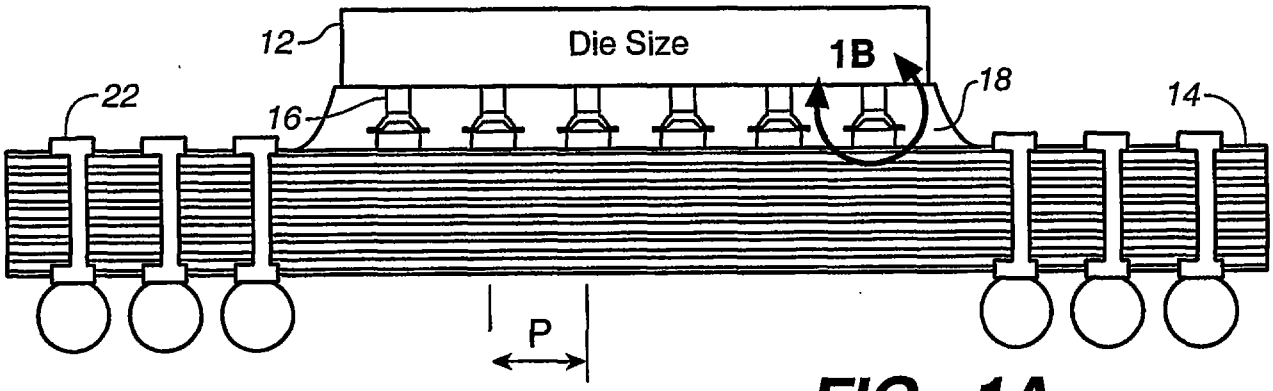


FIG._1A

163163
G00002

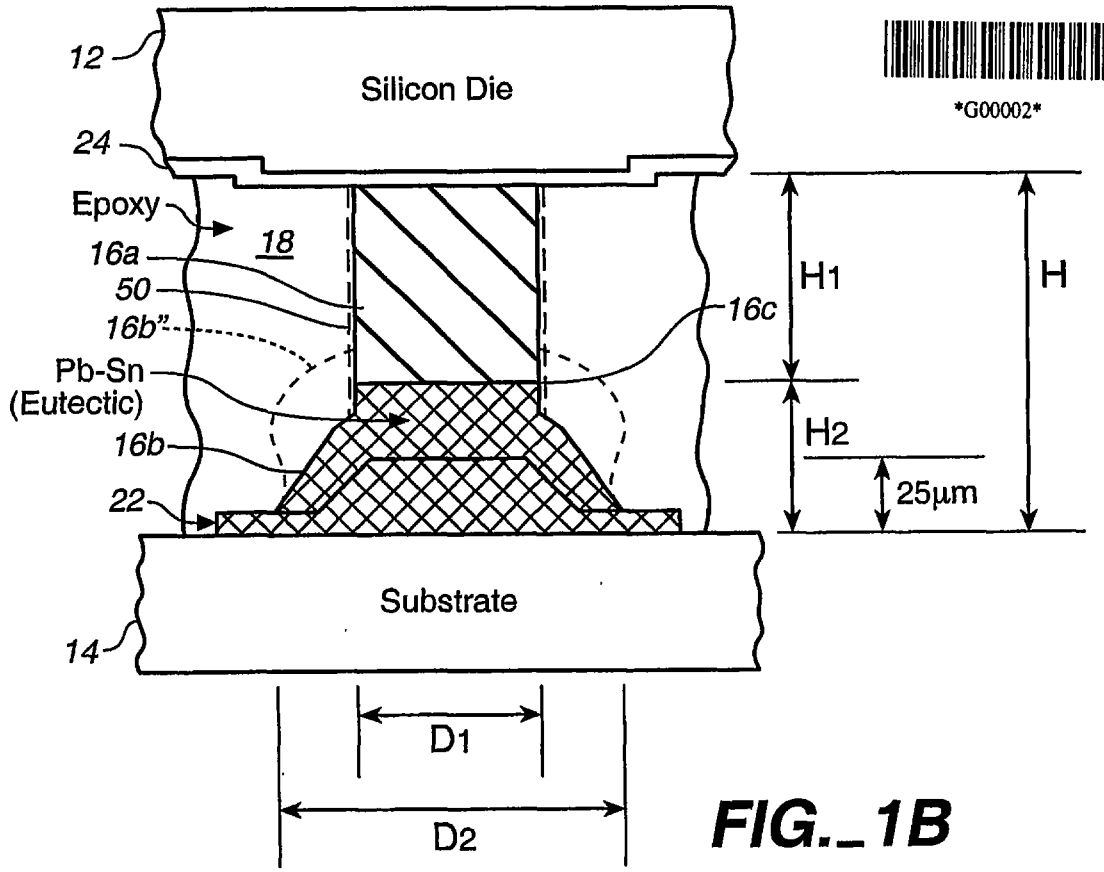


FIG._1B

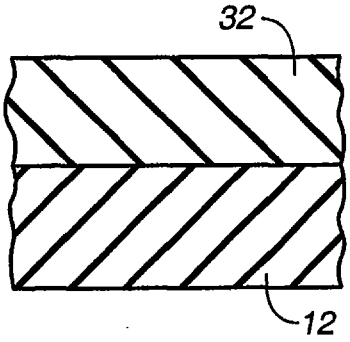


FIG._2A

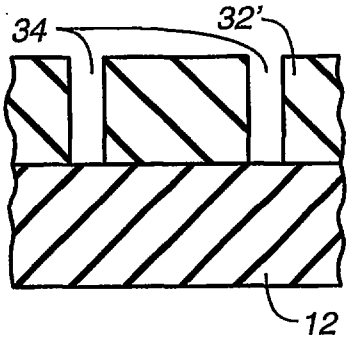


FIG._2B

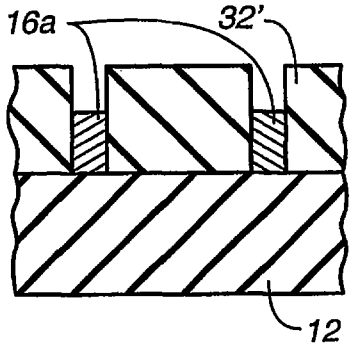


FIG._2C

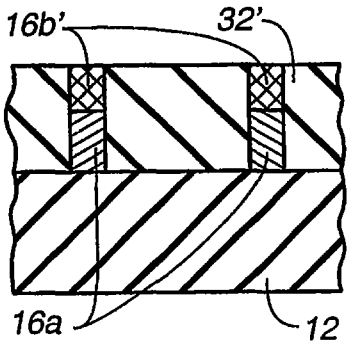


FIG._2D

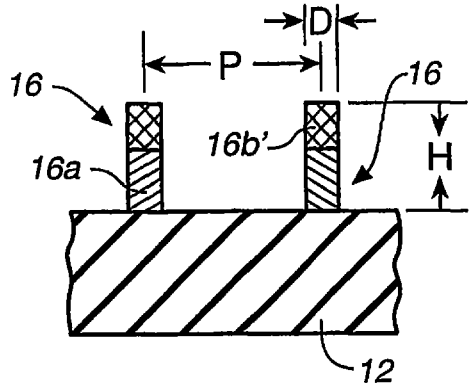


FIG._2E

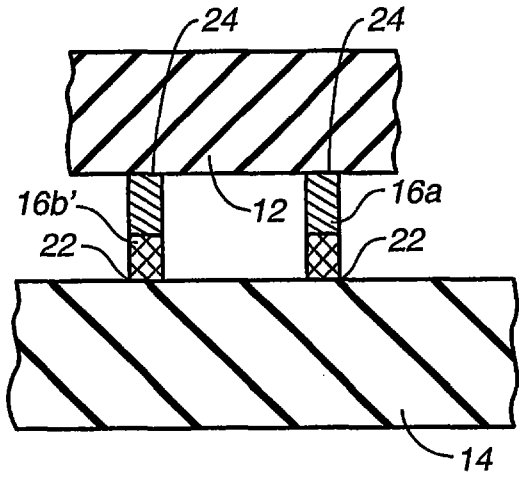


FIG._2F

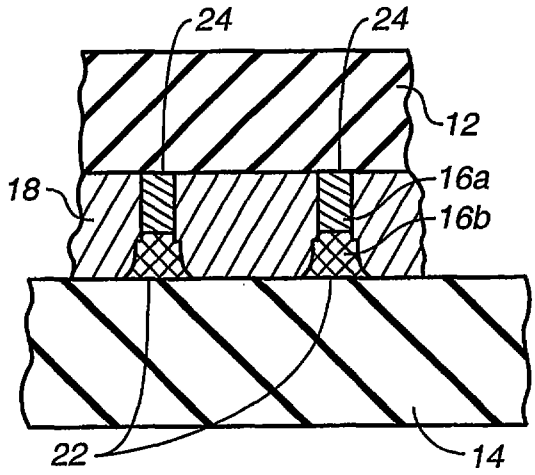


FIG._2G

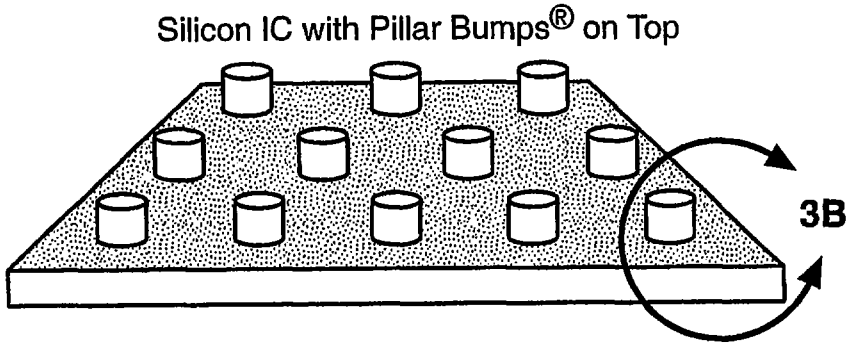
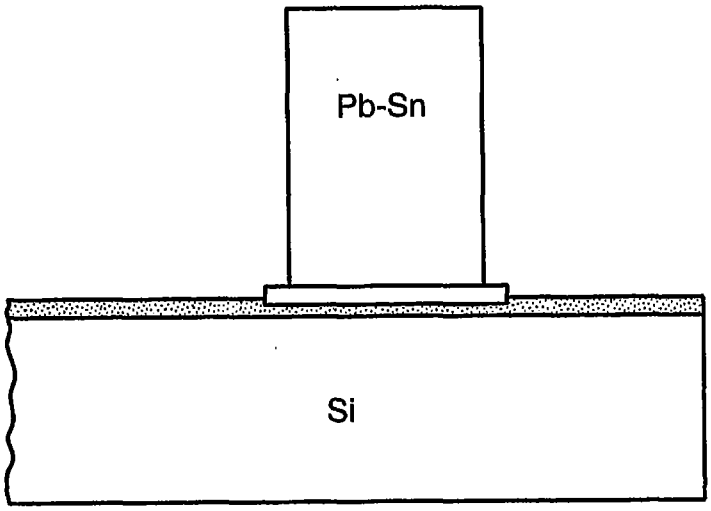


FIG._3A



After Flip Chip Attach
and Underfilled

FIG._3B

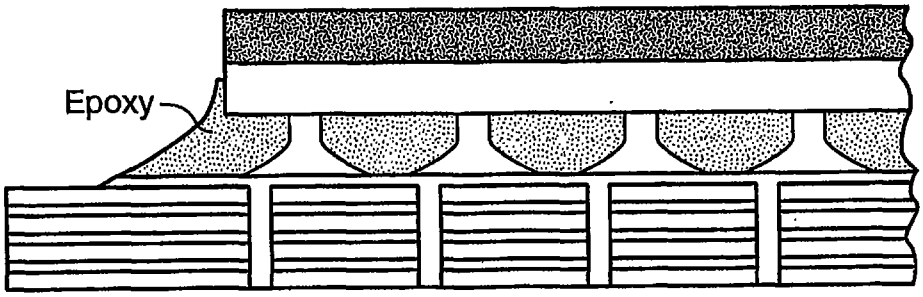


FIG._3C

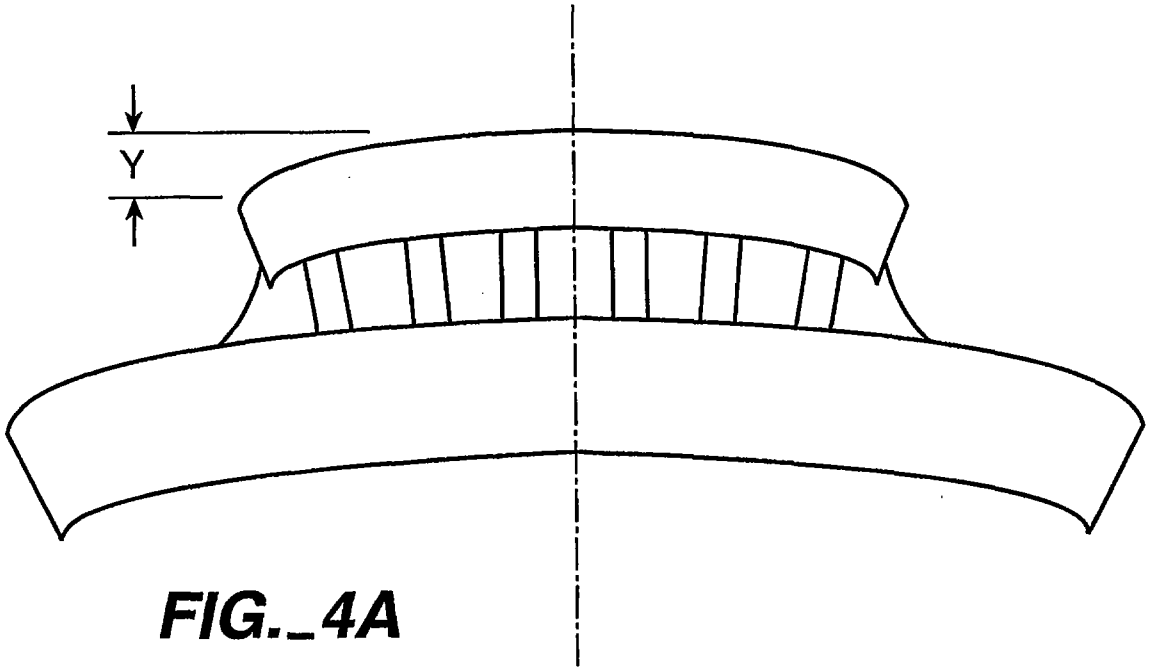


FIG._4A

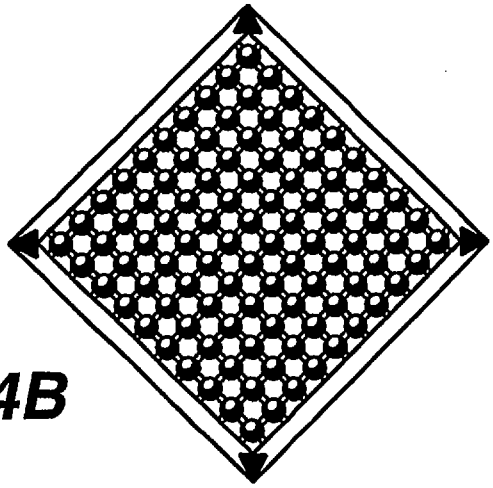


FIG._4B

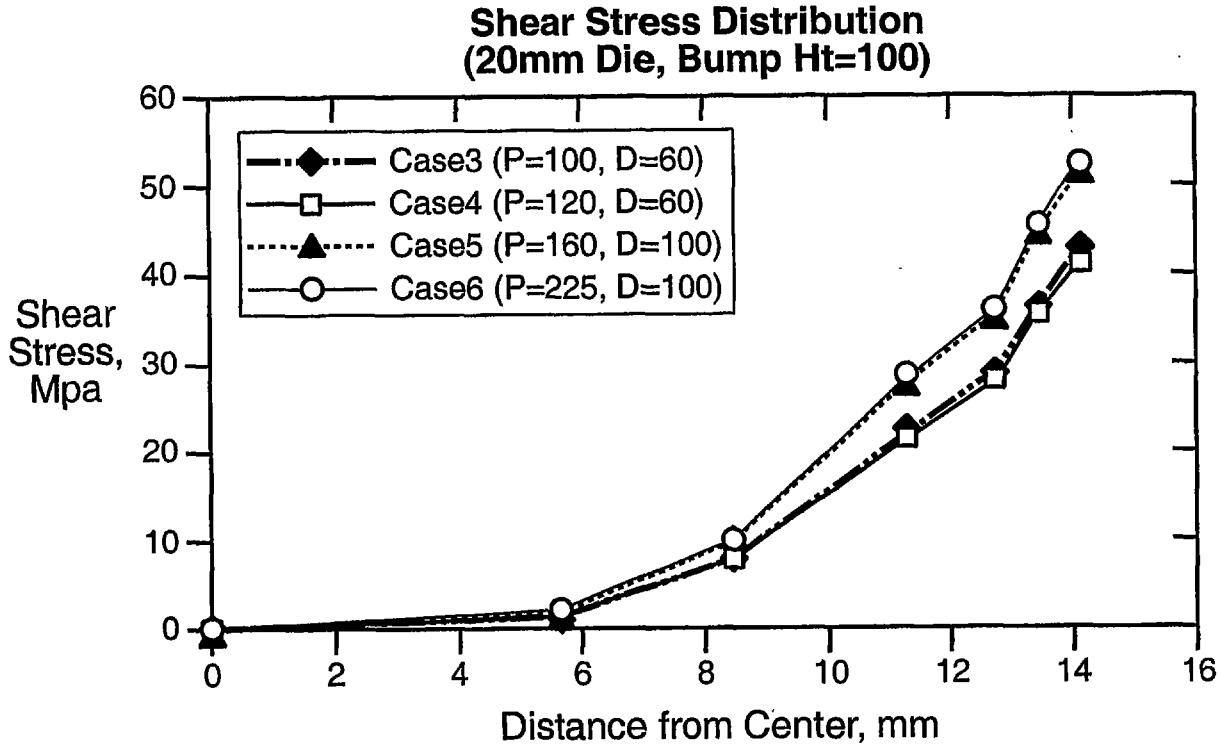

Shear Stress Distribution
(20mm Die, Bump Ht=100)
Case3 (P=100, D=60)
Case4 (P=120, D=60)
Case5 (P=160, D=100)
Case6 (P=225, D=100)
Shear Stress, Mpa
Distance from Center, mm
0
10
20
30
40
50
60
0
2
4
6
8
10
12
14
16

FIG._5A

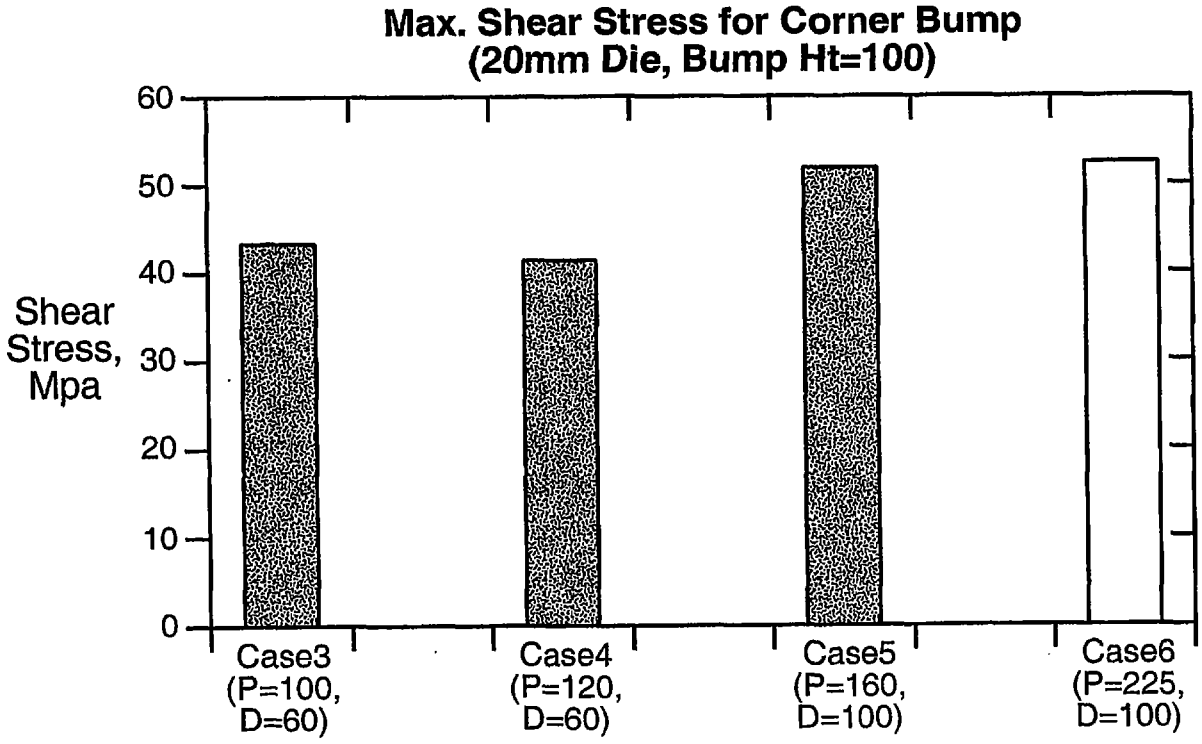

Max. Shear Stress for Corner Bump
(20mm Die, Bump Ht=100)
Shear Stress, Mpa
0
10
20
30
40
50
60
Case3 (P=100, D=60)
Case4 (P=120, D=60)
Case5 (P=160, D=100)
Case6 (P=225, D=100)

FIG._5B

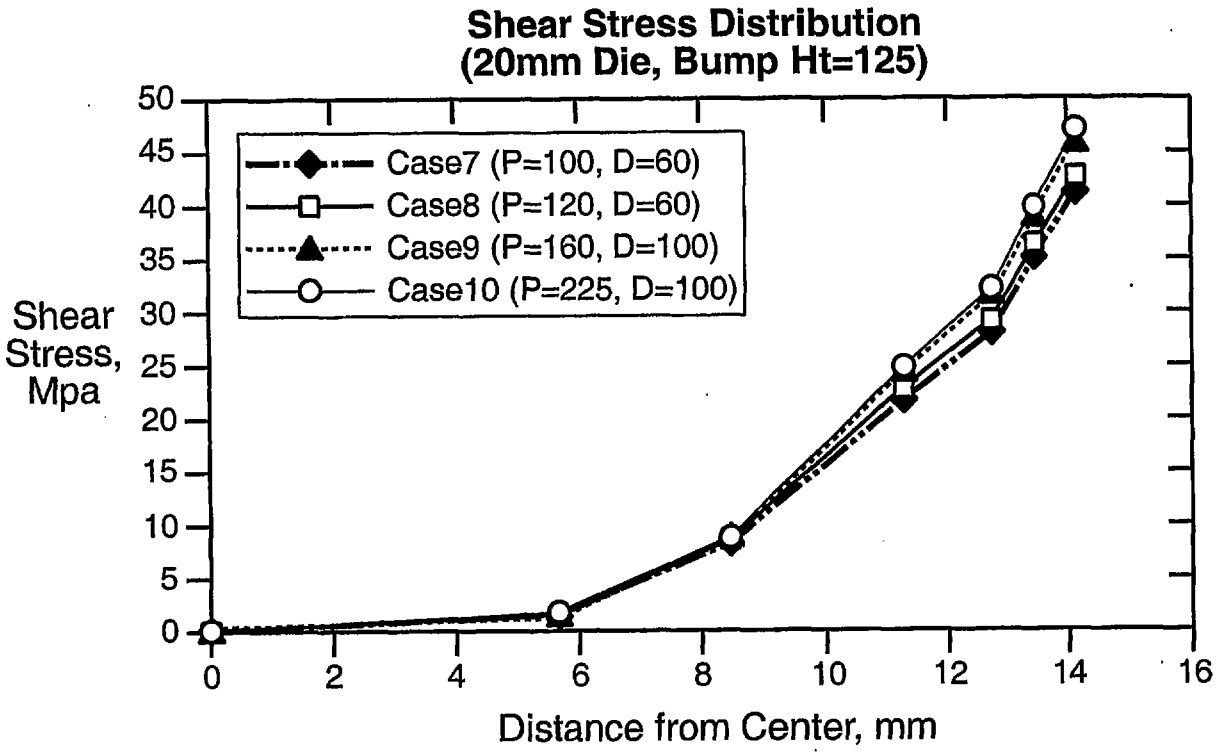

Shear Stress Distribution
(20mm Die, Bump Ht=125)
Case7 (P=100, D=60)
Case8 (P=120, D=60)
Case9 (P=160, D=100)
Case10 (P=225, D=100)
Shear Stress, Mpa
50
45
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
Distance from Center, mm

FIG._6A

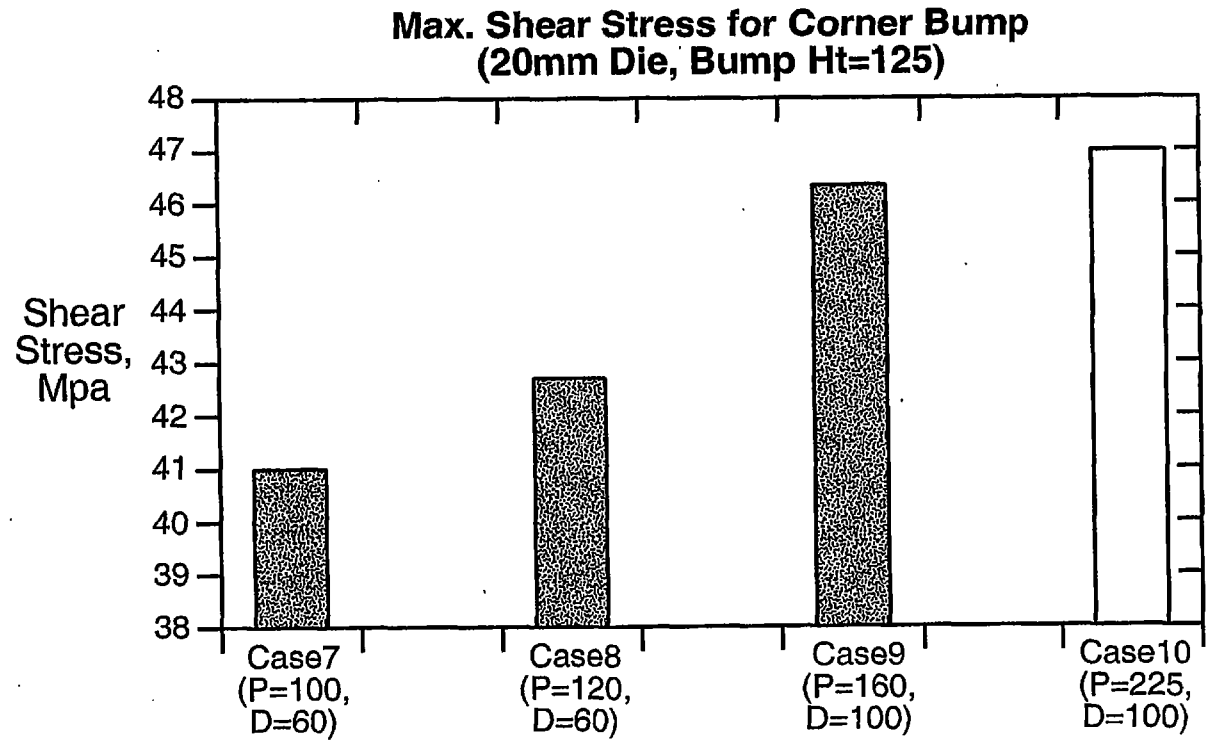

Max. Shear Stress for Corner Bump
(20mm Die, Bump Ht=125)
Shear Stress, Mpa
48
47
46
45
44
43
42
41
40
39
38
Case7 (P=100, D=60)
Case8 (P=120, D=60)
Case9 (P=160, D=100)
Case10 (P=225, D=100)

FIG._6B