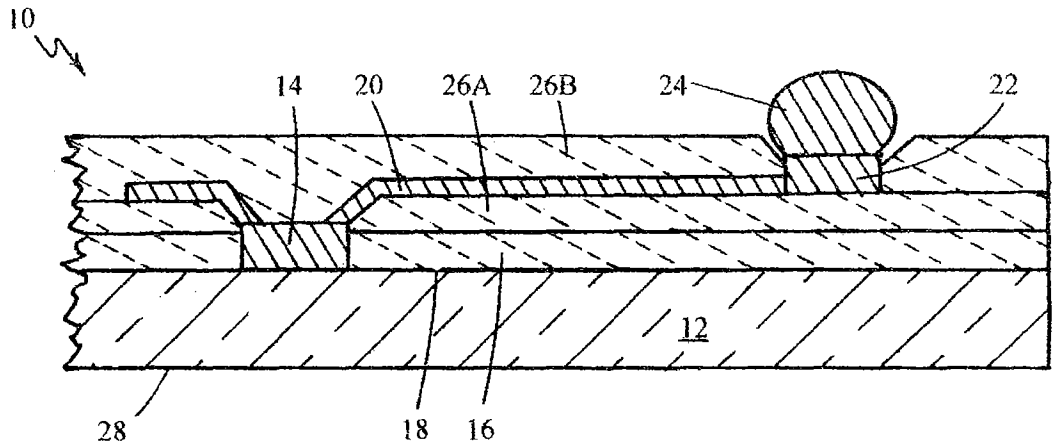


FIG. 1
PRIOR ART

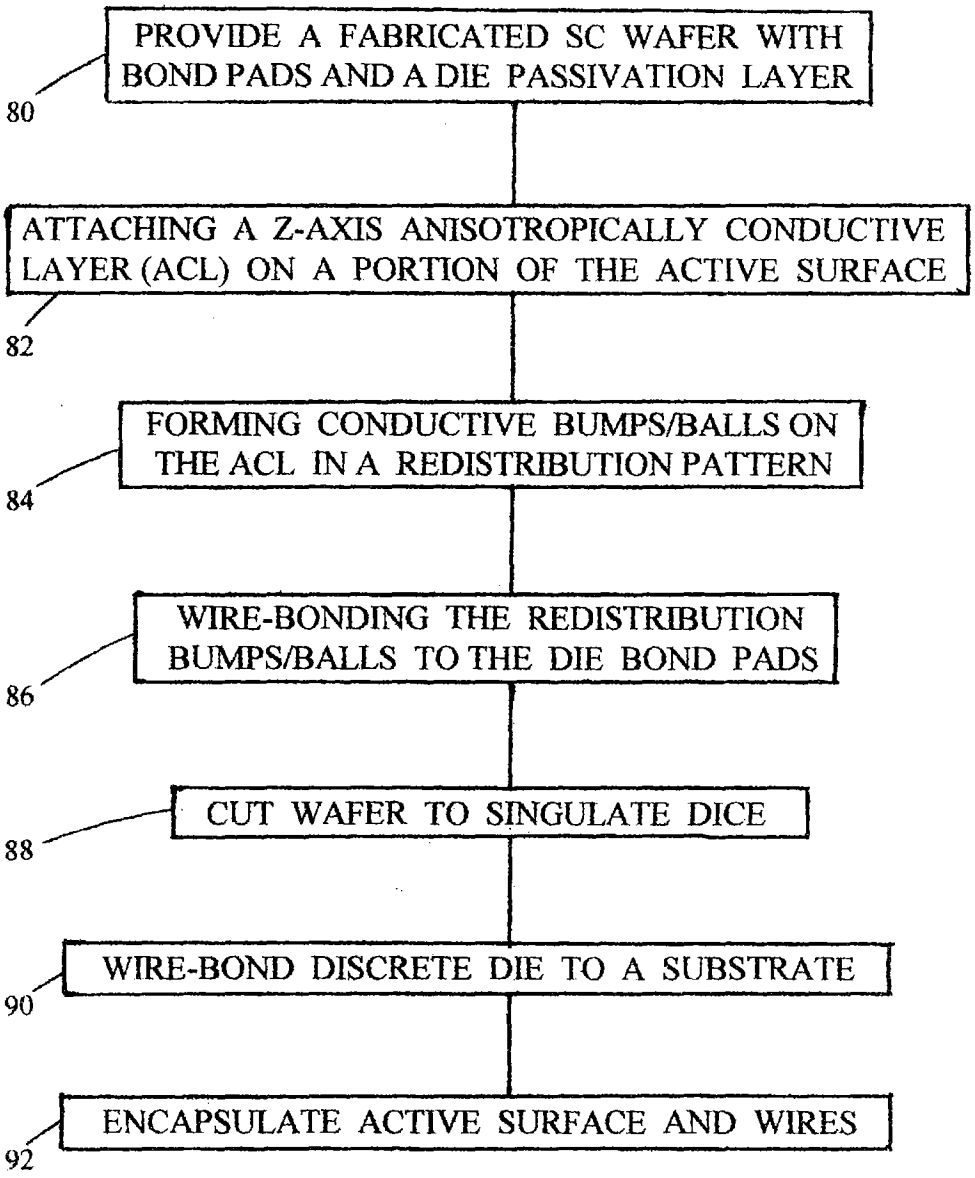

PROVIDE A FABRICATED SC WAFER WITH BOND PADS AND A DIE PASSIVATION LAYER
80
ATTACHING A Z-AXIS ANISOTROPICALLY CONDUCTIVE LAYER (ACL) ON A PORTION OF THE ACTIVE SURFACE
82
FORMING CONDUCTIVE BUMPS/BALLS ON THE ACL IN A REDISTRIBUTION PATTERN
84
WIRE-BONDING THE REDISTRIBUTION BUMPS/BALLS TO THE DIE BOND PADS
86
CUT WAFER TO SINGULATE DICE
88
WIRE-BOND DISCRETE DIE TO A SUBSTRATE
90
ENCAPSULATE ACTIVE SURFACE AND WIRES
92

FIG. 2

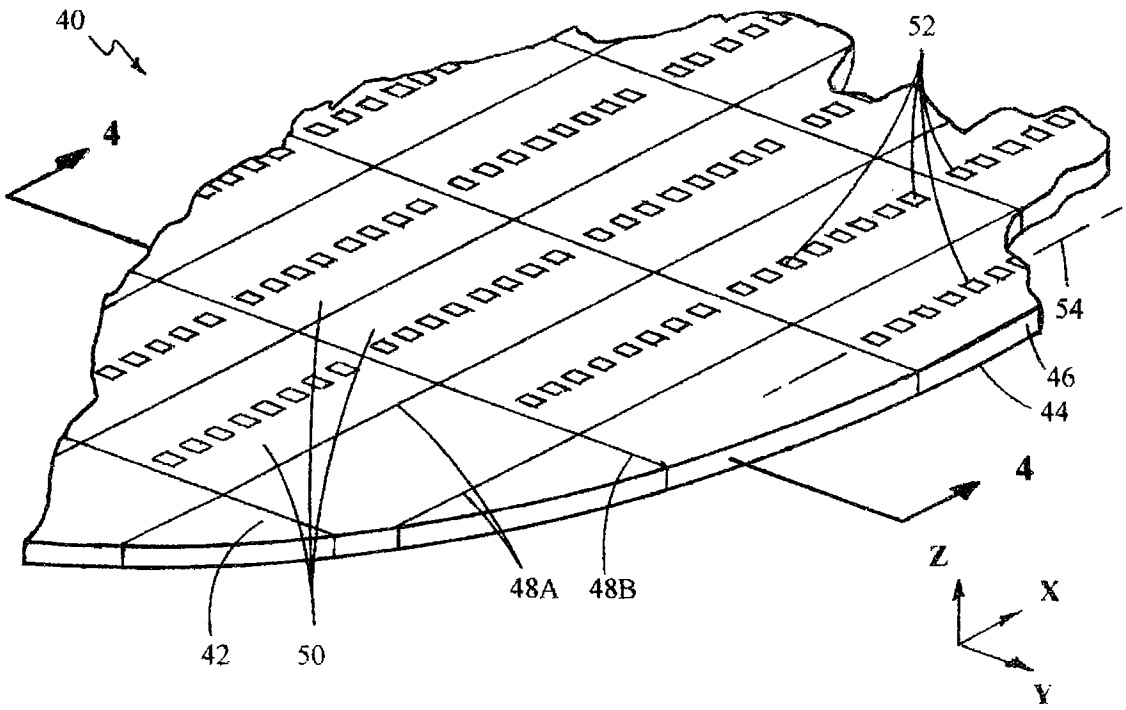


FIG. 3

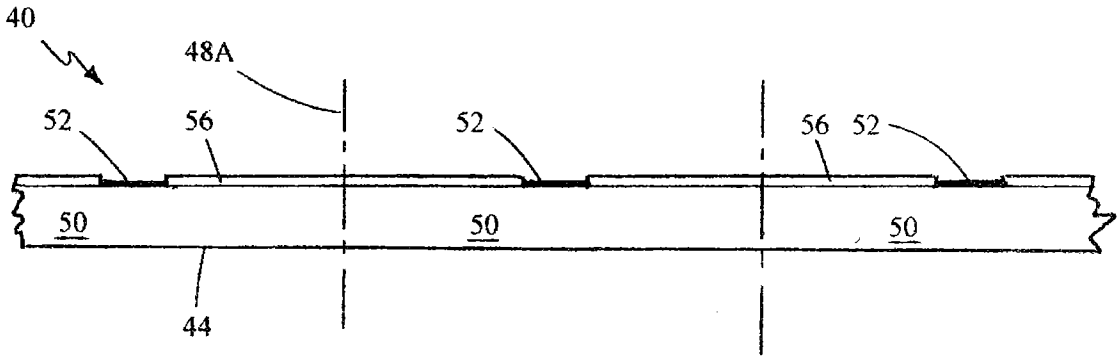


FIG. 4

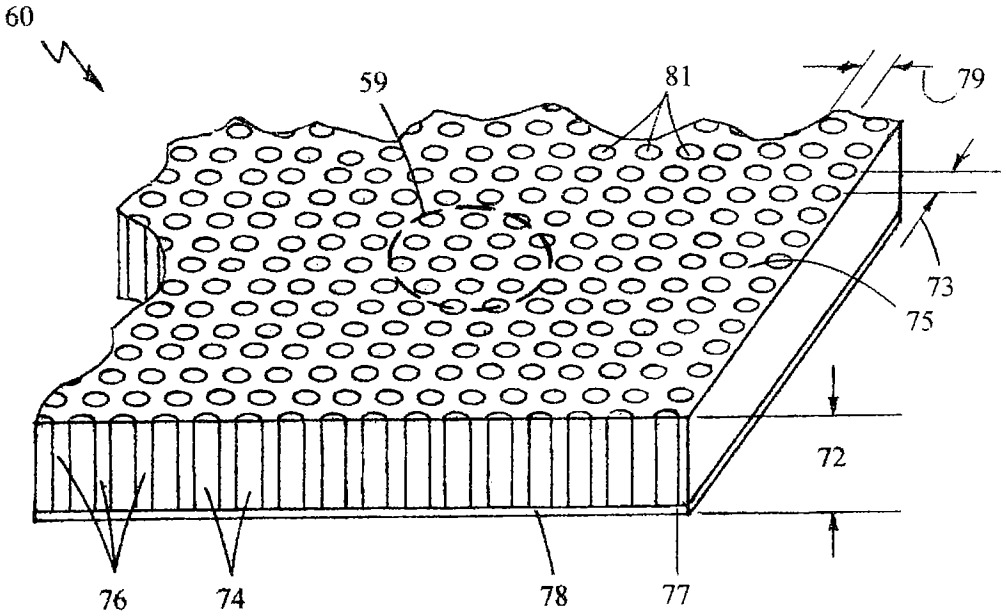


FIG. 5

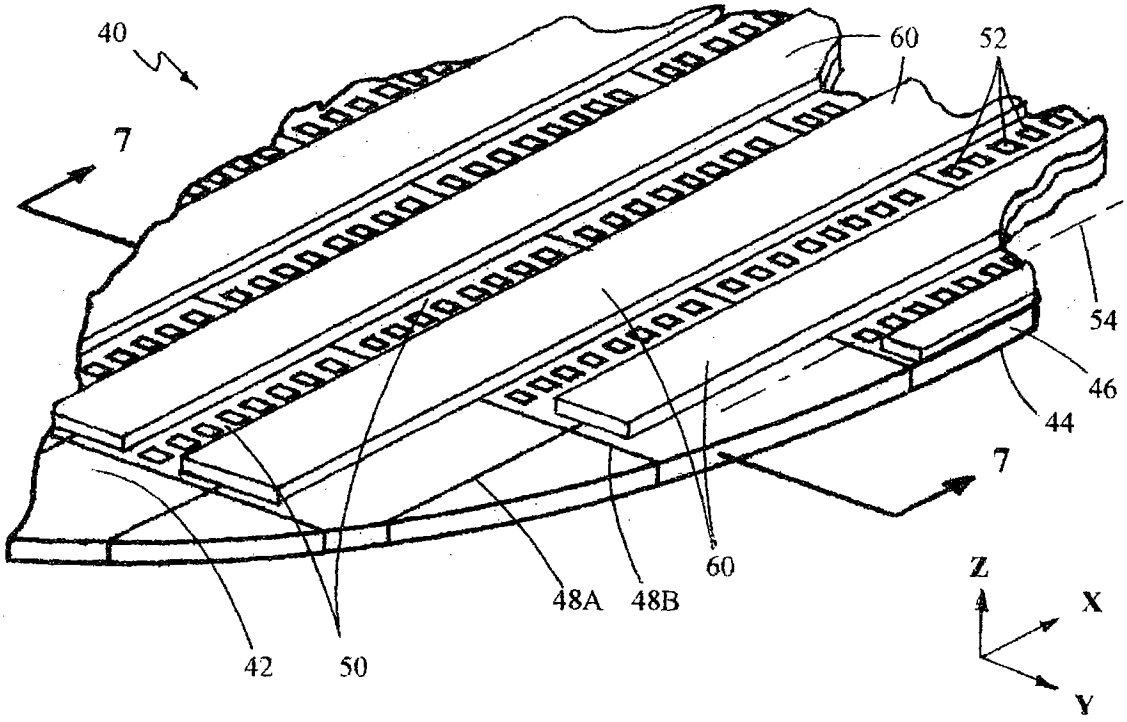

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7
60
52
54
46
44
7
60
48A
48B
42
50
Z
X
Y

FIG. 6

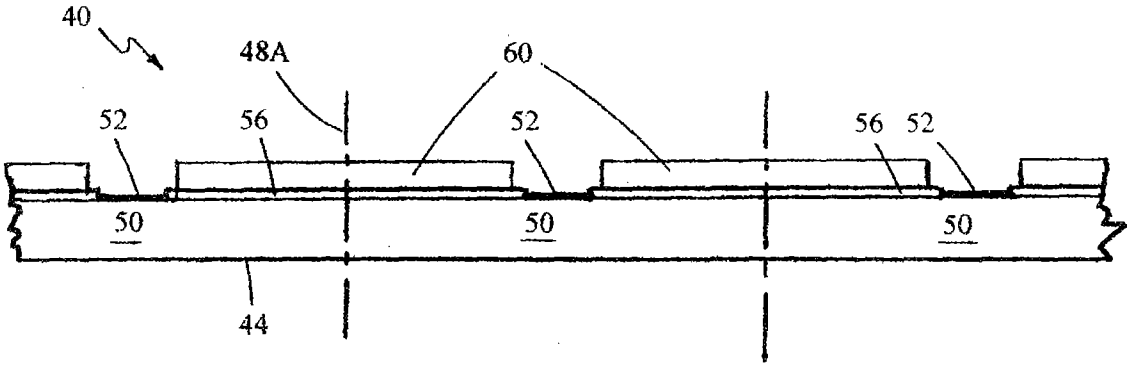

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48A
60
52
56
52
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52
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50
50
44

FIG. 7

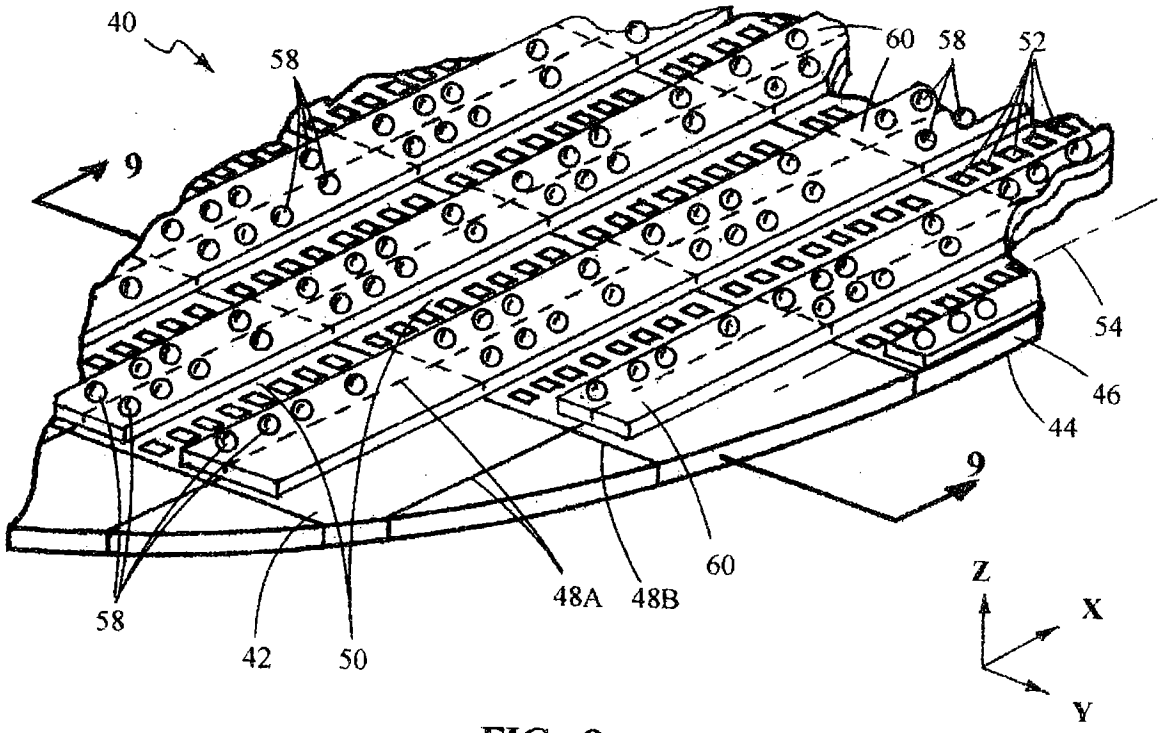

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58
9
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9
58
42
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48A
48B
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Z
X
Y

FIG. 8

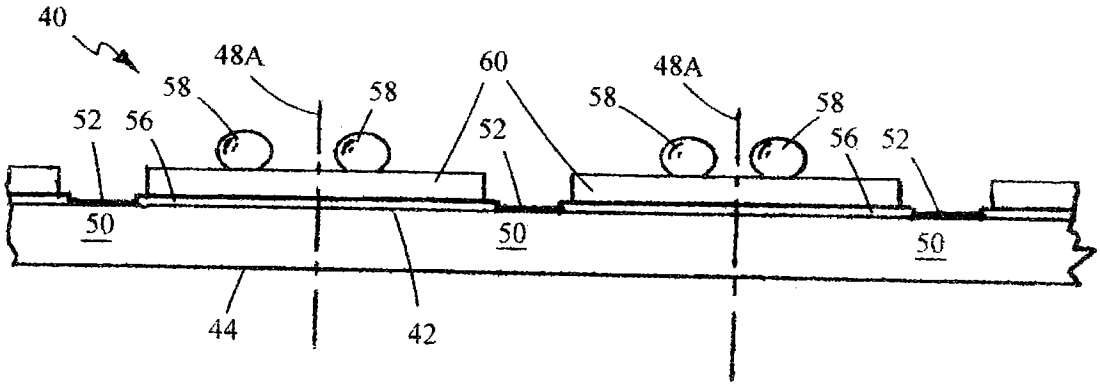

40
48A
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58
60
48A
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58
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44
42

FIG. 9

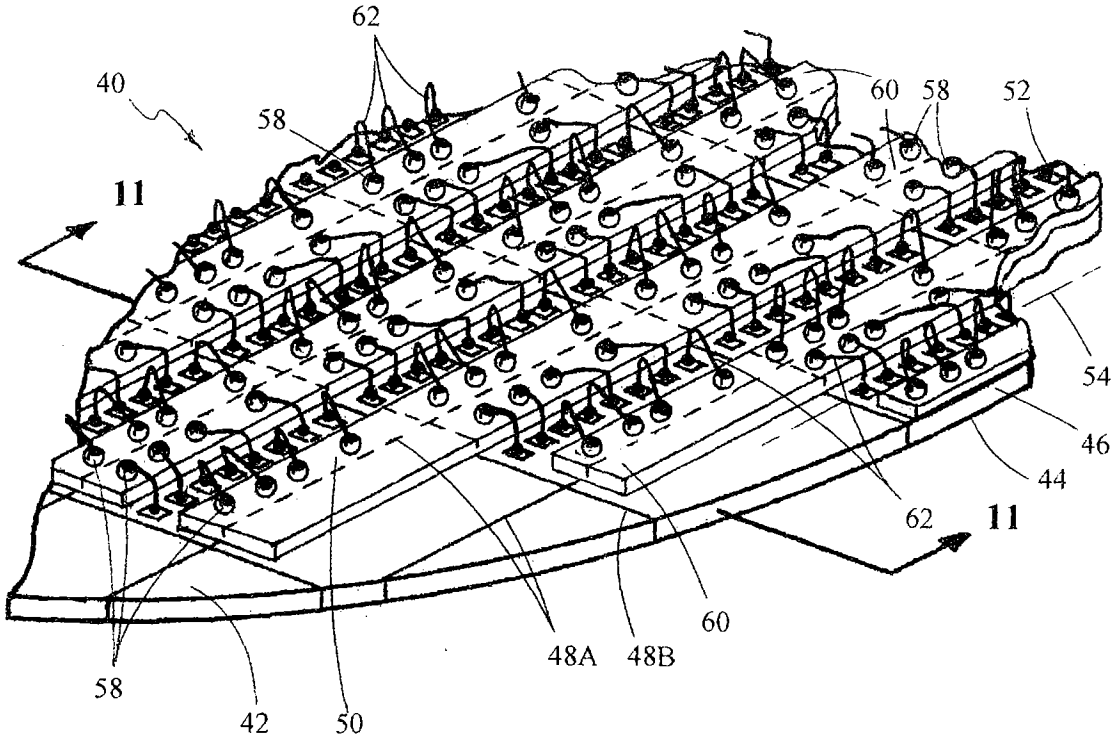

62
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58
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58
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62
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48A
48B
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42
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FIG. 10

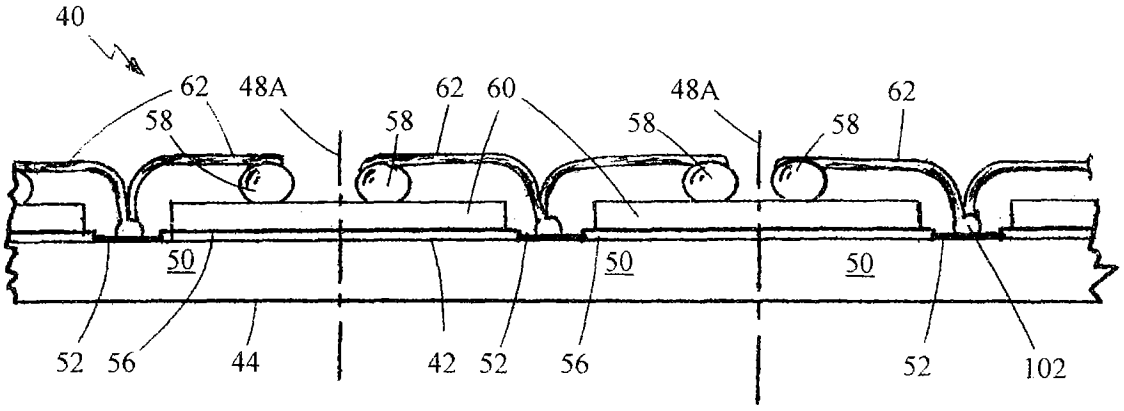

40
62
48A
58
62
60
58
48A
58
62
58
50
50
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52
56
44
42
52
56
52
102

FIG. 11

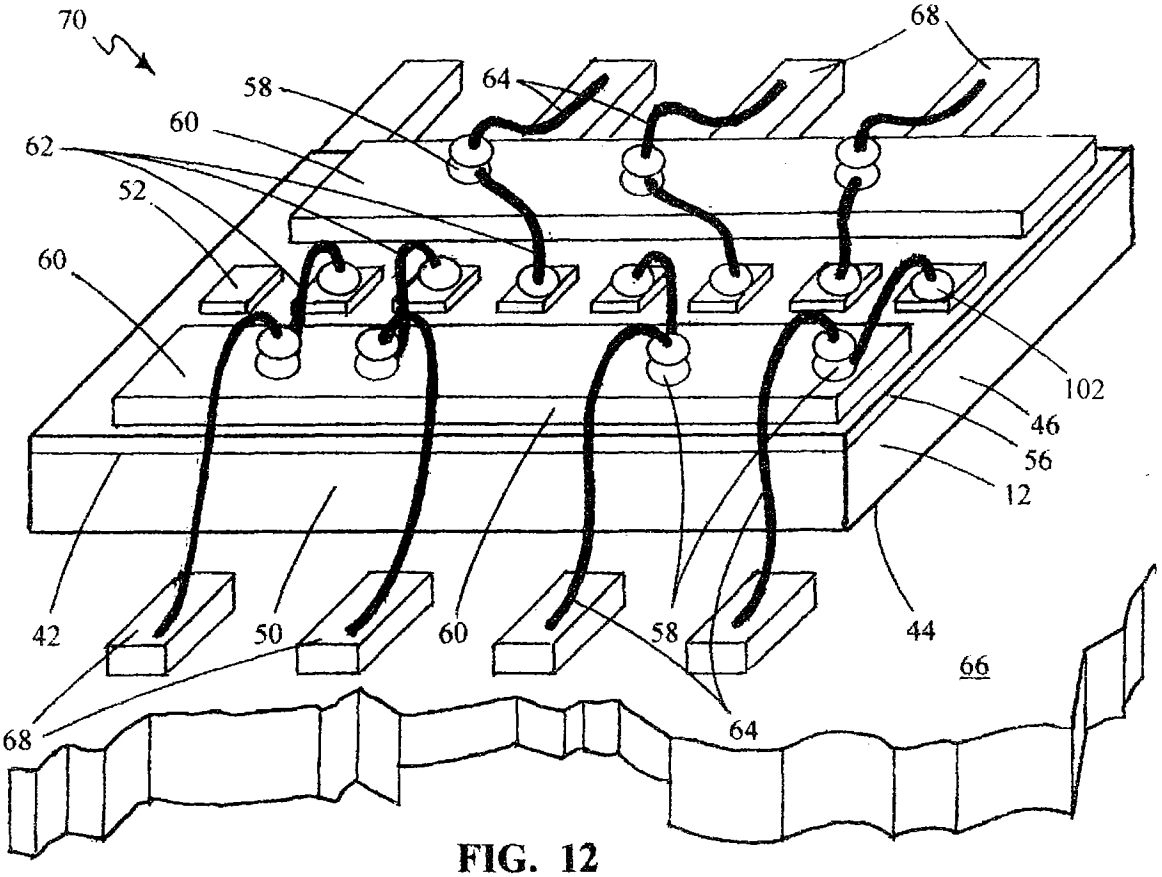


FIG. 12

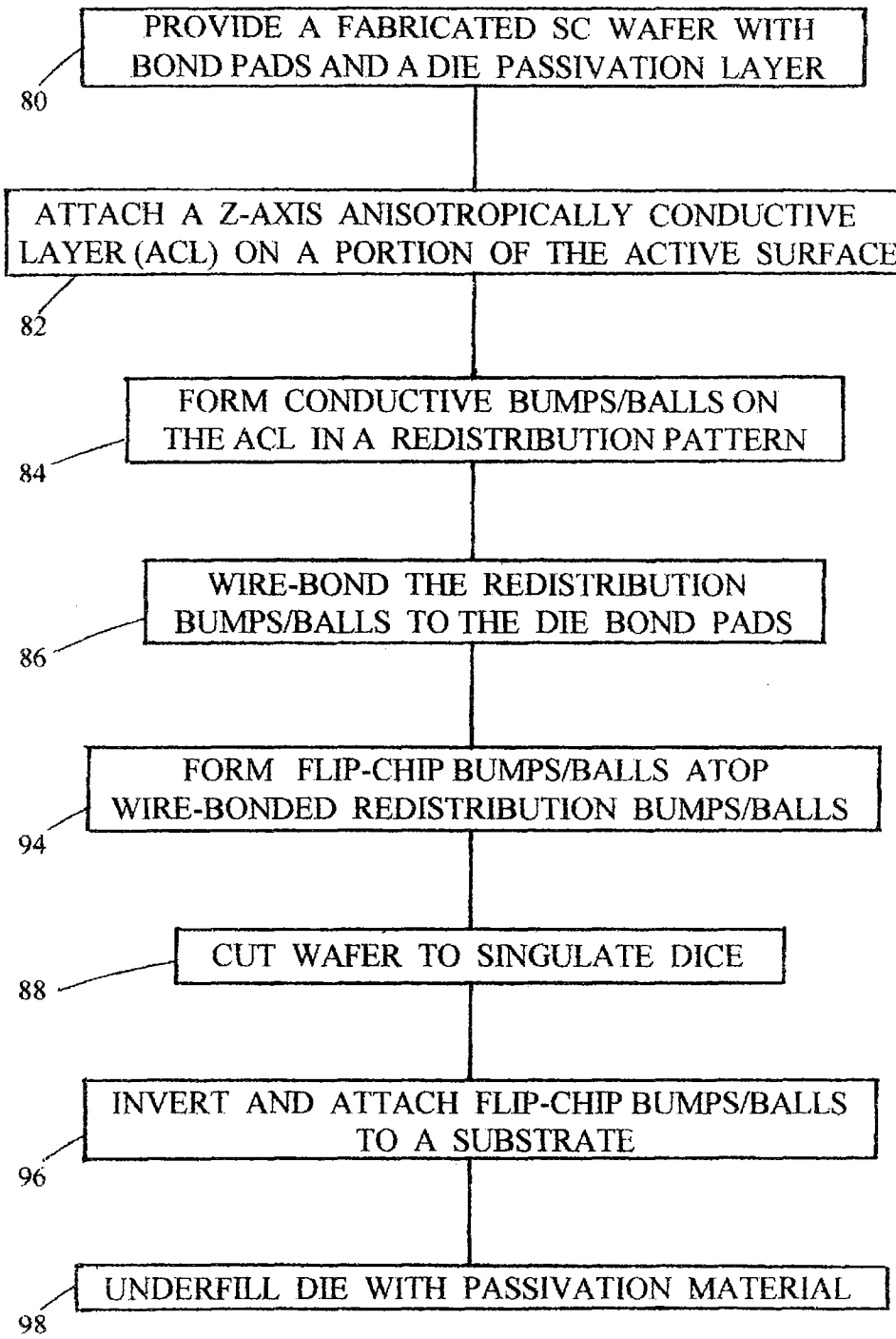

PROVIDE A FABRICATED SC WAFER WITH BOND PADS AND A DIE PASSIVATION LAYER
80
ATTACH A Z-AXIS ANISOTROPICALLY CONDUCTIVE LAYER (ACL) ON A PORTION OF THE ACTIVE SURFACE
82
FORM CONDUCTIVE BUMPS/BALLS ON THE ACL IN A REDISTRIBUTION PATTERN
84
WIRE-BOND THE REDISTRIBUTION BUMPS/BALLS TO THE DIE BOND PADS
86
FORM FLIP-CHIP BUMPS/BALLS ATOP WIRE-BONDED REDISTRIBUTION BUMPS/BALLS
94
CUT WAFER TO SINGULATE DICE
88
INVERT AND ATTACH FLIP-CHIP BUMPS/BALLS TO A SUBSTRATE
96
UNDERFILL DIE WITH PASSIVATION MATERIAL
98

FIG. 13

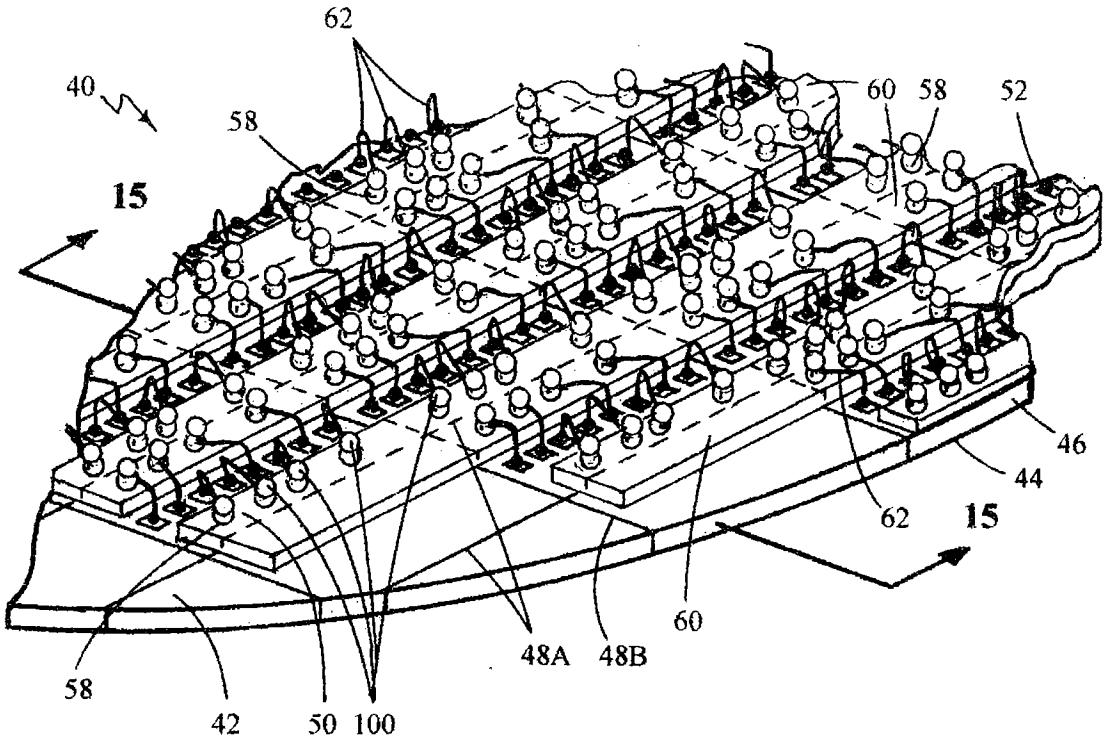

62
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48A
48B
58
42
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FIG. 14

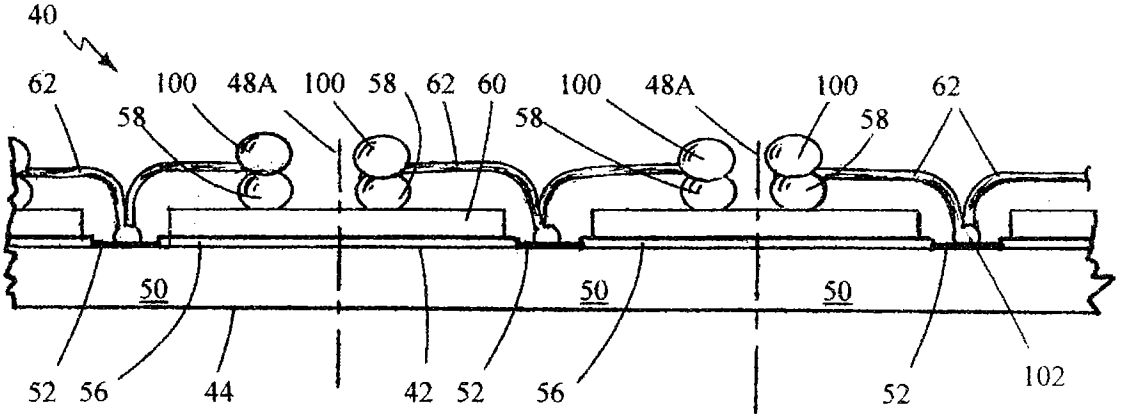

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62
100
48A
100
58
62
60
100
48A
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44
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56
52
102

FIG. 15

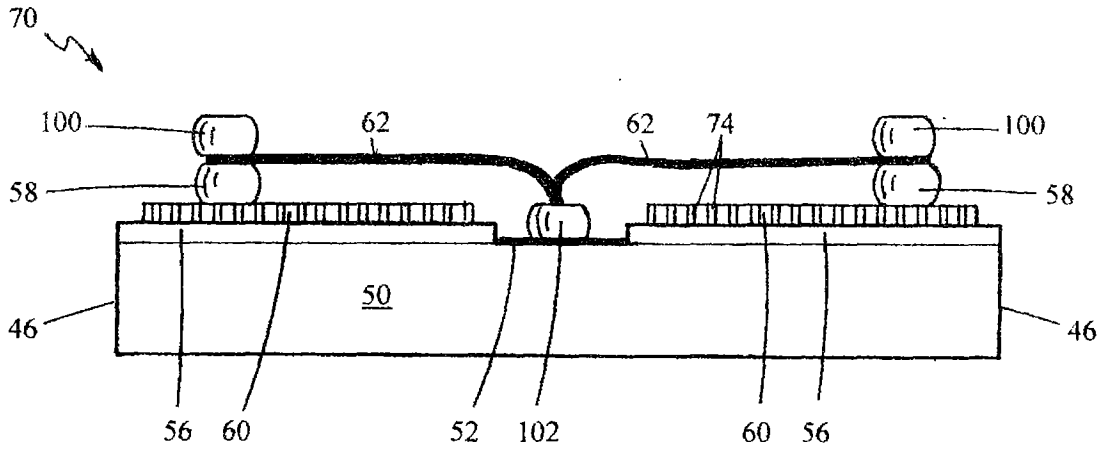

70
100
62
62
74
100
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52
102
60
56

FIG. 16

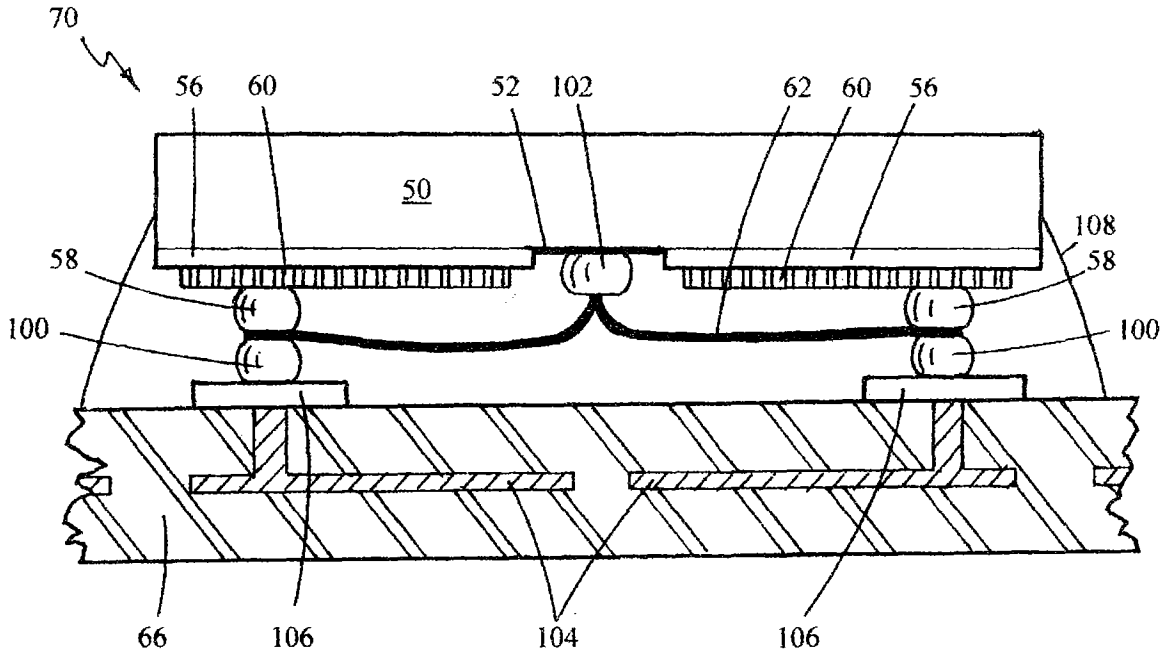

70
56
60
52
102
62
60
56
50
108
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58
100
100
66
106
104
106

FIG. 17