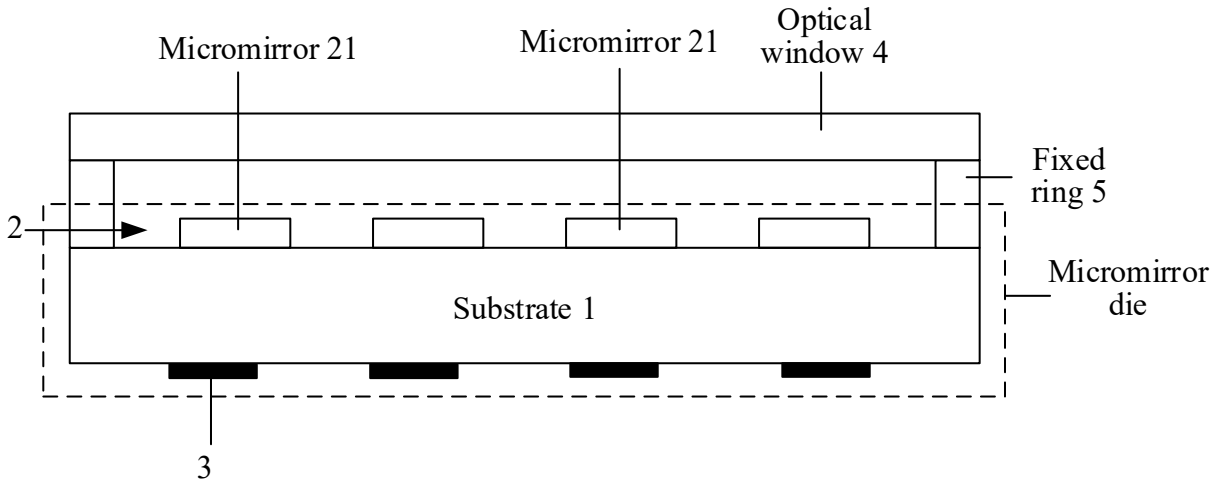

Micromirror 21
Micromirror 21
Optical window 4
Fixed ring 5
2
Micromirror die
Substrate 1
3

FIG. 1

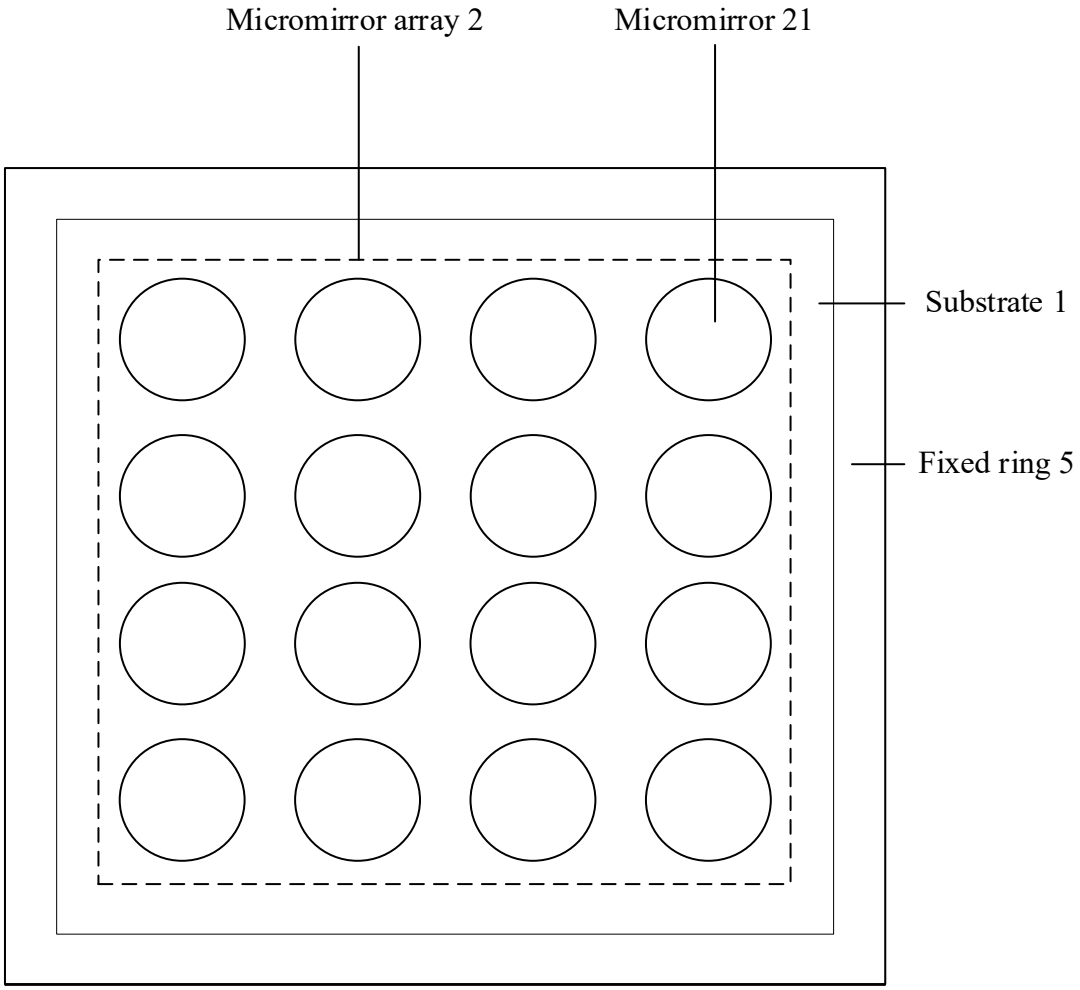

Micromirror array 2
Micromirror 21
Substrate 1
Fixed ring 5

FIG. 2

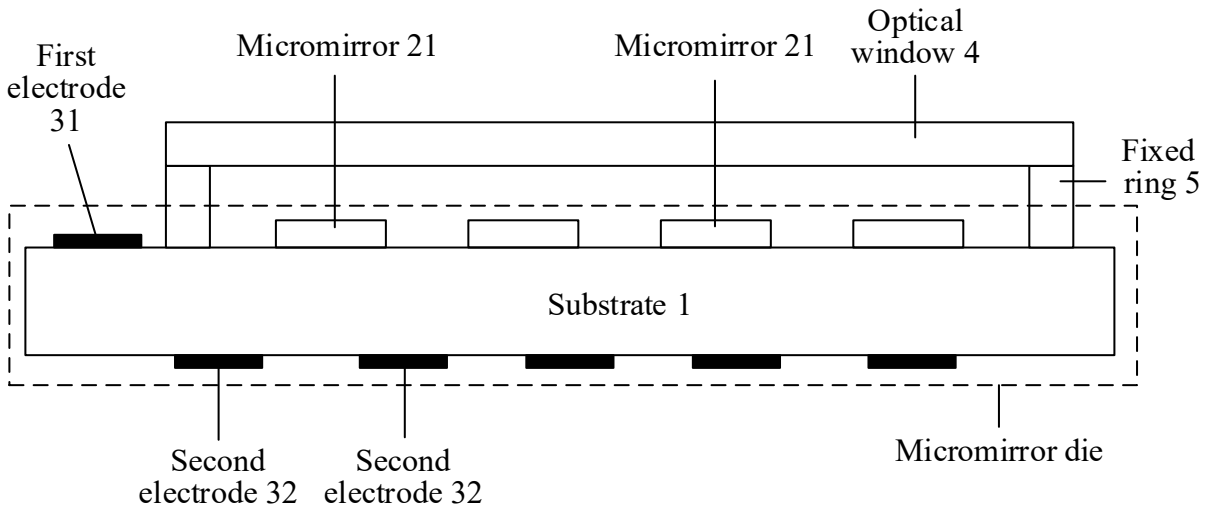

First electrode 31
Micromirror 21
Micromirror 21
Optical window 4
Fixed ring 5
Substrate 1
Second electrode 32
Second electrode 32
Micromirror die

FIG. 3

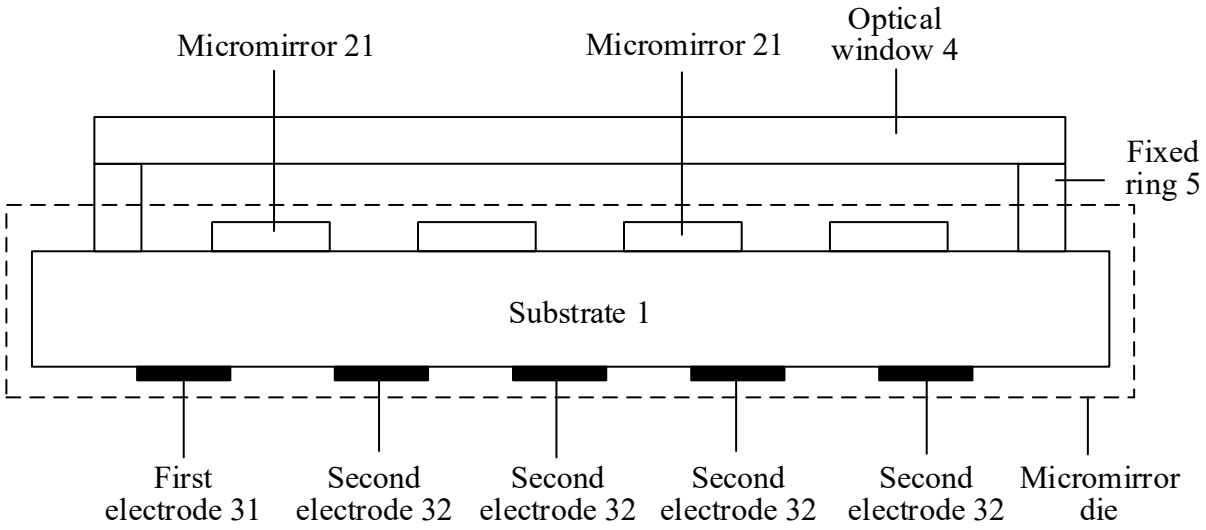

Micromirror 21
Micromirror 21
Optical window 4
Fixed ring 5
Substrate 1
First electrode 31
Second electrode 32
Second electrode 32
Second electrode 32
Second electrode 32
Micromirror die

FIG. 4

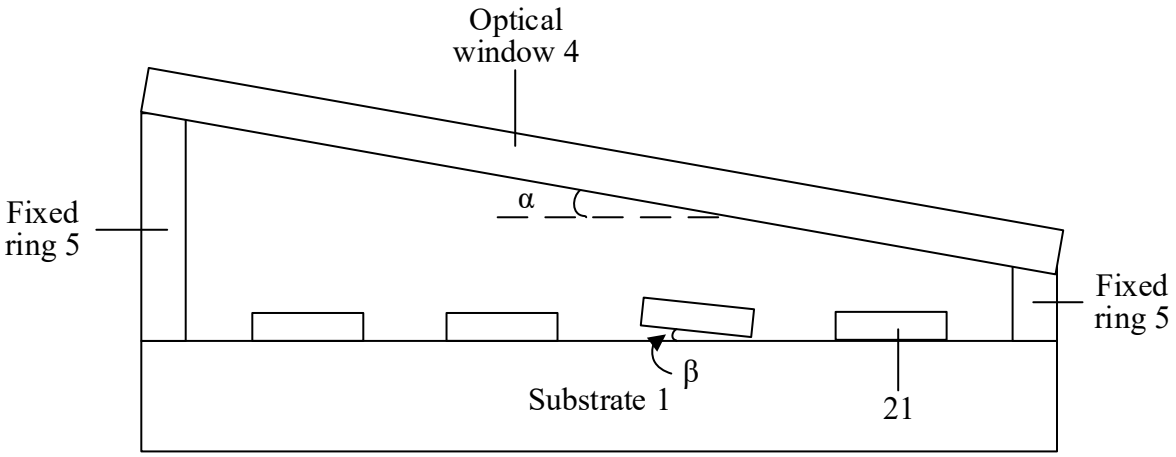

Optical
window 4
α
Fixed
ring 5
Fixed
ring 5
β
Substrate 1
21

FIG. 5

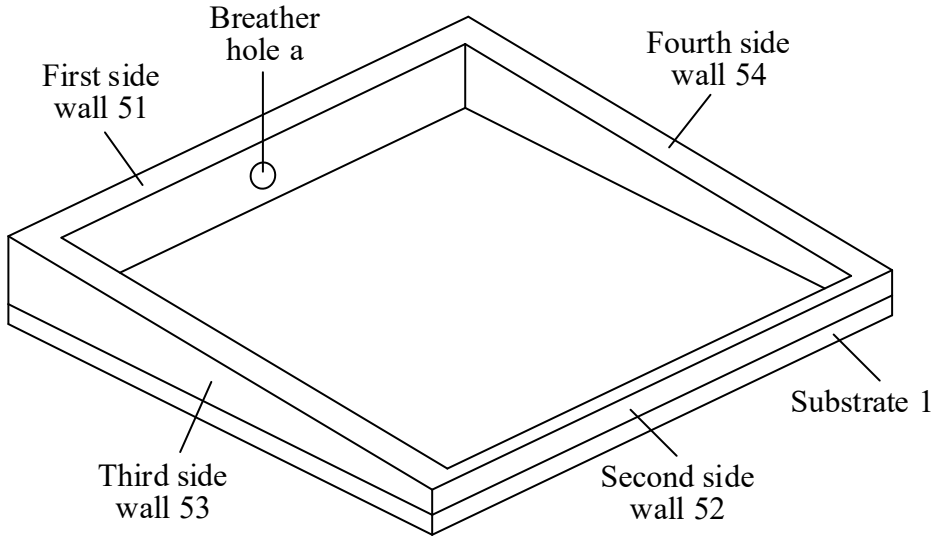

Breather
hole a
First side
wall 51
Fourth side
wall 54
Substrate 1
Third side
wall 53
Second side
wall 52

FIG. 6

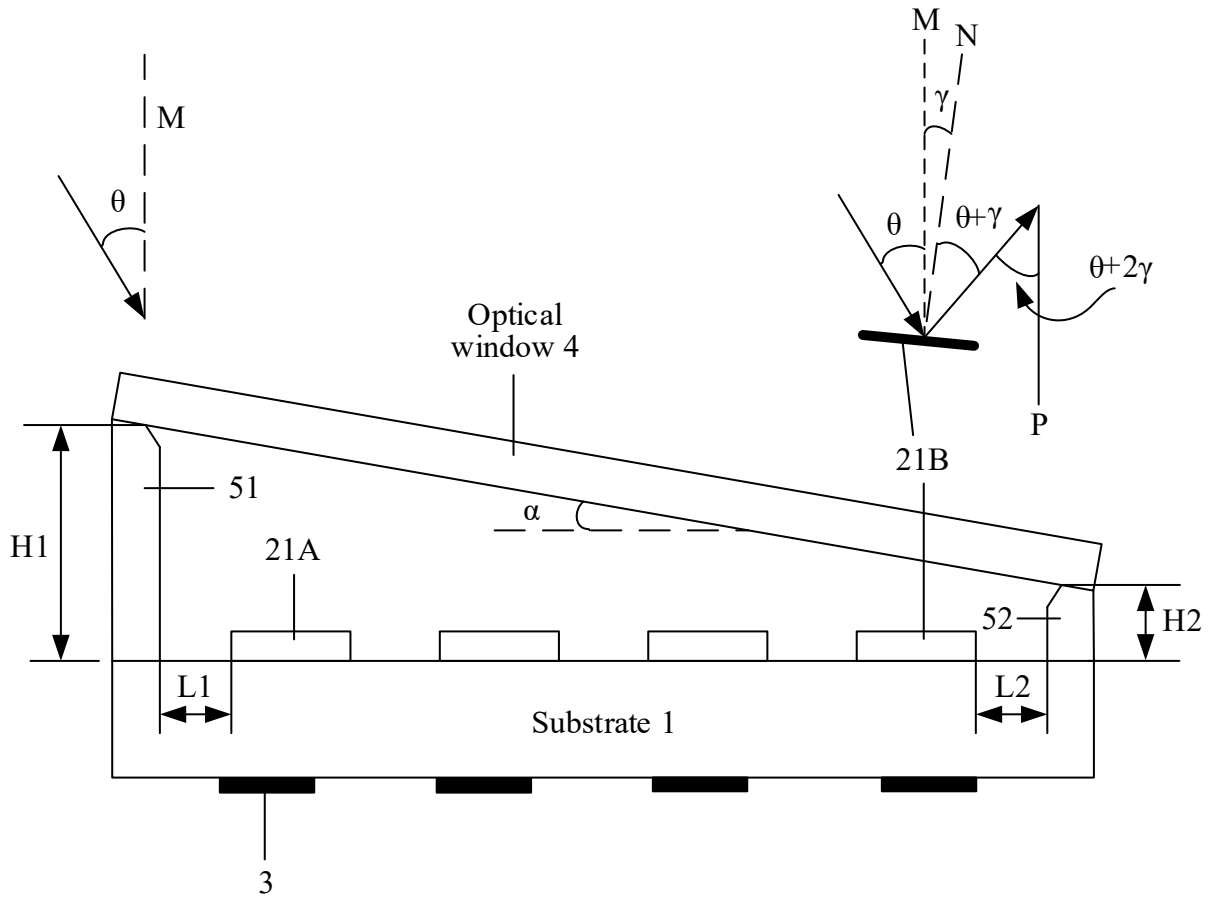

M
θ
M
N
γ
θ
θ+γ
θ+2γ
Optical
window 4
21B
P
51
α
H1
21A
52
H2
L1
L2
Substrate 1
3

FIG. 7

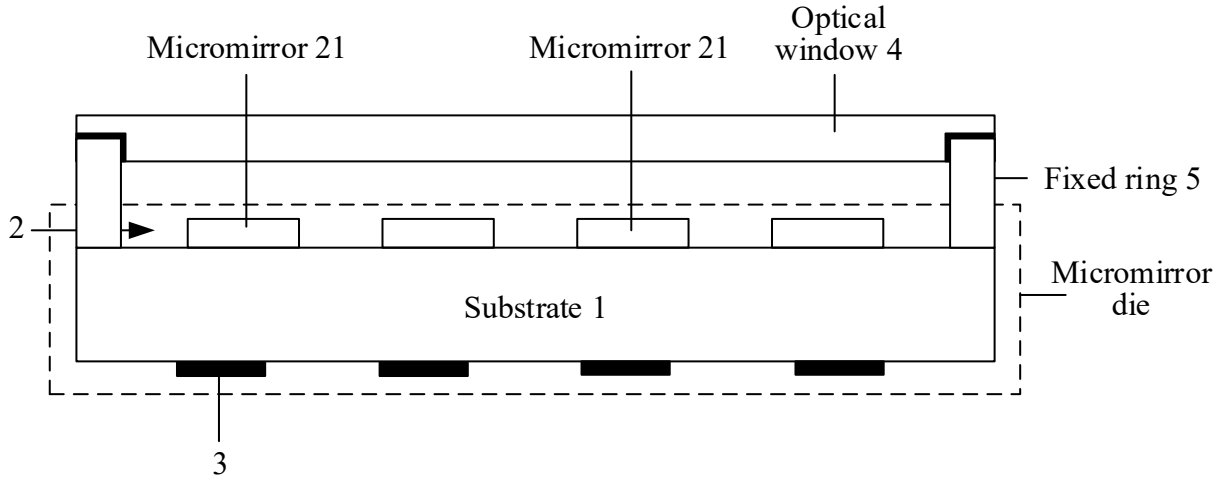

Micromirror 21
Micromirror 21
Optical
window 4
Fixed ring 5
2
Micromirror
die
Substrate 1
3

FIG. 8

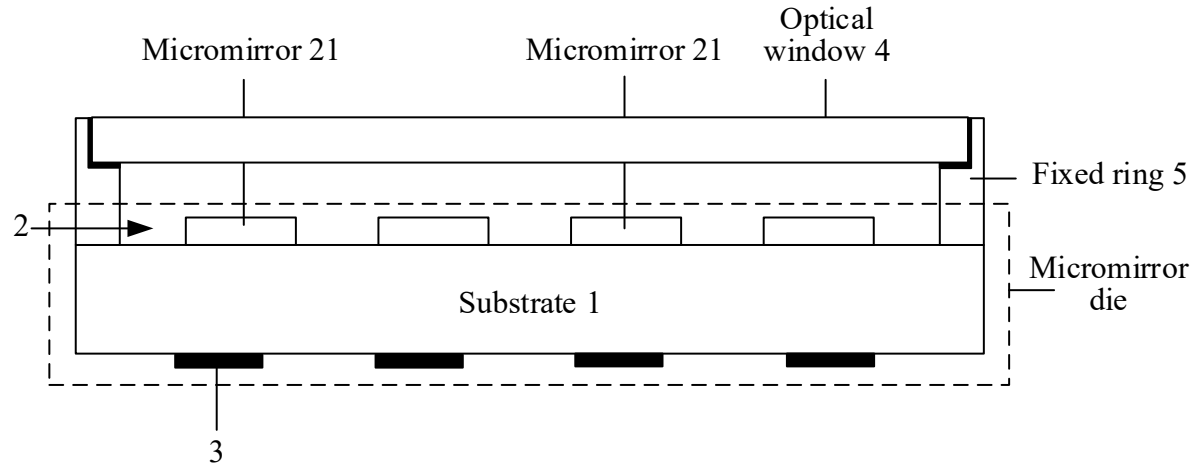


FIG. 9

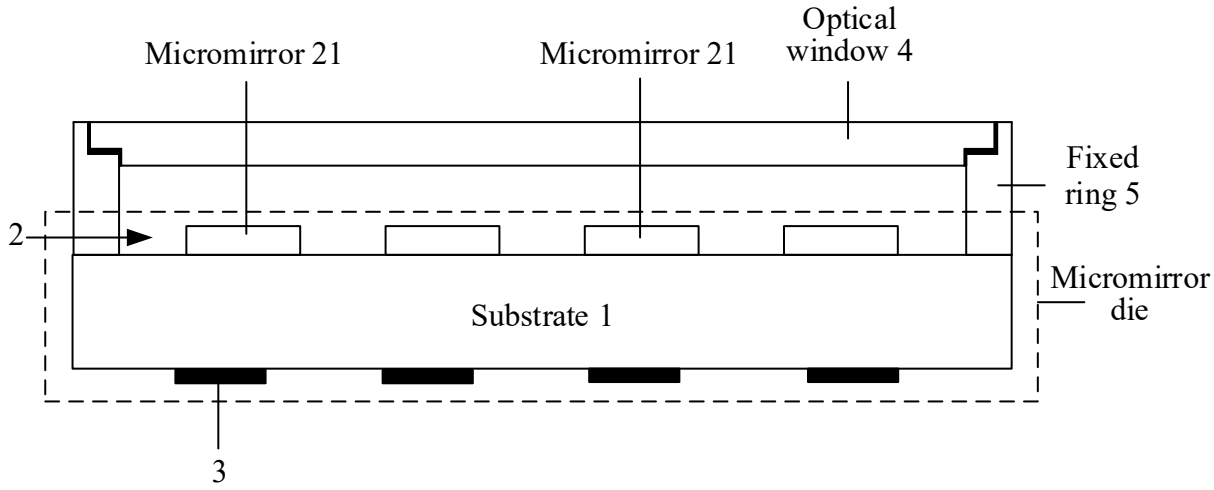


FIG. 10

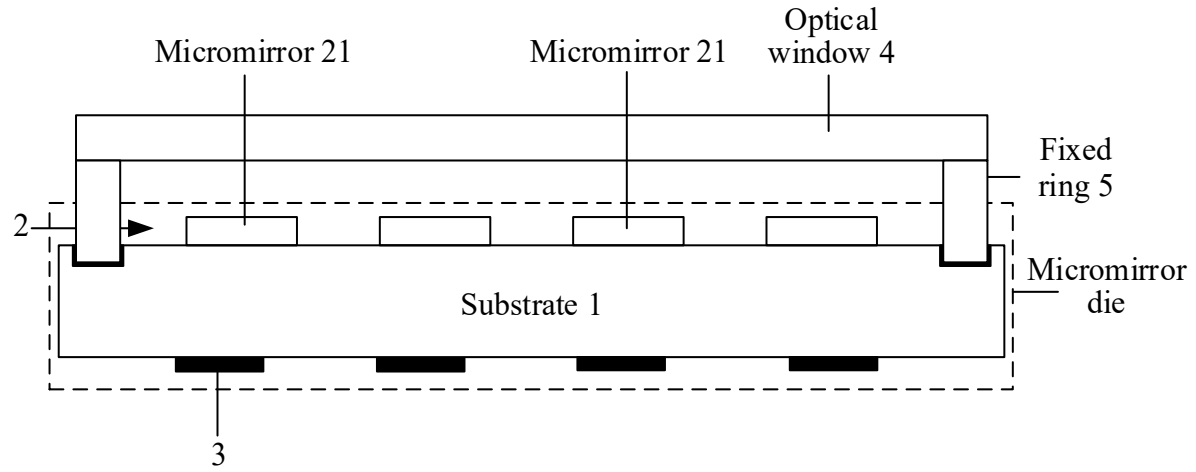


FIG. 11

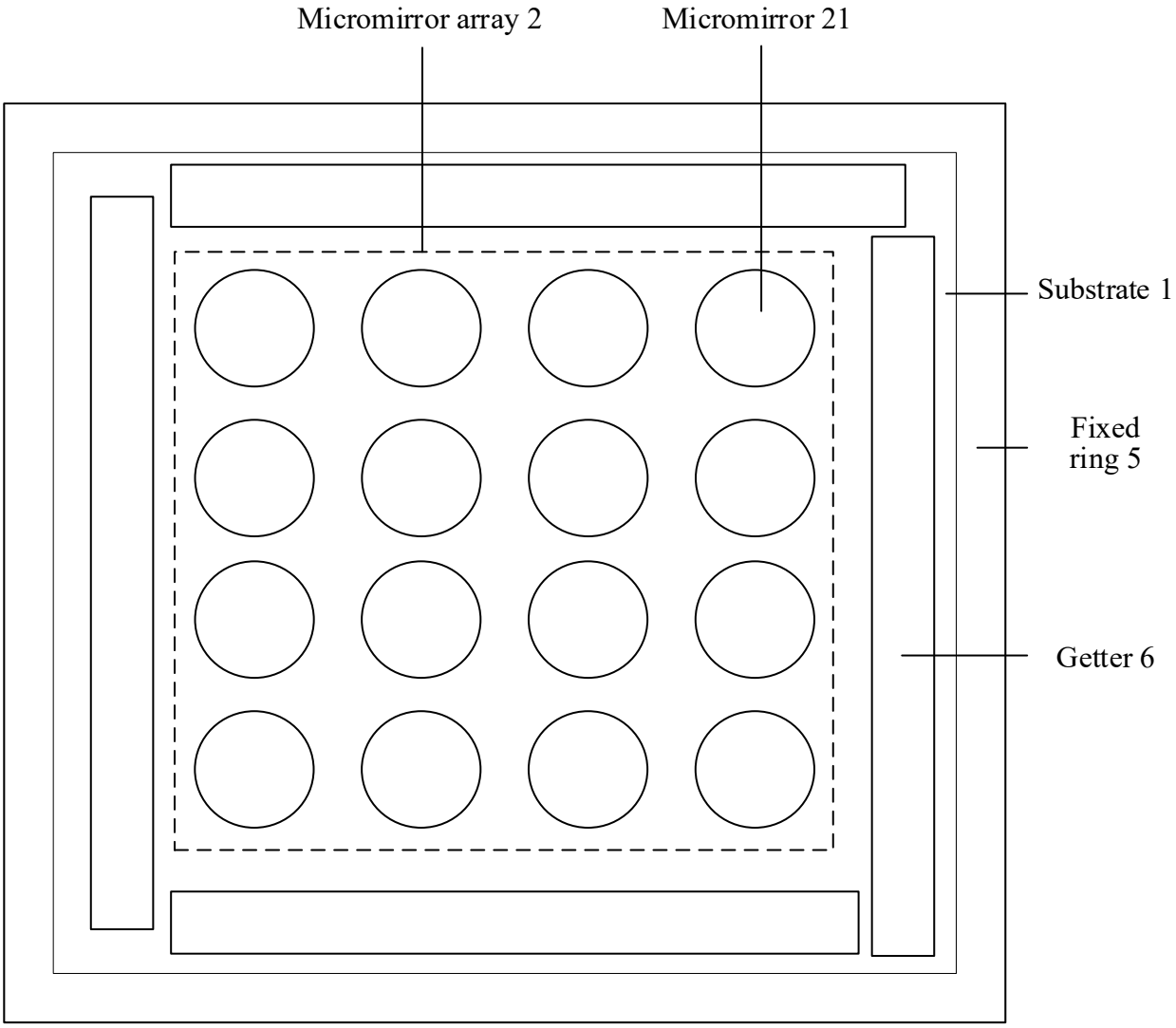

Micromirror array 2
Micromirror 21
Substrate 1
Fixed ring 5
Getter 6

FIG. 12

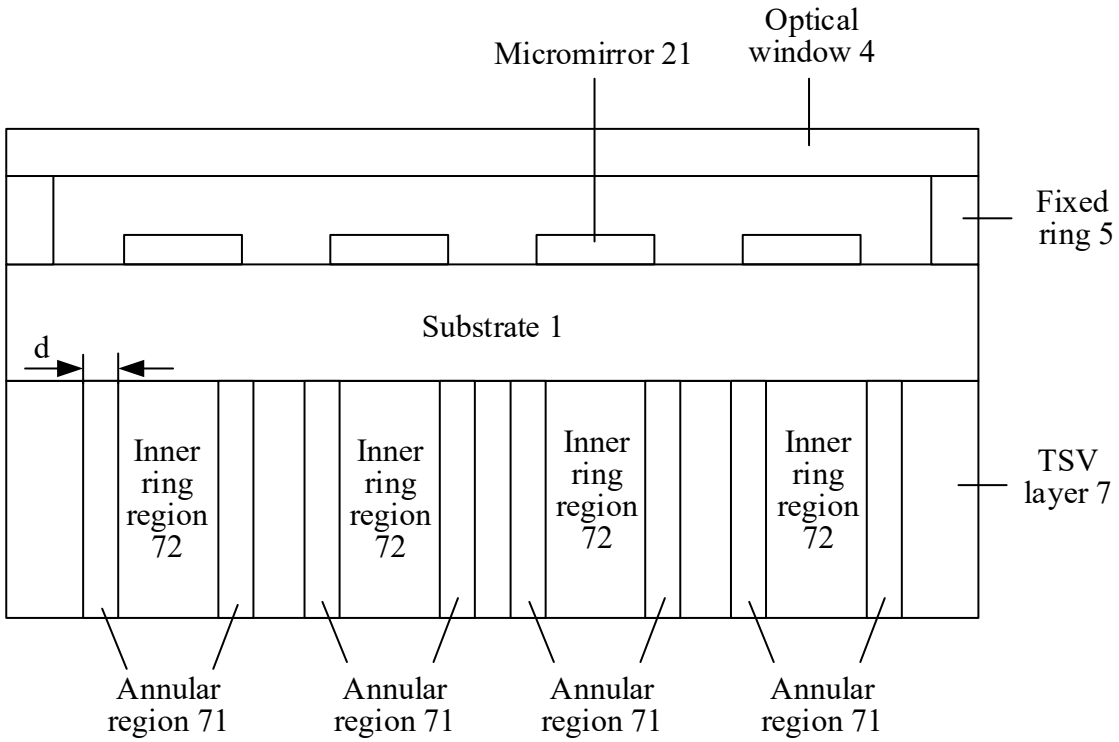

Micromirror 21
Optical window 4
Fixed ring 5
Substrate 1
d
Inner ring region 72
Inner ring region 72
Inner ring region 72
Inner ring region 72
TSV layer 7
Annular region 71
Annular region 71
Annular region 71
Annular region 71

FIG. 13

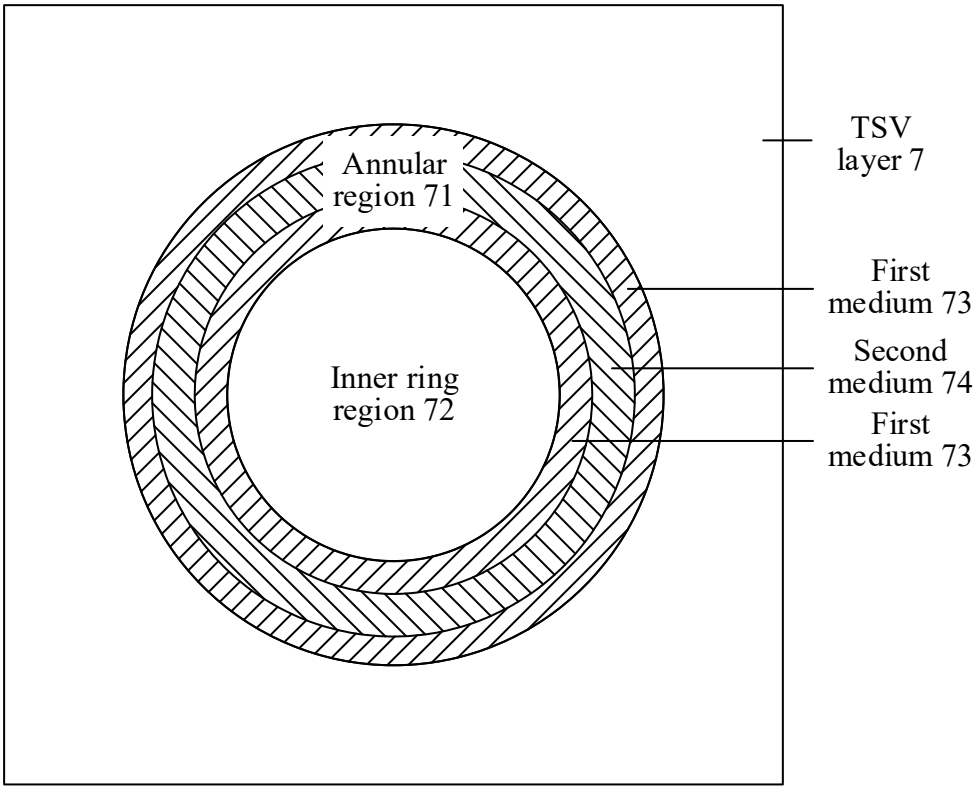

TSV layer 7
Annular region 71
Inner ring region 72
First medium 73
Second medium 74
First medium 73

FIG. 14

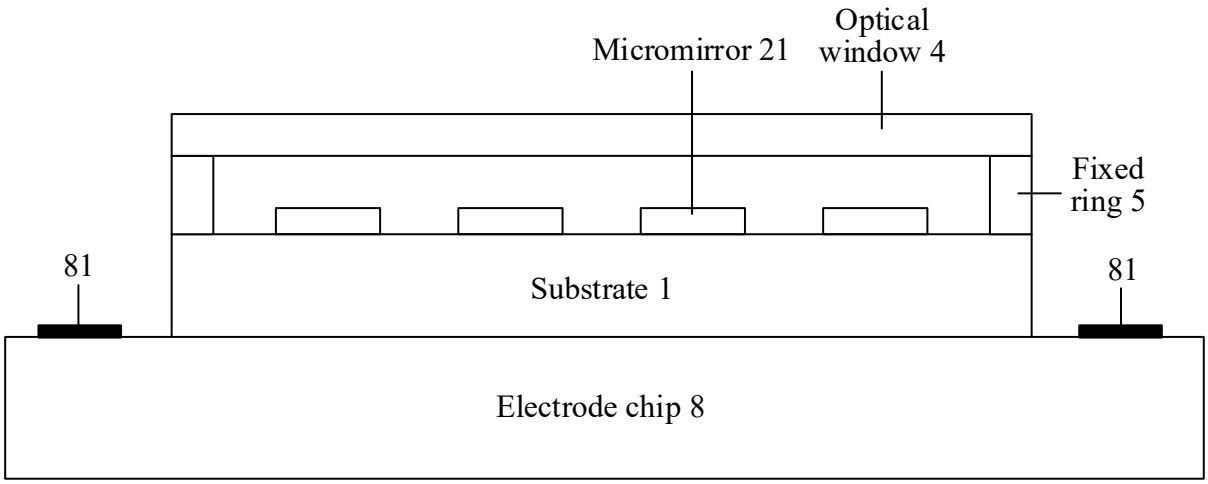

Micromirror 21
Optical window 4
Fixed ring 5
81
Substrate 1
81
Electrode chip 8

FIG. 15

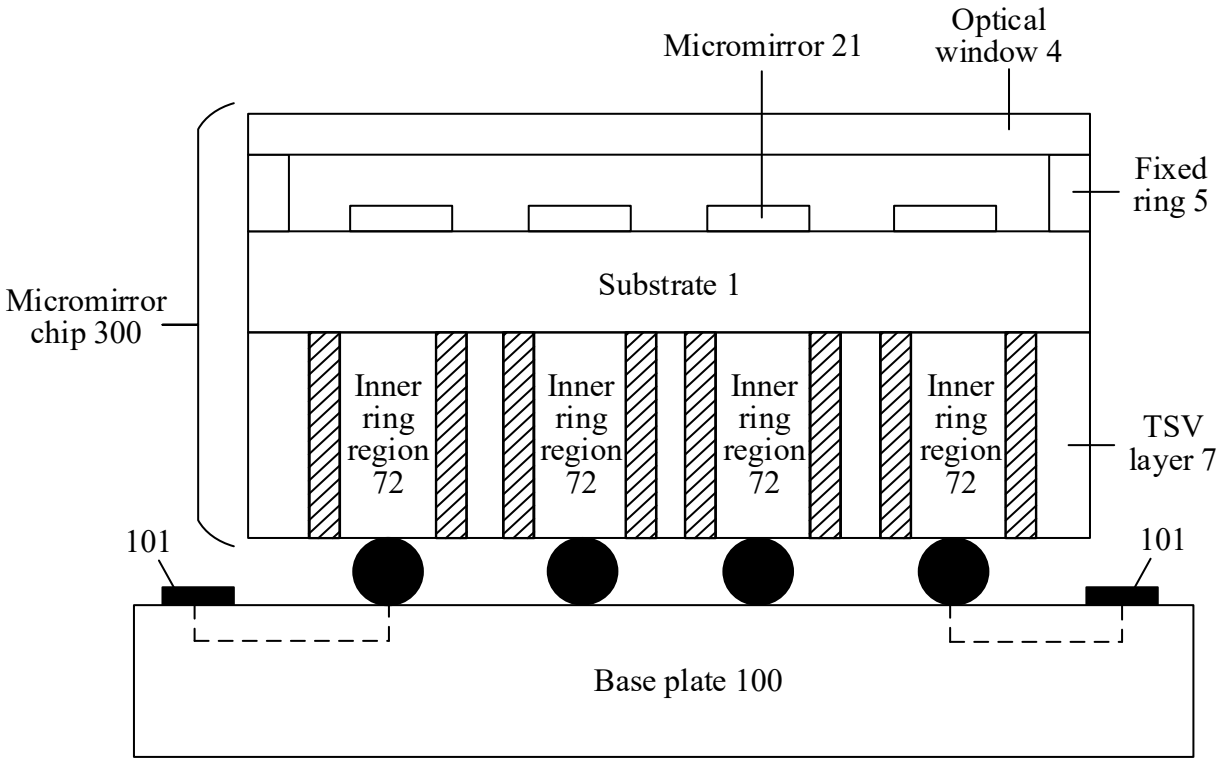

Micromirror 21
Optical window 4
Fixed ring 5
Micromirror chip 300
Substrate 1
Inner ring region 72
Inner ring region 72
Inner ring region 72
Inner ring region 72
TSV layer 7
101
101
Base plate 100

FIG. 16

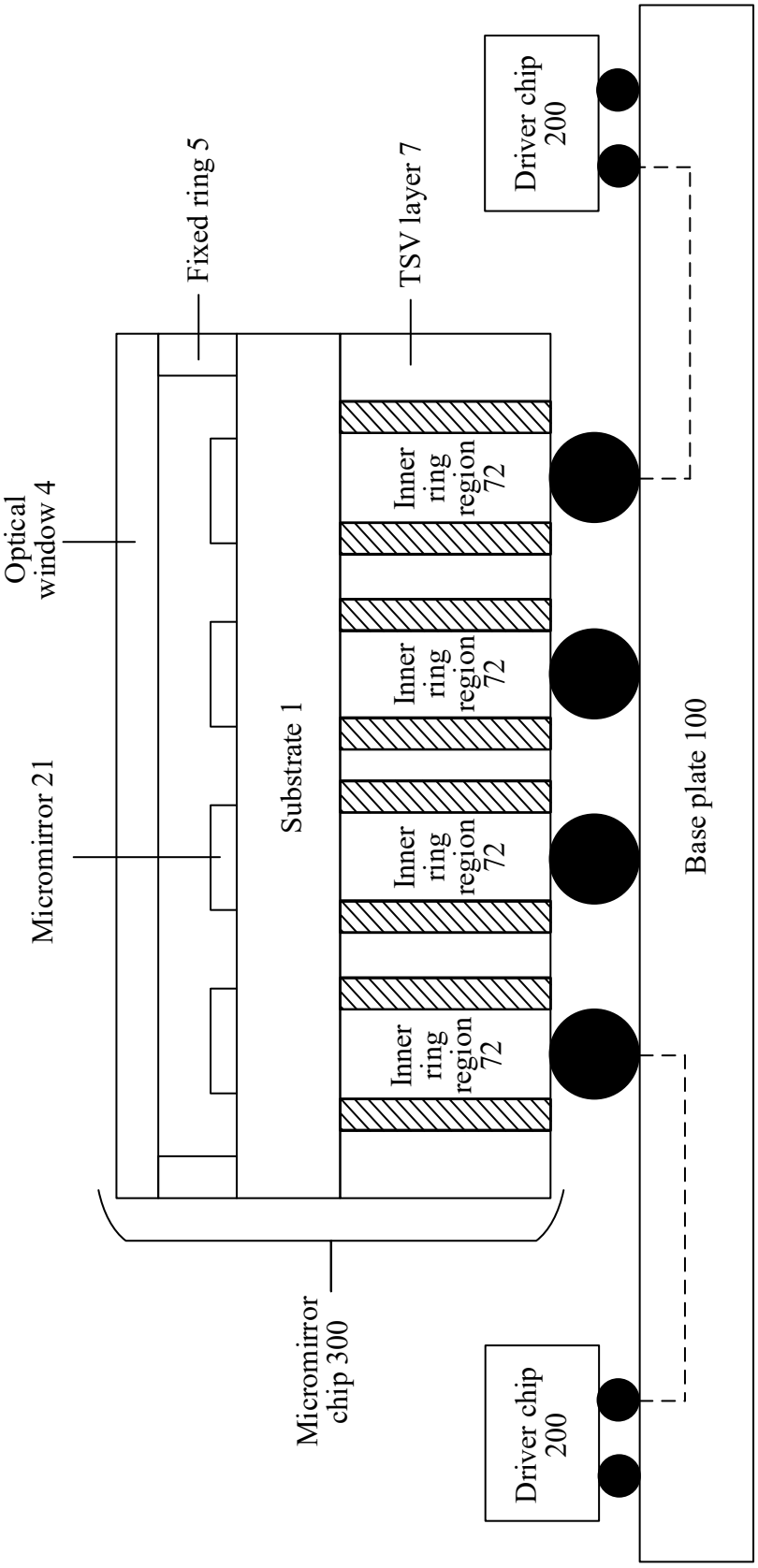

Optical window 4
Micromirror 21
Fixed ring 5
Substrate 1
TSV layer 7
Inner ring region 72
Inner ring region 72
Inner ring region 72
Inner ring region 72
Driver chip 200
Base plate 100
Micromirror chip 300
Driver chip 200

FIG. 17

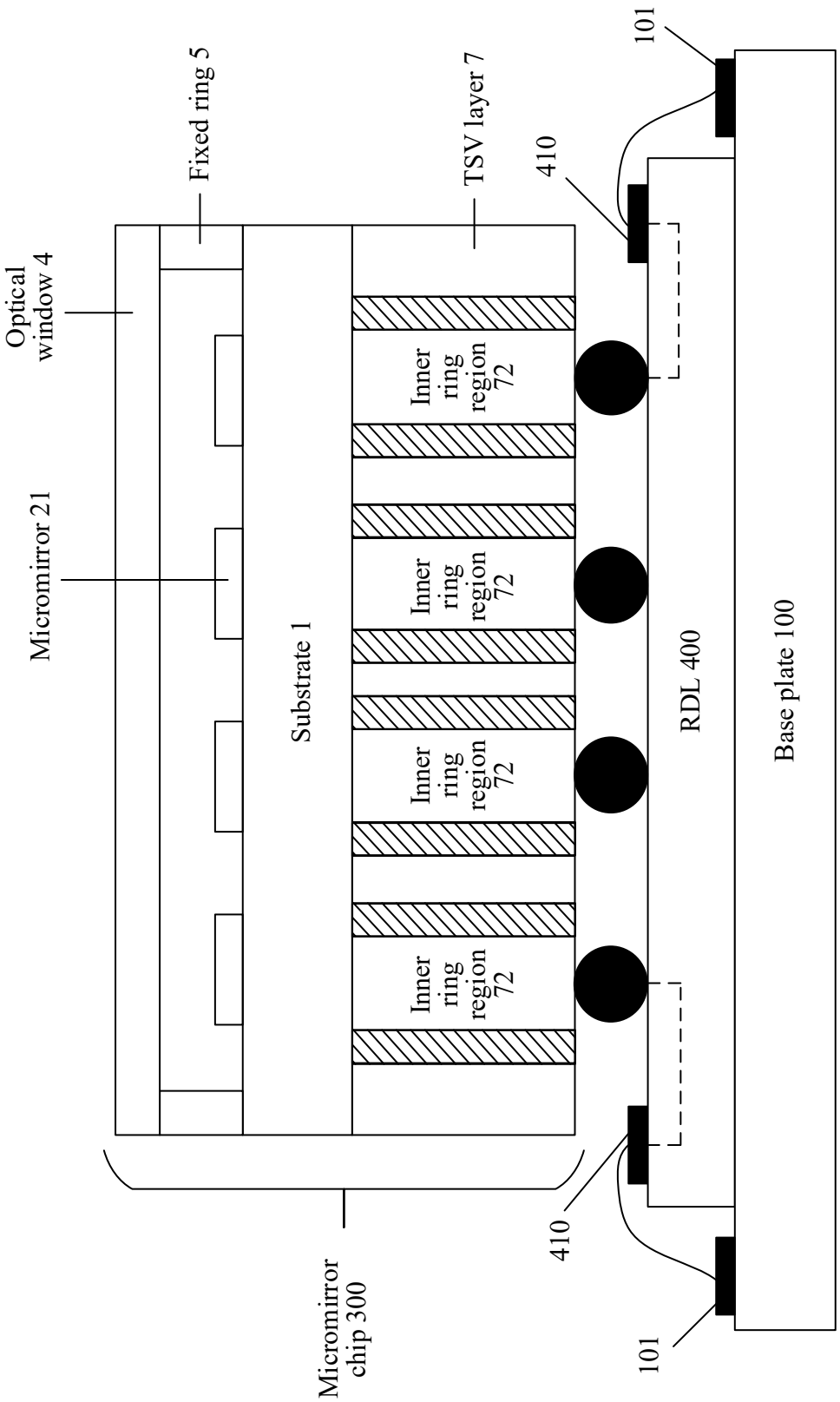

Optical window 4
Micromirror 21
Micromirror chip 300
Fixed ring 5
Substrate 1
TSV layer 7
Inner ring region 72
Inner ring region 72
Inner ring region 72
Inner ring region 72
410
410
RDL 400
101
101
Base plate 100

FIG. 18

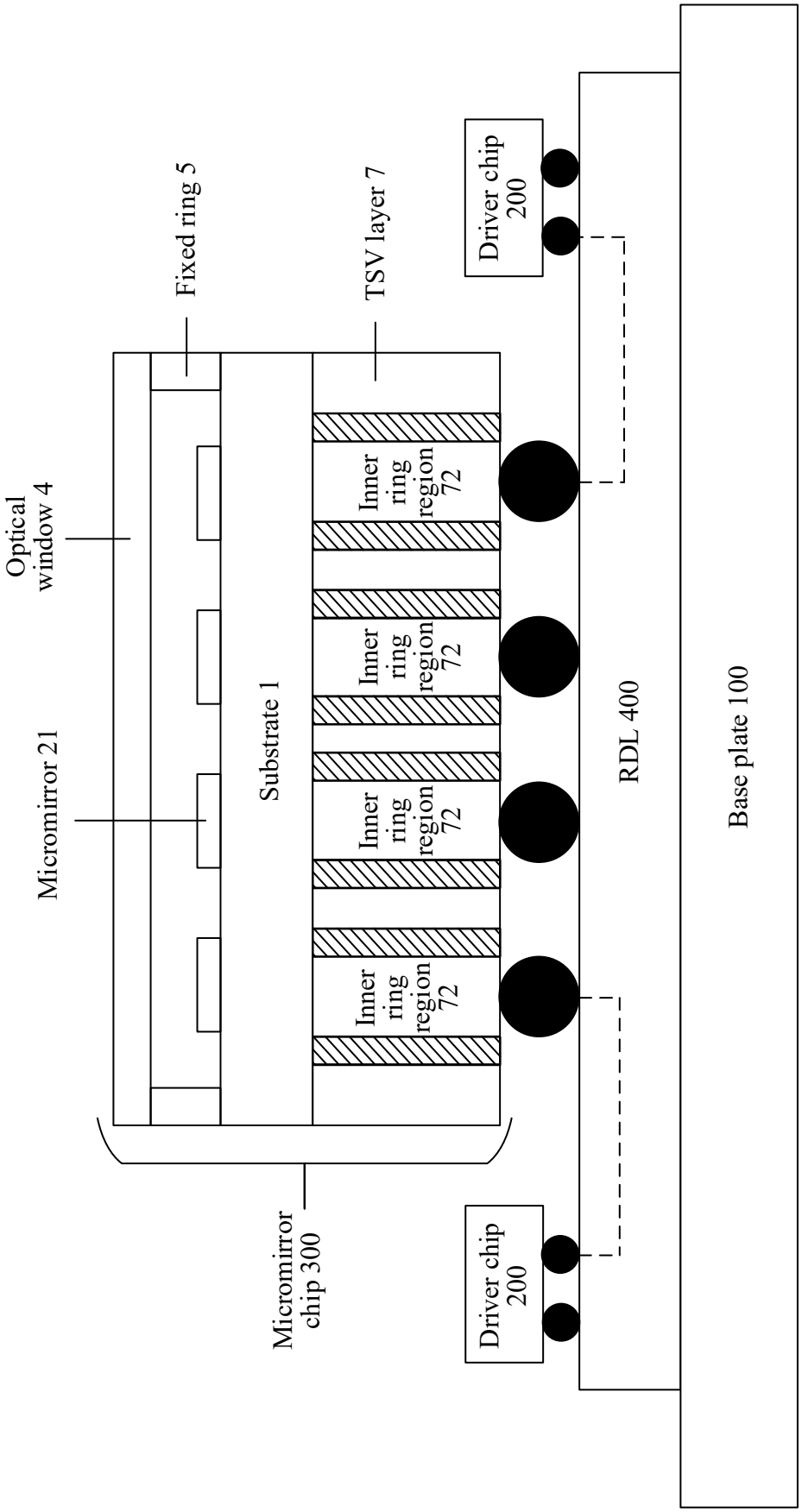

Optical window 4
Micromirror 21
Micromirror chip 300
Fixed ring 5
Substrate 1
TSV layer 7
Inner ring region 72
Inner ring region 72
Inner ring region 72
Inner ring region 72
Driver chip 200
Driver chip 200
RDL 400
Base plate 100

FIG. 19

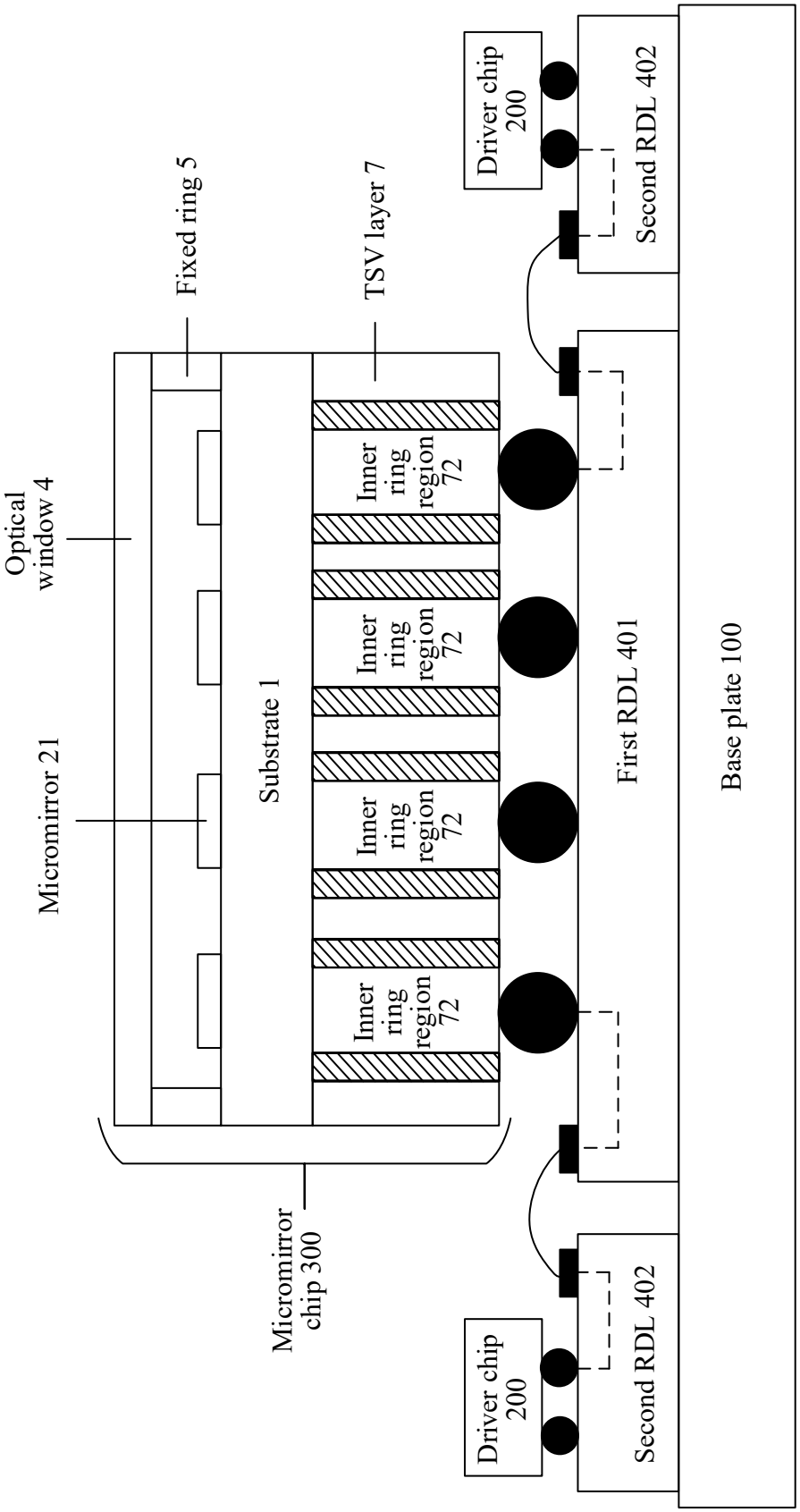

Optical window 4
Micromirror 21
Fixed ring 5
Substrate 1
TSV layer 7
Inner ring region 72
Inner ring region 72
Inner ring region 72
Inner ring region 72
Micromirror chip 300
Driver chip 200
Second RDL 402
First RDL 401
Base plate 100
Second RDL 402
Driver chip 200

FIG. 20

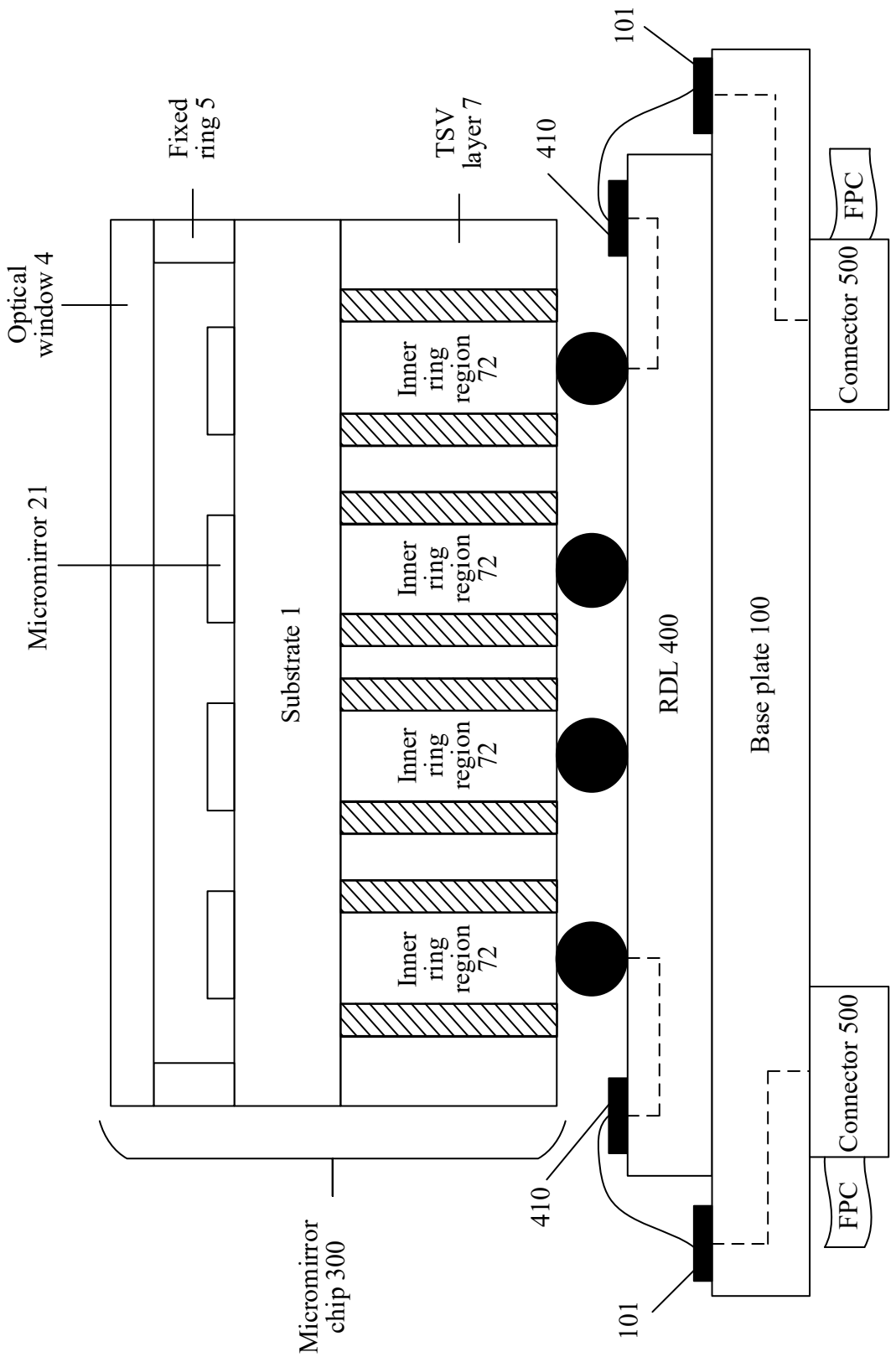

Optical window 4
Micromirror 21
Fixed ring 5
TSV layer 7
410
101
Substrate 1
Inner ring region 72
Inner ring region 72
Inner ring region 72
Inner ring region 72
RDL 400
Base plate 100
Connector 500
FPC
Connector 500
FPC
Micromirror chip 300
410
101

FIG. 21

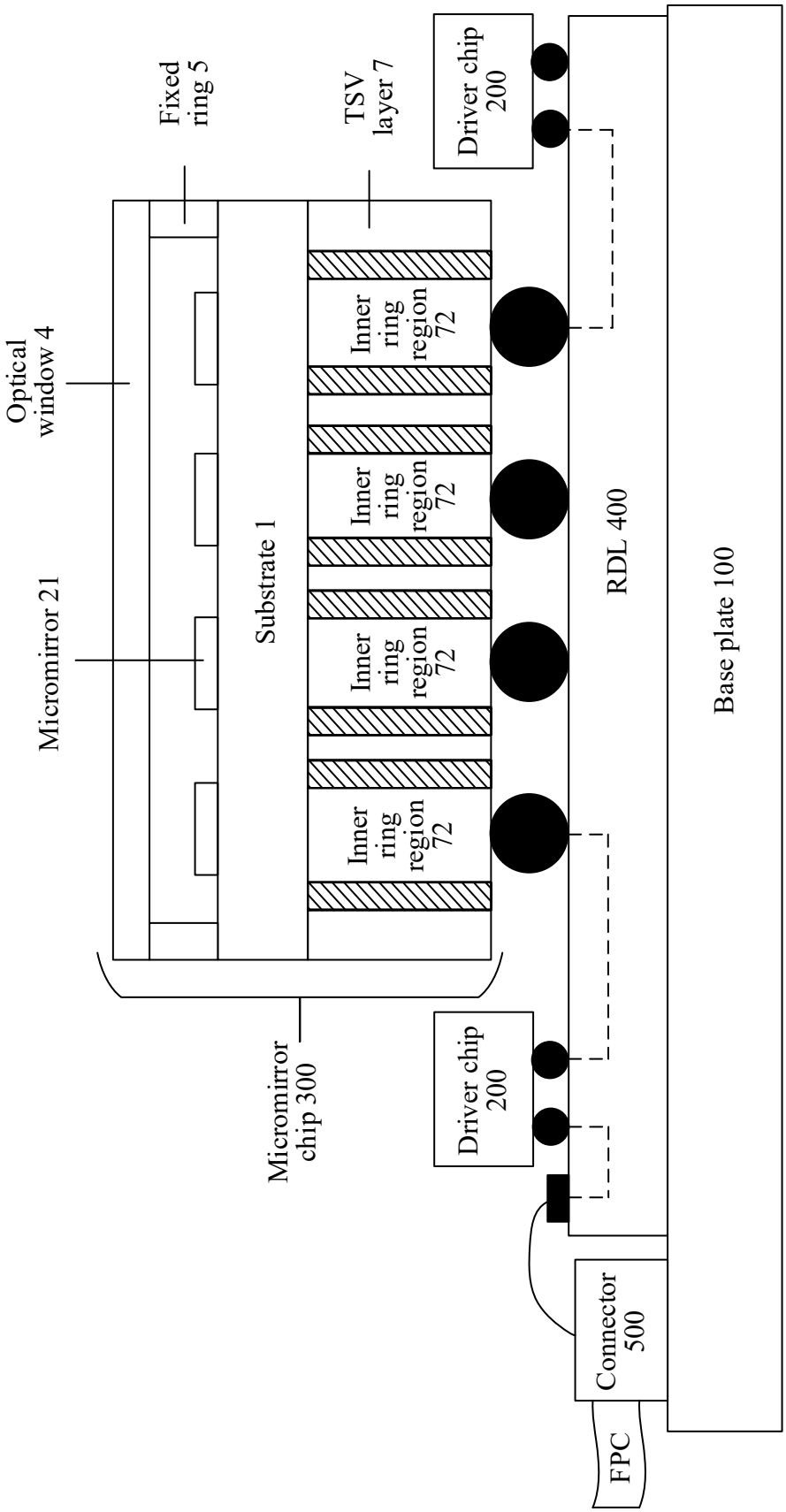

Optical window 4
Micromirror 21
Fixed ring 5
TSV layer 7
Driver chip 200
Substrate 1
Inner ring region 72
Inner ring region 72
Inner ring region 72
Inner ring region 72
RDL 400
Base plate 100
Micromirror chip 300
Driver chip 200
Connector 500
FPC

FIG. 22

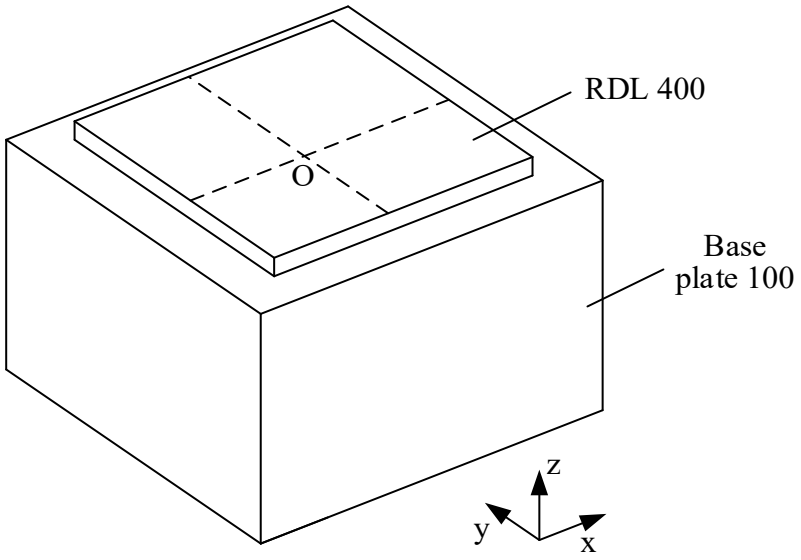


FIG. 23

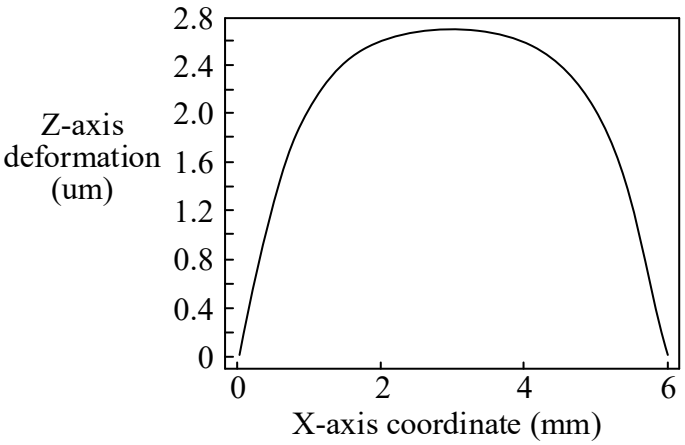


FIG. 24

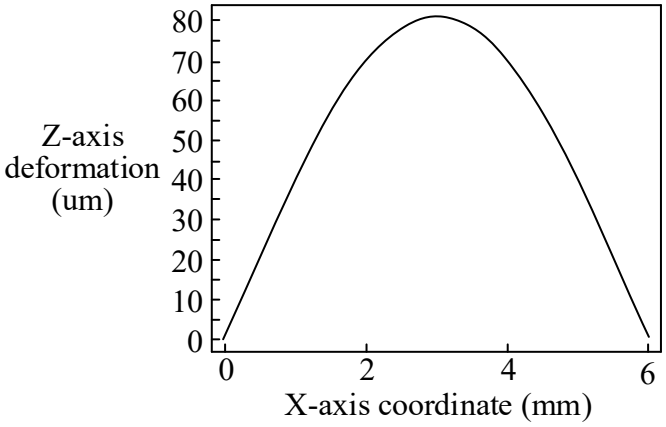


FIG. 25