

FIG. 1

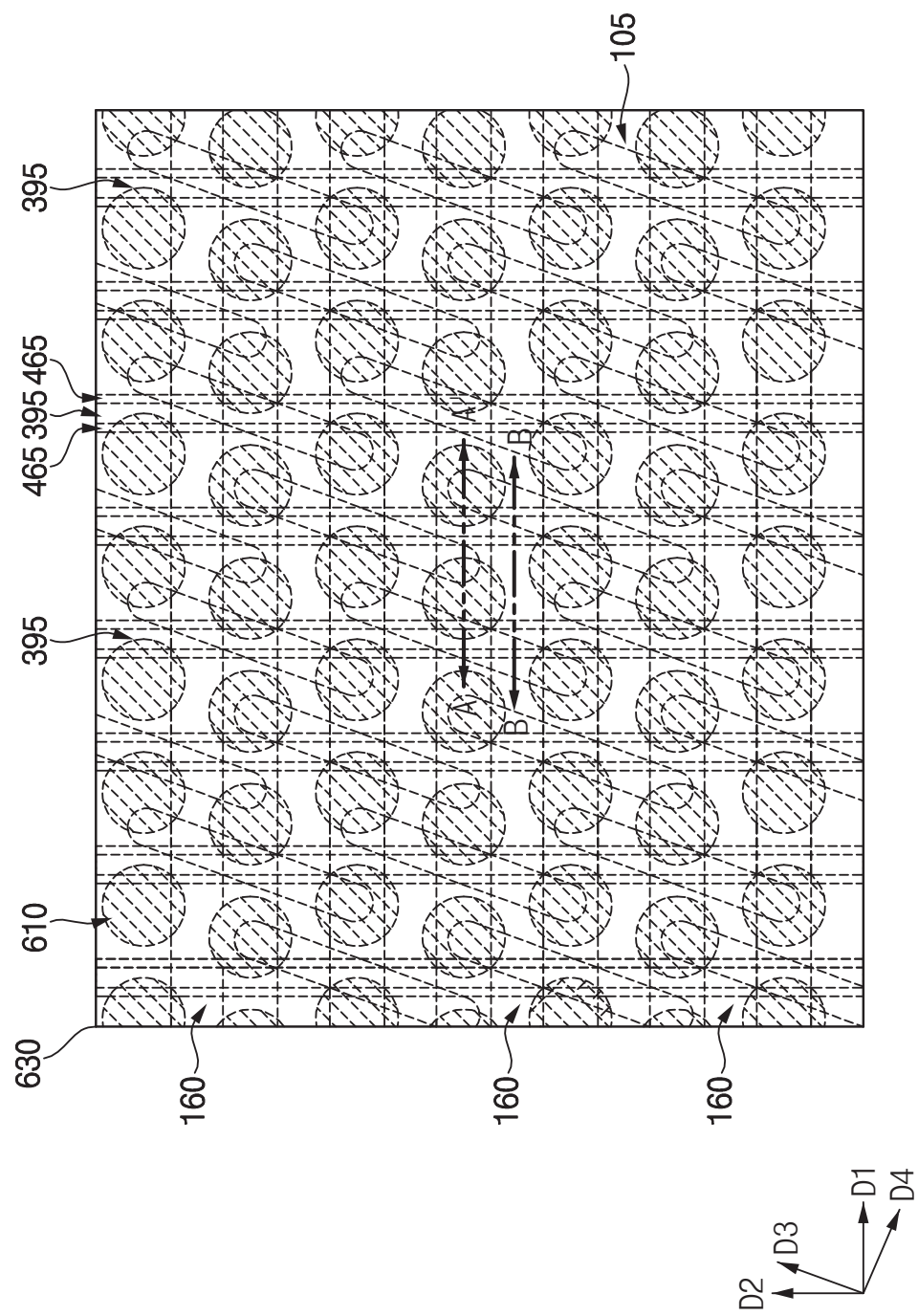


FIG. 2A

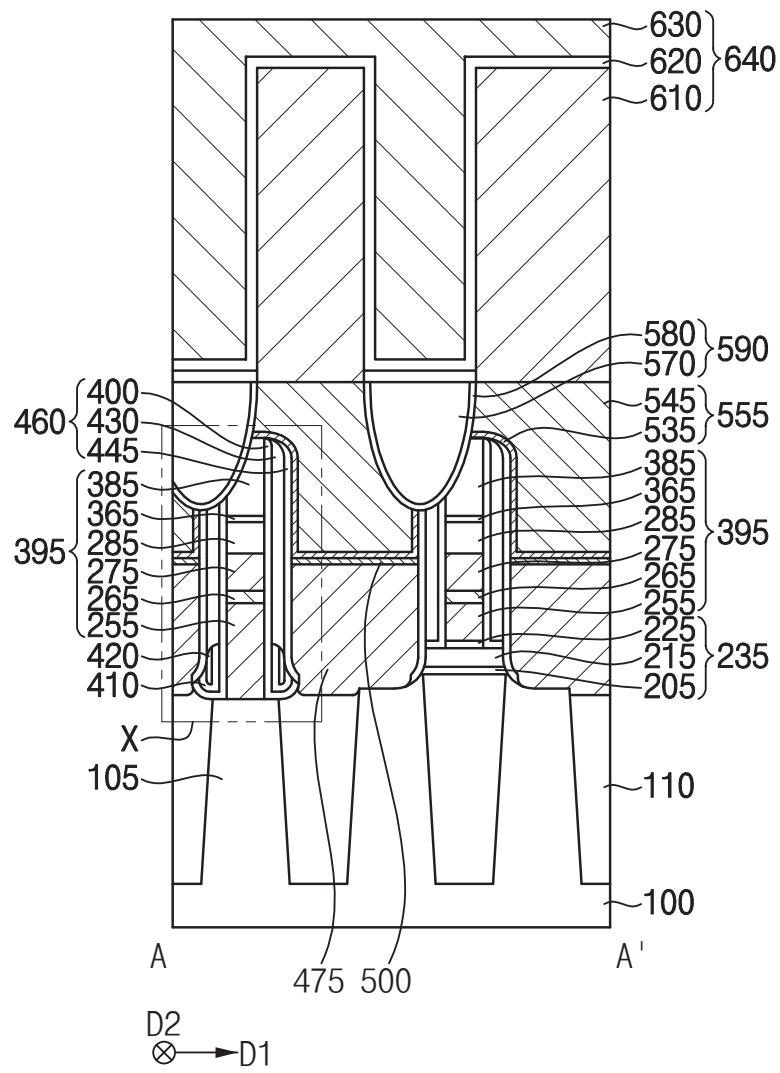


FIG. 2B

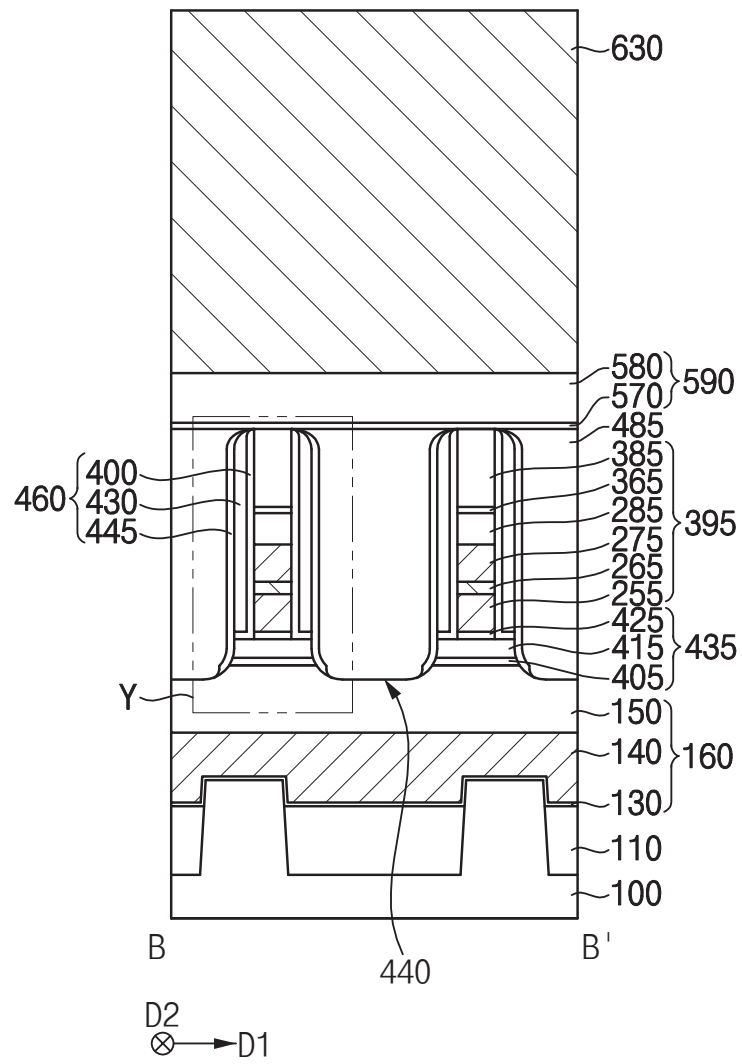


FIG. 3

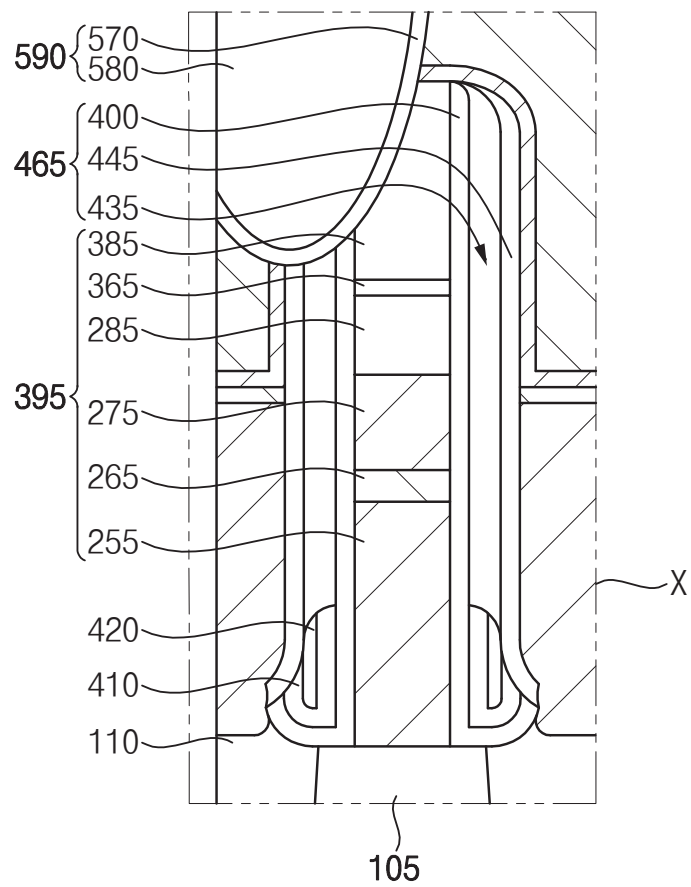


FIG. 4

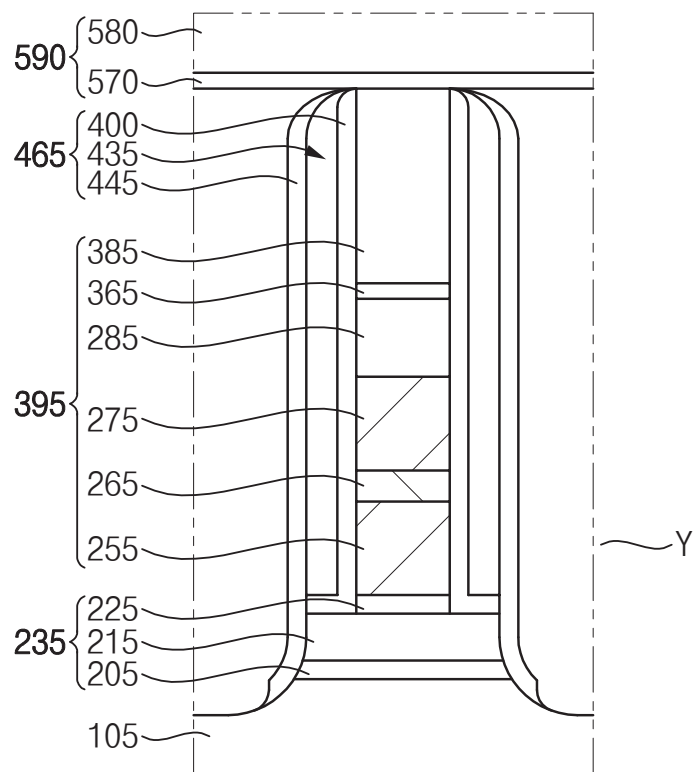


FIG. 5

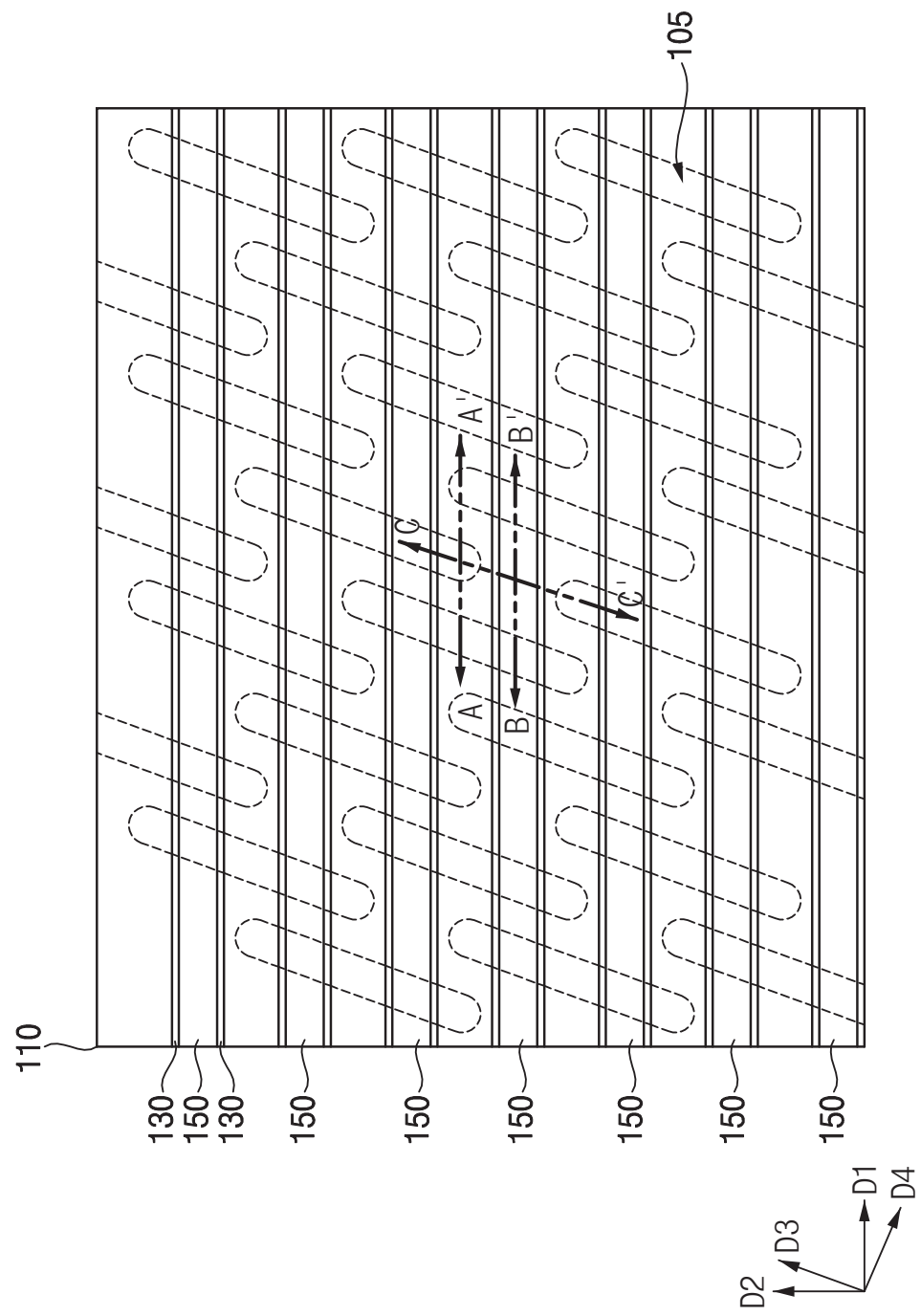


FIG. 6A

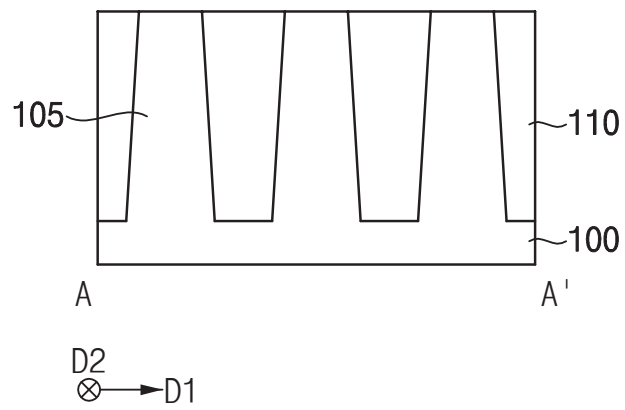


FIG. 6B

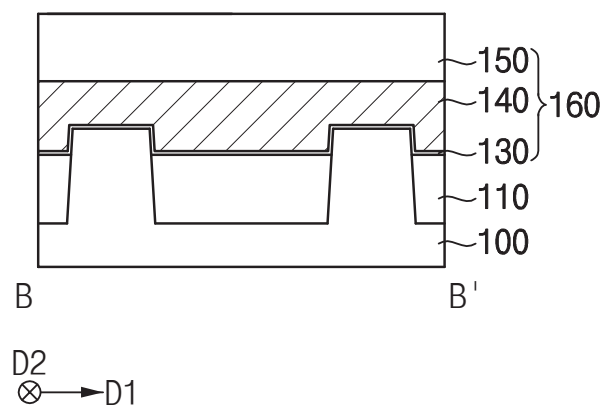


FIG. 6C

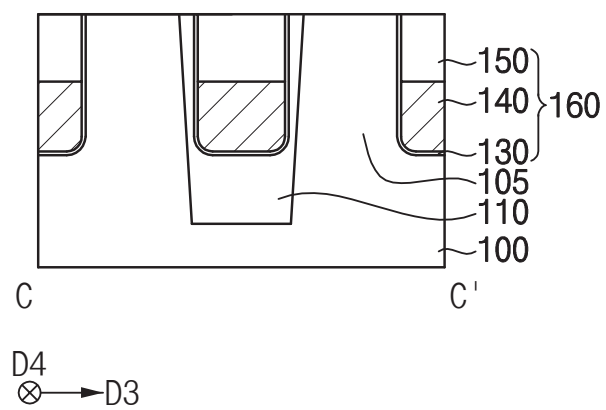


FIG. 7

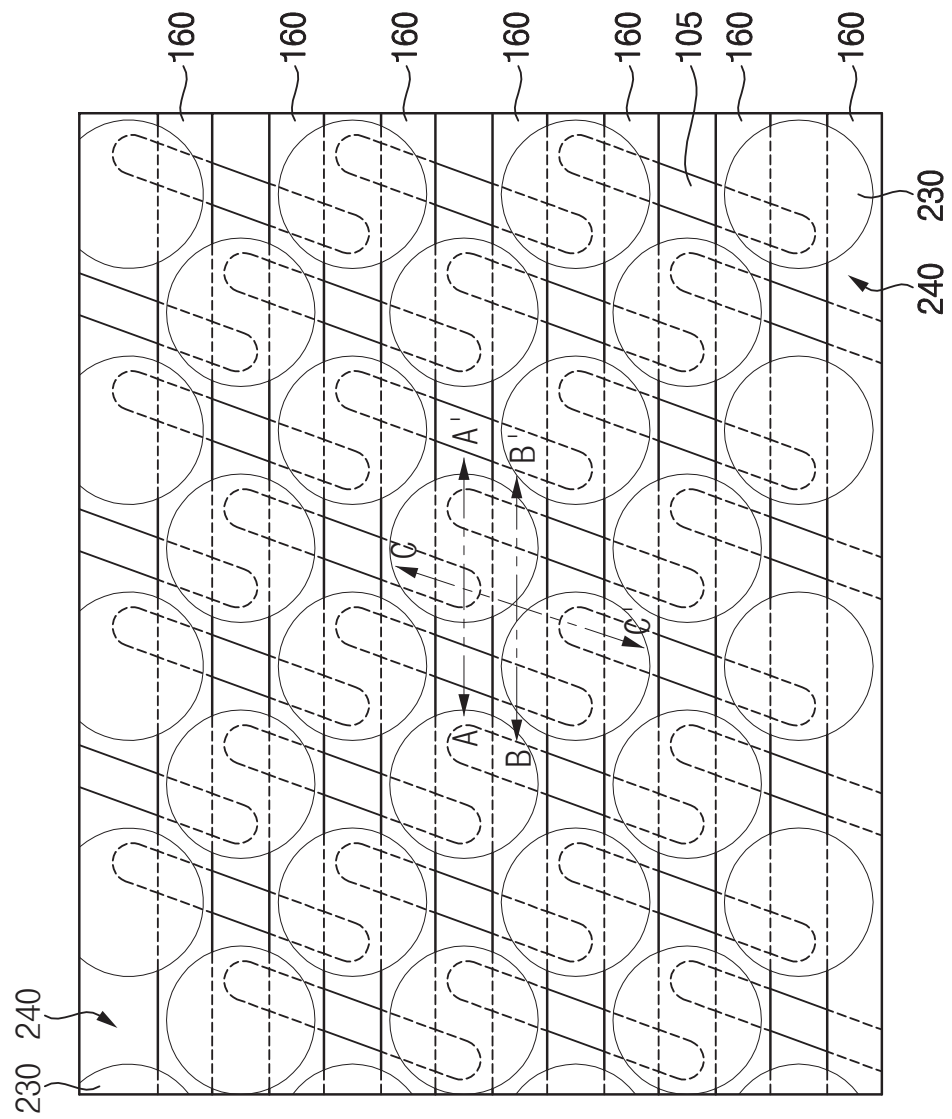


FIG. 8A

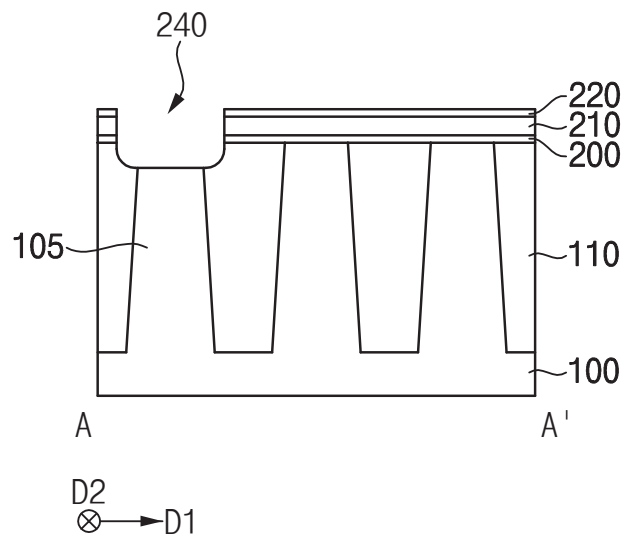


FIG. 8B

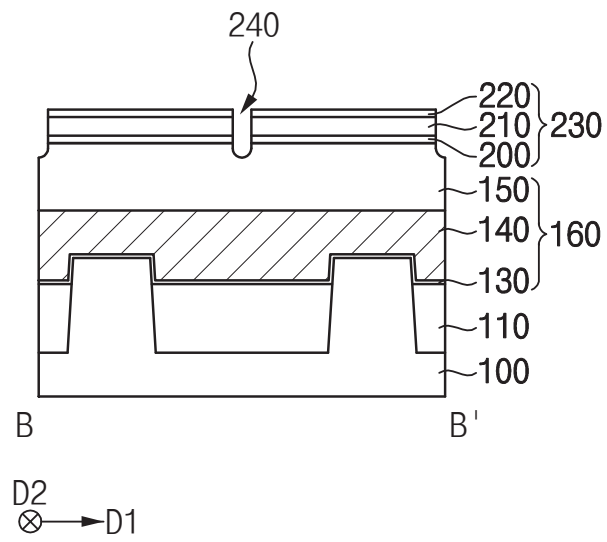


FIG. 8C

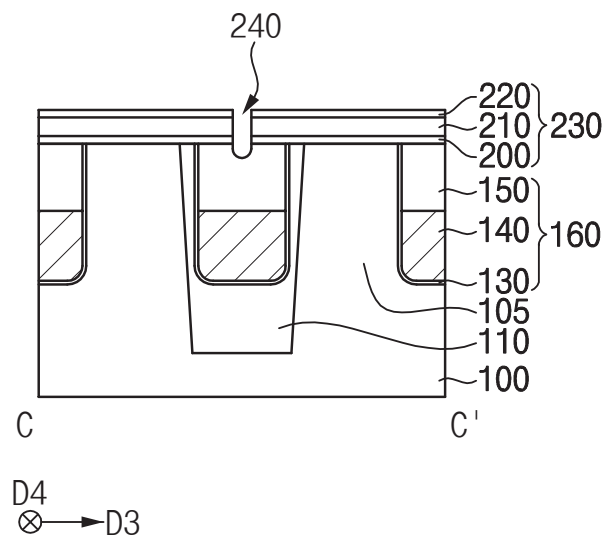


FIG. 9A

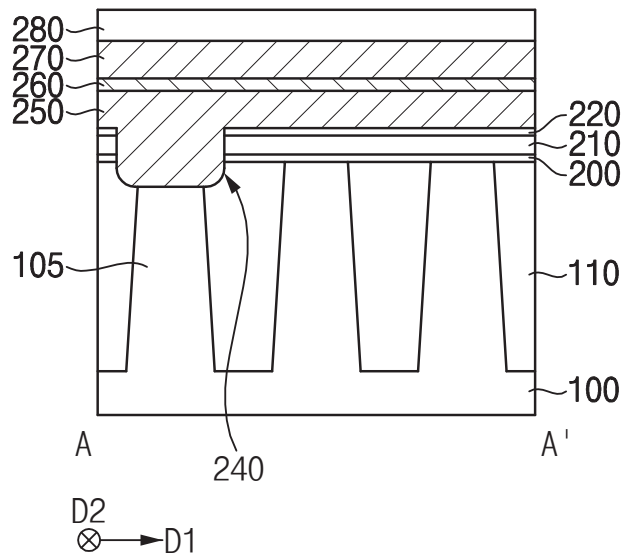


FIG. 9B

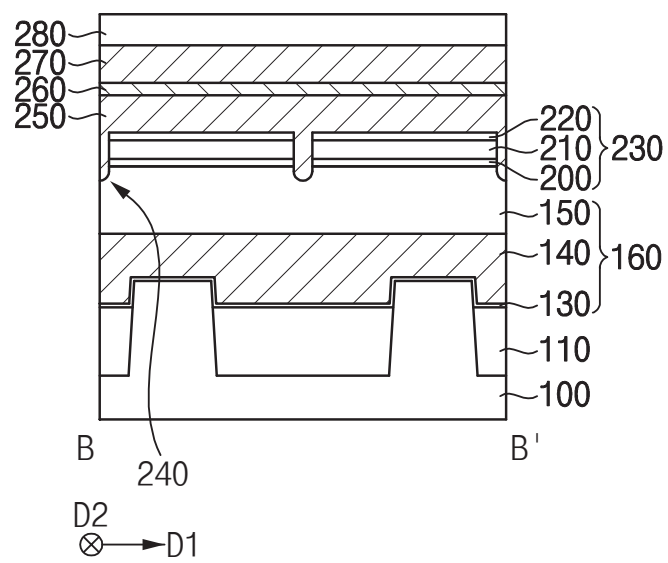


FIG. 9C

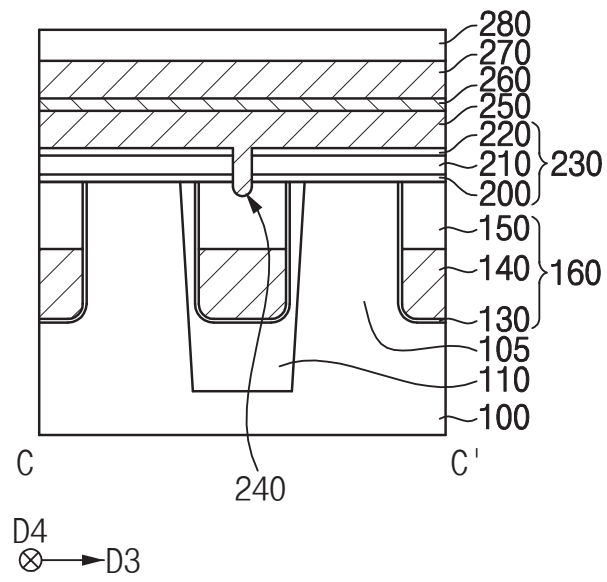


FIG. 10

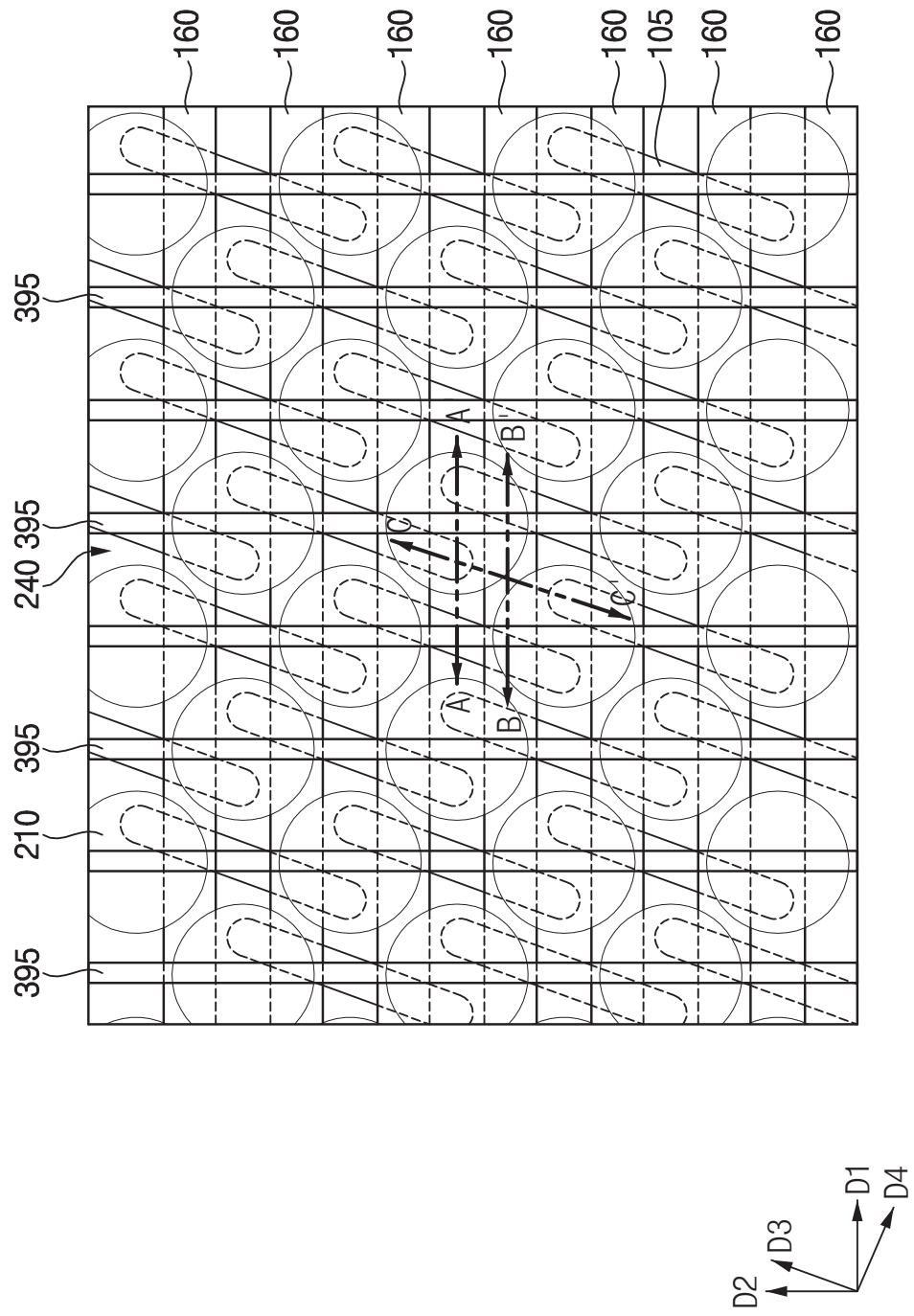


FIG. 11A

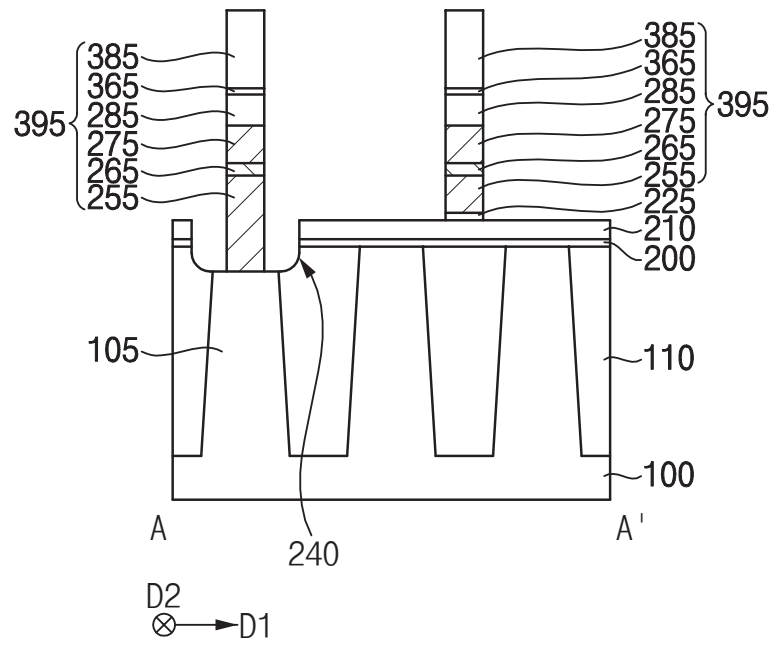


FIG. 11B

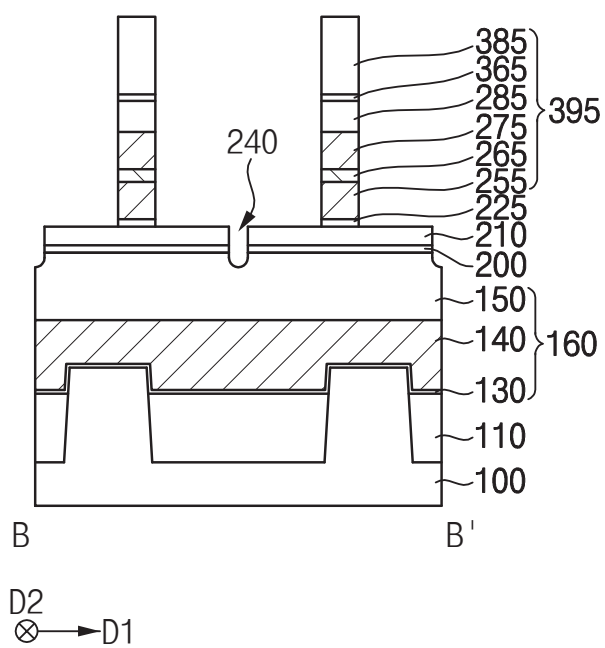
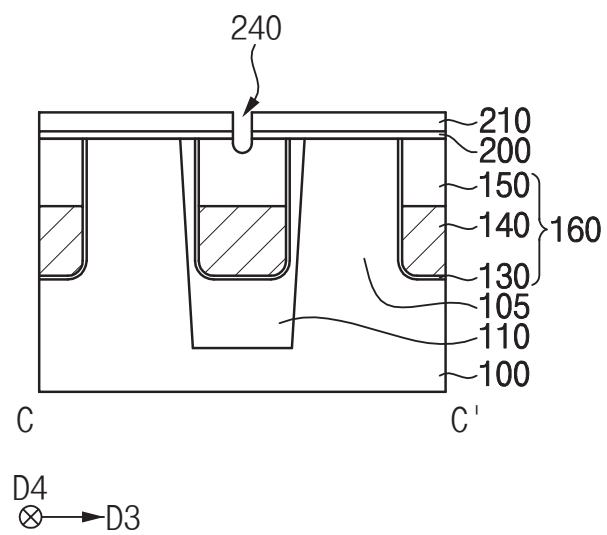


FIG. 11C



[illegible]

This cross-sectional diagram shows two vertical structures on a substrate. The left structure is labeled 440 with an arrow pointing to its top surface. The right structure has multiple layers labeled from bottom to top: 400, 430, 385, 365, 285, 275, 265, 255, 425, 415, and 405. Brackets group these layers into three sets: {395} for layers 385-405, {435} for layers 255-425, and {160} for layers 130-150. Below these are layers 100 and 110. A hatched layer 140 sits above layer 130. At the base is layer 100. Section lines B and B' are indicated at the bottom. A coordinate system at the bottom left shows D2 as the vertical axis and D1 as the horizontal axis.

FIG. 12C

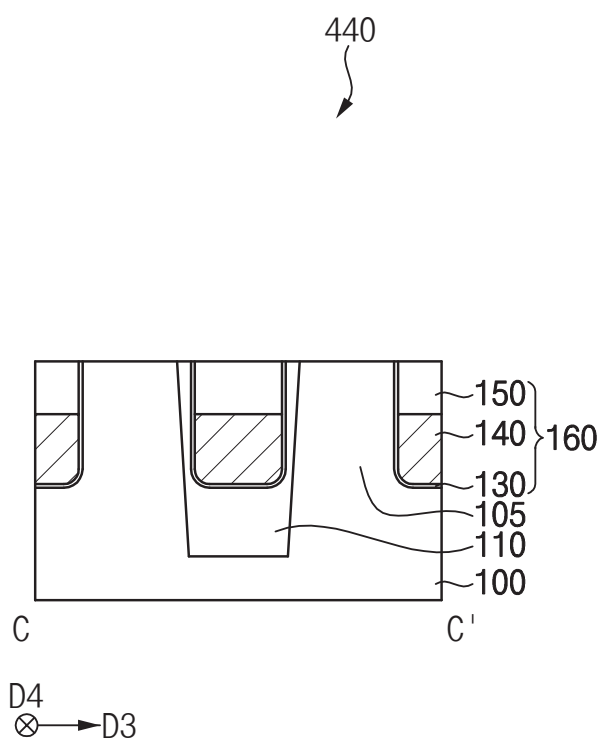


FIG. 13A

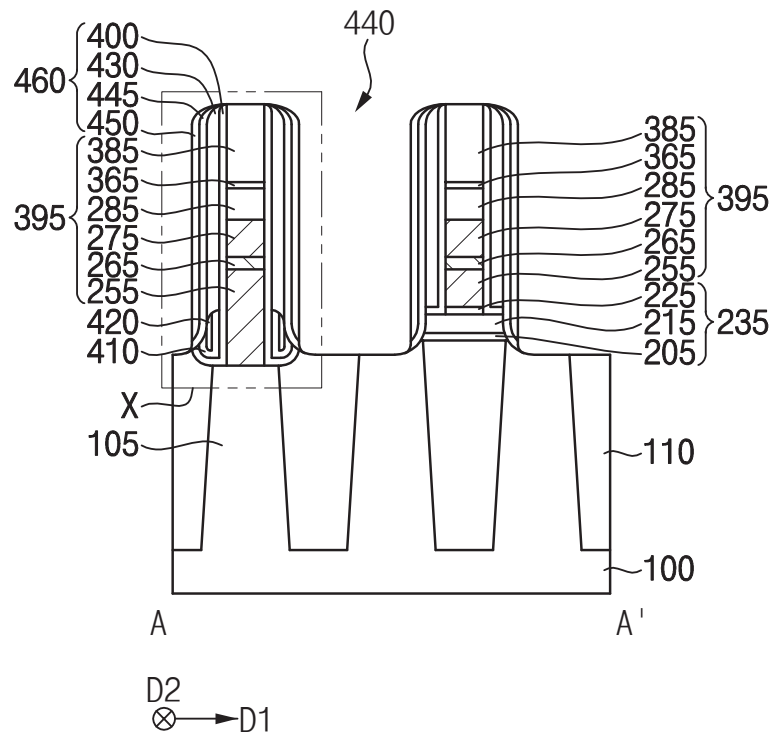


FIG. 13B

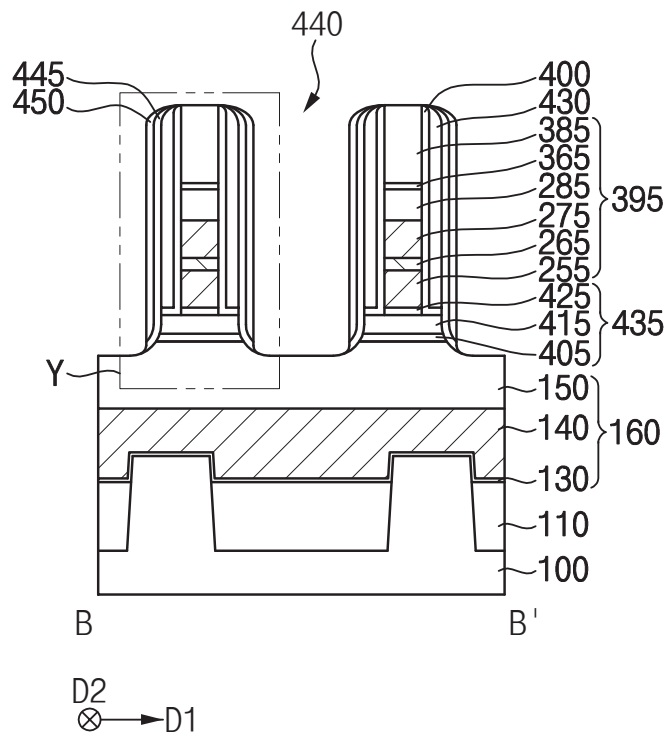


FIG. 13C

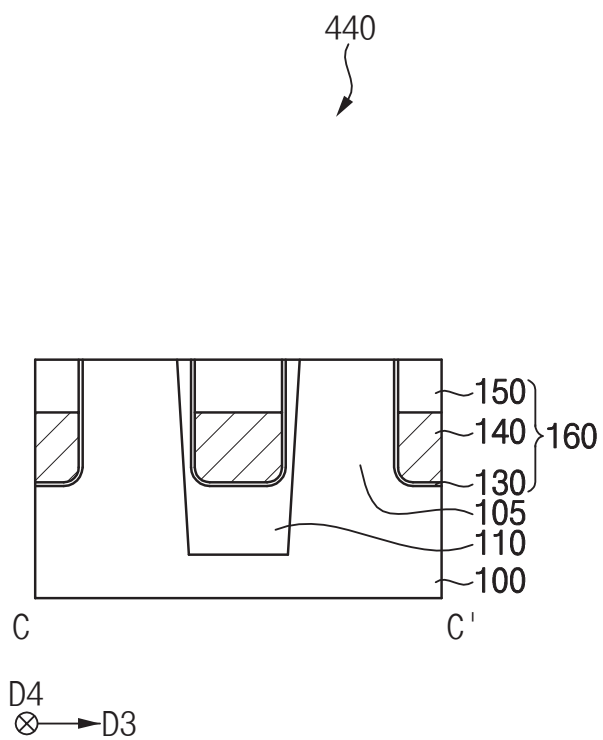


FIG. 14

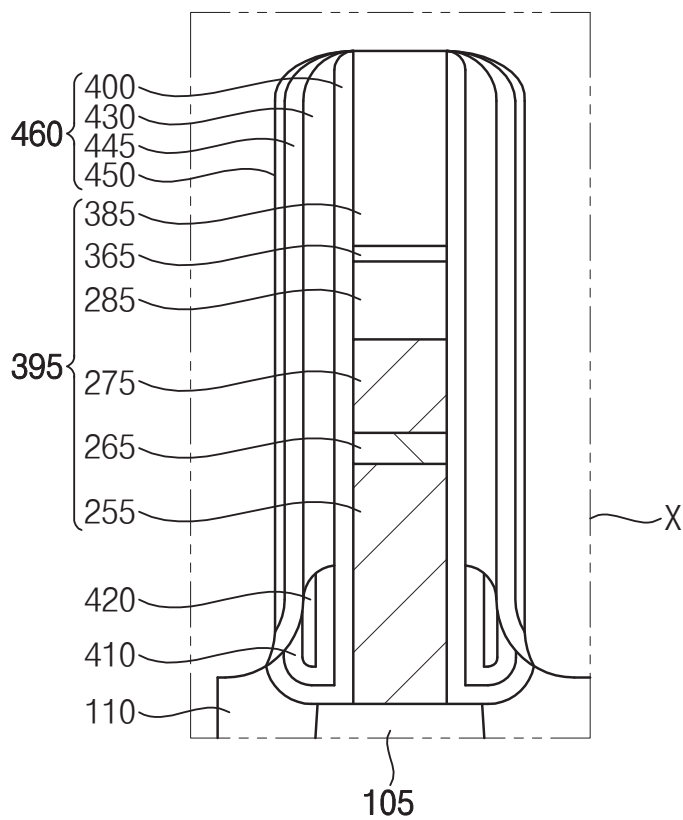


FIG. 15

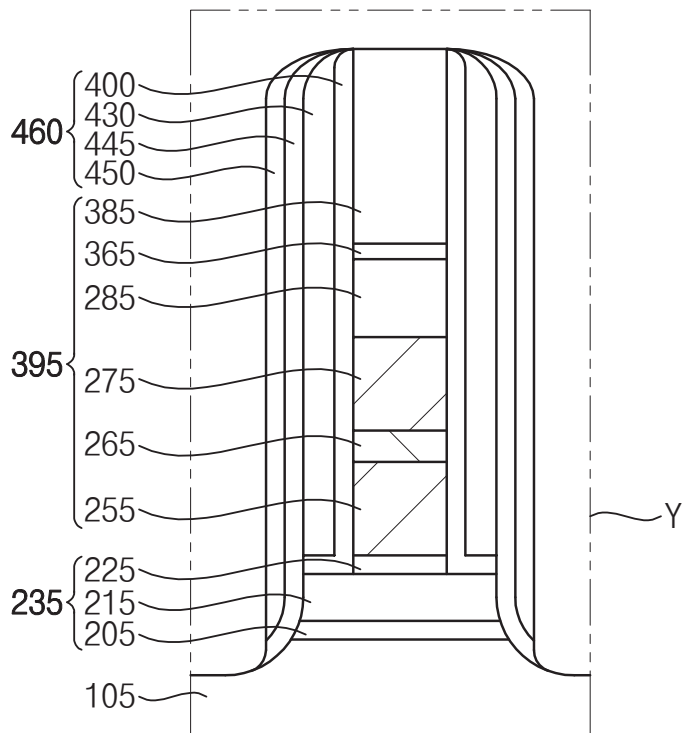


FIG. 16A

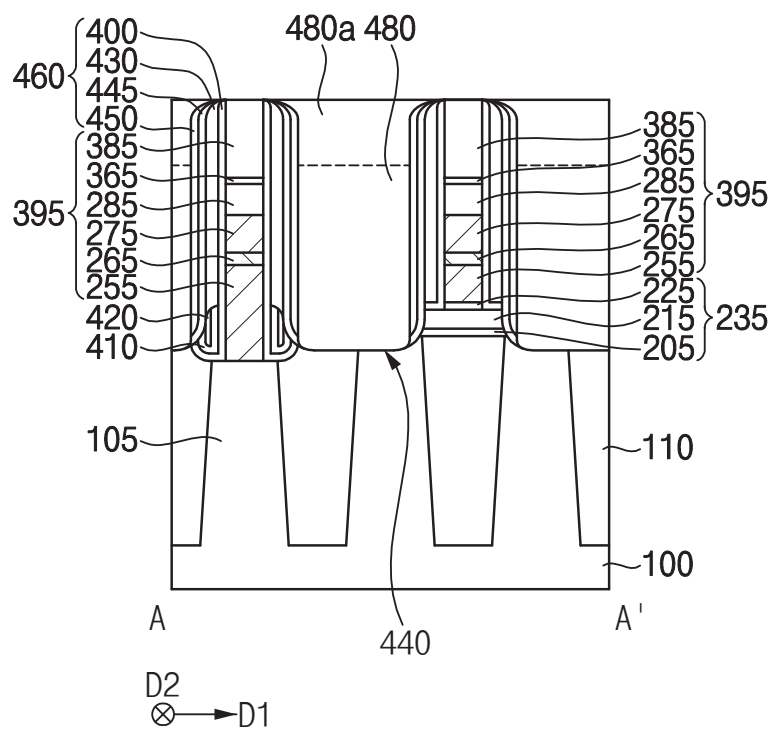


FIG. 16B

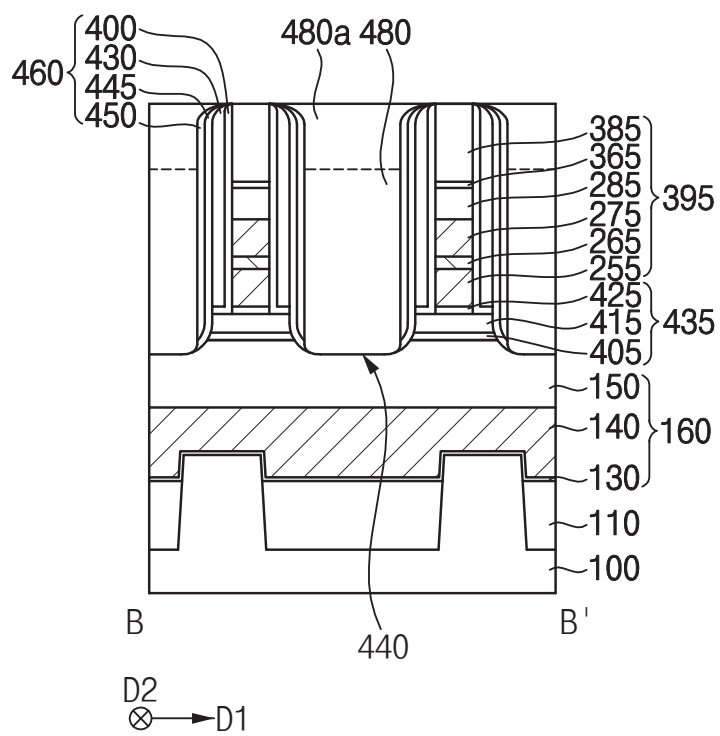


FIG. 16C

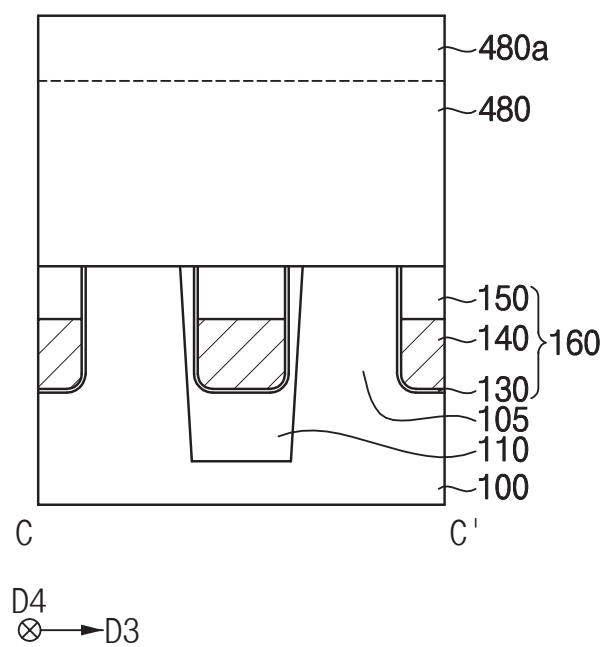


FIG. 17A

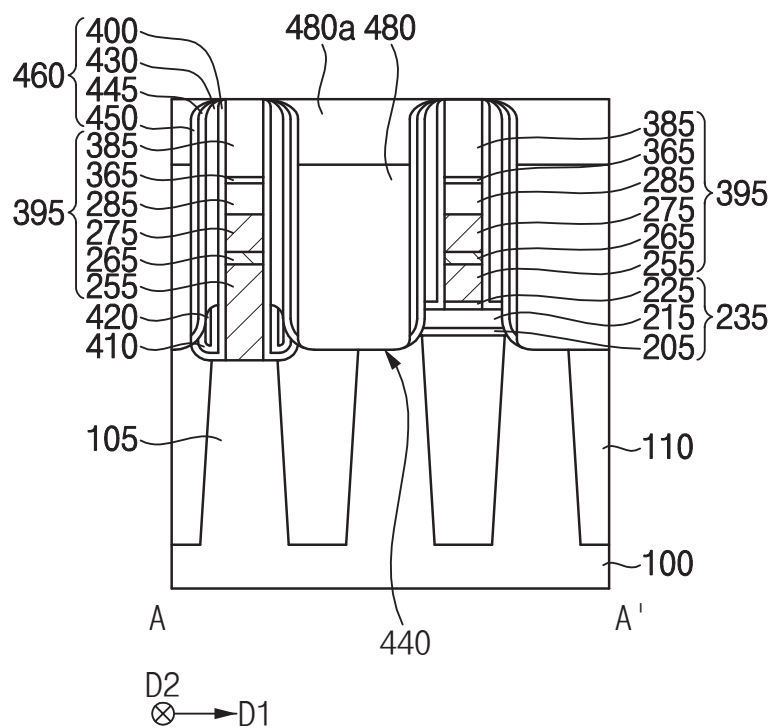


FIG. 17B

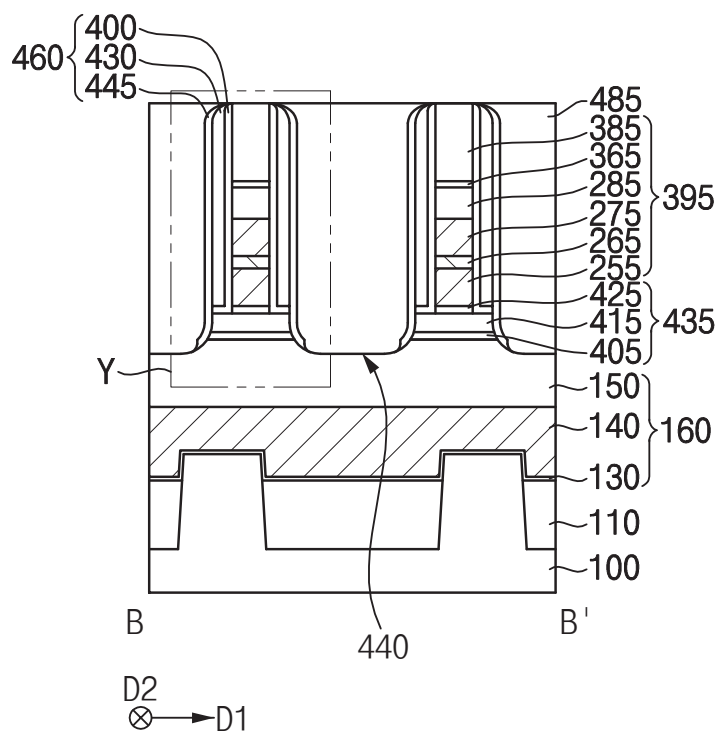


FIG. 17C

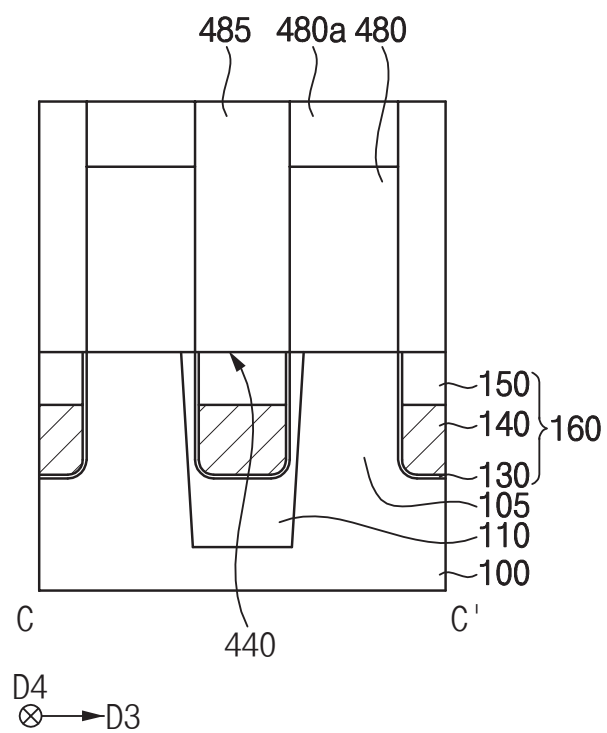
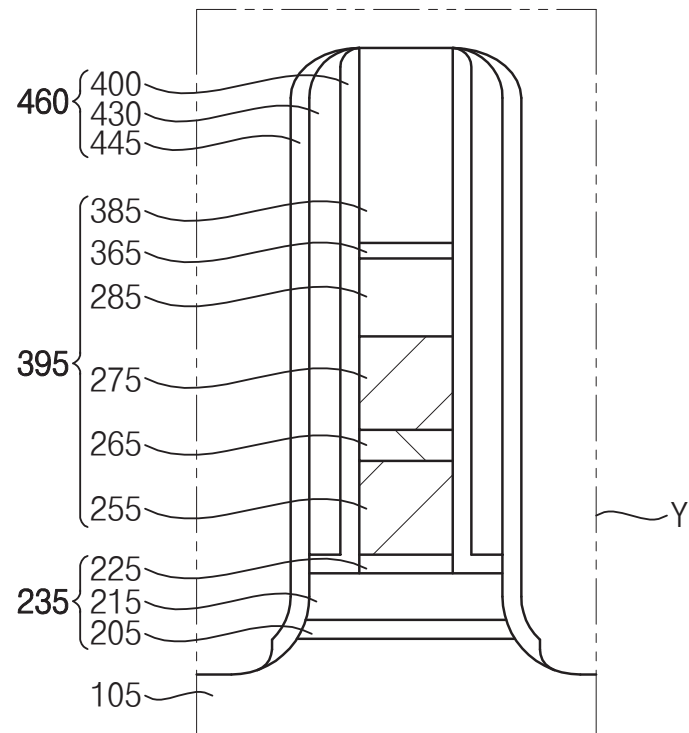


FIG. 18



[illegible][illegible]

FIG. 19C

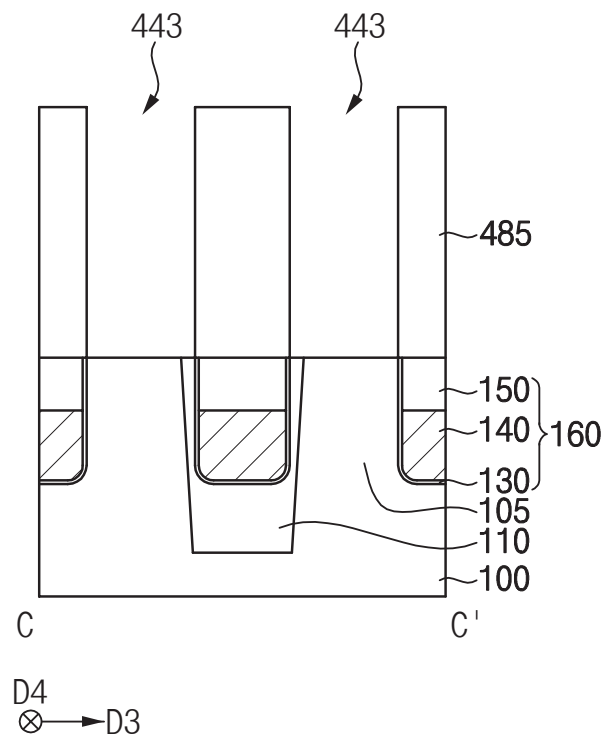


FIG. 20

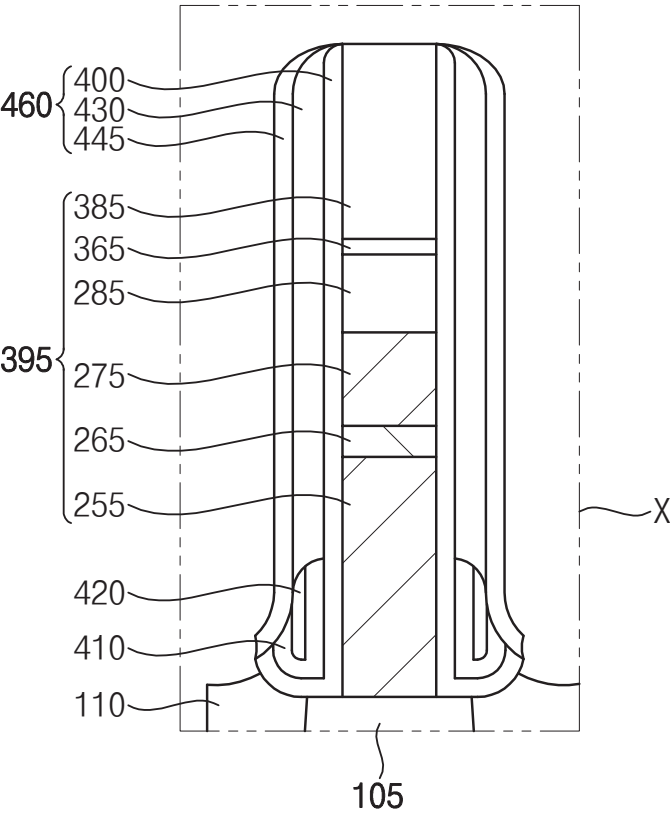


FIG. 21

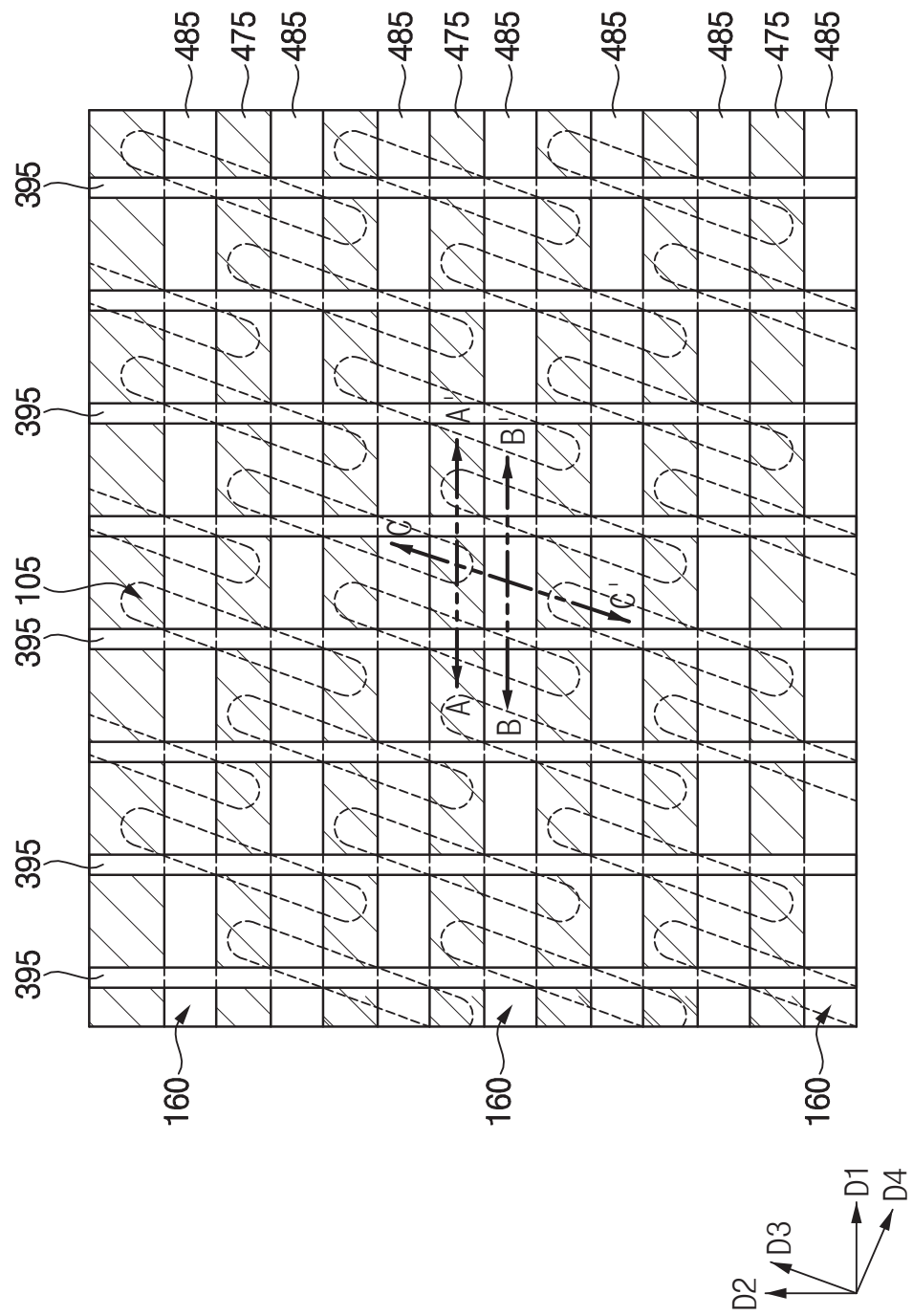


FIG. 22A

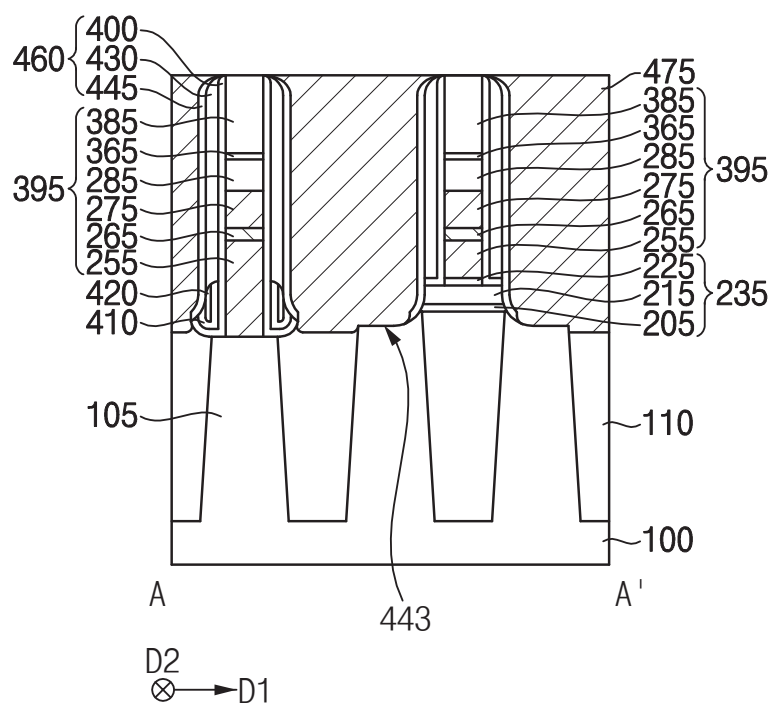


FIG. 22B

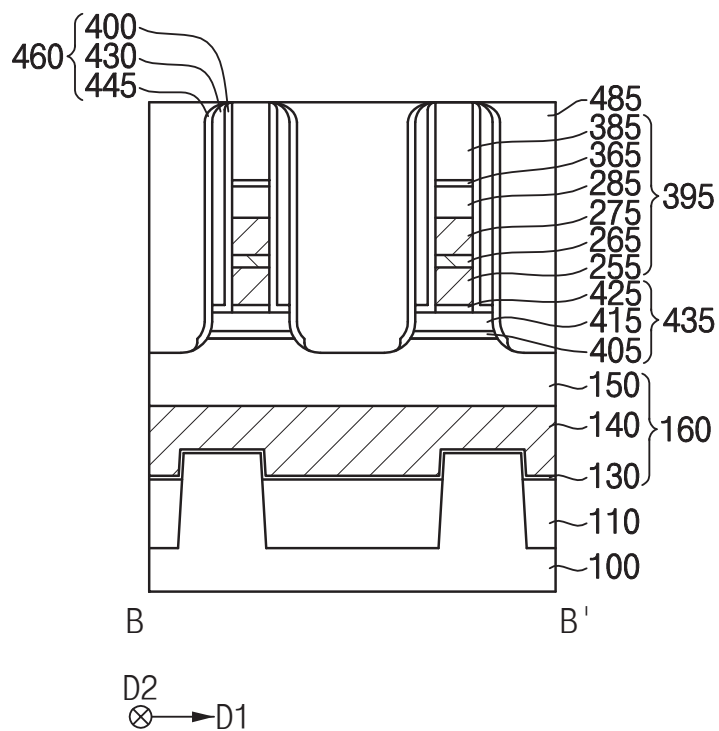


FIG. 22C

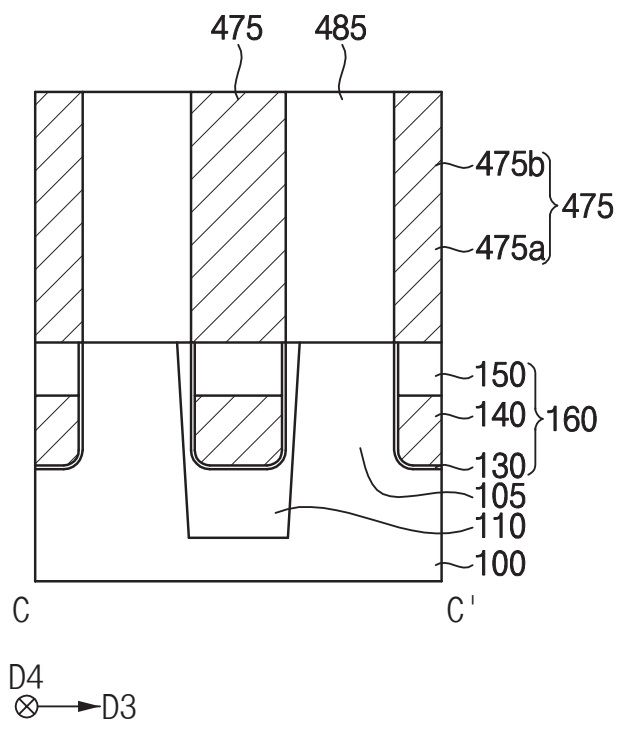


FIG. 23A

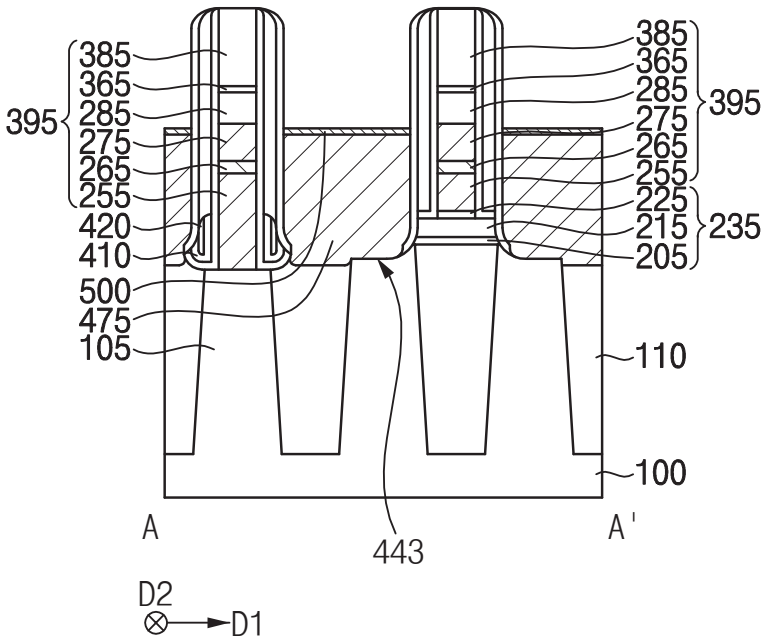


FIG. 23B

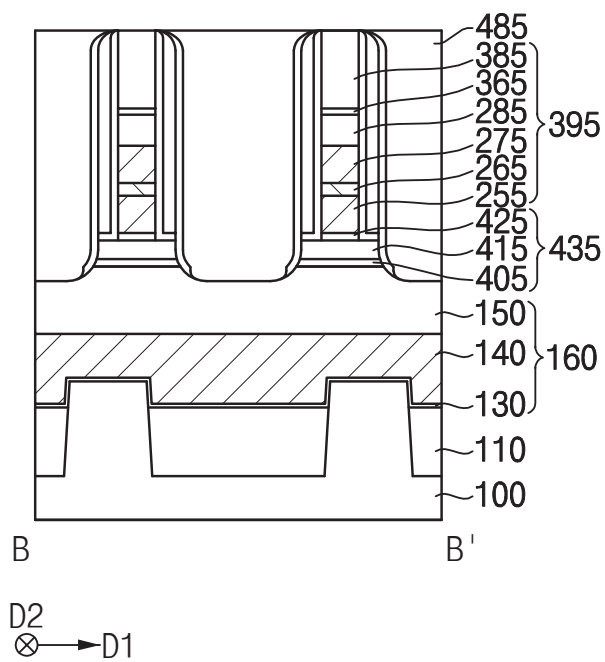


FIG. 24A

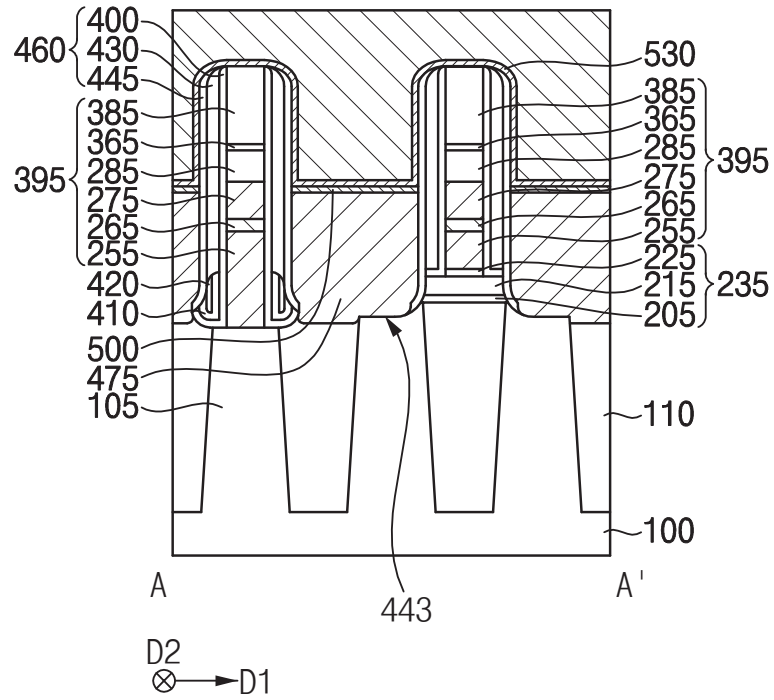


FIG. 24B

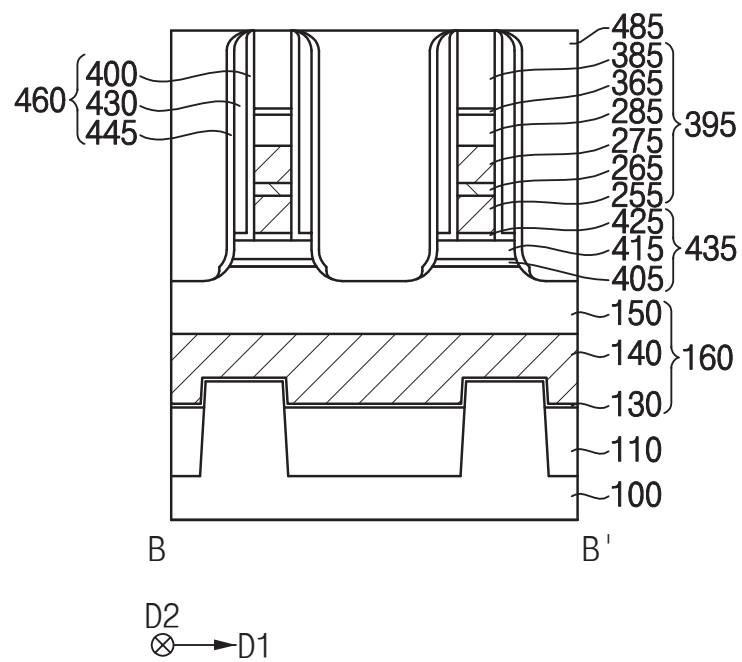
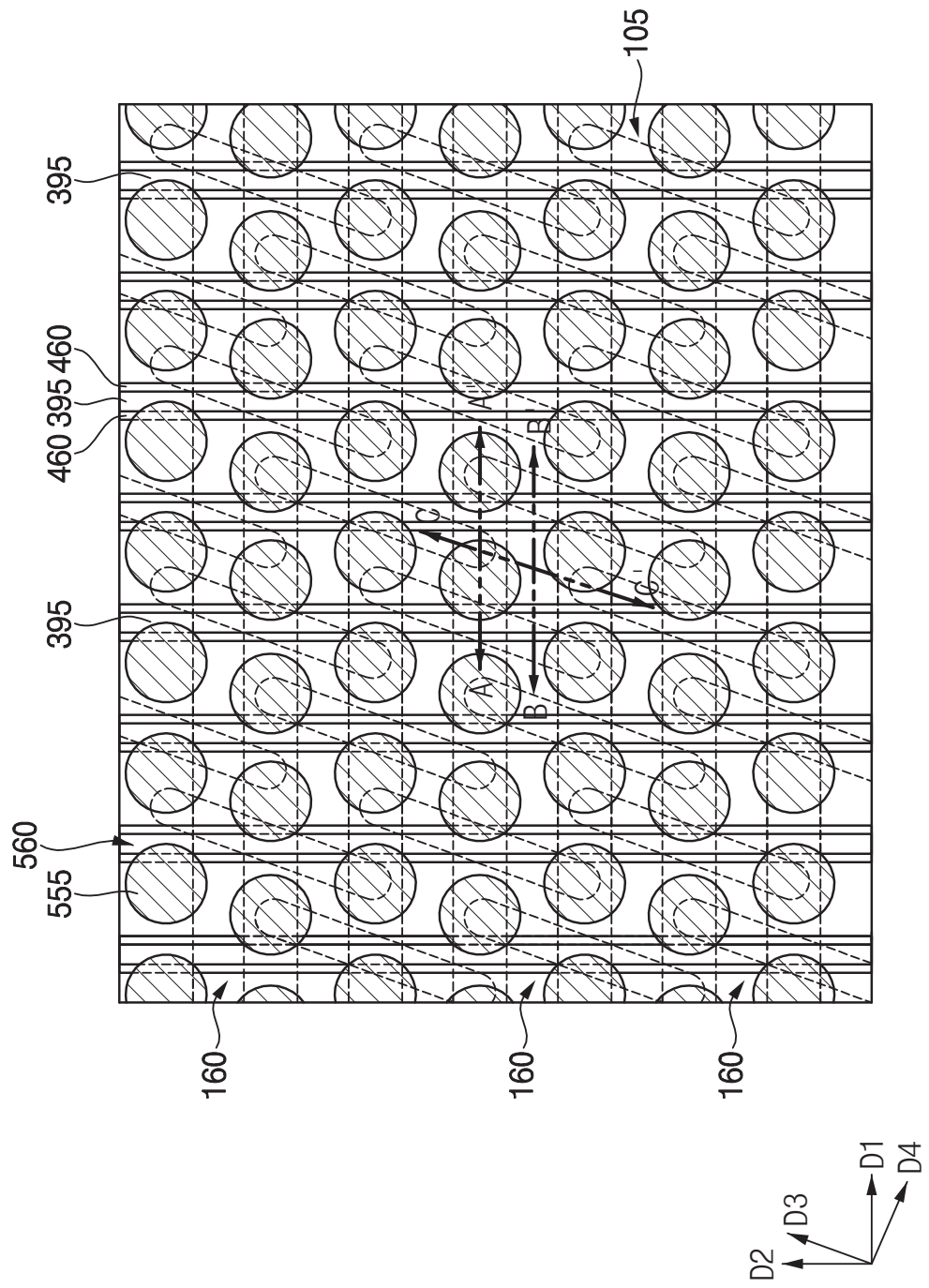


FIG. 25



[illegible]

This cross-sectional view shows the device structure along line B-B'. The substrate 100 features a central well 110 and side regions 130. A layer 140 is deposited over the substrate, with a layer 150 on top. The upper portion of the device includes two main vertical structures, each containing a central core 400, an inner shell 430, and an outer shell 445. Various other layers and interfaces are labeled with reference numerals: 255, 265, 275, 285, 365, 385, 405, 415, 425, 435, and 460. A bracket groups the layers 255, 265, 275, 285, 365, and 385 as 395. Another bracket groups the layers 405, 415, and 425 as 435. A third bracket groups the layers 435, 445, and 460 as 460. The device is oriented with D1 as the horizontal axis and D2 as the vertical axis.

FIG. 27A

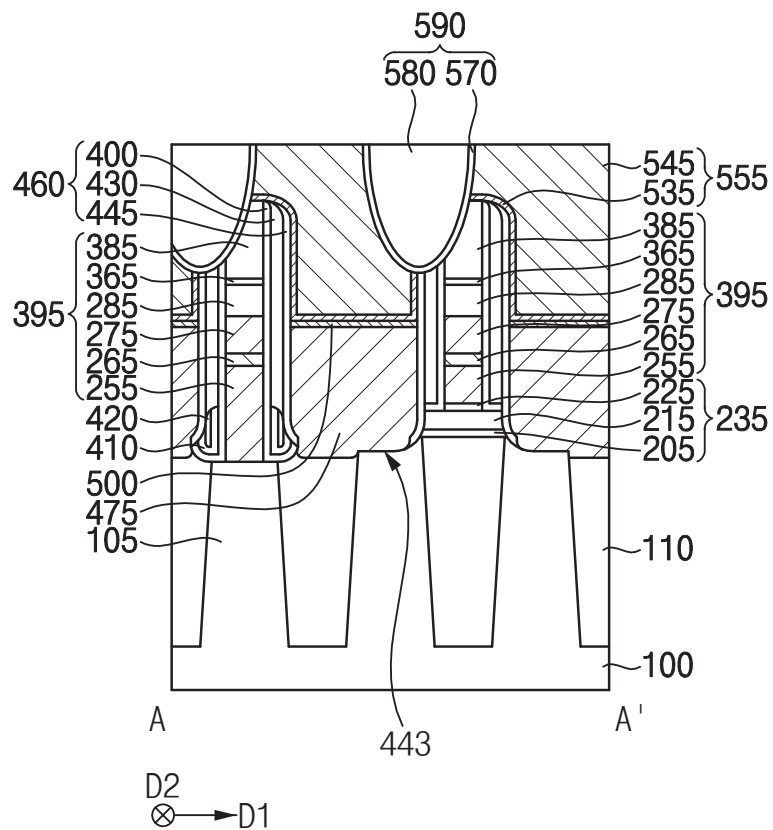


FIG. 27B

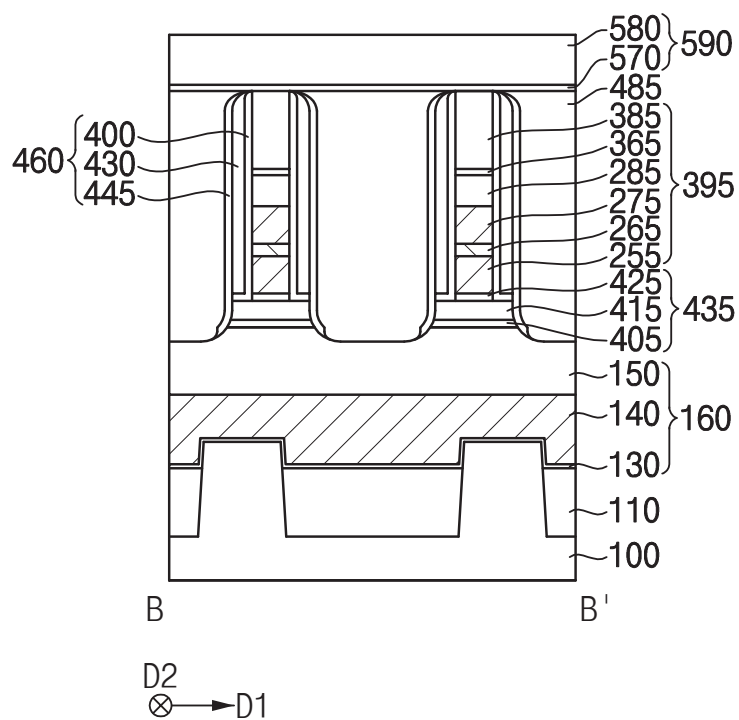


FIG. 28A

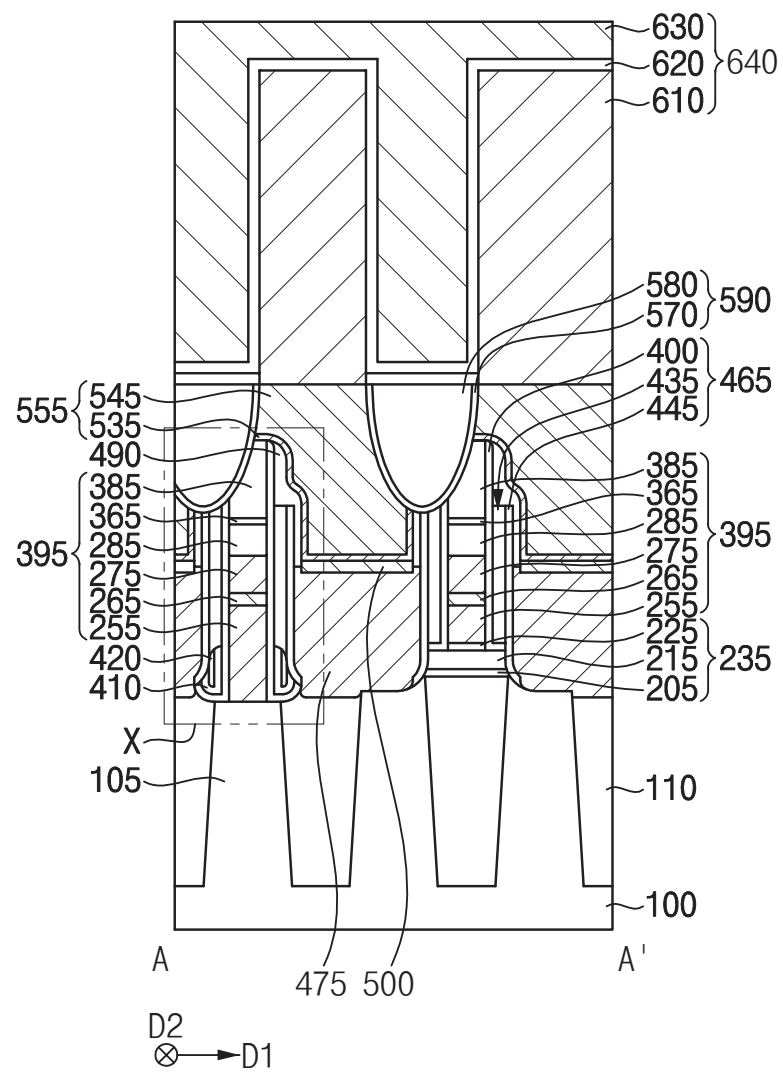


FIG. 28B

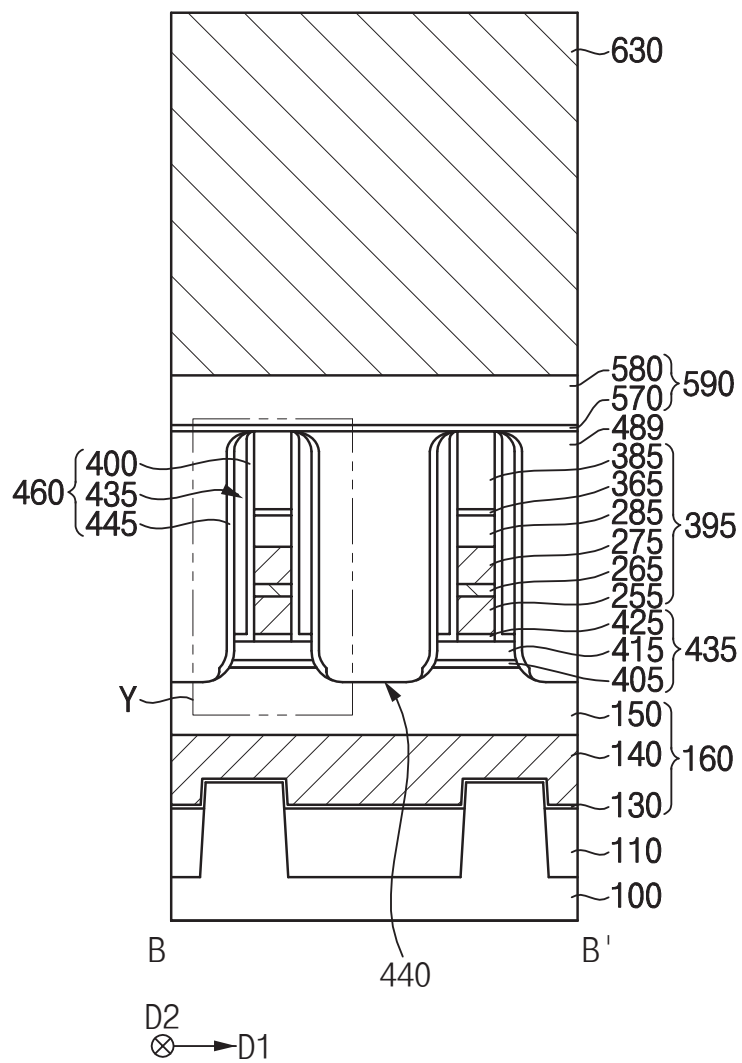


FIG. 29A

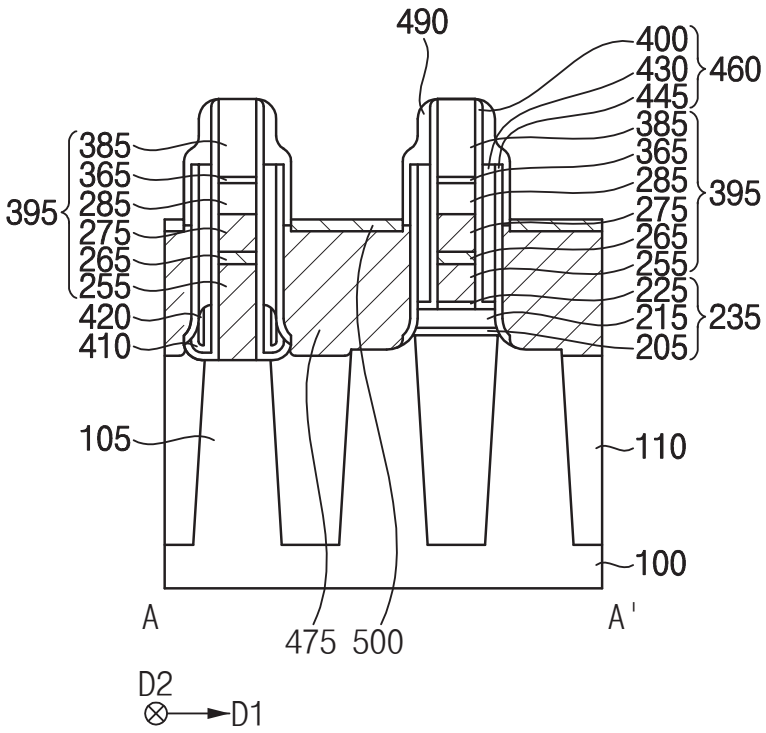


FIG. 29B

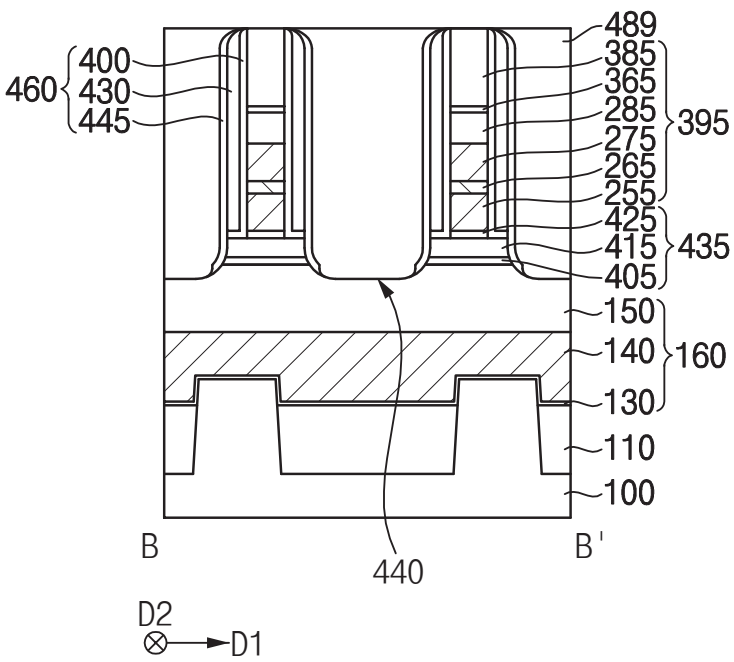


FIG. 30A

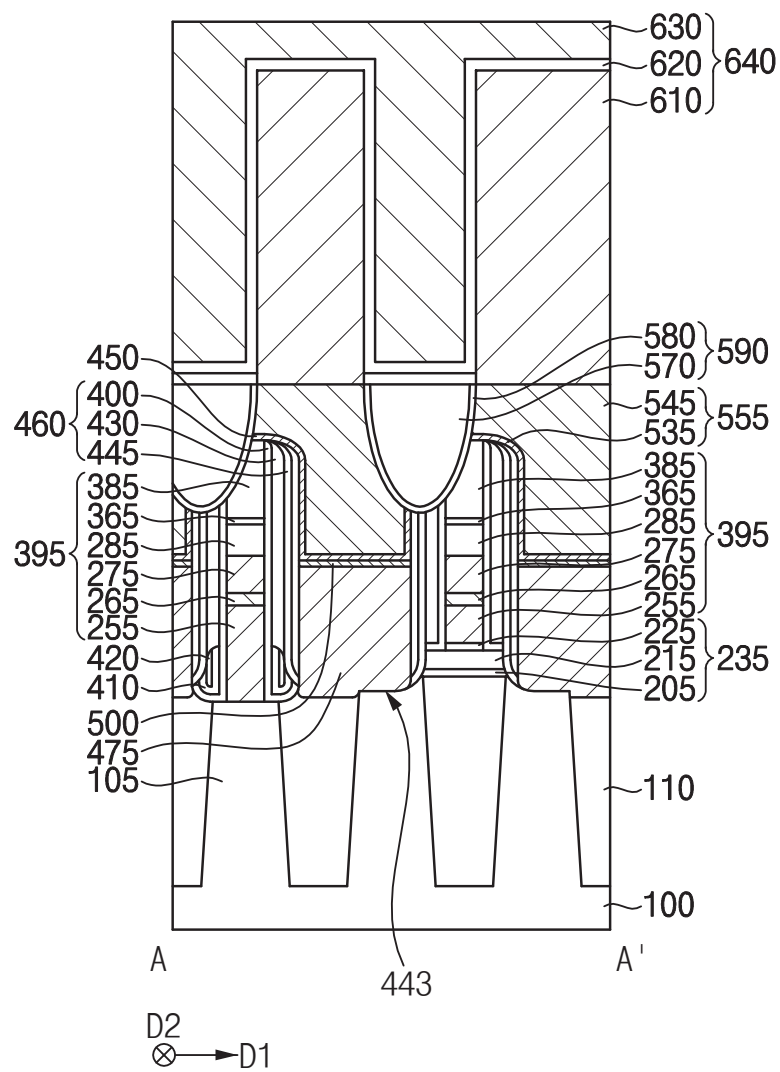


FIG. 30B

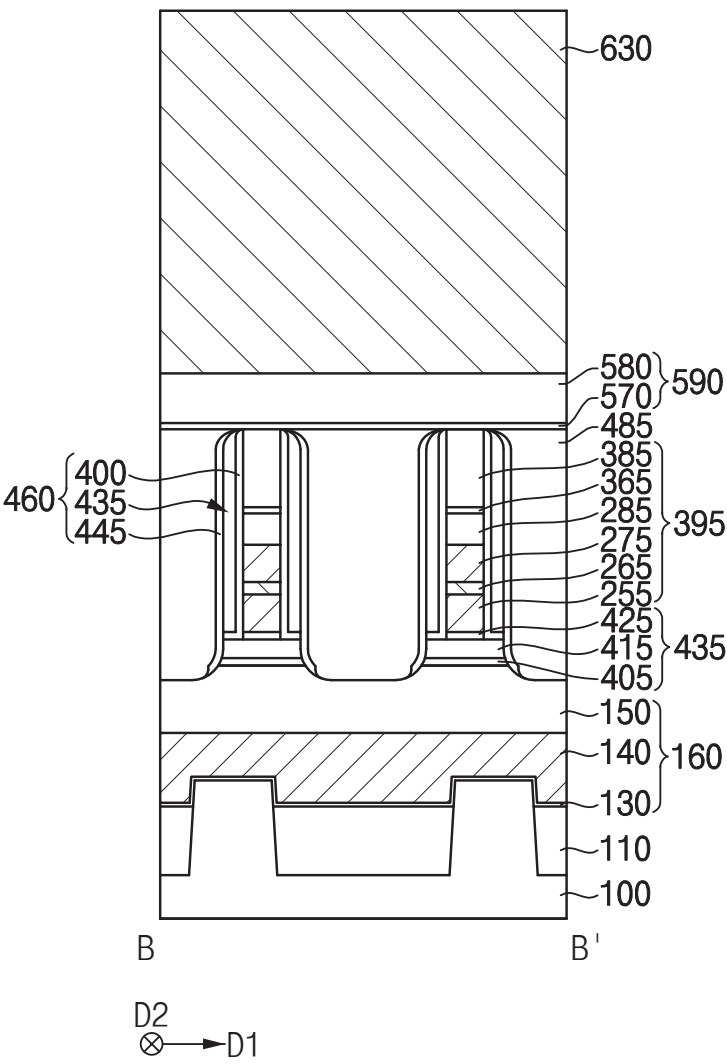


FIG. 31A

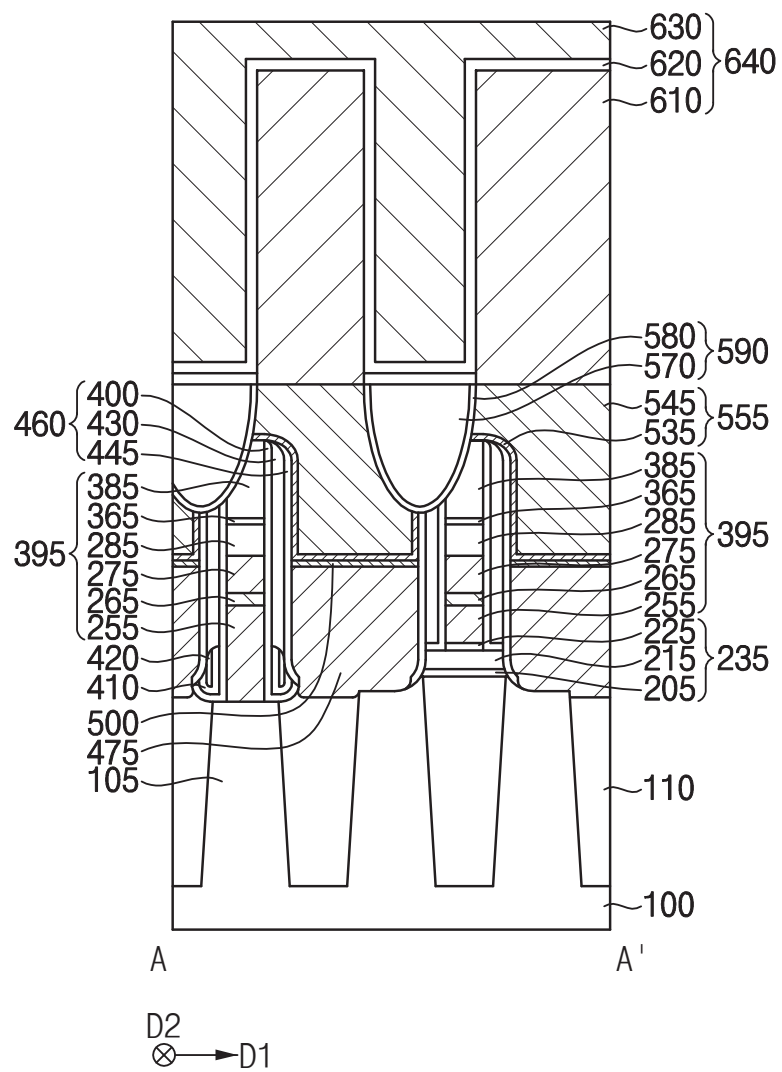


FIG. 31B

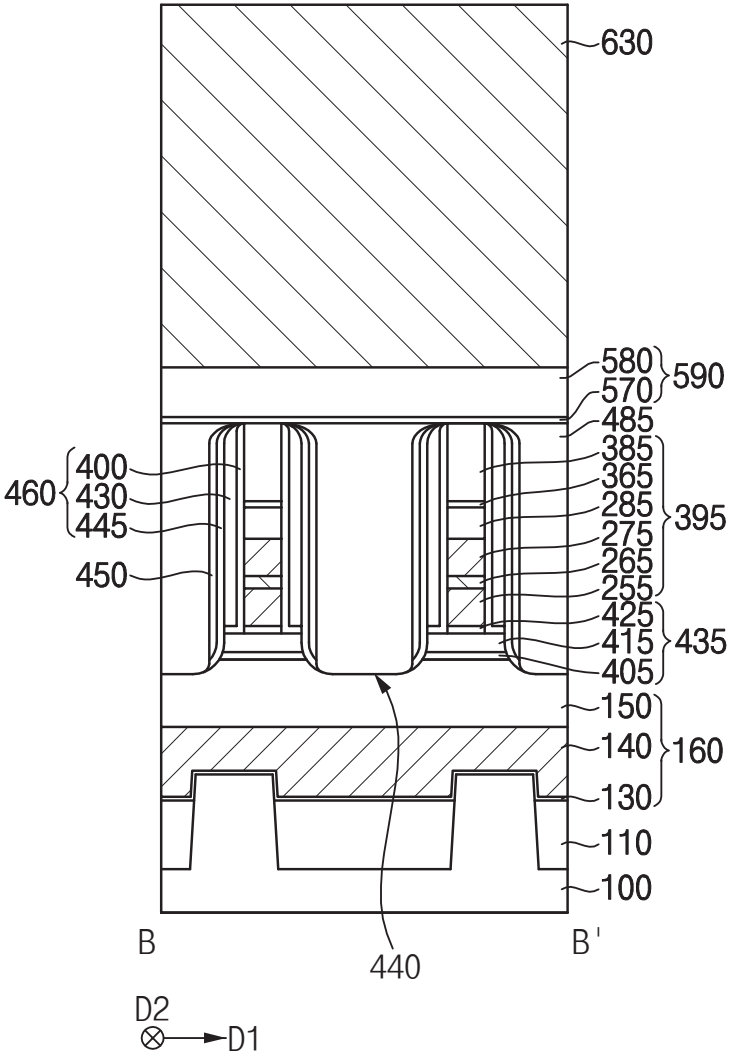


FIG. 32A

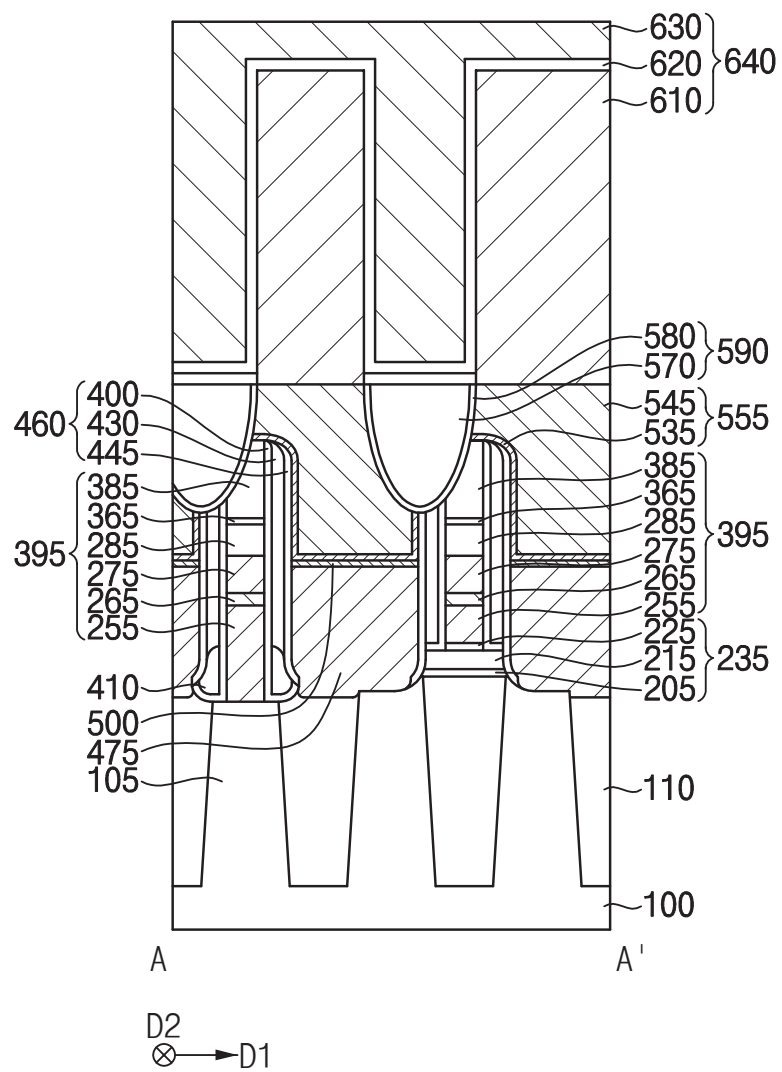


FIG. 32B

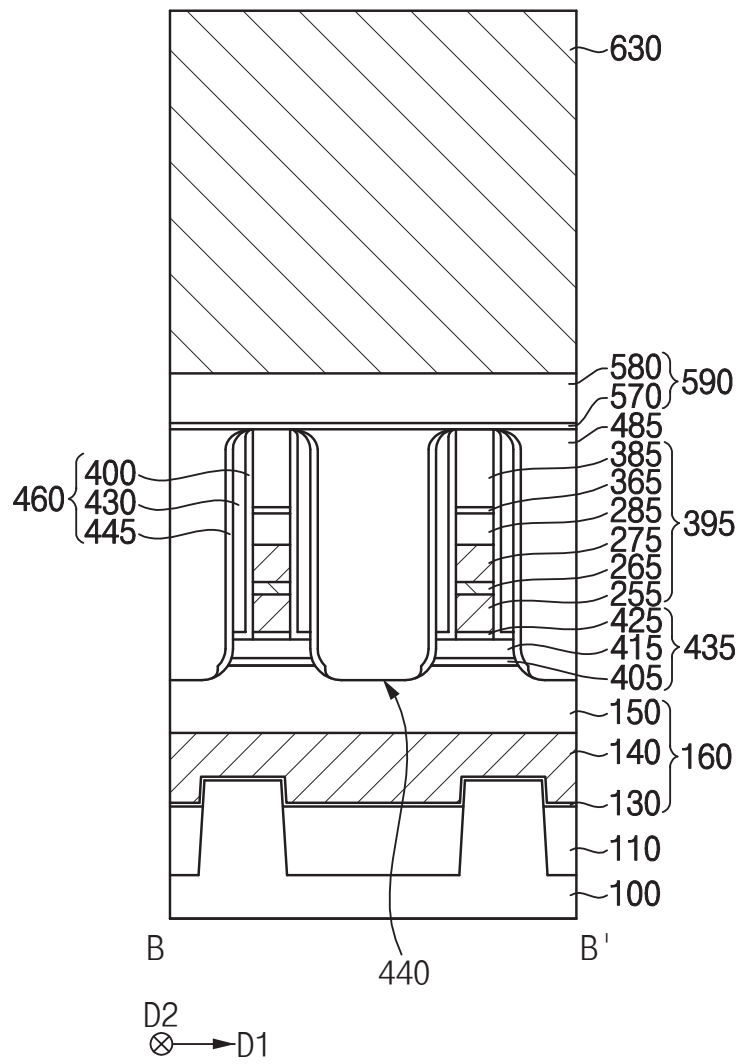


FIG. 33

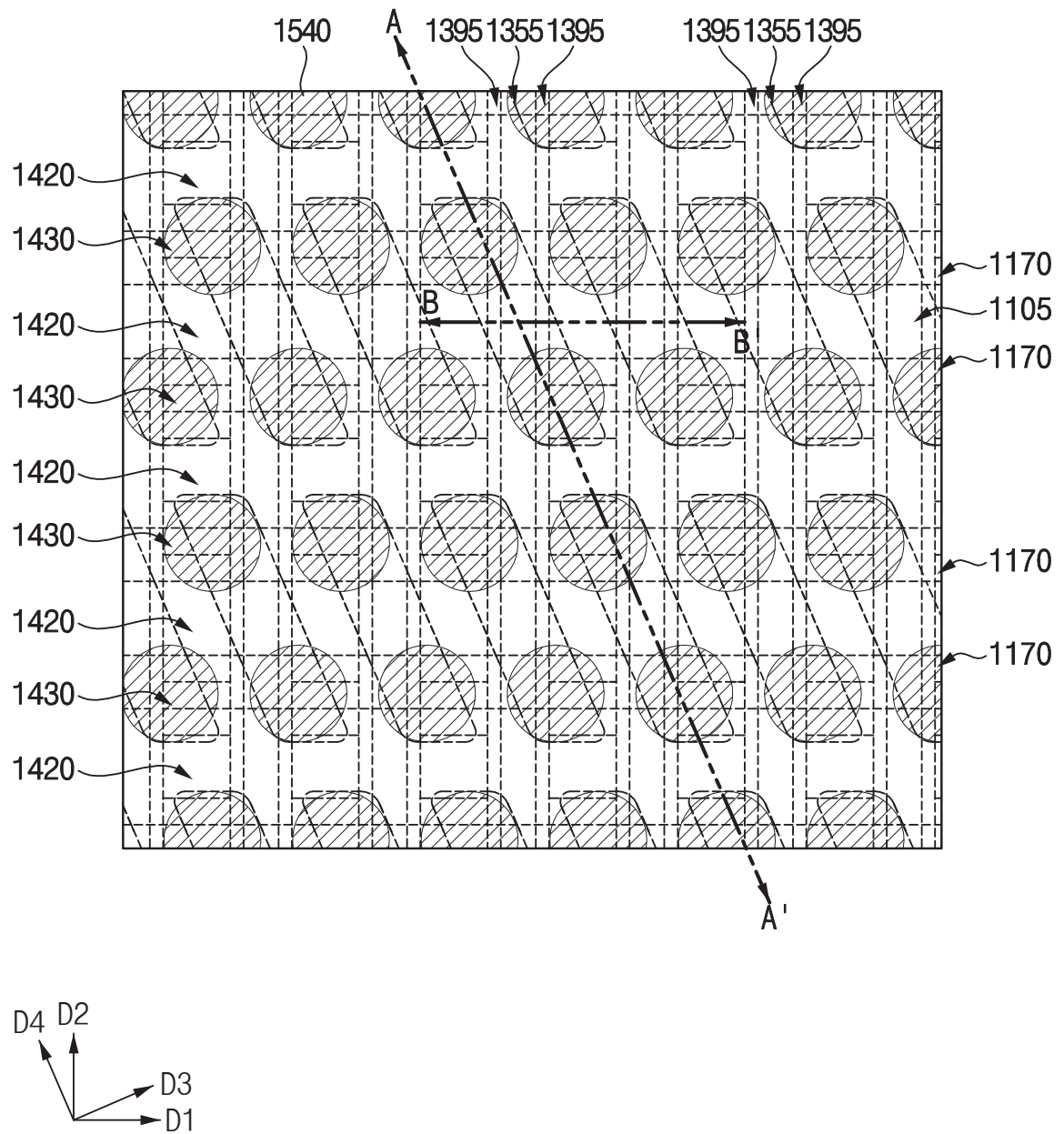


FIG. 34

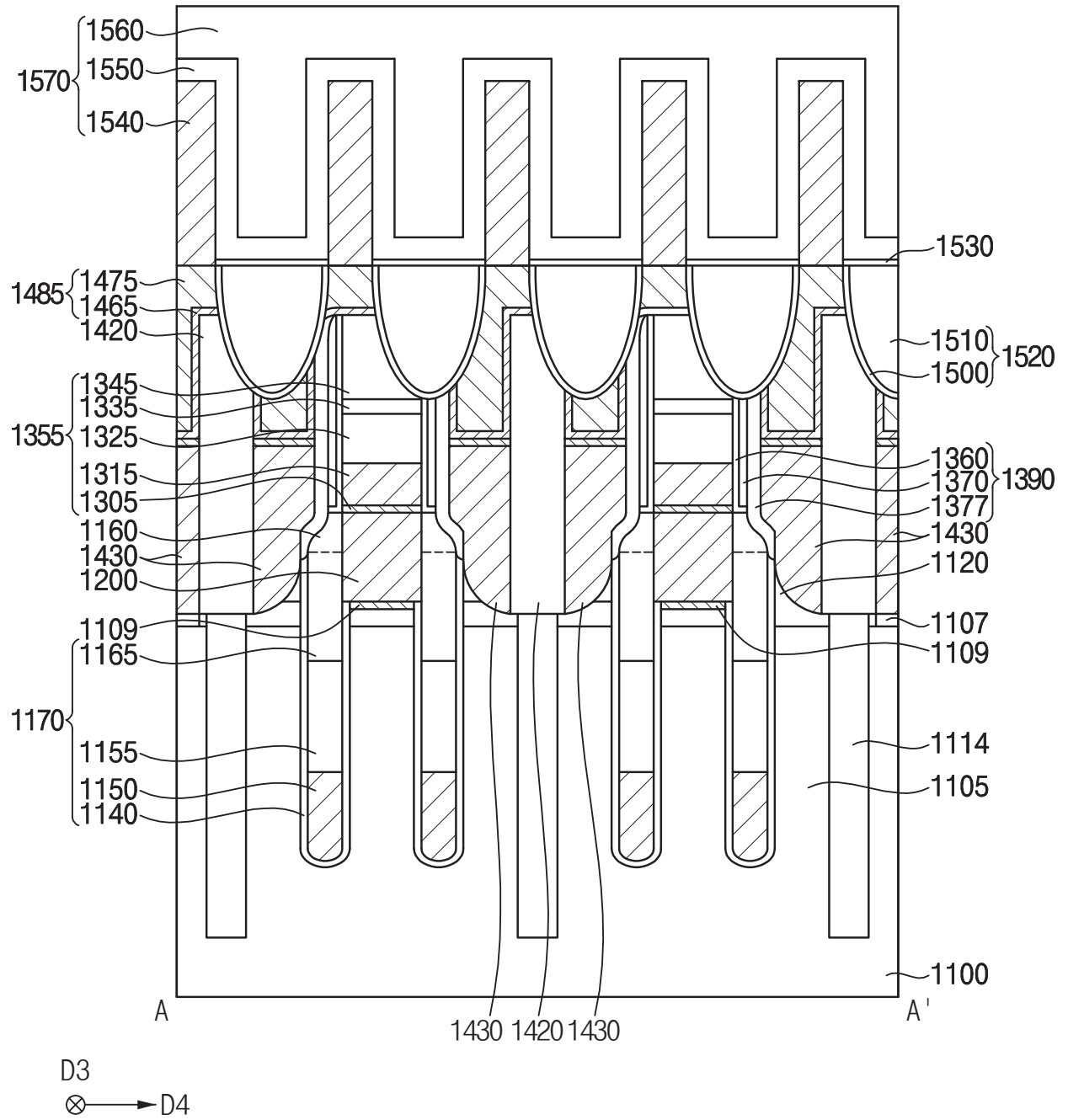


FIG. 35

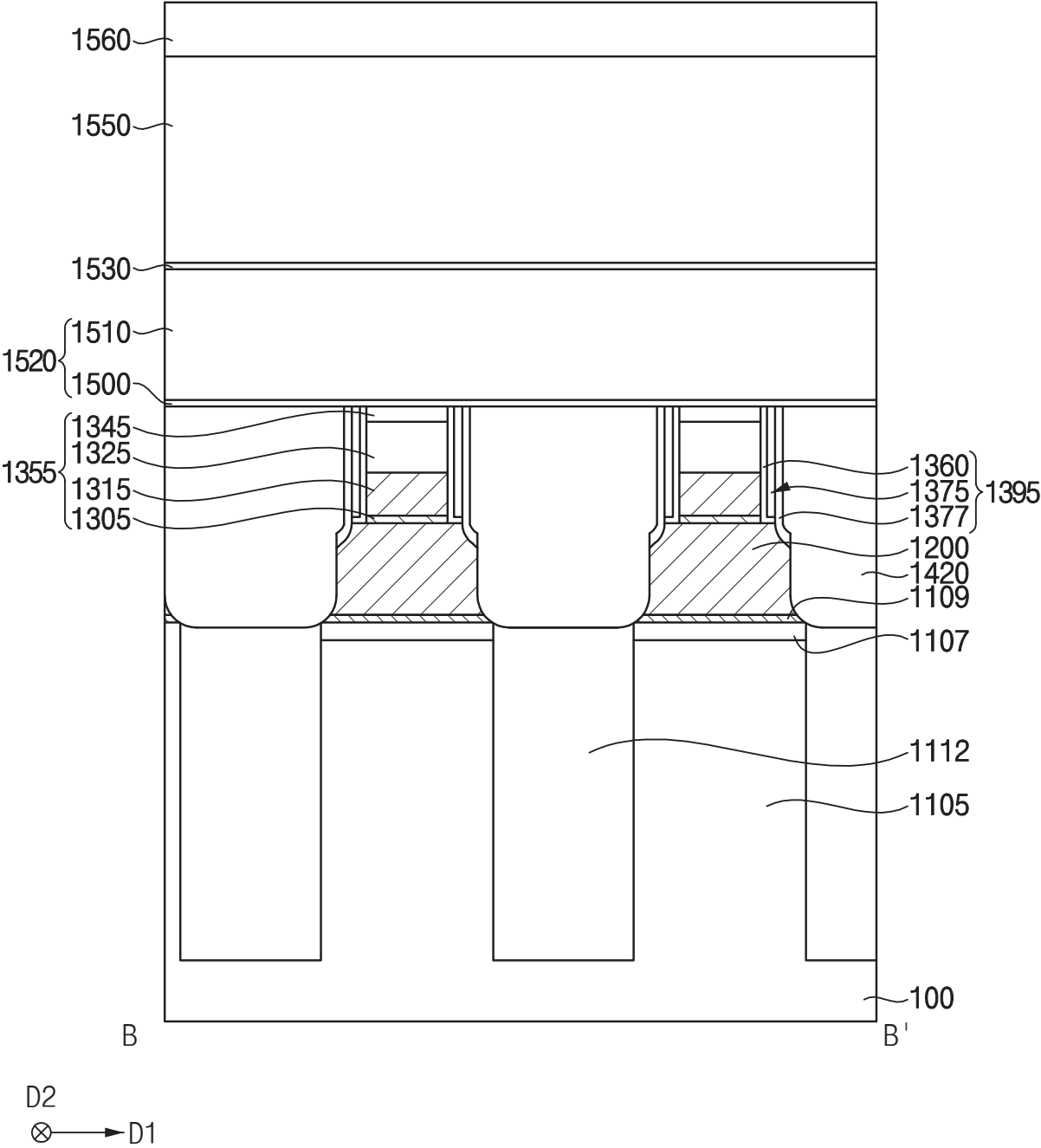


FIG. 36

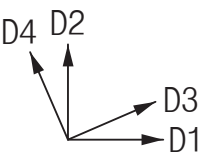
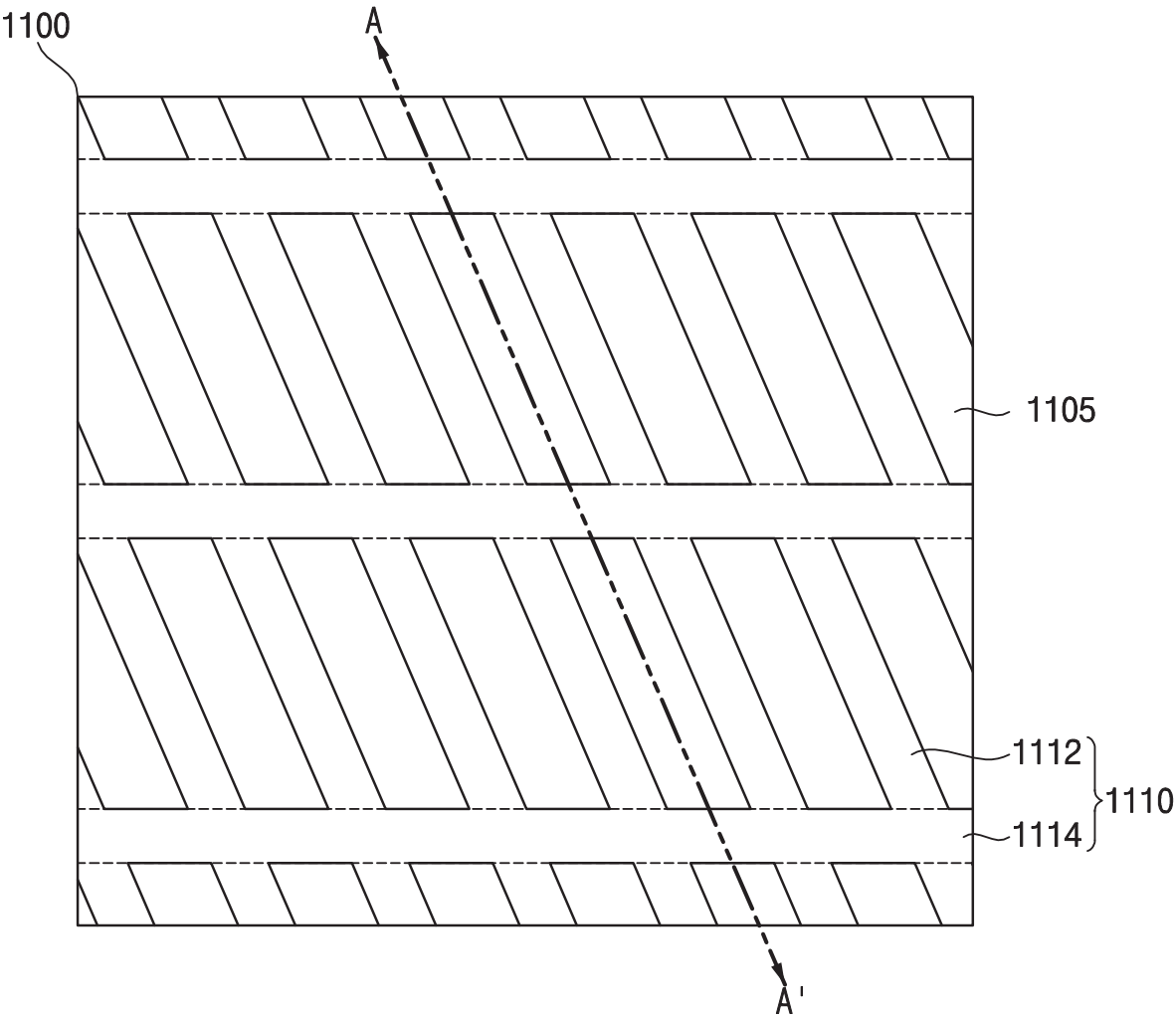


FIG. 37

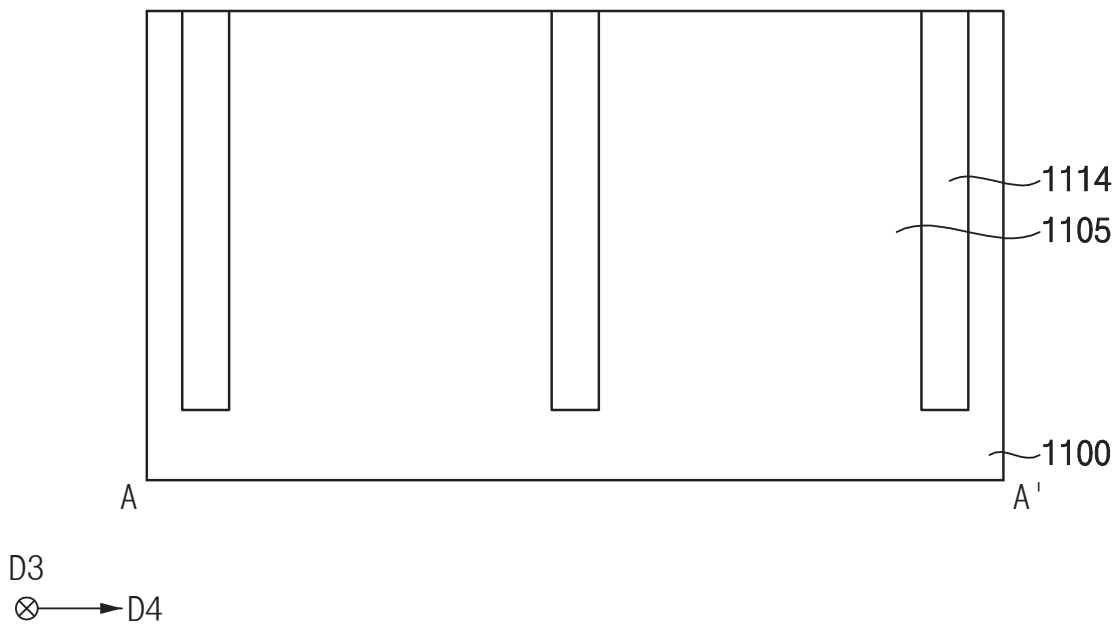


FIG. 38

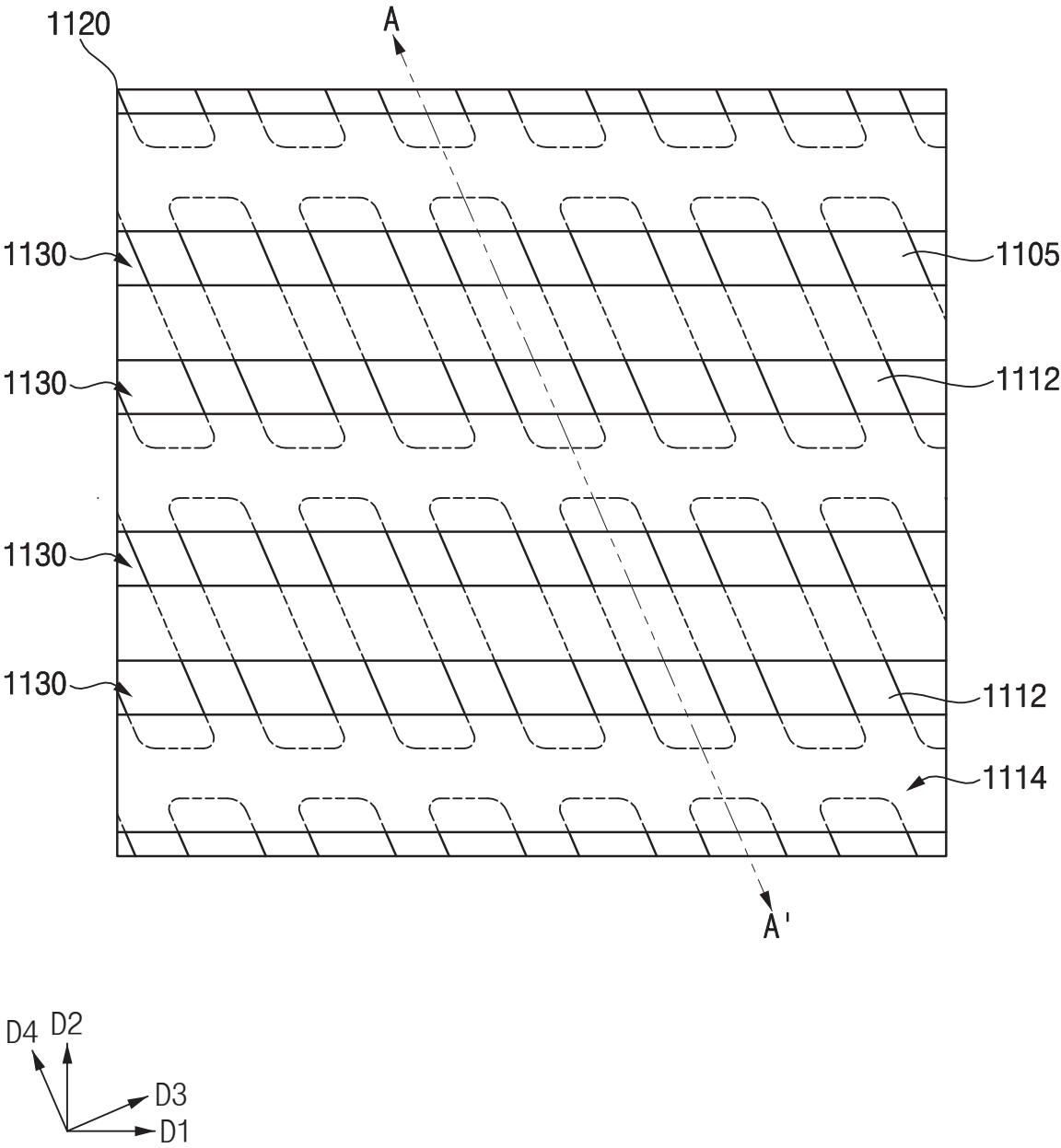


FIG. 39

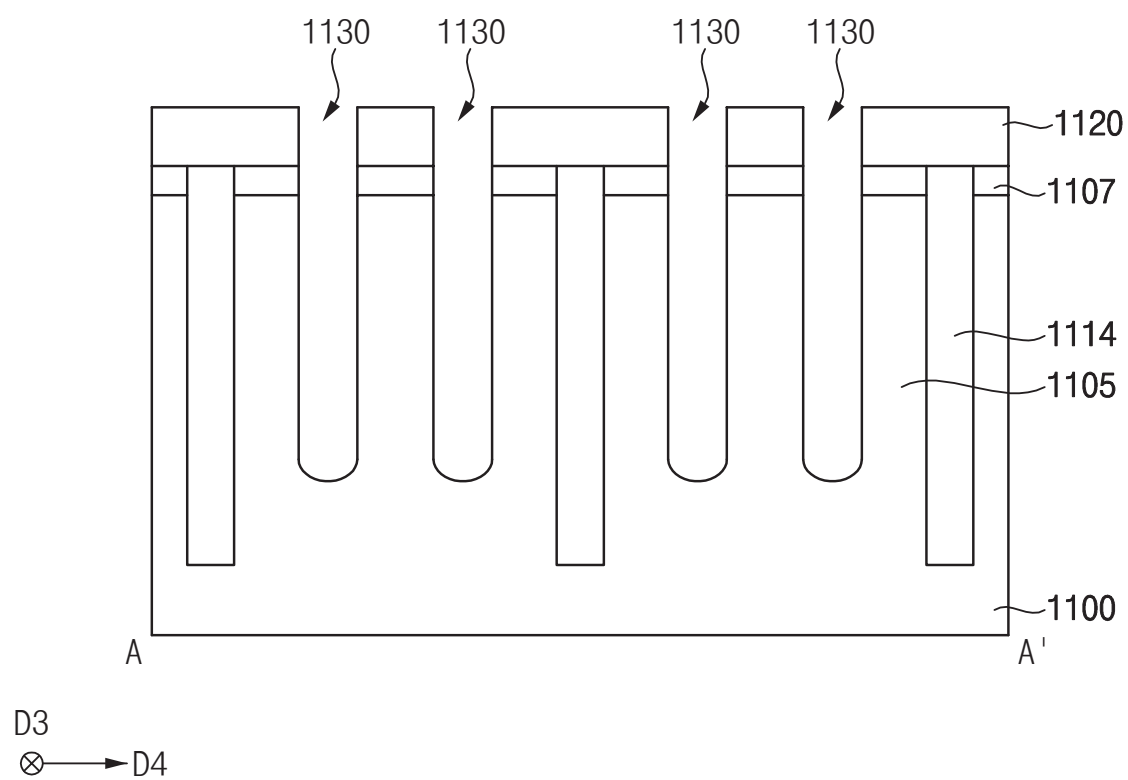
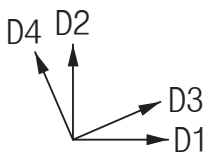
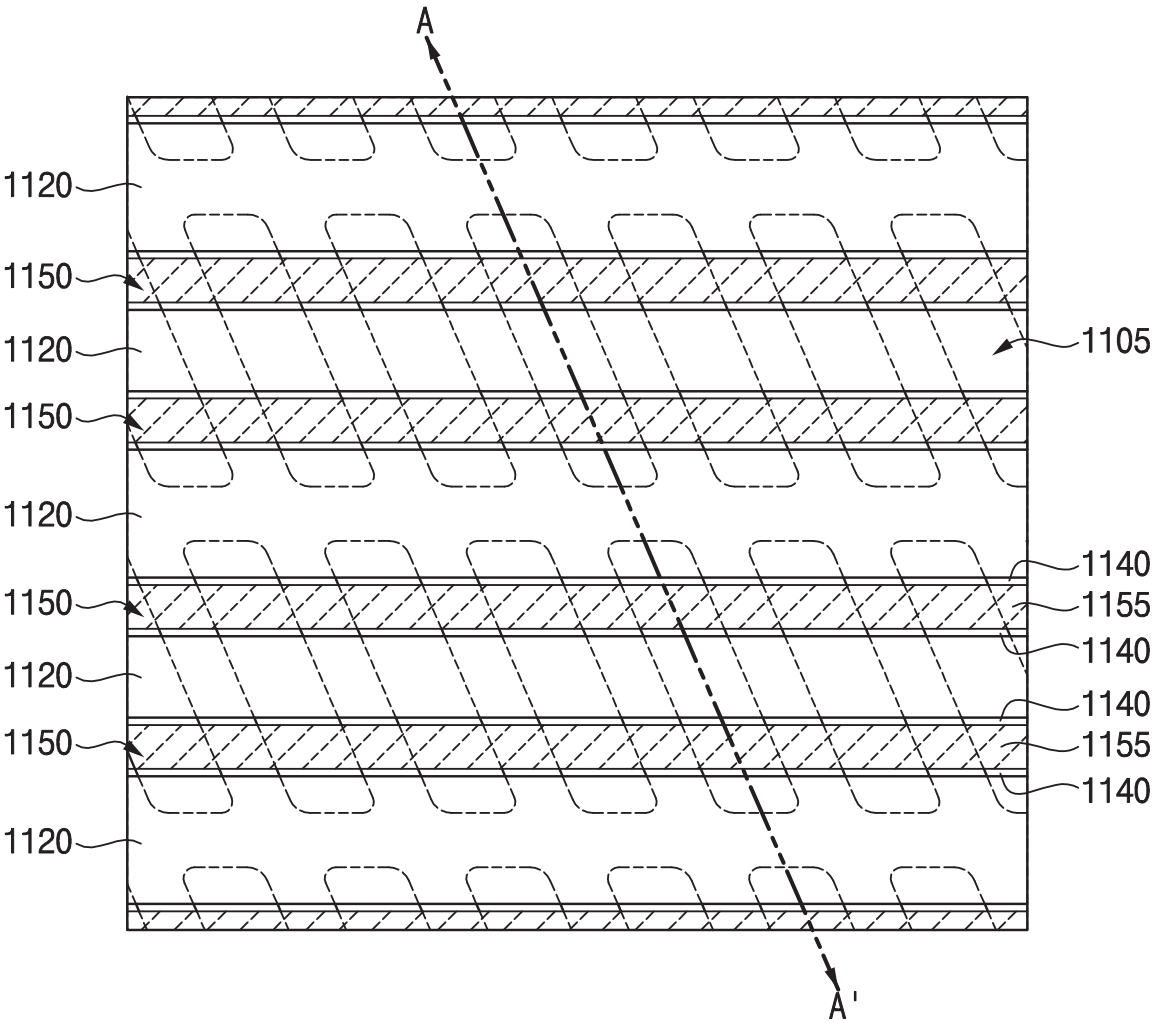


FIG. 40



This diagram shows a cross-sectional view of a semiconductor device along line A-A'. The device features a substrate 1100 with a series of vertical structures. A central vertical structure 1105 is flanked by two pairs of vertical structures 1114. Each pair of vertical structures 1114 is topped with a horizontal layer 1107. The top surface of the device is labeled 1120. The vertical structures 1114 are separated by gaps 1130. The bottom of the vertical structures 1114 is labeled 1140. The top of the vertical structures 1114 is labeled 1150. The top of the central vertical structure 1105 is labeled 1155. The diagram is labeled A at the left and A' at the right.

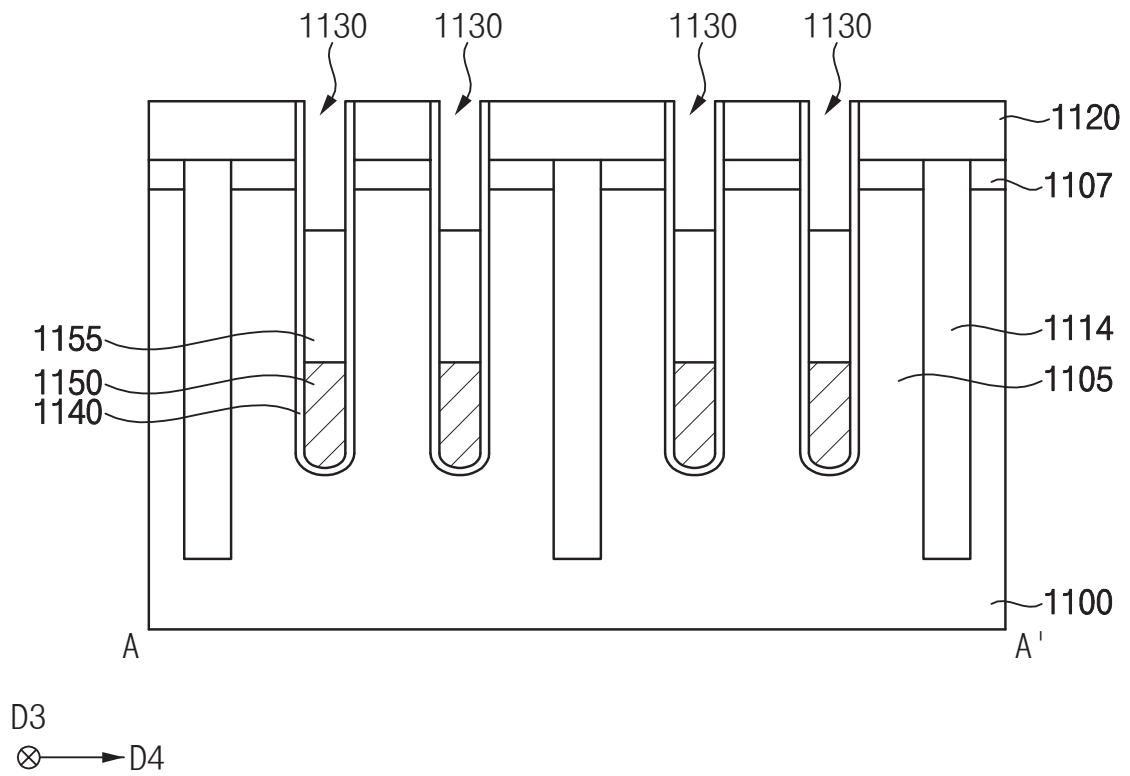
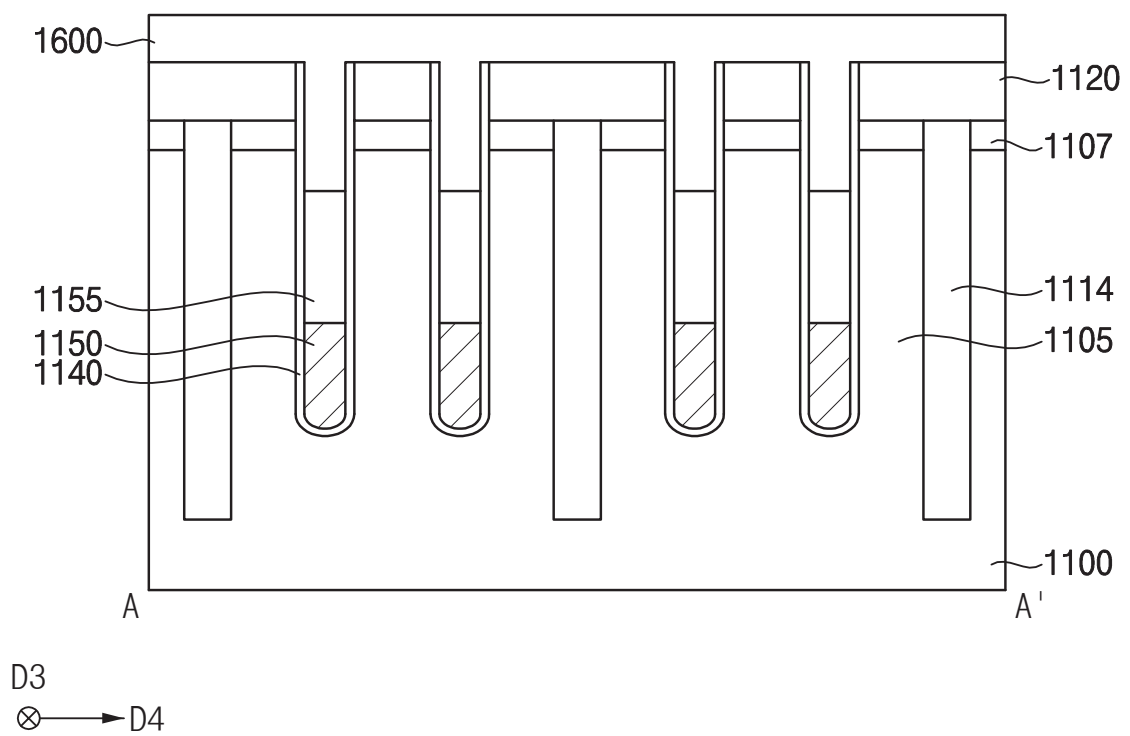
[illegible]

FIG. 43

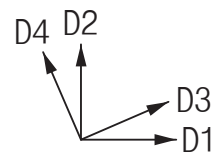
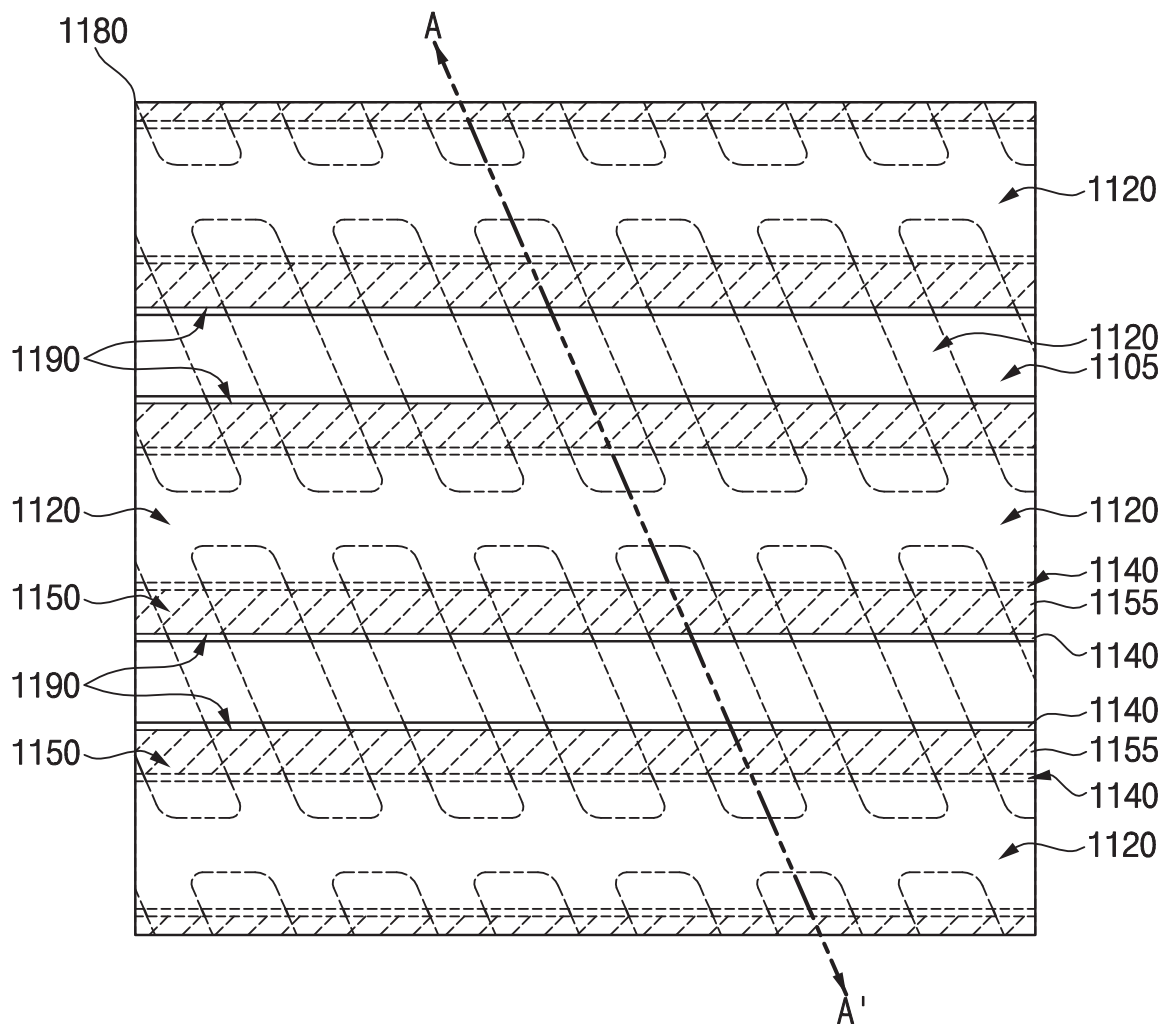


FIG. 44

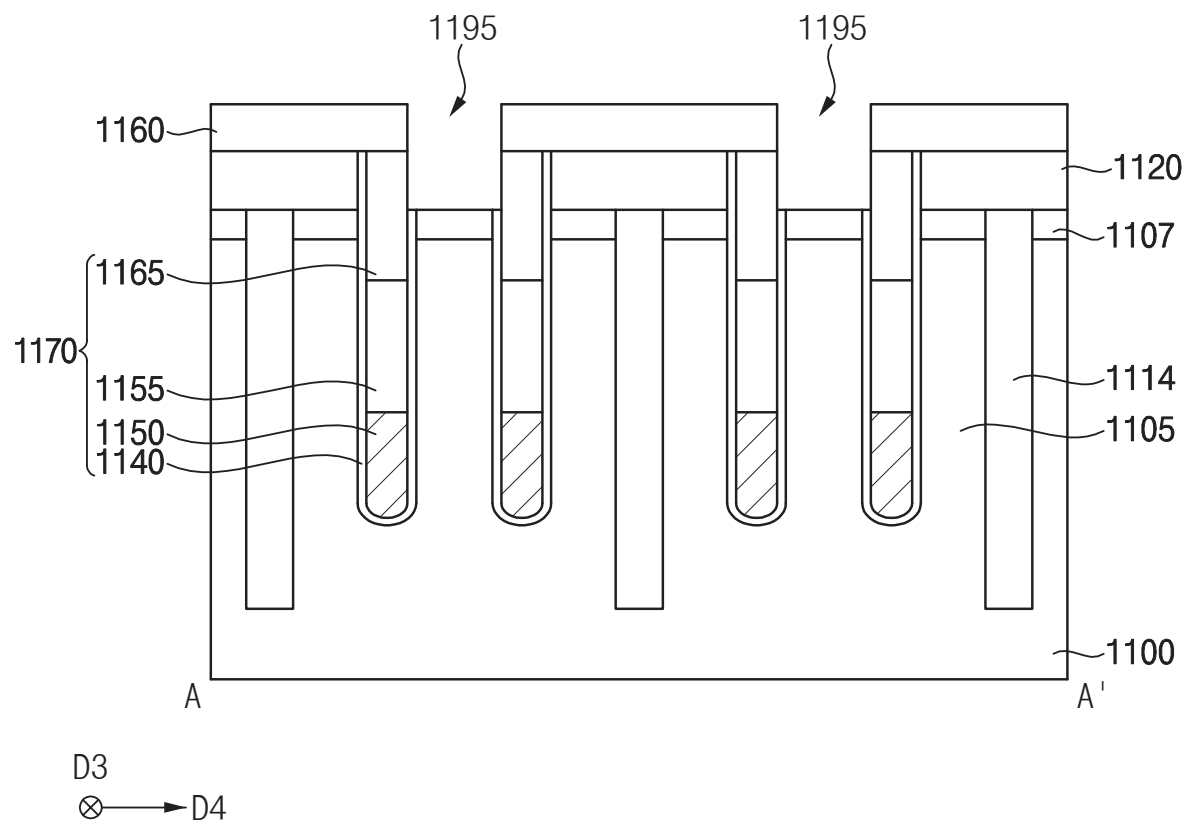


FIG. 45

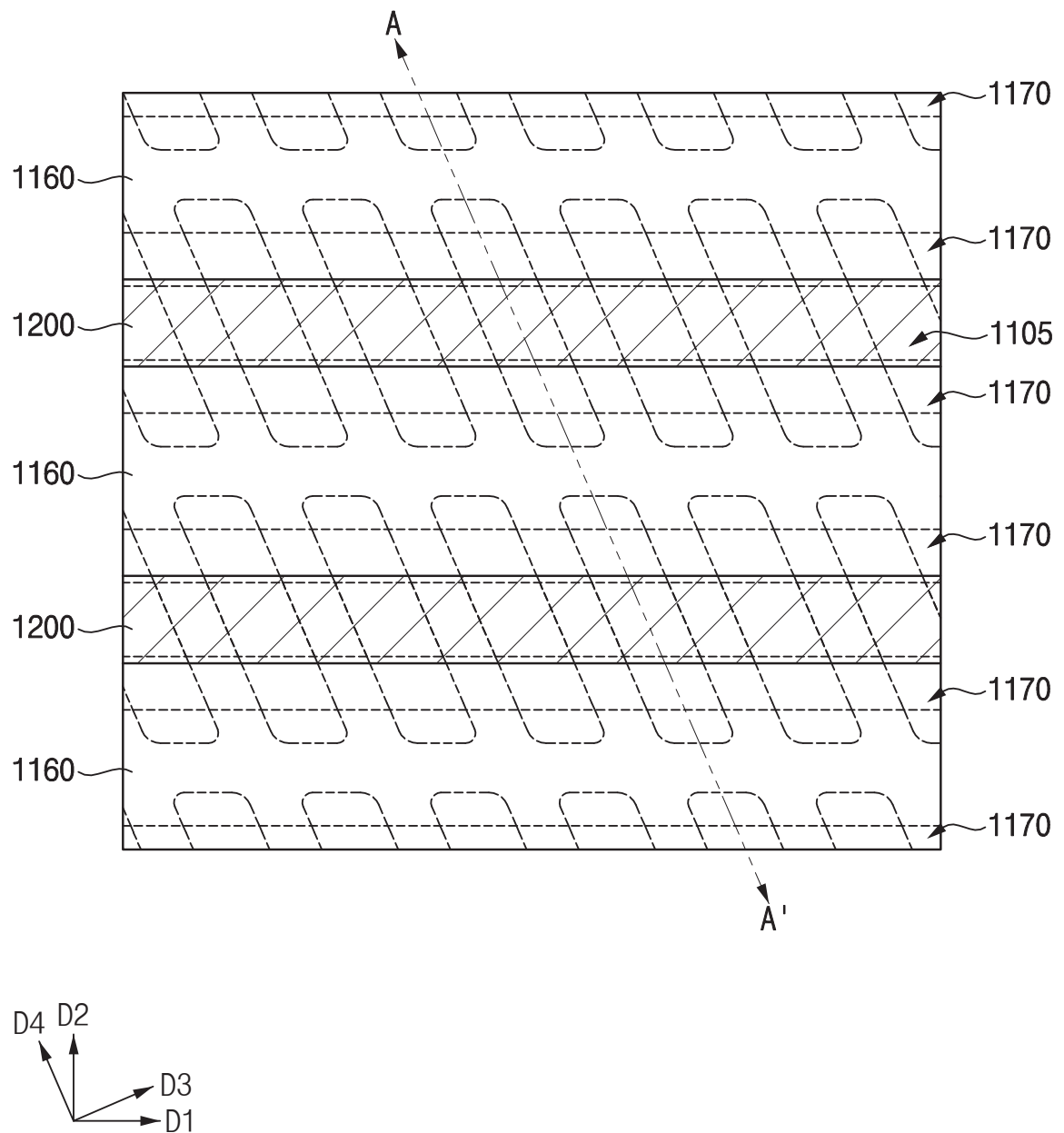


FIG. 46

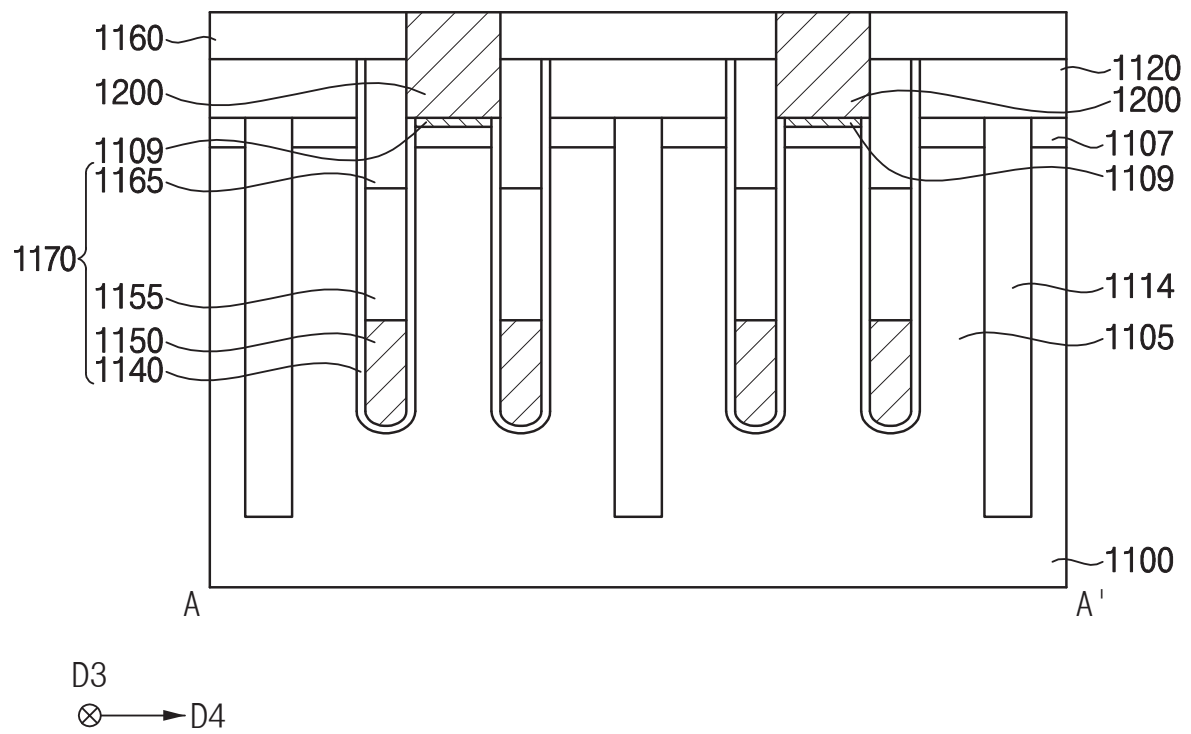


FIG. 47

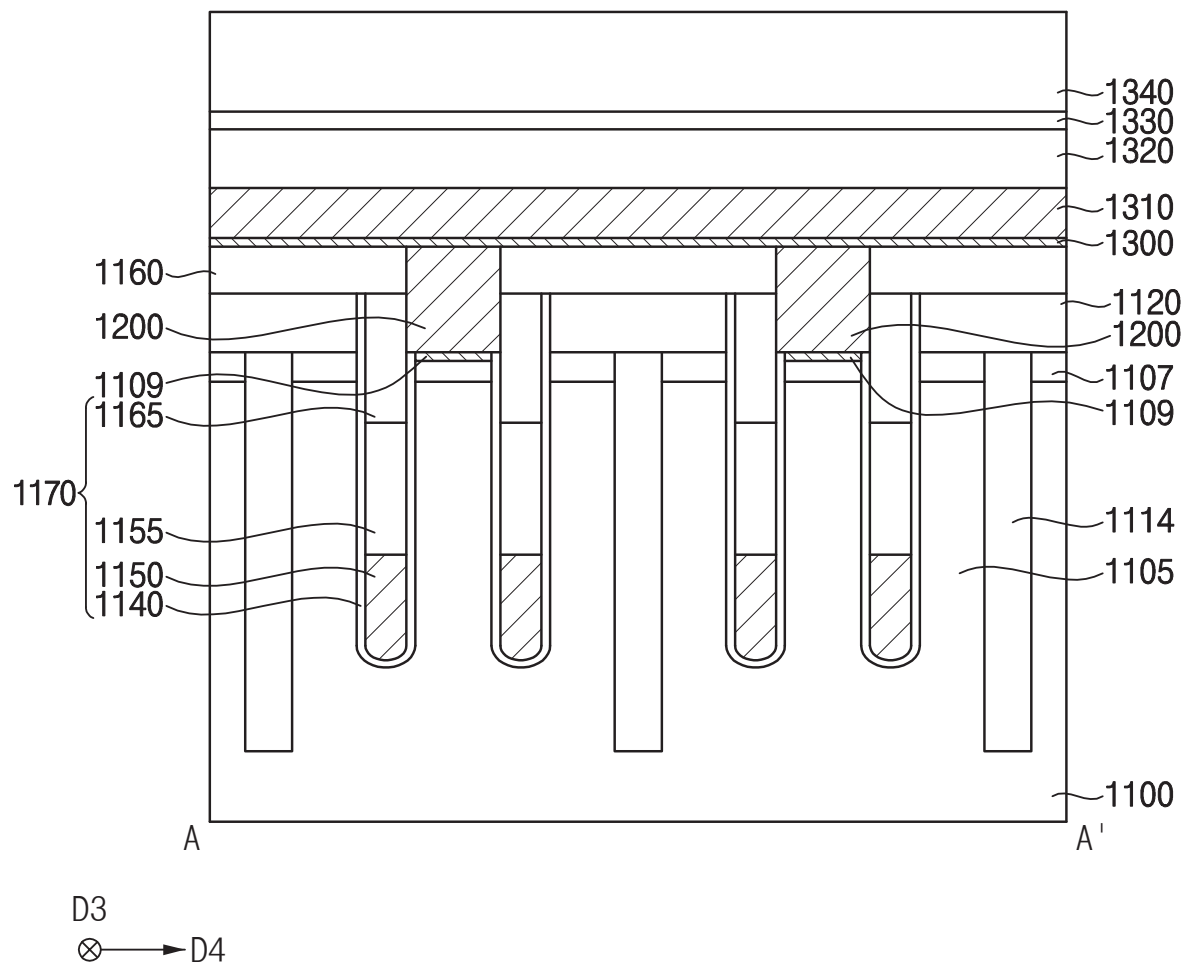


FIG. 48

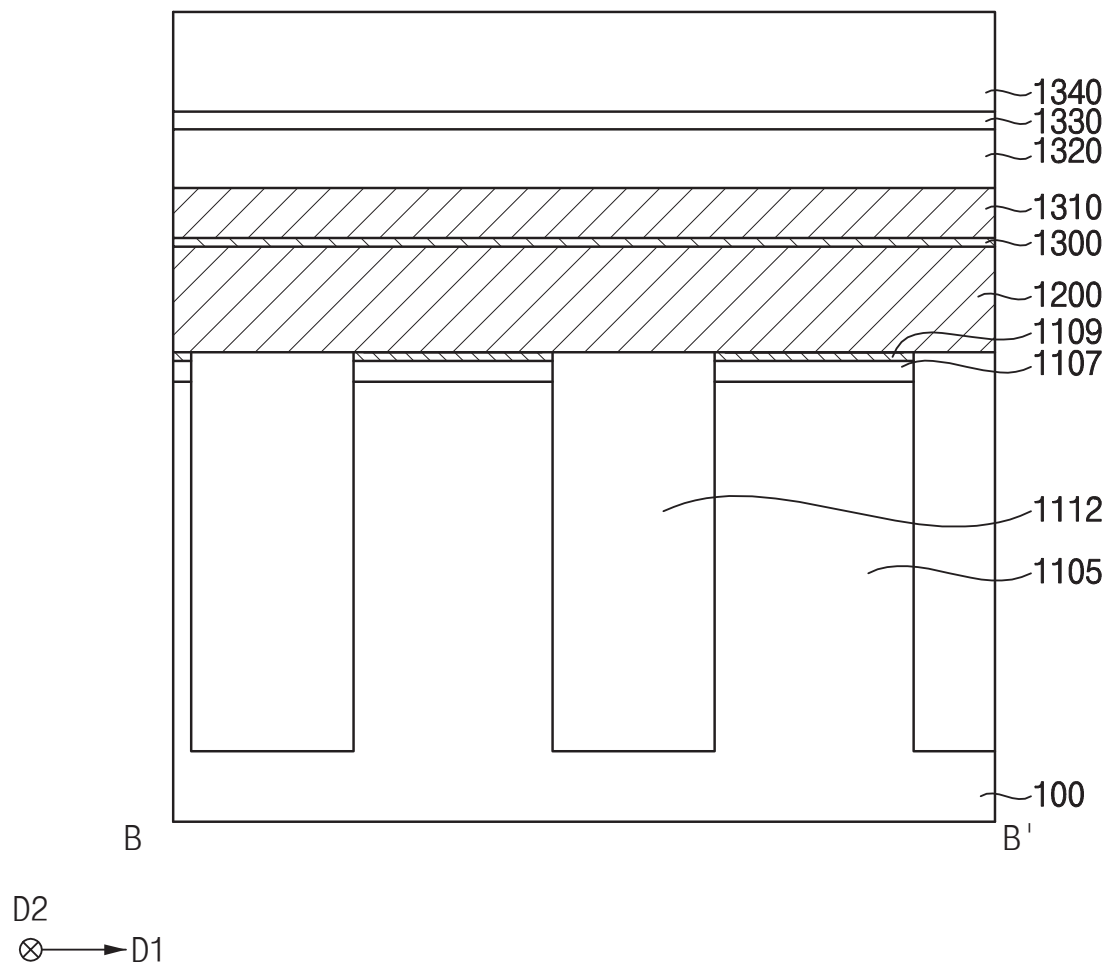


FIG. 49

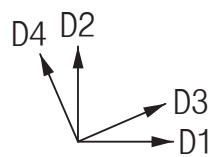
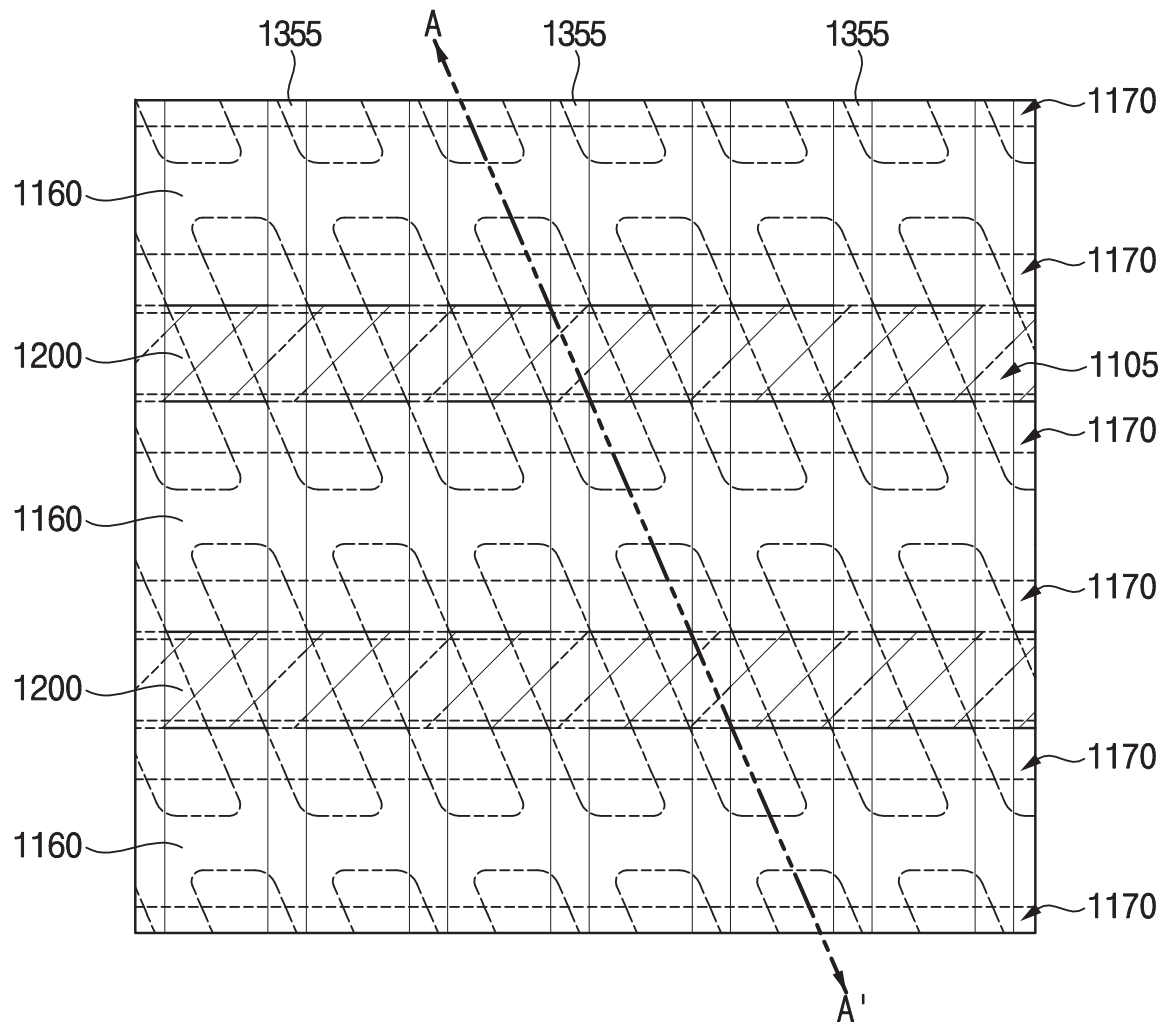


FIG. 50

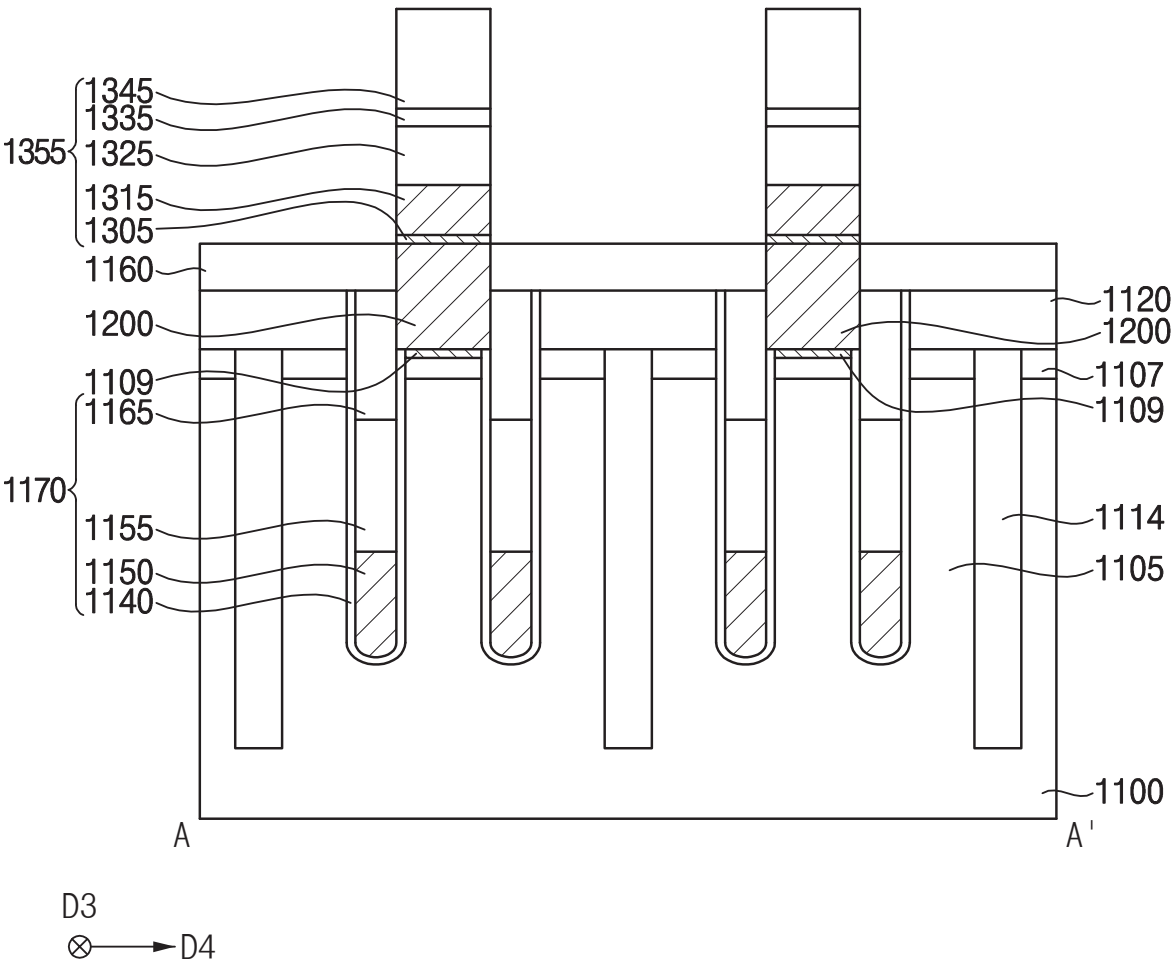


FIG. 51

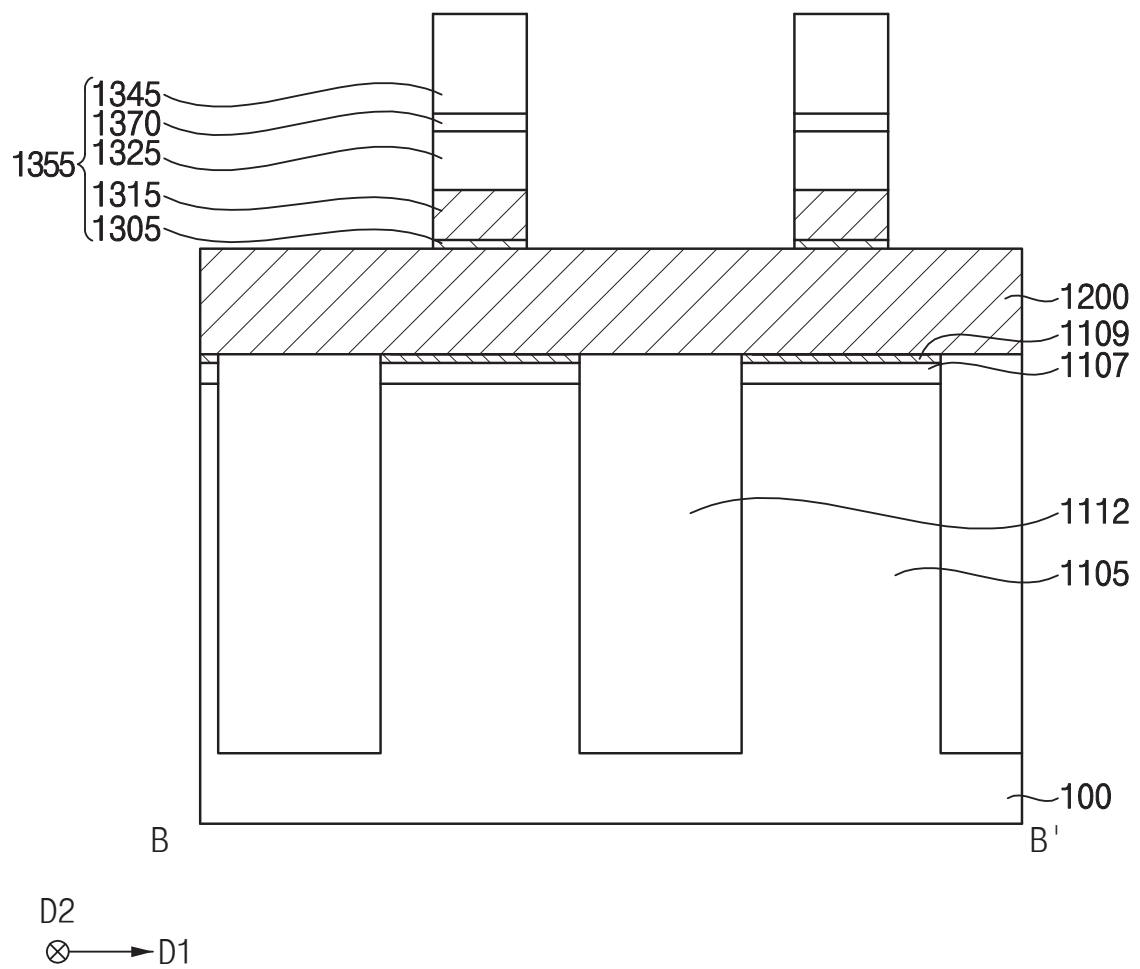


FIG. 52

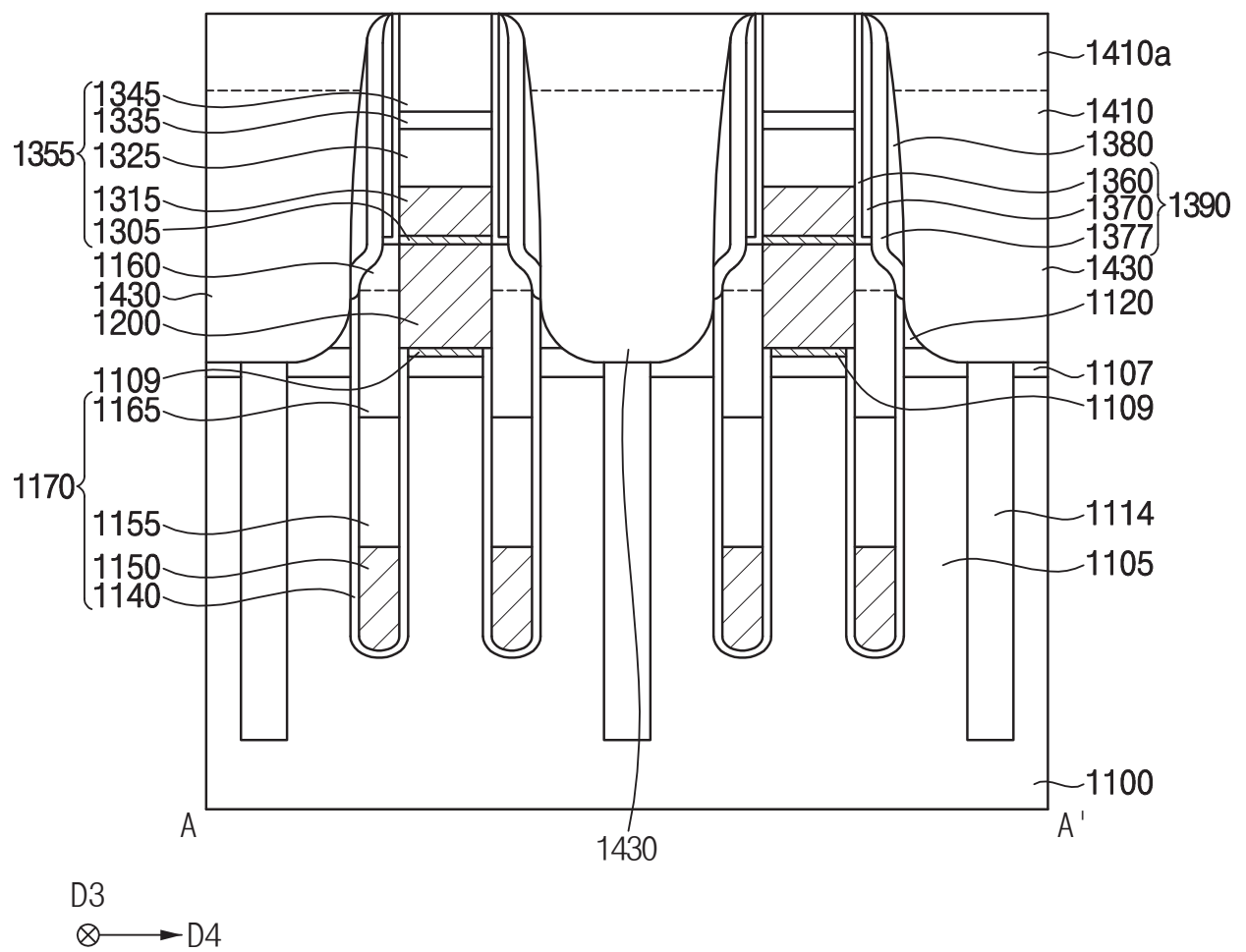


FIG. 53

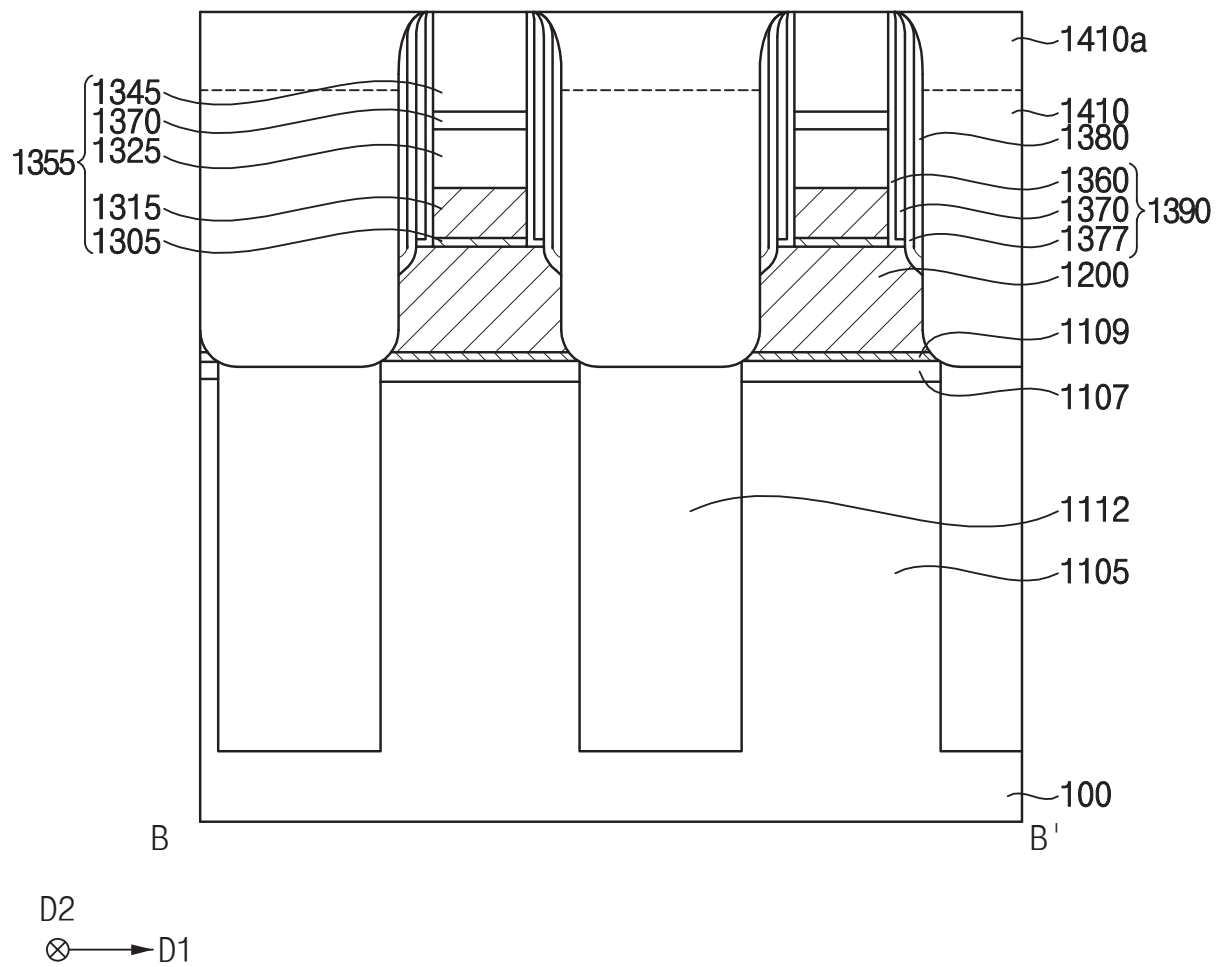


FIG. 54

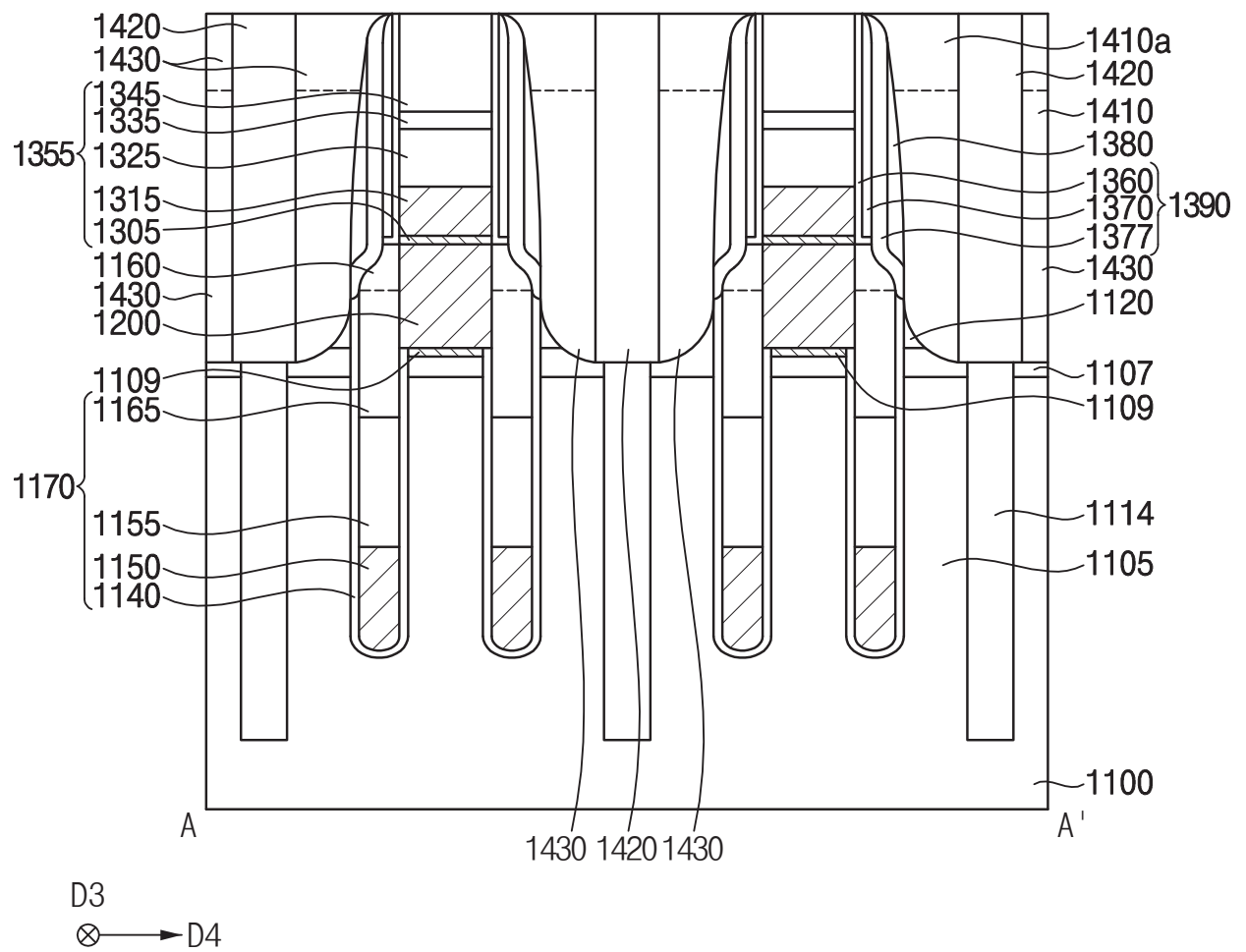


FIG. 55

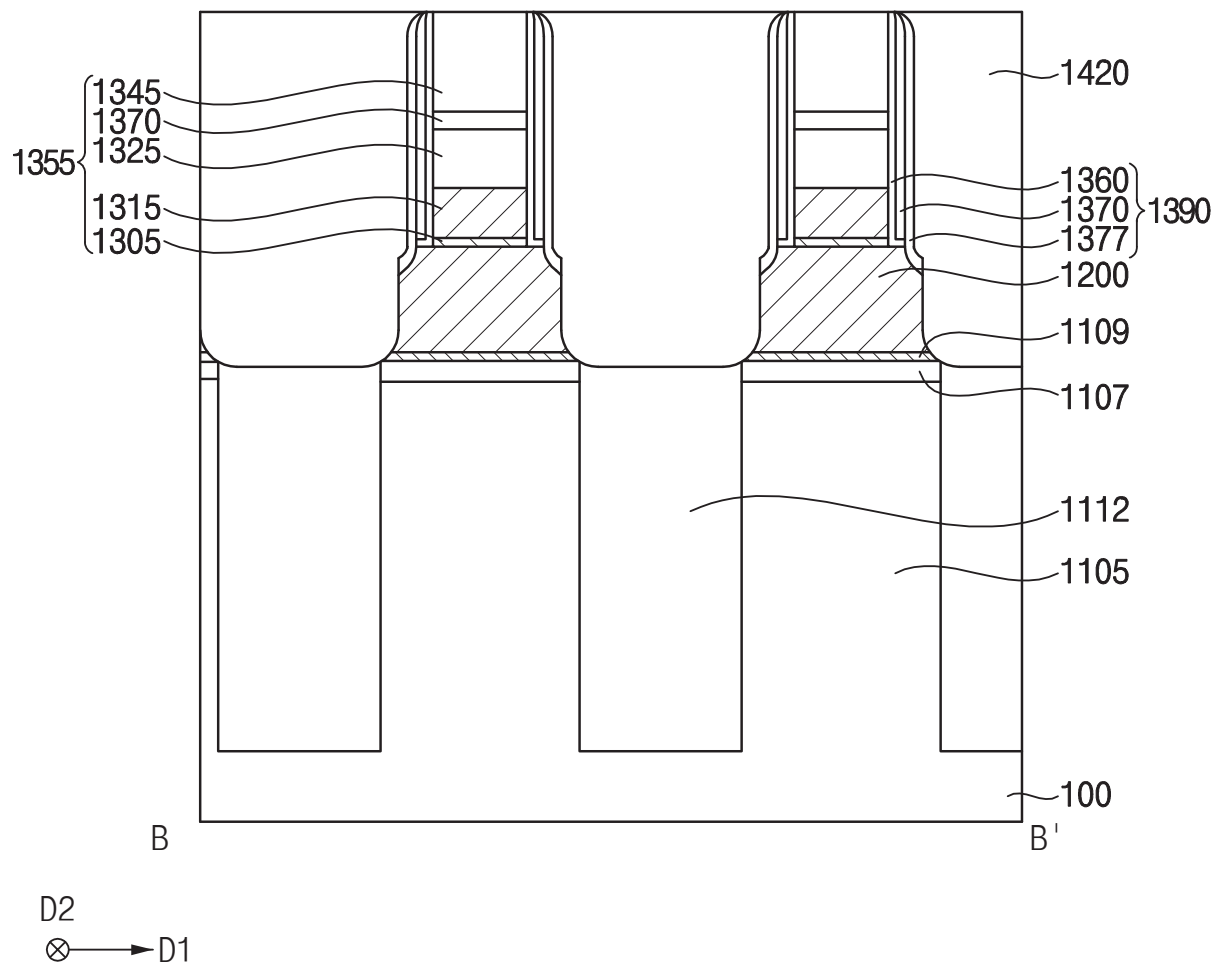


FIG. 56

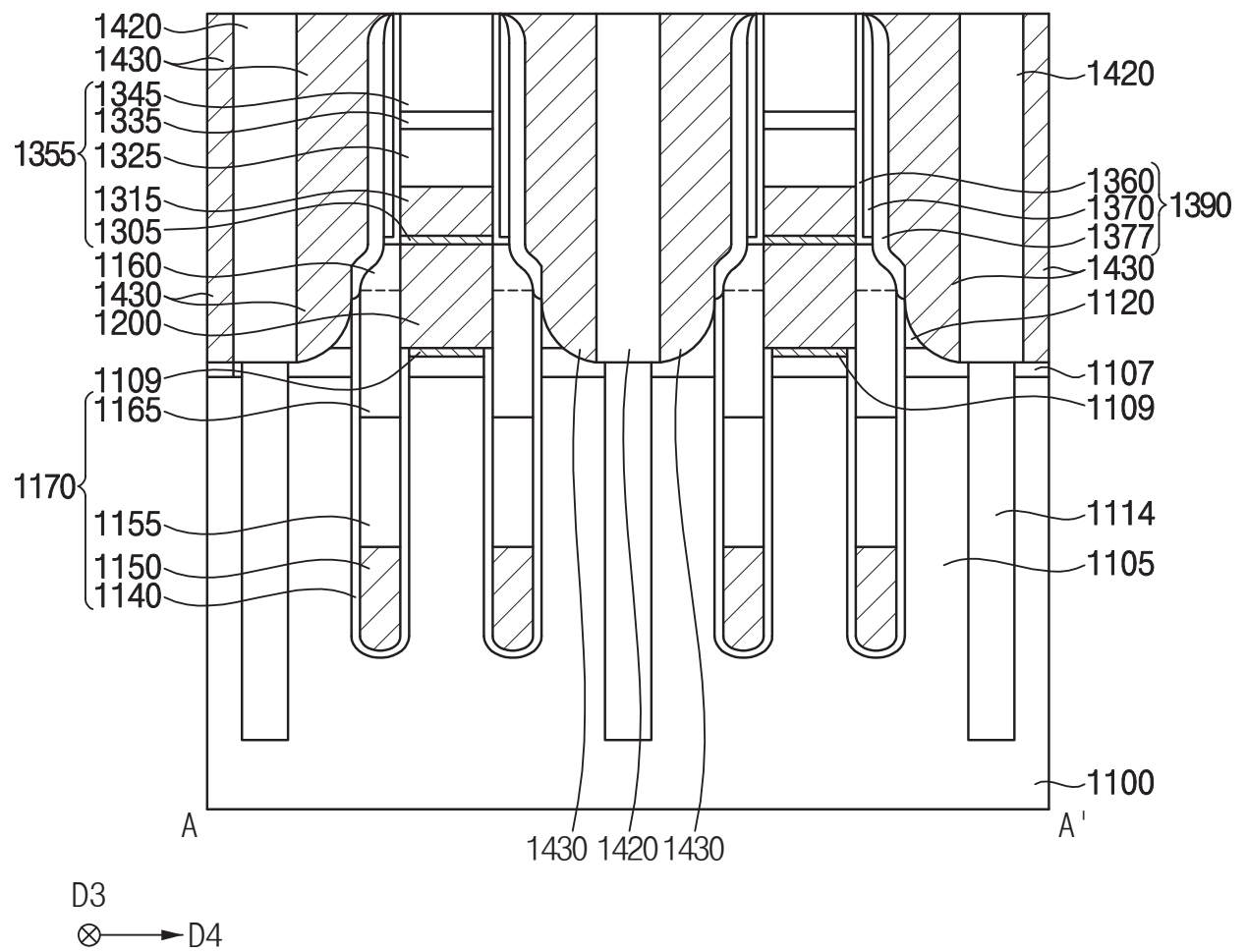


FIG. 57

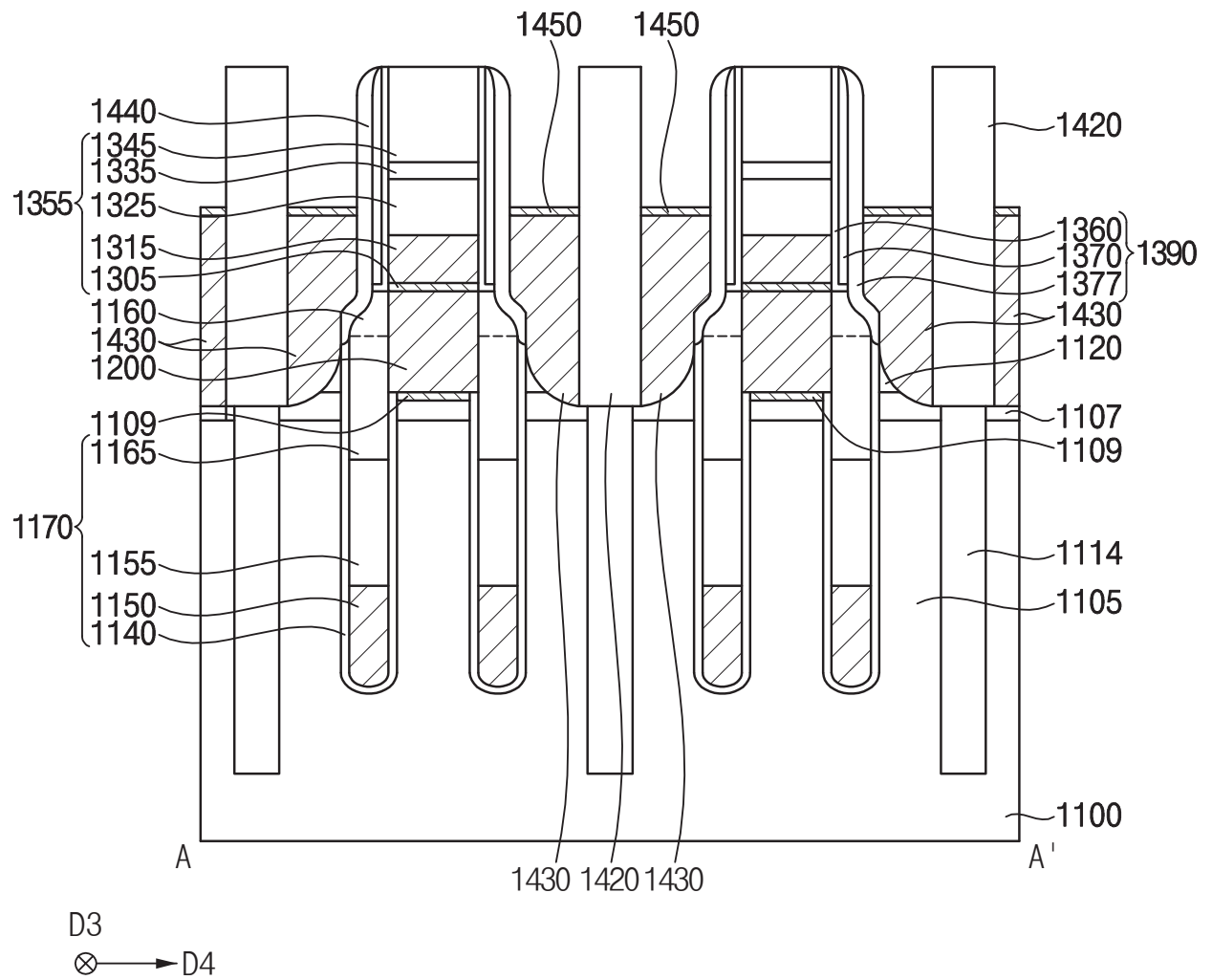


FIG. 58

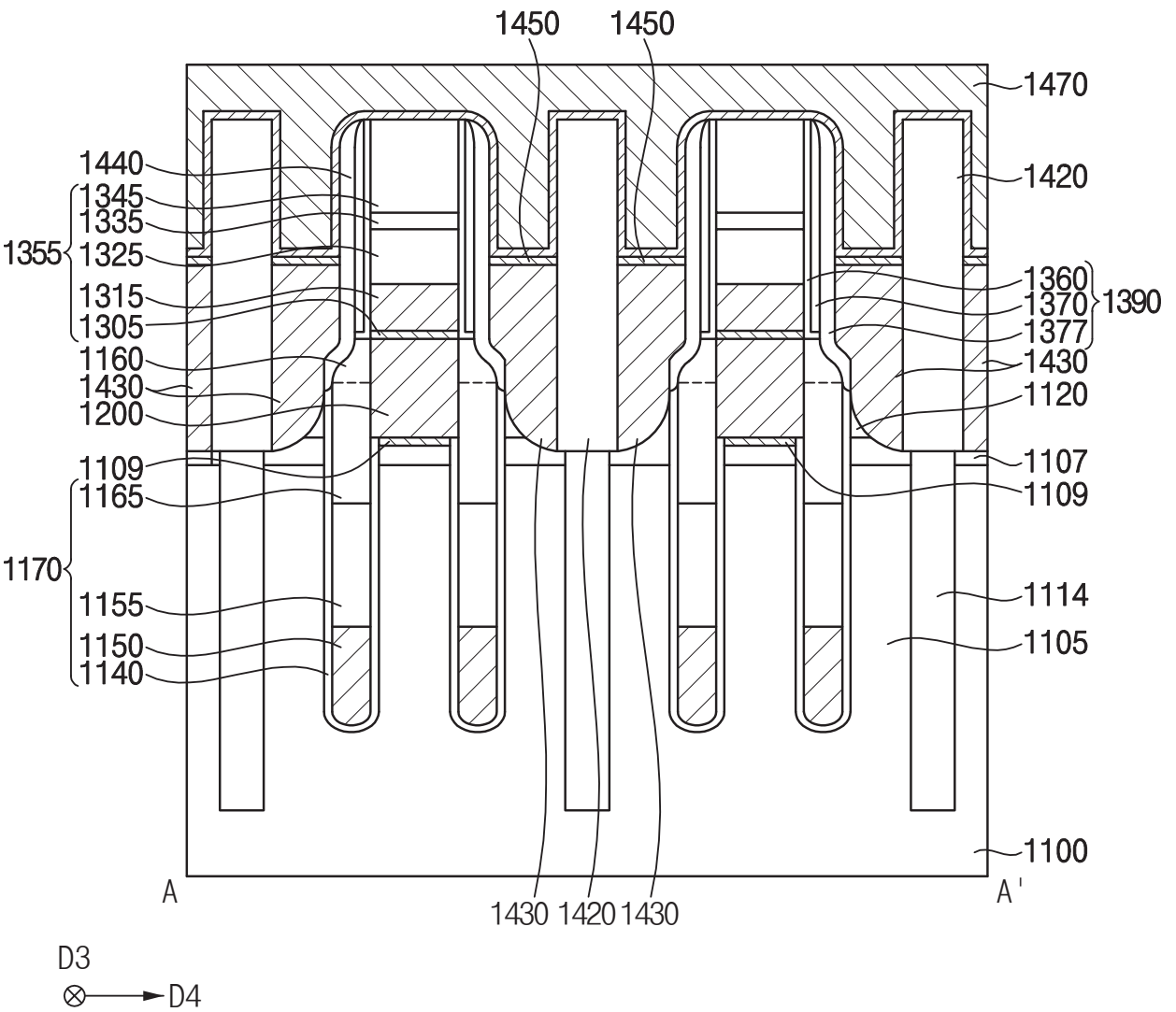


FIG. 59

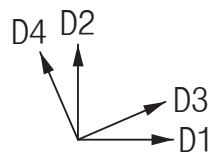
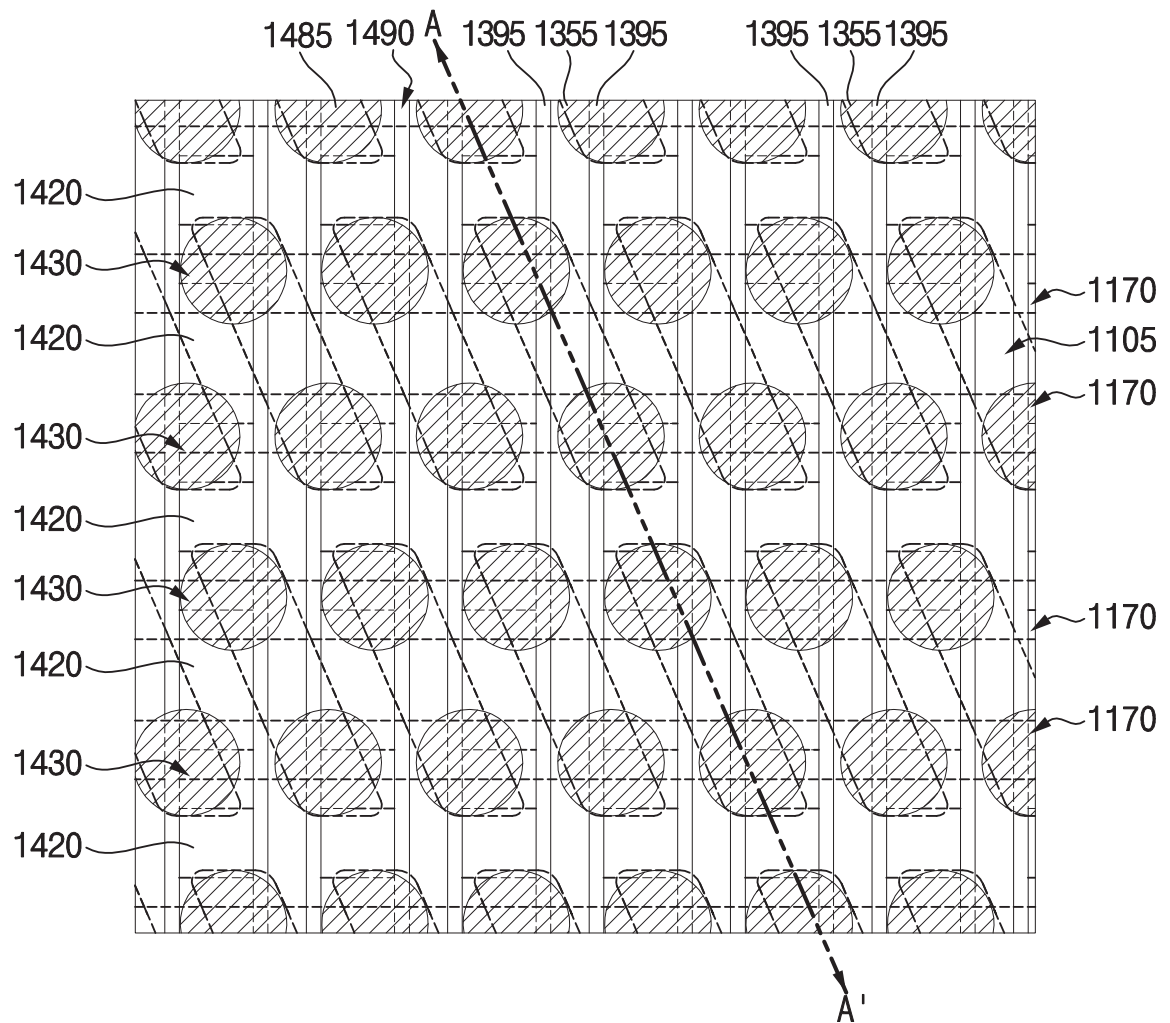
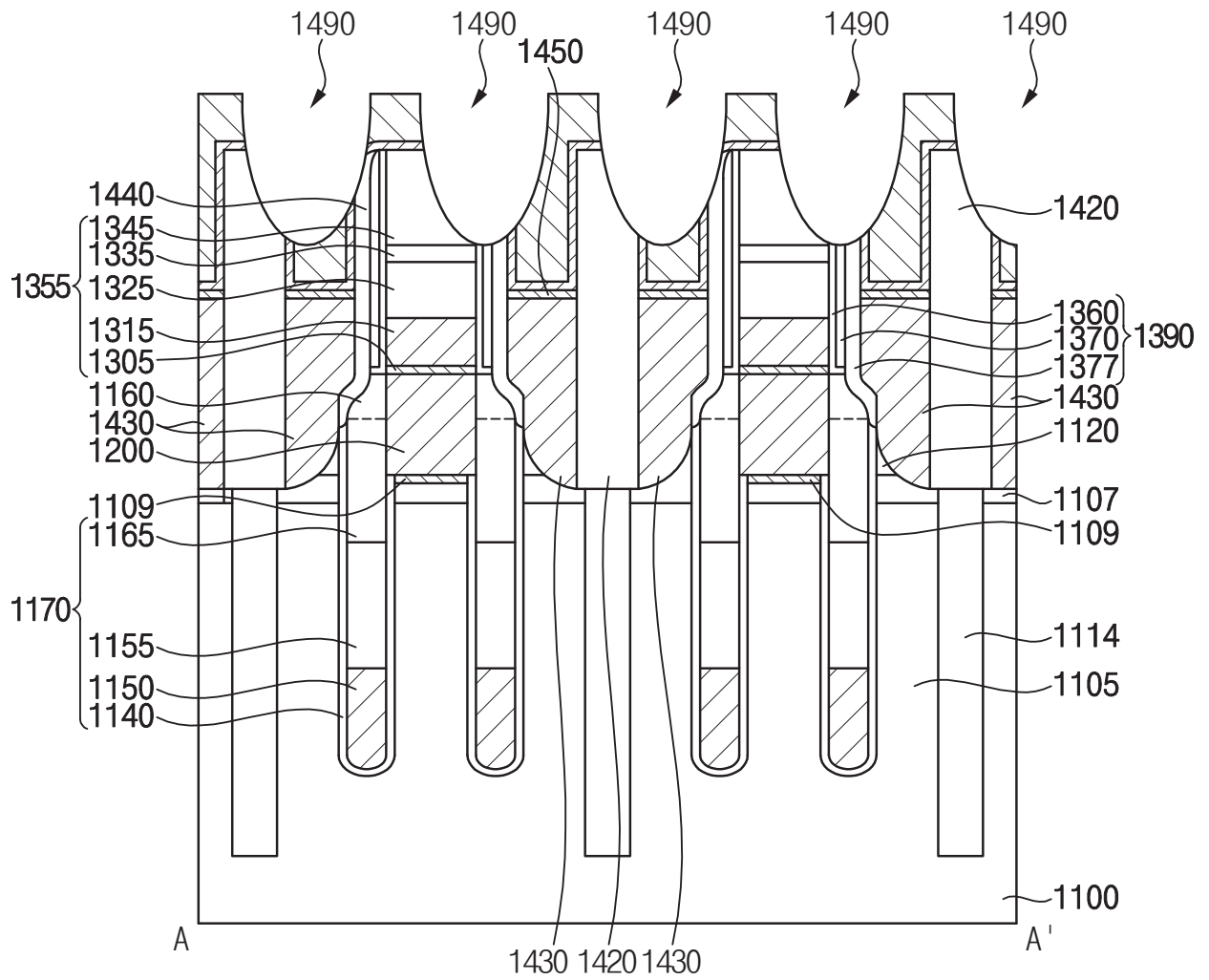


FIG. 60



D3
 ⊗ → D4

FIG. 61

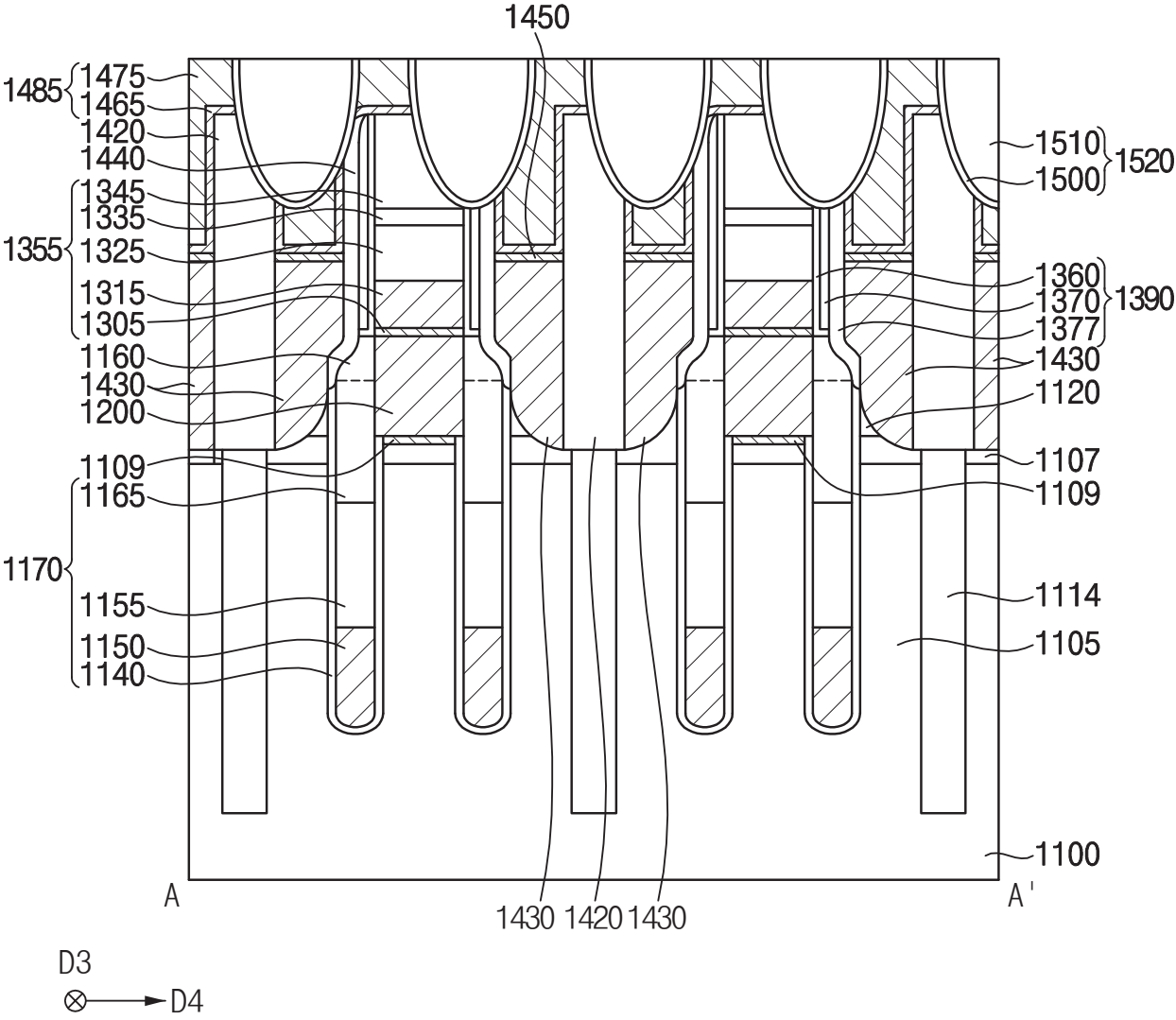


FIG. 62

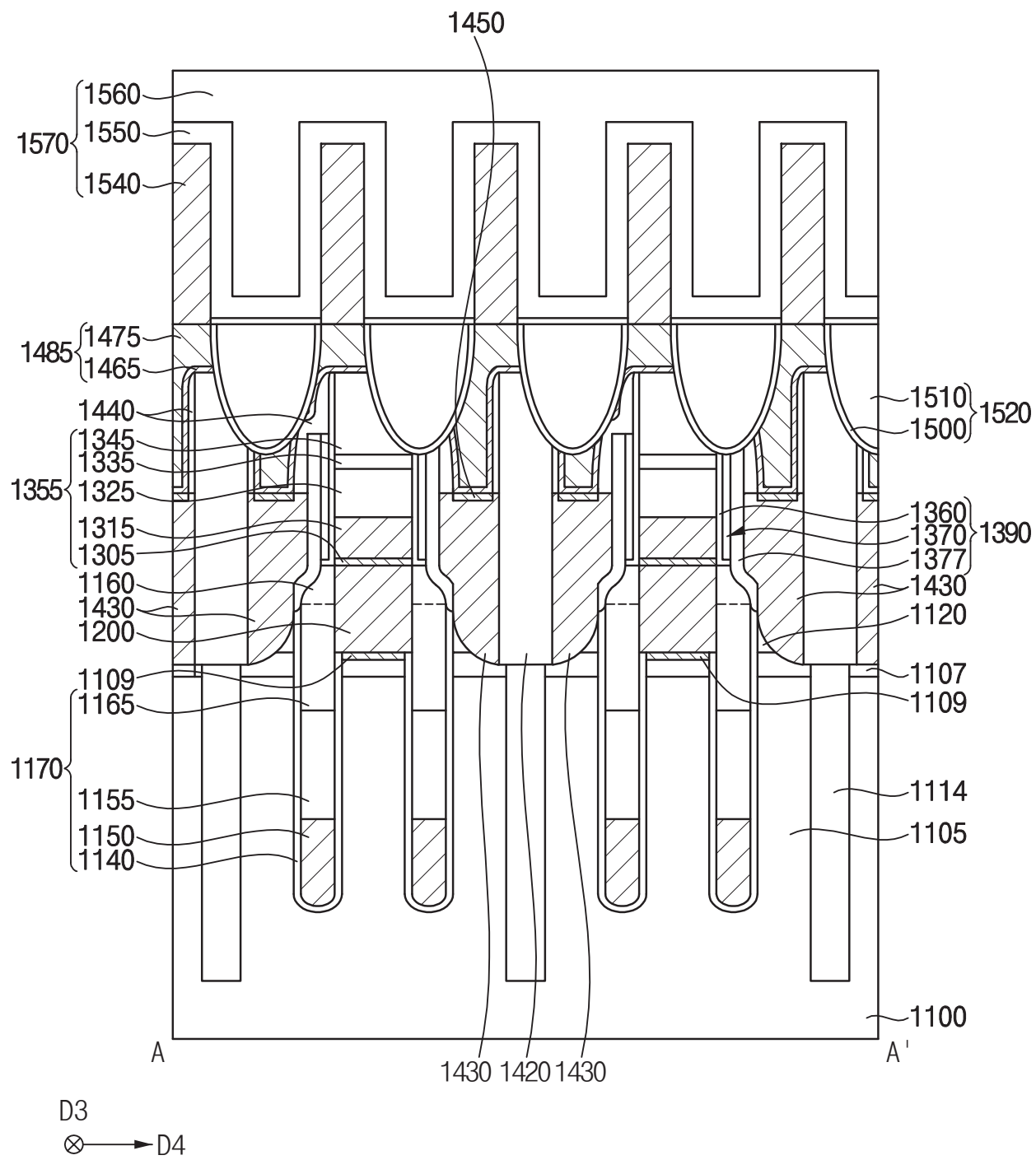
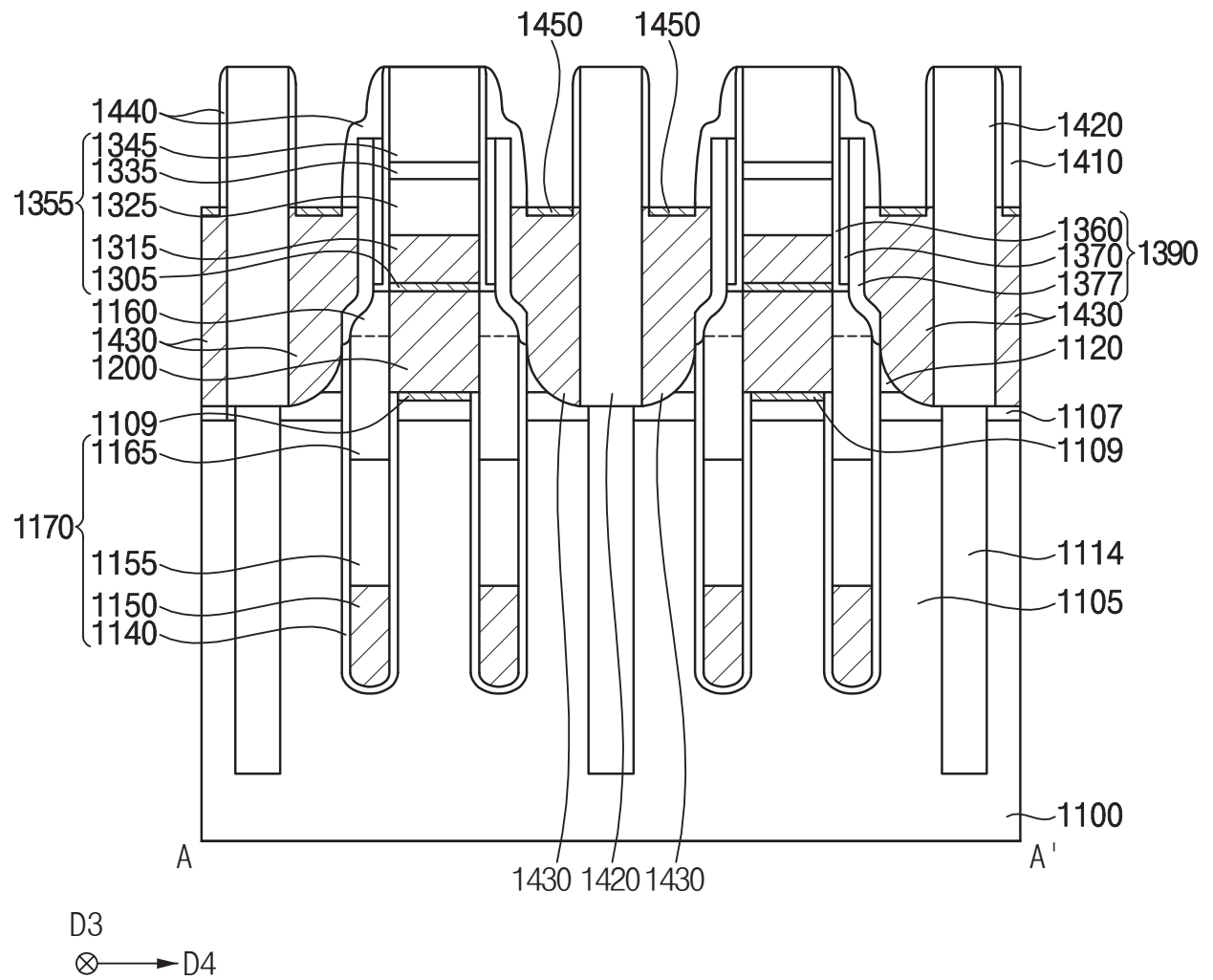


FIG. 63



1450



FIG. 65

