

100

FIG. 1

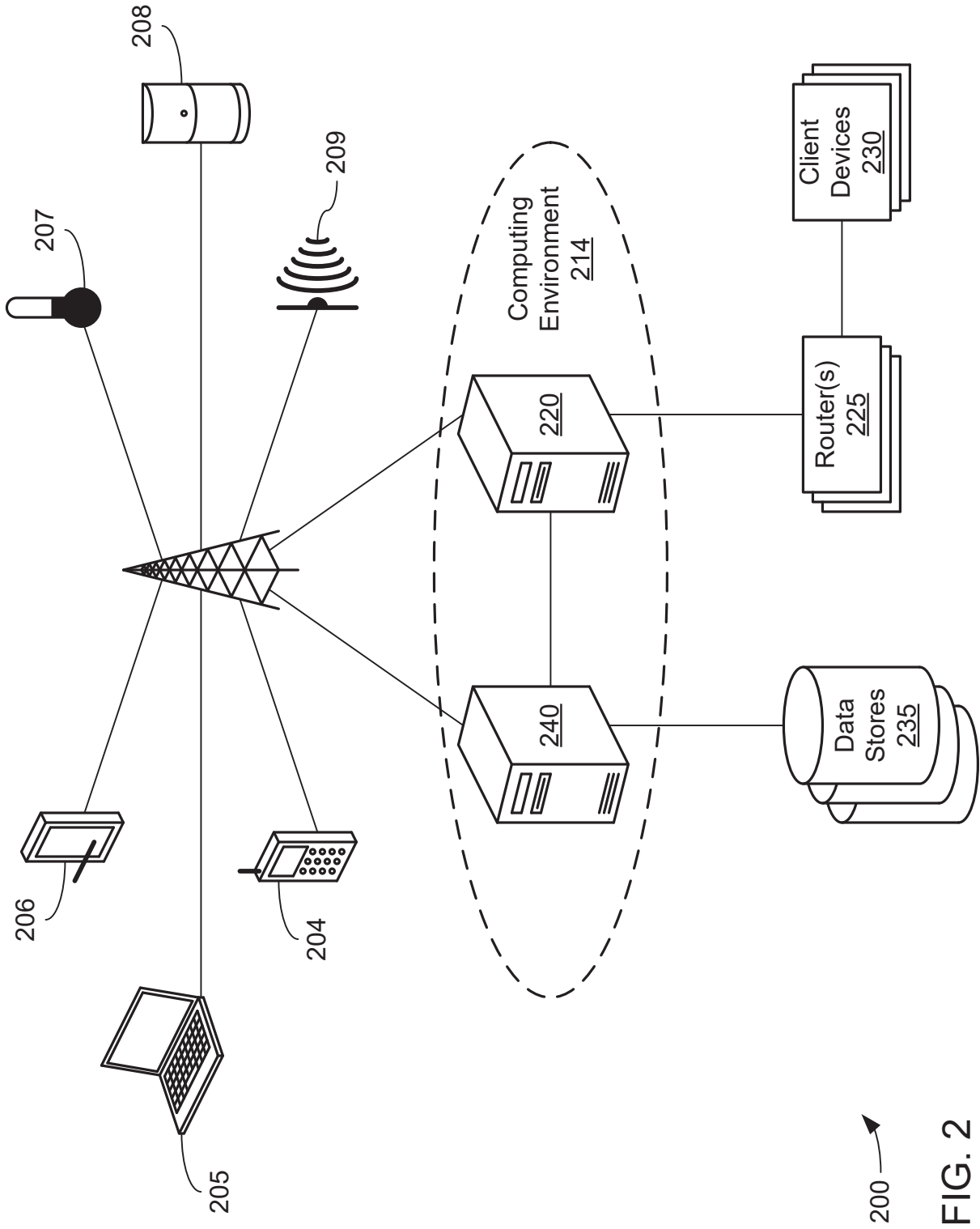


FIG. 2

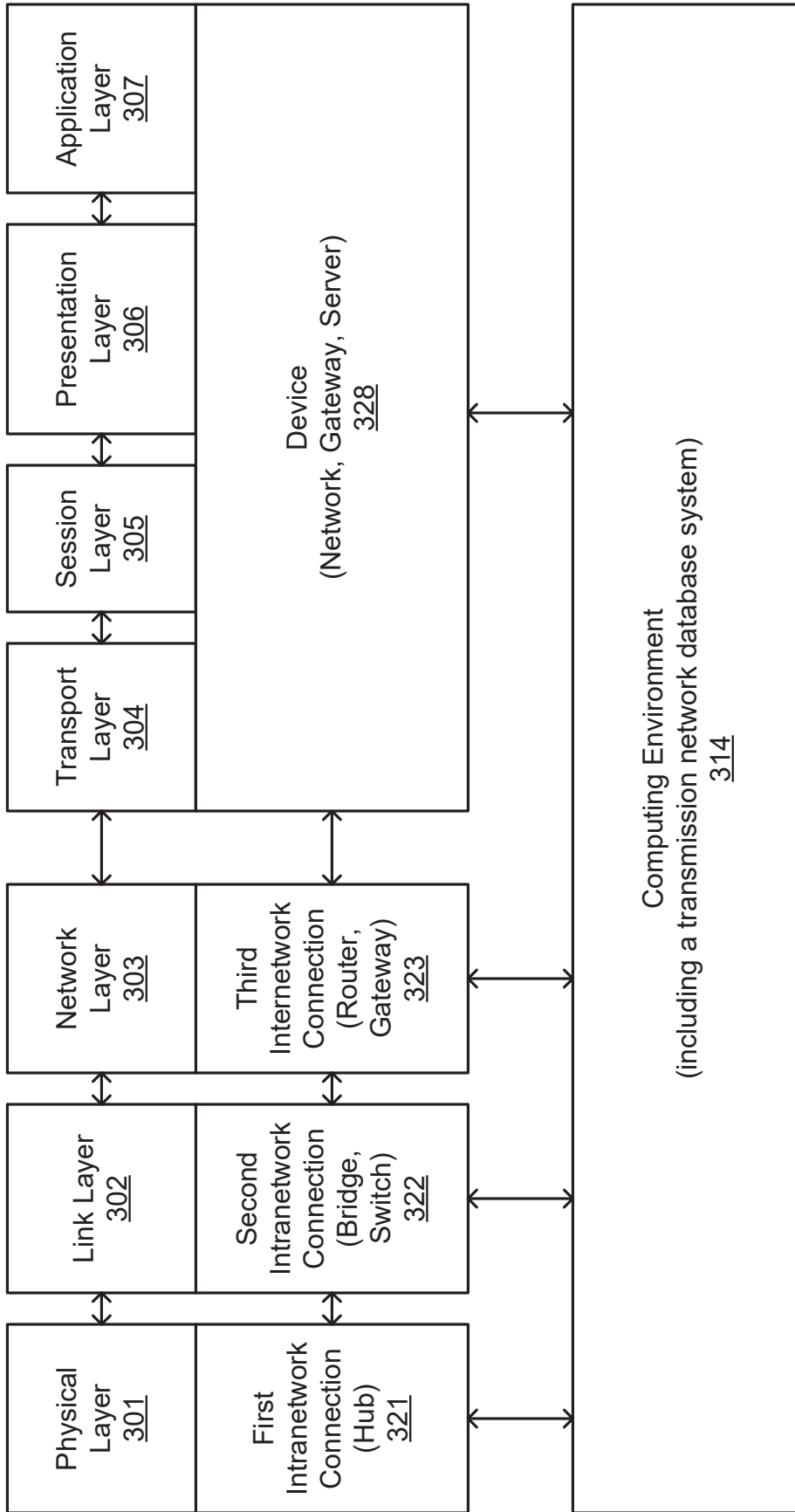


FIG. 3

300 →

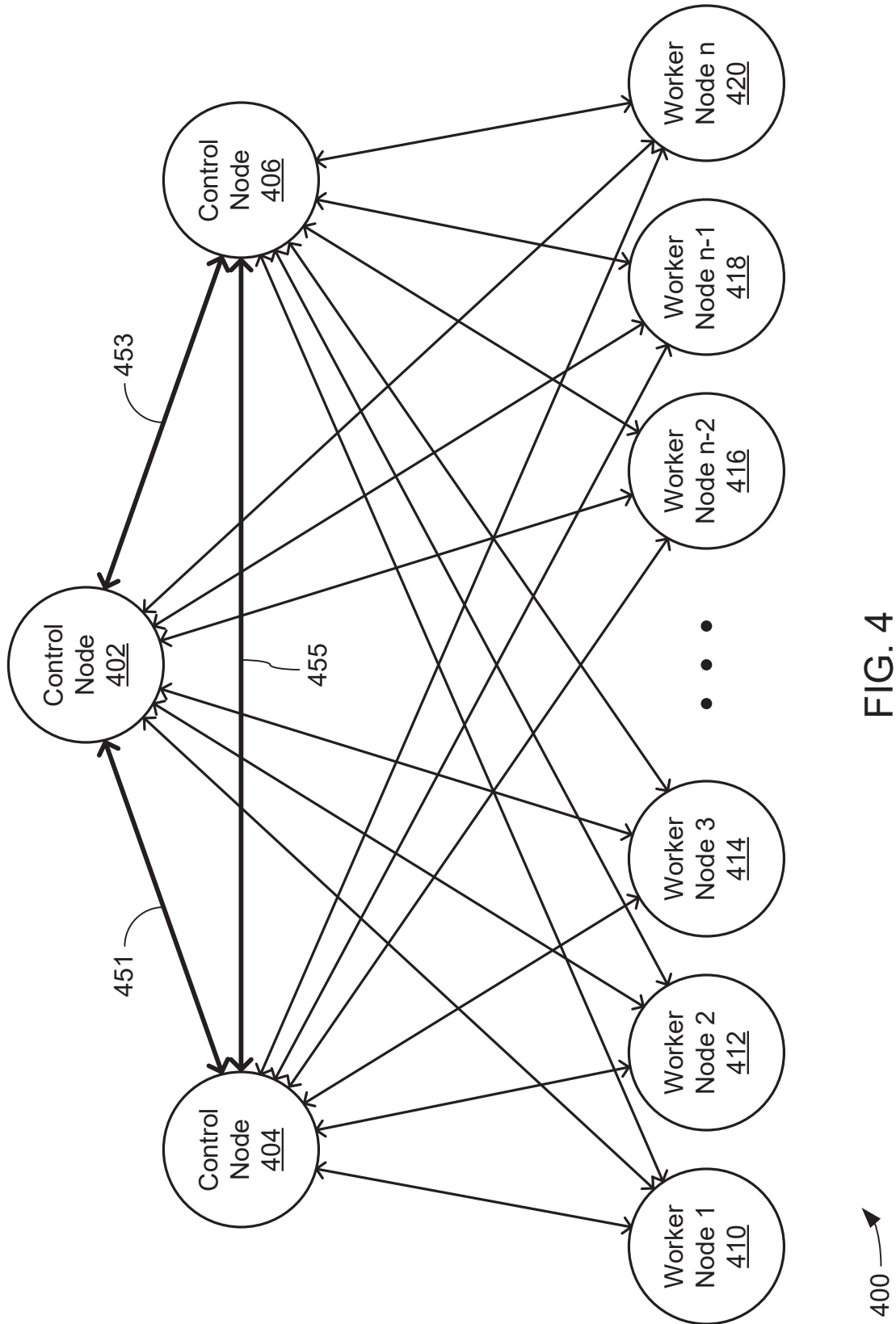
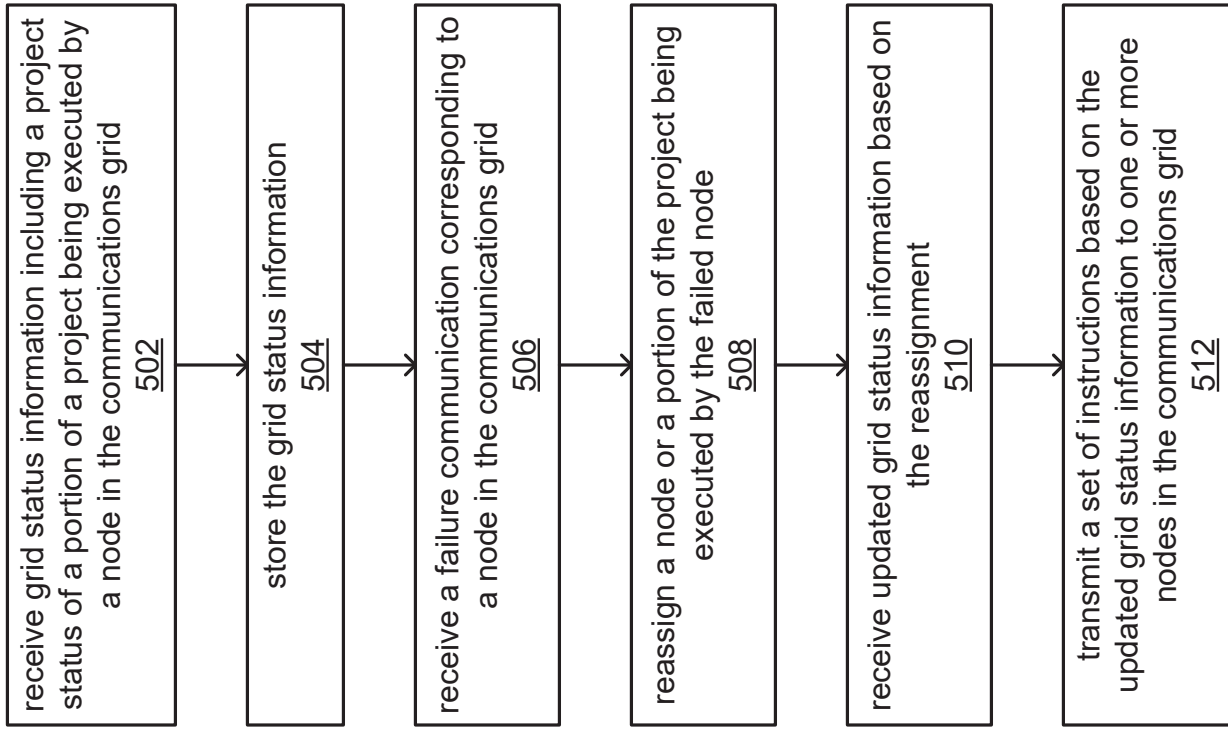


FIG. 4



500 →

FIG. 5

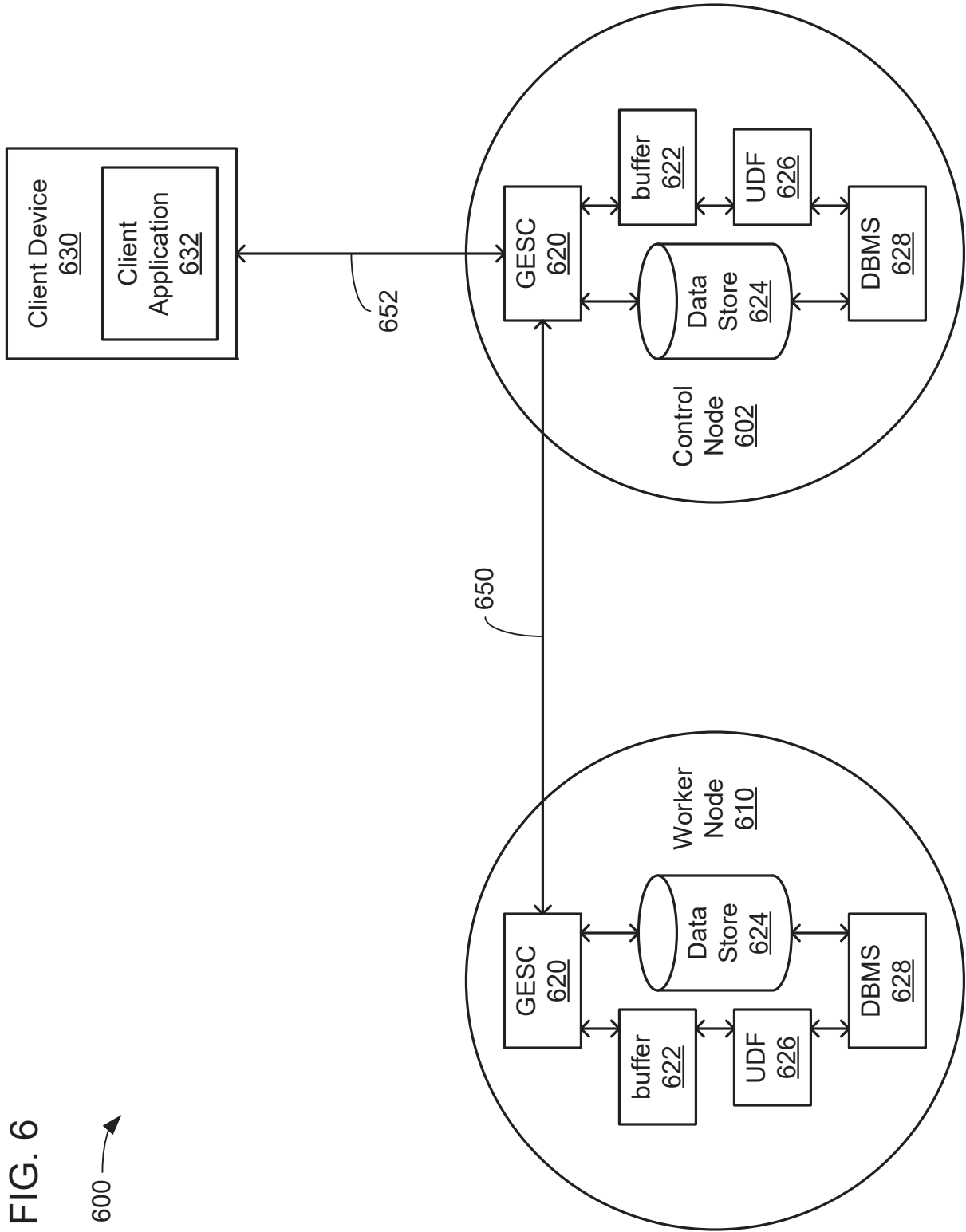
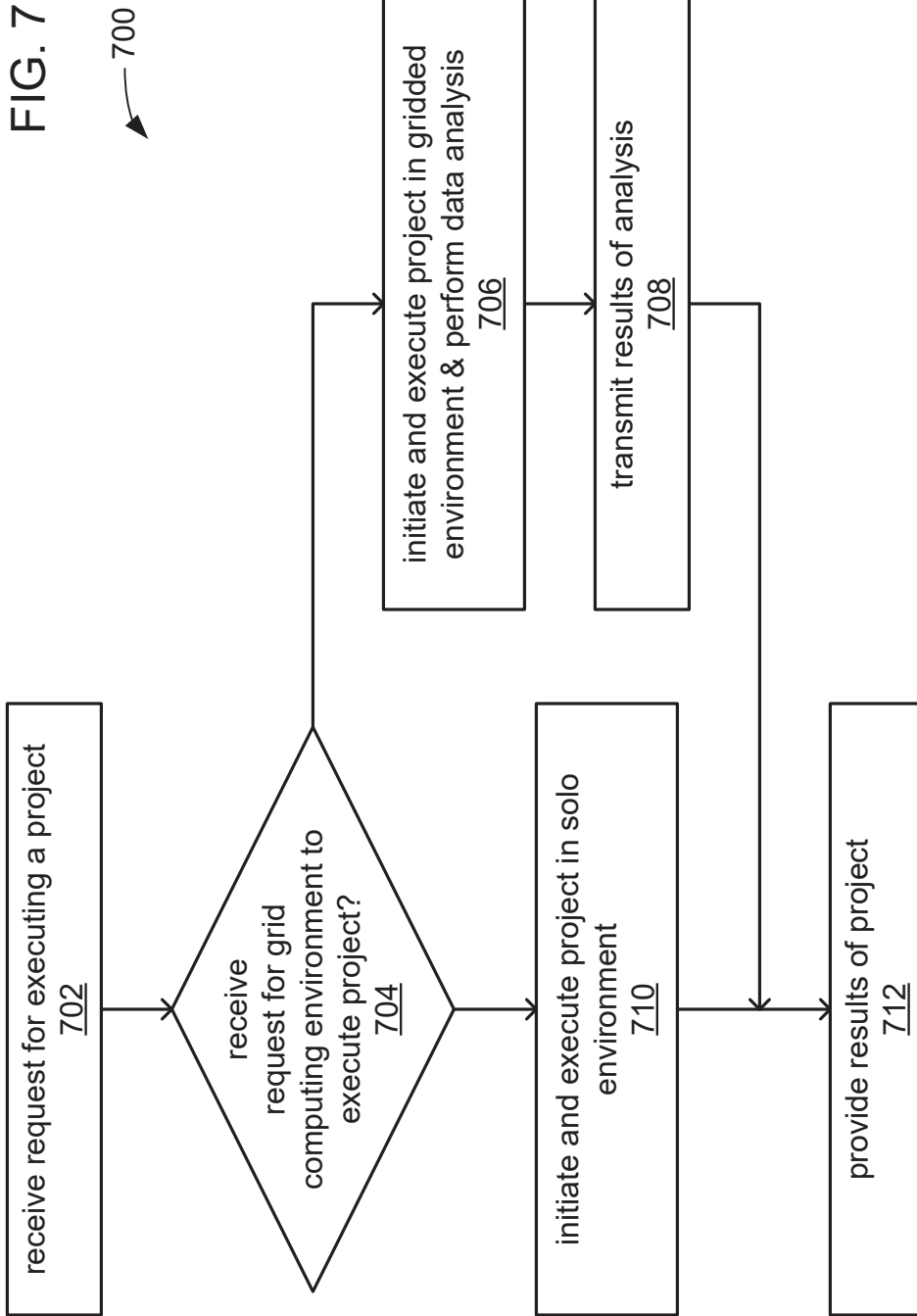


FIG. 6

600 →



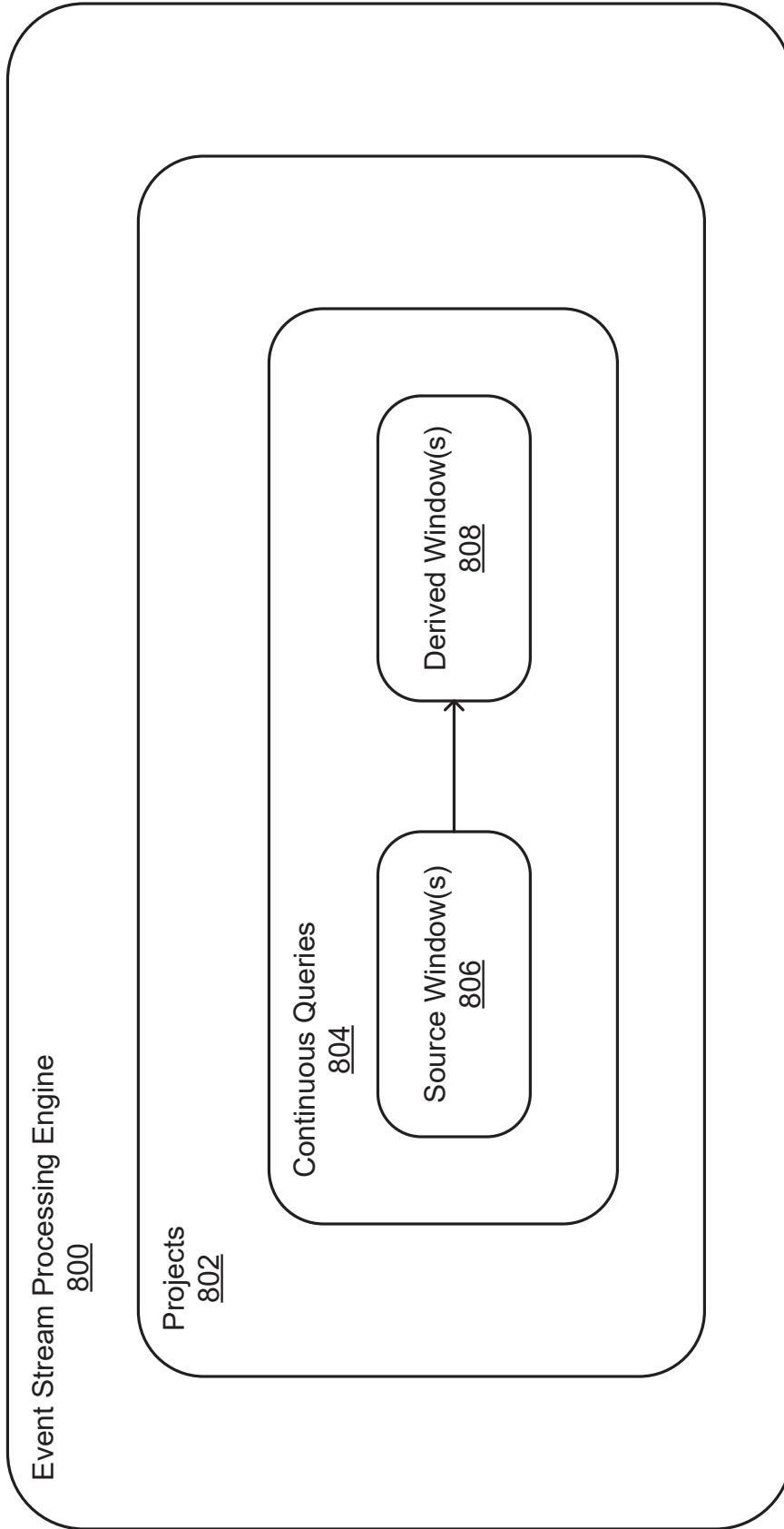
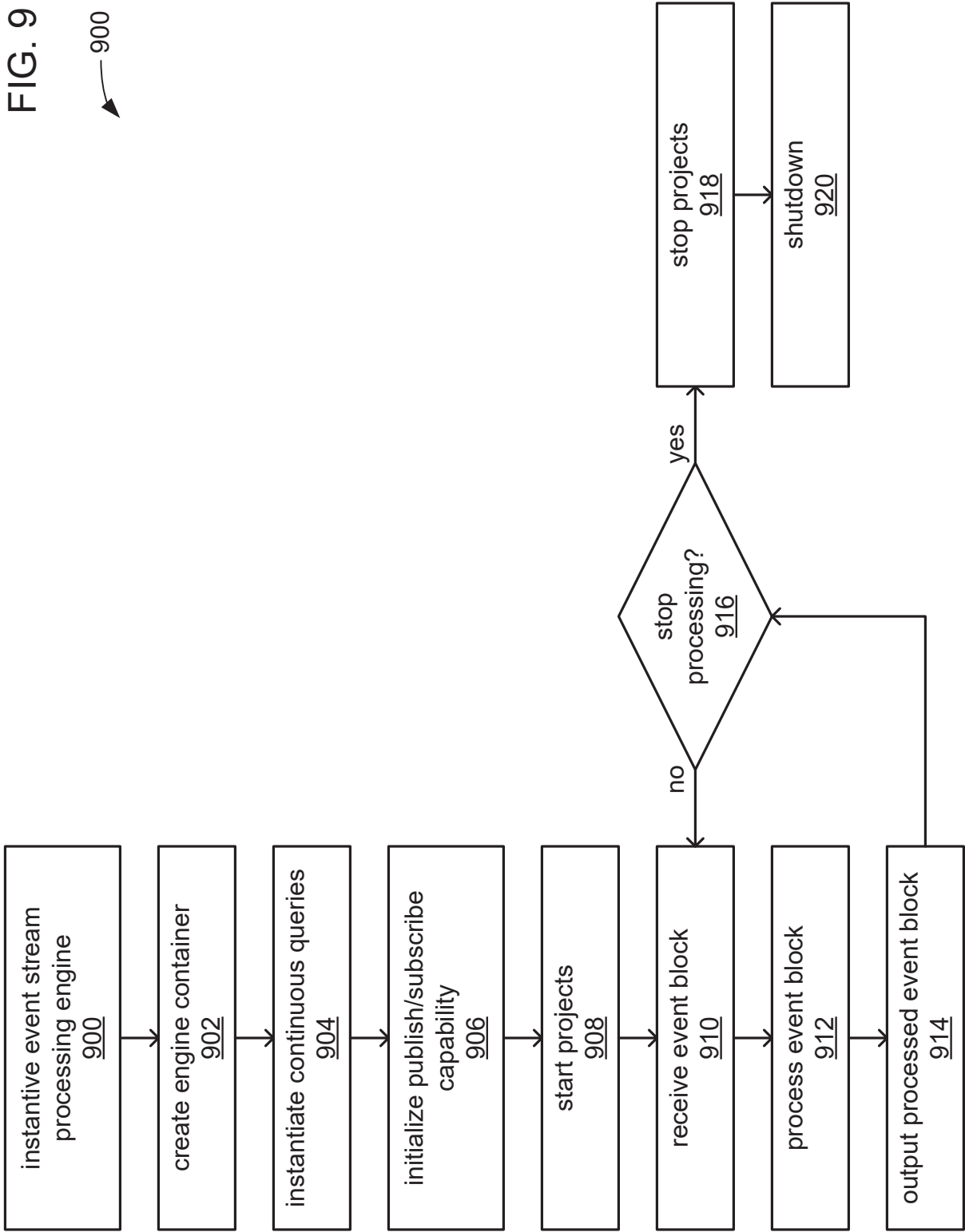


FIG. 8

FIG. 9



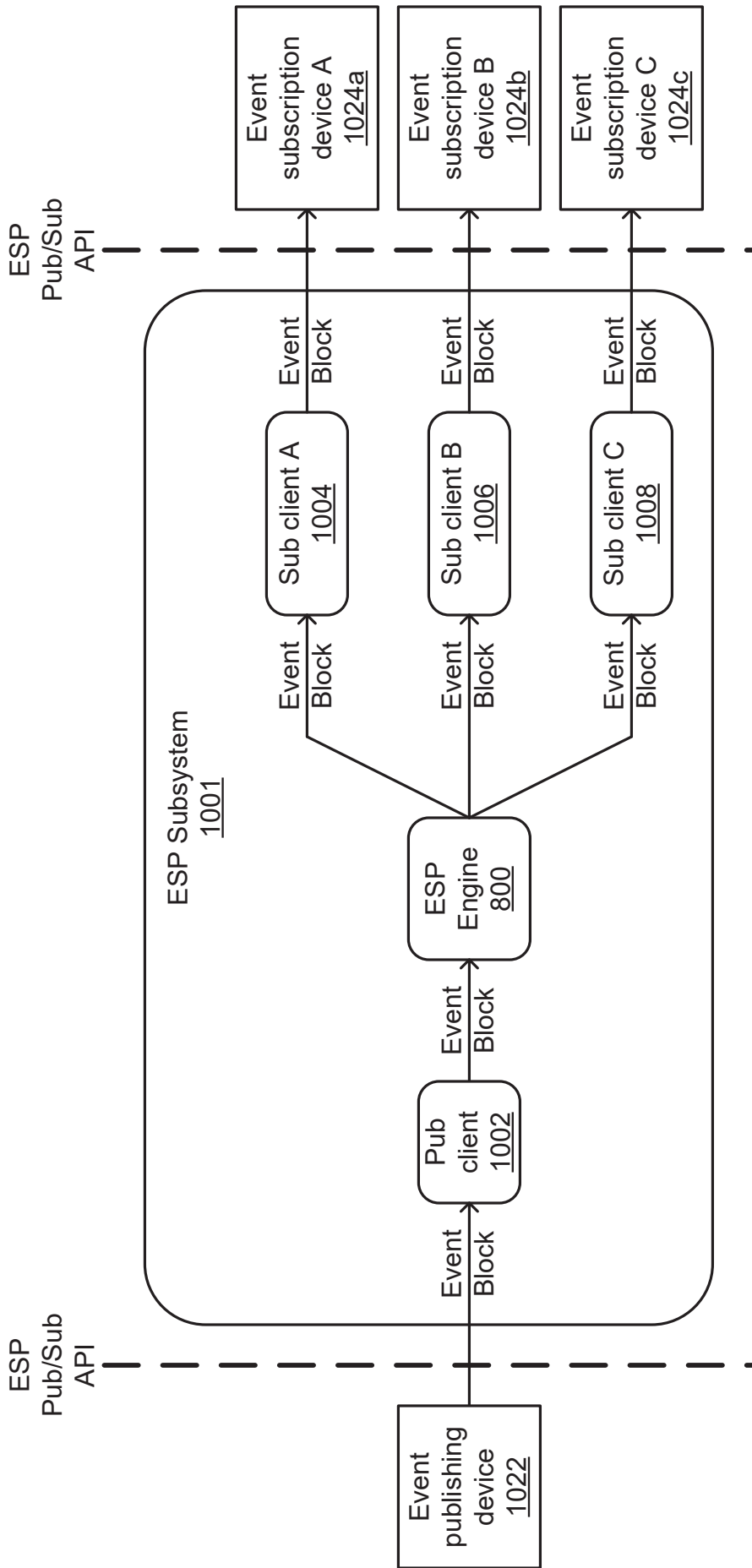


FIG. 10

1000 →

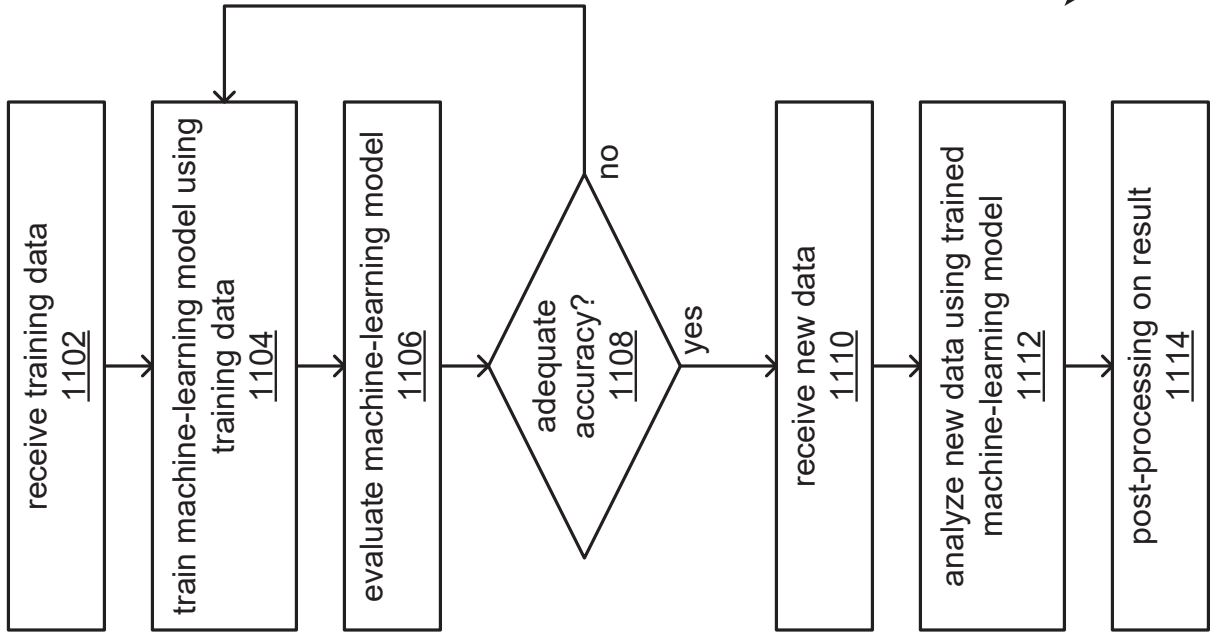


FIG. 11

FIG. 12

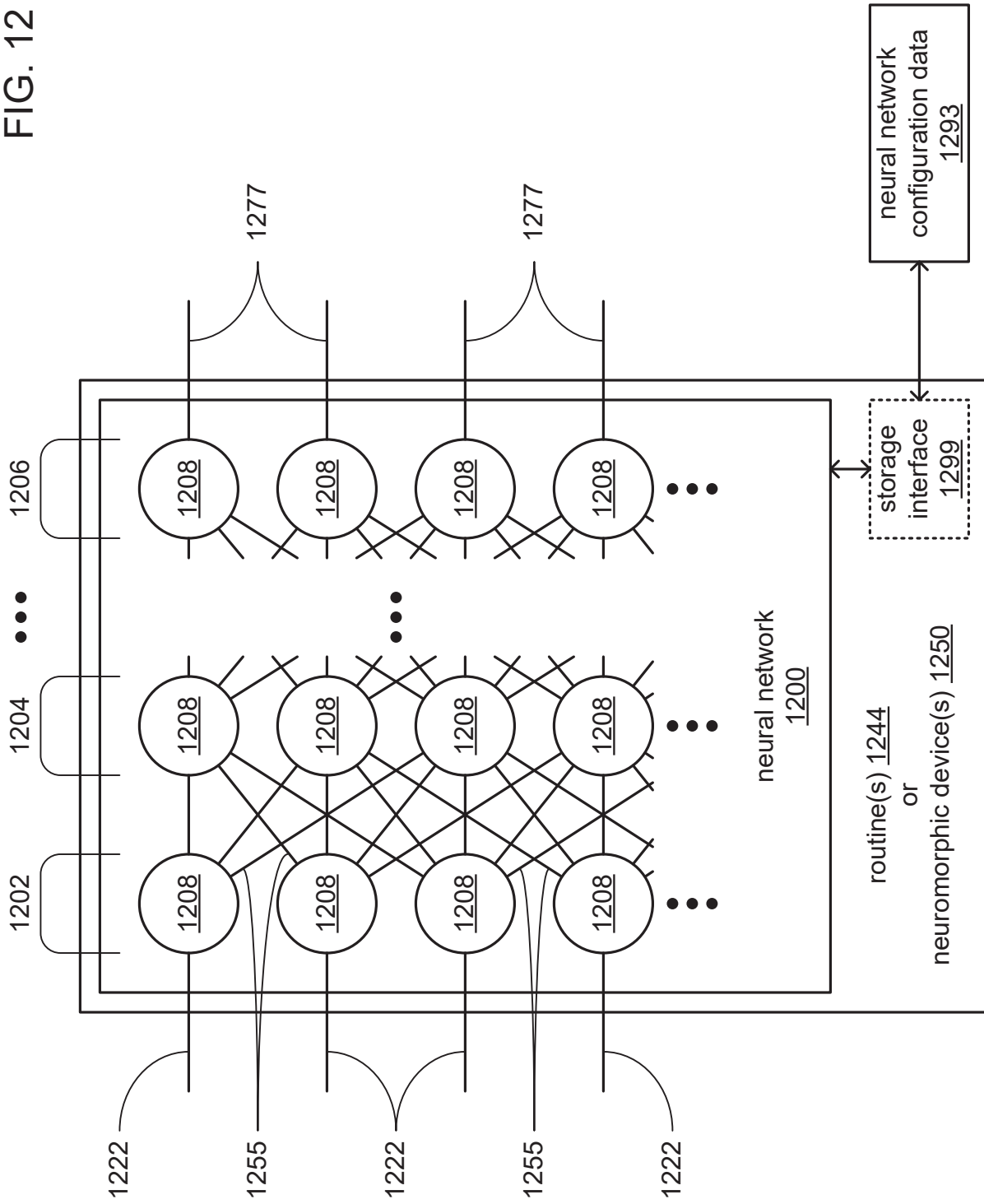
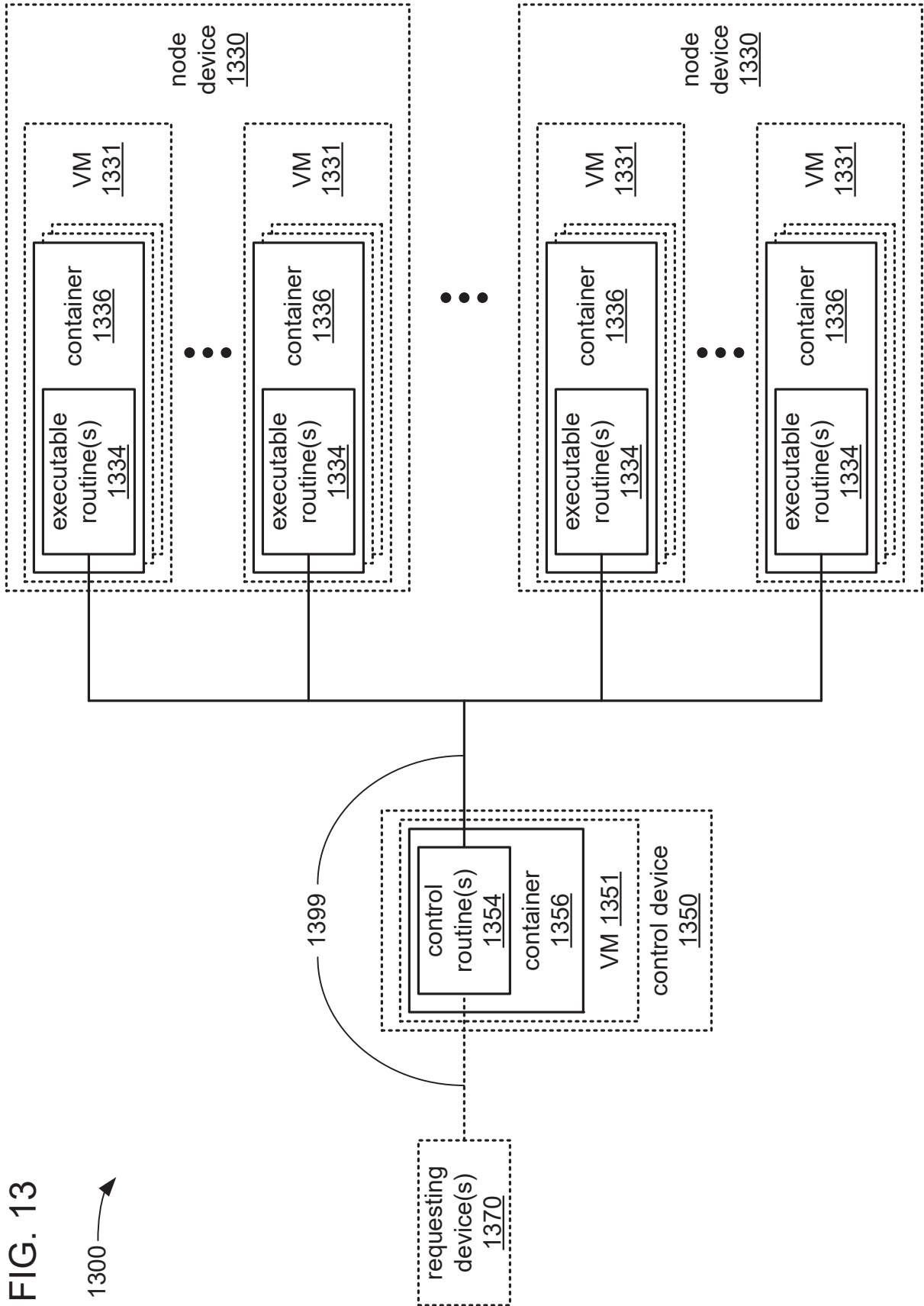
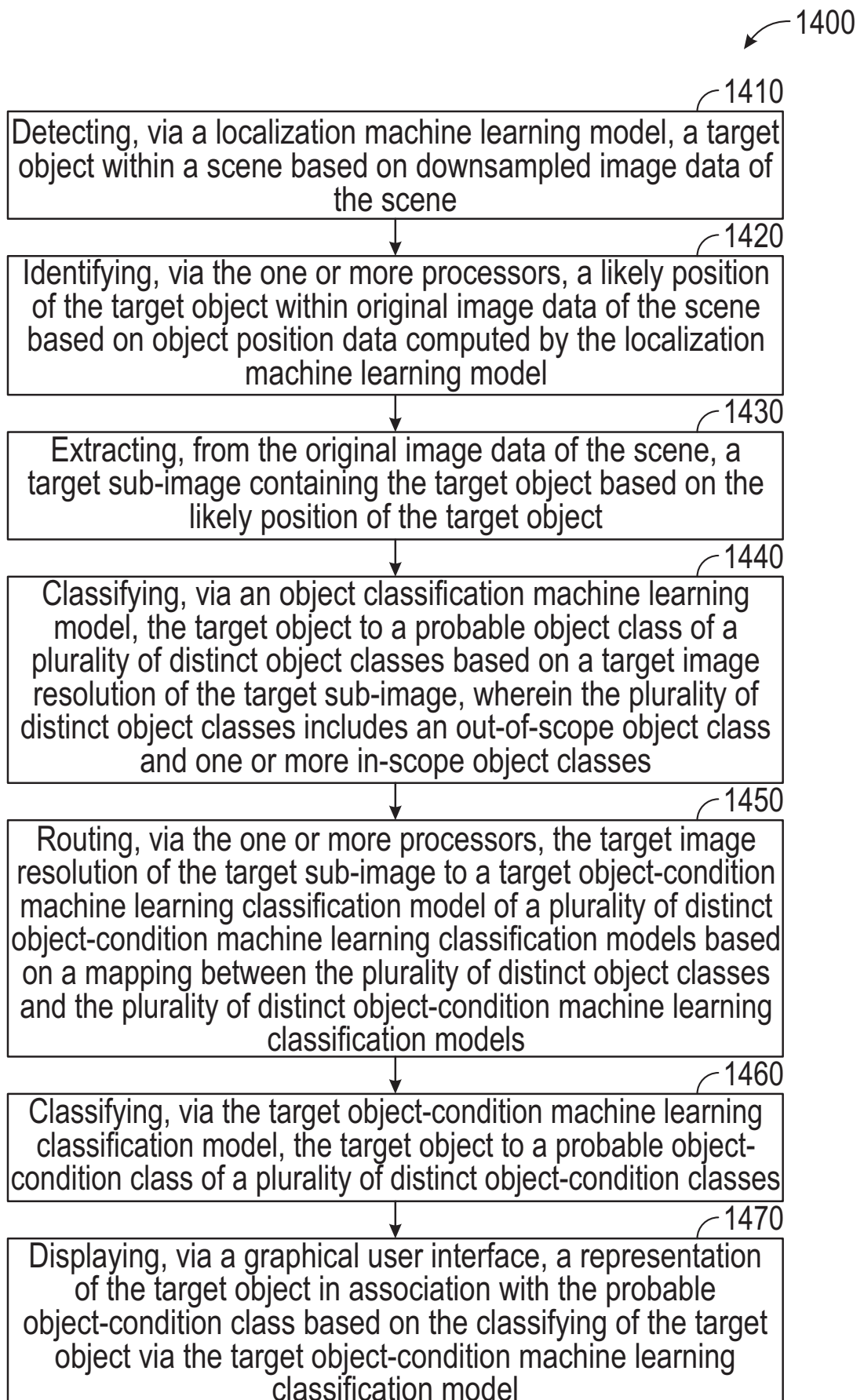
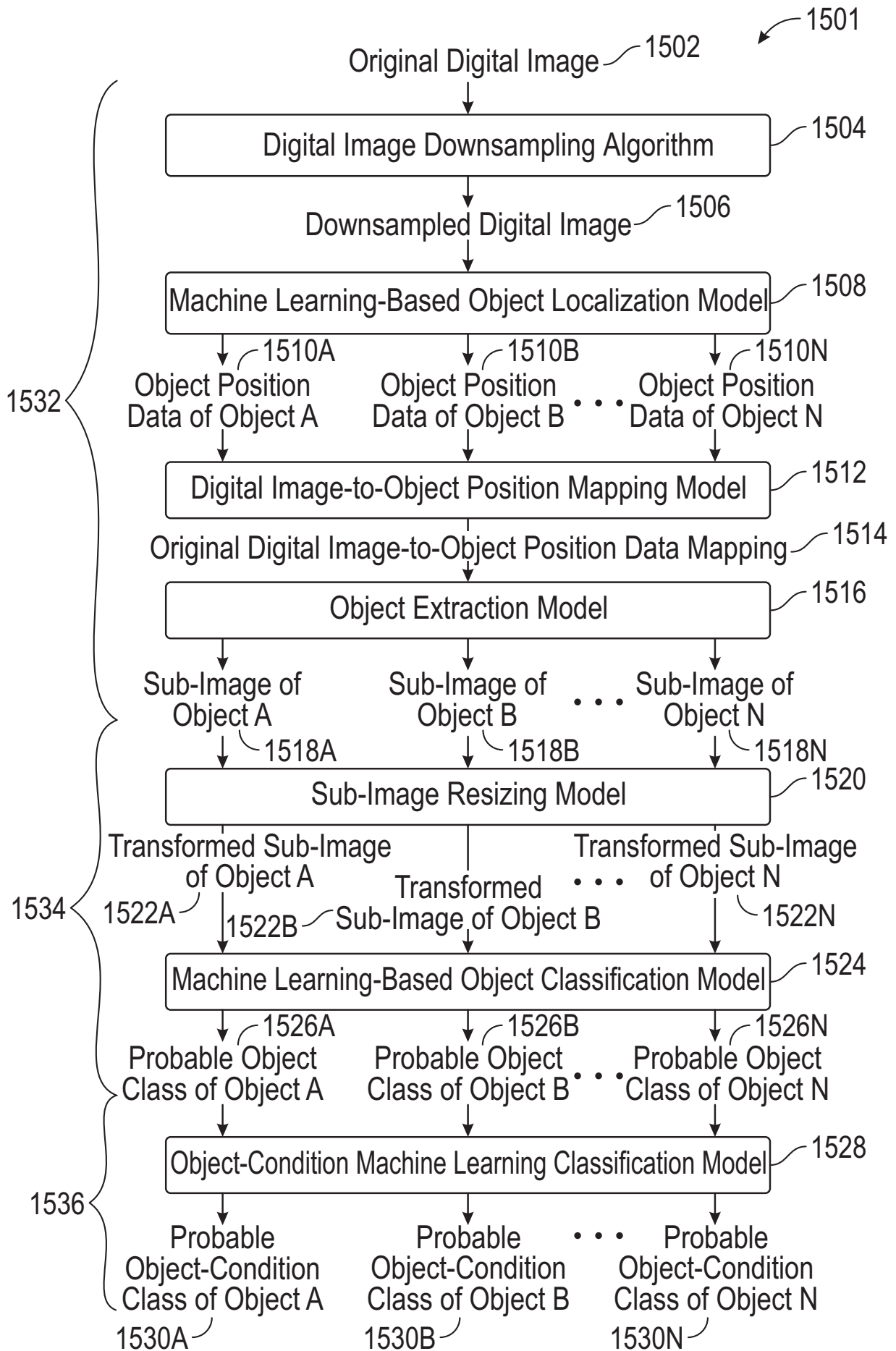


FIG. 13

1300 →



**FIG. 14**



**FIG. 15**

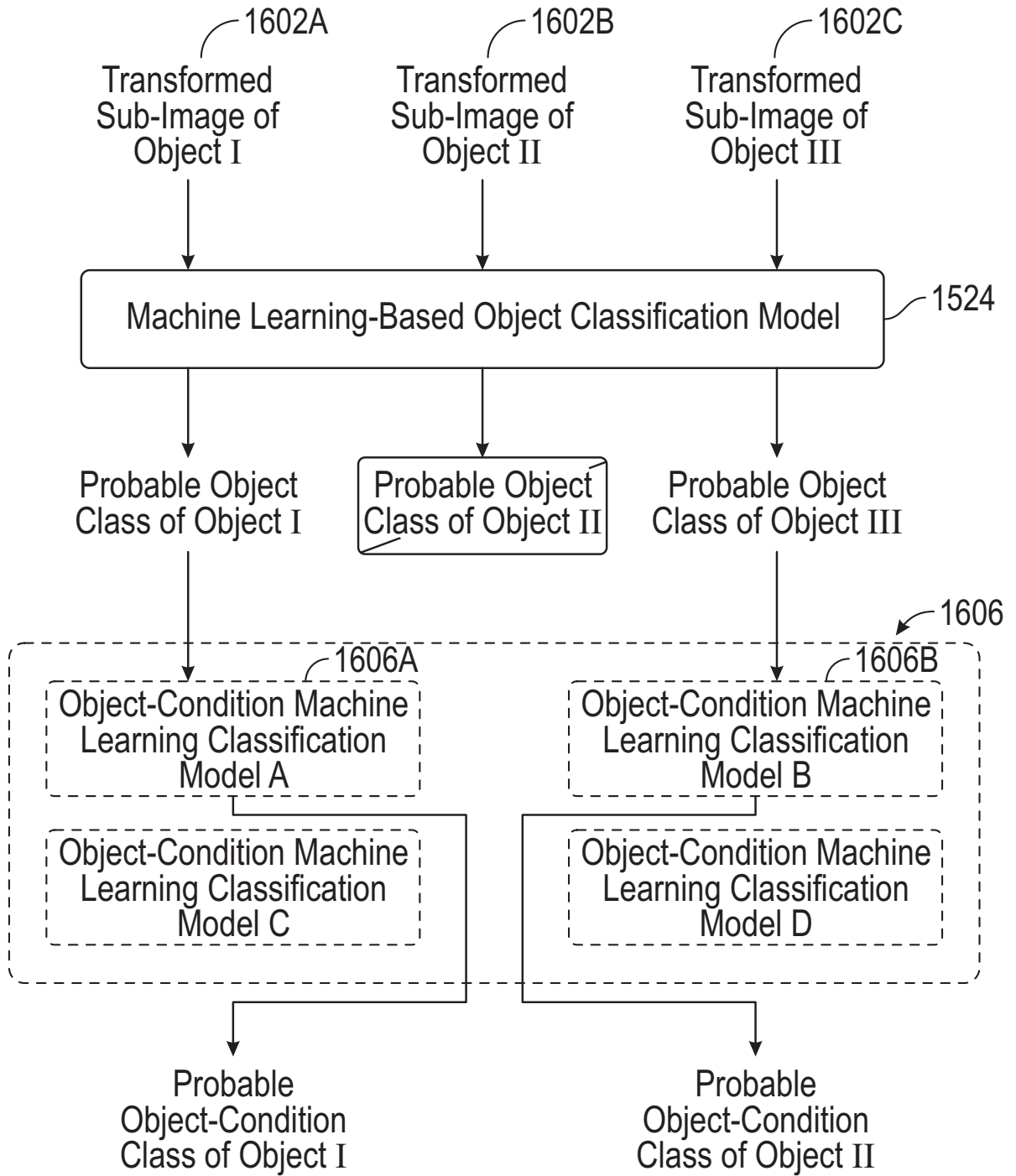


FIG. 16

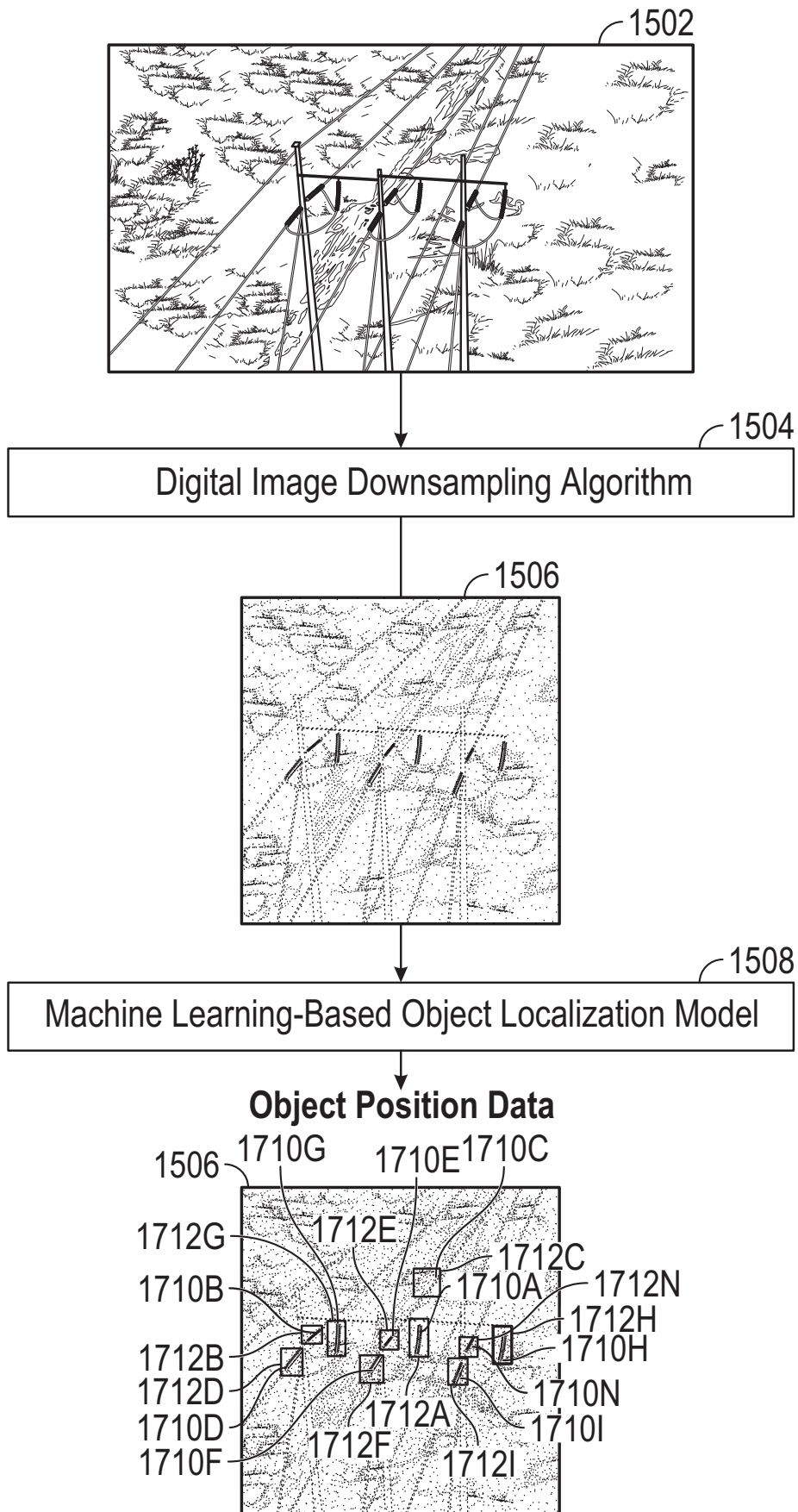


FIG. 17

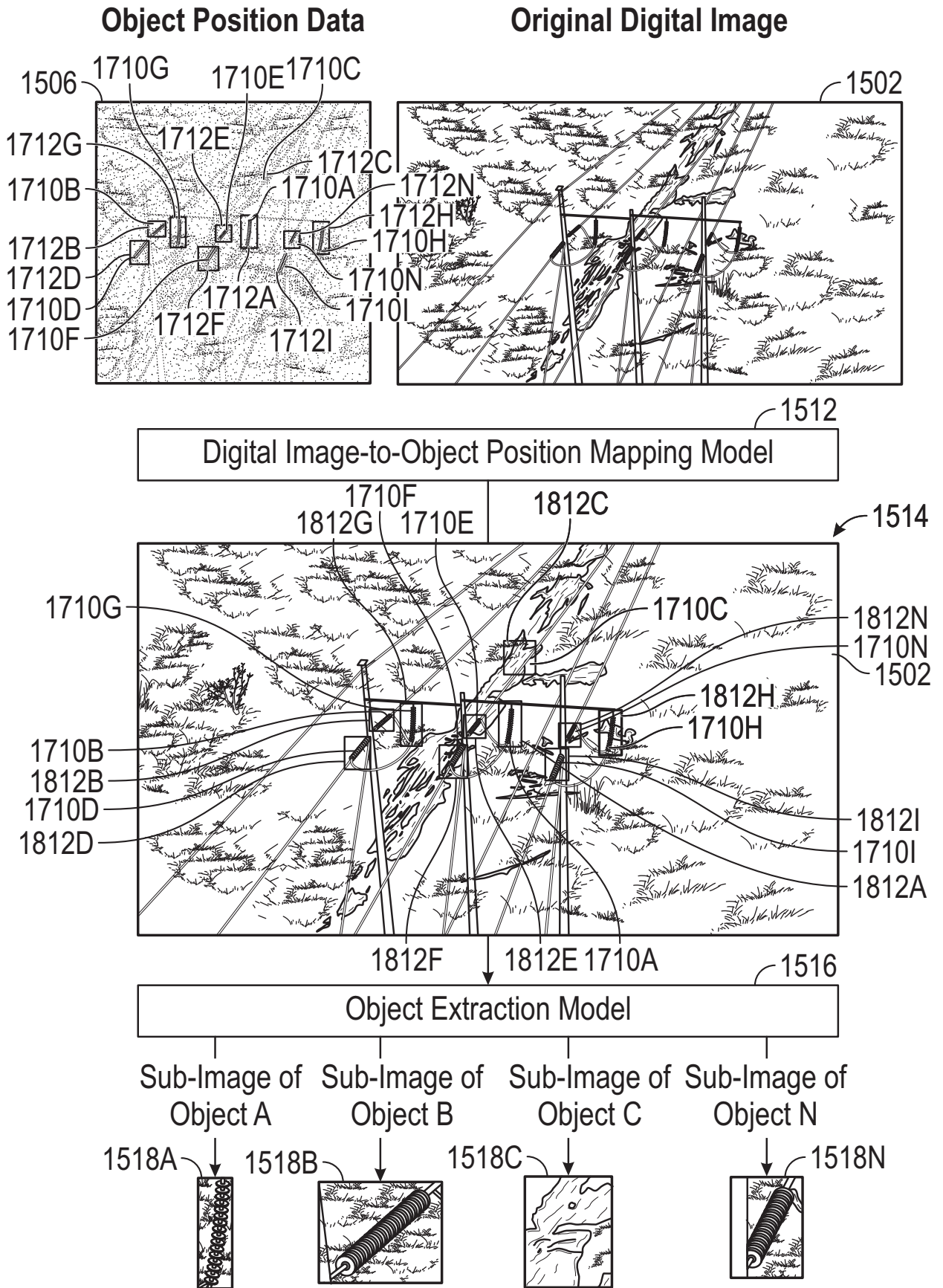


FIG. 18

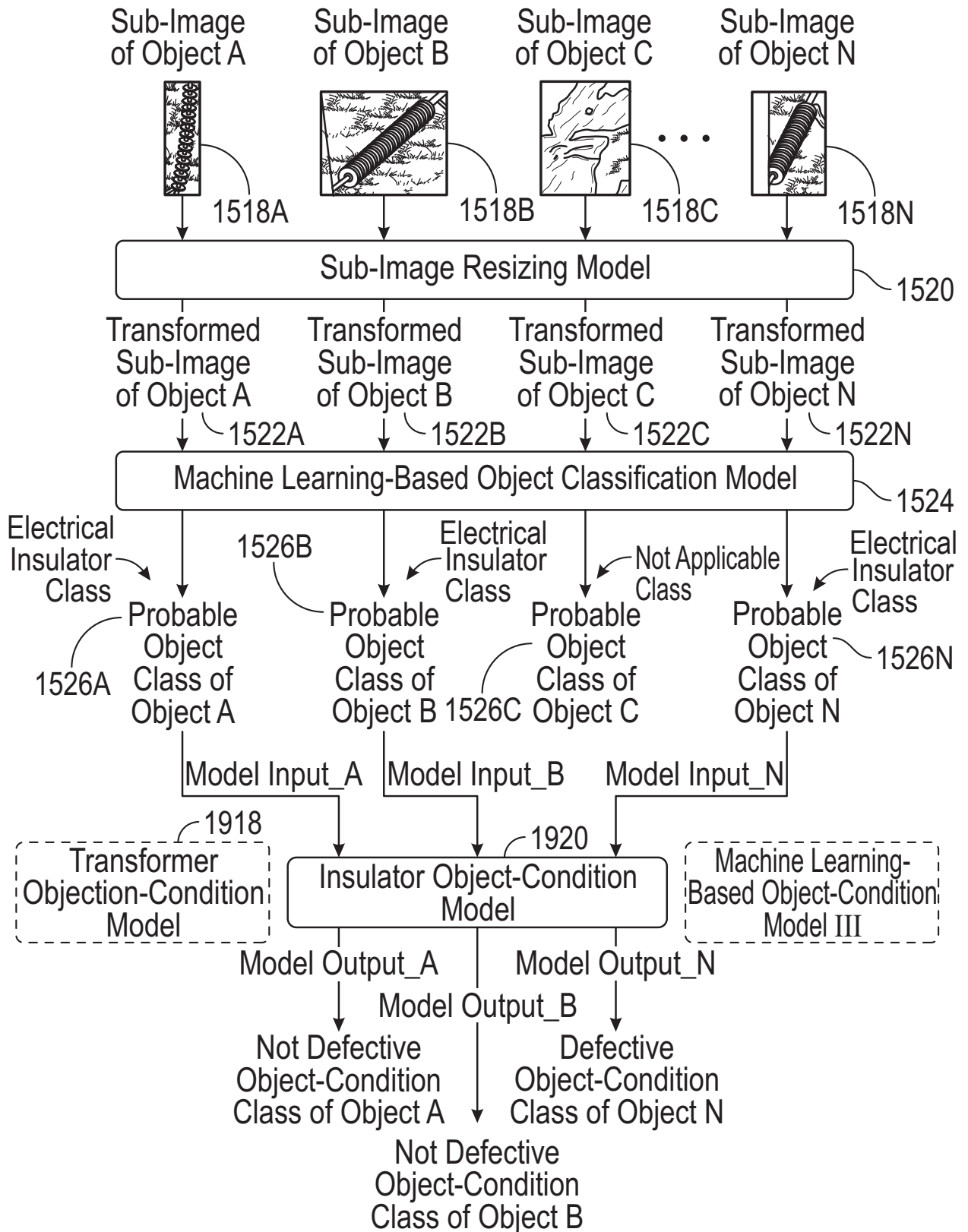


FIG. 19

↙ 2010

LossErr =

↙ 2012

$$\lambda_{\text{coord}} \sum_{i=0}^{S^2} \sum_{j=0}^B L_{ij}^{\text{obj}} [(Z_x^{ij} - \hat{Z}_x^l)^2 + (Z_y^{ij} - \hat{Z}_y^l)^2 + (Z_w^{ij} - \hat{Z}_w^l)^2 + (Z_h^{ij} - \hat{Z}_h^l)^2]$$

↙ 2014

$$+\lambda_{\text{obj}} \sum_{i=0}^{S^2} \sum_{j=0}^B L_{ij}^{\text{obj}} (C_{ij} - 1)^2$$

$$+\lambda_{\text{noobj}} \sum_{i=0}^{S^2} \sum_{j=0}^B L_{ij}^{\text{noobj}} (C_{ij} - 0)^2$$

$$+\lambda_{\text{class}} \sum_{i=0}^{S^2} L_{ij}^{\text{obj}} \sum_{c \in \text{classes}} (p_{ij}(c) - \hat{p}^l(c))^2$$

↙ 2016

↙ 2020

LossErr =

↙ 2012

$$\lambda_{\text{coord}} \sum_{i=0}^{S^2} \sum_{j=0}^B L_{ij}^{\text{obj}} [(Z_x^{ij} - \hat{Z}_x^l)^2 + (Z_y^{ij} - \hat{Z}_y^l)^2 + (Z_w^{ij} - \hat{Z}_w^l)^2 + (Z_h^{ij} - \hat{Z}_h^l)^2]$$

$$+\lambda_{\text{obj}} \sum_{i=0}^{S^2} \sum_{j=0}^B L_{ij}^{\text{obj}} (C_{ij} - 1)^2$$

$$+\lambda_{\text{noobj}} \sum_{i=0}^{S^2} \sum_{j=0}^B L_{ij}^{\text{noobj}} (C_{ij} - 0)^2$$

↙ 2014

**FIG. 20**