

FIG. 1A

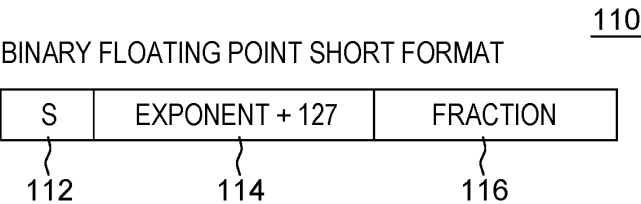


FIG. 1B

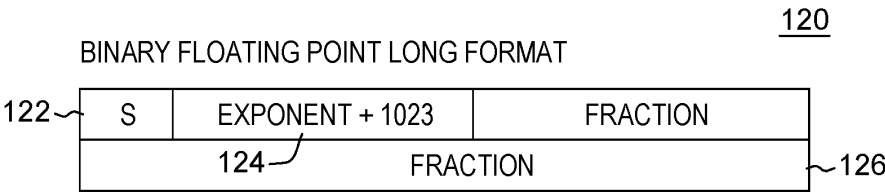


FIG. 1C

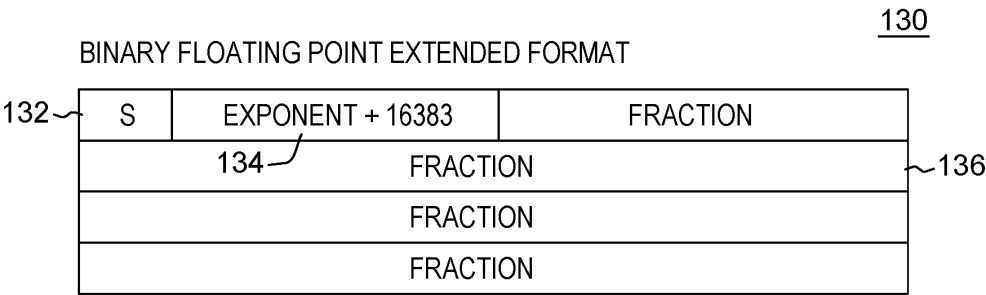


FIG. 1D

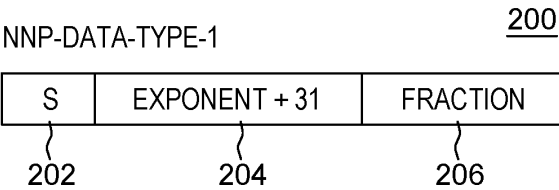


FIG. 2

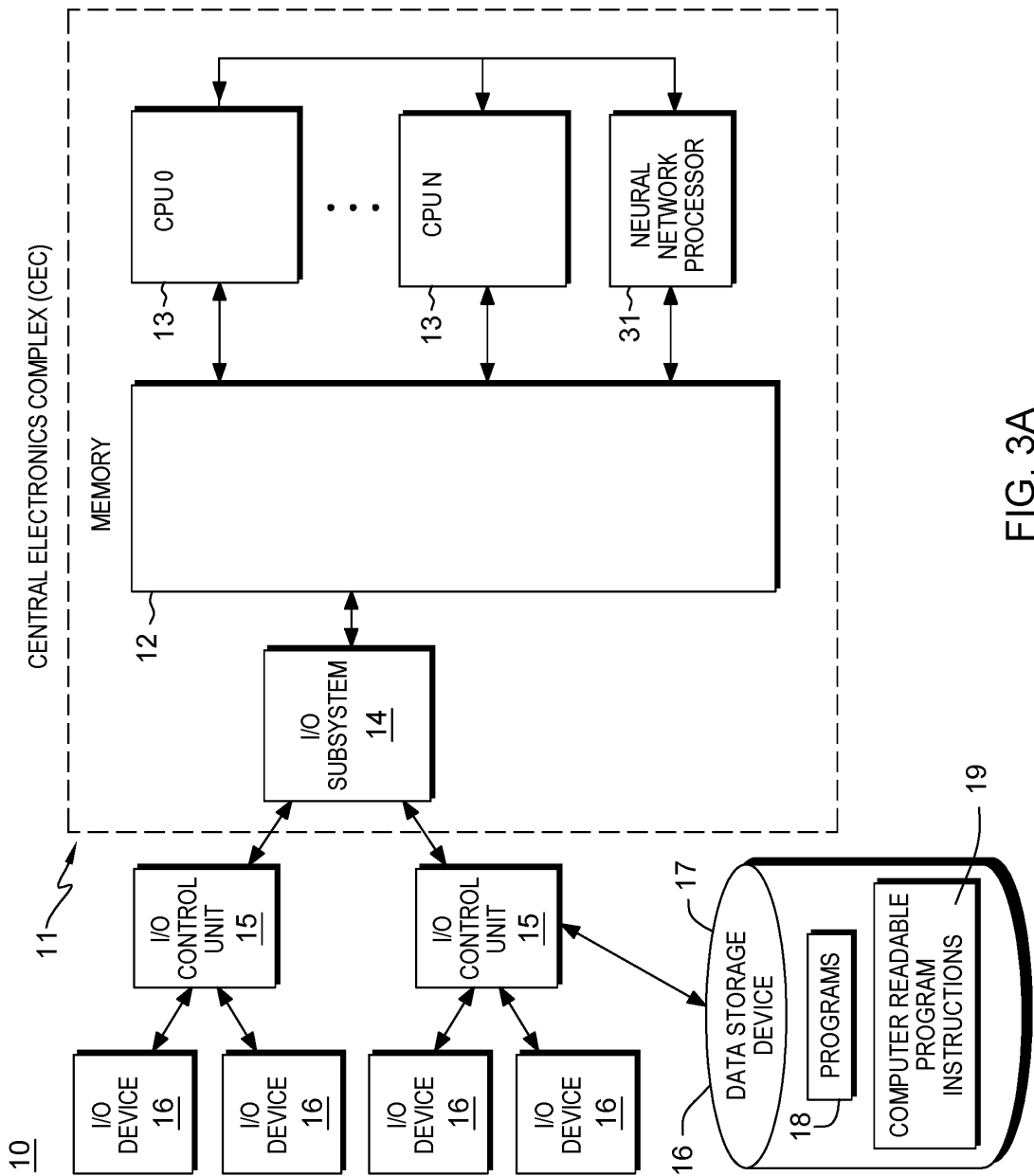


FIG. 3A

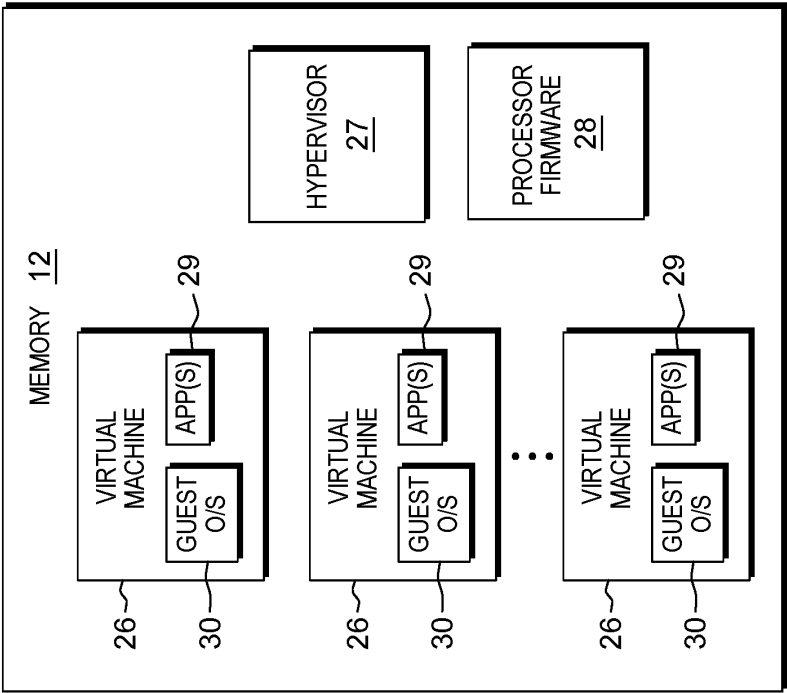


FIG. 3C

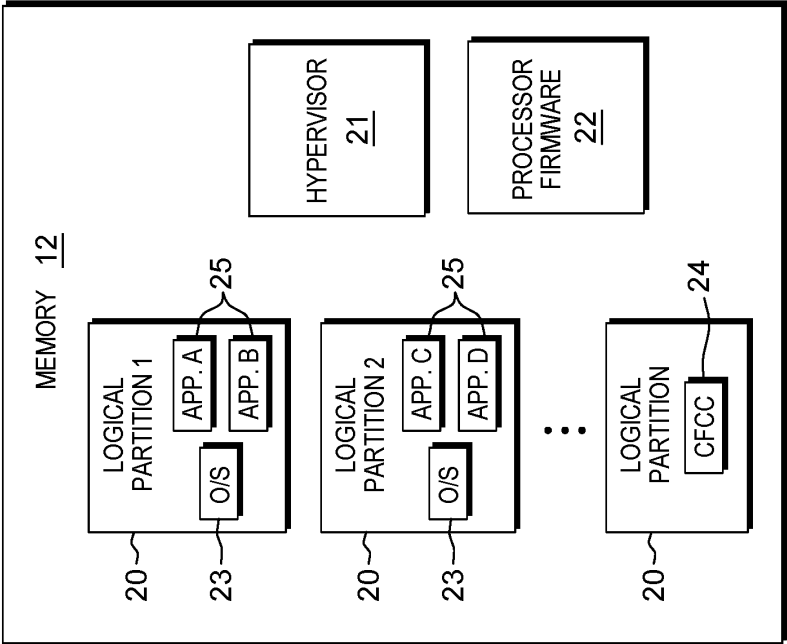


FIG. 3B

4/19

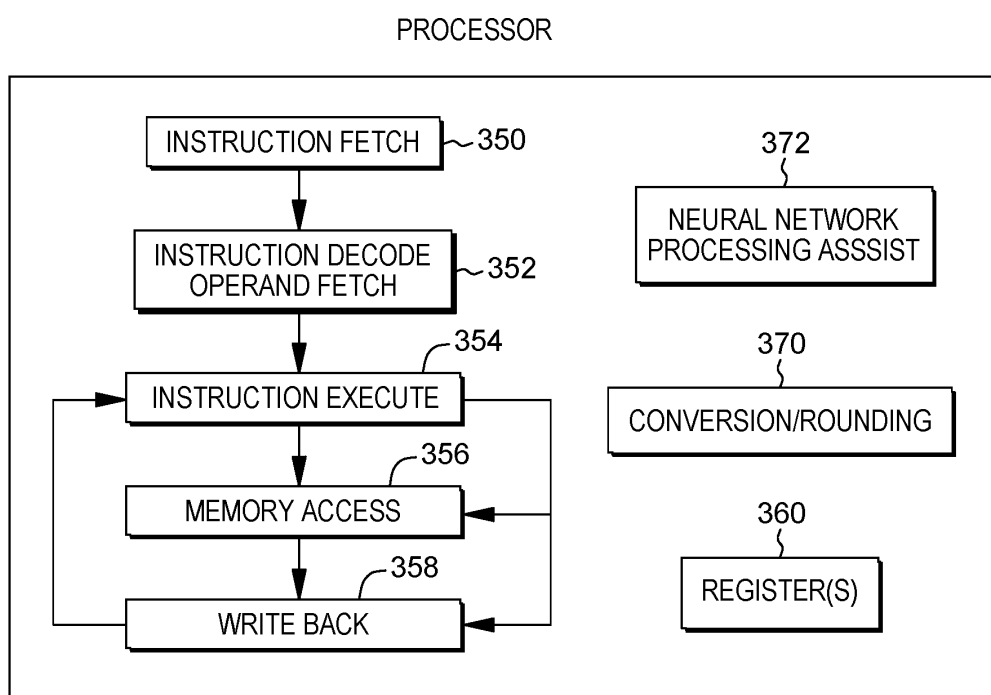


FIG. 3D

5/19

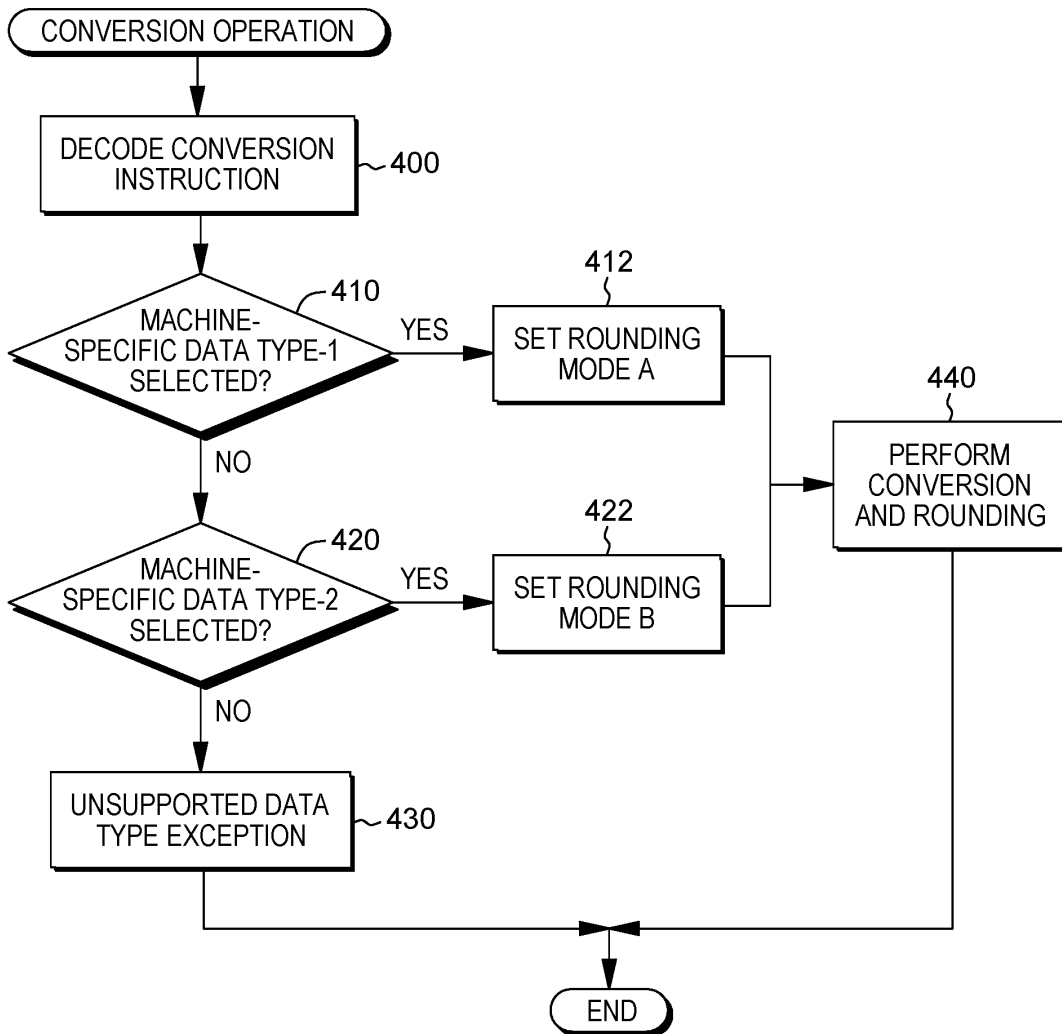


FIG. 4A

6/19

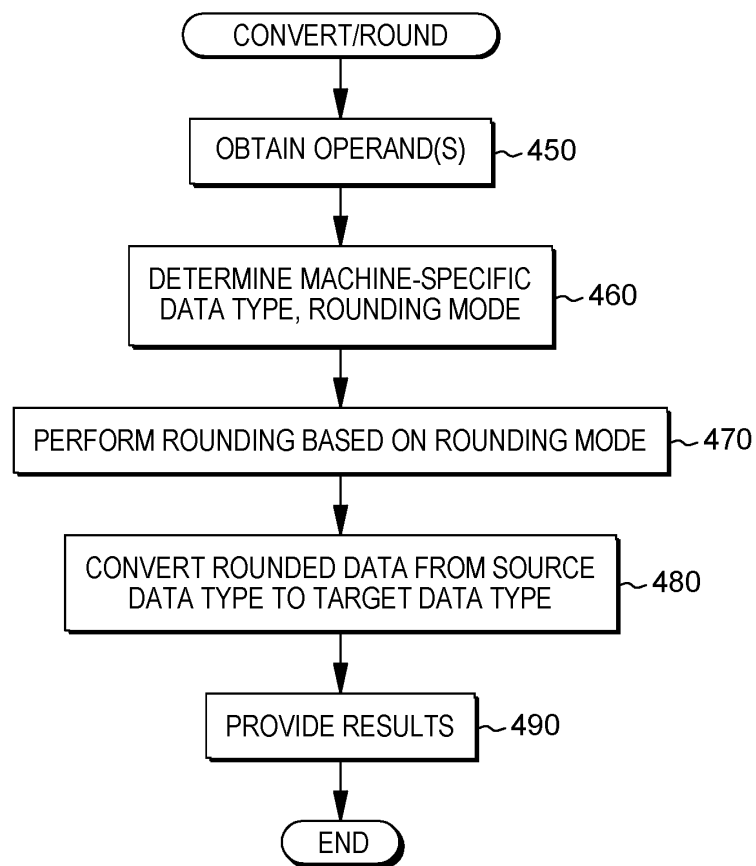


FIG. 4B

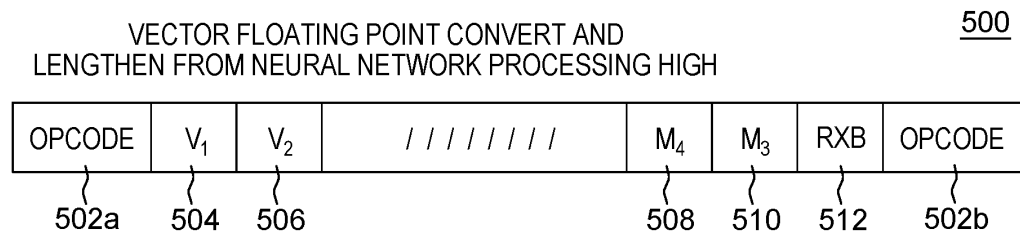


FIG. 5A

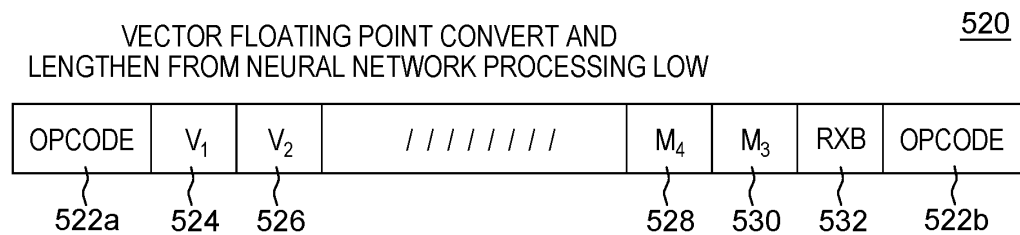


FIG. 5B

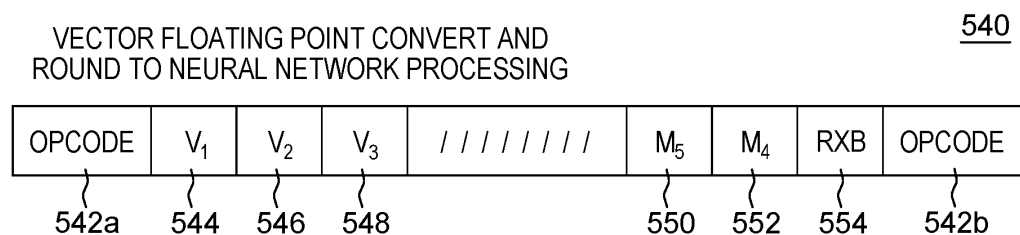


FIG. 5C

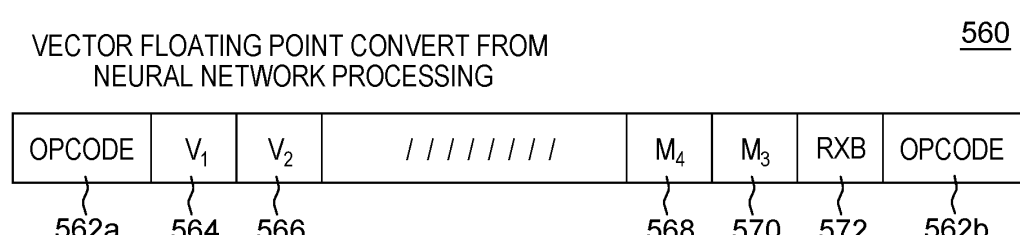


FIG. 5D

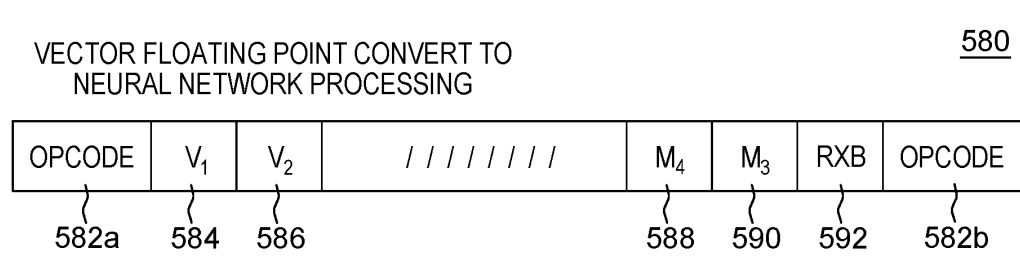


FIG. 5E

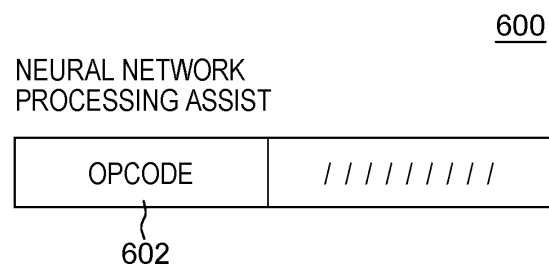


FIG. 6A

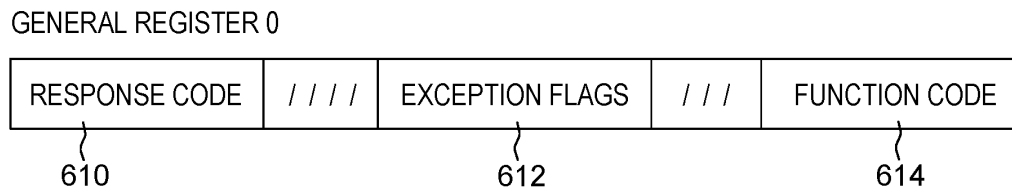


FIG. 6B

| CODE<br>(DEC) | CODE<br>(HEX) | FUNCTION                 | PARAMETER<br>BLOCK SIZE<br>(BYTES) |
|---------------|---------------|--------------------------|------------------------------------|
| 0             | 0             | NNPA - QAF               | 256                                |
| 16            | 10            | NNPA - ADD               | 4096                               |
| 17            | 11            | NNPA - SUB               | 4096                               |
| 18            | 12            | NNPA - MUL               | 4096                               |
| 19            | 13            | NNPA - DIV               | 4096                               |
| 20            | 14            | NNPA - MIN               | 4096                               |
| 21            | 15            | NNPA - MAX               | 4096                               |
| 32            | 20            | NNPA - LOG               | 4096                               |
| 33            | 21            | NNPA - EXP               | 4096                               |
| 49            | 31            | NNPA - RELU              | 4096                               |
| 50            | 32            | NNPA - TANH              | 4096                               |
| 51            | 33            | NNPA - SIGMOID           | 4096                               |
| 52            | 34            | NNPA - SOFTMAX           | 4096                               |
| 64            | 40            | NNPA - BATCHNORM         | 4096                               |
| 80            | 50            | NNPA - MAXPOOL2D         | 4096                               |
| 81            | 51            | NNPA - AVGPOOL2D         | 4096                               |
| 96            | 60            | NNPA - LSTMACT           | 4096                               |
| 97            | 61            | NNPA - GRUACT            | 4096                               |
| 112           | 70            | NNPA - CONVOLUTION       | 4096                               |
| 113           | 71            | NNPA - MATMUL-OP         | 4096                               |
| 114           | 72            | NNPA - MATMUL-OP-BCAST23 | 4096                               |

FIG. 6C

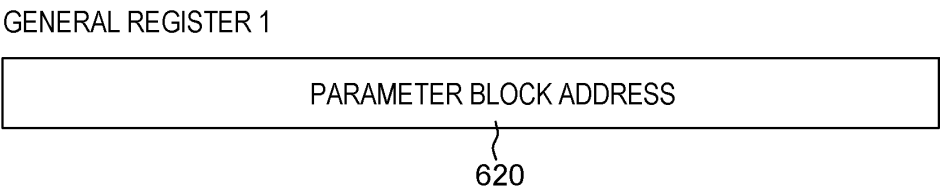


FIG. 6D

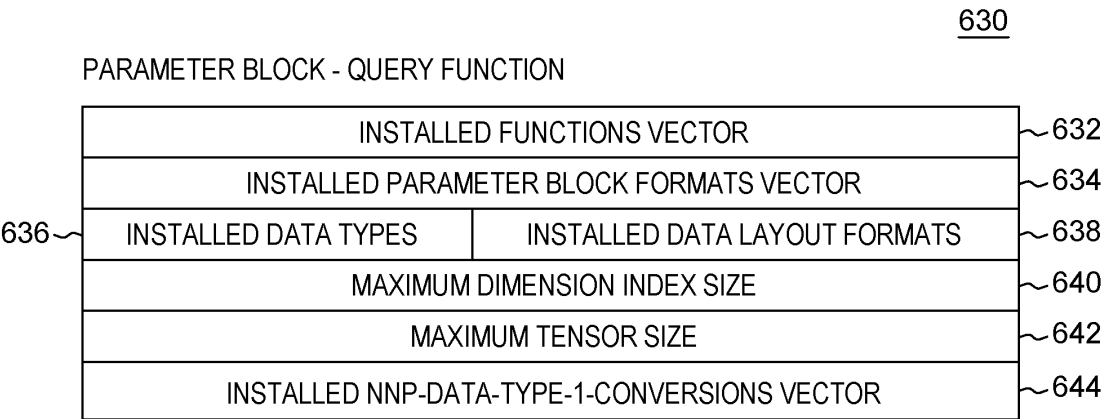


FIG. 6E

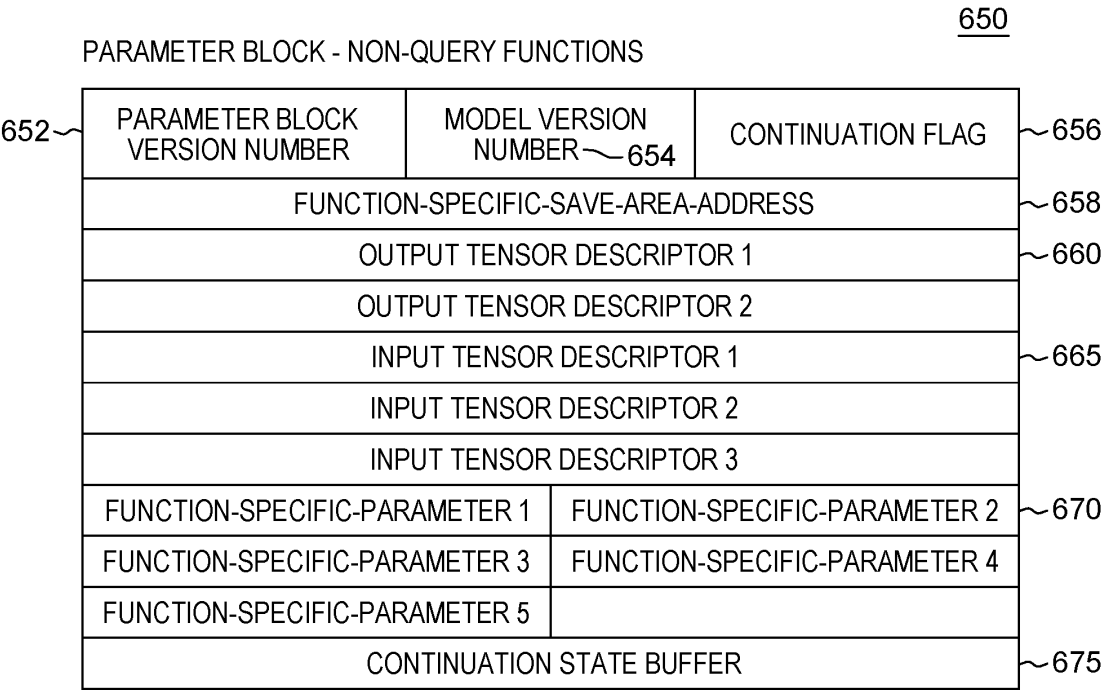


FIG. 6F

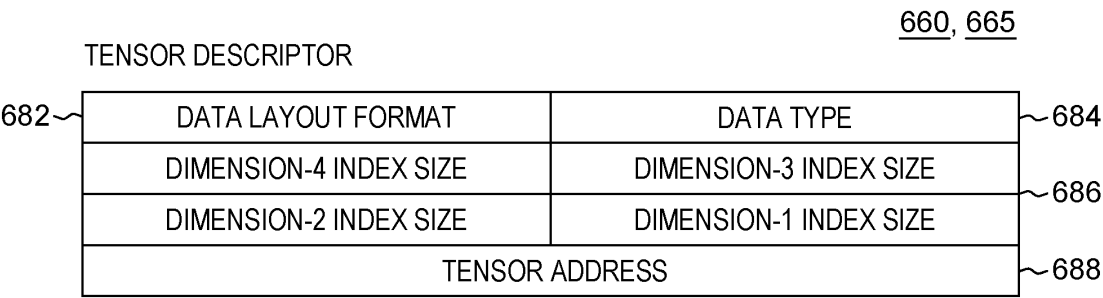
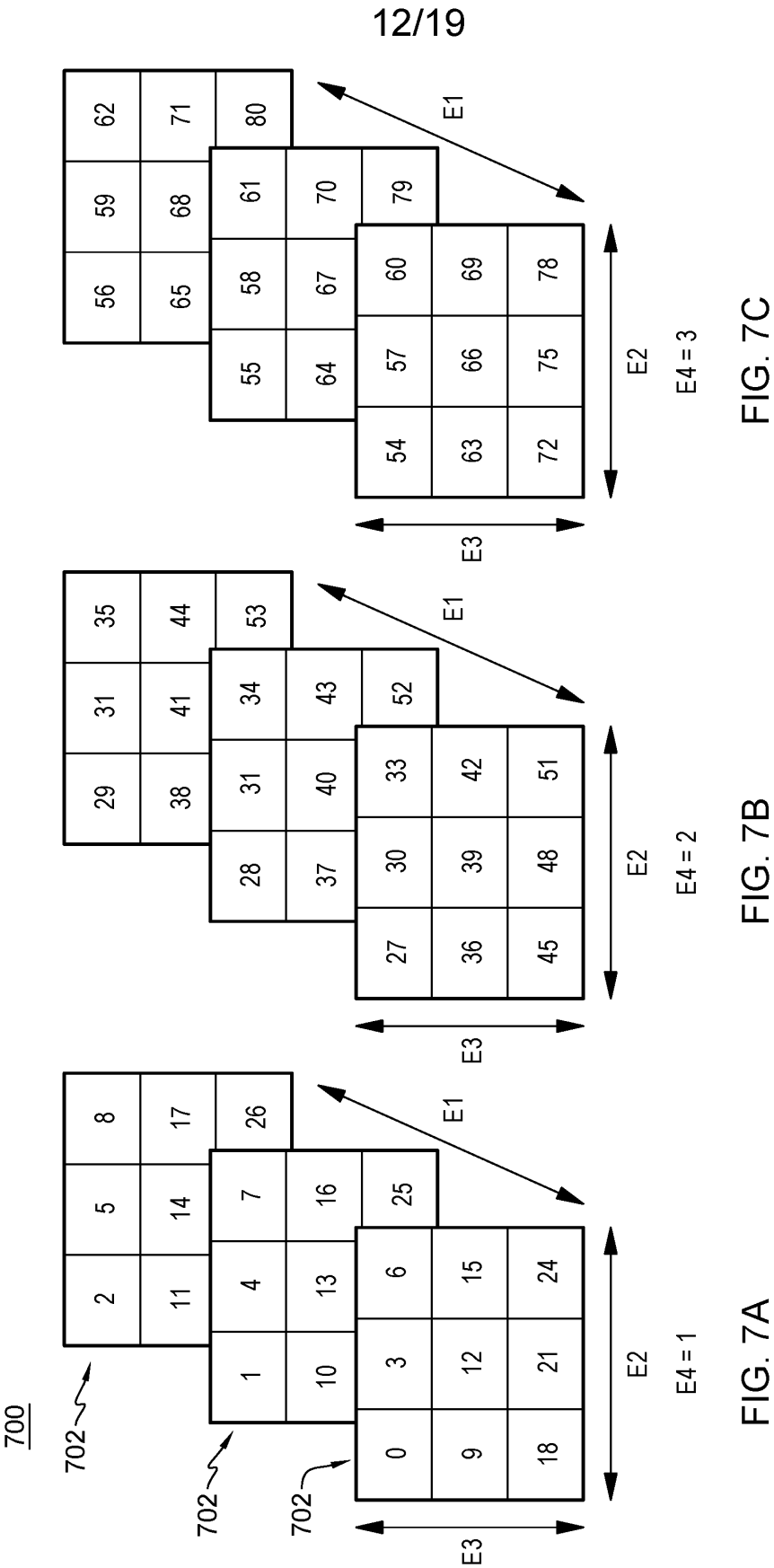


FIG. 6G



**E4 = 1**

**PAGE 0**

| e2_page_idx | e1_page_idx |     |     |         |
|-------------|-------------|-----|-----|---------|
|             | 0           | 1   | 2   | 3 to 63 |
| 0           | 0           | 1   | 2   | PAD     |
| 1           | 3           | 4   | 5   | PAD     |
| 2           | 6           | 7   | 8   | PAD     |
| 3-31        | PAD         | PAD | PAD | PAD     |

**PAGE 1**

| e2_page_idx | e1_page_idx |     |     |         |
|-------------|-------------|-----|-----|---------|
|             | 0           | 1   | 2   | 3 to 63 |
| 0           | 9           | 10  | 11  | PAD     |
| 1           | 12          | 13  | 14  | PAD     |
| 2           | 15          | 16  | 17  | PAD     |
| 3-31        | PAD         | PAD | PAD | PAD     |

**PAGE 2**

| e2_page_idx | e1_page_idx |     |     |         |
|-------------|-------------|-----|-----|---------|
|             | 0           | 1   | 2   | 3 to 63 |
| 0           | 18          | 19  | 20  | PAD     |
| 1           | 21          | 22  | 23  | PAD     |
| 2           | 24          | 25  | 26  | PAD     |
| 3-31        | PAD         | PAD | PAD | PAD     |

**PAGE 3**

| e2_page_idx | e1_page_idx |     |     |         |
|-------------|-------------|-----|-----|---------|
|             | 0           | 1   | 2   | 3 to 63 |
| 0           | 27          | 28  | 29  | PAD     |
| 1           | 30          | 31  | 32  | PAD     |
| 2           | 33          | 34  | 35  | PAD     |
| 3-31        | PAD         | PAD | PAD | PAD     |

**PAGE 4**

| e2_page_idx | e1_page_idx |     |     |         |
|-------------|-------------|-----|-----|---------|
|             | 0           | 1   | 2   | 3 to 63 |
| 0           | 36          | 37  | 38  | PAD     |
| 1           | 39          | 40  | 41  | PAD     |
| 2           | 42          | 43  | 44  | PAD     |
| 3-31        | PAD         | PAD | PAD | PAD     |

**PAGE 5**

| e2_page_idx | e1_page_idx |     |     |         |
|-------------|-------------|-----|-----|---------|
|             | 0           | 1   | 2   | 3 to 63 |
| 0           | 45          | 46  | 47  | PAD     |
| 1           | 48          | 49  | 50  | PAD     |
| 2           | 51          | 52  | 53  | PAD     |
| 3-31        | PAD         | PAD | PAD | PAD     |

**PAGE 6**

| e2_page_idx | e1_page_idx |     |     |         |
|-------------|-------------|-----|-----|---------|
|             | 0           | 1   | 2   | 3 to 63 |
| 0           | 54          | 55  | 56  | PAD     |
| 1           | 57          | 58  | 59  | PAD     |
| 2           | 60          | 61  | 62  | PAD     |
| 3-31        | PAD         | PAD | PAD | PAD     |

**PAGE 7**

| e2_page_idx | e1_page_idx |     |     |         |
|-------------|-------------|-----|-----|---------|
|             | 0           | 1   | 2   | 3 to 63 |
| 0           | 63          | 64  | 65  | PAD     |
| 1           | 66          | 67  | 68  | PAD     |
| 2           | 69          | 70  | 71  | PAD     |
| 3-31        | PAD         | PAD | PAD | PAD     |

**PAGE 8**

| e2_page_idx | e1_page_idx |     |     |         |
|-------------|-------------|-----|-----|---------|
|             | 0           | 1   | 2   | 3 to 63 |
| 0           | 72          | 73  | 74  | PAD     |
| 1           | 75          | 76  | 77  | PAD     |
| 2           | 78          | 79  | 80  | PAD     |
| 3-31        | PAD         | PAD | PAD | PAD     |

**E4 = 2**

**E4 = 3**

FIG. 8A

FIG. 8B

FIG. 8C

14/19

OBTAIN AN INSTRUCTION TO CONVERT DATA FROM A SOURCE DATA TYPE TO A TARGET DATA TYPE ~900

THE SOURCE DATA TYPE IS SELECTED FROM ONE OR MORE SOURCE DATA TYPES SUPPORTED BY THE INSTRUCTION ~902

THE TARGET DATA TYPE IS SELECTED FROM ONE OR MORE TARGET DATA TYPES SUPPORTED BY THE INSTRUCTION ~904

BASED ON A SELECTED DATA TYPE OF ONE OF THE SOURCE DATA TYPE AND THE TARGET DATA TYPE, A DETERMINATION IS MADE OF A ROUNDING MODE FOR USE BY THE INSTRUCTION ~906

THE ROUNDING MODE IS IMPLICITLY SET BASED ON THE SELECTED DATA TYPE ~908

THE ROUNDING MODE IS ASSIGNED TO THE SELECTED DATA TYPE ~910

A CONVERSION OF THE DATA FROM THE SOURCE DATA TYPE TO THE TARGET DATA TYPE IS PERFORMED ~912

THE CONVERSION INCLUDES PERFORMING A ROUNDING OPERATION USING THE ROUNDING MODE IMPLICITLY SET BASED ON THE SELECTED DATA TYPE ~914

THE PERFORMING THE CONVERSION PROVIDES A RESULT IN THE TARGET DATA TYPE ~916

WRITE THE RESULT TO A SELECT LOCATION ~918

THE SELECTED DATA TYPE IS THE TARGET DATA TYPE SPECIFIED USING THE INSTRUCTION ~920

THE TARGET DATA TYPE IS A MACHINE-SPECIFIC DATA TYPE SPECIFIED USING THE INSTRUCTION ~922

THE MACHINE-SPECIFIC DATA TYPE IS A NEURAL NETWORK PROCESSING-DATA-TYPE-1 DATA TYPE ~924

THE ROUNDING MODE ASSIGNED TO THE NEURAL NETWORK PROCESSING-DATA-TYPE-1 DATA TYPE IS A ROUND TO NEAREST TIES AWAY FROM ZERO ~926

THE SOURCE DATA TYPE IS A STANDARD DATA TYPE SPECIFIED USING THE INSTRUCTION ~928

FIG. 9A

15/19

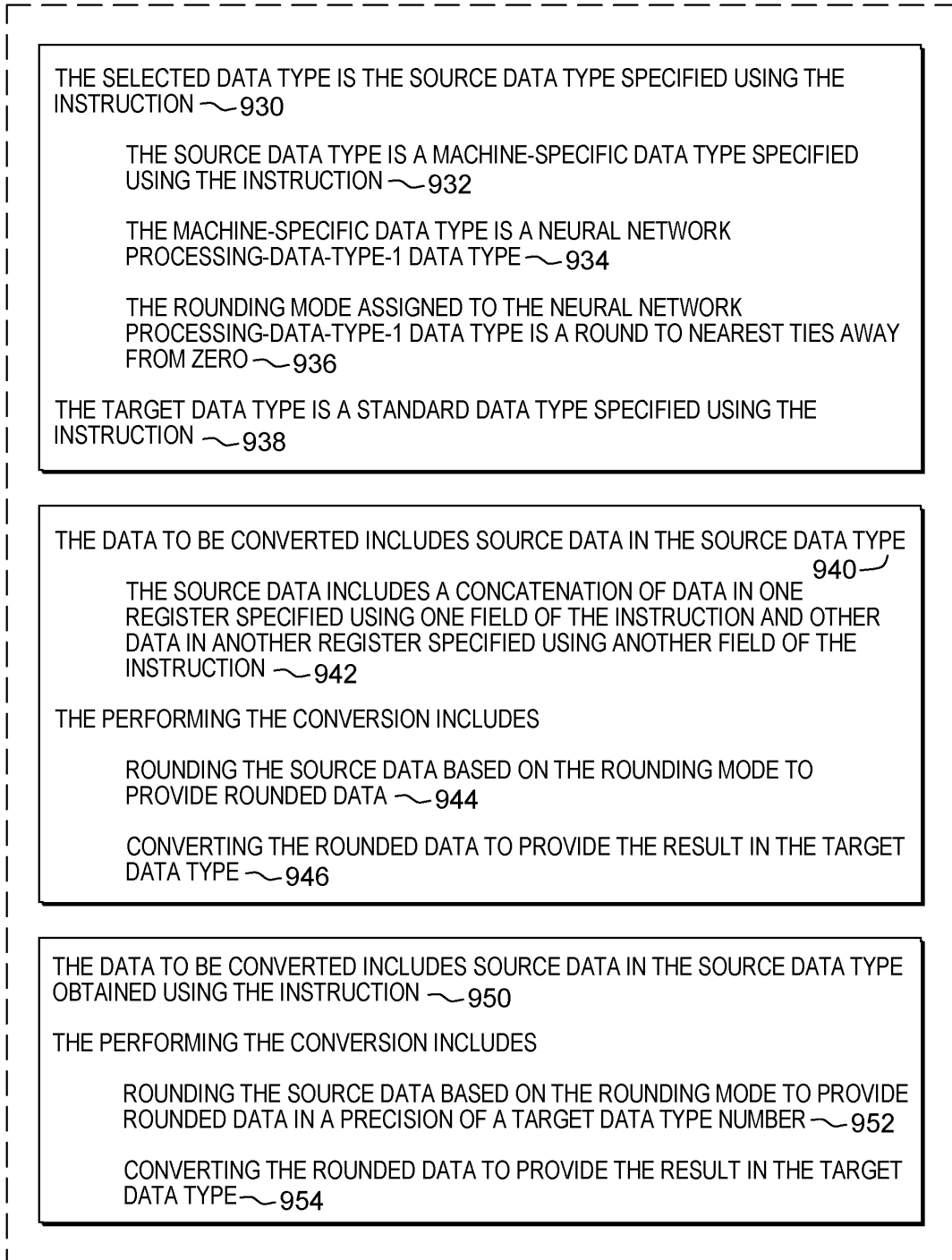


FIG. 9B

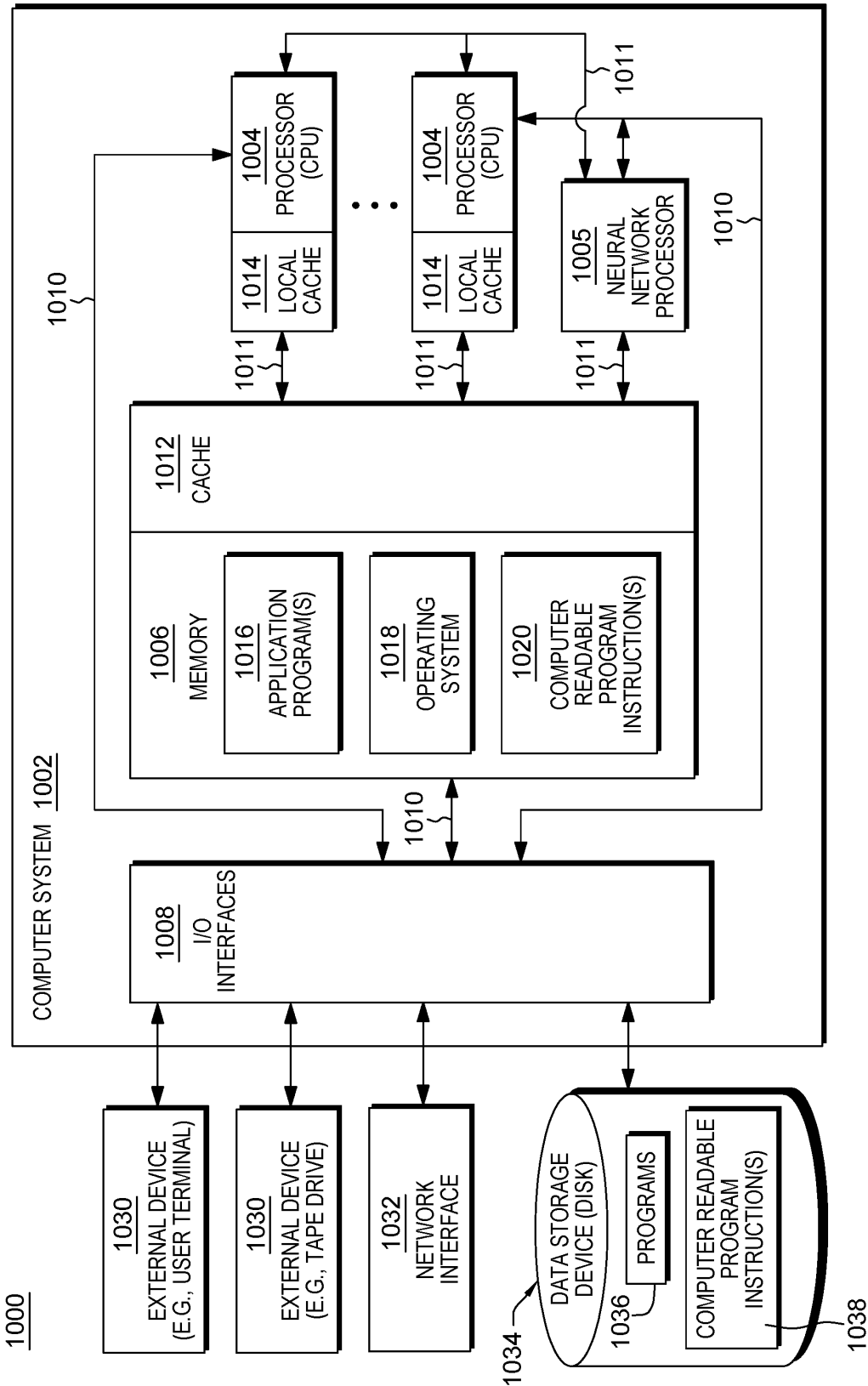


FIG. 10

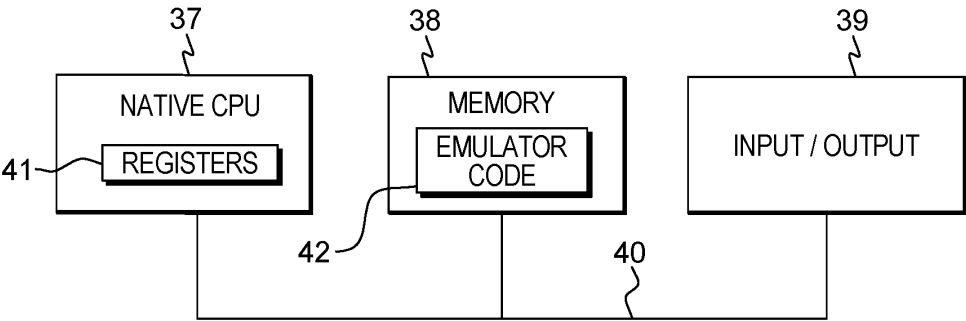


FIG. 11A

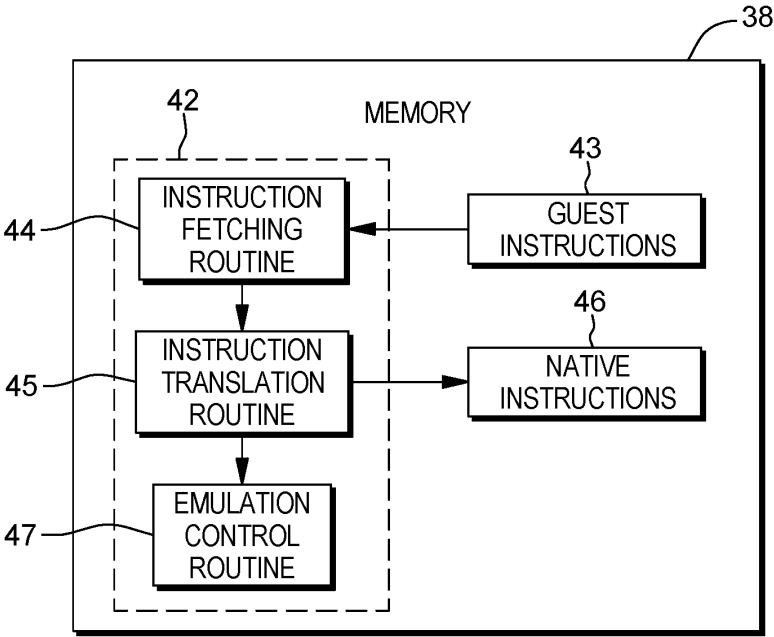


FIG. 11B

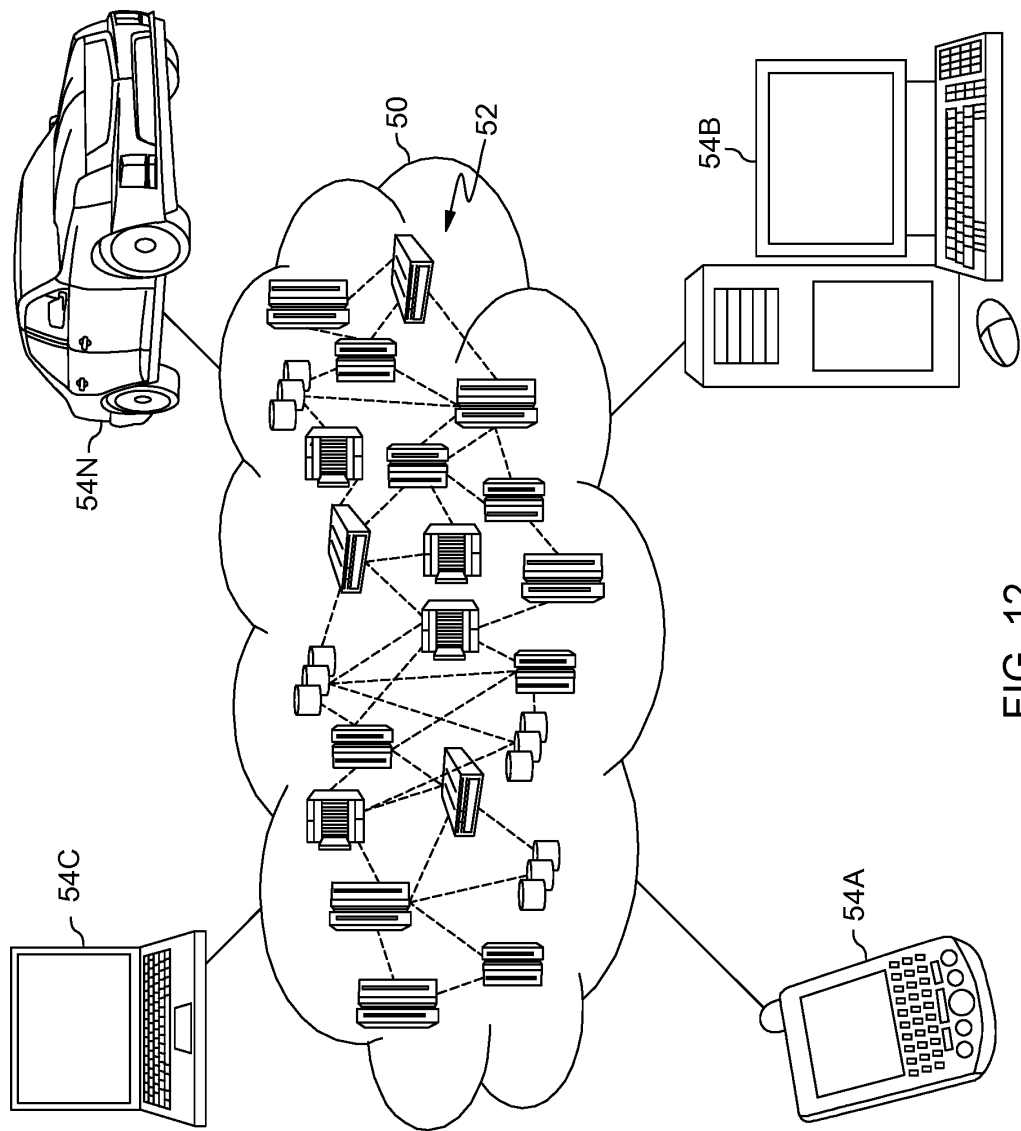


FIG. 12

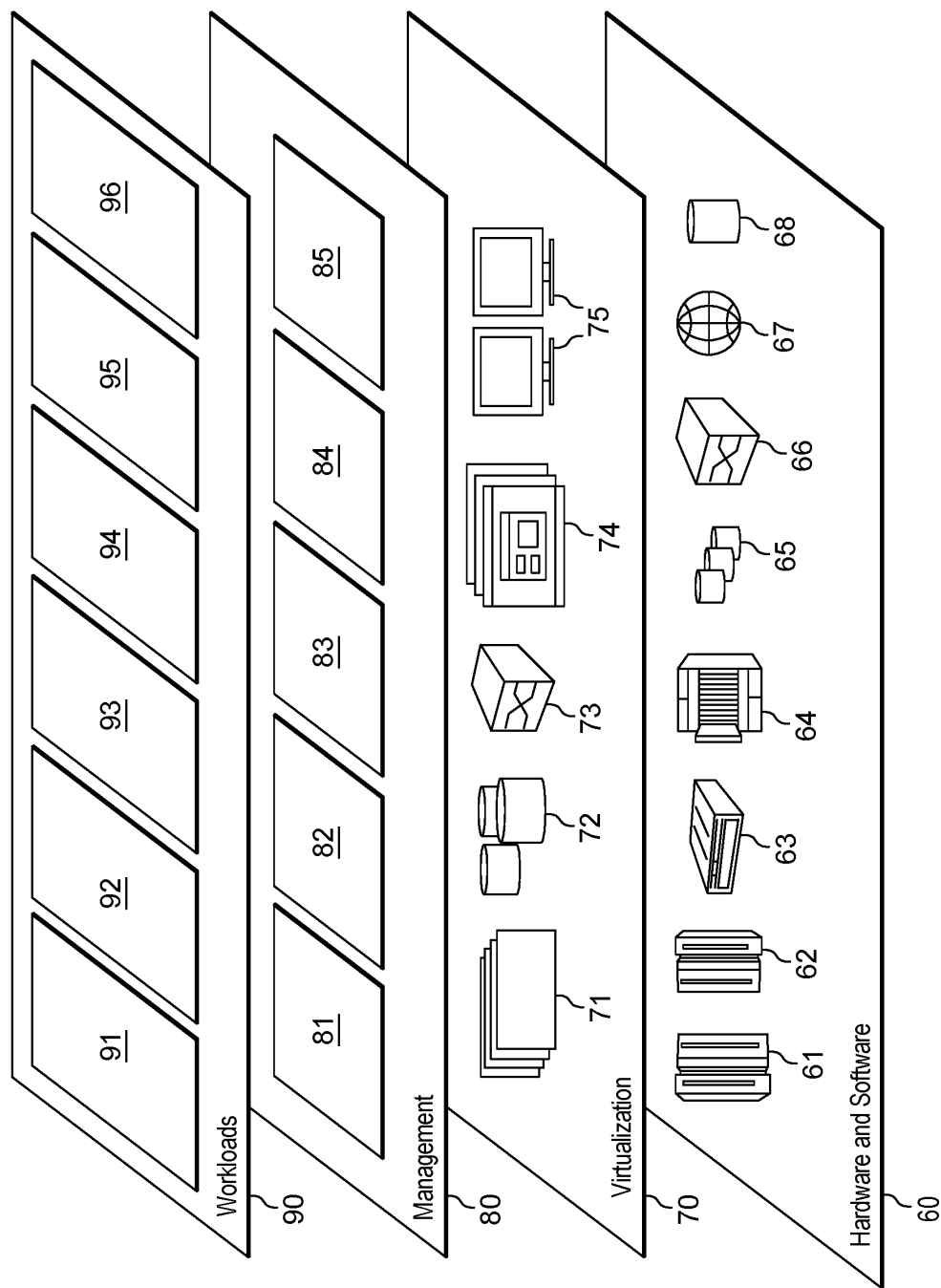


FIG. 13