

1/13

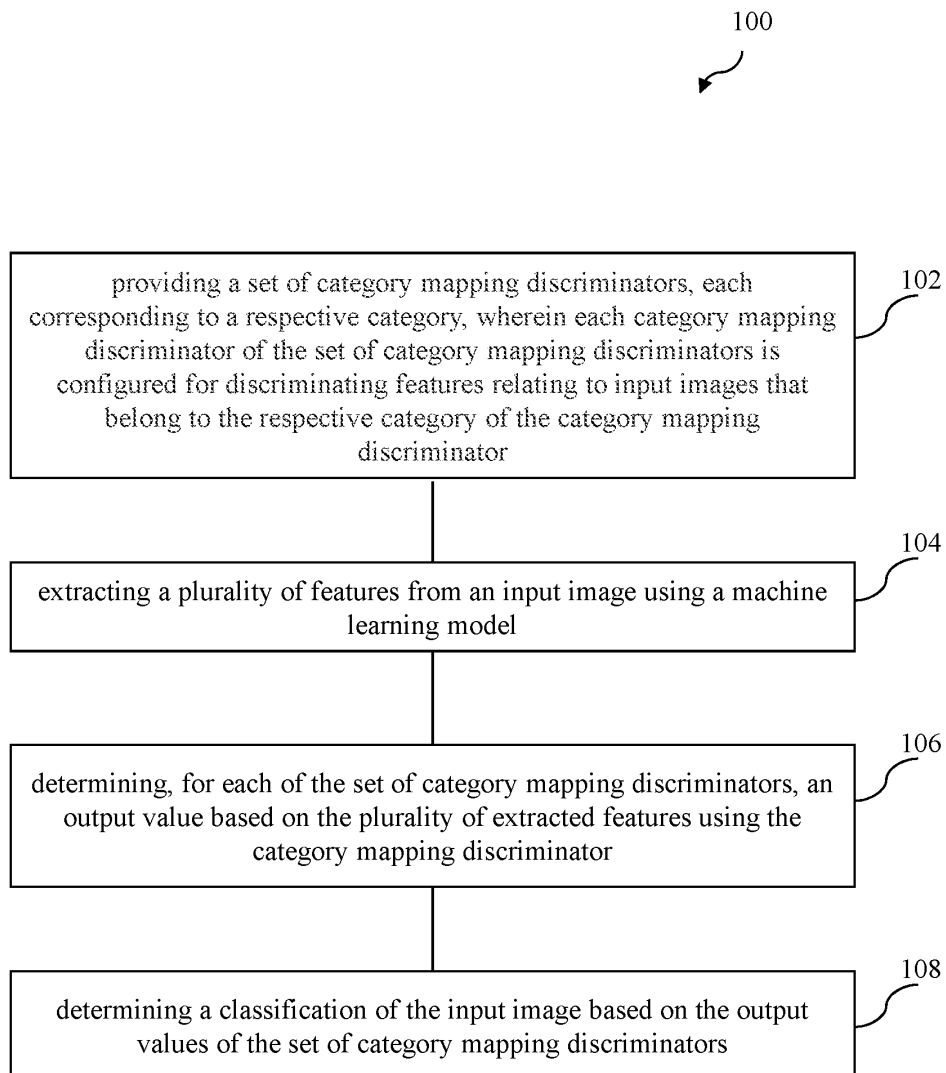


FIG. 1

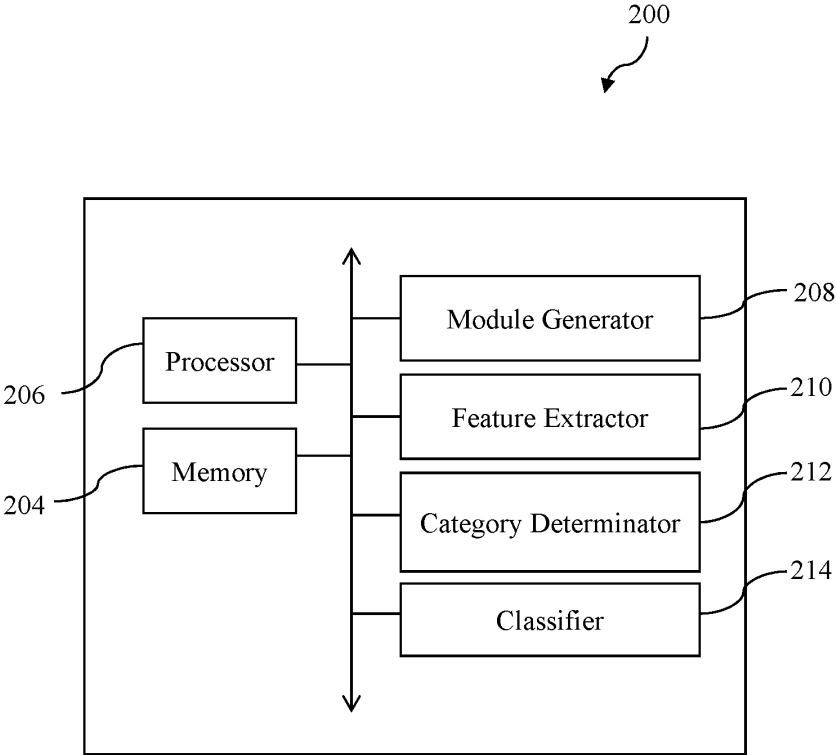


FIG. 2

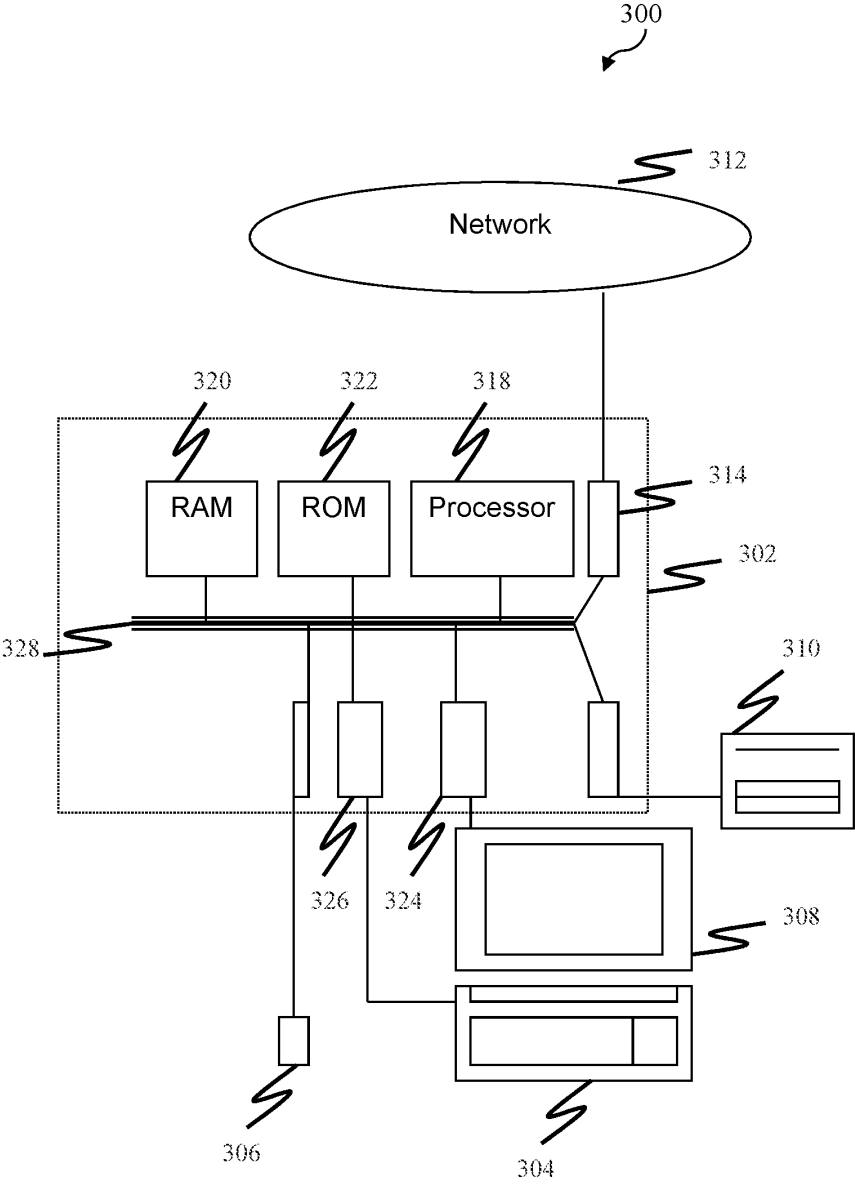


FIG. 3

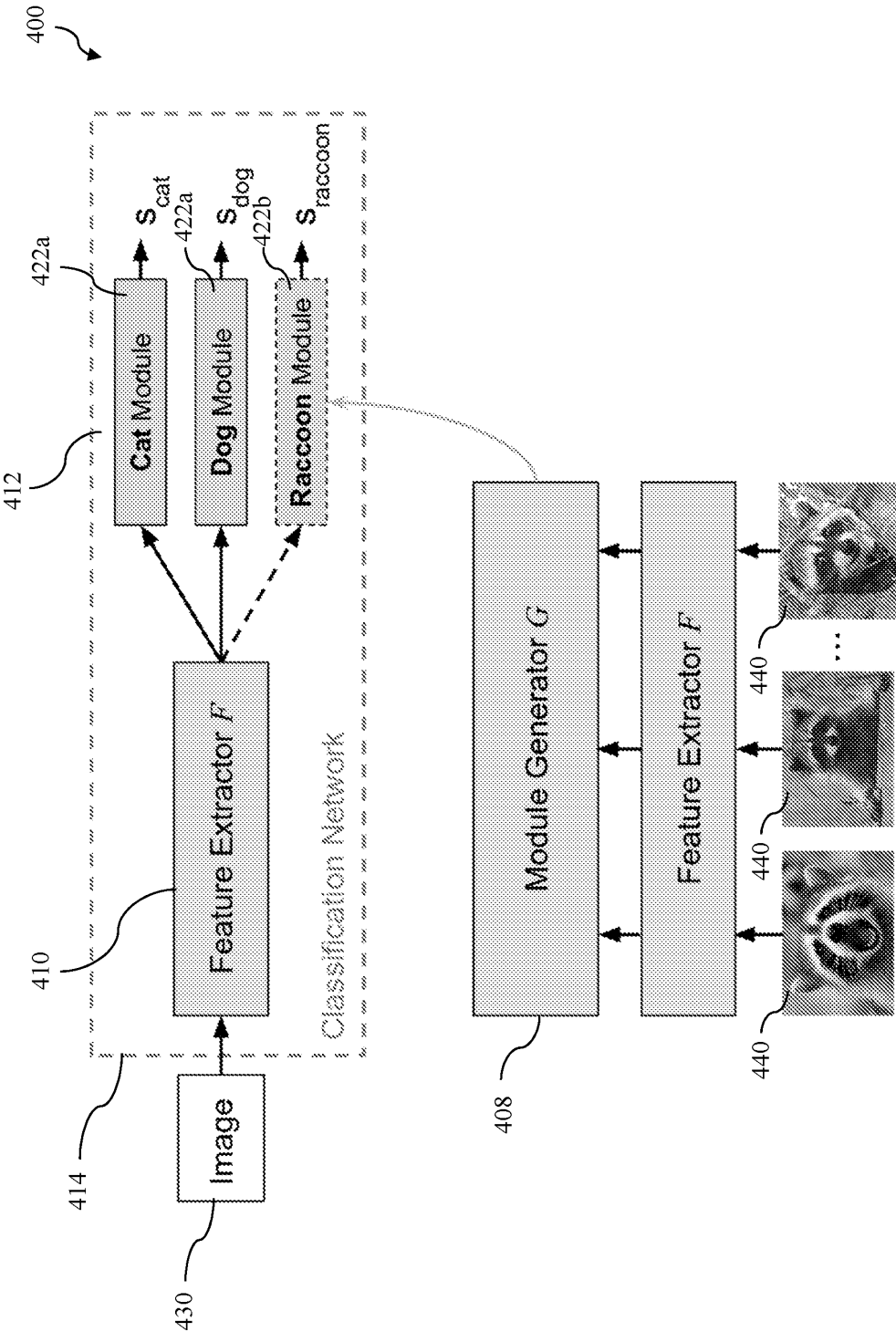


FIG. 4

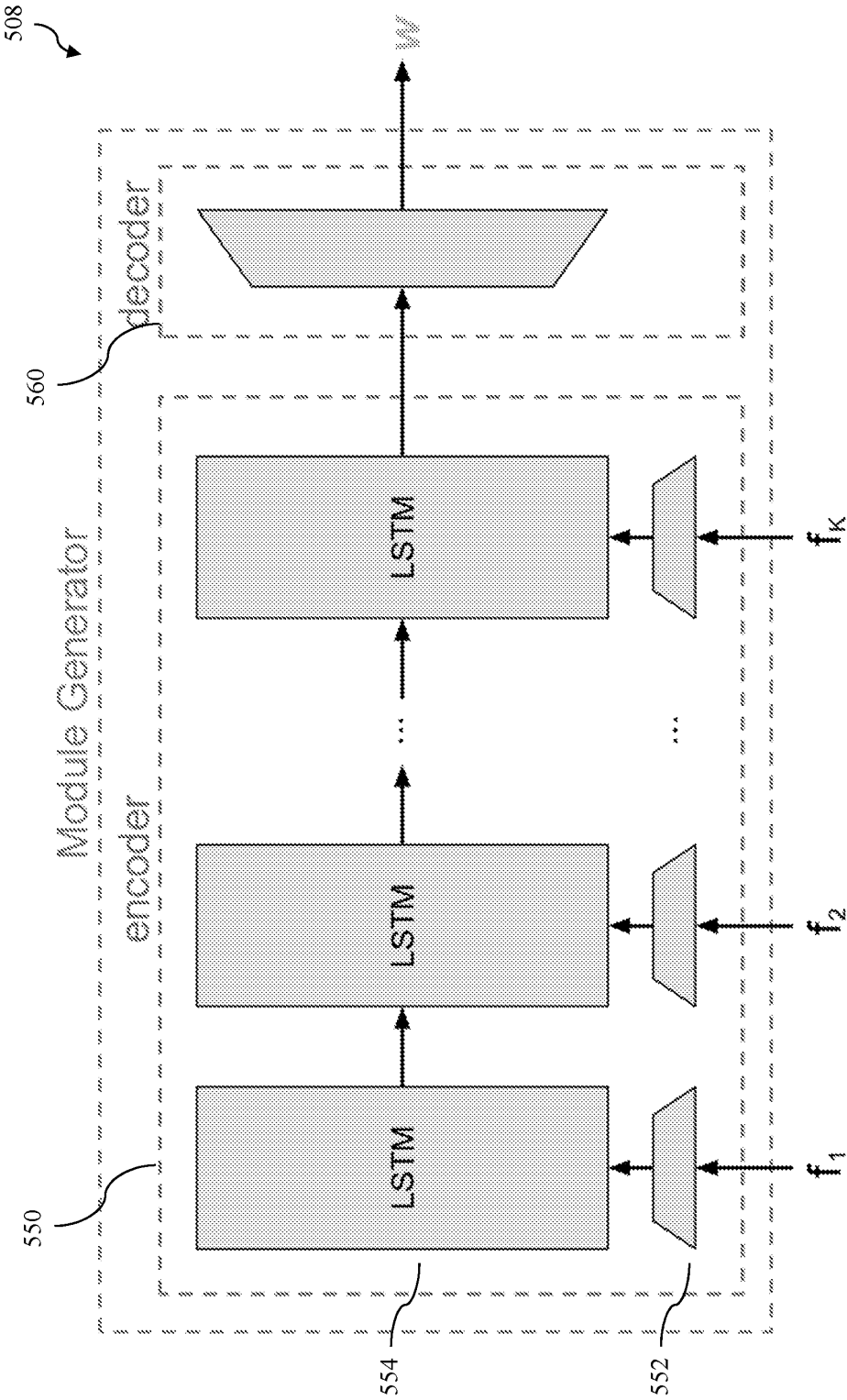


FIG. 5

Algorithm 1: Meta-Training of Module Generator

Input: task distribution $p(\tau)$ over a meta-set $\mathcal{D}_{train}$

Output: parameters θ of G

```

1  $\theta \leftarrow \text{Initialize}(\theta)$ 
2 while not done do
3    $\tau \leftarrow$  sample a batch of tasks from  $p(\tau)$ 
4   foreach  $\tau_i \in \tau$  do
5     foreach  $S_c \in D_{train}(\tau_i)$  do
6        $M_{\theta}^{(c)}(\cdot) \leftarrow M(\cdot; G_{\theta} \circ F(S_c))$ 
7        $L_l(\tau_i) \leftarrow 0$ 
8        $L_g(\tau_i) \leftarrow 0$ 
9       foreach  $(\mathbf{x}_i, y_i) \in D_{test}(\tau_i)$  do
10         $L_l(\tau_i) \leftarrow L_l(\tau_i) - \log \sigma(M_{\theta}^{(y_i)} \circ F(\mathbf{x}_i)) -$ 
            $\sum_{c \neq y_i} \log(1 - \sigma(M_{\theta}^{(c)} \circ F(\mathbf{x}_i)))$ 
11         $L_g(\tau_i) \leftarrow L_g(\tau_i) - \log \frac{\exp(M_{\theta}^{(y_i)} \circ F(\mathbf{x}_i))}{\sum_c \exp(M_{\theta}^{(c)} \circ F(\mathbf{s}_i))}$ 
12       $L(\tau_i) \leftarrow \frac{1}{NC} L_l(\tau_i) + \frac{\lambda}{N} L_g(\tau_i)$ 
13     $\theta \leftarrow \theta - \alpha \nabla_{\theta} (\sum_{\tau_i \in \tau} L(\tau_i))$ 
14 return  $\theta$ 

```

FIG. 6

7/13

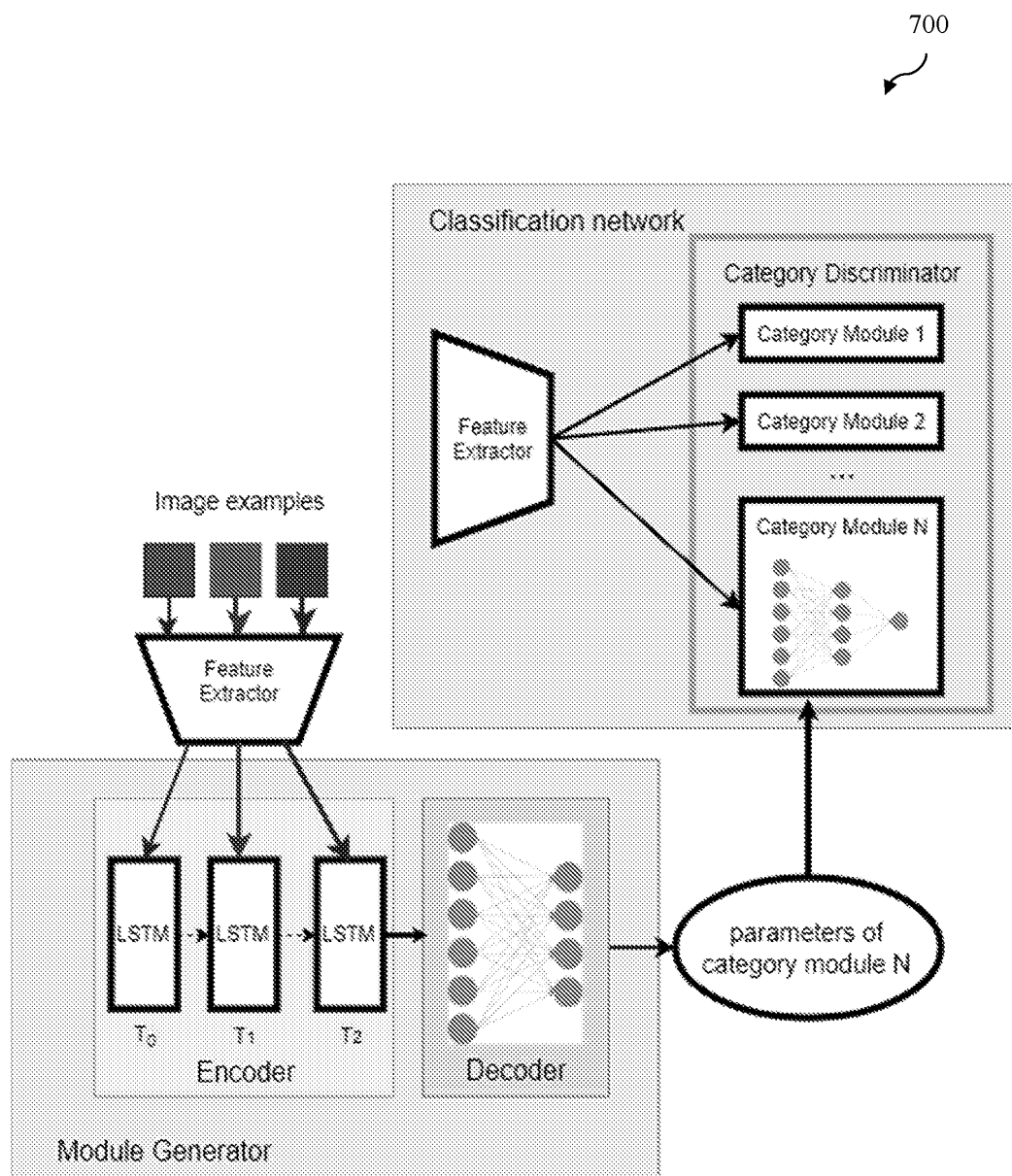


FIG. 7

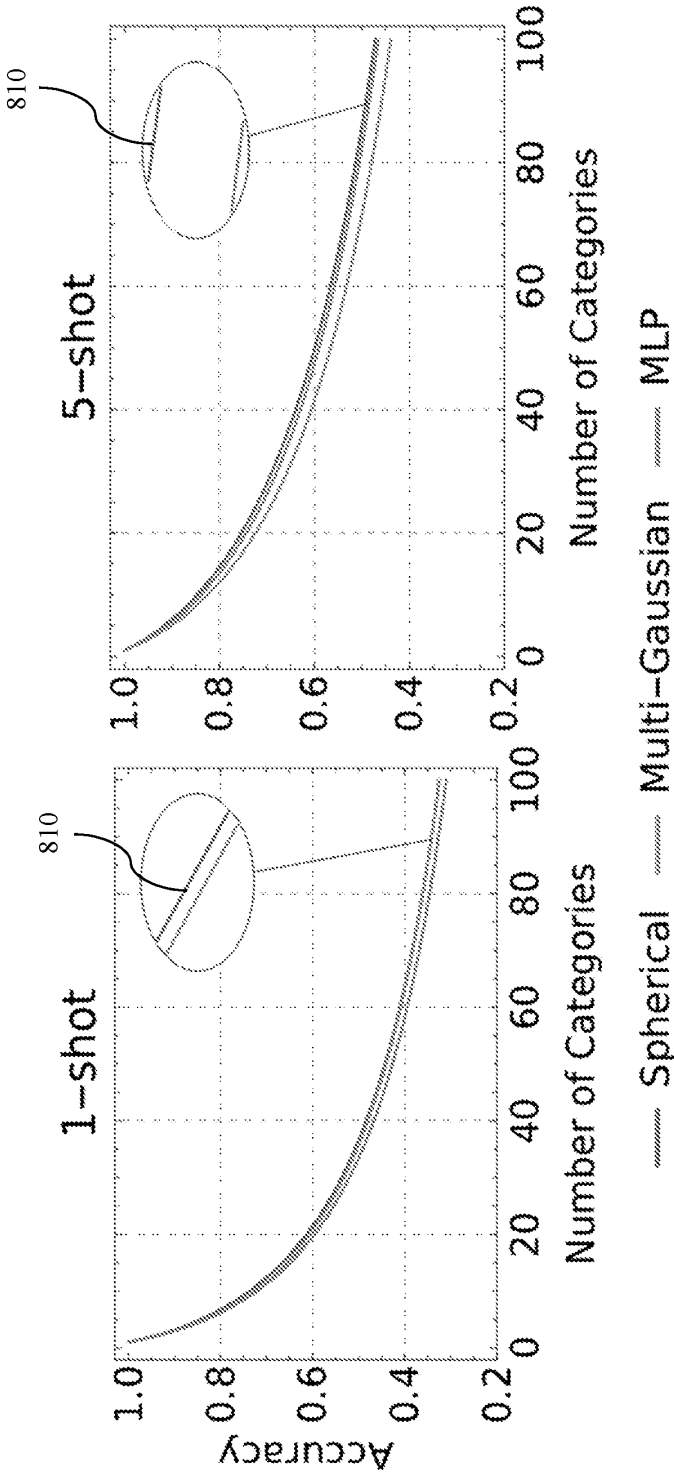


FIG. 8A

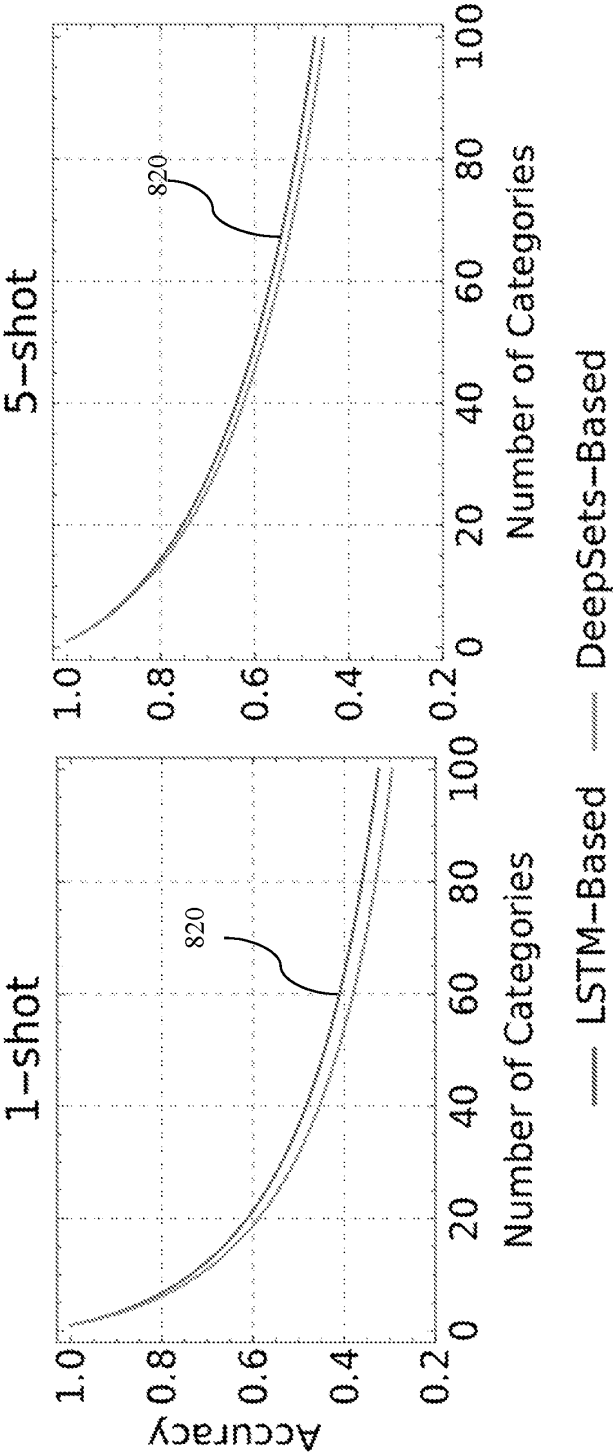


FIG. 8B

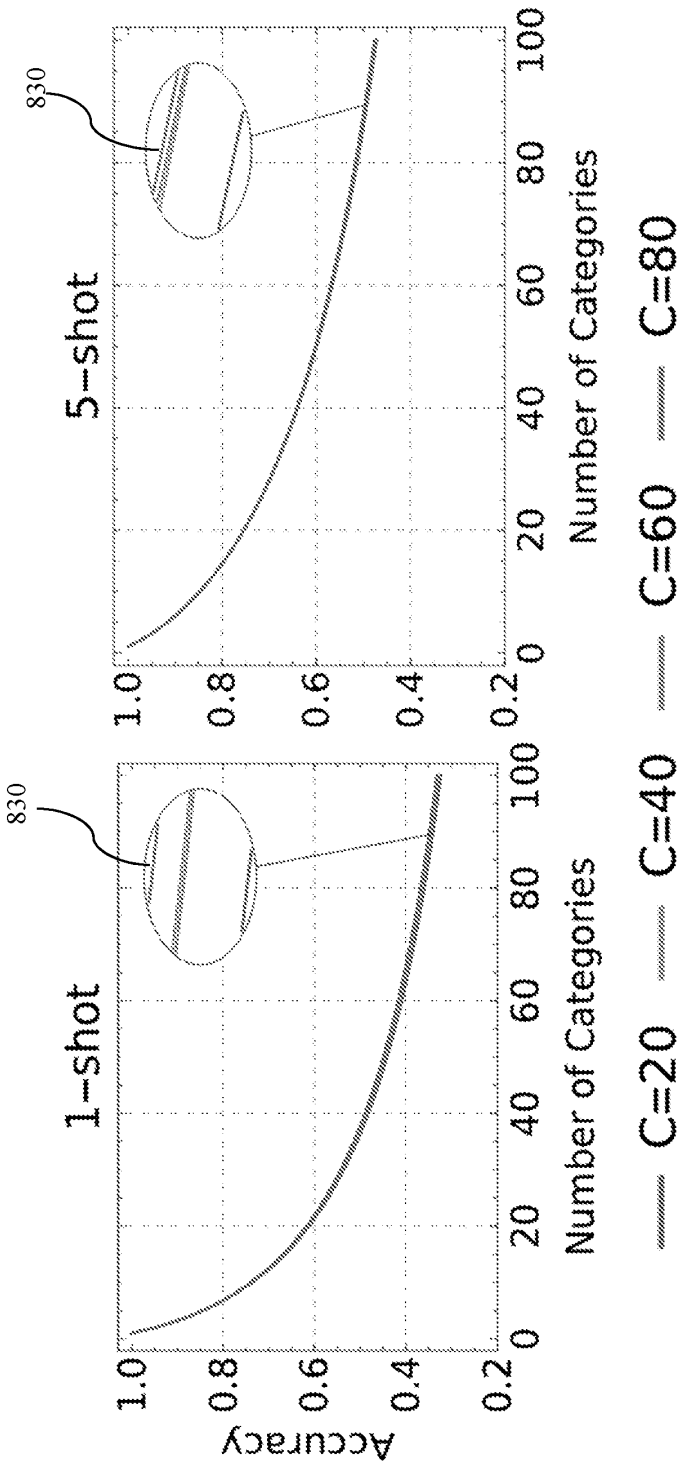


FIG. 8C

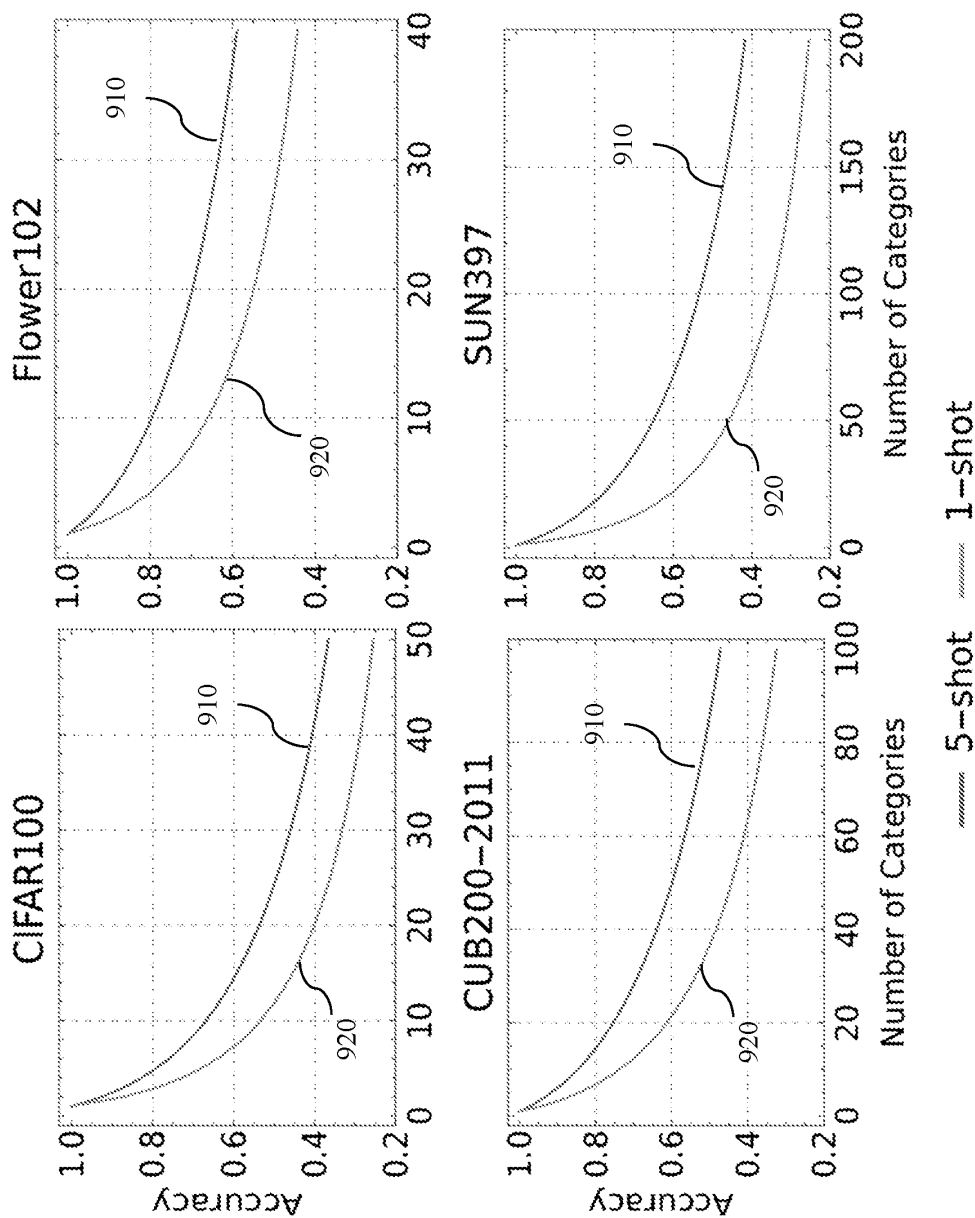


FIG. 9

	5-way 1-shot	5-way 5-shot	20-way 1-shot	20-way 5-shot
Matching Networks [26]	43.56 $\pm$ 0.84%	55.31 $\pm$ 0.73%	17.31 $\pm$ 0.22%	22.69 $\pm$ 0.20%
Meta-LSTM [20]	43.44 $\pm$ 0.77%	60.60 $\pm$ 0.71%	16.70 $\pm$ 0.23%	26.06 $\pm$ 0.25%
MAML [5]	48.70 $\pm$ 1.84%	63.11 $\pm$ 0.92%	16.49 $\pm$ 0.58%	19.29 $\pm$ 0.29%
Meta-SGD [14]	50.47 $\pm$ 1.87%	64.03 $\pm$ 0.94%	17.56 $\pm$ 0.64%	28.92 $\pm$ 0.35%
Relation Network [25]	50.44 $\pm$ 0.82%	65.32 $\pm$ 0.70%	19.47 $\pm$ 0.25%	33.48 $\pm$ 0.24%
MM-Net [2]	53.37 $\pm$ 0.48%	66.97 $\pm$ 0.35%	-	-
SNAIL [17]	55.71 $\pm$ 0.99%	68.88 $\pm$ 0.92%	-	-
MetaMG, Ours	53.78 $\pm$ 0.87%	67.40 $\pm$ 0.68%	23.98 $\pm$ 0.29%	36.57 $\pm$ 0.29%

FIG. 10

13/13

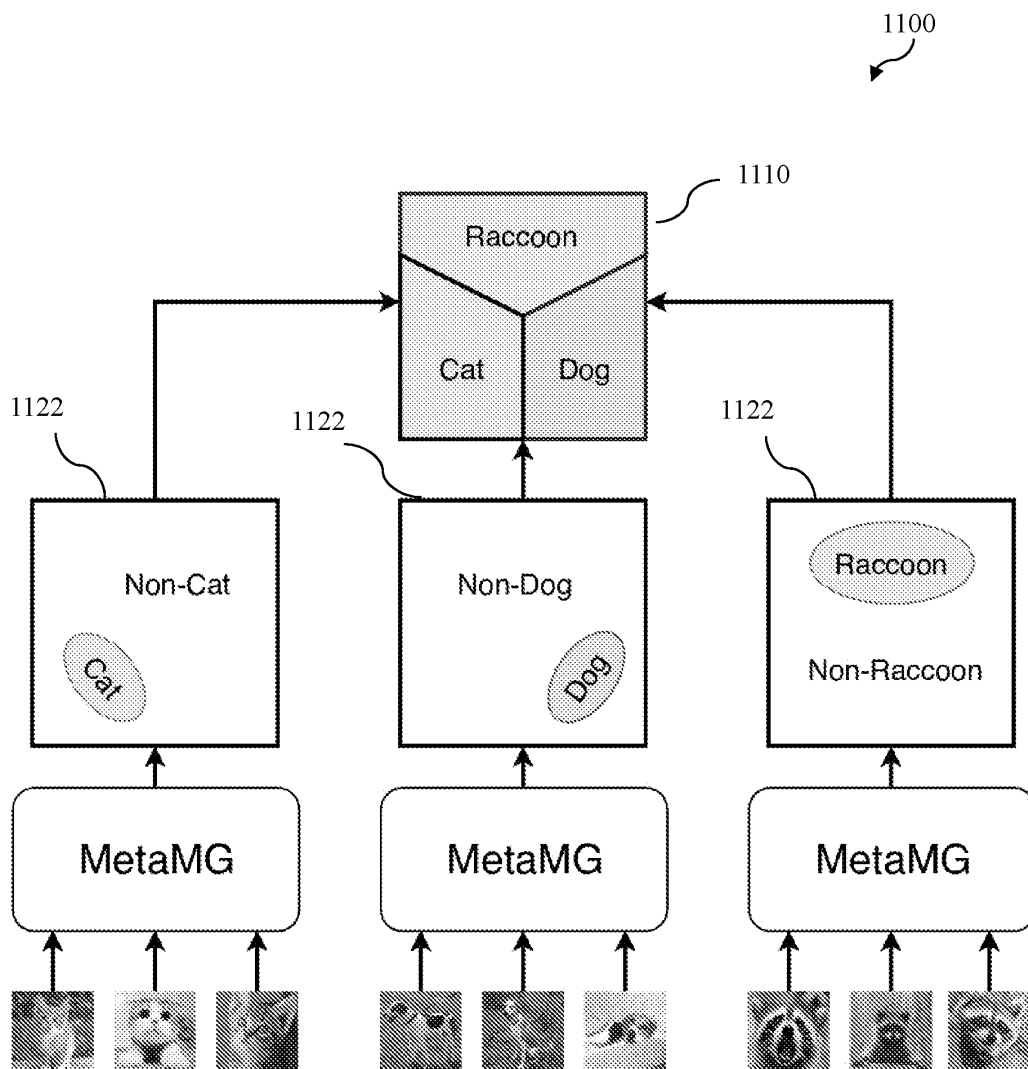


FIG. 11