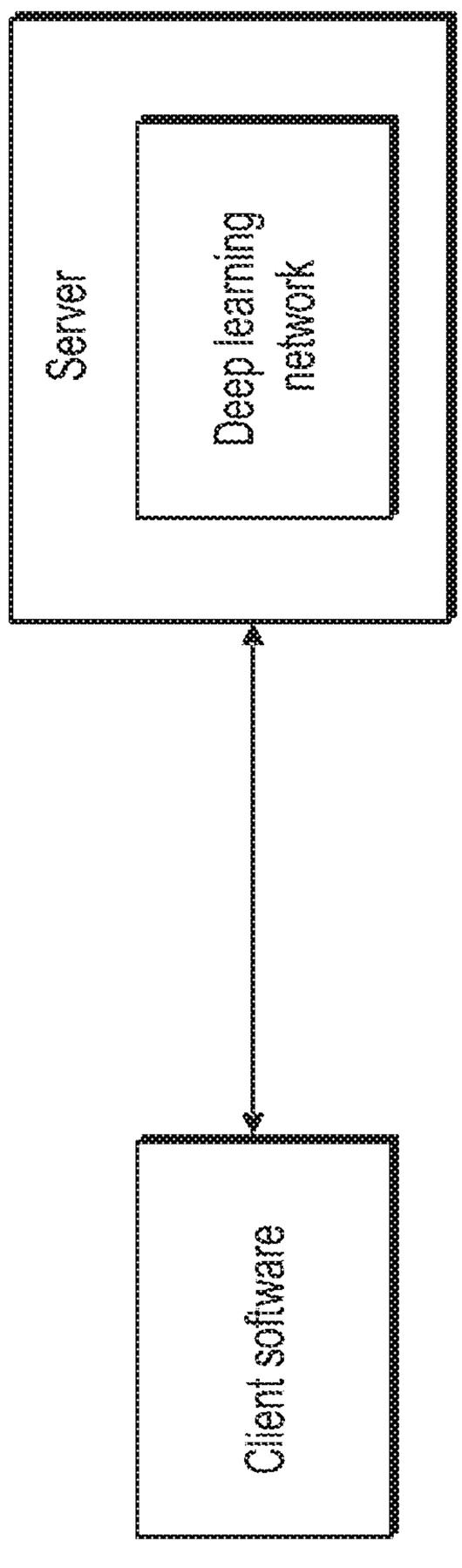

FIG. 1

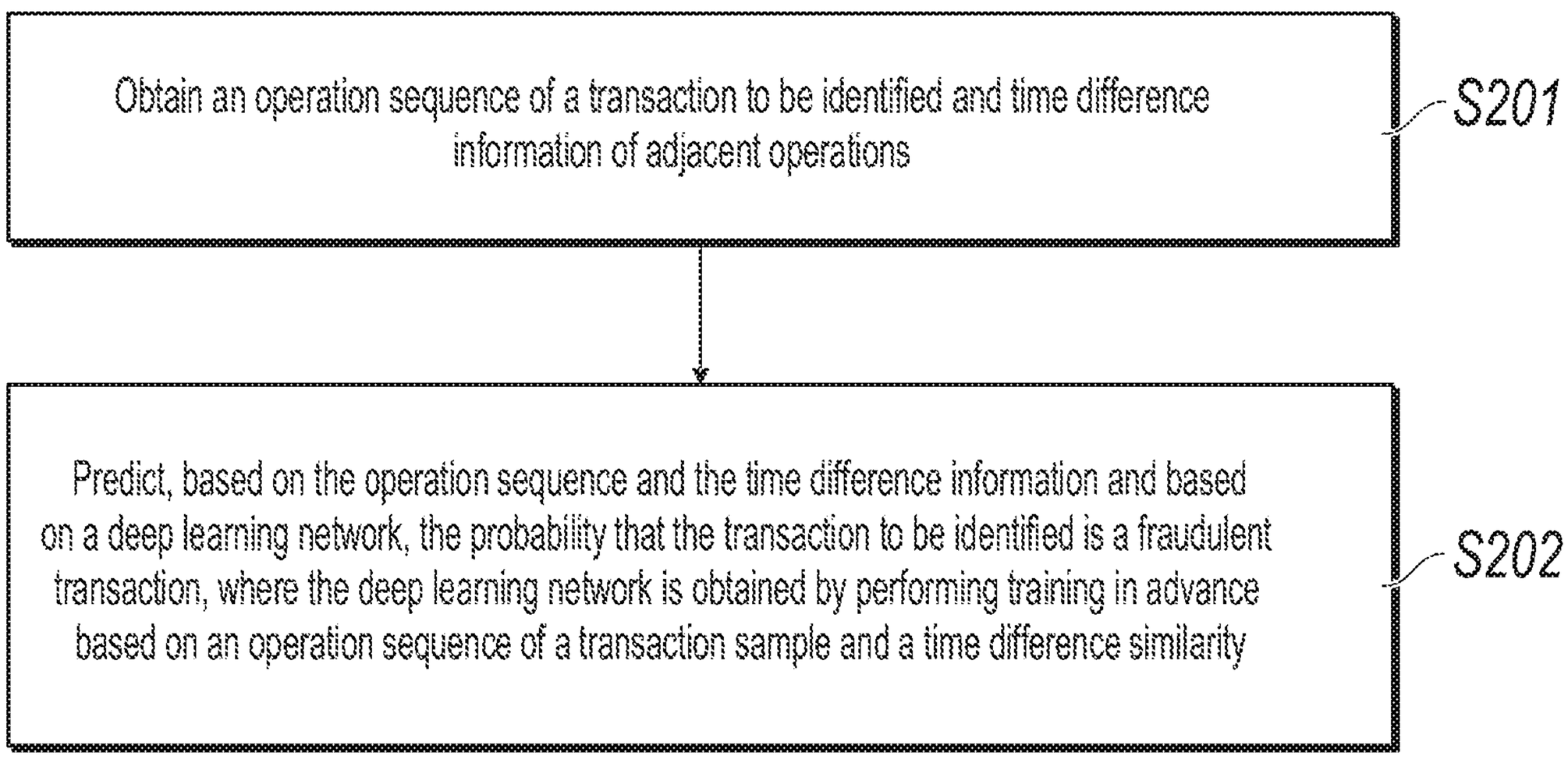
Obtain an operation sequence of a transaction to be identified and time difference information of adjacent operations
S201
Predict, based on the operation sequence and the time difference information and based on a deep learning network, the probability that the transaction to be identified is a fraudulent transaction, where the deep learning network is obtained by performing training in advance based on an operation sequence of a transaction sample and a time difference similarity
S202

FIG. 2

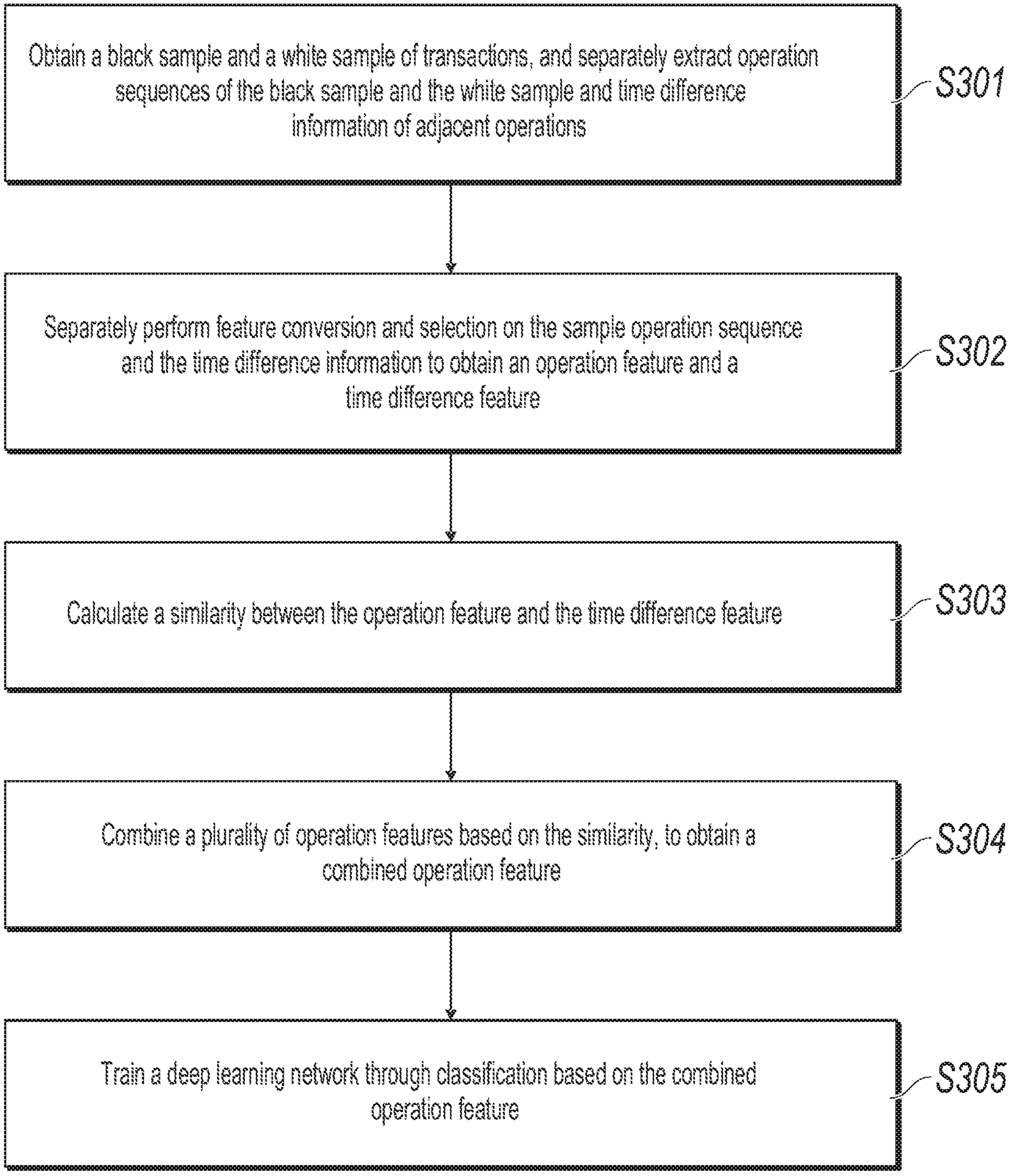
Obtain a black sample and a white sample of transactions, and separately extract operation sequences of the black sample and the white sample and time difference information of adjacent operations
S301
Separately perform feature conversion and selection on the sample operation sequence and the time difference information to obtain an operation feature and a time difference feature
S302
Calculate a similarity between the operation feature and the time difference feature
S303
Combine a plurality of operation features based on the similarity, to obtain a combined operation feature
S304
Train a deep learning network through classification based on the combined operation feature
S305

FIG. 3

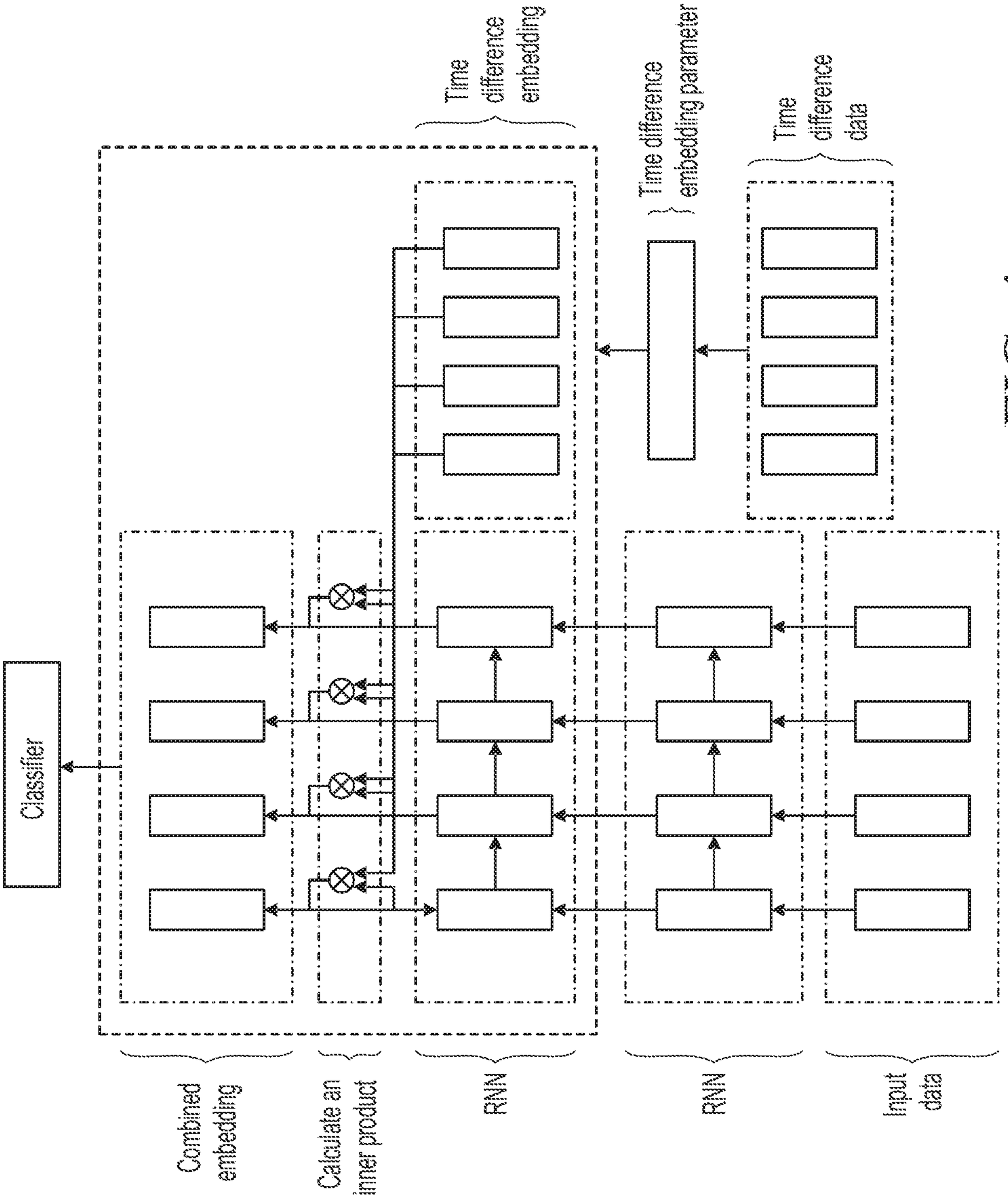
Time difference embedding
Time difference embedding parameter
Time difference data
Classifier
Combined embedding
Calculate an inner product
RNN
RNN
Input data

FIG. 4

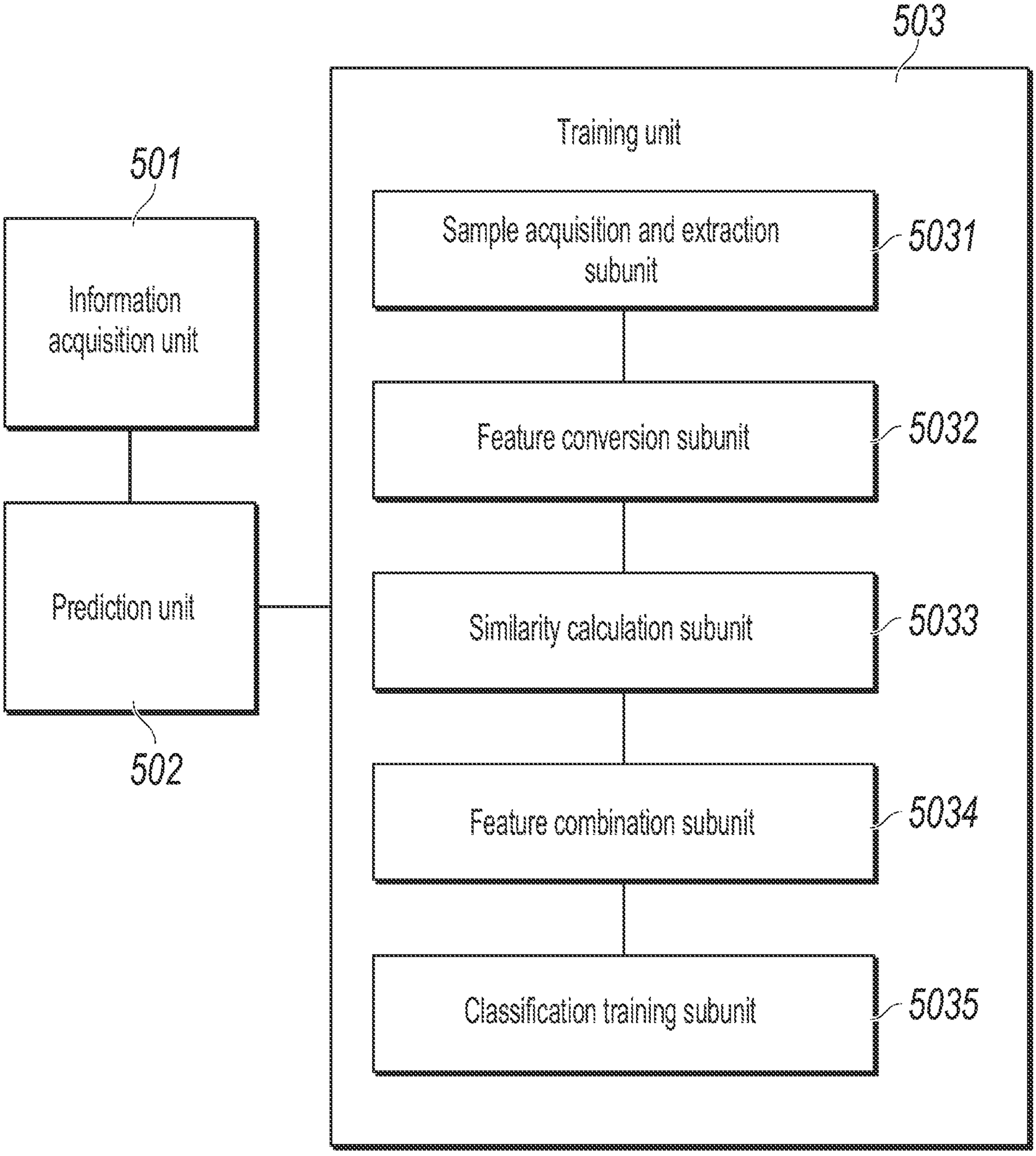
503
Training unit
501
Information acquisition unit
Prediction unit
502
Sample acquisition and extraction subunit
5031
Feature conversion subunit
5032
Similarity calculation subunit
5033
Feature combination subunit
5034
Classification training subunit
5035

FIG. 5

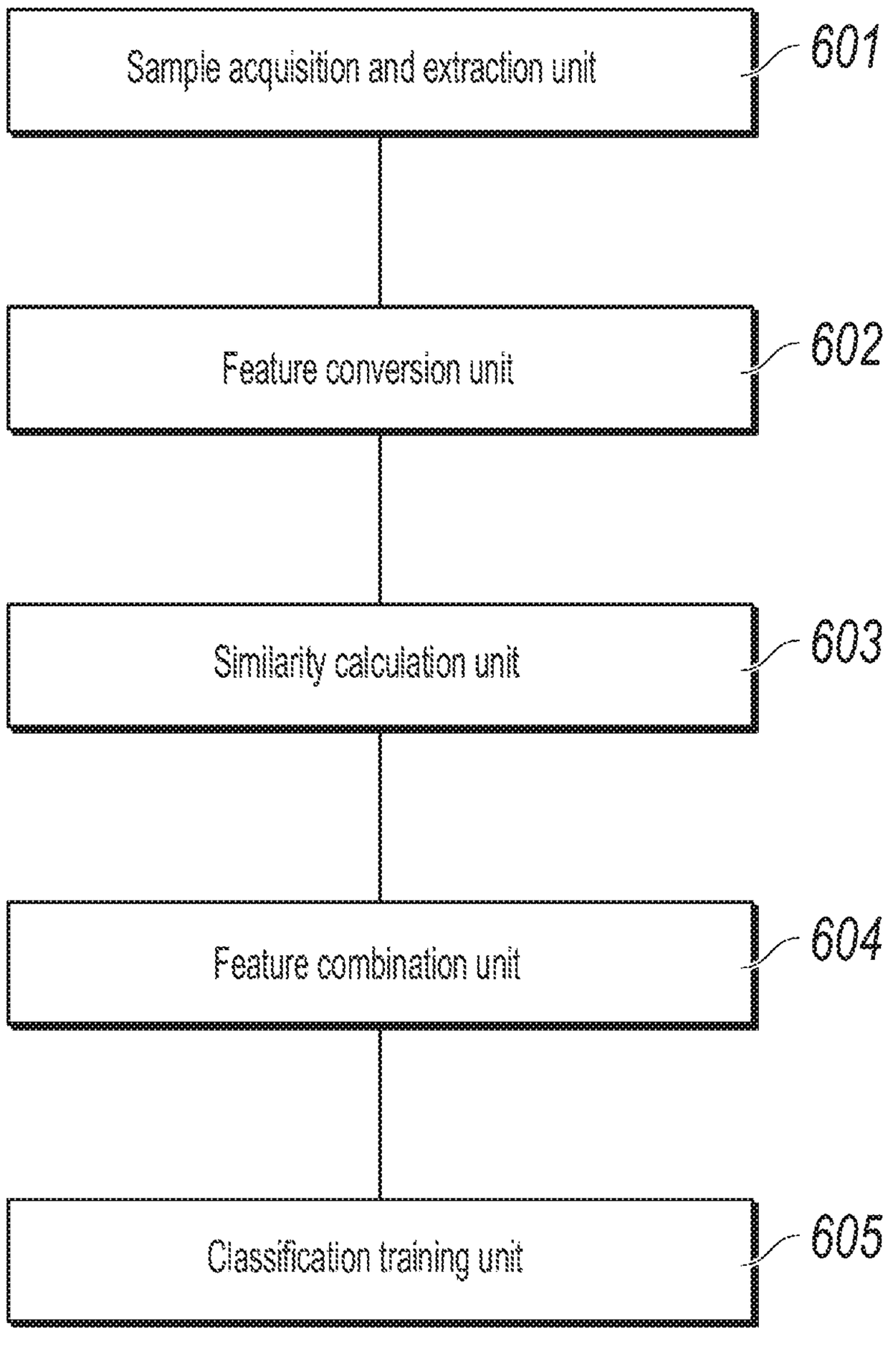
Sample acquisition and extraction unit
601
Feature conversion unit
602
Similarity calculation unit
603
Feature combination unit
604
Classification training unit
605

FIG. 6

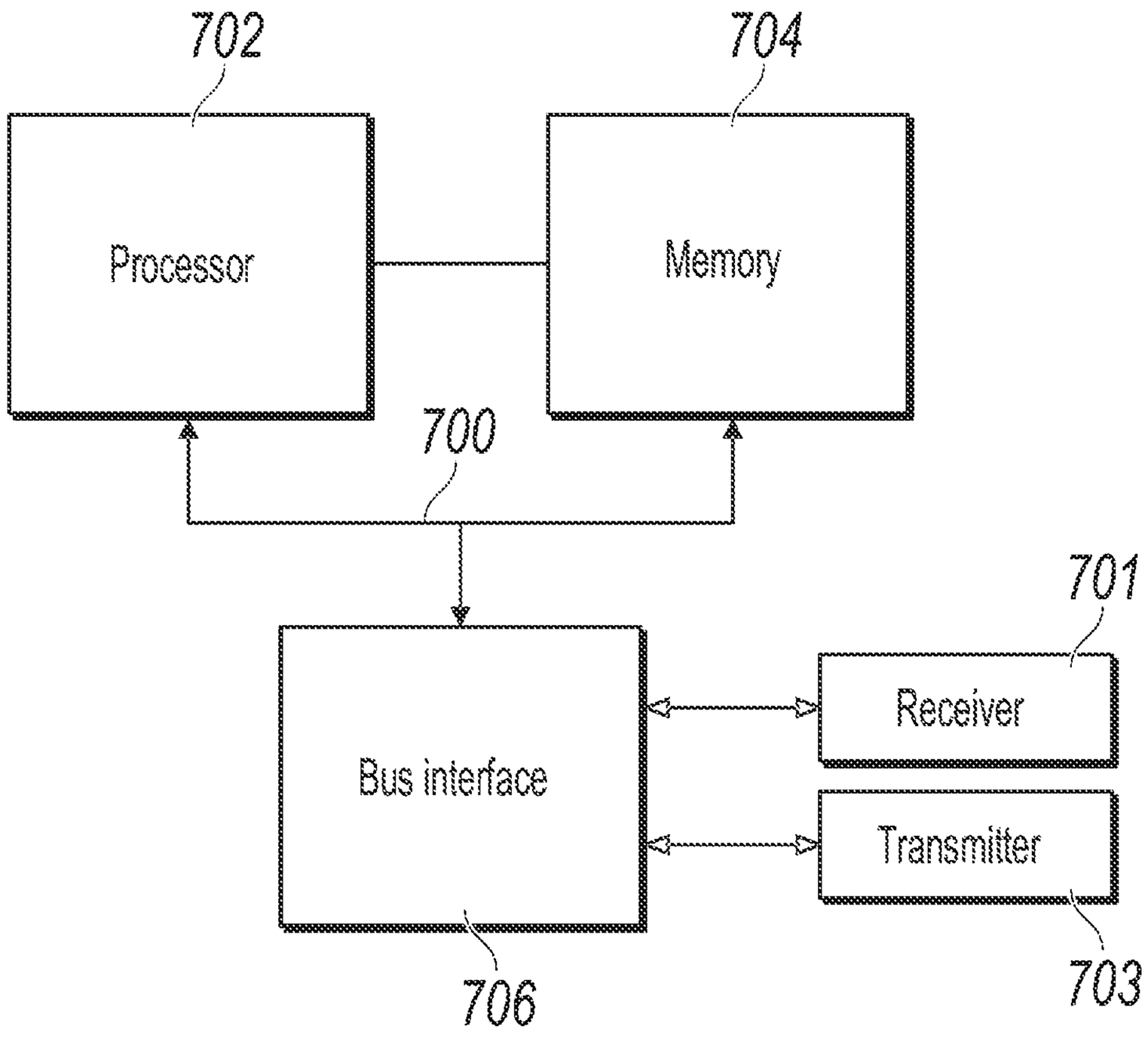
702
704
Processor
Memory
700
Bus interface
701
Receiver
Transmitter
706
703

FIG. 7

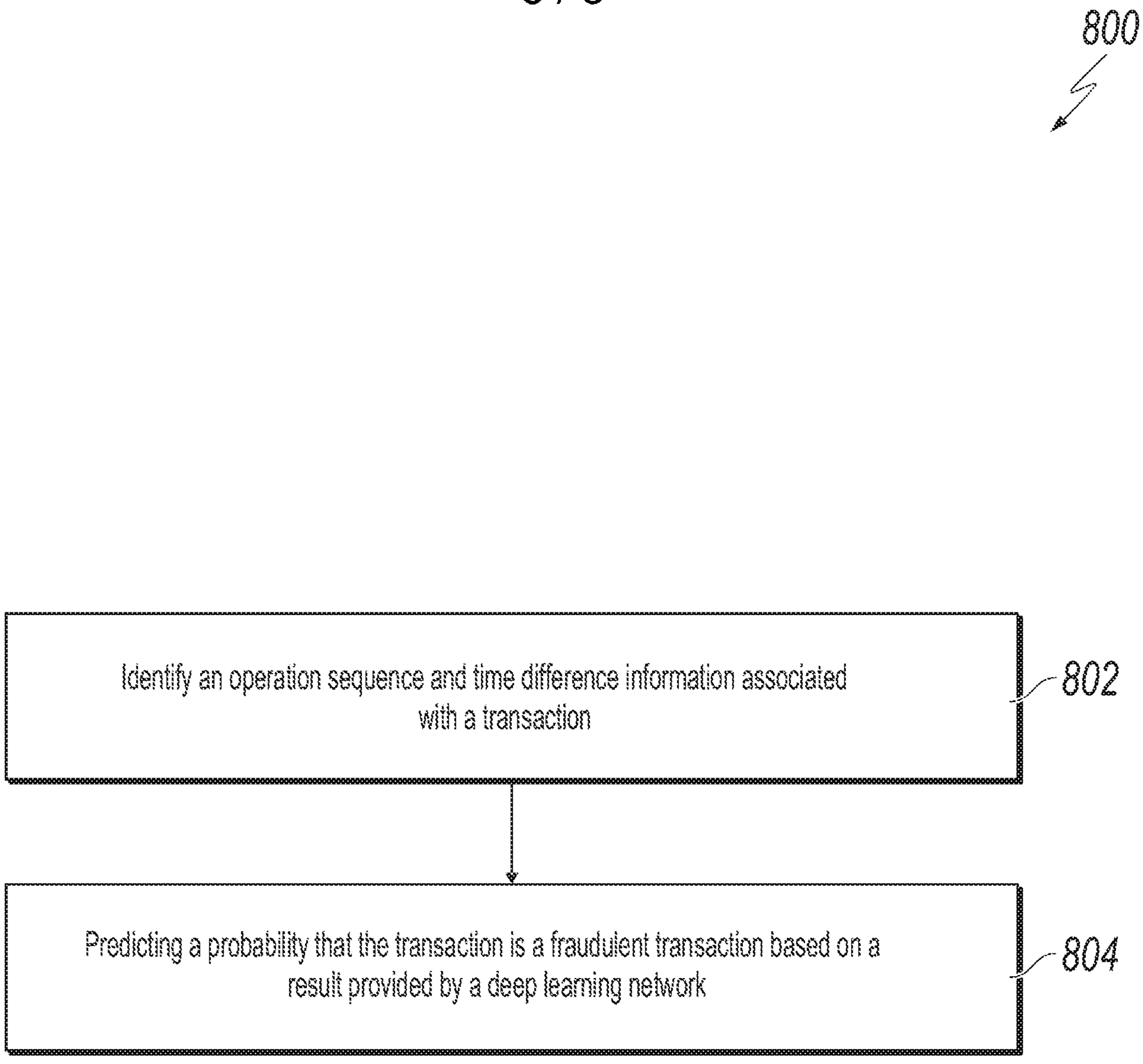
800
Identify an operation sequence and time difference information associated with a transaction
802
Predicting a probability that the transaction is a fraudulent transaction based on a result provided by a deep learning network
804

FIG. 8