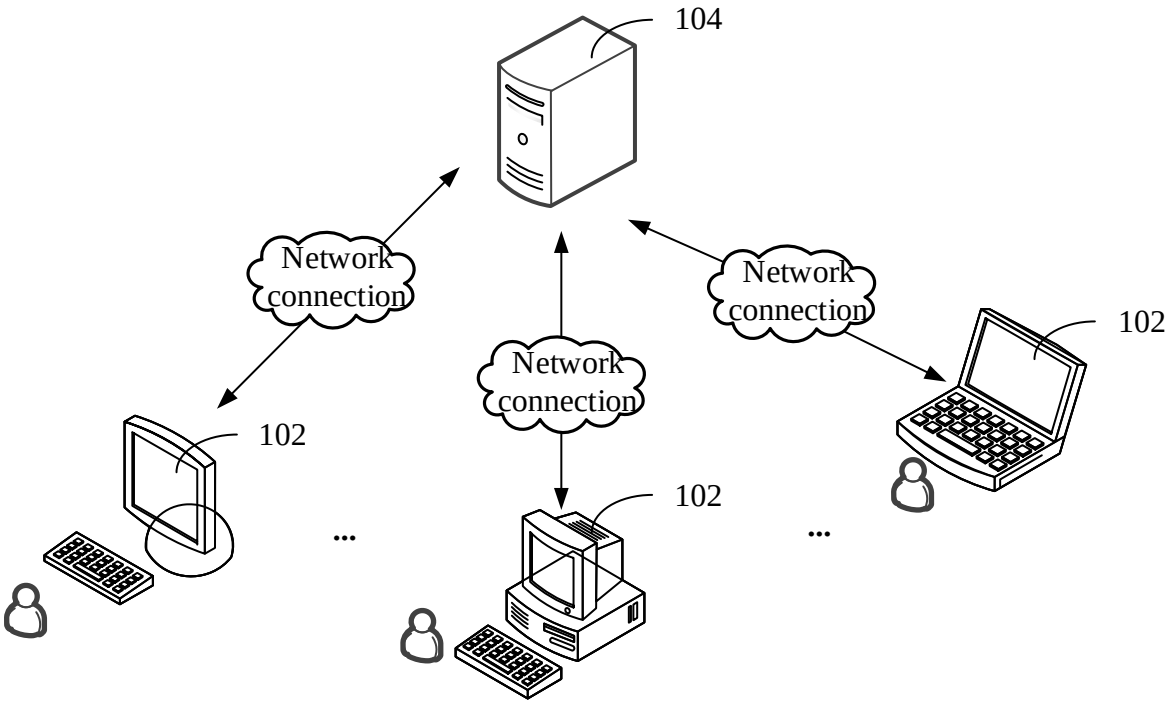

104
Network connection
Network connection
Network connection
102
102
102
...
...

FIG. 1

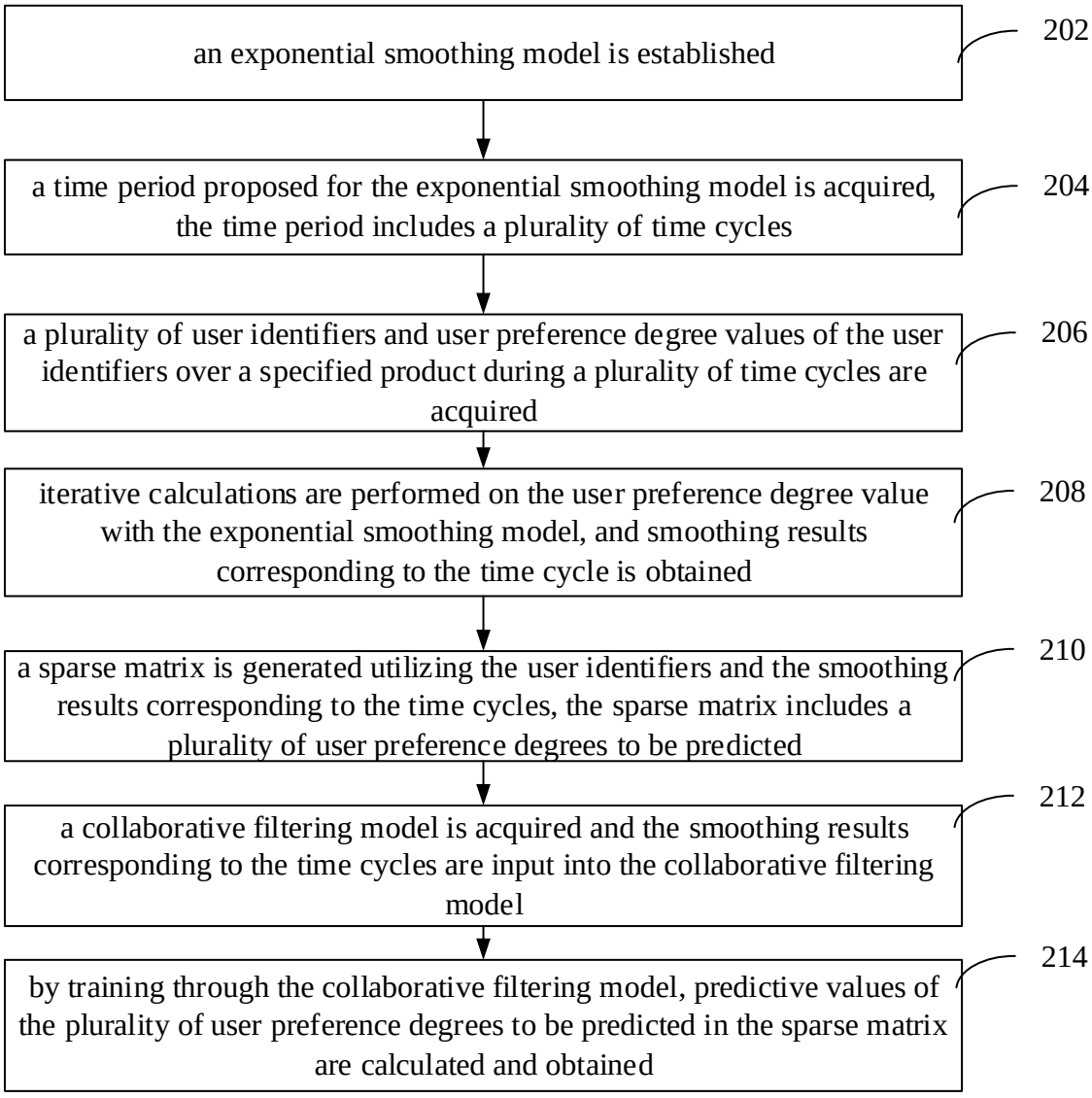

an exponential smoothing model is established
202
a time period proposed for the exponential smoothing model is acquired, the time period includes a plurality of time cycles
204
a plurality of user identifiers and user preference degree values of the user identifiers over a specified product during a plurality of time cycles are acquired
206
iterative calculations are performed on the user preference degree value with the exponential smoothing model, and smoothing results corresponding to the time cycle is obtained
208
a sparse matrix is generated utilizing the user identifiers and the smoothing results corresponding to the time cycles, the sparse matrix includes a plurality of user preference degrees to be predicted
210
a collaborative filtering model is acquired and the smoothing results corresponding to the time cycles are input into the collaborative filtering model
212
by training through the collaborative filtering model, predictive values of the plurality of user preference degrees to be predicted in the sparse matrix are calculated and obtained
214

FIG. 2

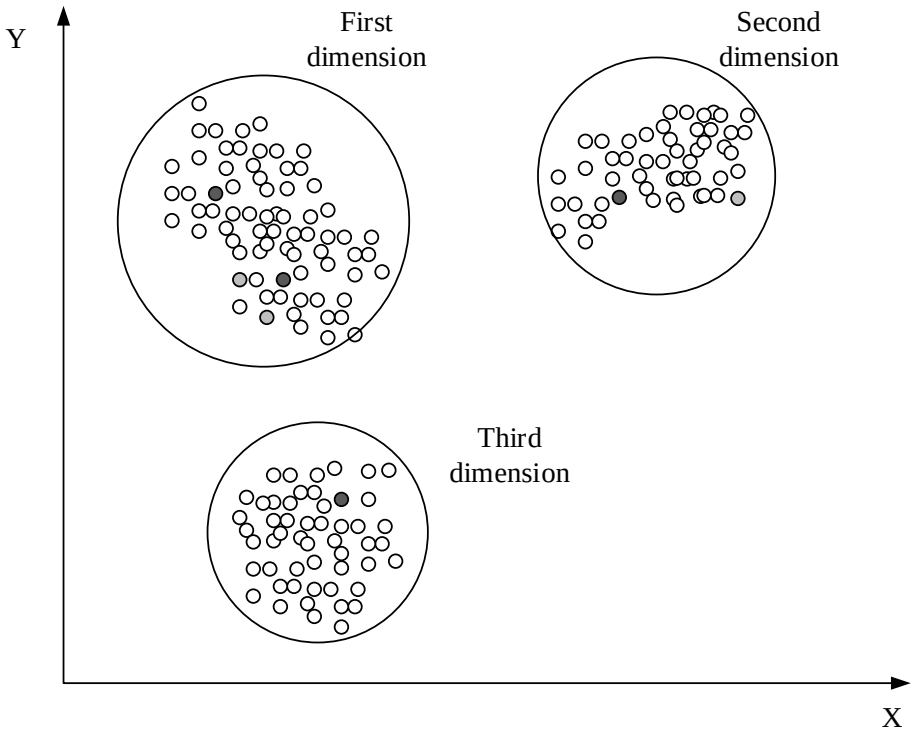

Y
First dimension
Second dimension
Third dimension
X

FIG. 3

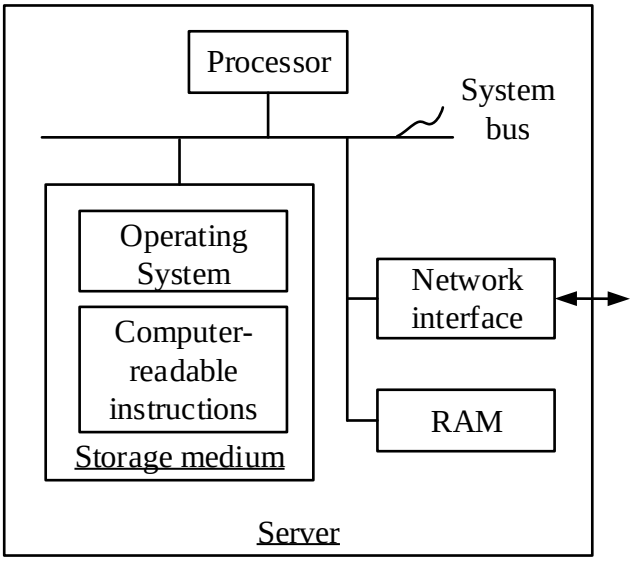

Processor
System bus
Operating System
Computer-readable instructions
Storage medium
Network interface
RAM
Server

FIG. 4

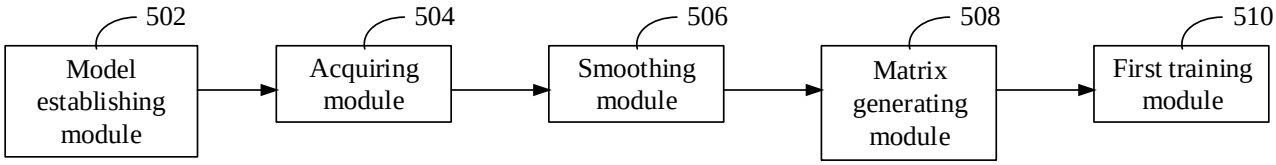

502
Model establishing module
504
Acquiring module
506
Smoothing module
508
Matrix generating module
510
First training module

FIG. 5

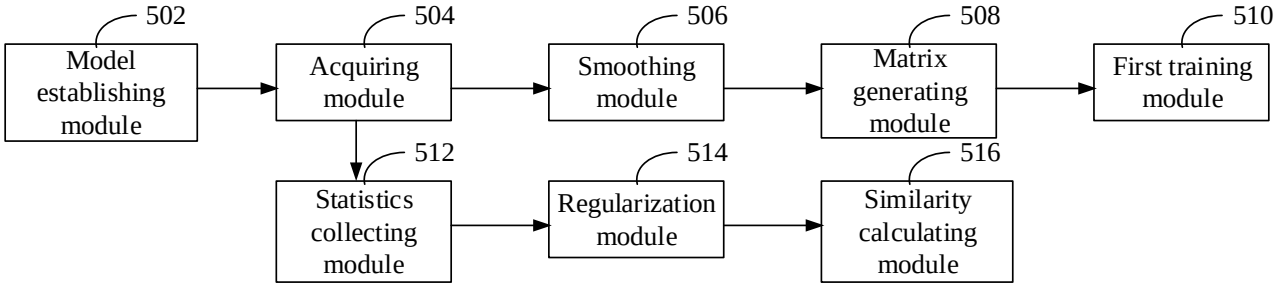

502
Model establishing module
504
Acquiring module
506
Smoothing module
508
Matrix generating module
510
First training module
512
Statistics collecting module
514
Regularization module
516
Similarity calculating module

FIG. 6

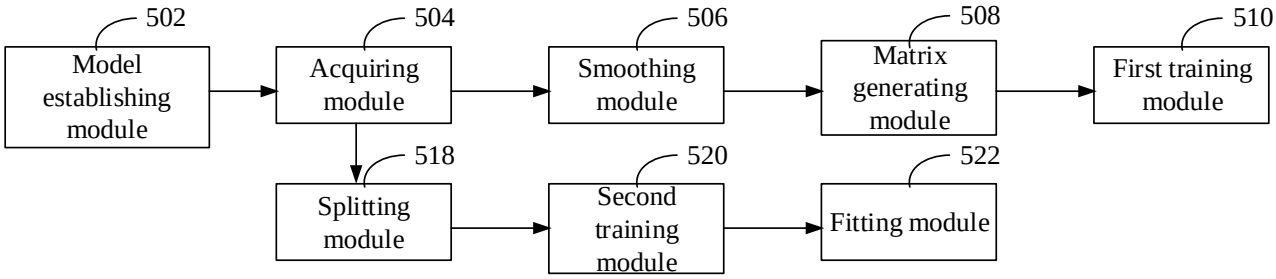

502
Model establishing module
504
Acquiring module
506
Smoothing module
508
Matrix generating module
510
First training module
518
Splitting module
520
Second training module
522
Fitting module

FIG. 7

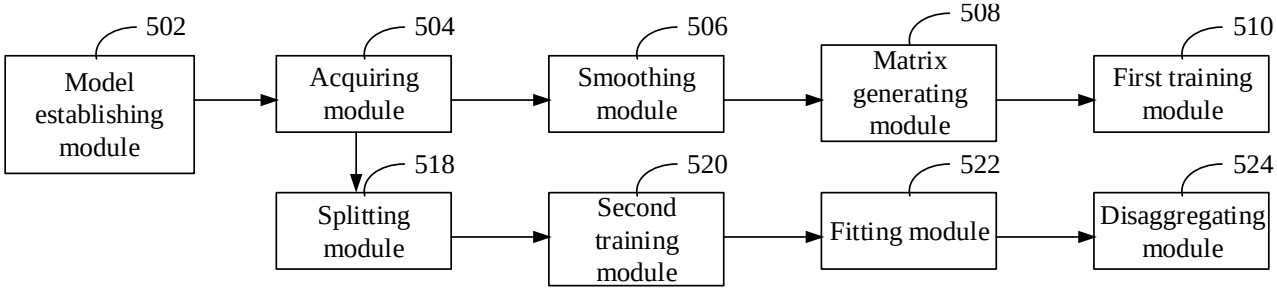

502
Model establishing module
504
Acquiring module
506
Smoothing module
508
Matrix generating module
510
First training module
518
Splitting module
520
Second training module
522
Fitting module
524
Disaggregating module

FIG. 8