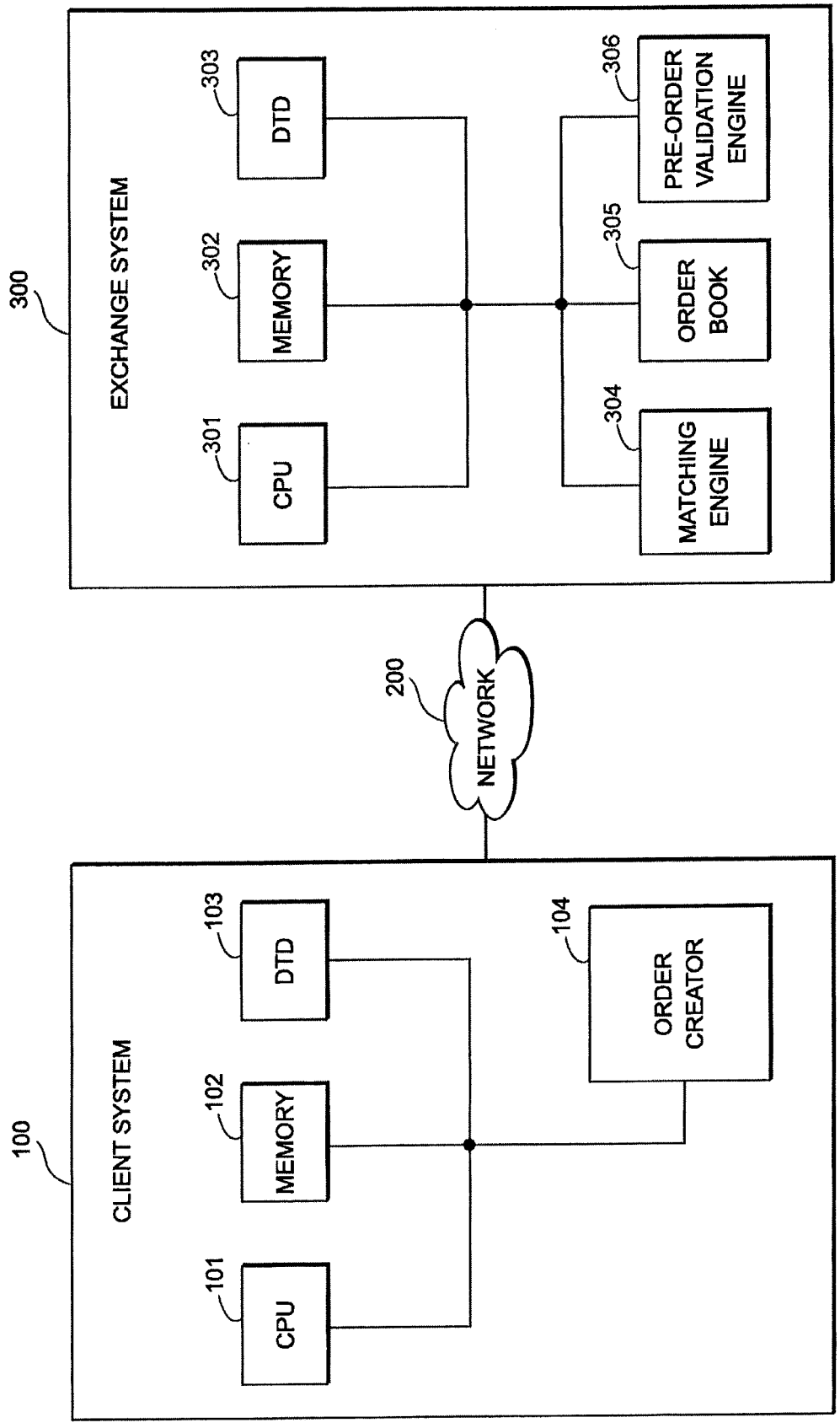

CLIENT SYSTEM
100
CPU
101
MEMORY
102
DTD
103
ORDER CREATOR
104
NETWORK
200
EXCHANGE SYSTEM
300
CPU
301
MEMORY
302
DTD
303
MATCHING ENGINE
304
ORDER BOOK
305
PRE-ORDER VALIDATION ENGINE
306

FIG. 1

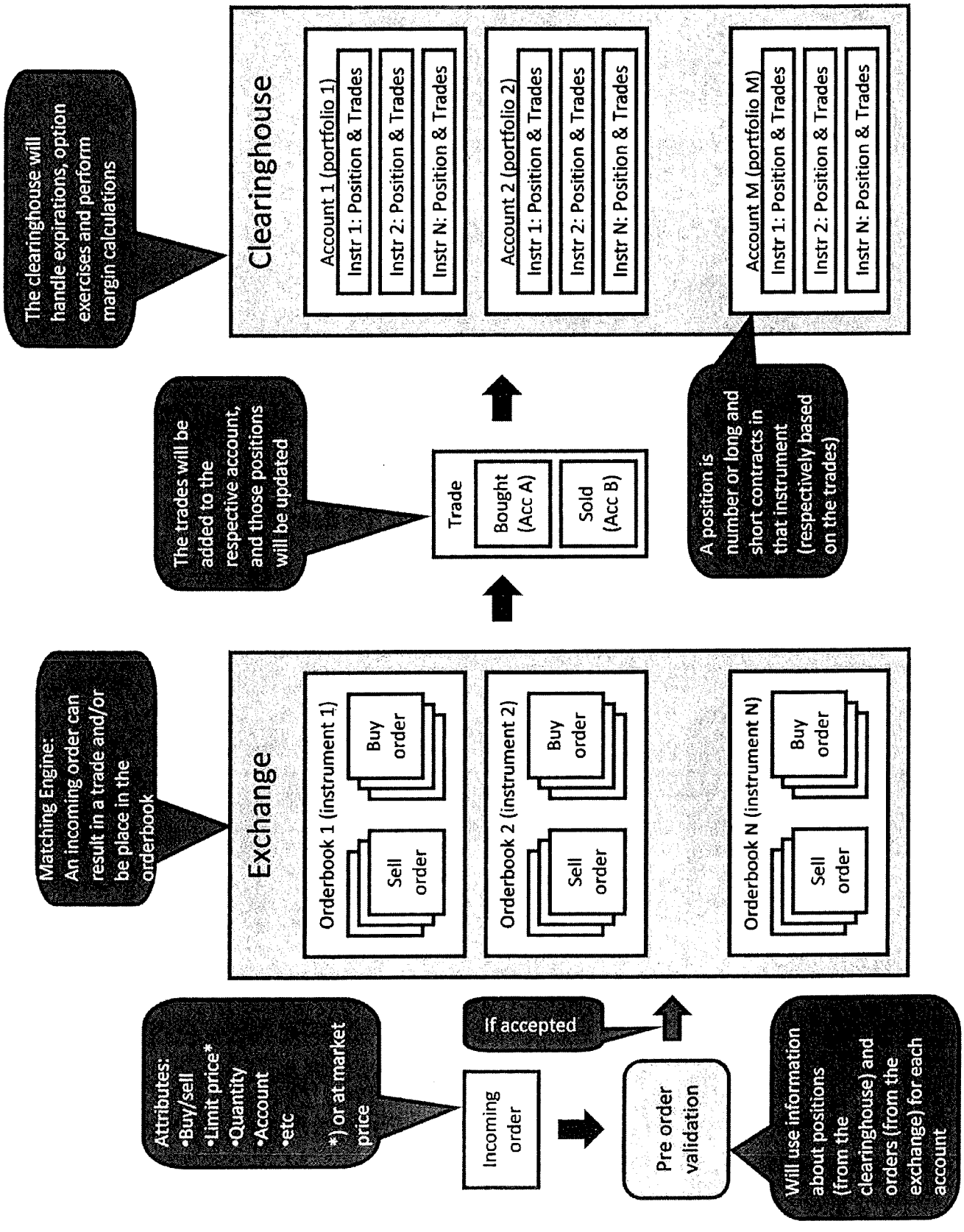

Attributes:
•Buy/sell
•Limit price*
•Quantity
•Account
•etc
*) or at market price
Incoming order
Pre order validation
Will use information about positions (from the clearinghouse) and orders (from the exchange) for each account
If accepted
Matching Engine:
An incoming order can result in a trade and/or be place in the orderbook
Exchange
Orderbook 1 (instrument 1)
Buy order
Sell order
Orderbook 2 (instrument 2)
Buy order
Sell order
Orderbook N (instrument N)
Buy order
Sell order
The trades will be added to the respective account, and those positions will be updated
Trade
Bought (Acc A)
Sold (Acc B)
A position is number or long and short contracts in that instrument (respectively based on the trades)
The clearinghouse will handle expirations, option exercises and perform margin calculations
Clearinghouse
Account 1 (portfolio 1)
Instr 1: Position & Trades
Instr 2: Position & Trades
Instr N: Position & Trades
Account 2 (portfolio 2)
Instr 1: Position & Trades
Instr 2: Position & Trades
Instr N: Position & Trades
Account M (portfolio M)
Instr 1: Position & Trades
Instr 2: Position & Trades
Instr N: Position & Trades

FIG. 2

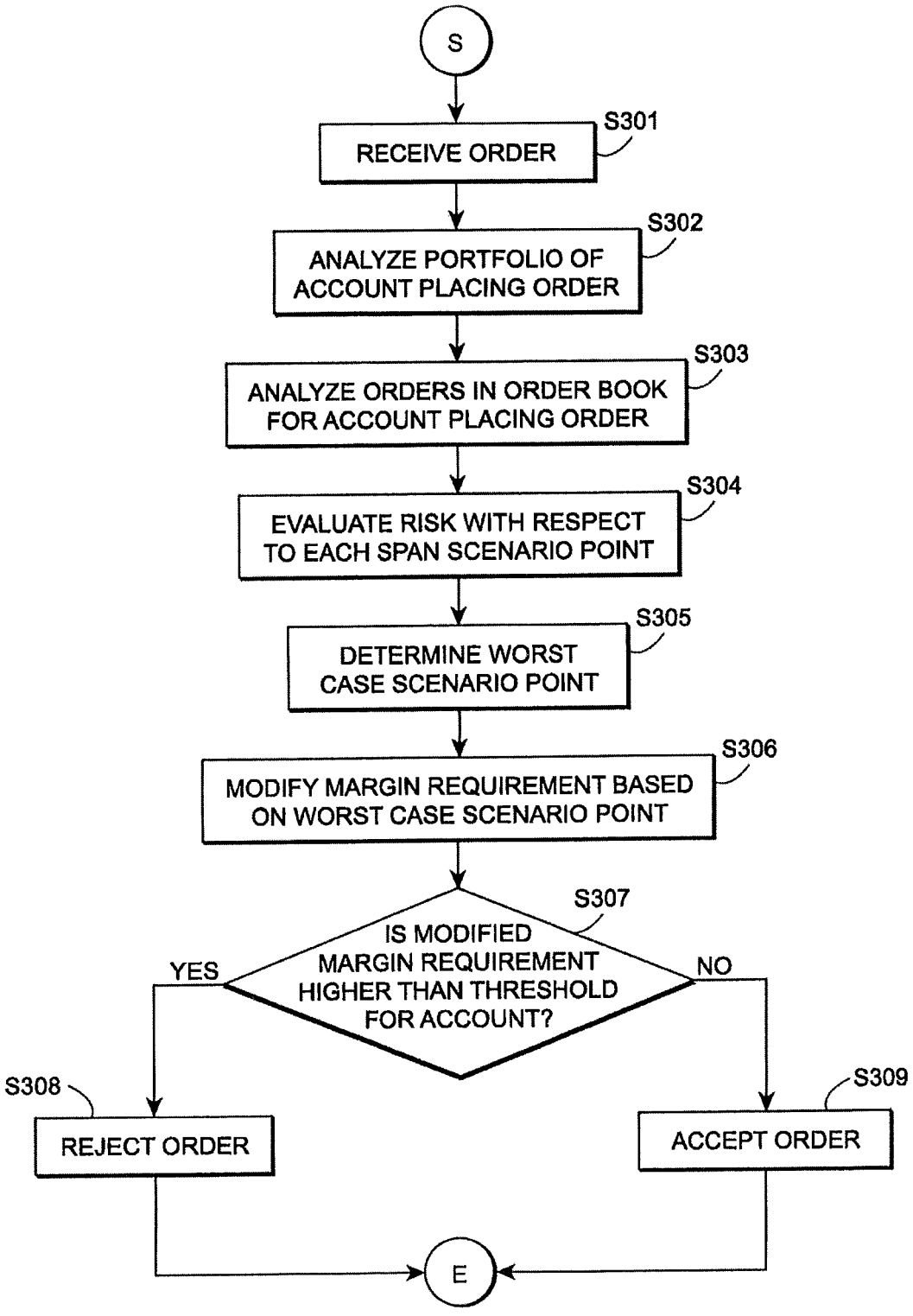

S
S301
RECEIVE ORDER
S302
ANALYZE PORTFOLIO OF ACCOUNT PLACING ORDER
S303
ANALYZE ORDERS IN ORDER BOOK FOR ACCOUNT PLACING ORDER
S304
EVALUATE RISK WITH RESPECT TO EACH SPAN SCENARIO POINT
S305
DETERMINE WORST CASE SCENARIO POINT
S306
MODIFY MARGIN REQUIREMENT BASED ON WORST CASE SCENARIO POINT
S307
IS MODIFIED MARGIN REQUIREMENT HIGHER THAN THRESHOLD FOR ACCOUNT?
YES
NO
S308
REJECT ORDER
S309
ACCEPT ORDER
E

FIG. 3

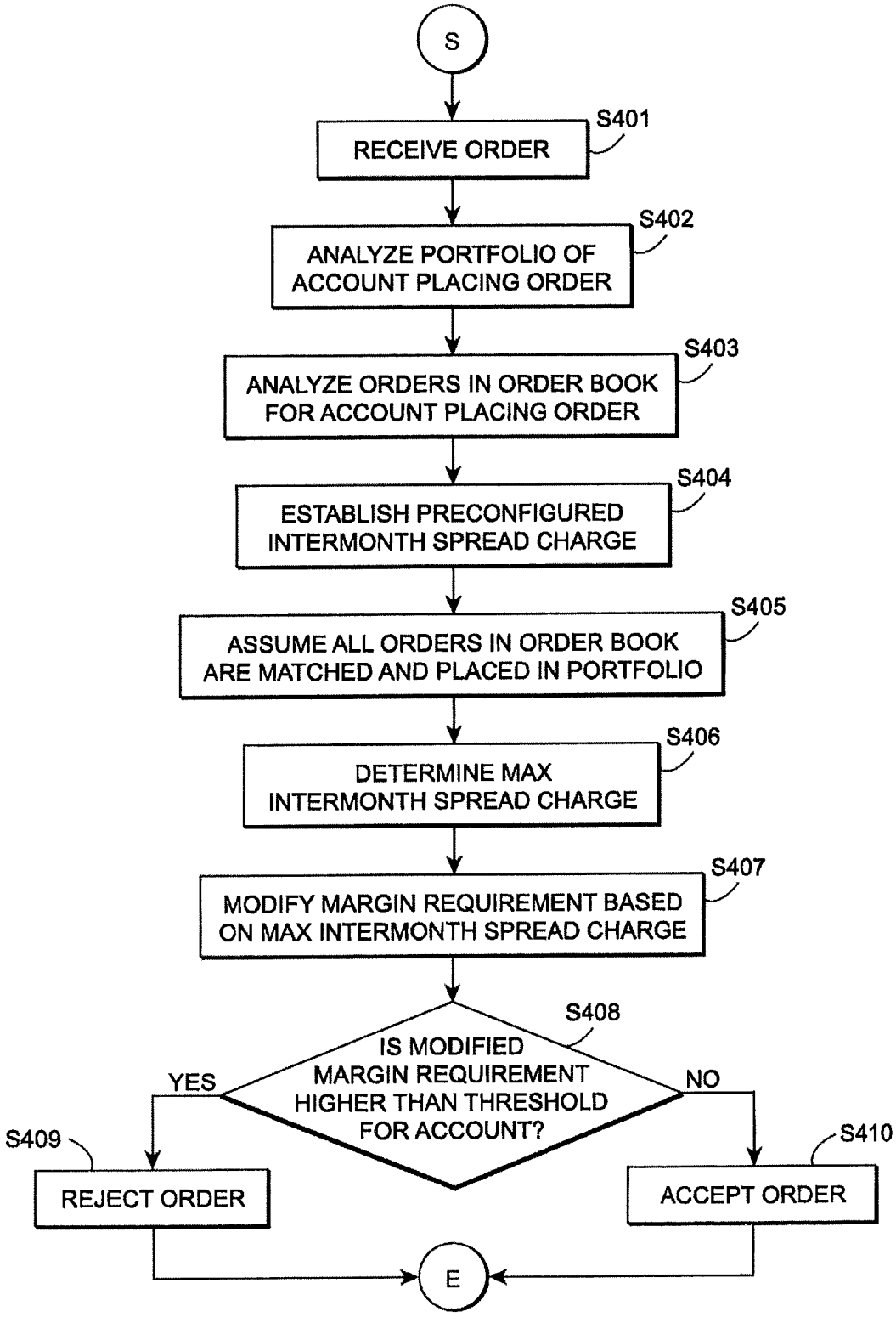

S
RECEIVE ORDER
S401
ANALYZE PORTFOLIO OF ACCOUNT PLACING ORDER
S402
ANALYZE ORDERS IN ORDER BOOK FOR ACCOUNT PLACING ORDER
S403
ESTABLISH PRECONFIGURED INTERMONTH SPREAD CHARGE
S404
ASSUME ALL ORDERS IN ORDER BOOK ARE MATCHED AND PLACED IN PORTFOLIO
S405
DETERMINE MAX INTERMONTH SPREAD CHARGE
S406
MODIFY MARGIN REQUIREMENT BASED ON MAX INTERMONTH SPREAD CHARGE
S407
IS MODIFIED MARGIN REQUIREMENT HIGHER THAN THRESHOLD FOR ACCOUNT?
S408
YES
NO
S409
REJECT ORDER
S410
ACCEPT ORDER
E

FIG. 4

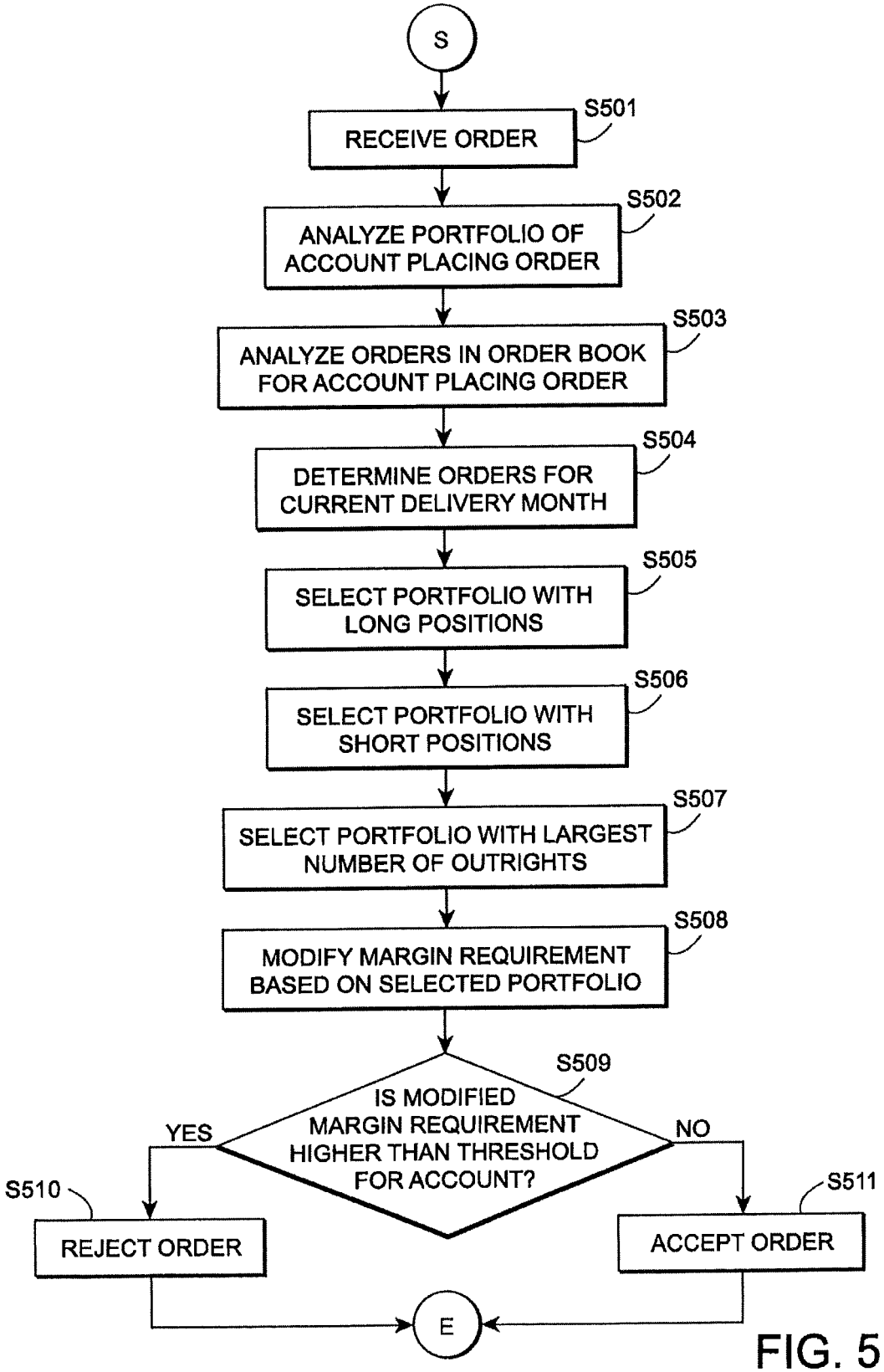

S
S501
RECEIVE ORDER
S502
ANALYZE PORTFOLIO OF ACCOUNT PLACING ORDER
S503
ANALYZE ORDERS IN ORDER BOOK FOR ACCOUNT PLACING ORDER
S504
DETERMINE ORDERS FOR CURRENT DELIVERY MONTH
S505
SELECT PORTFOLIO WITH LONG POSITIONS
S506
SELECT PORTFOLIO WITH SHORT POSITIONS
S507
SELECT PORTFOLIO WITH LARGEST NUMBER OF OUTRIGHTS
S508
MODIFY MARGIN REQUIREMENT BASED ON SELECTED PORTFOLIO
S509
IS MODIFIED MARGIN REQUIREMENT HIGHER THAN THRESHOLD FOR ACCOUNT?
YES
NO
S510
REJECT ORDER
S511
ACCEPT ORDER
E

FIG. 5

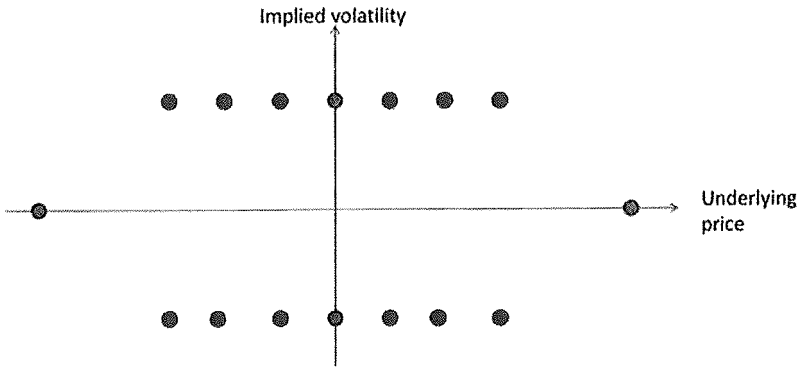


FIG. 6

Tier	Positions				
1	$long_1$	$short_1$			
2	$long_2$	$short_2$		Tier	Positions
...	...	...	→	1	$long_{tot}$ $short_{tot}$
N-1	$long_{N-1}$	$short_{N-1}$			
N	$long_N$	$short_N$			

FIG. 7

Spread Charges

Tier	1	2	...	N-1	N
1	$charge_{1\ to\ 1}$	-	-	-	-
2	$charge_{1\ to\ 2}$	$charge_{2\ to\ 2}$	-	-	
...	...	...	...	--	-
$max(charge_{i\ to\ j})$					
N-1	$charge_{1\ to\ N-1}$	$charge_{2\ to\ N-1}$	...	$charge_{N-1\ to\ N-1}$	
N	$charge_{1\ to\ N}$	$charge_{2\ to\ N}$	...	$charge_{N-1\ to\ N}$	$charge_{N\ to\ N}$

⟶

Spread Charges

Tier	1
1	

FIG. 8

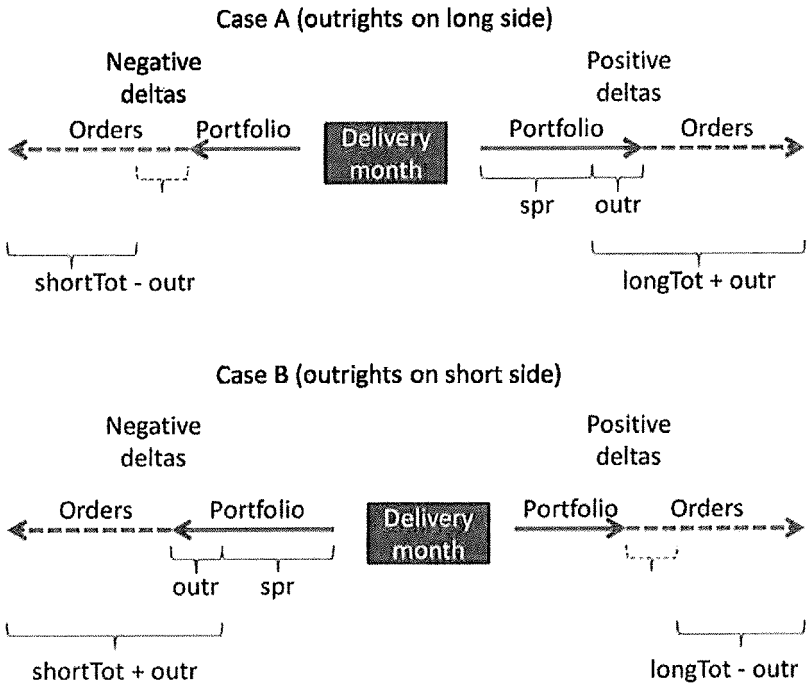

Case A (outrights on long side)
Negative deltas
Orders
Portfolio
Delivery month
Positive deltas
Portfolio
Orders
spr
outr
shortTot - outr
longTot + outr
Case B (outrights on short side)
Negative deltas
Orders
Portfolio
Delivery month
Positive deltas
Portfolio
Orders
outr
spr
shortTot + outr
longTot - outr

FIG. 9

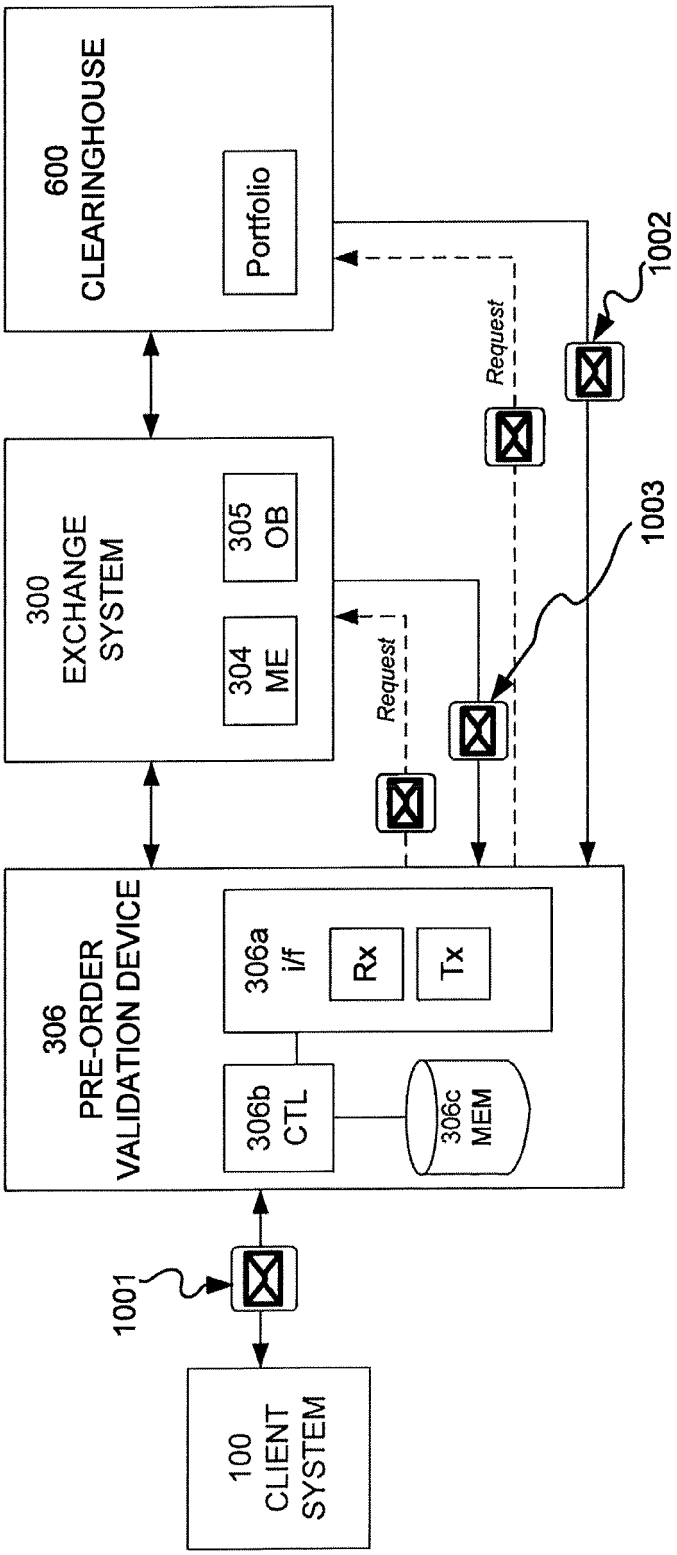

600
CLEARINGHOUSE
Portfolio
300
EXCHANGE
SYSTEM
305
OB
304
ME
306
PRE-ORDER
VALIDATION DEVICE
306a
i/f
Rx
Tx
306b
CTL
306c
MEM
100
CLIENT
SYSTEM
1001
1002
1003
Request
Request

FIG. 10