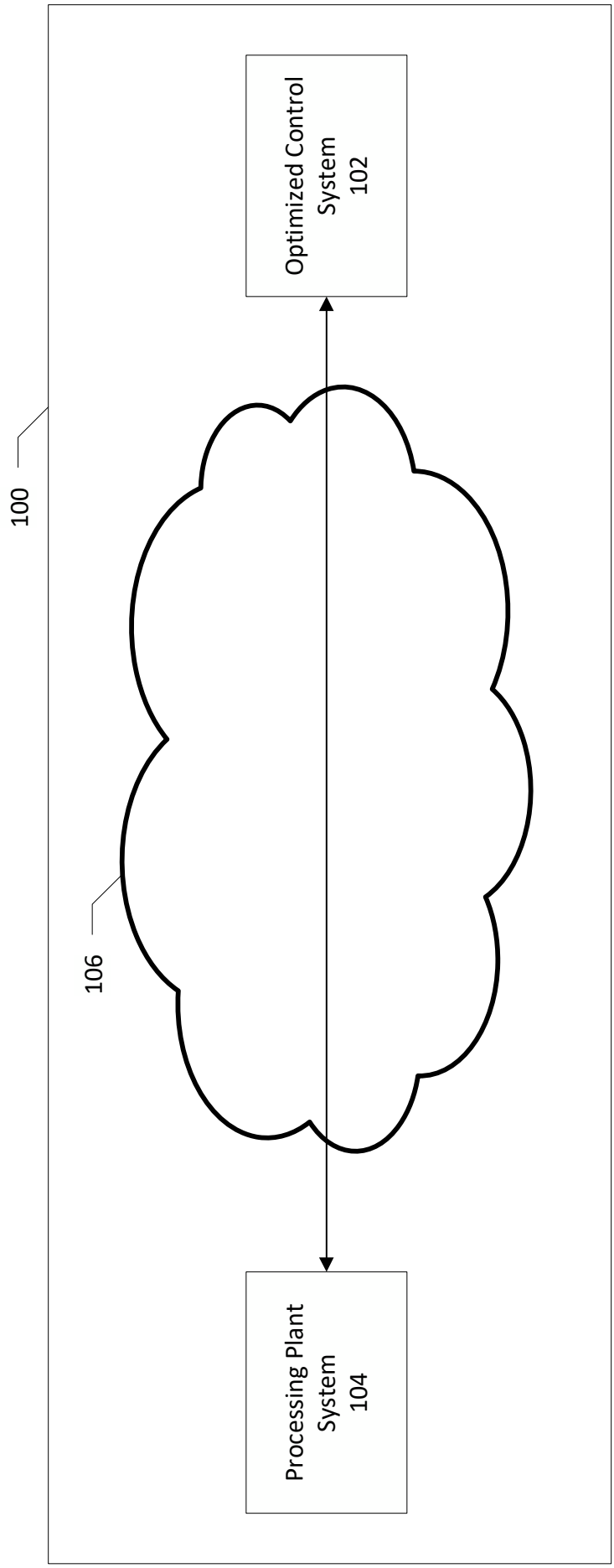

Optimized Control System 102
100
106
Processing Plant System 104

FIG. 1

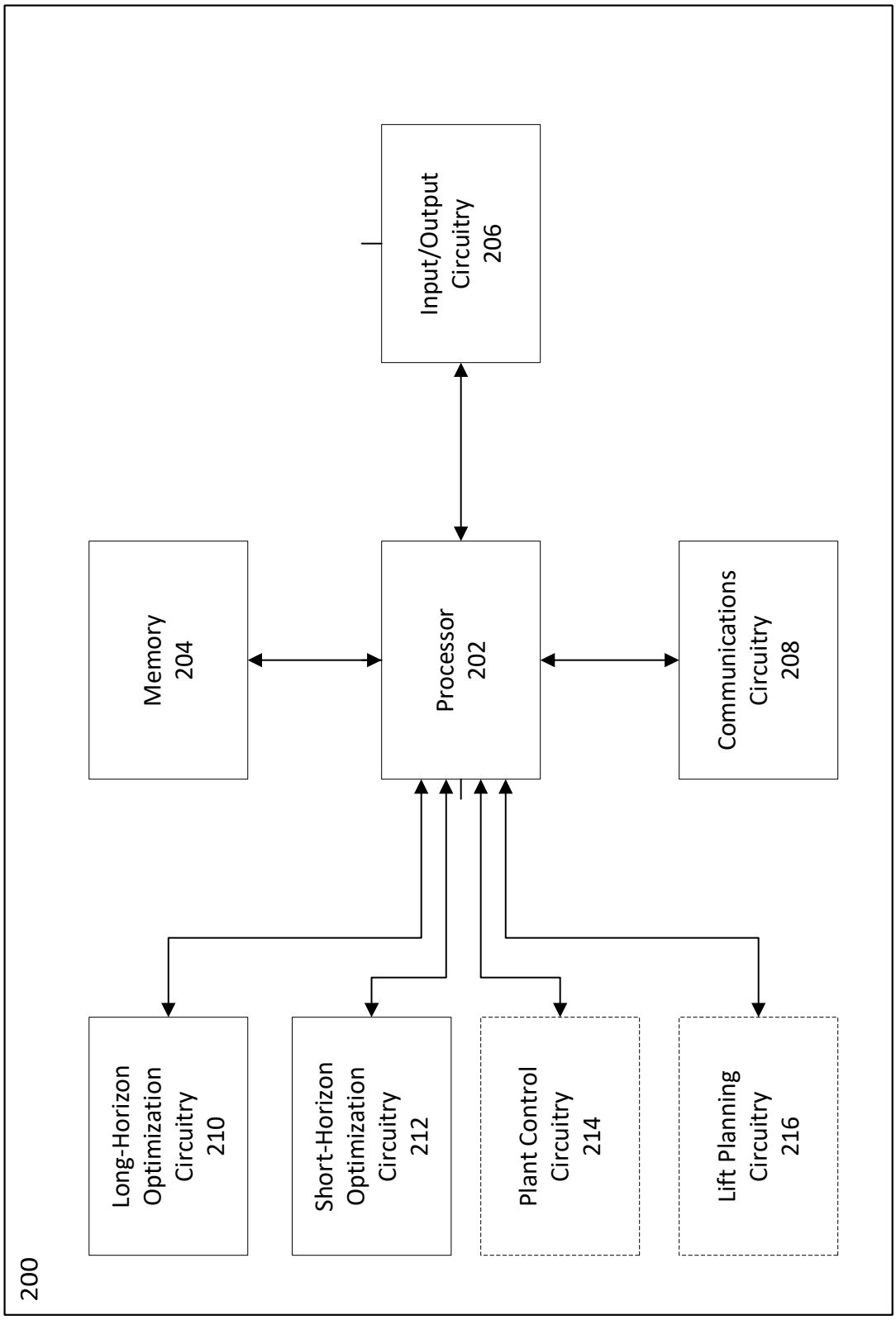

200
Input/Output Circuitry 206
Memory 204
Processor 202
Communications Circuitry 208
Long-Horizon Optimization Circuitry 210
Short-Horizon Optimization Circuitry 212
Plant Control Circuitry 214
Lift Planning Circuitry 216

FIG. 2

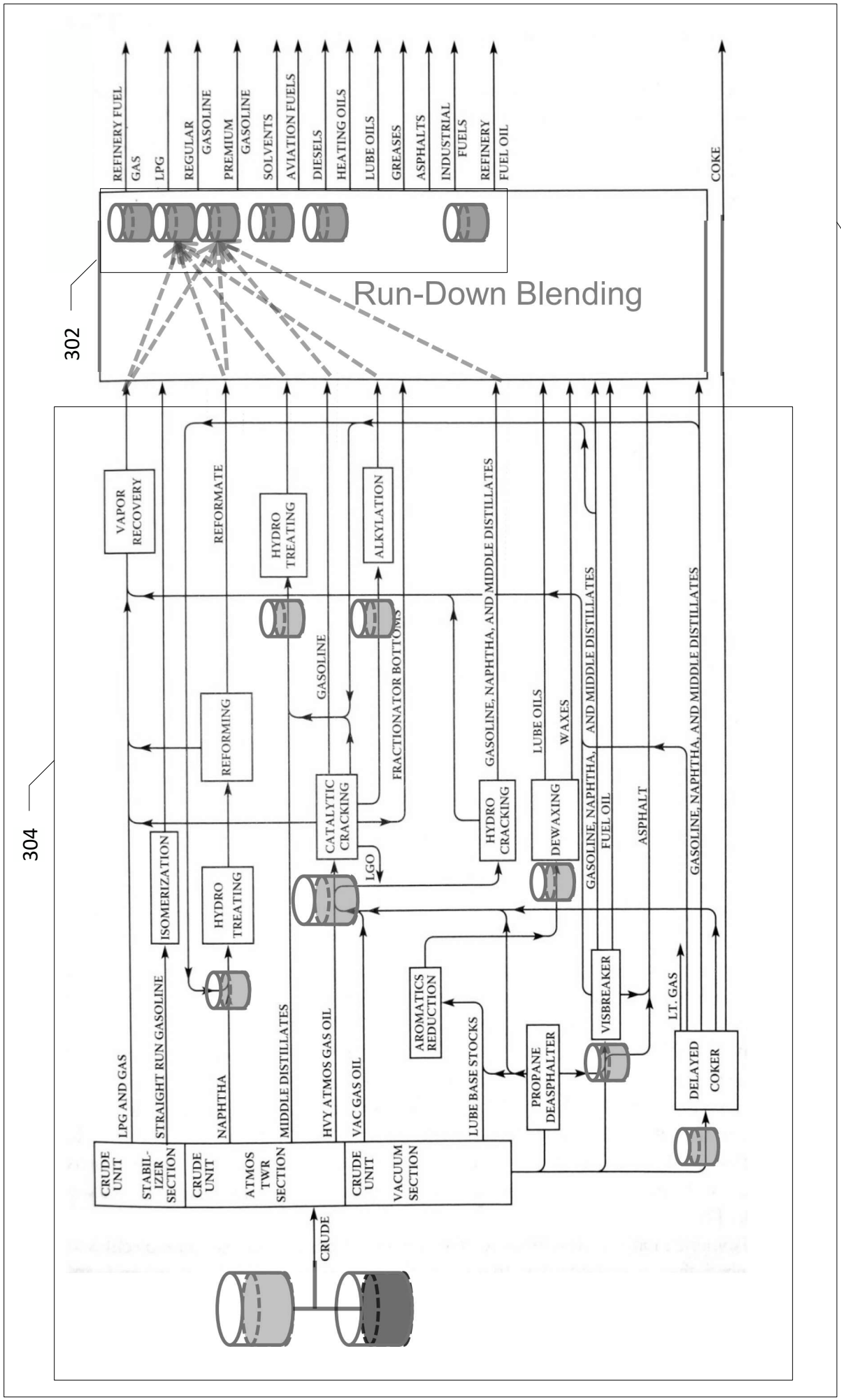

300
302
304
Run-Down Blending
REFINERY FUEL
GAS
LPG
REGULAR GASOLINE
PREMIUM GASOLINE
SOLVENTS
AVIATION FUELS
DIESELS
HEATING OILS
LUBE OILS
GREASES
ASPHALTS
INDUSTRIAL FUELS
REFINERY FUEL OIL
COKE
VAPOR RECOVERY
REFORMATE
HYDRO TREATING
ALKYLATION
GASOLINE
FRACTIONATOR BOTTOMS
GASOLINE, NAPHTHA, AND MIDDLE DISTILLATES
LUBE OILS
WAXES
AND MIDDLE DISTILLATES
GASOLINE, NAPHTHA,
FUEL OIL
ASPHALT
GASOLINE, NAPHTHA, AND MIDDLE DISTILLATES
ISOMERIZATION
REFORMING
HYDRO TREATING
CATALYTIC CRACKING
LGO
HYDRO CRACKING
DEWAXING
VISBREAKER
LT. GAS
DELAYED COKER
AROMATICS REDUCTION
PROPANE DEASPHALTER
LPG AND GAS
STRAIGHT RUN GASOLINE
NAPHTHA
MIDDLE DISTILLATES
HVY ATMOS GAS OIL
VAC GAS OIL
LUBE BASE STOCKS
CRUDE UNIT STABILIZER SECTION
CRUDE UNIT ATMOS TWR SECTION
CRUDE UNIT VACUUM SECTION
CRUDE

FIG. 3

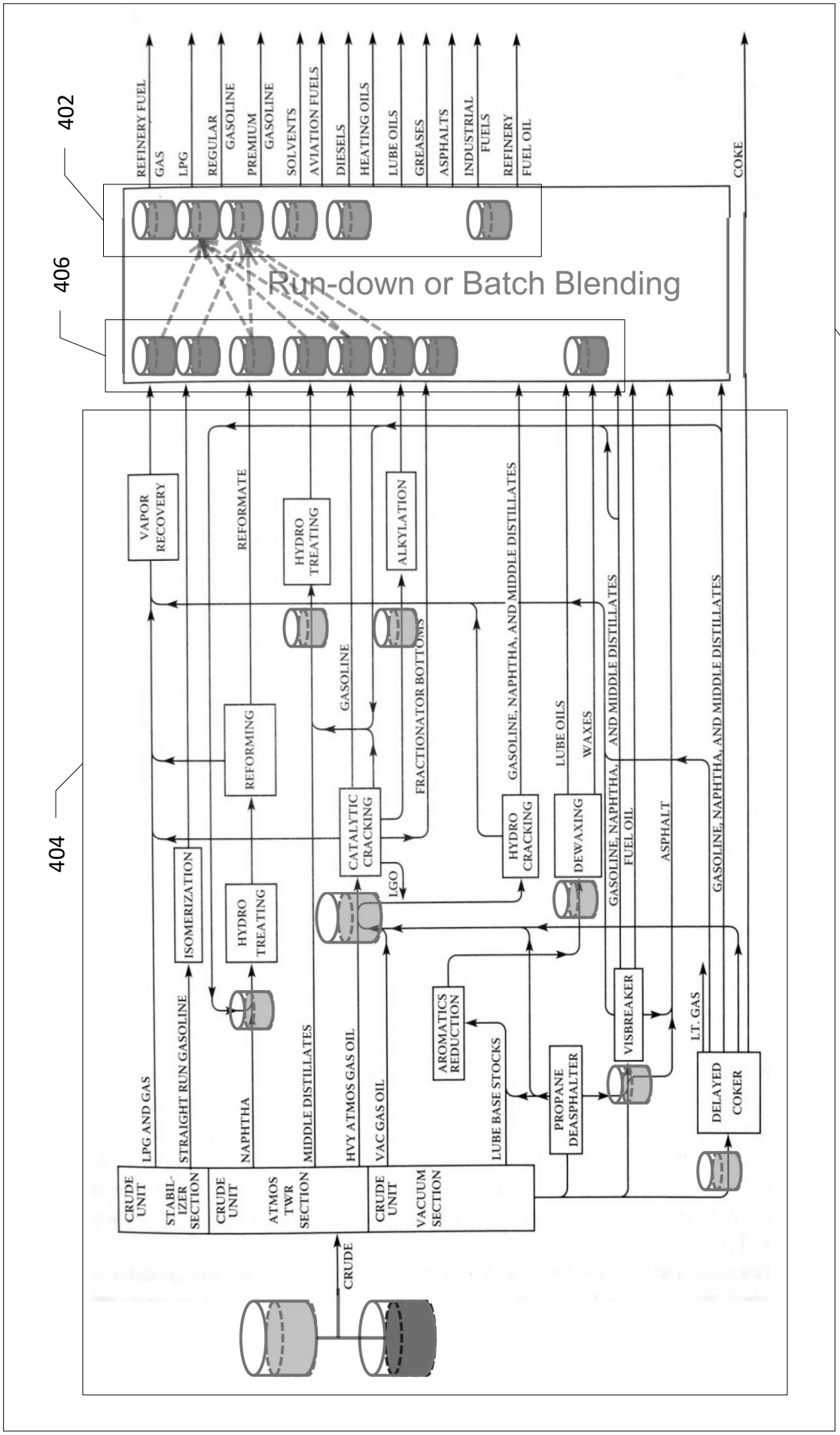

402
406
404
404
Run-down or Batch Blending
REFINERY FUEL GAS
LPG
REGULAR GASOLINE
PREMIUM GASOLINE
SOLVENTS
AVIATION FUELS
DIESELS
HEATING OILS
LUBE OILS
GREASES
ASPHALTS
INDUSTRIAL FUELS
REFINERY FUEL OIL
COKE
VAPOR RECOVERY
REFORMATE
HYDRO TREATING
ALKYLATION
ISOMERIZATION
REFORMING
HYDRO TREATING
CATALYTIC CRACKING
HYDRO CRACKING
DEWAXING
VISBREAKER
AROMATICS REDUCTION
PROPANE DEASPHALTER
DELAYED COKER
GASOLINE
FRACTIONATOR BOTTOMS
LGO
GASOLINE, NAPHTHA, AND MIDDLE DISTILLATES
LUBE OILS
WAXES
GASOLINE, NAPHTHA, AND MIDDLE DISTILLATES
FUEL OIL
ASPHALT
LT. GAS
GASOLINE, NAPHTHA, AND MIDDLE DISTILLATES
LPG AND GAS
STRAIGHT RUN GASOLINE
NAPHTHA
MIDDLE DISTILLATES
HVY ATMOS GAS OIL
VAC GAS OIL
LUBE BASE STOCKS
CRUDE UNIT STABILIZER SECTION
CRUDE UNIT ATMOS TWR SECTION
CRUDE UNIT VACUUM SECTION
CRUDE

FIG. 4

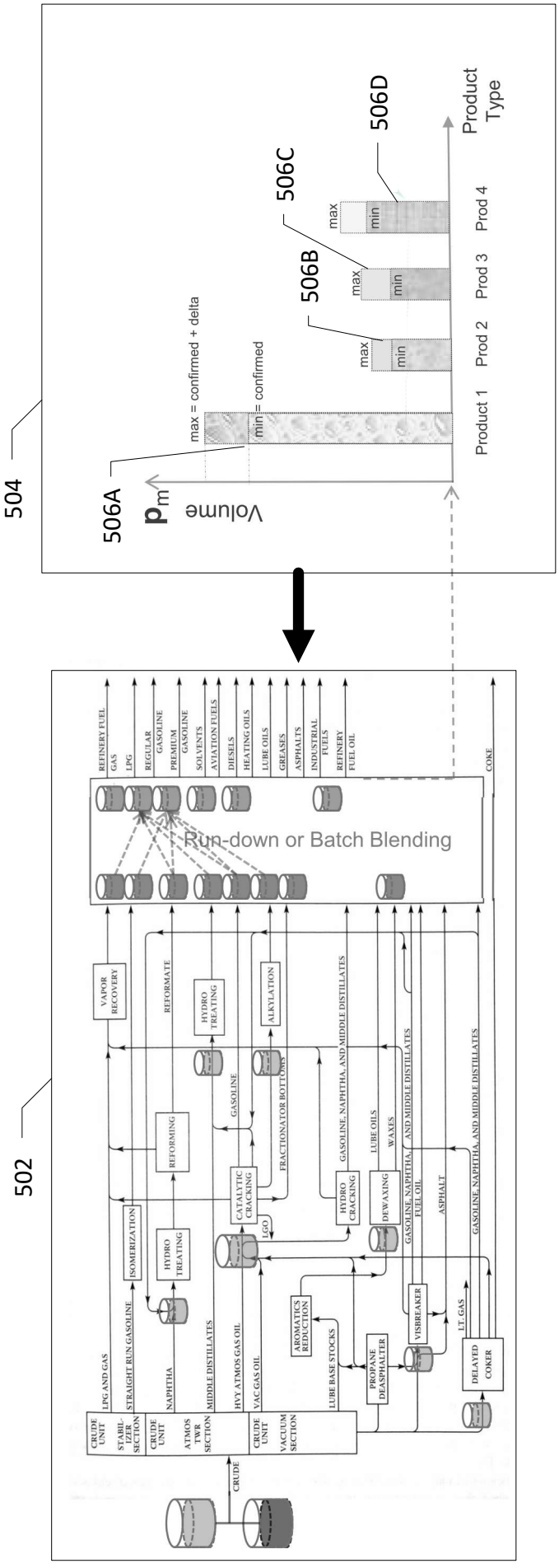

504
506A
Volume
max = confirmed + delta
min = confirmed
Product 1
Prod 2
506B
max
min
Prod 3
506C
max
min
Prod 4
506D
Product Type
502
CRUDE
CRUDE UNIT ATMOS TWR SECTION
CRUDE UNIT VACUUM SECTION
CRUDE UNIT STABILIZER SECTION
LPG AND GAS
STRAIGHT RUN GASOLINE
NAPHTHA
MIDDLE DISTILLATES
HVY ATMOS GAS OIL
VAC GAS OIL
LUBE BASE STOCKS
ISOMERIZATION
HYDRO TREATING
REFORMING
AROMATICS REDUCTION
PROPANE DEASPHALTER
CATALYTIC CRACKING
GO
FRACTIONATOR BOTTOMS
GASOLINE
HYDRO TREATING
REFORMATE
VAPOR RECOVERY
ALKYLATION
HYDRO CRACKING
GASOLINE, NAPHTHA, AND MIDDLE DISTILLATES
DEWAXING
LUBE OILS
WAXES
VISBREAKER
FUEL OIL
ASPHALT
DELAYED COKER
LT. GAS
GASOLINE, NAPHTHA, AND MIDDLE DISTILLATES
Run-down or Batch Blending
REFINERY FUEL GAS
LPG
REGULAR GASOLINE
PREMIUM GASOLINE
SOLVENTS
AVIATION FUELS
DIESELS
HEATING OILS
LUBE OILS
GREASES
ASPHALTS
INDUSTRIAL FUELS
REFINERY FUEL OIL
COKE

FIG. 5

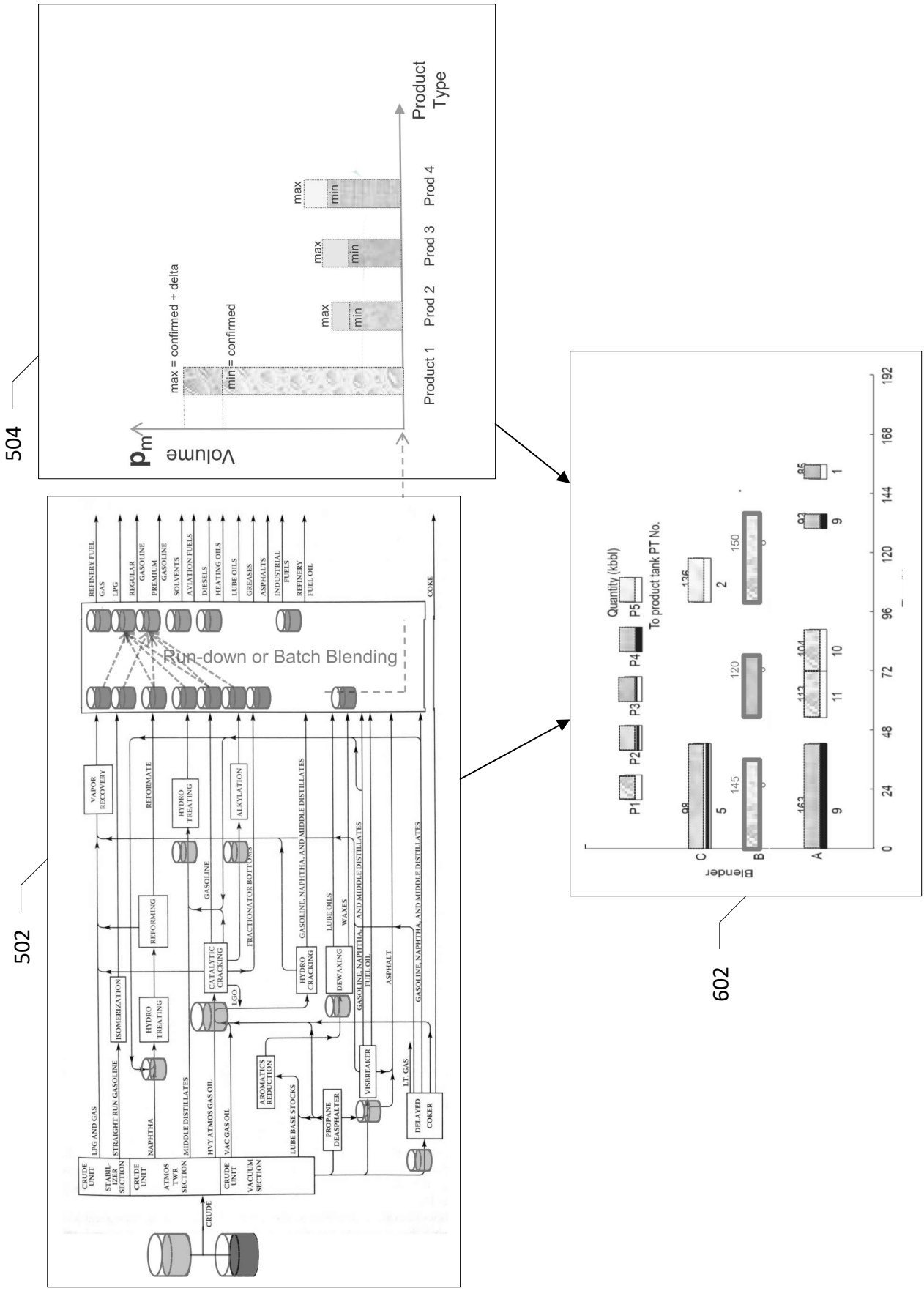

504
Volume
p_m
max = confirmed + delta
min = confirmed
Product 1
Prod 2
Prod 3
Prod 4
Product Type
max
min
502
Run-down or Batch Blending
REFINERY FUEL GAS
LPG
REGULAR GASOLINE
PREMIUM GASOLINE
SOLVENTS
AVIATION FUELS
DIESELS
HEATING OILS
LUBE OILS
GREASES
ASPHALTS
INDUSTRIAL FUELS
REFINERY FUEL OIL
COKE
CRUDE
CRUDE UNIT STABILIZER SECTION
CRUDE UNIT ATMOS TWR SECTION
CRUDE UNIT VACUUM SECTION
LPG AND GAS
STRAIGHT RUN GASOLINE
NAPHTHA
MIDDLE DISTILLATES
HVY ATMOS GAS OIL
VAC GAS OIL
LUBE BASE STOCKS
ISOMERIZATION
HYDRO TREATING
REFORMING
REFORMATE
HYDRO TREATING
GASOLINE
CATALYTIC CRACKING
LCO
FRACTIONATOR BOTTOMS
ALKYLATION
VAPOR RECOVERY
AROMATICS REDUCTION
PROPANE DEASPHALTER
HYDRO CRACKING
GASOLINE, NAPHTHA, AND MIDDLE DISTILLATES
LUBE OILS
DEWAXING
WAXES
GASOLINE, NAPHTHA, AND MIDDLE DISTILLATES
FUEL OIL
VISBREAKER
ASPHALT
LT. GAS
DELAYED COKER
GASOLINE, NAPHTHA, AND MIDDLE DISTILLATES
602
Quantity (kbbl)
To product tank PT No.
P1
P2
P3
P4
P5
Blender
A
B
C
0
24
48
72
96
120
144
168
192
162
9
112
11
104
10
93
9
85
1
98
5
145
120
136
2
150

FIG. 6

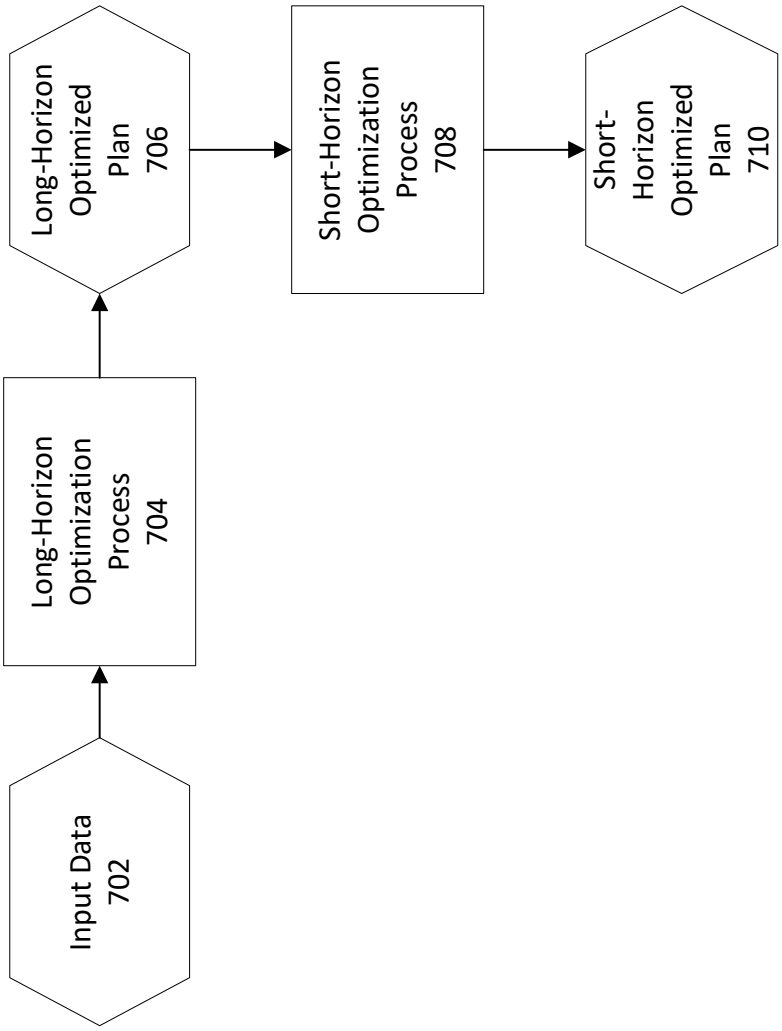

Input Data
702
Long-Horizon
Optimization
Process
704
Long-Horizon
Optimized
Plan
706
Short-Horizon
Optimization
Process
708
Short-
Horizon
Optimized
Plan
710

FIG. 7

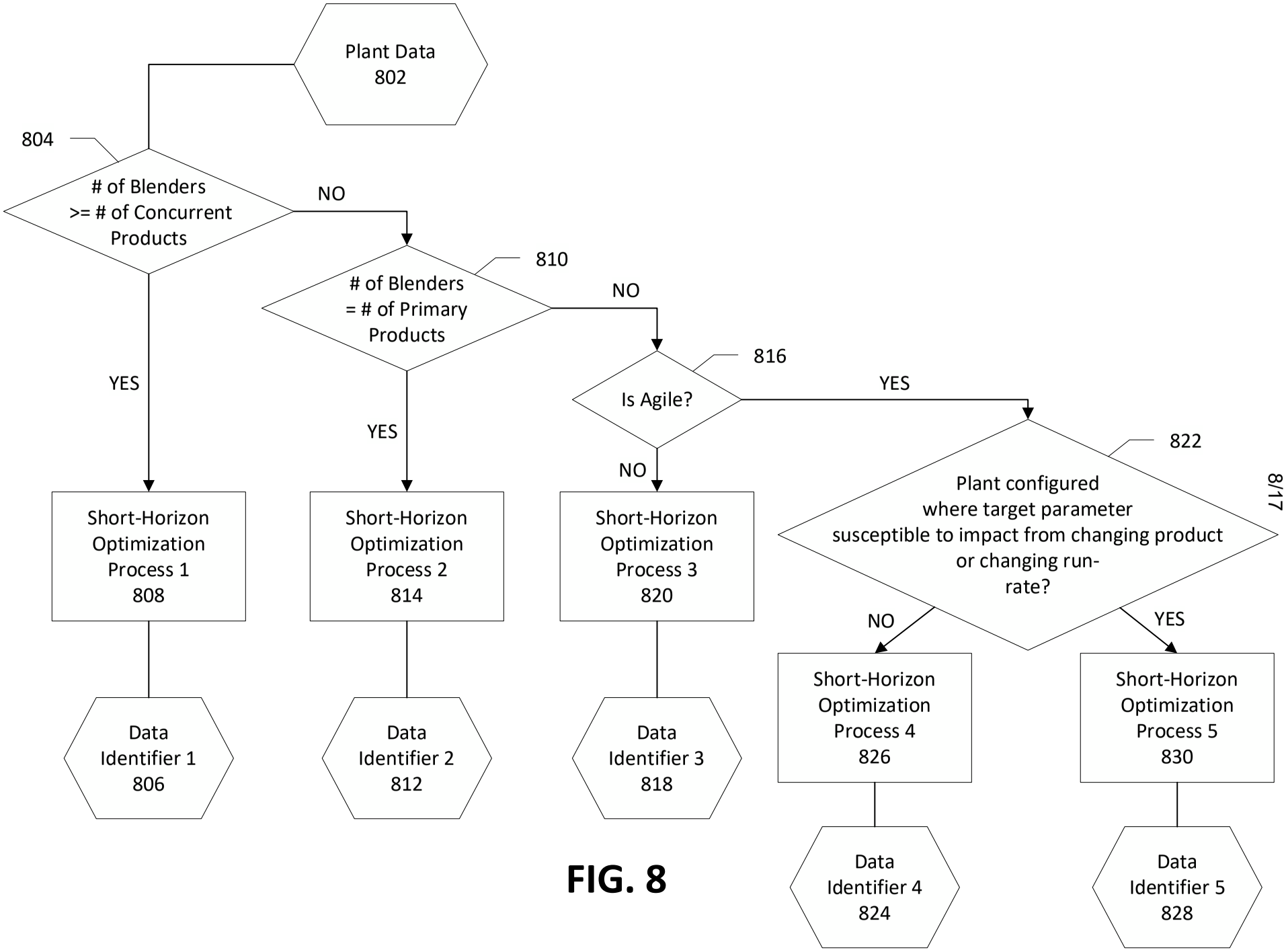

Plant Data
802
804
# of Blenders
>= # of Concurrent
Products
NO
YES
810
# of Blenders
= # of Primary
Products
NO
YES
816
Is Agile?
YES
NO
822
Plant configured
where target parameter
susceptible to impact from changing product
or changing run-
rate?
NO
YES
Short-Horizon
Optimization
Process 1
808
Short-Horizon
Optimization
Process 2
814
Short-Horizon
Optimization
Process 3
820
Short-Horizon
Optimization
Process 4
826
Short-Horizon
Optimization
Process 5
830
Data
Identifier 1
806
Data
Identifier 2
812
Data
Identifier 3
818
Data
Identifier 4
824
Data
Identifier 5
828

FIG. 8

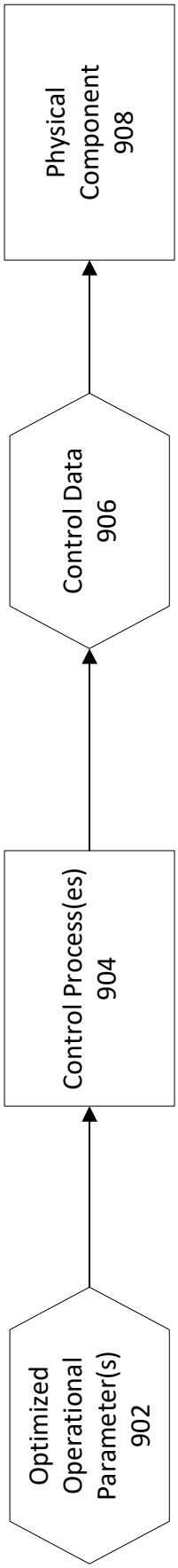

Optimized Operational Parameter(s) 902
Control Process(es) 904
Control Data 906
Physical Component 908

FIG. 9

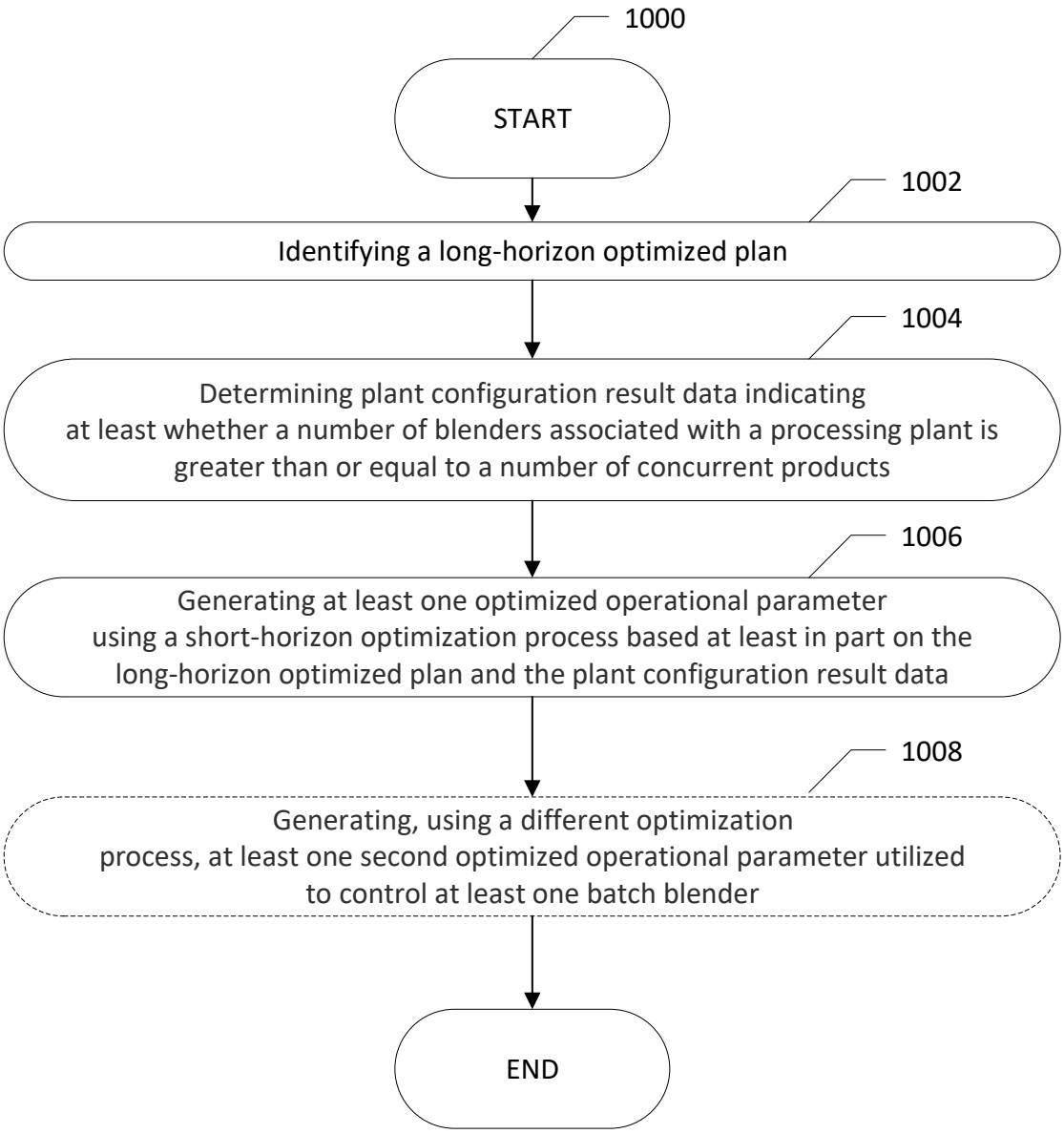

1000
START
1002
Identifying a long-horizon optimized plan
1004
Determining plant configuration result data indicating at least whether a number of blenders associated with a processing plant is greater than or equal to a number of concurrent products
1006
Generating at least one optimized operational parameter using a short-horizon optimization process based at least in part on the long-horizon optimized plan and the plant configuration result data
1008
Generating, using a different optimization process, at least one second optimized operational parameter utilized to control at least one batch blender
END

FIG. 10

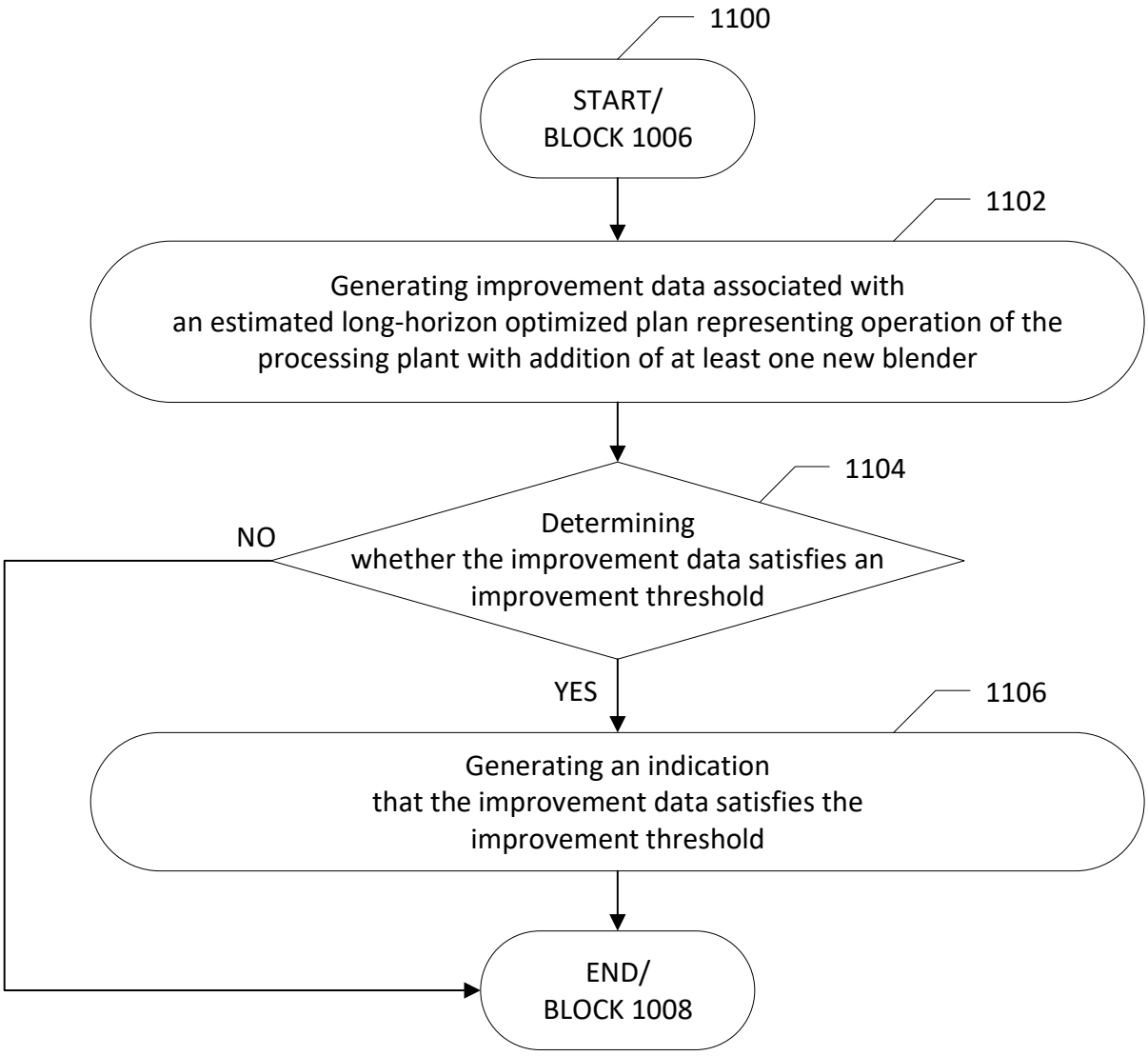

1100
START/
BLOCK 1006
1102
Generating improvement data associated with
an estimated long-horizon optimized plan representing operation of the
processing plant with addition of at least one new blender
1104
Determining
whether the improvement data satisfies an
improvement threshold
NO
YES
1106
Generating an indication
that the improvement data satisfies the
improvement threshold
END/
BLOCK 1008

FIG. 11

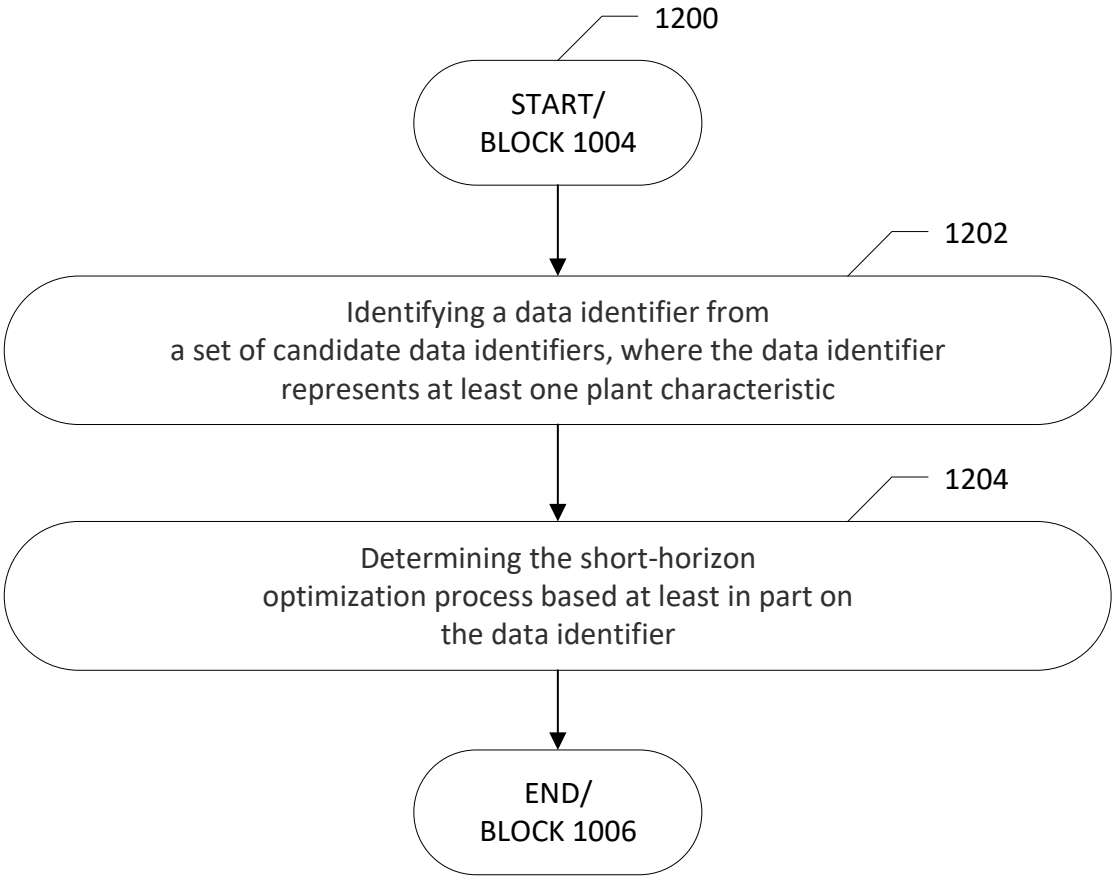

1200
START/
BLOCK 1004
1202
Identifying a data identifier from
a set of candidate data identifiers, where the data identifier
represents at least one plant characteristic
1204
Determining the short-horizon
optimization process based at least in part on
the data identifier
END/
BLOCK 1006

FIG. 12

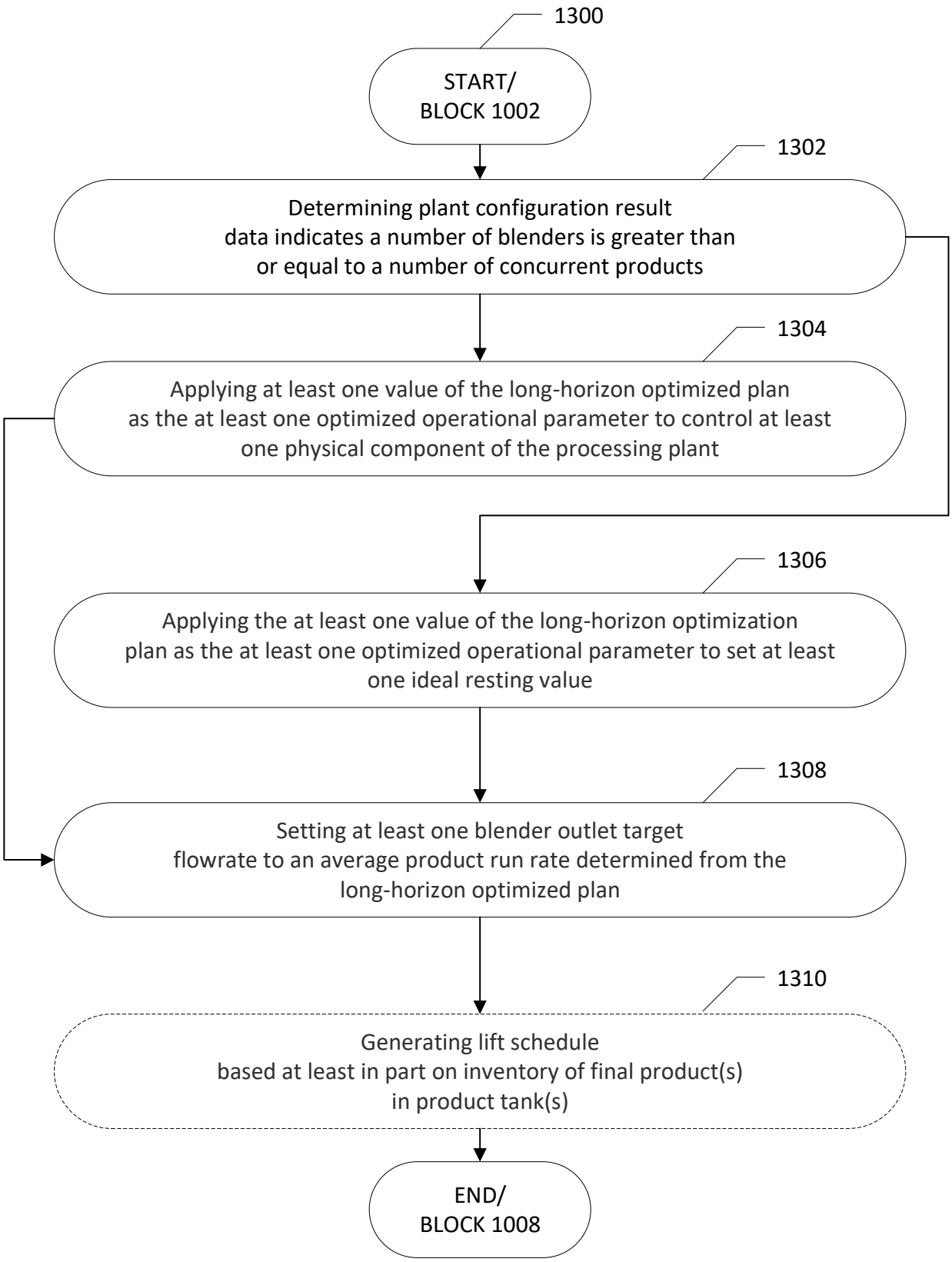

1300
START/
BLOCK 1002
1302
Determining plant configuration result
data indicates a number of blenders is greater than
or equal to a number of concurrent products
1304
Applying at least one value of the long-horizon optimized plan
as the at least one optimized operational parameter to control at least
one physical component of the processing plant
1306
Applying the at least one value of the long-horizon optimization
plan as the at least one optimized operational parameter to set at least
one ideal resting value
1308
Setting at least one blender outlet target
flowrate to an average product run rate determined from the
long-horizon optimized plan
1310
Generating lift schedule
based at least in part on inventory of final product(s)
in product tank(s)
END/
BLOCK 1008

FIG. 13

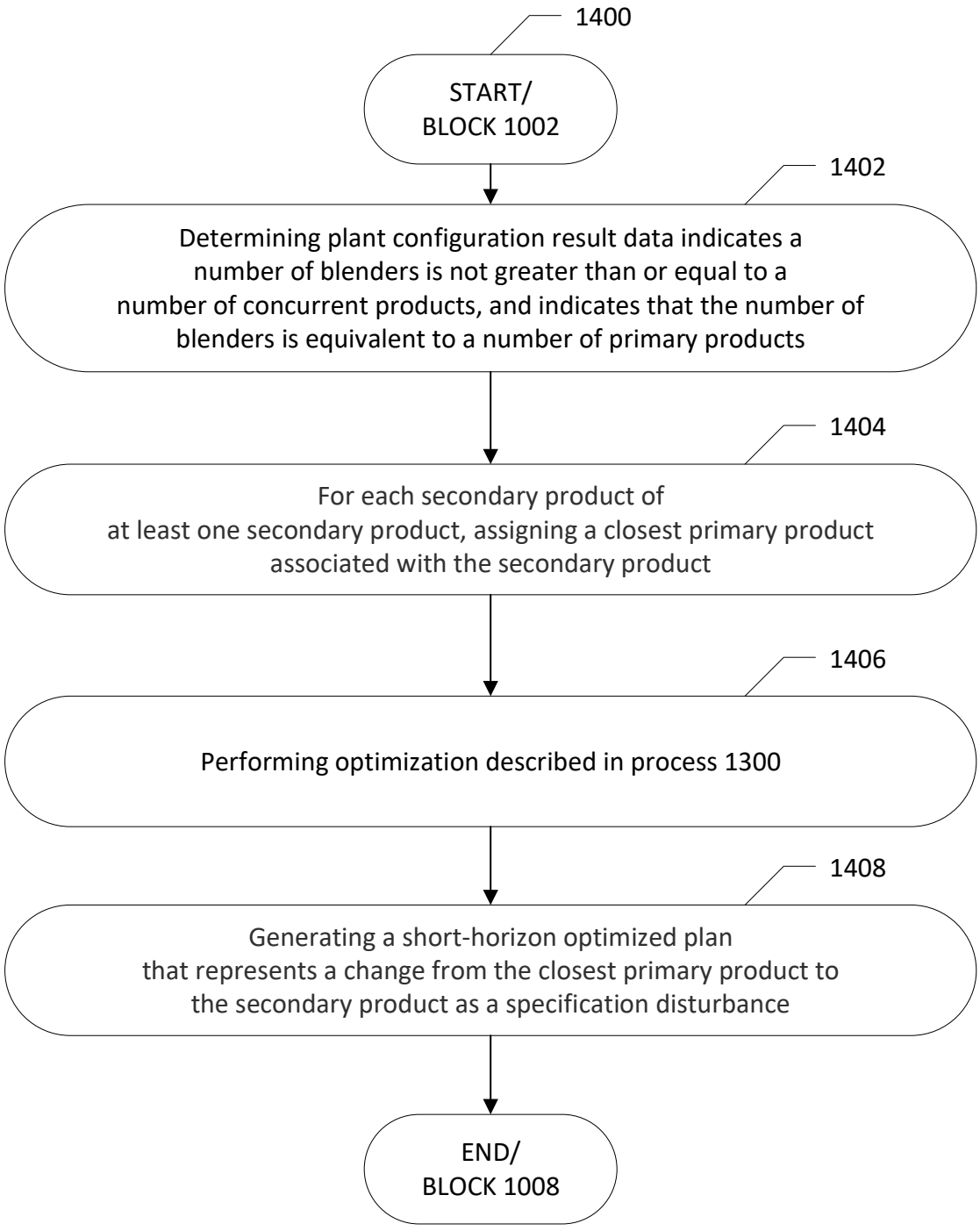

1400
START/
BLOCK 1002
1402
Determining plant configuration result data indicates a number of blenders is not greater than or equal to a number of concurrent products, and indicates that the number of blenders is equivalent to a number of primary products
1404
For each secondary product of at least one secondary product, assigning a closest primary product associated with the secondary product
1406
Performing optimization described in process 1300
1408
Generating a short-horizon optimized plan that represents a change from the closest primary product to the secondary product as a specification disturbance
END/
BLOCK 1008

FIG. 14

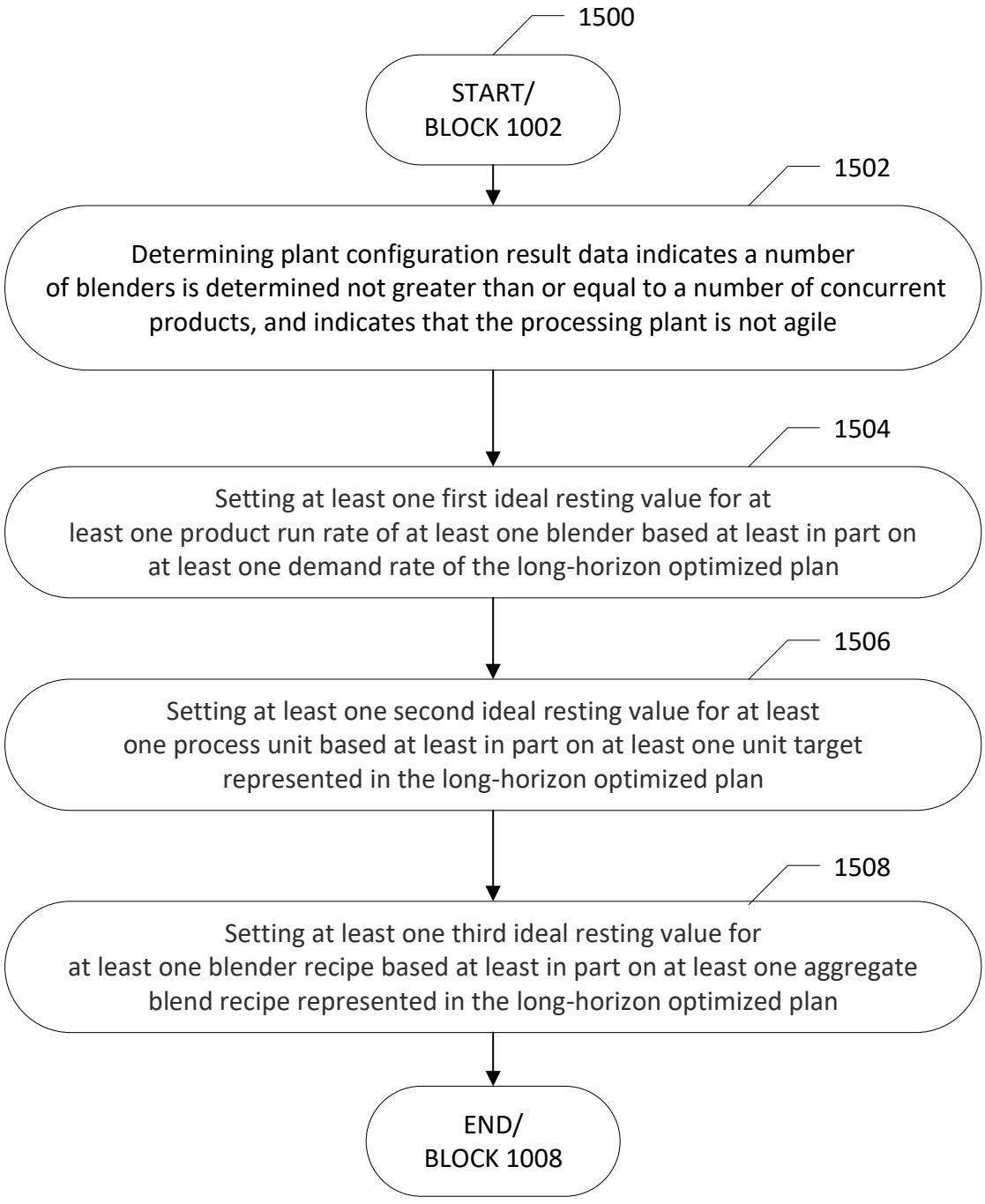

1500
START/
BLOCK 1002
1502
Determining plant configuration result data indicates a number of blenders is determined not greater than or equal to a number of concurrent products, and indicates that the processing plant is not agile
1504
Setting at least one first ideal resting value for at least one product run rate of at least one blender based at least in part on at least one demand rate of the long-horizon optimized plan
1506
Setting at least one second ideal resting value for at least one process unit based at least in part on at least one unit target represented in the long-horizon optimized plan
1508
Setting at least one third ideal resting value for at least one blender recipe based at least in part on at least one aggregate blend recipe represented in the long-horizon optimized plan
END/
BLOCK 1008

FIG. 15

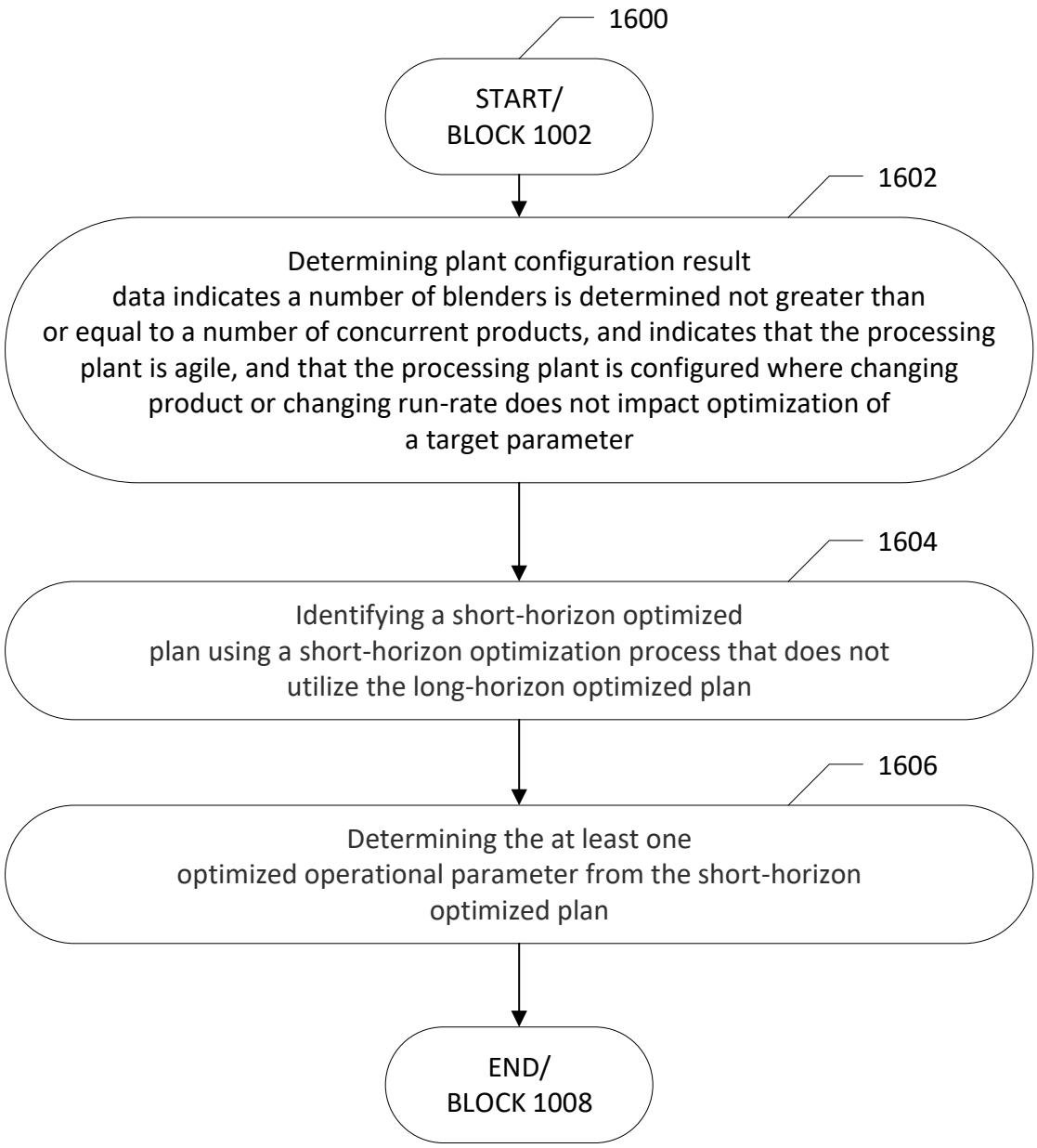

1600
START/
BLOCK 1002
1602
Determining plant configuration result
data indicates a number of blenders is determined not greater than
or equal to a number of concurrent products, and indicates that the processing
plant is agile, and that the processing plant is configured where changing
product or changing run-rate does not impact optimization of
a target parameter
1604
Identifying a short-horizon optimized
plan using a short-horizon optimization process that does not
utilize the long-horizon optimized plan
1606
Determining the at least one
optimized operational parameter from the short-horizon
optimized plan
END/
BLOCK 1008

FIG. 16

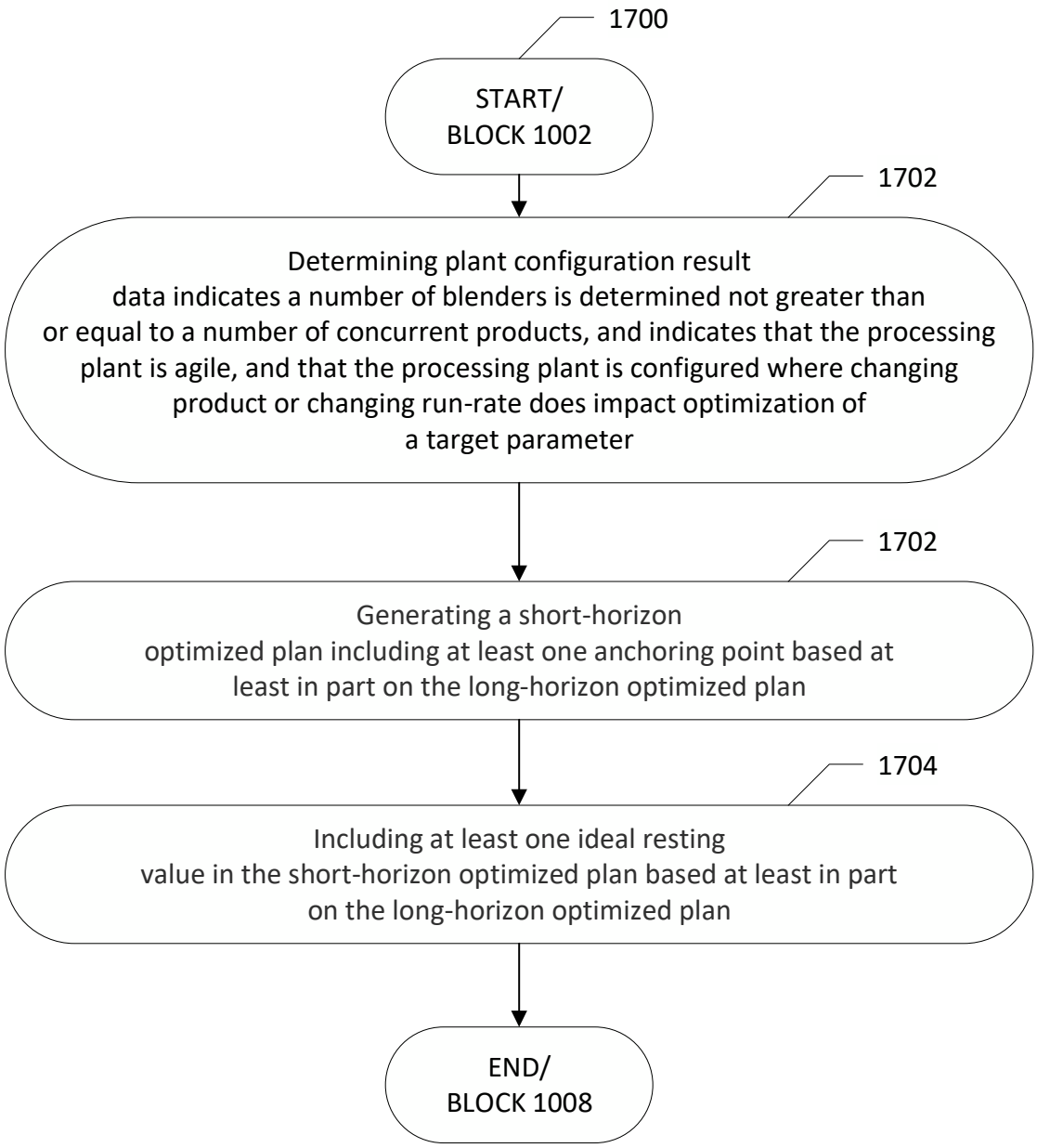

1700
START/
BLOCK 1002
1702
Determining plant configuration result
data indicates a number of blenders is determined not greater than
or equal to a number of concurrent products, and indicates that the processing
plant is agile, and that the processing plant is configured where changing
product or changing run-rate does impact optimization of
a target parameter
1702
Generating a short-horizon
optimized plan including at least one anchoring point based at
least in part on the long-horizon optimized plan
1704
Including at least one ideal resting
value in the short-horizon optimized plan based at least in part
on the long-horizon optimized plan
END/
BLOCK 1008

FIG. 17