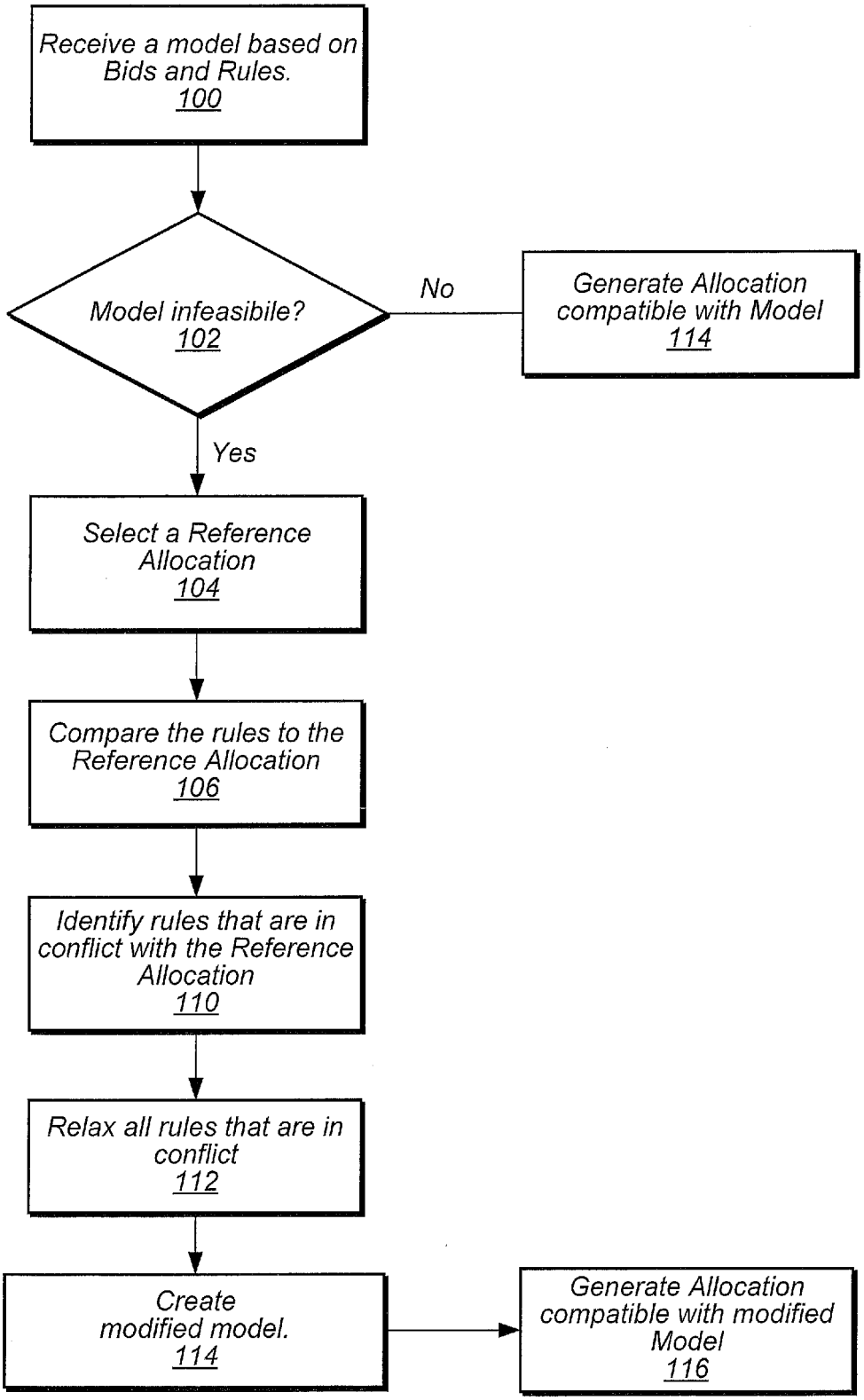

Receive a model based on Bids and Rules.
100
Model infeasibile?
102
No
Generate Allocation compatible with Model
114
Yes
Select a Reference Allocation
104
Compare the rules to the Reference Allocation
106
Identify rules that are in conflict with the Reference Allocation
110
Relax all rules that are in conflict
112
Create modified model.
114
Generate Allocation compatible with modified Model
116

FIG. 1A

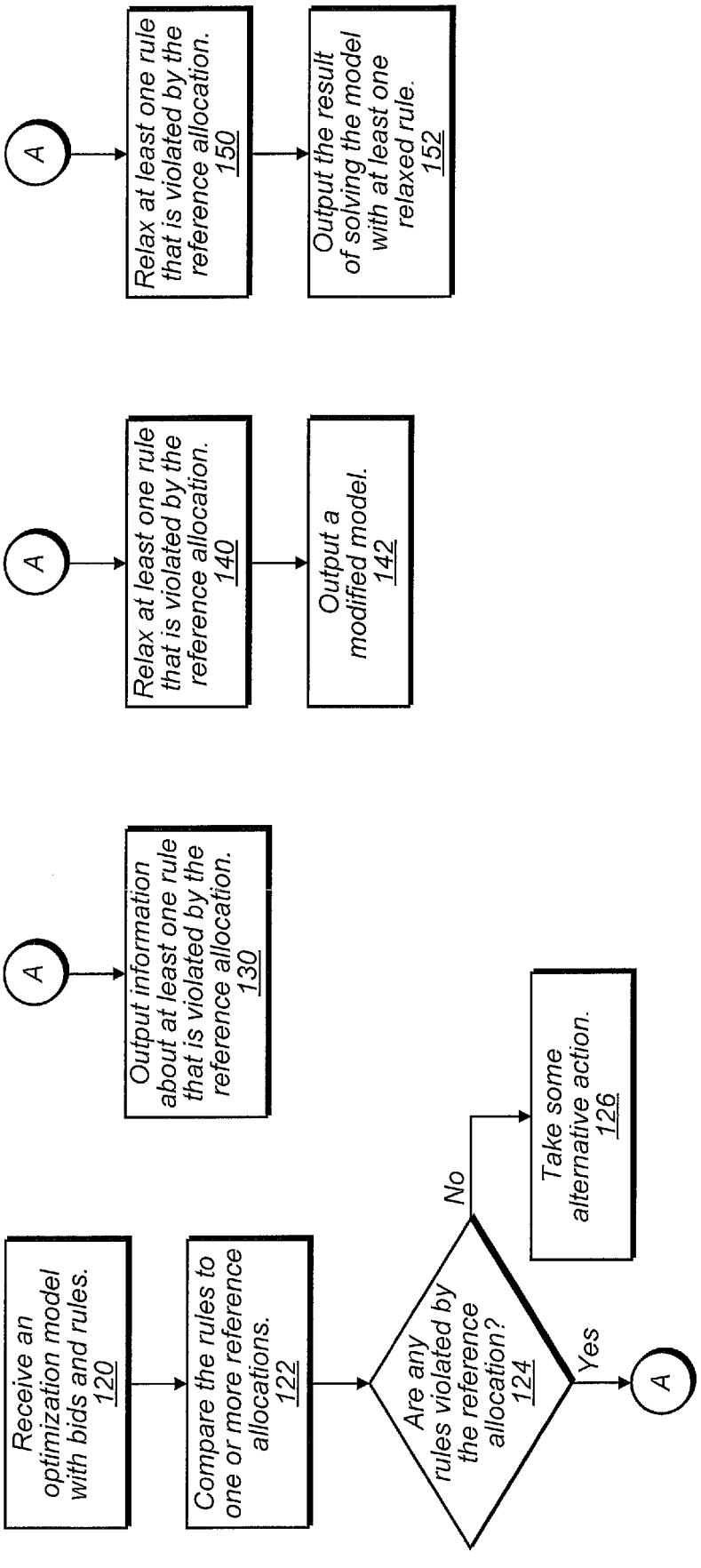

Receive an optimization model with bids and rules. 120
Compare the rules to one or more reference allocations. 122
Are any rules violated by the reference allocation? 124
No
Yes
Take some alternative action. 126
A
Output information about at least one rule that is violated by the reference allocation. 130
Relax at least one rule that is violated by the reference allocation. 140
Output a modified model. 142
Relax at least one rule that is violated by the reference allocation. 150
Output the result of solving the model with at least one relaxed rule. 152

FIG. 1B

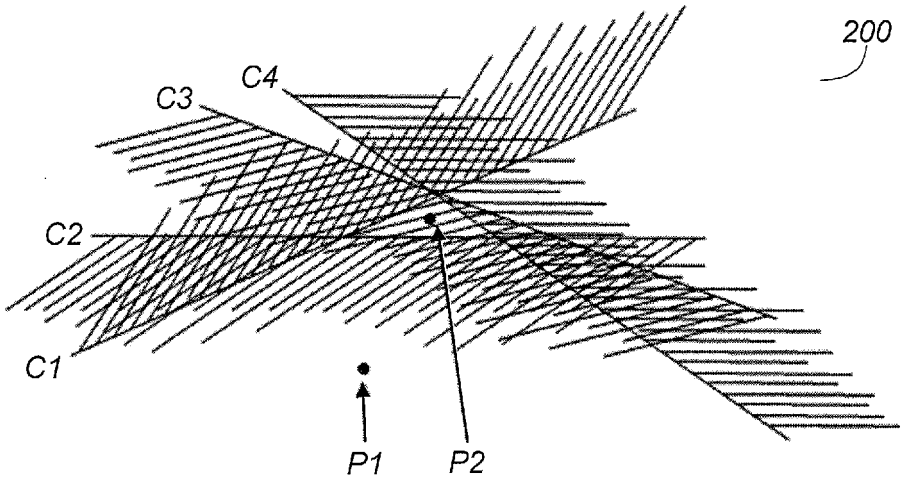


FIG. 2

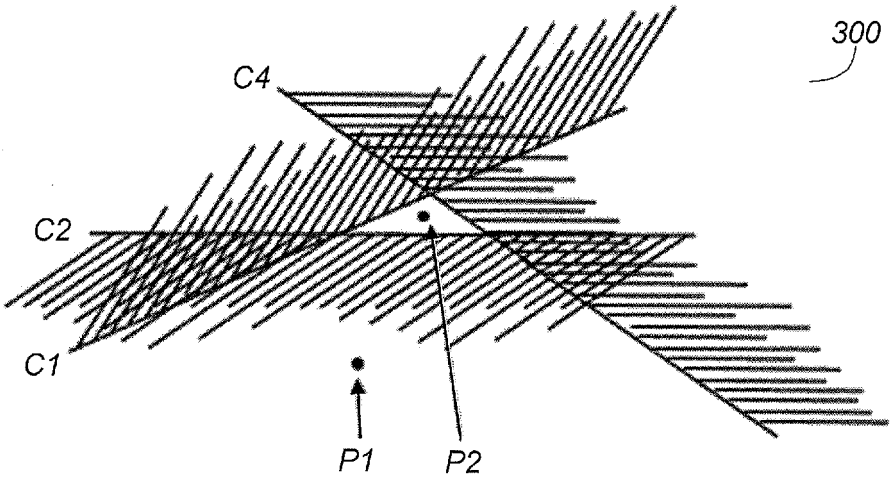


FIG. 3

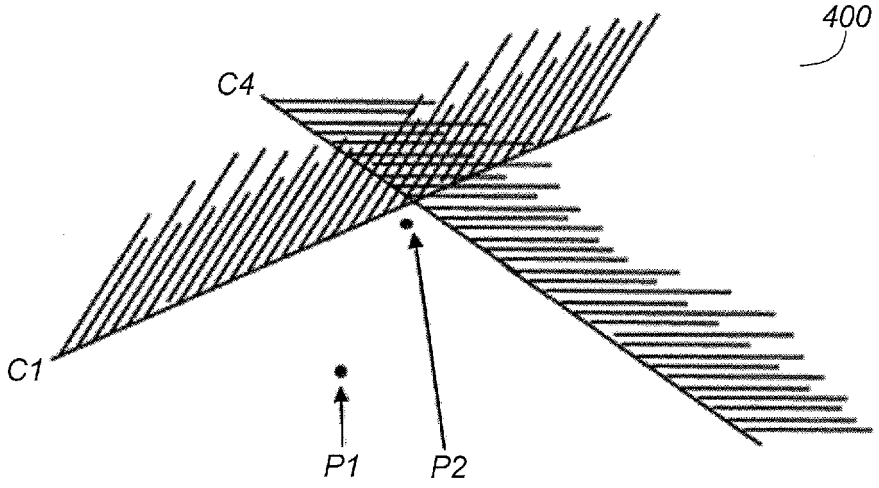


FIG. 4

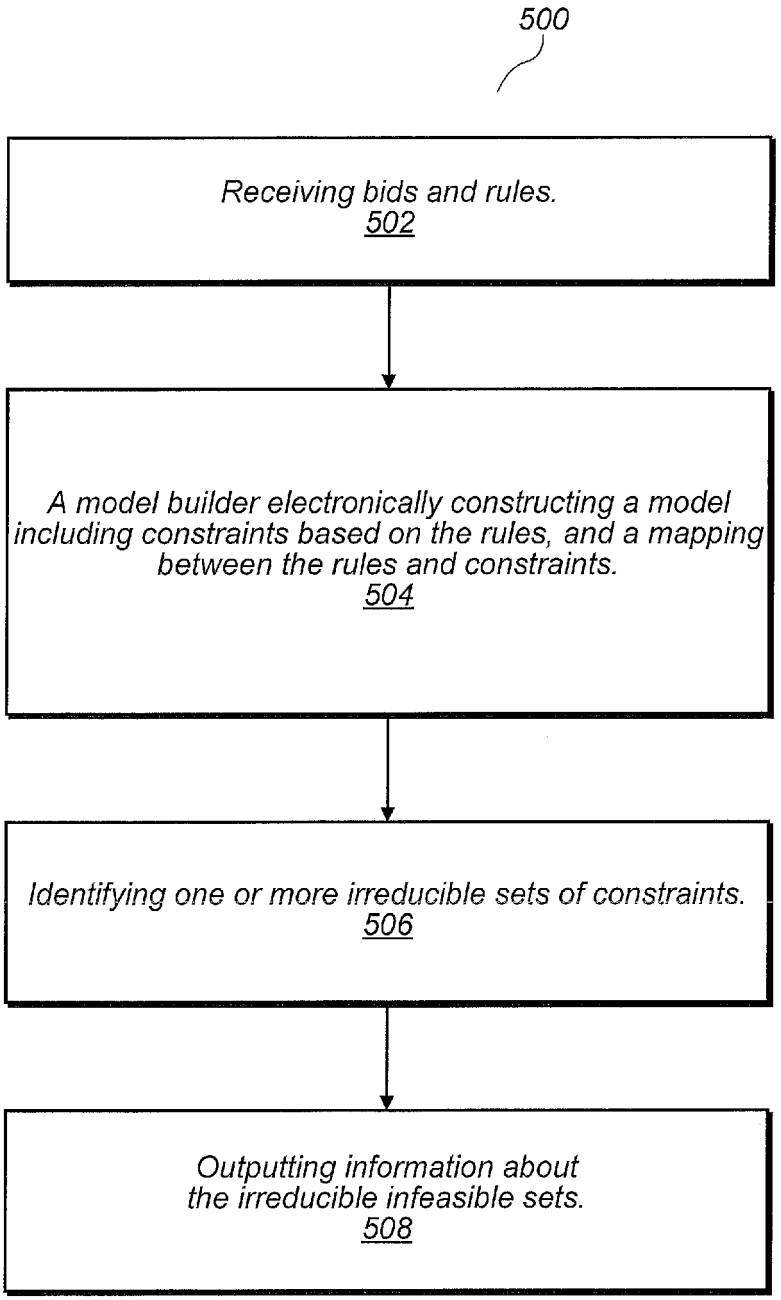

500
Receiving bids and rules.
502
A model builder electronically constructing a model including constraints based on the rules, and a mapping between the rules and constraints.
504
Identifying one or more irreducible sets of constraints.
506
Outputting information about the irreducible infeasible sets.
508

FIG. 5

WO 2016/083981 PCT/IB2015/059048

600

The following rules are contradictory			
Rule Name	Description	Scope	Number of bids in rule
R1	Number of winners is at most 2	Global	321
R2	Number of winners per production country is at least 3	France	112
The following rule can never be fulfilled			
Rule Name	Description	Scope	Number of bids in rule
R17	Allocation is at least 120 000 tons	Global	321
The following rules are contradictory			
Rule Name	Description	Scope	Number of bids in rule
R3	Divide allocation in proportions 70, 20, and 10% per country	USE, Inland	23
R12	Allocate incumbents at least 50% of their volume	Bidder = Universal Transports	6
R13	Reject all bids	Non-certified bidders	3

602

604

606

FIG. 6

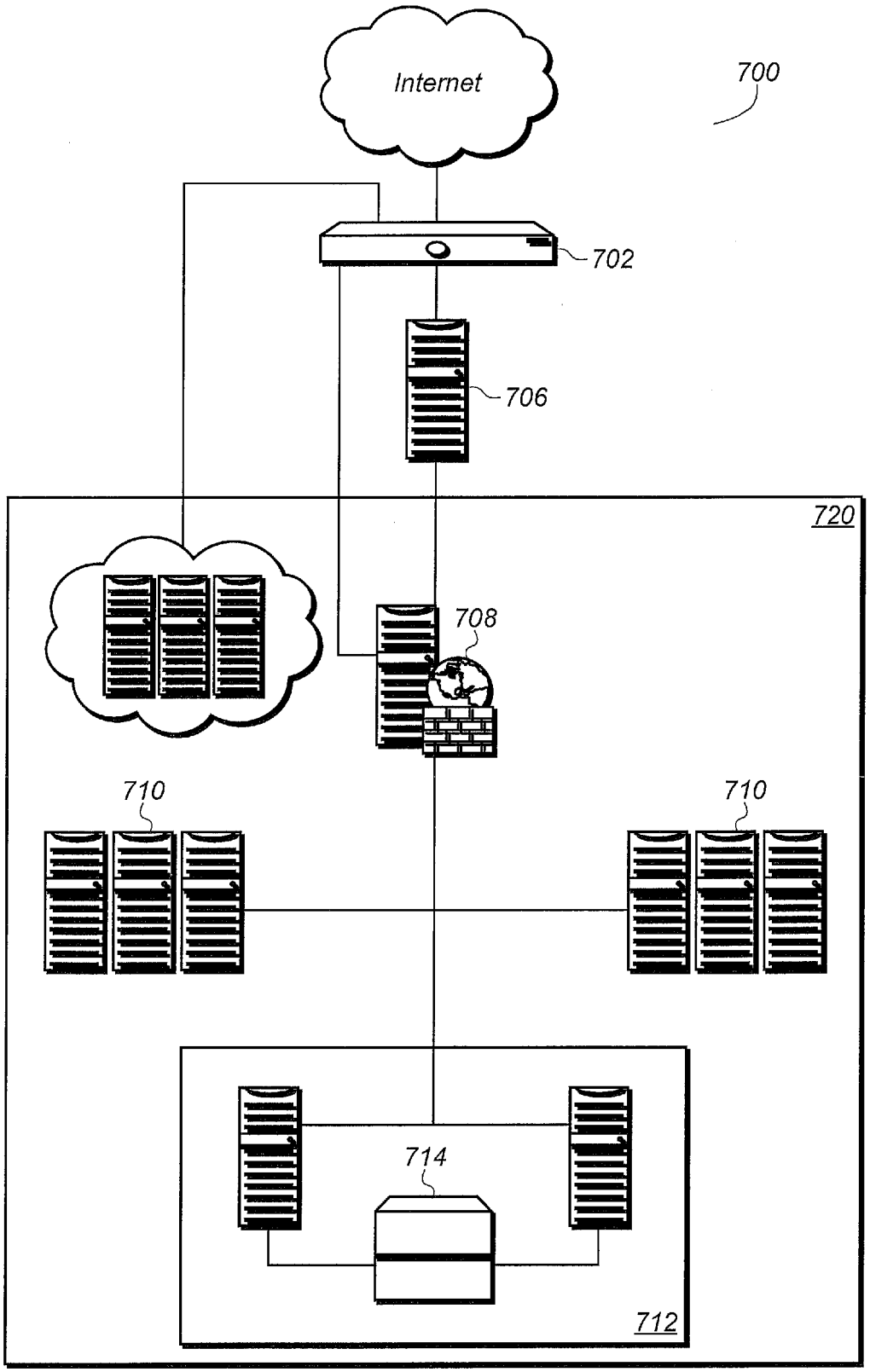


FIG. 7

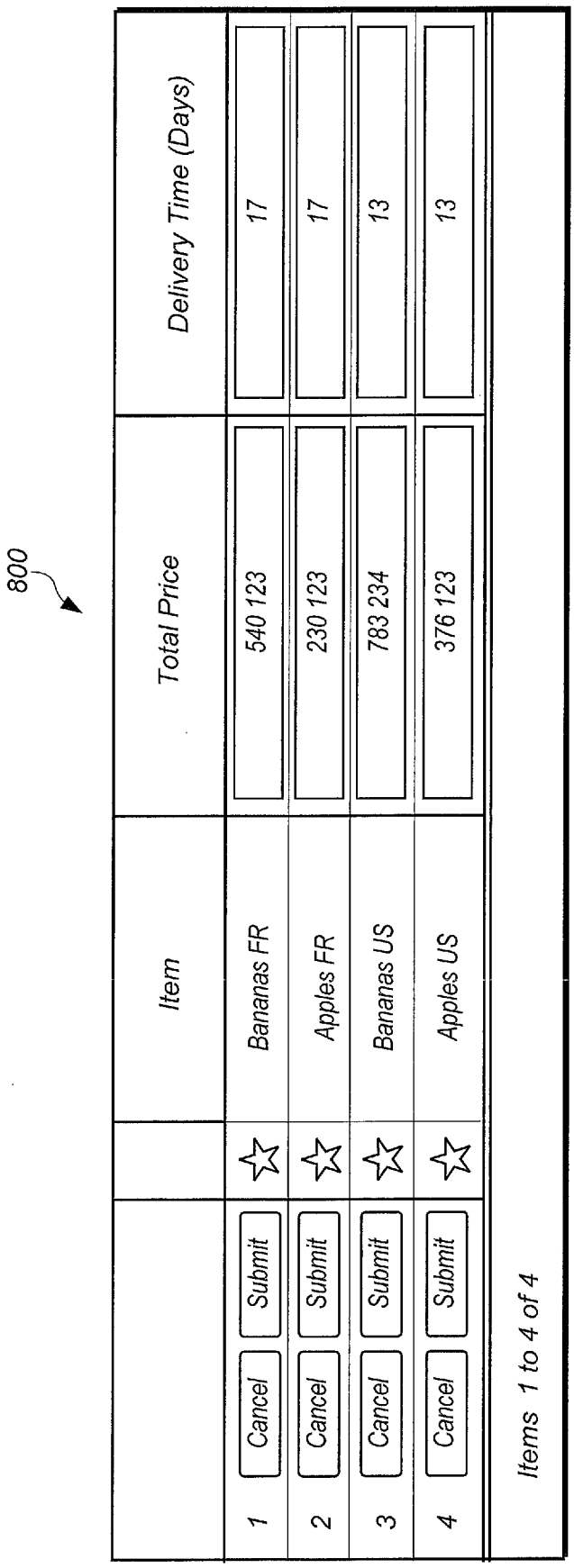

800
Item
Total Price
Delivery Time (Days)
1
Cancel
Submit
Bananas FR
540 123
17
2
Cancel
Submit
Apples FR
230 123
17
3
Cancel
Submit
Bananas US
783 234
13
4
Cancel
Submit
Apples US
376 123
13
Items 1 to 4 of 4

FIG. 8

900

Rule		Scope
R1.1	Number of winners at most 2.00	Everywhere
R2.1	Allocation (%) is at least 75.00	Bidders Demo Bidder 01
R3.1	Allocation (%) is at least 5.00	Bidders Demo Bidder 06
R4.1	Allocation (%) is at least 5.00	Bidders Demo Bidder 07

FIG. 9

1000

Index	Name	Status	Number of Winners	Payment (USD)
1	Cherry pick	Solved. 11/6/14 10:16:14 AM.	3.00	2,017,246.00
2	Max 2 winners	Solved. 11/6/14 10:16:15 AM.	2.00	2,035,246.00
3	Min 75% to bidder 1	Solved. 11/6/14 10:16:15 AM.	3.00	2,044,388.46
4	Min 75% to bidder 1, 5% to each of bidder 6 & 7	Solved. 11/6/14 10:16:15 AM.	4.00	2,049,474.64
5	Max 2 winners + Min 75% to bidder 1, 5% to each of bidder 6	Infeasable.		

FIG. 10

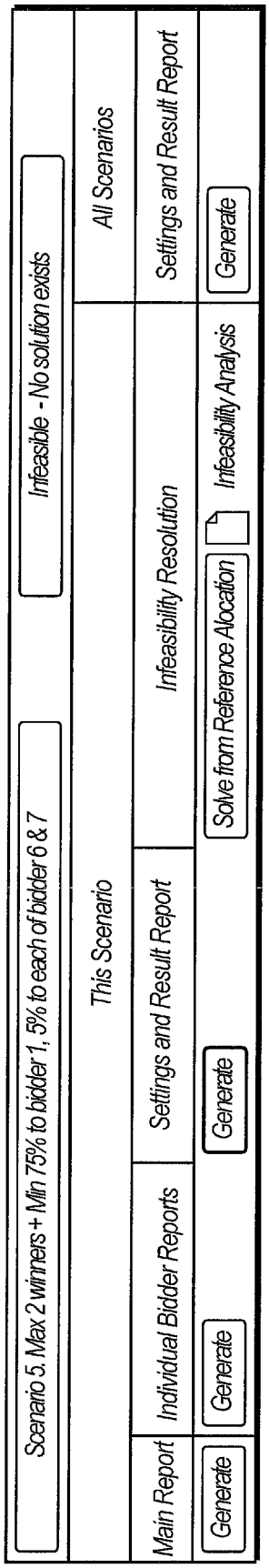


FIG. 11

1200

Index	Name	Status	Number of Winners	Payment (USD)
1	Cherry pick	Solved. 11/6/14 10:16:14 AM.	3.00	2,017,246.00
2	Max 2 winners	Solved. 11/6/14 10:16:15 AM.	2.00	2,035,246.00
3	Min 75% to bidder 1	Solved. 11/6/14 10:16:15 AM.	3.00	2,044,388.46
4	Min 75% to bidder 1, 5% to each of bidder 6 & 7	Solved. 11/6/14 10:16:15 AM.	4.00	2,049,474.64
5	Max 2 winners + Min 75% to bidder 1, 5% to each of bidder 6 & 7	Inconsistent rules found. Solved with reference allocation: Zero. 11/6/14 12:25:36 PM	2.00	2,062,388.64

FIG. 12

1300

	1. Cherry pick		2. Max 2 winners		3. Min 75% to bidder 1		4. Min 75% to bidder 1, 5% to each of bidders 6 & 7		5. Max 2 winners + Min 75% to bidder 1, 5% to each of bidders 6 & 7	
Bidder	Allocation (%)	Payment (USD)	Allocation (%)	Payment (USD)	Allocation (%)	Payment (USD)	Allocation (%)	Payment (USD)	Allocation (%)	Payment (USD)
Demo Bidder 01	44.90	1,046,246.00	44.90	1,046,246.00	75.00	1,474,916.24	75.00	1,474,916.24	75.00	1,474,916.24
Demo Bidder 06							5.00	68,480.63		
Demo Bidder 07	36.73	490,000.00	55.10	989,000.00	6.63	88,472.22	5.00	113,261.11	25.00	587,472.22
Demo Bidder 13	18.37	481,000.00			18.37	481,000.00	15.00	392,816.67		
Sum	100.00	2,017,246.00	100.00	2,035,246.00	100.00	2,044,388.46	100.00	2,049,474.64	100.00	2,062,388.46

FIG. 13