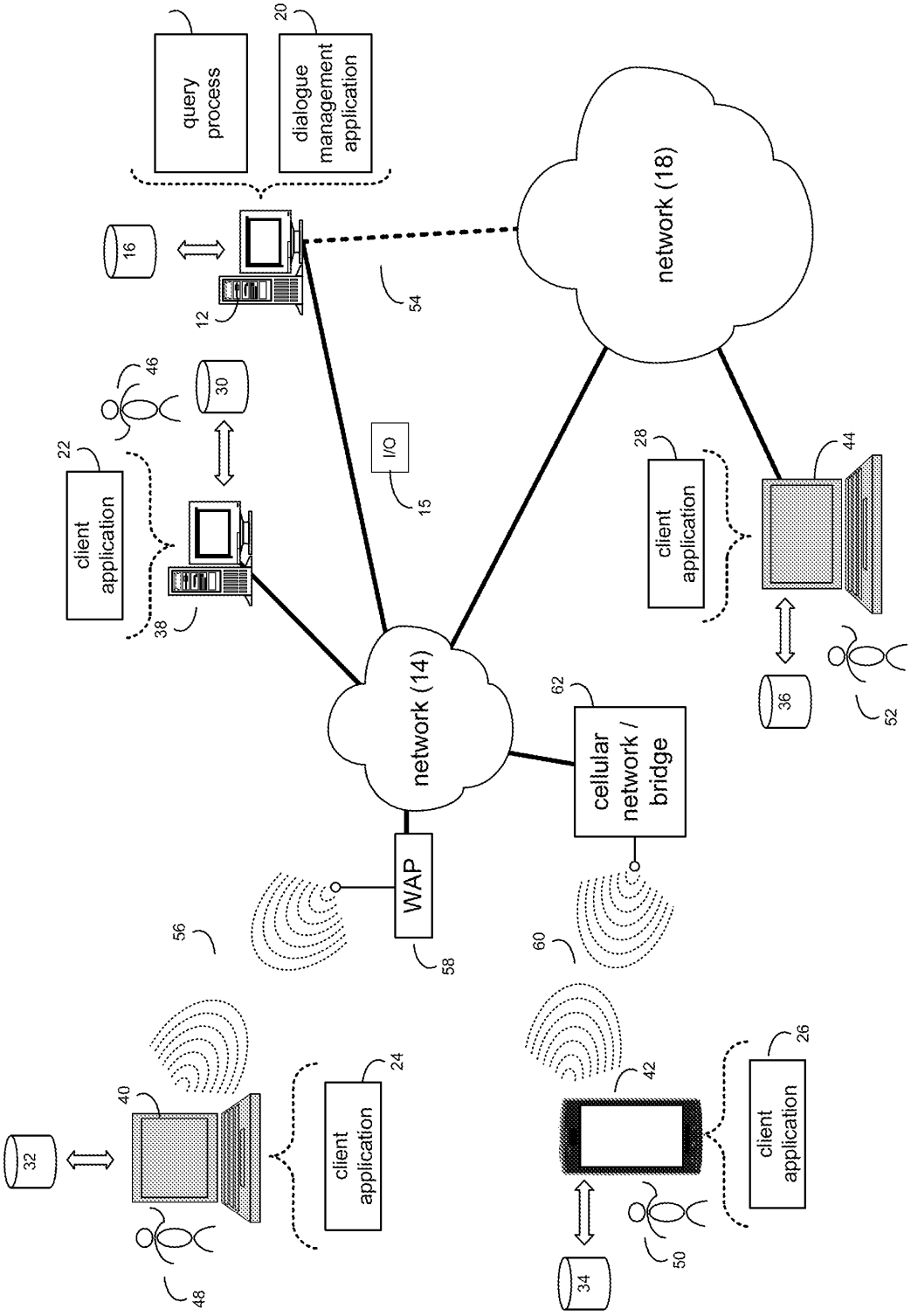

query process
dialogue management application
20
16
12
54
network (18)
46
30
22
client application
38
I/O
15
28
client application
44
network (14)
62
cellular network / bridge
36
52
WAP
56
58
60
32
40
client application
24
42
client application
26
34
50
48

FIG. 1

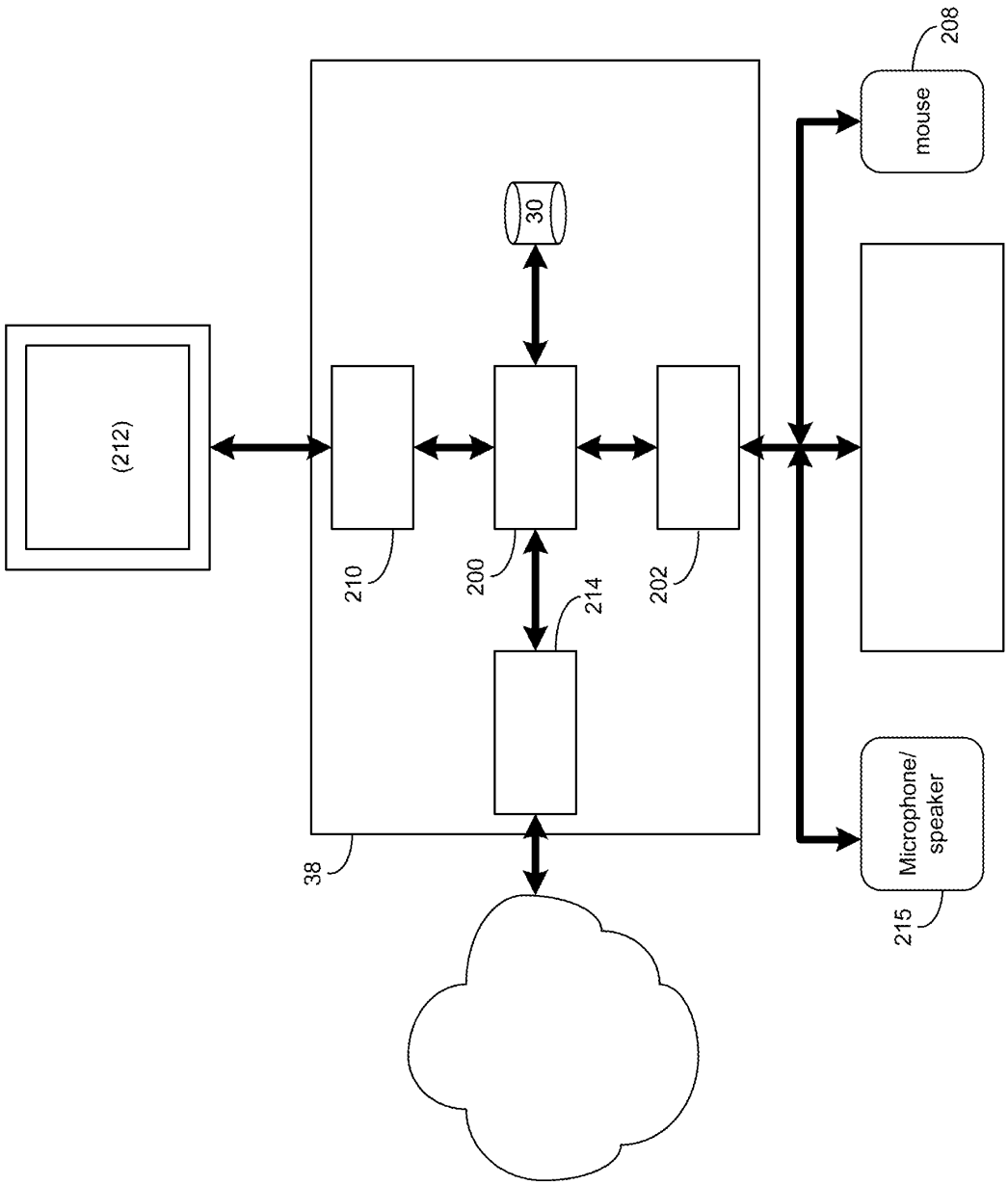


FIG. 2

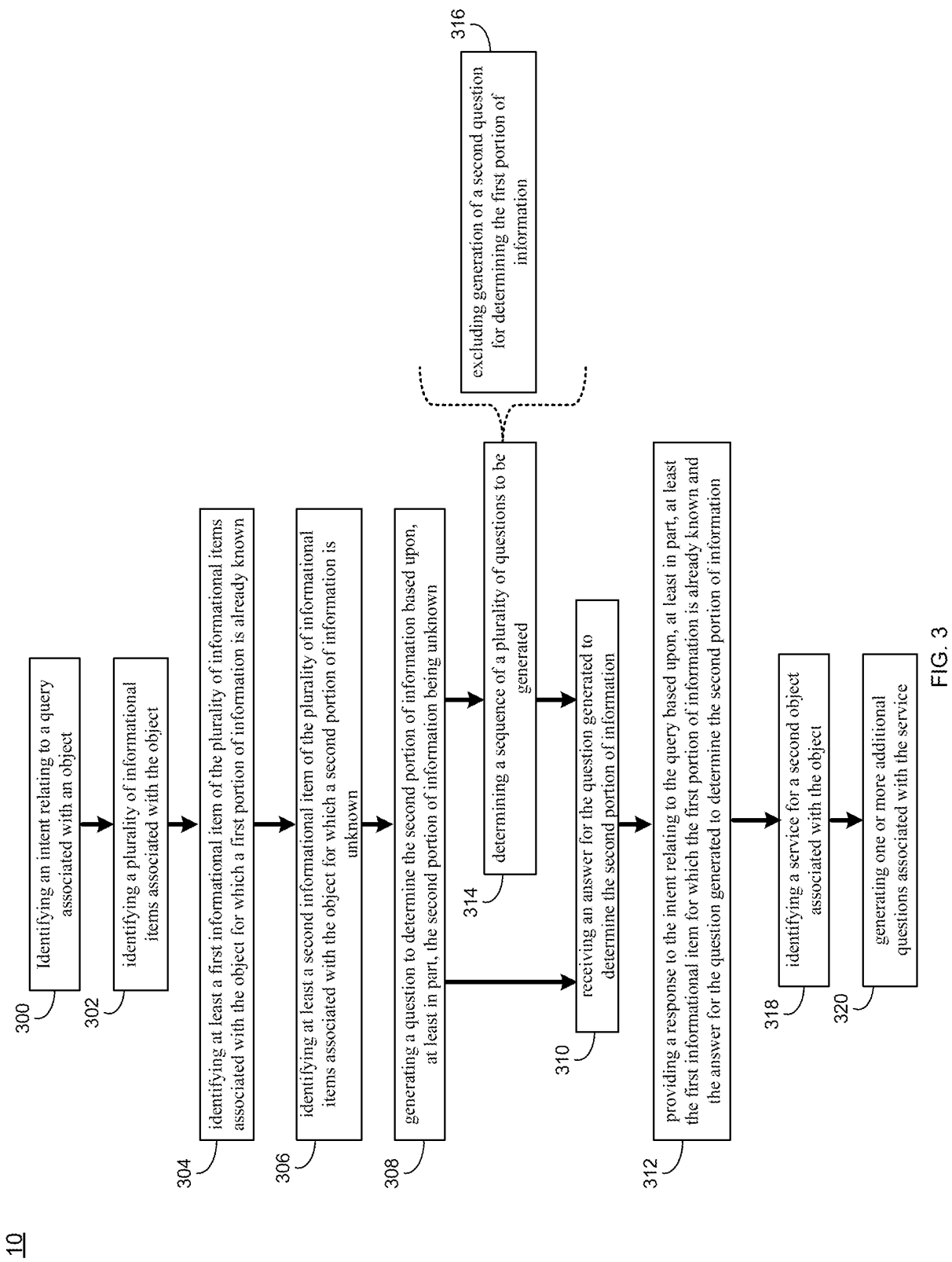

10
300
Identifying an intent relating to a query associated with an object
302
identifying a plurality of informational items associated with the object
304
identifying at least a first informational item of the plurality of informational items associated with the object for which a first portion of information is already known
306
identifying at least a second informational item of the plurality of informational items associated with the object for which a second portion of information is unknown
308
generating a question to determine the second portion of information based upon, at least in part, the second portion of information being unknown
314
determining a sequence of a plurality of questions to be generated
316
excluding generation of a second question for determining the first portion of information
310
receiving an answer for the question generated to determine the second portion of information
312
providing a response to the intent relating to the query based upon, at least in part, at least the first informational item for which the first portion of information is already known and the answer for the question generated to determine the second portion of information
318
identifying a service for a second object associated with the object
320
generating one or more additional questions associated with the service

FIG. 3

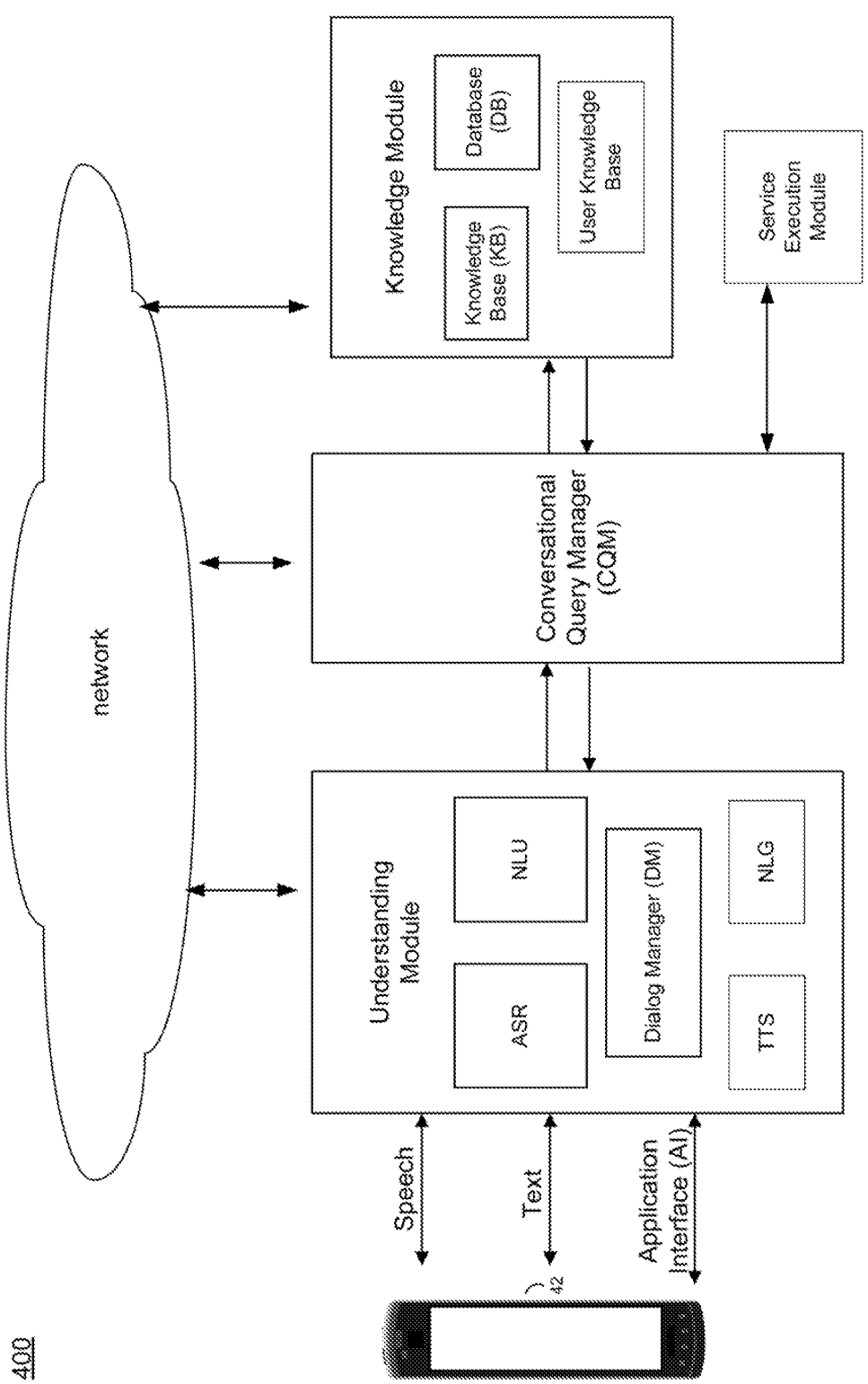
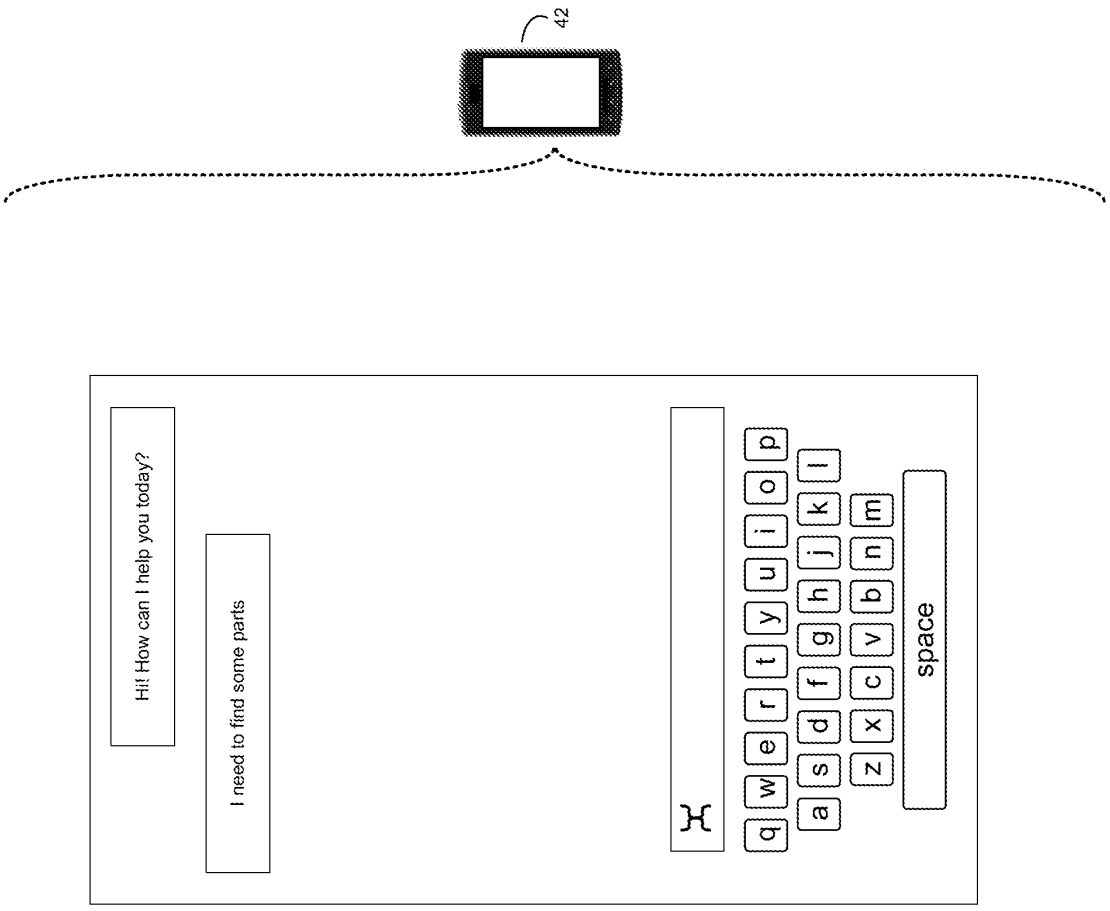

400
network
Knowledge Module
Knowledge Base (KB)
Database (DB)
User Knowledge Base
Service Execution Module
Conversational Query Manager (CQM)
Understanding Module
ASR
NLU
Dialog Manager (DM)
TTS
NLG
Speech
Text
Application Interface (AI)
42
Query Process

FIG. 4


42
Hi! How can I help you today?
I need to find some parts
q w e r t y u i o p
a s d f g h j k l
z x c v b n m
space

500

FIG. 5

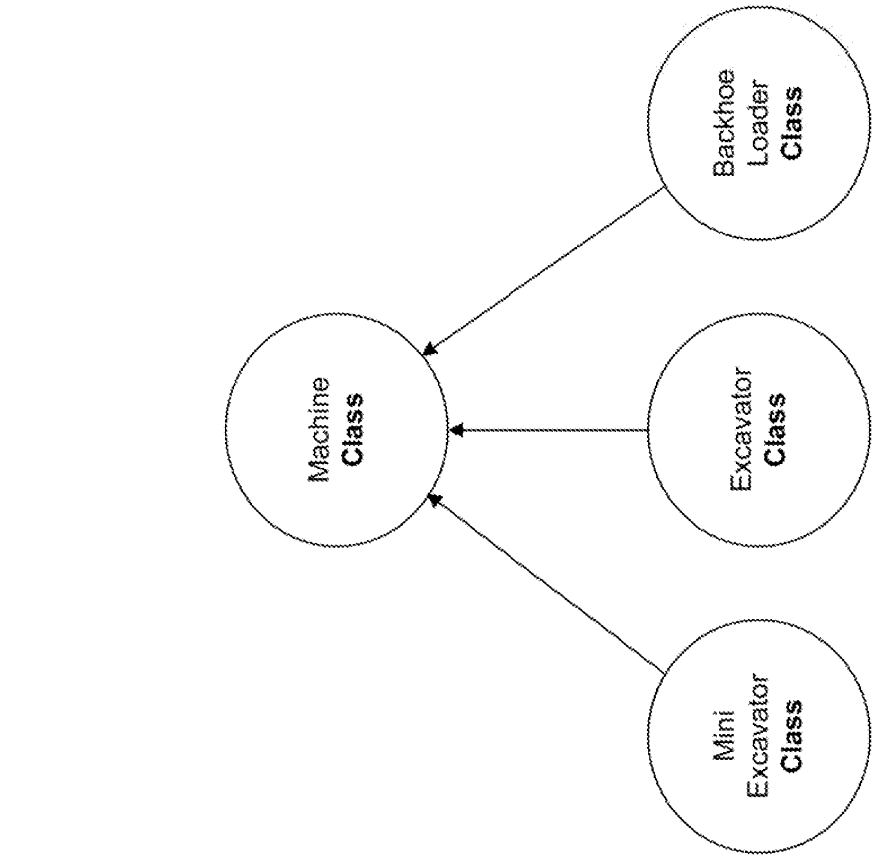

600
Machine Class
Backhoe Loader Class
Excavator Class
Mini Excavator Class

FIG. 6

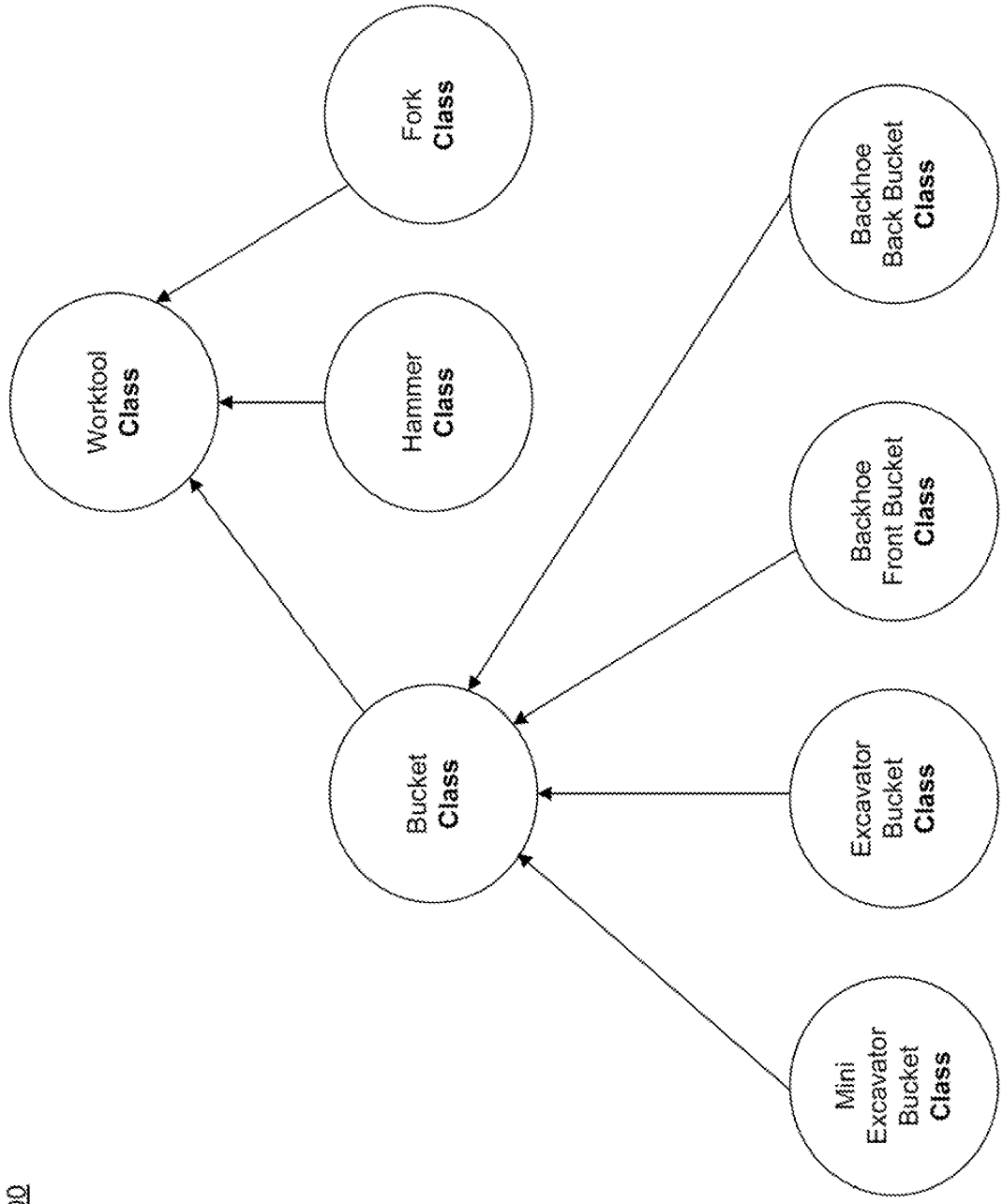

700
Worktool Class
Fork Class
Hammer Class
Bucket Class
Backhoe Back Bucket Class
Backhoe Front Bucket Class
Excavator Bucket Class
Mini Excavator Bucket Class

FIG. 7

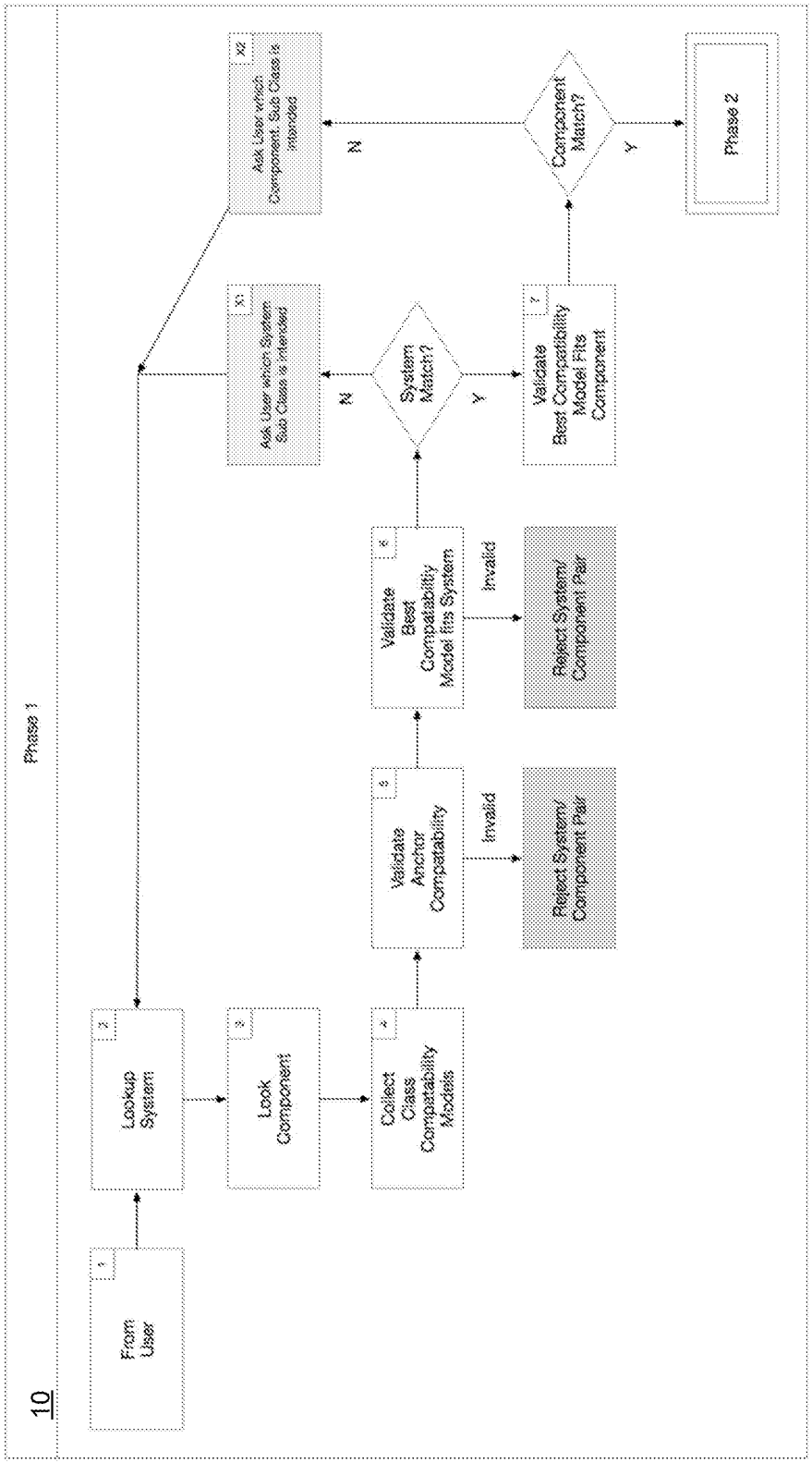

10
Phase 1
1
From User
2
Lookup System
3
Look Component
4
Collect Class Compatability Models
5
Validate Anchor Compatability
Invalid
Reject System/ Component Pair
6
Validate Best Compatability Model fits System
Invalid
Reject System/ Component Pair
System Match?
N
Y
X1
Ask User which System Sub Class is intended
7
Validate Best Compatability Model Fits Component
Component Match?
N
Y
X2
Ask User which Component Sub Class is intended
Phase 2

FIG. 8

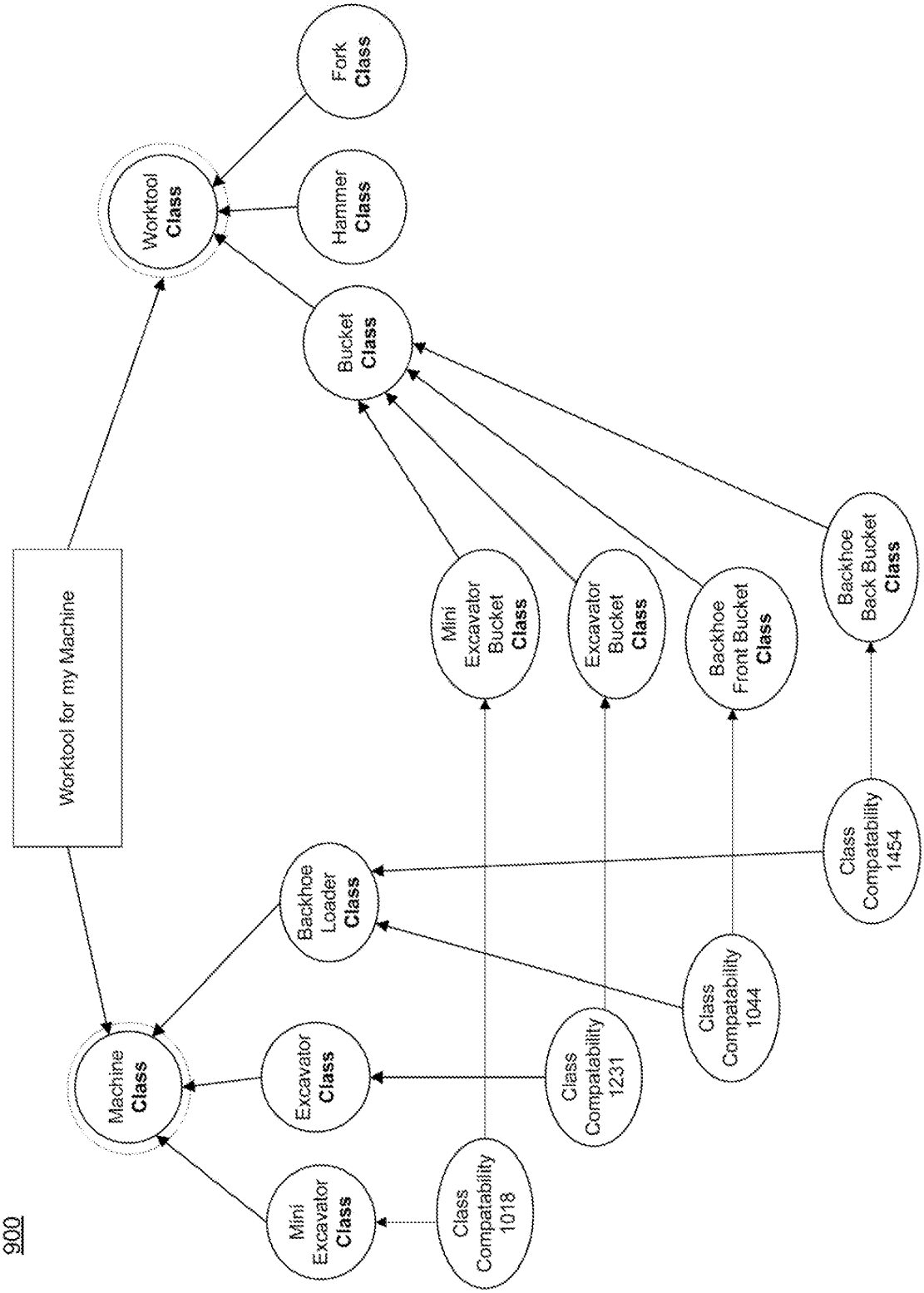

900
Worktool for my Machine
Worktool Class
Fork Class
Hammer Class
Bucket Class
Machine Class
Backhoe Loader Class
Mini Excavator Class
Excavator Class
Mini Excavator Bucket Class
Excavator Bucket Class
Backhoe Front Bucket Class
Backhoe Back Bucket Class
Class Compatability 1018
Class Compatability 1231
Class Compatability 1044
Class Compatability 1454

FIG. 9

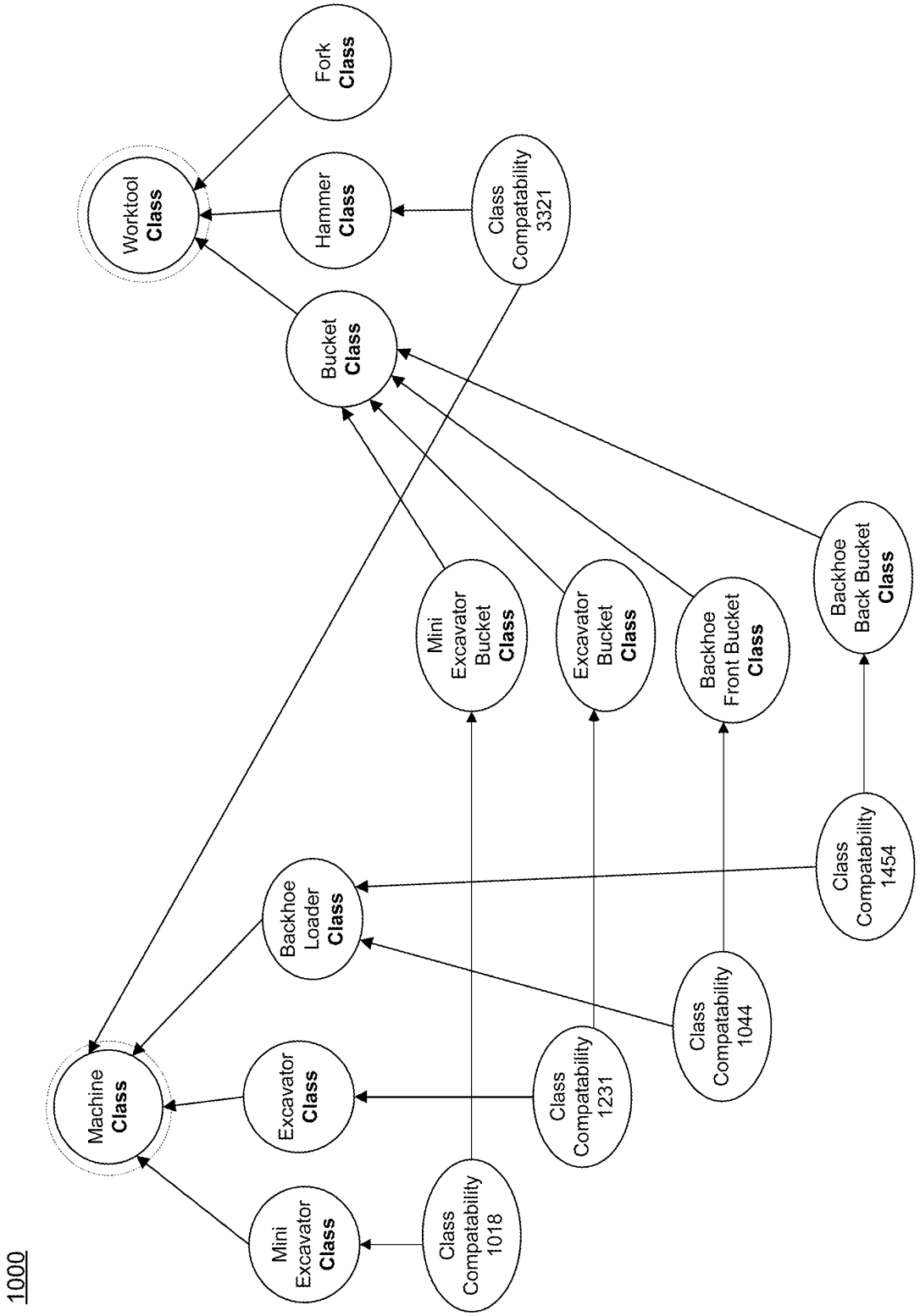

1000
Machine Class
Worktool Class
Fork Class
Hammer Class
Class Compatability 3321
Bucket Class
Mini Excavator Class
Excavator Class
Backhoe Loader Class
Mini Excavator Bucket Class
Excavator Bucket Class
Backhoe Front Bucket Class
Backhoe Back Bucket Class
Class Compatability 1018
Class Compatability 1231
Class Compatability 1044
Class Compatability 1454

FIG. 10

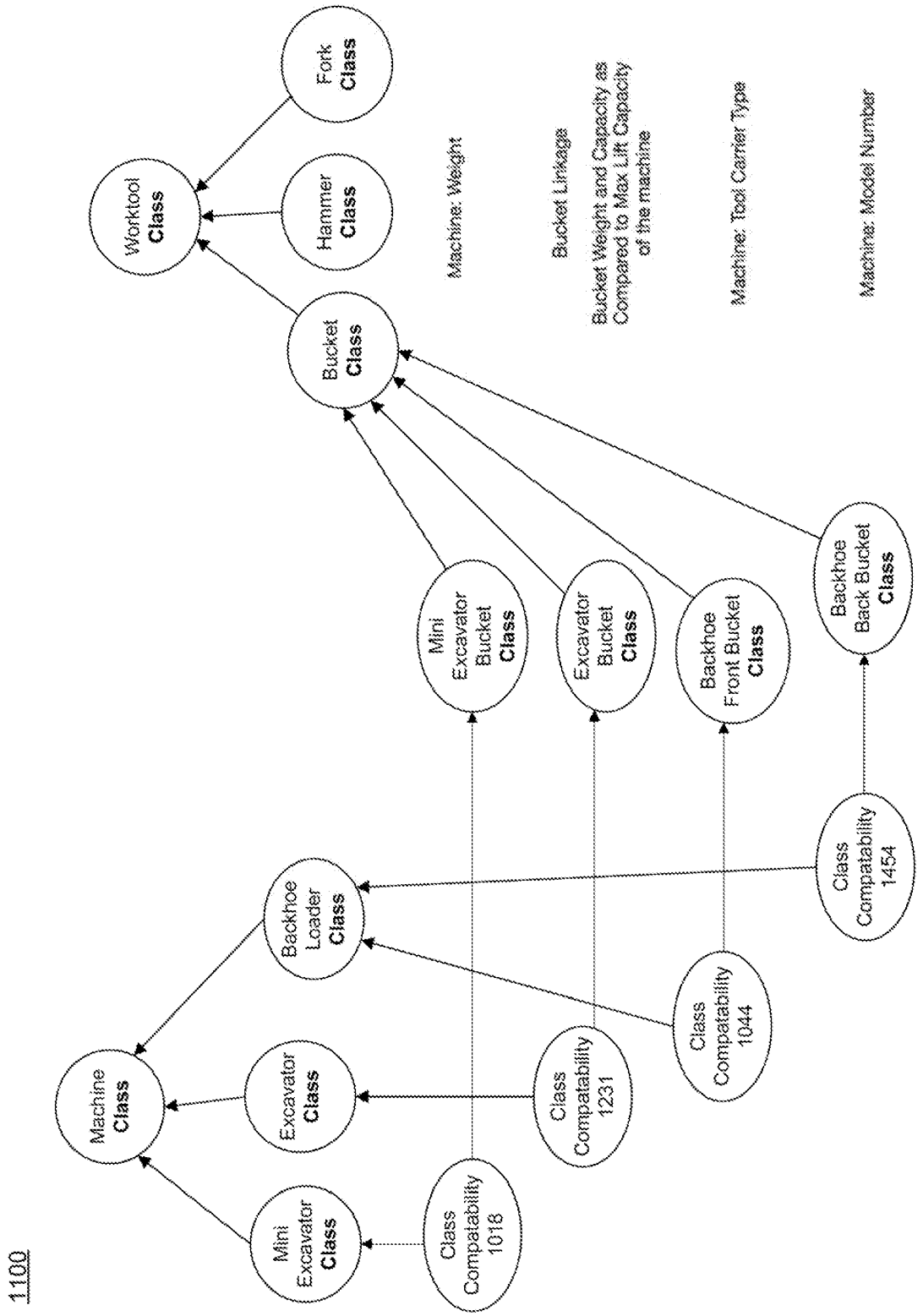

1100
Machine Class
Excavator Class
Backhoe Loader Class
Mini Excavator Class
Class Compatability 1018
Class Compatability 1231
Class Compatability 1044
Class Compatability 1454
Mini Excavator Bucket Class
Excavator Bucket Class
Backhoe Front Bucket Class
Backhoe Back Bucket Class
Bucket Class
Worktool Class
Fork Class
Hammer Class
Machine: Weight
Bucket Linkage
Bucket Weight and Capacity as Compared to Max Lift Capacity of the machine
Machine: Tool Carrier Type
Machine: Model Number

FIG. 11

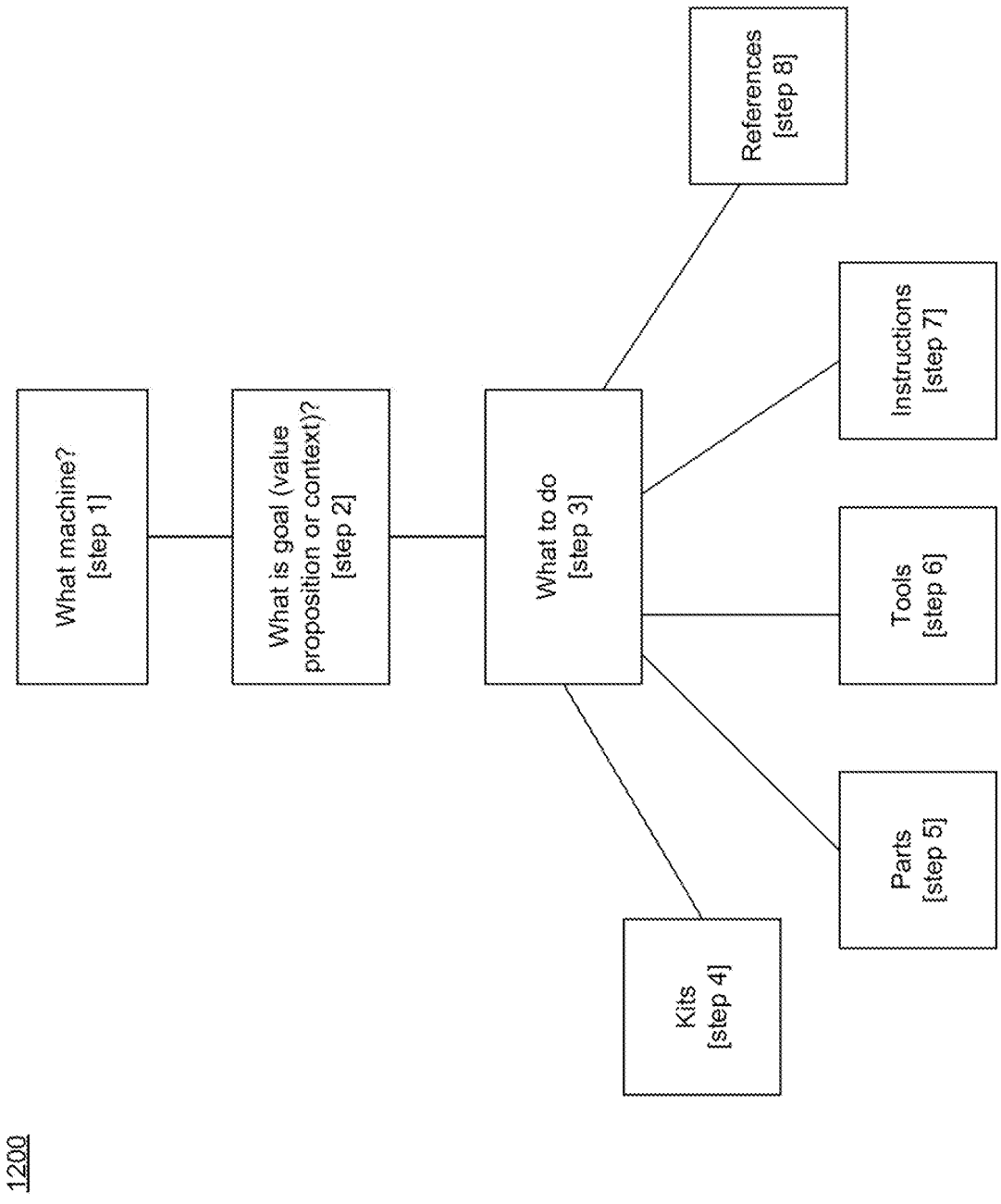

1200
What machine? [step 1]
What is goal (value proposition or context)? [step 2]
What to do [step 3]
References [step 8]
Instructions [step 7]
Tools [step 6]
Parts [step 5]
Kits [step 4]

FIG. 12