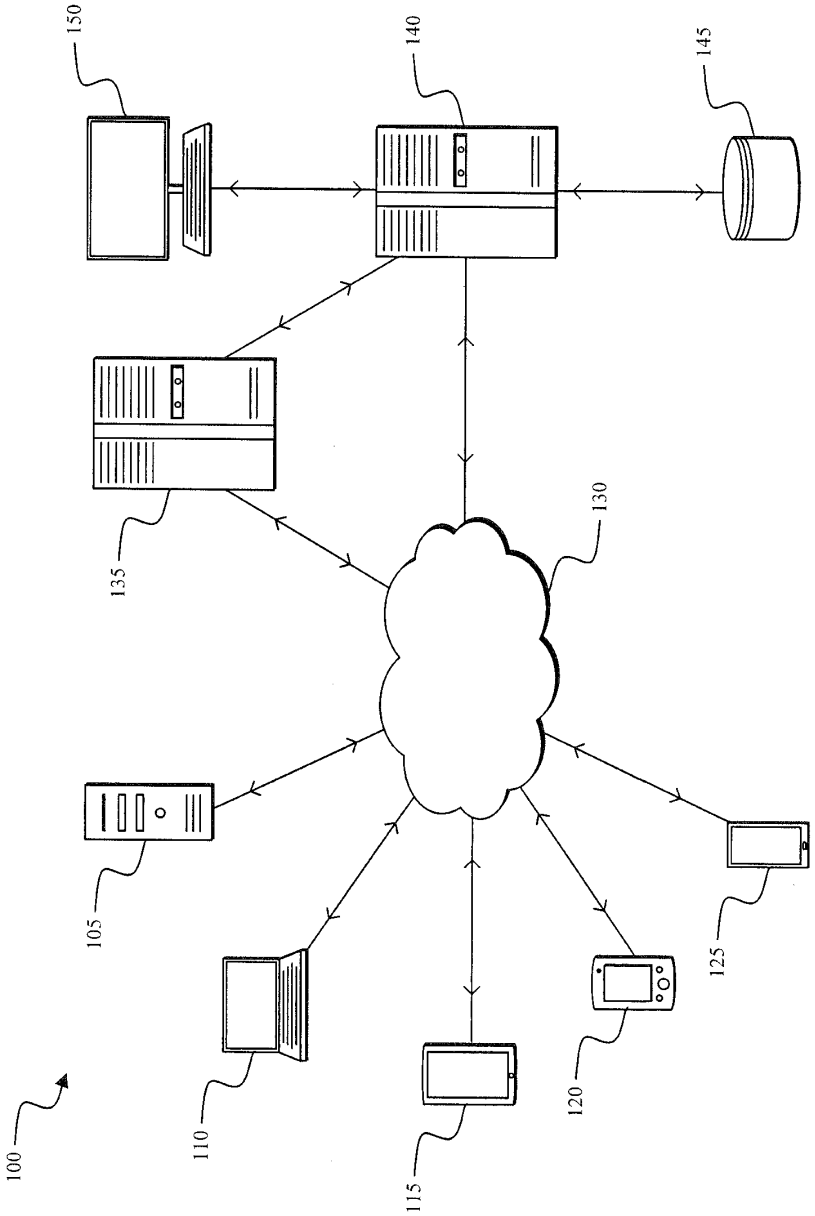


FIG. 1

FIG. 2

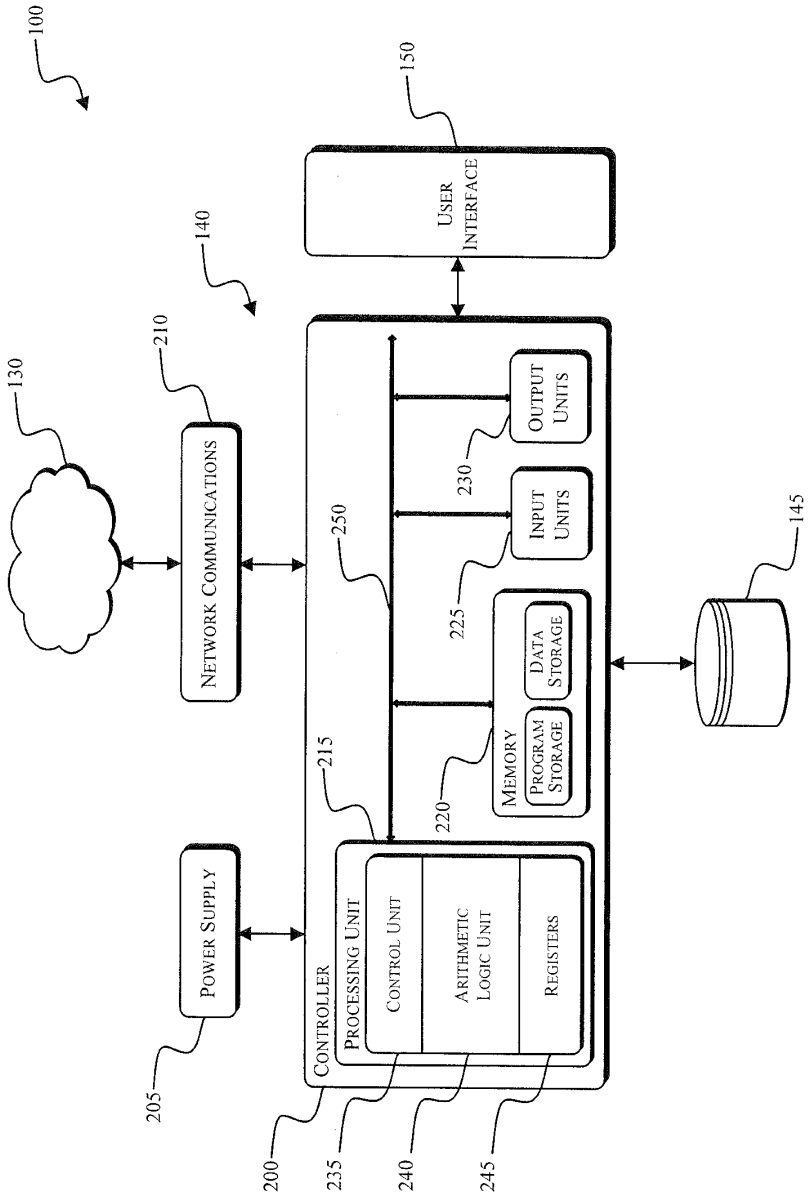

100
150
User Interface
140
210
130
Network Communications
250
Output Units
230
Input Units
225
145
Memory
Program Storage
Data Storage
220
215
Power Supply
205
Controller
Processing Unit
Control Unit
Arithmetic Logic Unit
Registers
200
235
240
245

FIG. 3

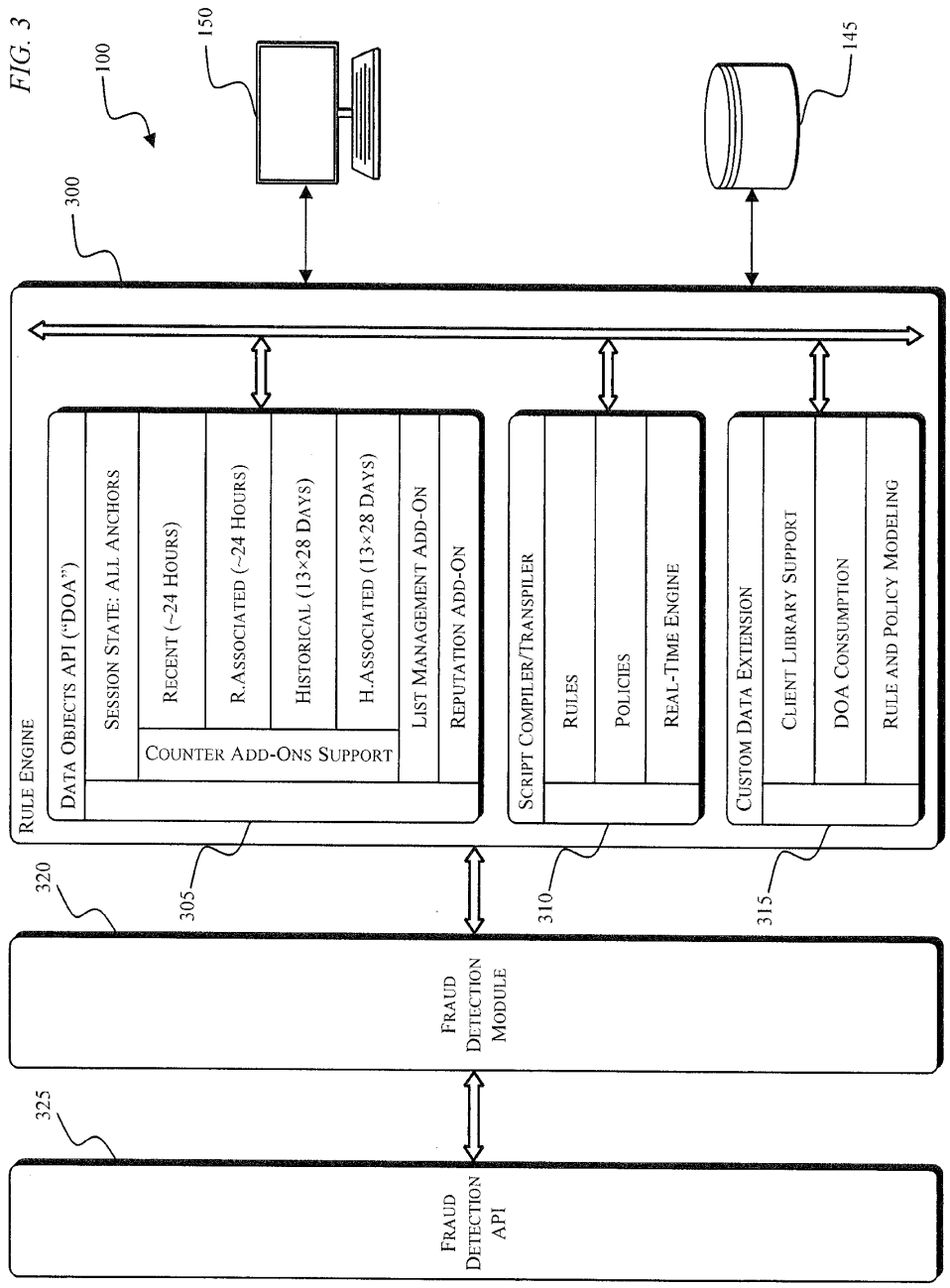

100
150
145
300
RULE ENGINE
DATA OBJECTS API ("DOA")
SESSION STATE: ALL ANCHORS
RECENT (~24 HOURS)
R.ASSOCIATED (~24 HOURS)
HISTORICAL (13×28 DAYS)
H.ASSOCIATED (13×28 DAYS)
COUNTER ADD-ONS SUPPORT
LIST MANAGEMENT ADD-ON
REPUTATION ADD-ON
SCRIPT COMPILER/TRANSPILER
RULES
POLICIES
REAL-TIME ENGINE
CUSTOM DATA EXTENSION
CLIENT LIBRARY SUPPORT
DOA CONSUMPTION
RULE AND POLICY MODELING
305
310
315
320
FRAUD DETECTION MODULE
325
FRAUD DETECTION API

FIG. 4

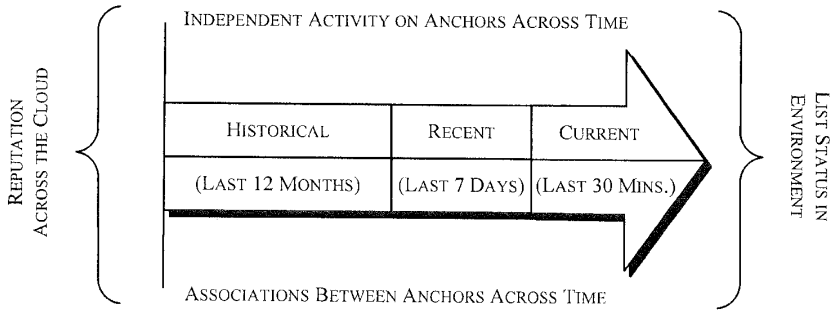
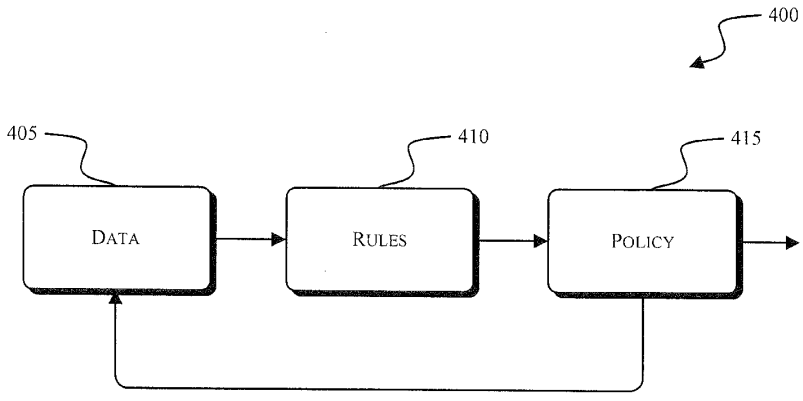

INDEPENDENT ACTIVITY ON ANCHORS ACROSS TIME
REPUTATION ACROSS THE CLOUD
HISTORICAL
RECENT
CURRENT
(LAST 12 MONTHS)
(LAST 7 DAYS)
(LAST 30 MINS.)
LIST STATUS IN ENVIRONMENT
ASSOCIATIONS BETWEEN ANCHORS ACROSS TIME

FIG. 5


400
405
410
415
DATA
RULES
POLICY

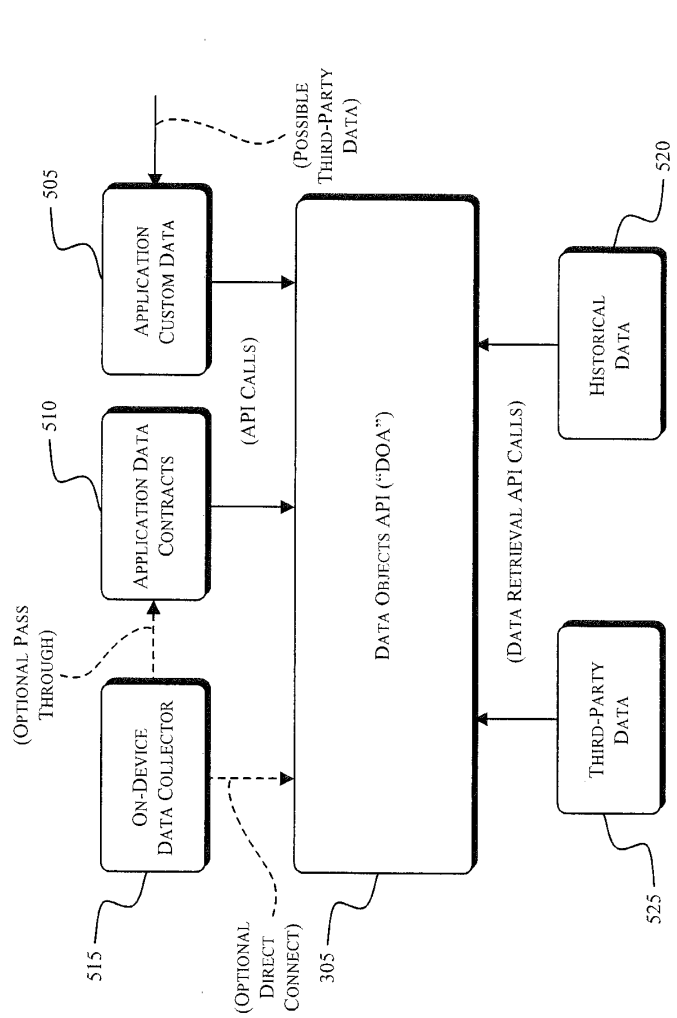

500
APPLICATION CUSTOM DATA
505
(POSSIBLE THIRD-PARTY DATA)
APPLICATION DATA CONTRACTS
510
(API CALLS)
(OPTIONAL PASS THROUGH)
ON-DEVICE DATA COLLECTOR
515
(OPTIONAL DIRECT CONNECT)
DATA OBJECTS API ("DOA")
305
(DATA RETRIEVAL API CALLS)
HISTORICAL DATA
520
THIRD-PARTY DATA
525

FIG. 6

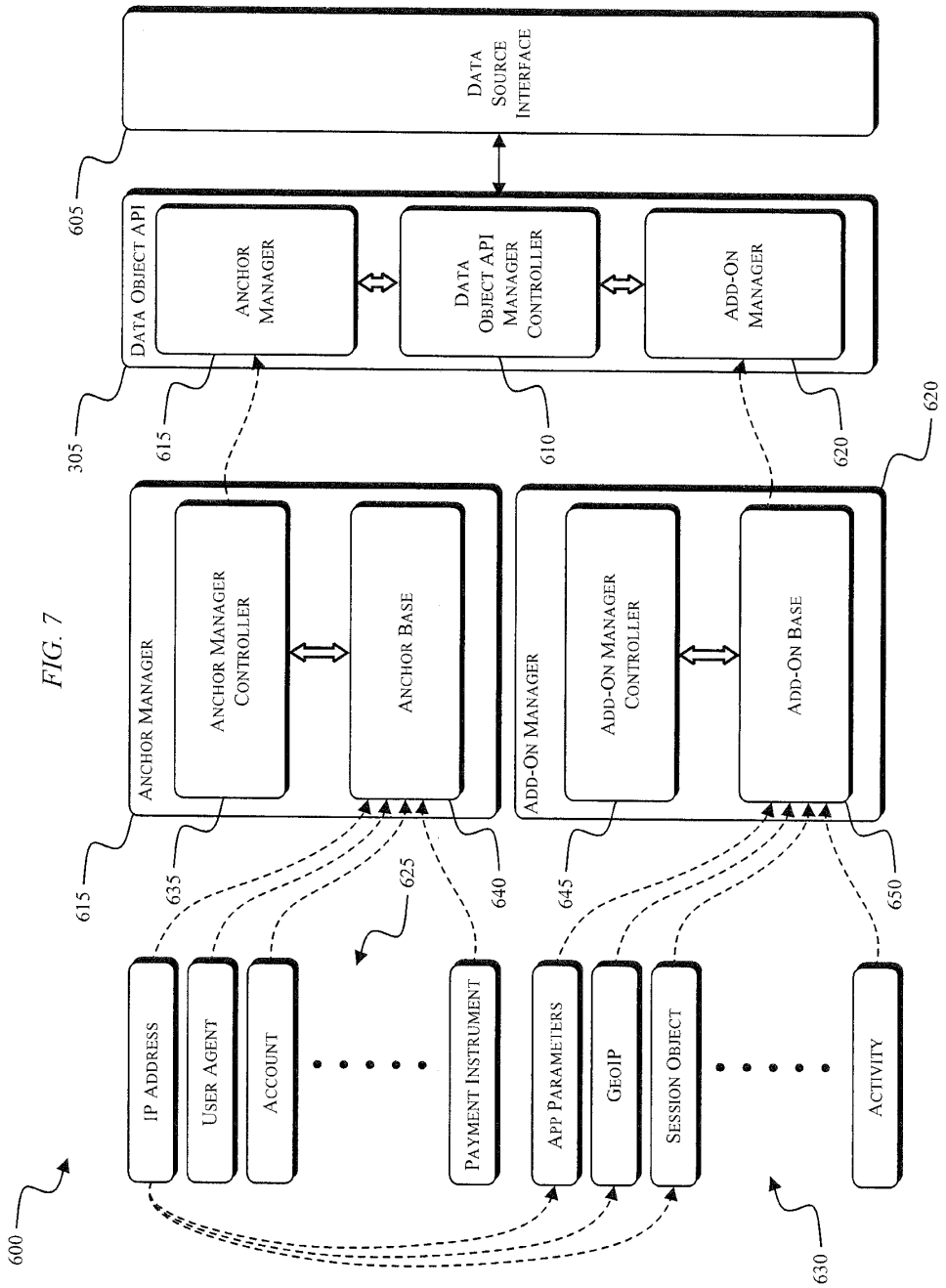

DATA SOURCE INTERFACE
605
DATA OBJECT API
ANCHOR MANAGER
DATA OBJECT API MANAGER CONTROLLER
ADD-ON MANAGER
305
615
610
620
620
ANCHOR MANAGER
ANCHOR MANAGER CONTROLLER
ANCHOR BASE
ADD-ON MANAGER
ADD-ON MANAGER CONTROLLER
ADD-ON BASE
615
635
625
640
645
650
IP ADDRESS
USER AGENT
ACCOUNT
PAYMENT INSTRUMENT
APP PARAMETERS
GEOIP
SESSION OBJECT
ACTIVITY
600
630

FIG. 7

FIG. 8

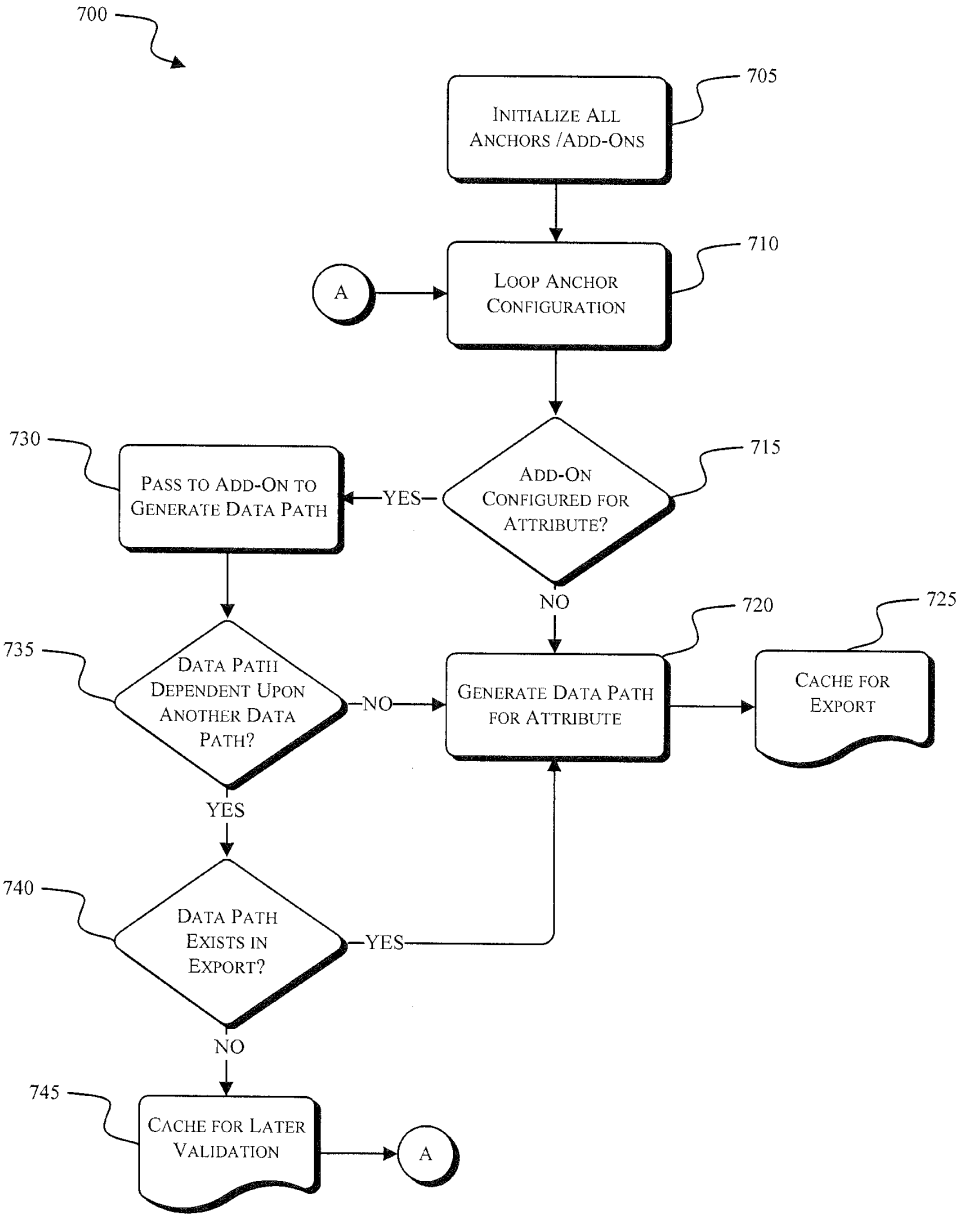
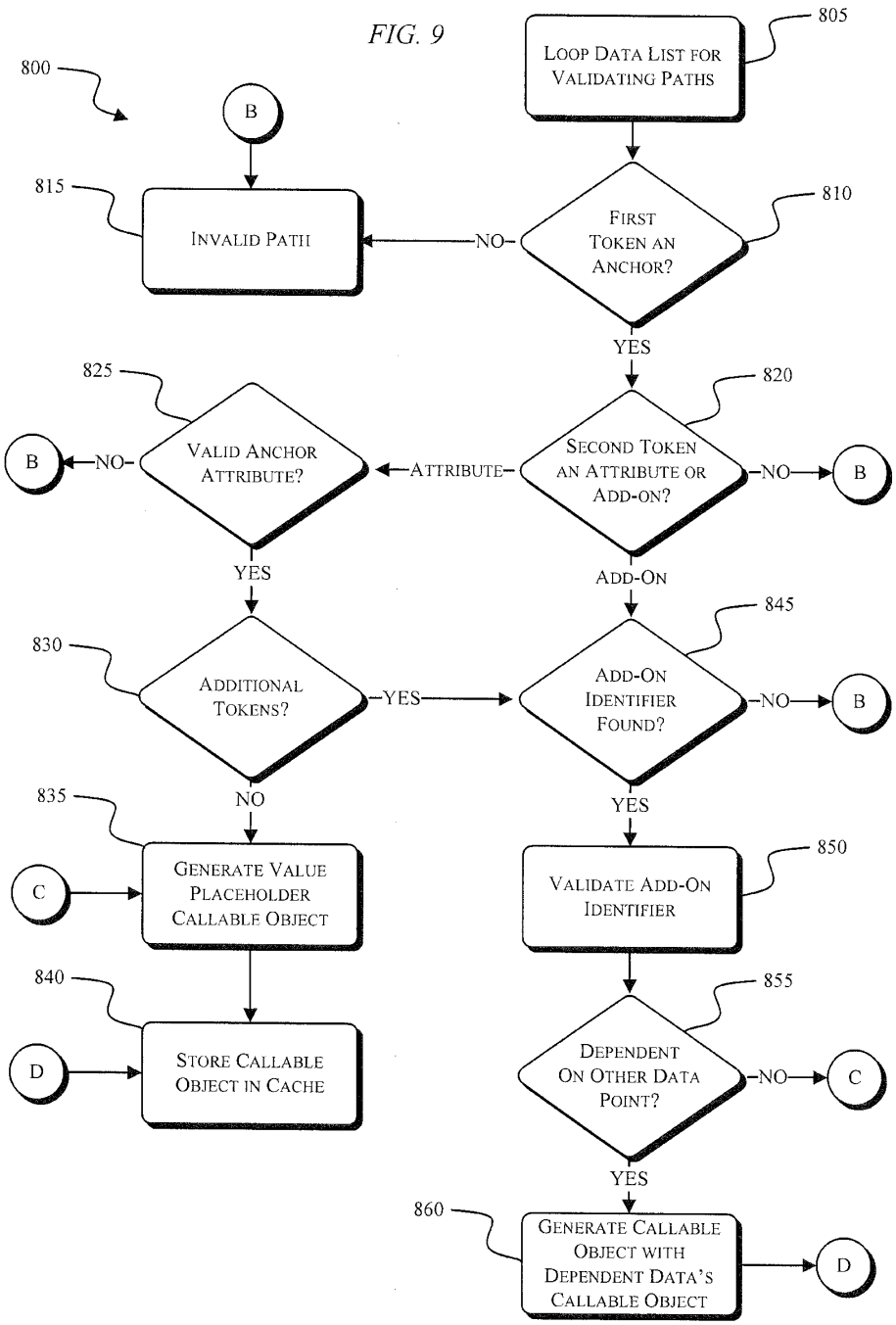

700
INITIALIZE ALL ANCHORS /ADD-ONS
705
LOOP ANCHOR CONFIGURATION
710
A
ADD-ON CONFIGURED FOR ATTRIBUTE?
715
YES
PASS TO ADD-ON TO GENERATE DATA PATH
730
NO
GENERATE DATA PATH FOR ATTRIBUTE
720
CACHE FOR EXPORT
725
DATA PATH DEPENDENT UPON ANOTHER DATA PATH?
735
NO
YES
DATA PATH EXISTS IN EXPORT?
740
YES
NO
CACHE FOR LATER VALIDATION
745
A

FIG. 9


800
B
805
LOOP DATA LIST FOR VALIDATING PATHS
815
INVALID PATH
NO
FIRST TOKEN AN ANCHOR?
810
YES
825
820
B
NO
VALID ANCHOR ATTRIBUTE?
ATTRIBUTE
SECOND TOKEN AN ATTRIBUTE OR ADD-ON?
NO
B
YES
ADD-ON
845
830
ADDITIONAL TOKENS?
YES
ADD-ON IDENTIFIER FOUND?
NO
B
NO
YES
835
850
C
GENERATE VALUE PLACEHOLDER CALLABLE OBJECT
VALIDATE ADD-ON IDENTIFIER
840
855
D
STORE CALLABLE OBJECT IN CACHE
DEPENDENT ON OTHER DATA POINT?
NO
C
YES
860
GENERATE CALLABLE OBJECT WITH DEPENDENT DATA'S CALLABLE OBJECT
D

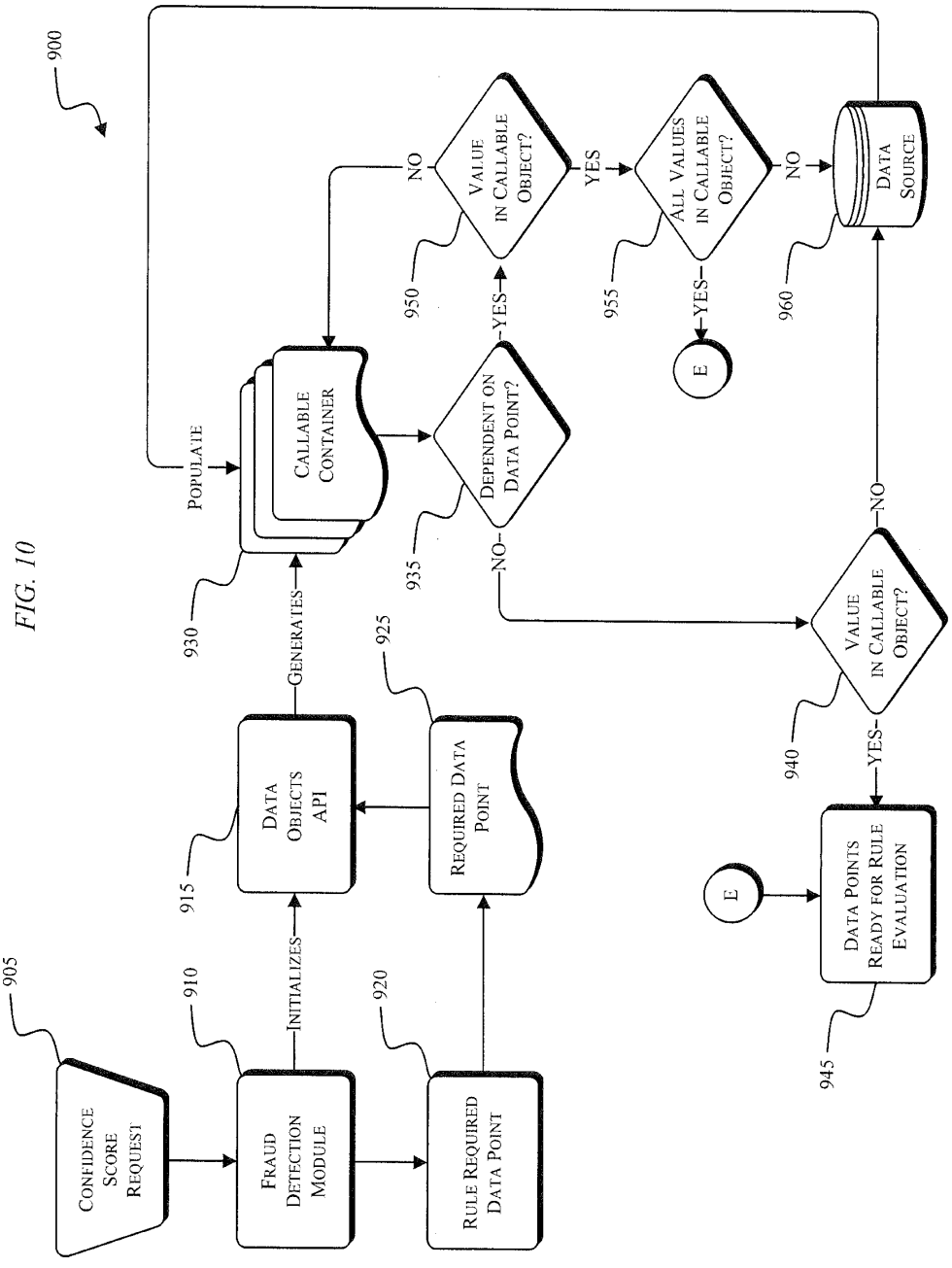

900
905
CONFIDENCE SCORE REQUEST
910
FRAUD DETECTION MODULE
INITIALIZES
915
DATA OBJECTS API
GENERATES
920
RULE REQUIRED DATA POINT
925
REQUIRED DATA POINT
930
CALLABLE CONTAINER
POPULATE
935
DEPENDENT ON DATA POINT?
YES
NO
940
VALUE IN CALLABLE OBJECT?
YES
NO
945
DATA POINTS READY FOR RULE EVALUATION
950
VALUE IN CALLABLE OBJECT?
NO
YES
955
ALL VALUES IN CALLABLE OBJECT?
YES
NO
960
DATA SOURCE
E
E

FIG. 10

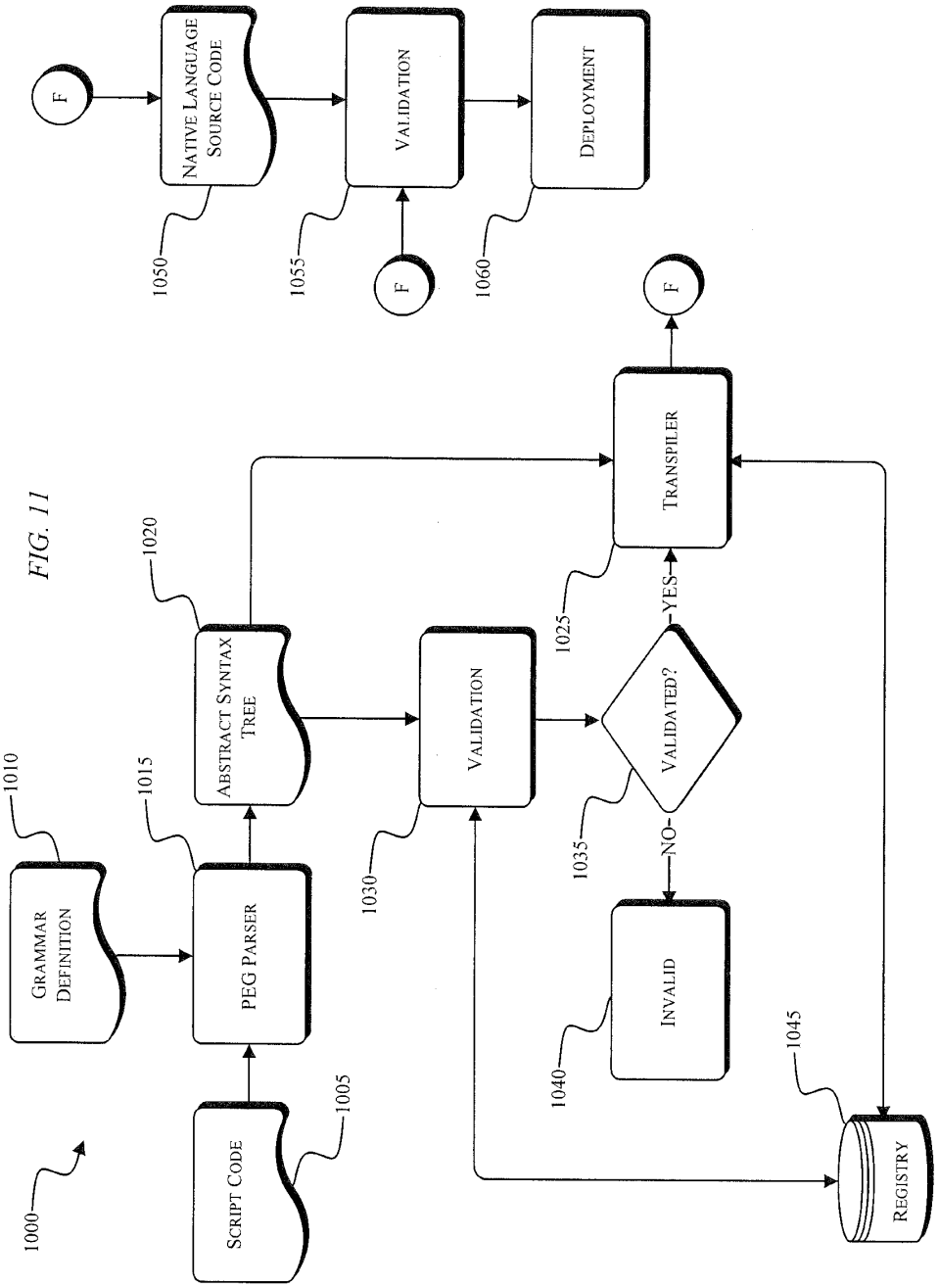

1000
SCRIPT CODE
1005
GRAMMAR DEFINITION
1010
PEG PARSER
1015
ABSTRACT SYNTAX TREE
1020
VALIDATION
1030
VALIDATED?
1035
NO
YES
INVALID
1040
TRANSPILER
1025
REGISTRY
1045
F
F
F
NATIVE LANGUAGE SOURCE CODE
1050
VALIDATION
1055
DEPLOYMENT
1060

FIG. 11

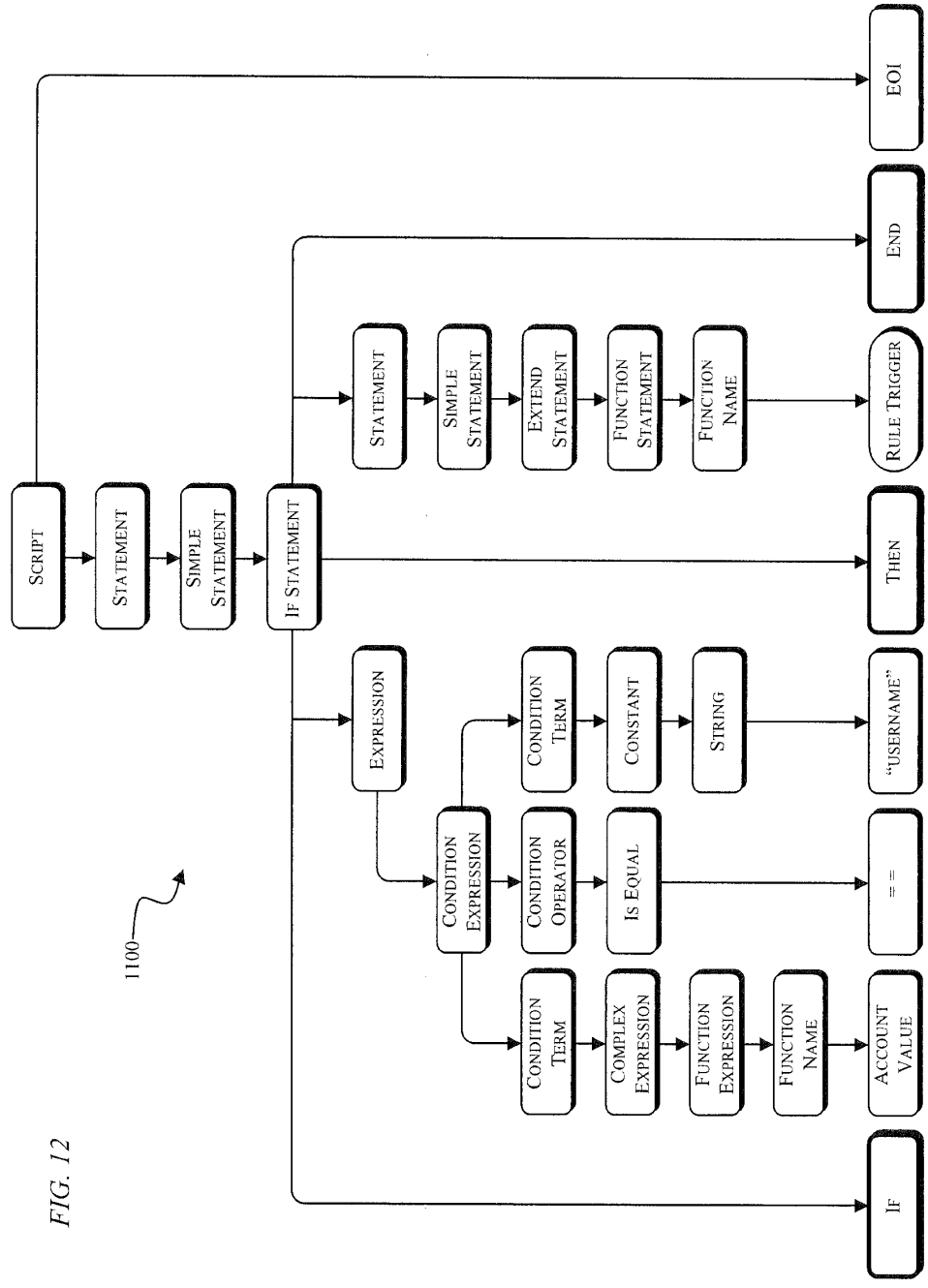

SCRIPT
STATEMENT
SIMPLE STATEMENT
IF STATEMENT
EOI
END
STATEMENT
SIMPLE STATEMENT
EXTEND STATEMENT
FUNCTION STATEMENT
FUNCTION NAME
RULE TRIGGER
THEN
EXPRESSION
CONDITION EXPRESSION
CONDITION TERM
CONDITION OPERATOR
IS EQUAL
CONSTANT
STRING
"USERNAME"
==
CONDITION TERM
COMPLEX EXPRESSION
FUNCTION EXPRESSION
FUNCTION NAME
ACCOUNT VALUE
IF
1100

FIG. 12

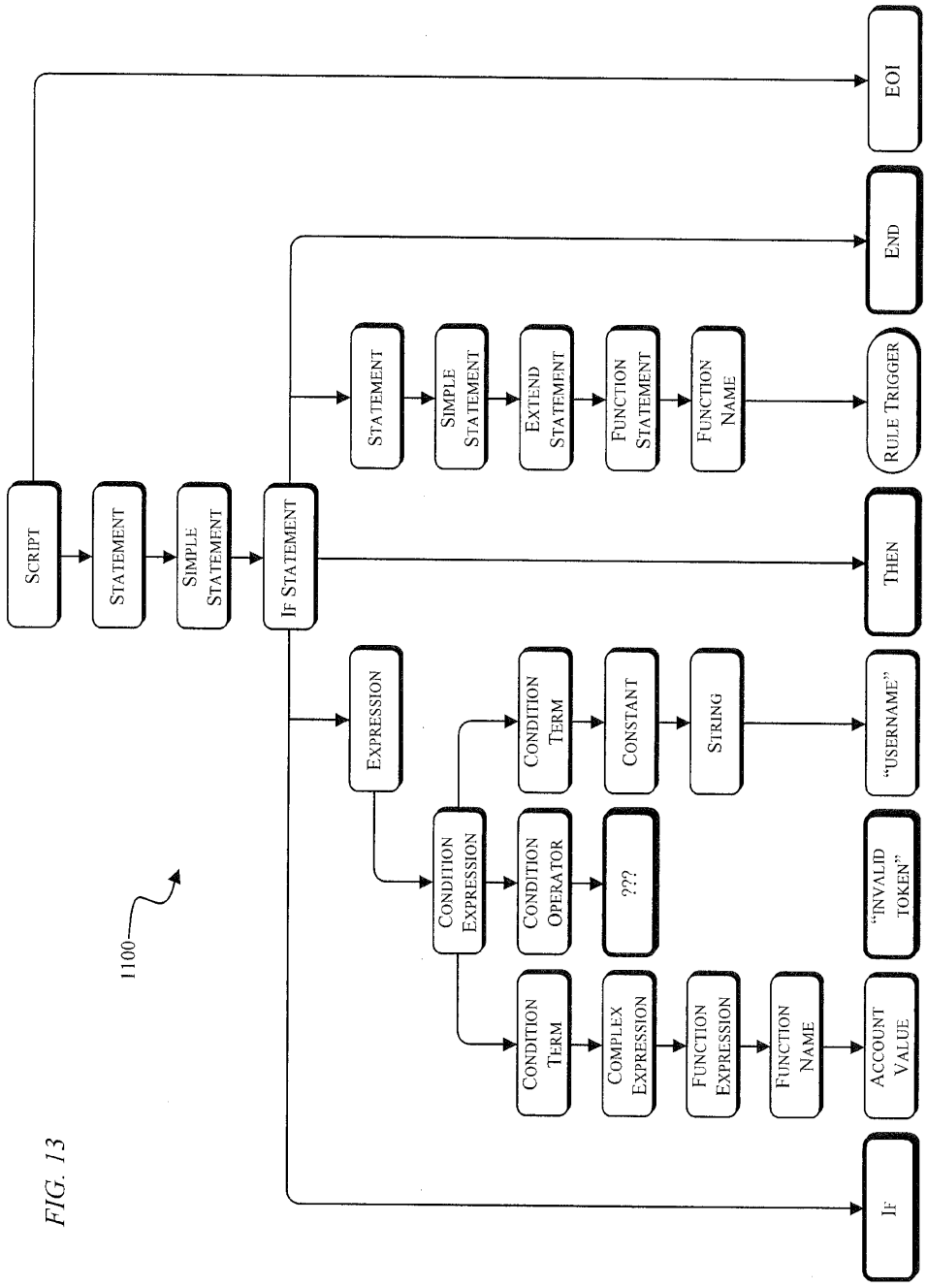

SCRIPT
STATEMENT
SIMPLE STATEMENT
IF STATEMENT
EOI
END
STATEMENT
SIMPLE STATEMENT
EXTEND STATEMENT
FUNCTION STATEMENT
FUNCTION NAME
RULE TRIGGER
THEN
EXPRESSION
CONDITION TERM
CONSTANT
STRING
"USERNAME"
CONDITION EXPRESSION
CONDITION OPERATOR
???
"INVALID TOKEN"
CONDITION TERM
COMPLEX EXPRESSION
FUNCTION EXPRESSION
FUNCTION NAME
ACCOUNT VALUE
IF
1100

FIG. 13

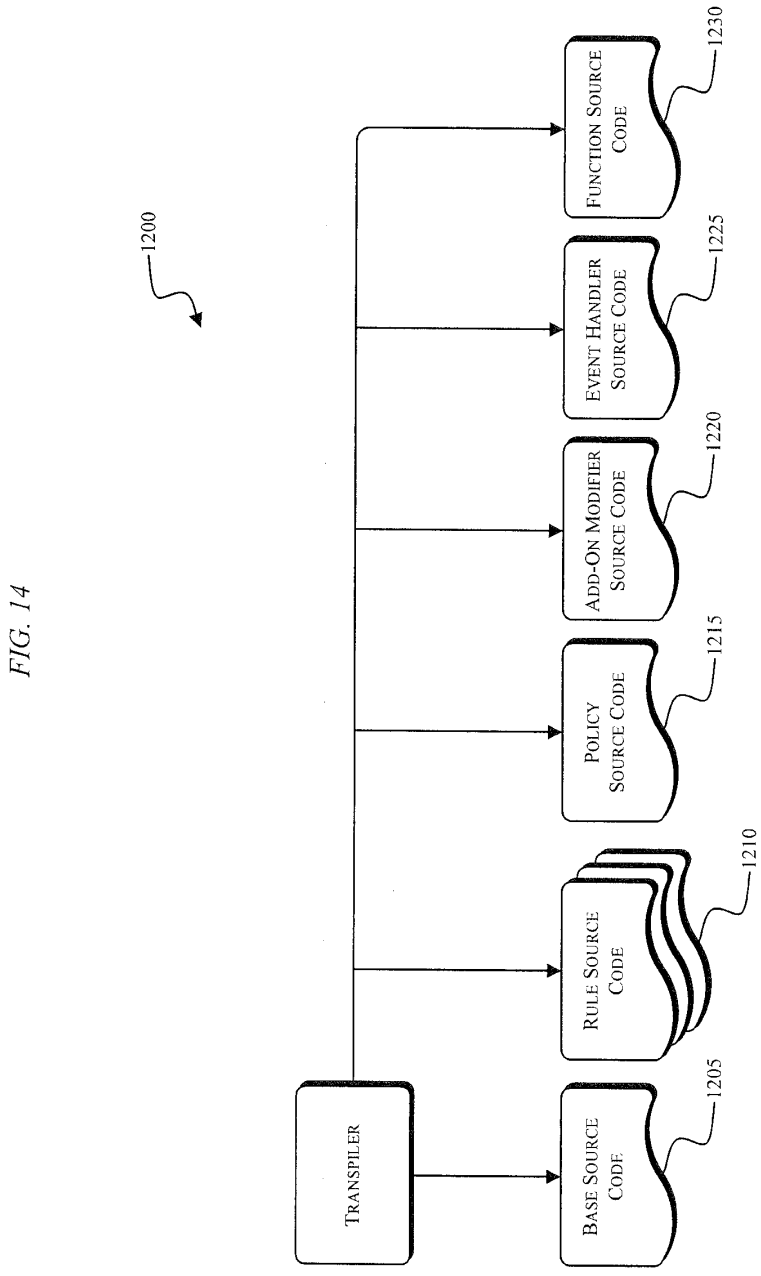
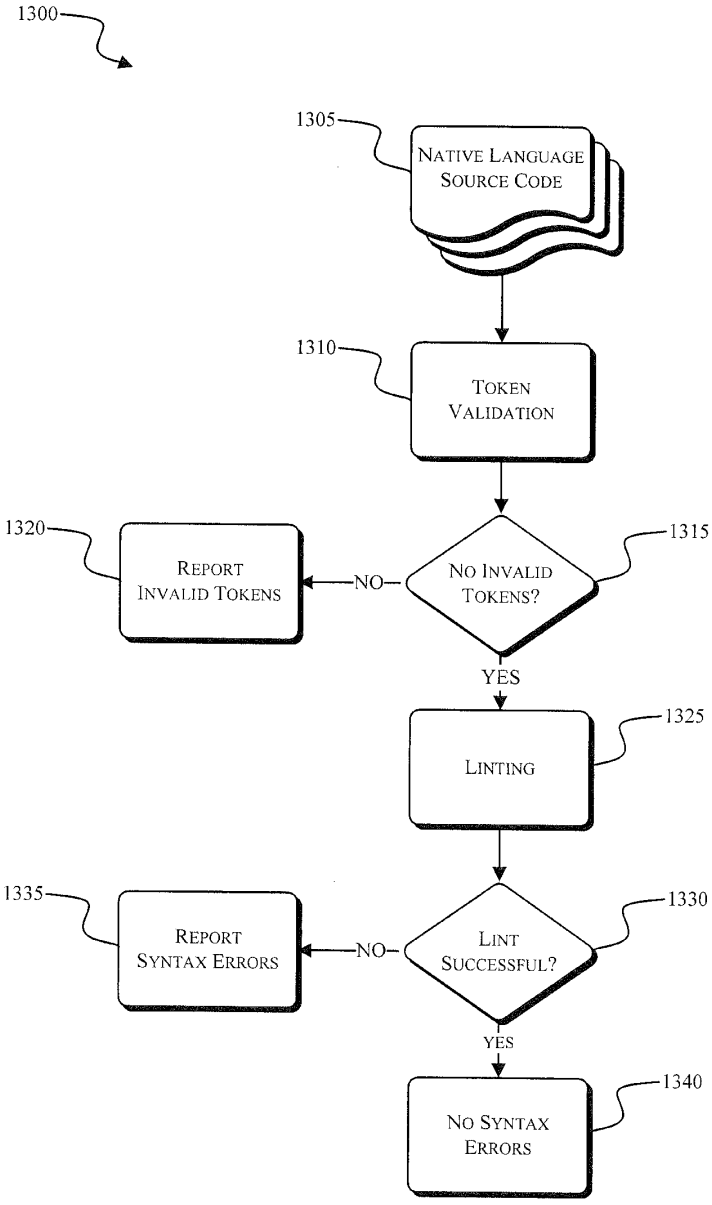

1200
TRANSPILER
BASE SOURCE CODE
1205
RULE SOURCE CODE
1210
POLICY SOURCE CODE
1215
ADD-ON MODIFIER SOURCE CODE
1220
EVENT HANDLER SOURCE CODE
1225
FUNCTION SOURCE CODE
1230

FIG. 14

FIG. 15


1300
1305
NATIVE LANGUAGE SOURCE CODE
1310
TOKEN VALIDATION
1320
REPORT INVALID TOKENS
NO
NO INVALID TOKENS?
1315
YES
1325
LINTING
1335
REPORT SYNTAX ERRORS
NO
LINT SUCCESSFUL?
1330
YES
1340
NO SYNTAX ERRORS