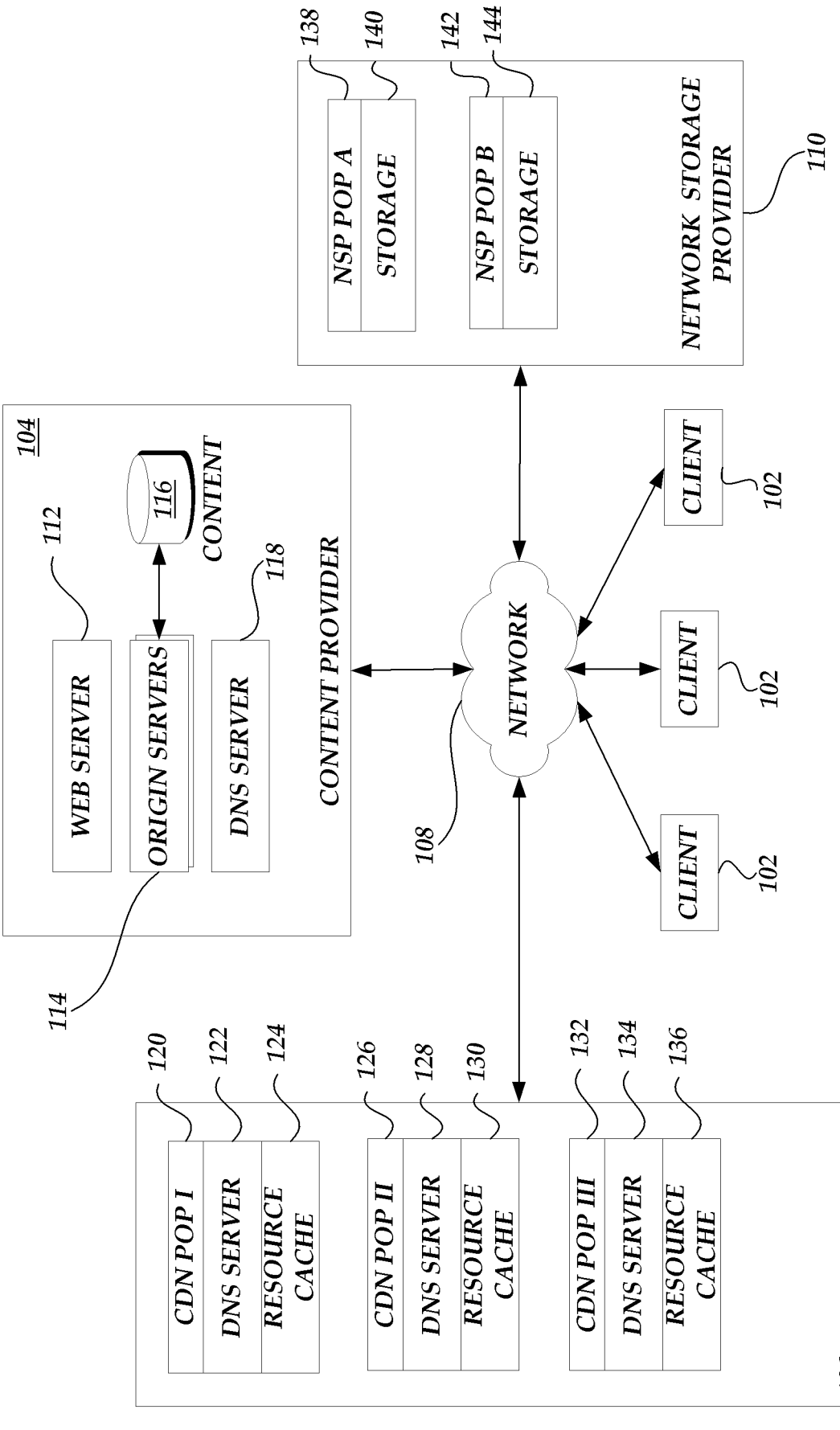
138
140
142
144
NSP POP A
STORAGE
NSP POP B
STORAGE
NETWORK STORAGE PROVIDER
110
104
112
116
CONTENT
118
WEB SERVER
ORIGIN SERVERS
DNS SERVER
CONTENT PROVIDER
NETWORK
CLIENT
102
CLIENT
102
CLIENT
102
108
114
120
122
124
126
128
130
132
134
136
CDN POP I
DNS SERVER
RESOURCE CACHE
CDN POP II
DNS SERVER
RESOURCE CACHE
CDN POP III
DNS SERVER
RESOURCE CACHE
106
SERVICE PROVIDER

Fig.1.

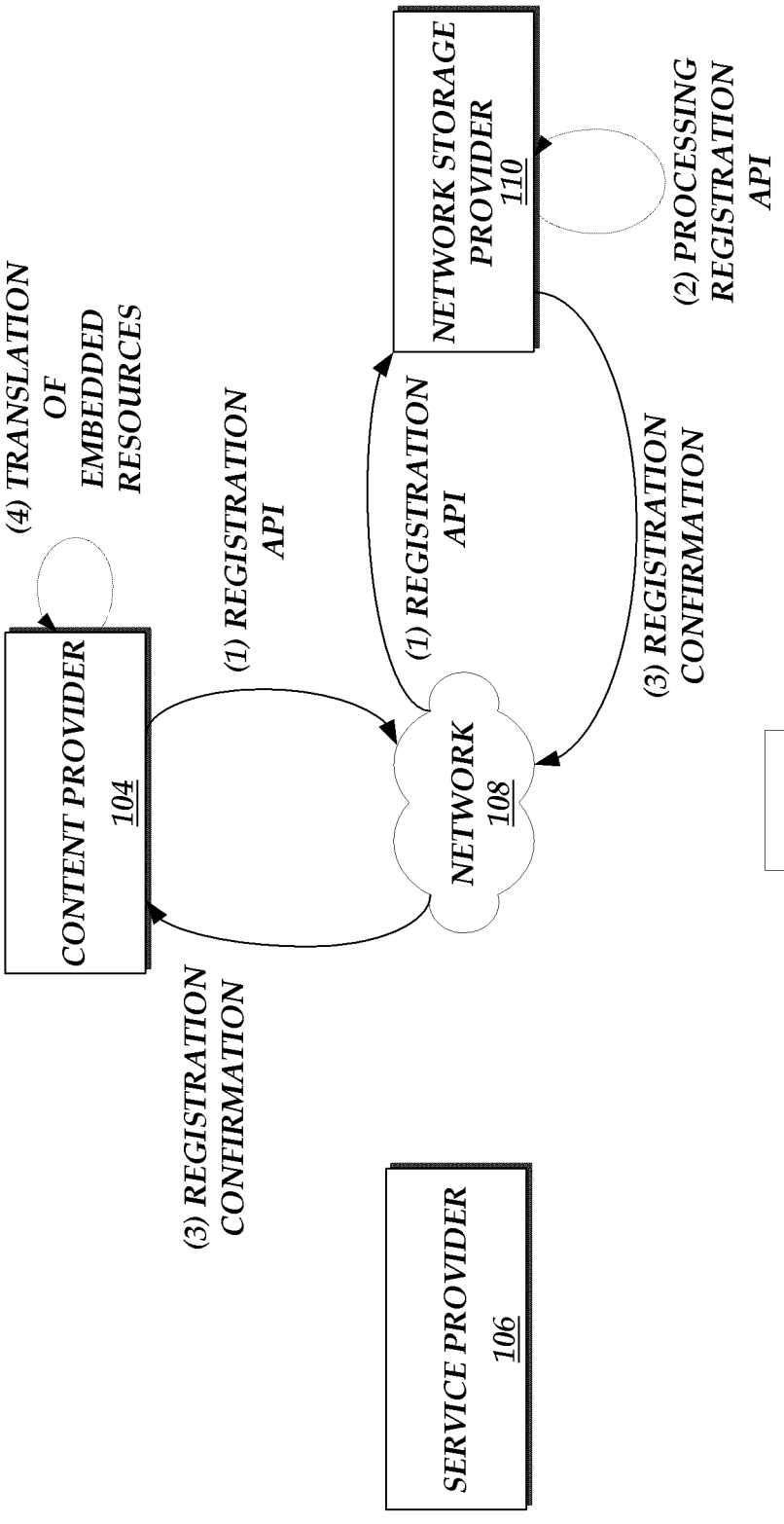
NETWORK STORAGE PROVIDER 110
(2) PROCESSING REGISTRATION API
(1) REGISTRATION API
(3) REGISTRATION CONFIRMATION
CONTENT PROVIDER 104
(4) TRANSLATION OF EMBEDDED RESOURCES
(1) REGISTRATION API
(3) REGISTRATION CONFIRMATION
NETWORK 108
CLIENT 102
SERVICE PROVIDER 106

Fig.2.

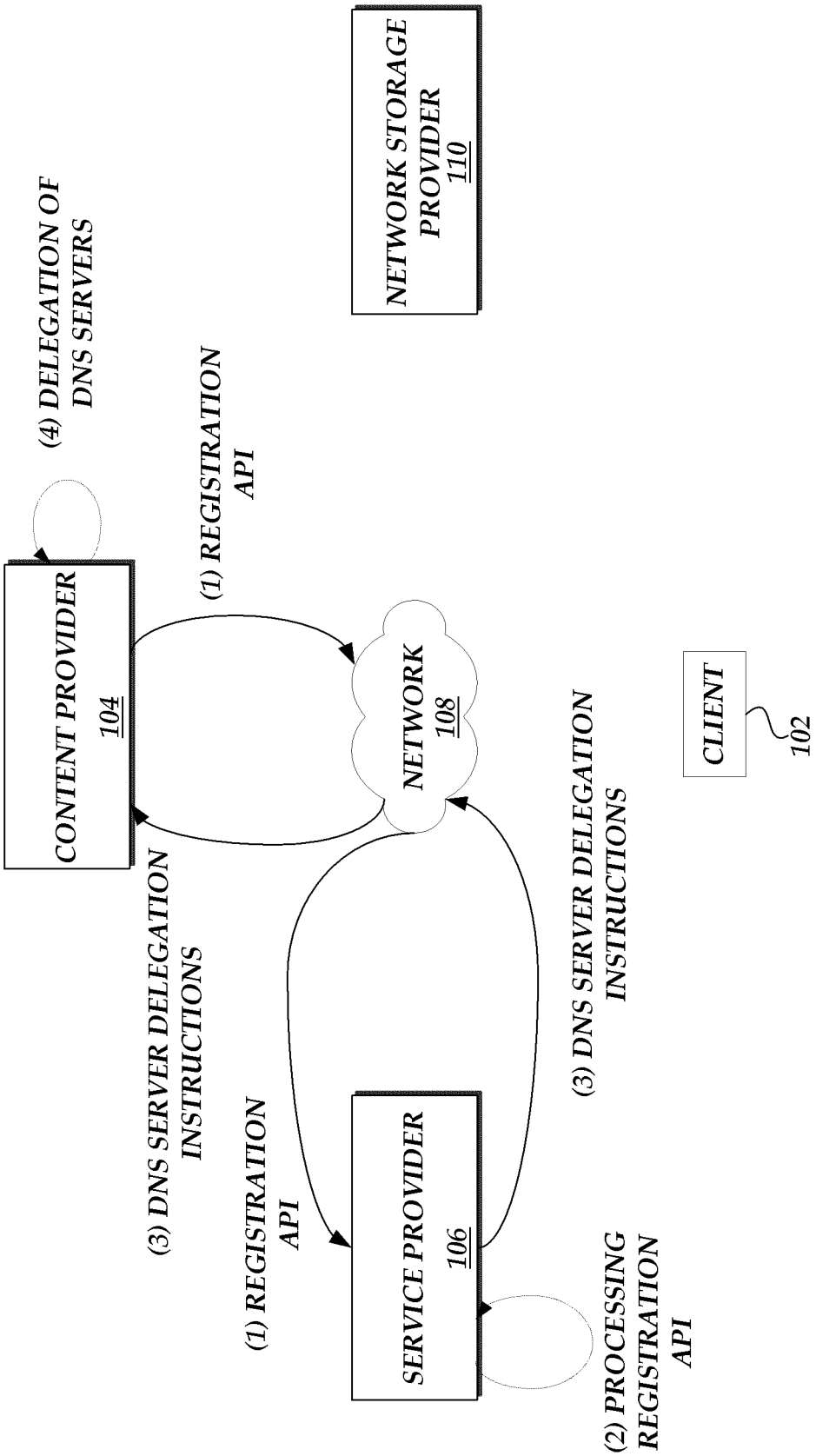
NETWORK STORAGE PROVIDER 110
(4) DELEGATION OF DNS SERVERS
CONTENT PROVIDER 104
(1) REGISTRATION API
(3) DNS SERVER DELEGATION INSTRUCTIONS
NETWORK 108
(1) REGISTRATION API
SERVICE PROVIDER 106
(3) DNS SERVER DELEGATION INSTRUCTIONS
CLIENT 102
(2) PROCESSING REGISTRATION API

Fig.3.

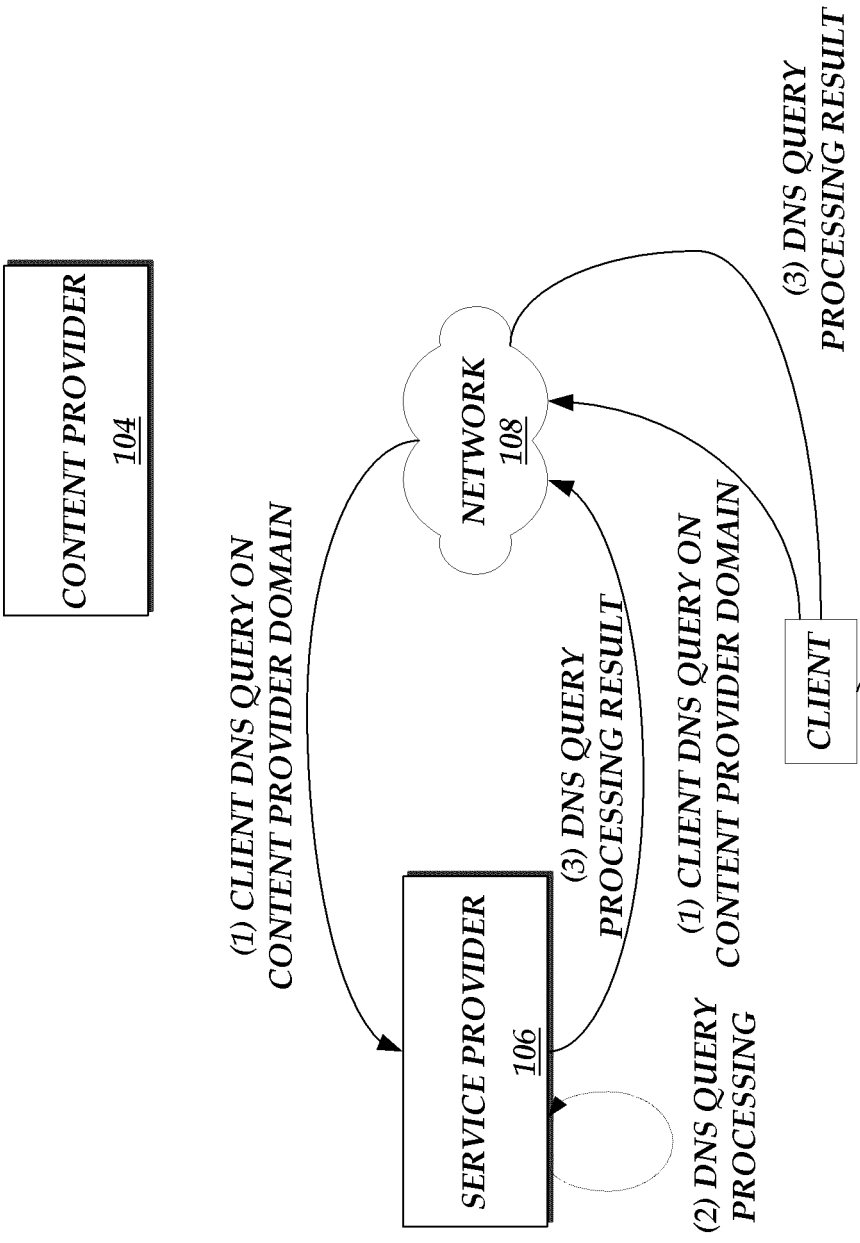
CONTENT PROVIDER
104
NETWORK
108
(1) CLIENT DNS QUERY ON
CONTENT PROVIDER DOMAIN
(3) DNS QUERY
PROCESSING RESULT
(3) DNS QUERY
PROCESSING RESULT
(1) CLIENT DNS QUERY ON
CONTENT PROVIDER DOMAIN
SERVICE PROVIDER
106
(2) DNS QUERY
PROCESSING
CLIENT
102

Fig.4.

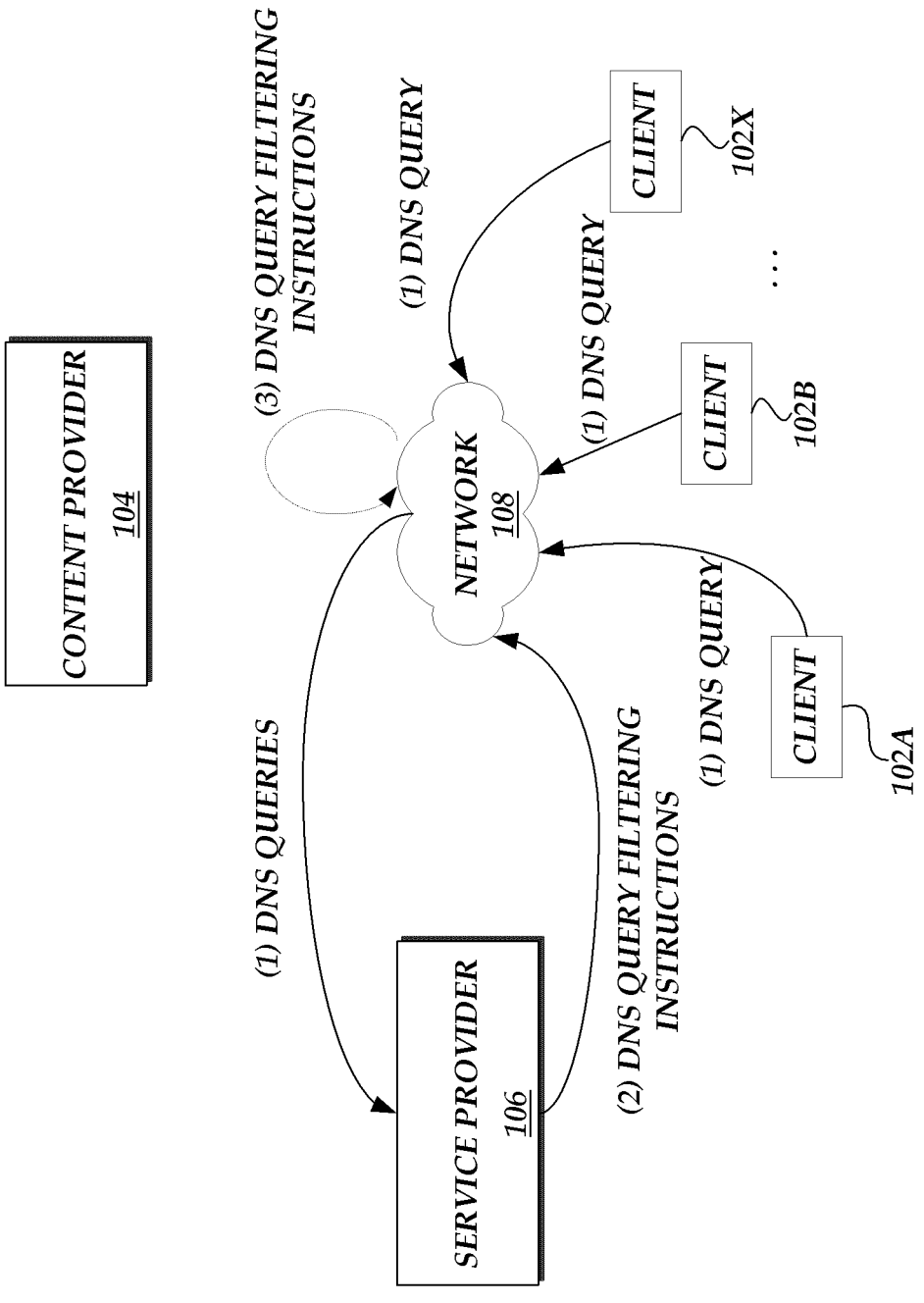
CONTENT PROVIDER
104
(3) DNS QUERY FILTERING INSTRUCTIONS
(1) DNS QUERY
NETWORK
108
CLIENT
102X
(1) DNS QUERY
CLIENT
102B
(1) DNS QUERY
CLIENT
102A
(1) DNS QUERIES
(2) DNS QUERY FILTERING INSTRUCTIONS
SERVICE PROVIDER
106

Fig.5A.

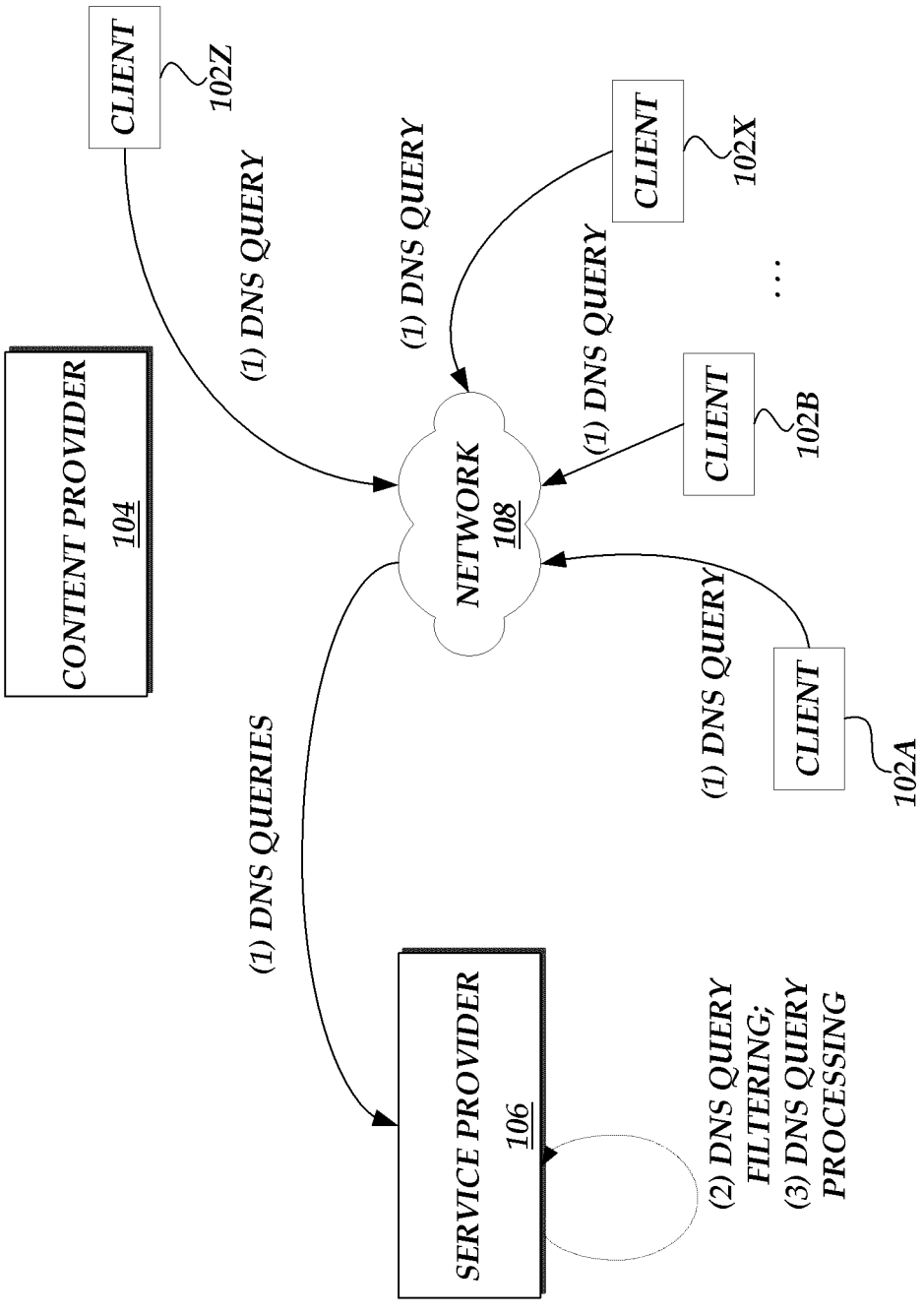
CLIENT
102Z
(1) DNS QUERY
CONTENT PROVIDER
104
(1) DNS QUERY
CLIENT
102X
(1) DNS QUERY
CLIENT
102B
NETWORK
108
(1) DNS QUERY
CLIENT
102A
(1) DNS QUERIES
SERVICE PROVIDER
106
(2) DNS QUERY FILTERING;
(3) DNS QUERY PROCESSING

Fig.5B.

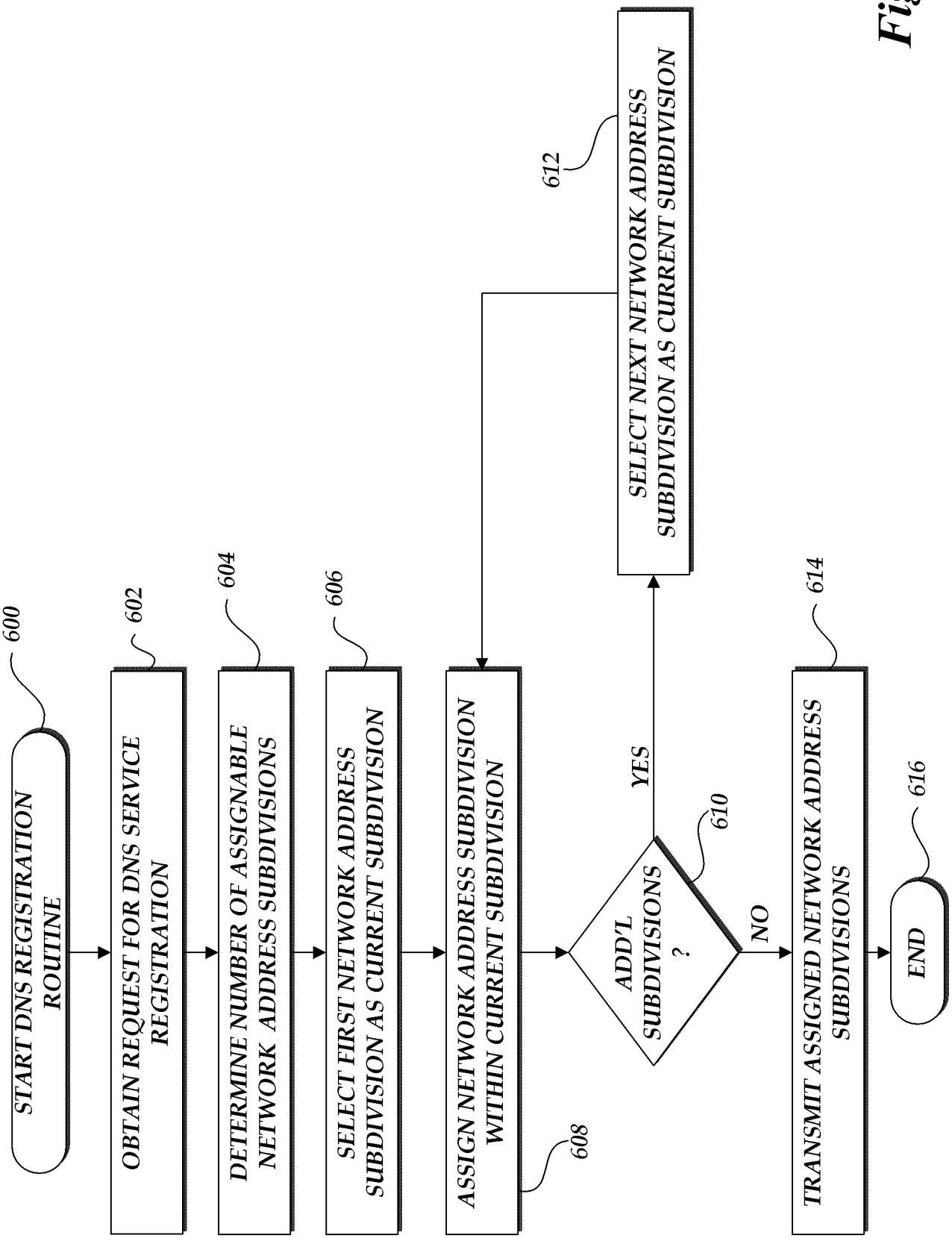
START DNS REGISTRATION ROUTINE
600
OBTAIN REQUEST FOR DNS SERVICE REGISTRATION
602
DETERMINE NUMBER OF ASSIGNABLE NETWORK ADDRESS SUBDIVISIONS
604
SELECT FIRST NETWORK ADDRESS SUBDIVISION AS CURRENT SUBDIVISION
606
ASSIGN NETWORK ADDRESS SUBDIVISION WITHIN CURRENT SUBDIVISION
608
ADD'L SUBDIVISIONS ?
610
YES
NO
SELECT NEXT NETWORK ADDRESS SUBDIVISION AS CURRENT SUBDIVISION
612
TRANSMIT ASSIGNED NETWORK ADDRESS SUBDIVISIONS
614
END
616

Fig.6.

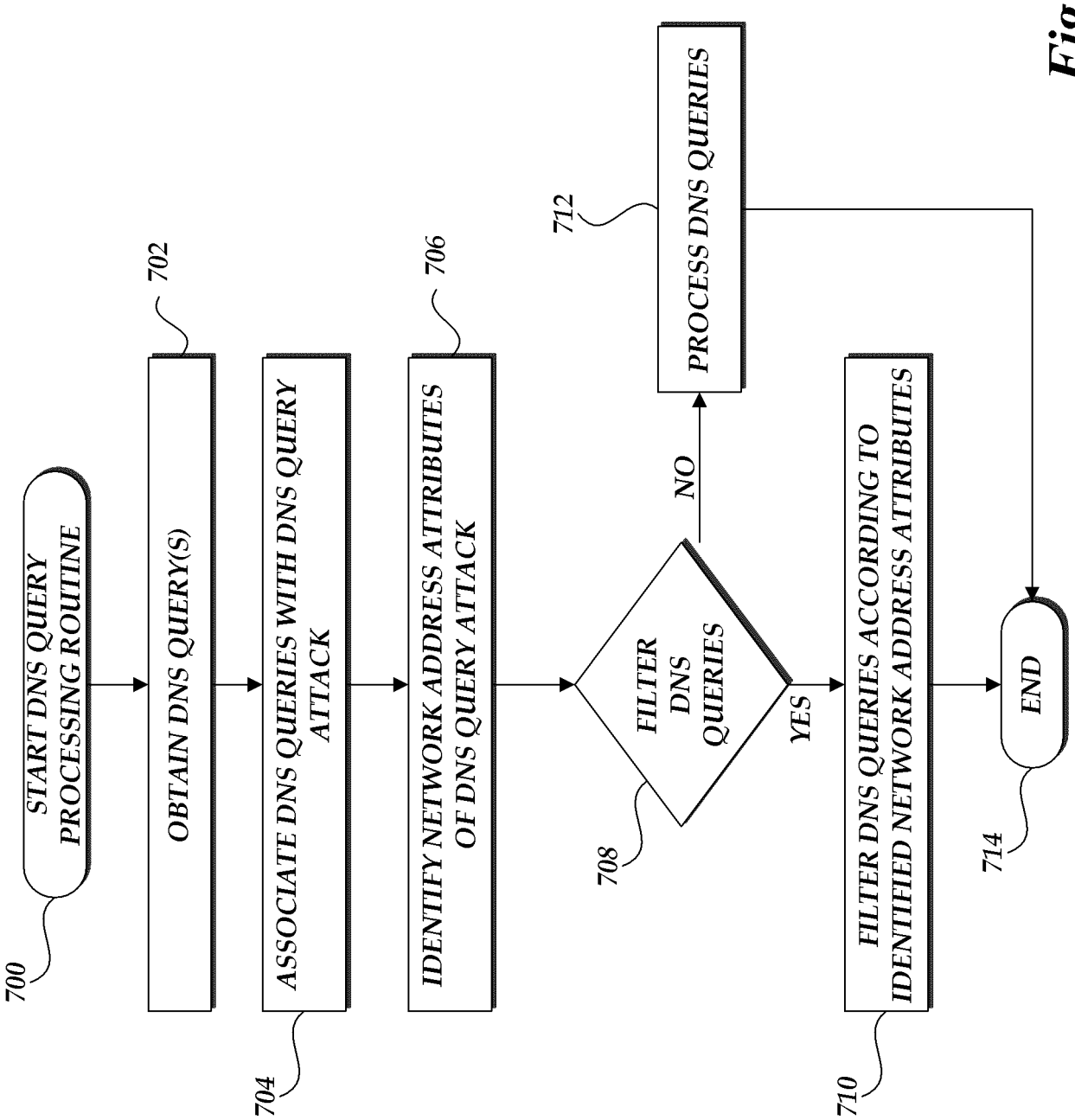
START DNS QUERY PROCESSING ROUTINE
700
OBTAIN DNS QUERY(S)
702
ASSOCIATE DNS QUERIES WITH DNS QUERY ATTACK
704
IDENTIFY NETWORK ADDRESS ATTRIBUTES OF DNS QUERY ATTACK
706
FILTER DNS QUERIES
708
NO
PROCESS DNS QUERIES
712
YES
FILTER DNS QUERIES ACCORDING TO IDENTIFIED NETWORK ADDRESS ATTRIBUTES
710
END
714

Fig. 7.