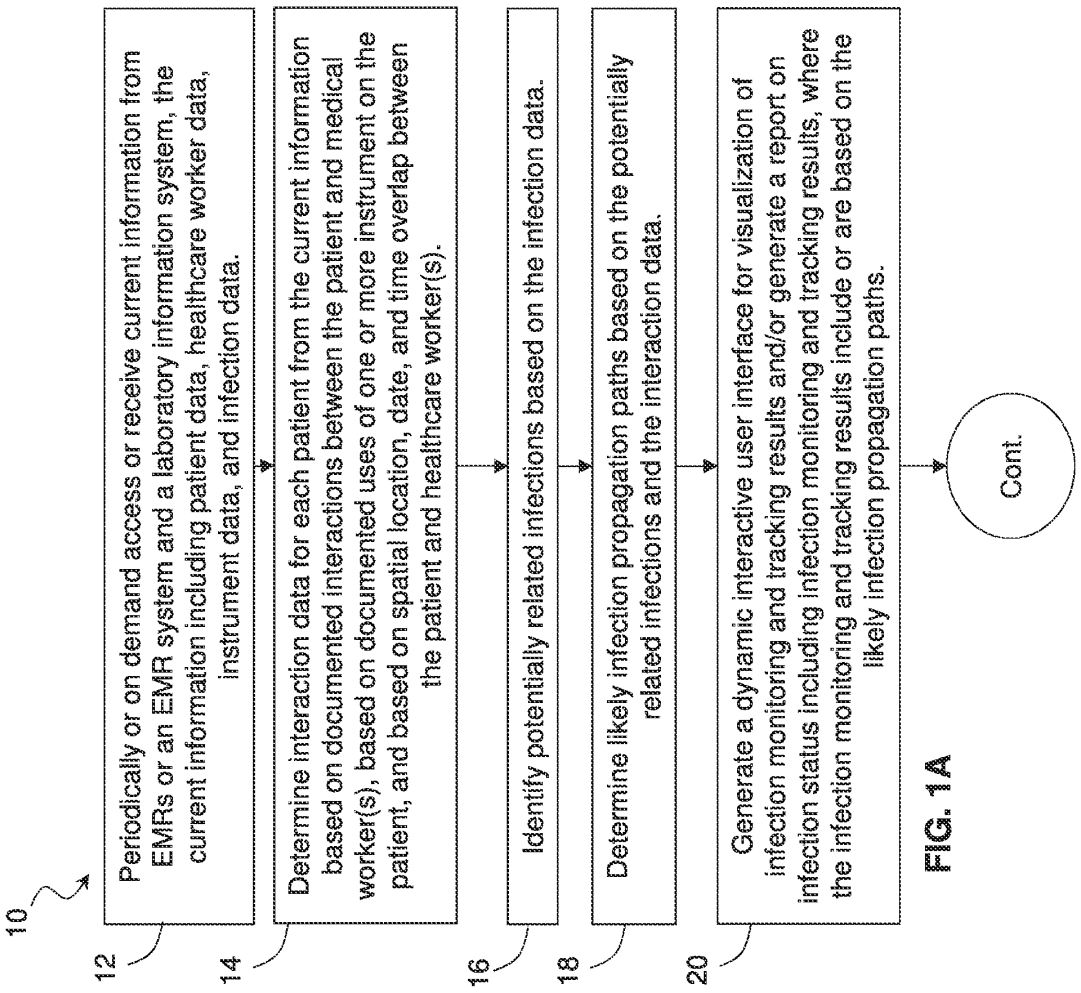

10
12
Periodically or on demand access or receive current information from EMRs or an EMR system and a laboratory information system, the current information including patient data, healthcare worker data, instrument data, and infection data.
14
Determine interaction data for each patient from the current information based on documented interactions between the patient and medical worker(s), based on documented uses of one or more instrument on the patient, and based on spatial location, date, and time overlap between the patient and healthcare worker(s).
16
Identify potentially related infections based on the infection data.
18
Determine likely infection propagation paths based on the potentially related infections and the interaction data.
20
Generate a dynamic interactive user interface for visualization of infection monitoring and tracking results and/or generate a report on infection status including infection monitoring and tracking results, where the infection monitoring and tracking results include or are based on the likely infection propagation paths.
Cont.

FIG. 1A

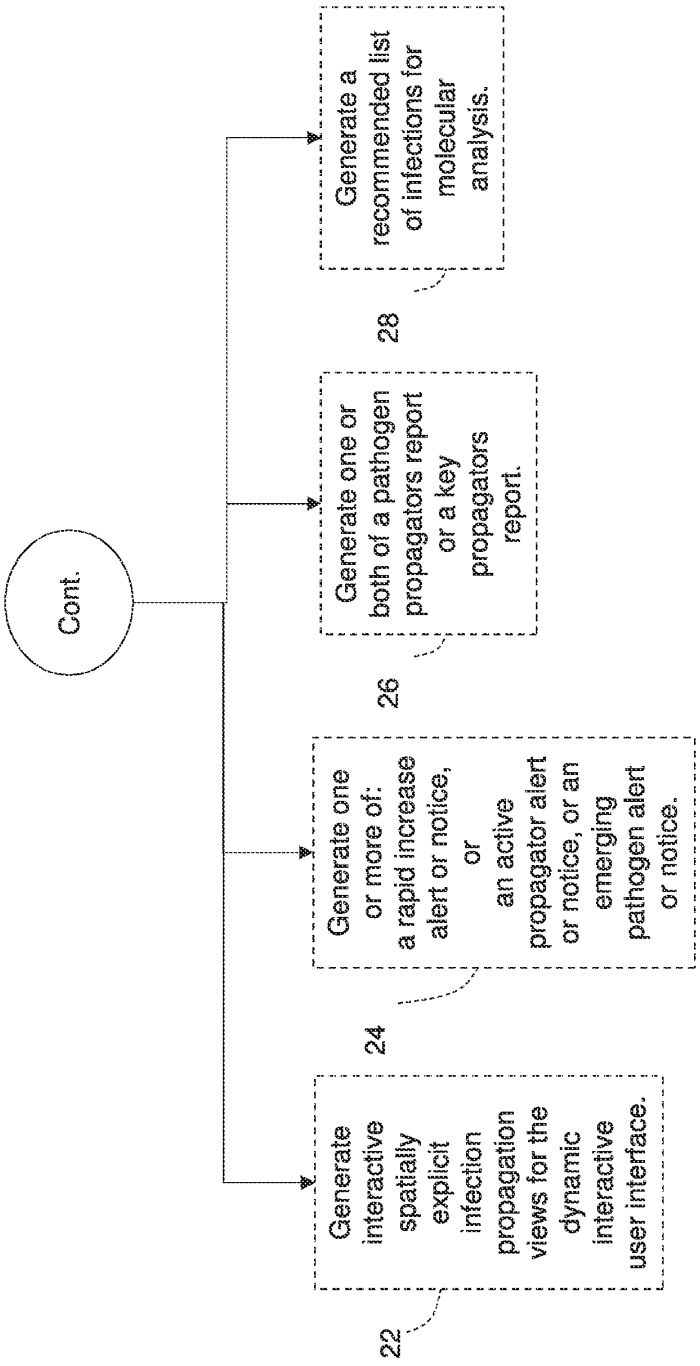
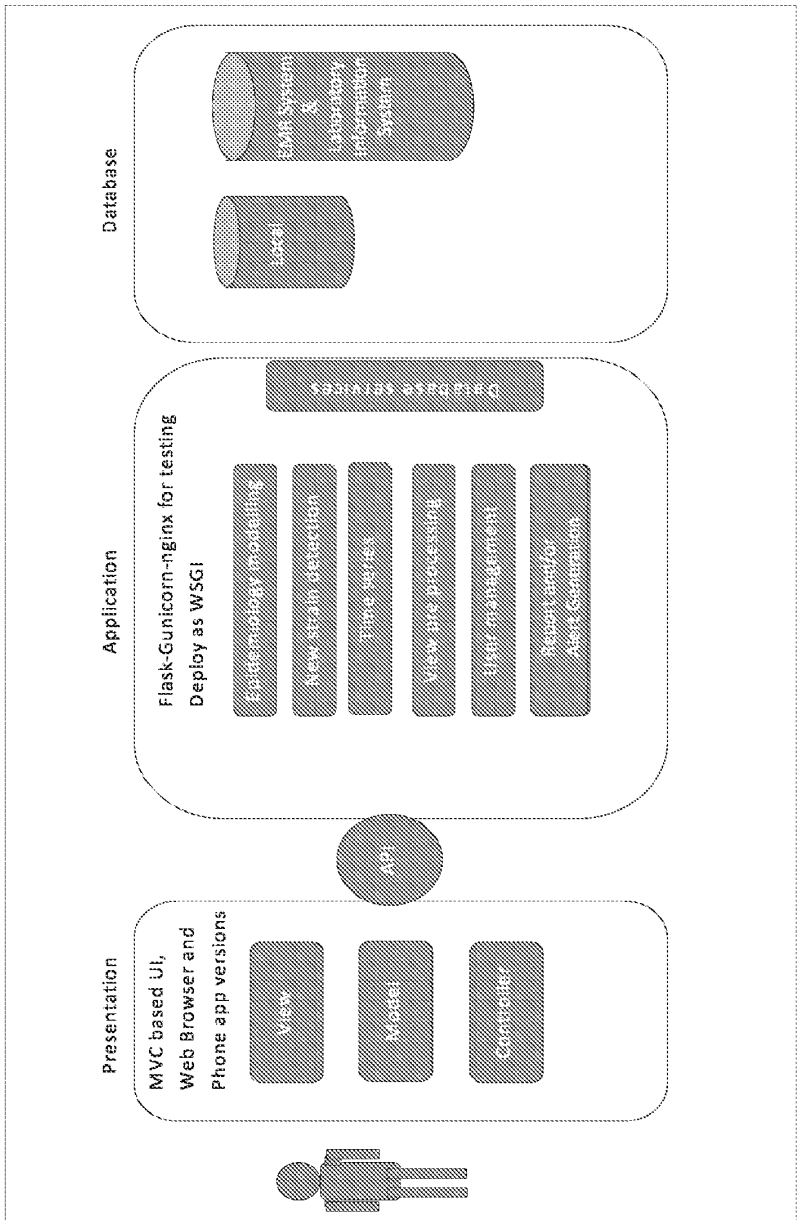

Cont.
Generate interactive spatially explicit infection propagation views for the dynamic interactive user interface.
22
Generate one or more of: a rapid increase alert or notice, or an active propagator alert or notice, or an emerging pathogen alert or notice.
24
Generate one or both of a pathogen propagators report or a key propagators report.
26
Generate a recommended list of infections for molecular analysis.
28

FIG. 1B



General architecture

FIG. 2

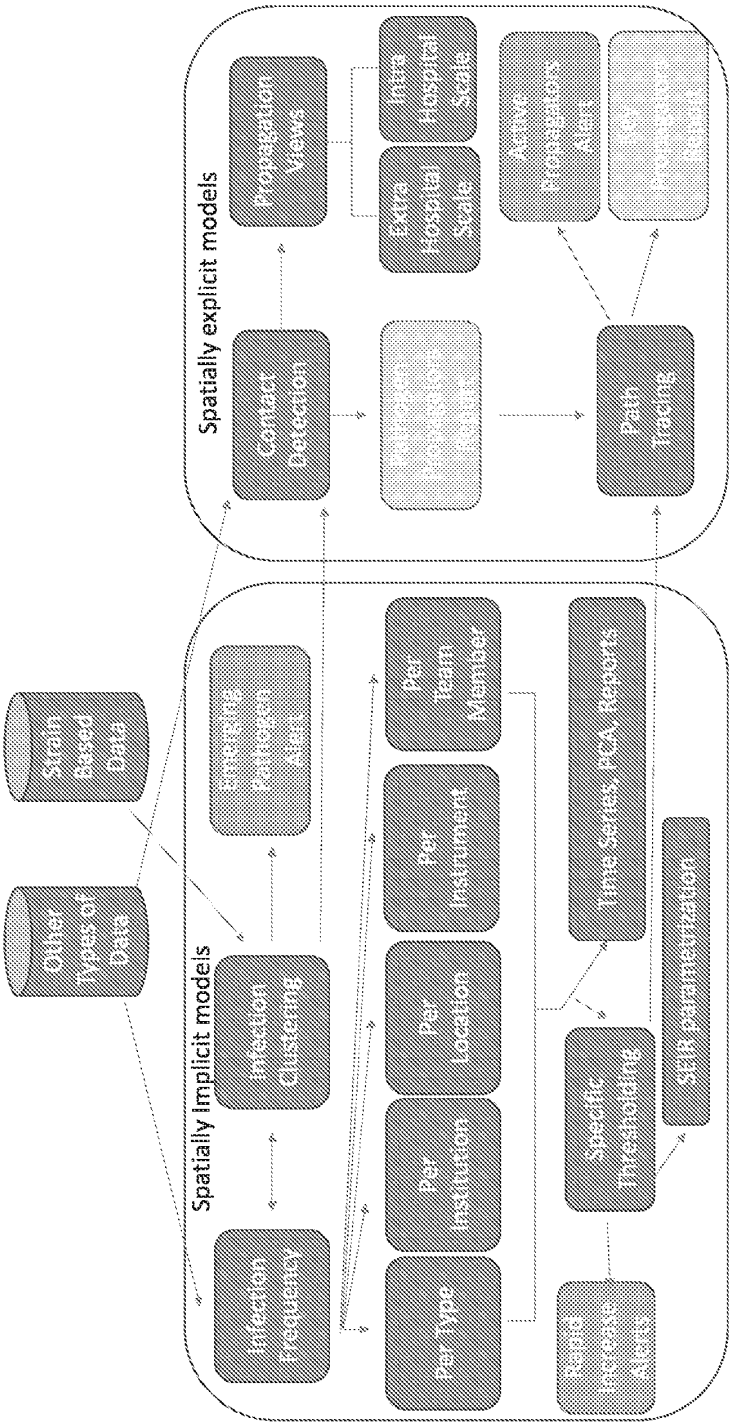

Spatially explicit models
Propagation Views
Intra Hospital Scale
Inter Hospital Scale
Active Monitoring Alert
Contact Detection
Pairs Trading
Spatially Implicit models
Strain Based Data
Other Types of Data
Emerging Pathogen Alert
Infection Clustering
Infection Frequency
Per Team Member
Per Instrument
Per Location
Per Institution
Per Type
Time Series ARIMA Reports
Specific Thresholding
Still parameterization
Rapid Increase Alert

FIG. 3

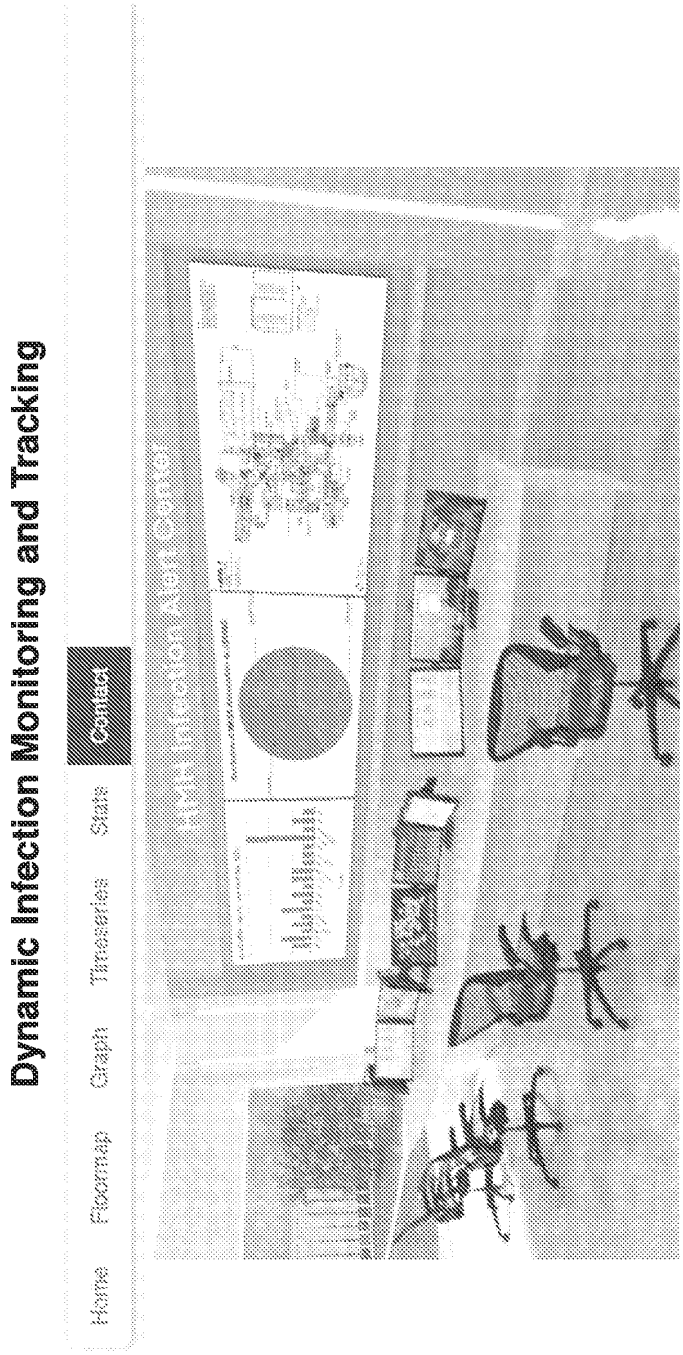

Dynamic Infection Monitoring and Tracking
Home
Floormap
Graph
Timeseries
Stats
Contact
MRI Infection Alert Control

FIG. 4

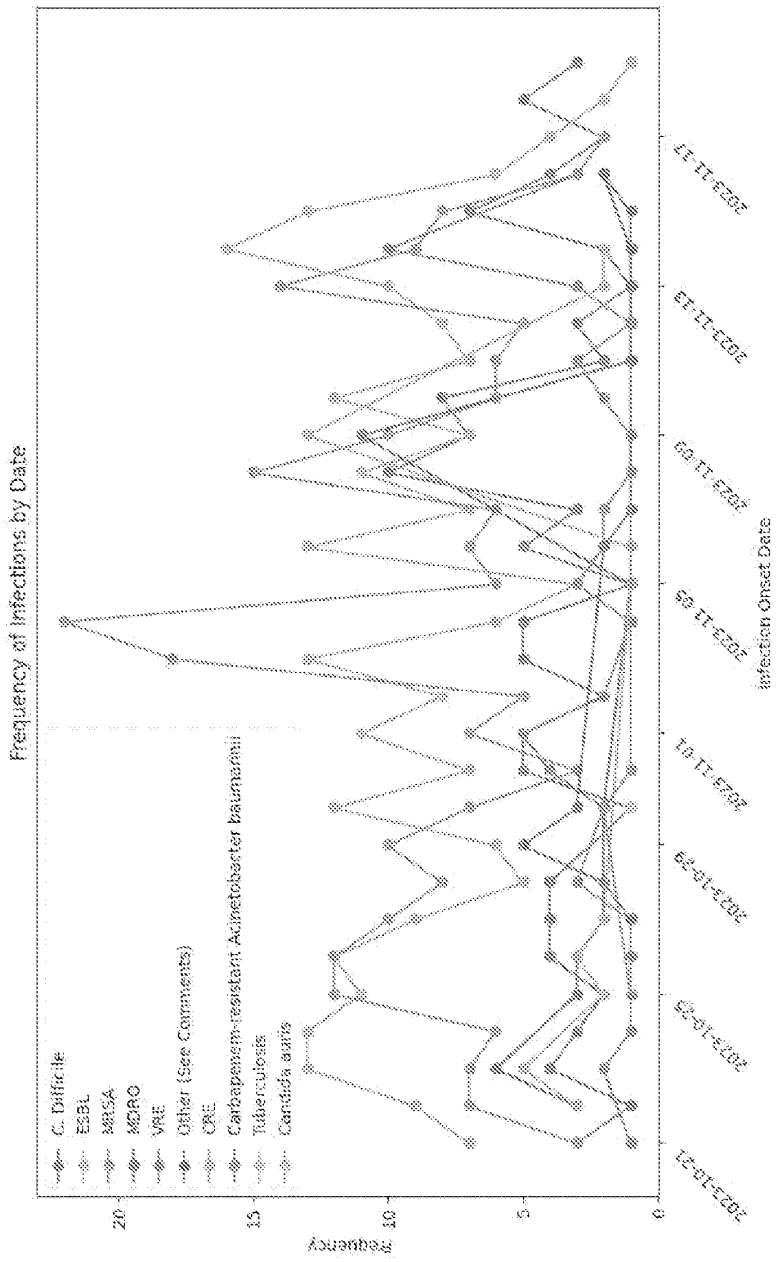

Frequency of Infections by Date
C. Difficile
ESBL
MRSA
MDRO
VRE
Other (See Comments)
CRE
Carbapenem-resistant Acinetobacter baumannii
Tuberculosis
Candida auris
Frequency
0
5
10
15
20
12-01-2022
10-01-2023
08-01-2023
06-01-2023
04-01-2023
02-01-2024
Infection Onset Date

FIG. 5

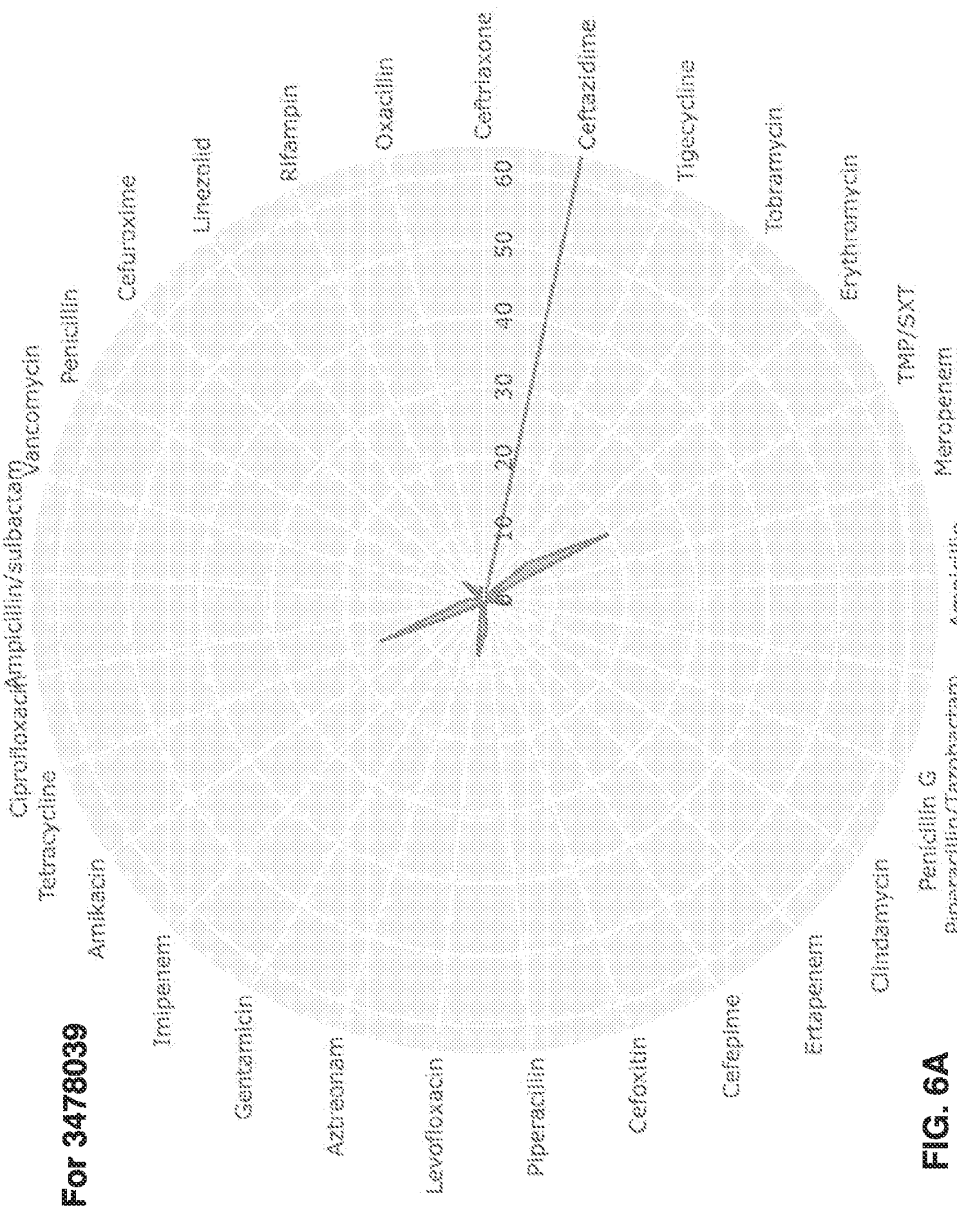

For 3478039
Ciprofloxacin
Ampicillin/sulbactam
Vancomycin
Penicillin
Cefuroxime
Linezolid
Rifampin
Oxacillin
Ceftriaxone
Ceftazidime
Tigecycline
Tobramycin
Erythromycin
TMP/SXT
Meropenem
Ampicillin
Penicillin G
Piperacillin/Tazobactam
Clindamycin
Ertapenem
Cefepime
Cefoxitin
Piperacillin
Levofloxacin
Aztreonam
Gentamicin
Imipenem
Amikacin
Tetracycline
10
20
30
40
50
60

FIG. 6A

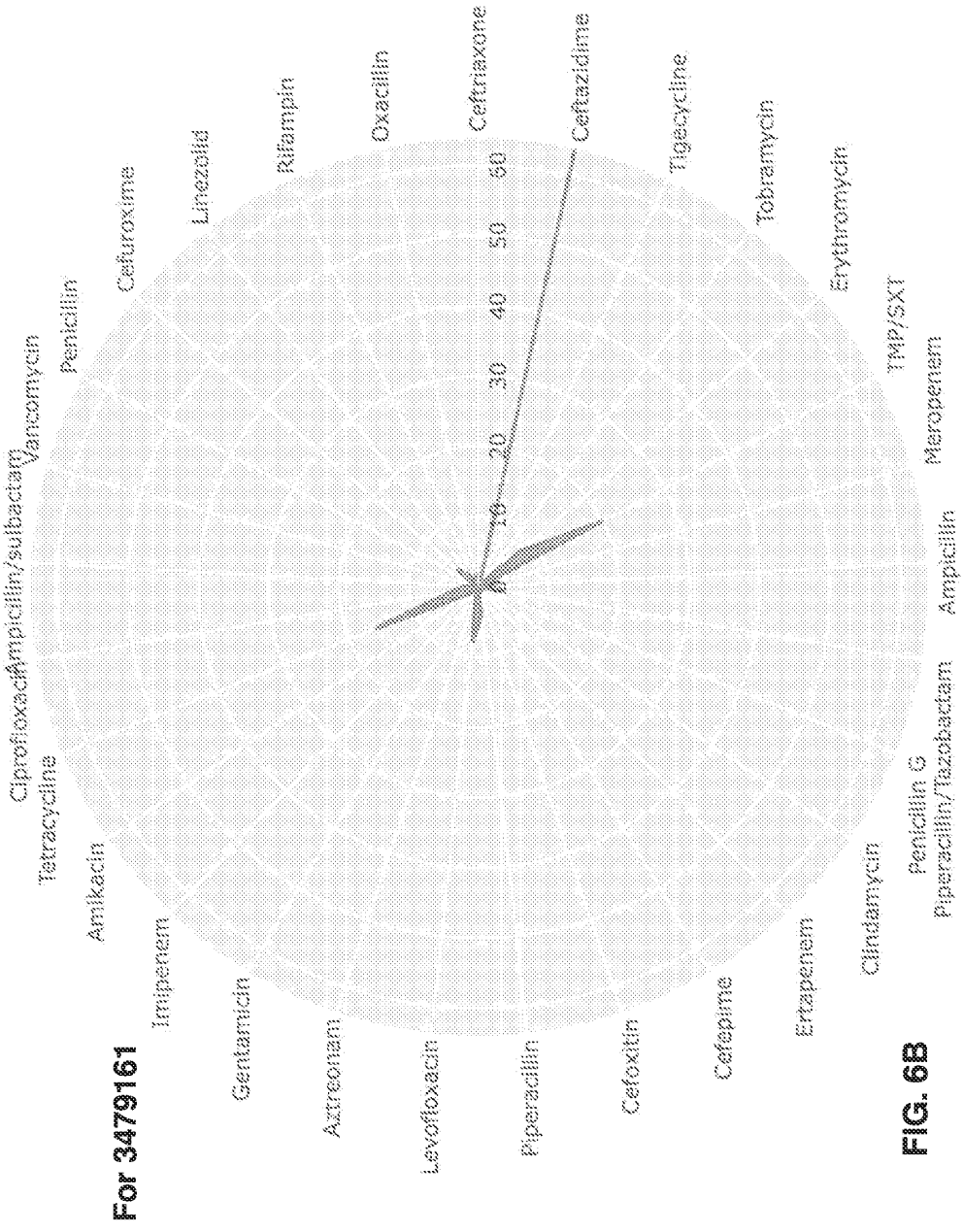

For 3479161
Ceftriaxone
Ceftazidime
Oxacillin
Rifampin
Linezolid
Cefuroxime
Penicillin
Vancomycin
Ampicillin/sulbactam
Ciprofloxacin
Tetracycline
Amikacin
Imipenem
Gentamicin
Aztreonam
Levofloxacin
Piperacillin
Cefoxitin
Cefepime
Ertapenem
Clindamycin
Penicillin G
Piperacillin/Tazobactam
Ampicillin
Meropenem
TMP/SXT
Erythromycin
Tobramycin
Tigecycline
10
20
30
40
50
60

FIG. 6B

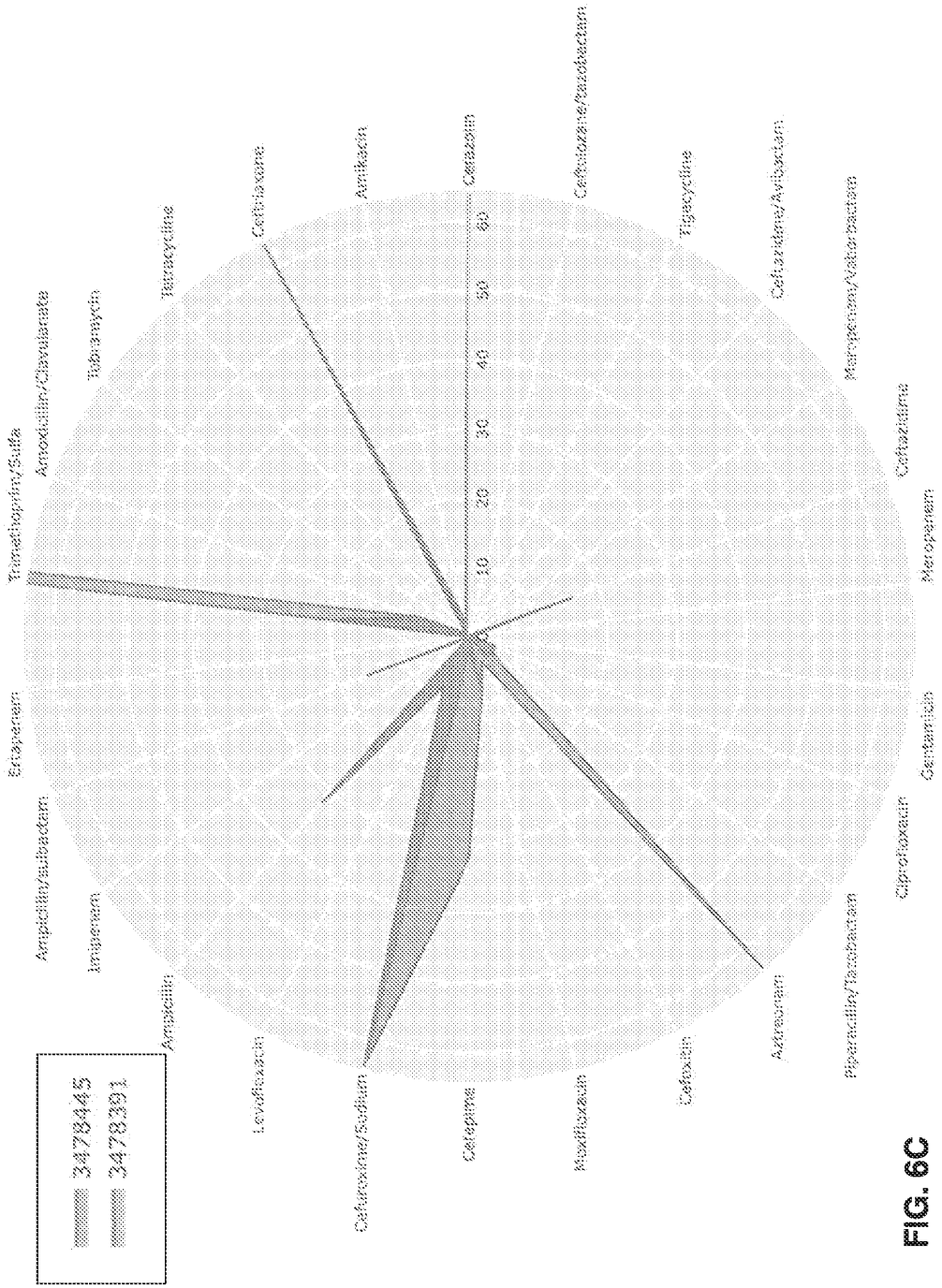

3478445
3478391
Ampicillin
Imipenem
Ampicillin/sulbactam
Ertapenem
Trimethoprim/Sulfa
Amoxicillin/Clavulanate
Tobramycin
Tetracycline
Ceftriaxone
Amikacin
Cefazolin
Ceftolozane/tazobactam
Tigecycline
Ceftazidime/Avibactam
Meropenem/Vaborbactam
Ceftazidime
Meropenem
Gentamicin
Ciprofloxacin
Aztreonam
Piperacillin/Tazobactam
Cefoxitin
Moxifloxacin
Cefepime
Ceftazoxime/Sodium
Levofloxacin
10
20
30
40
50
60

FIG. 6C

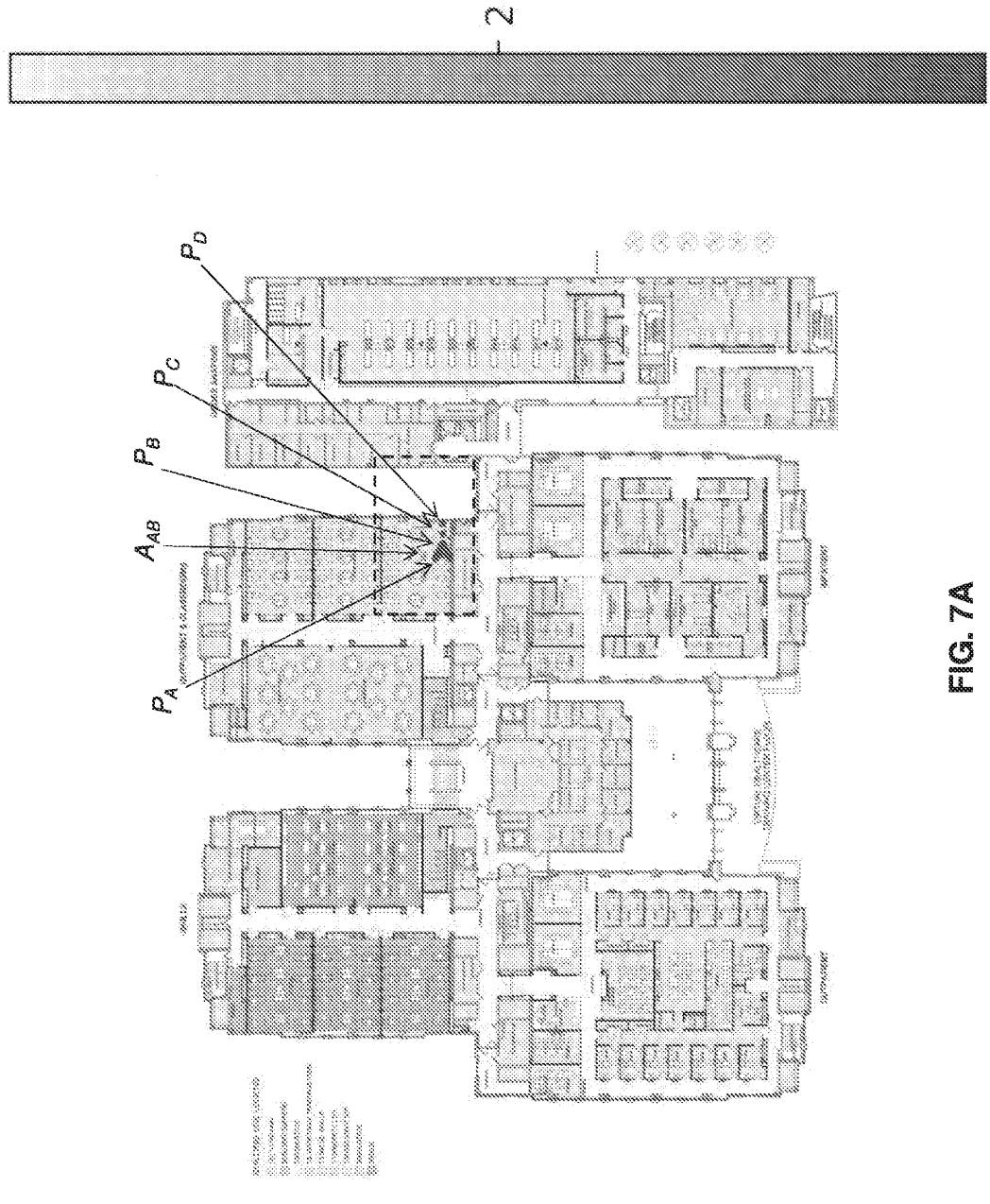


FIG. 7A

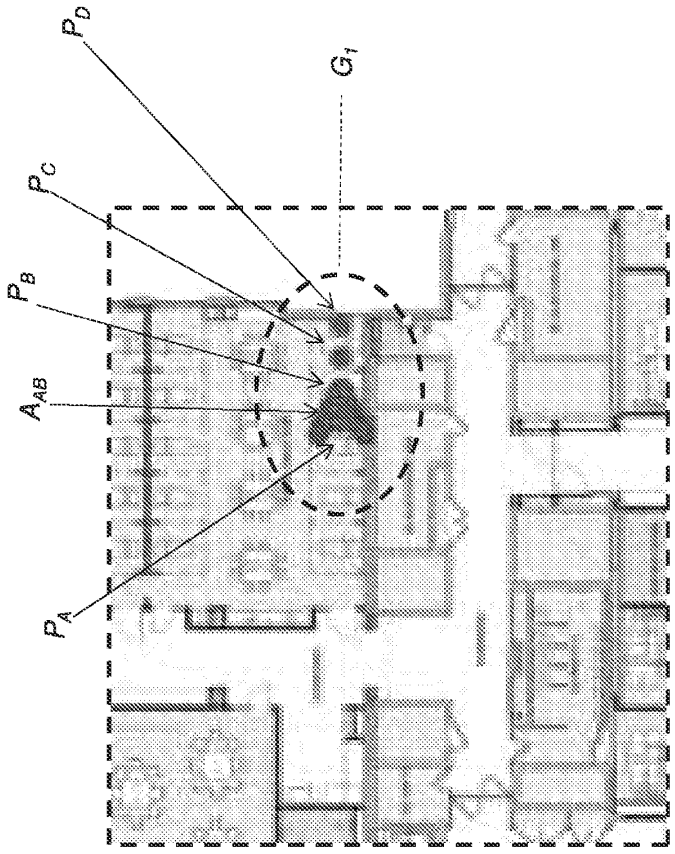


FIG. 7B

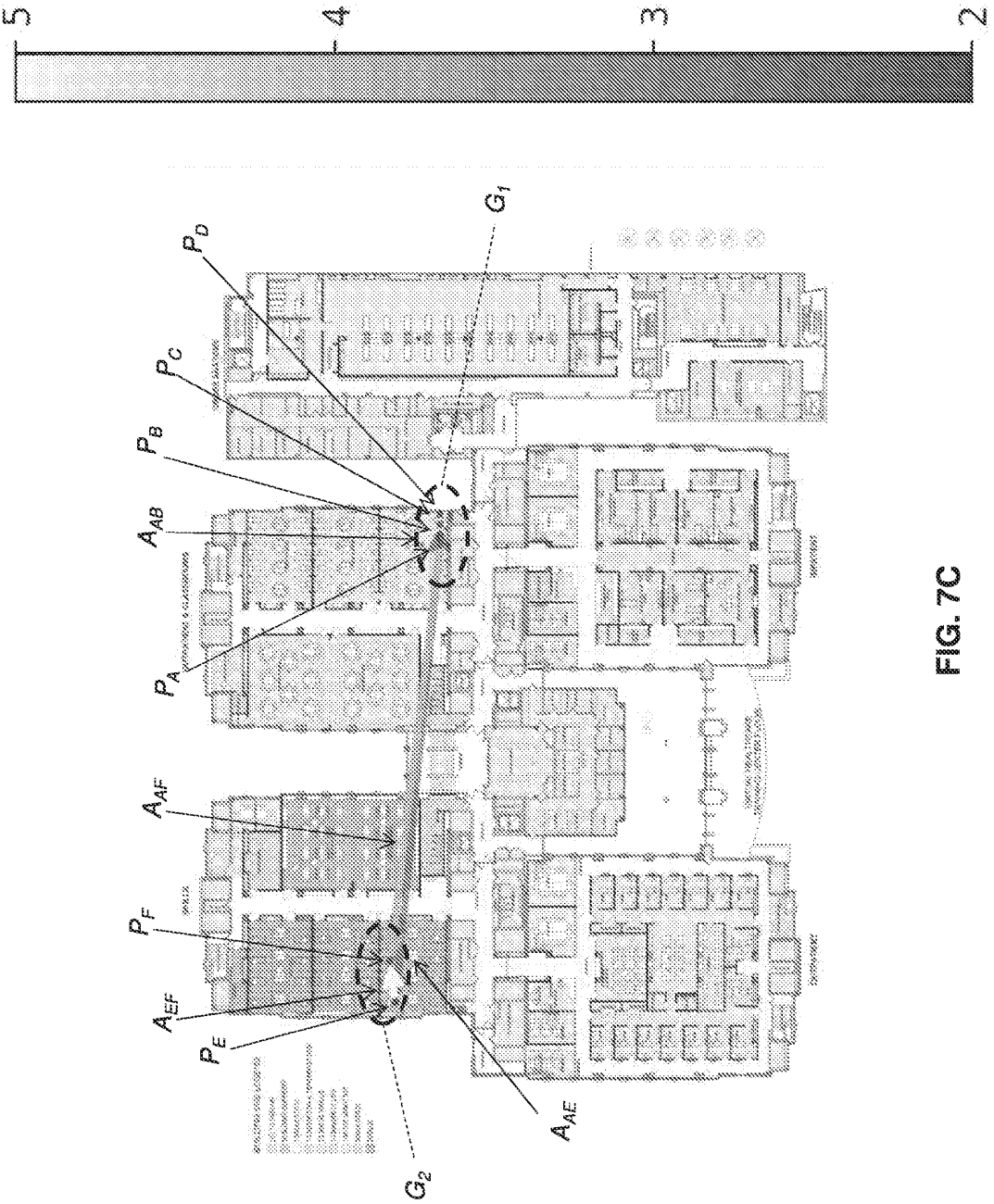


FIG. 7C

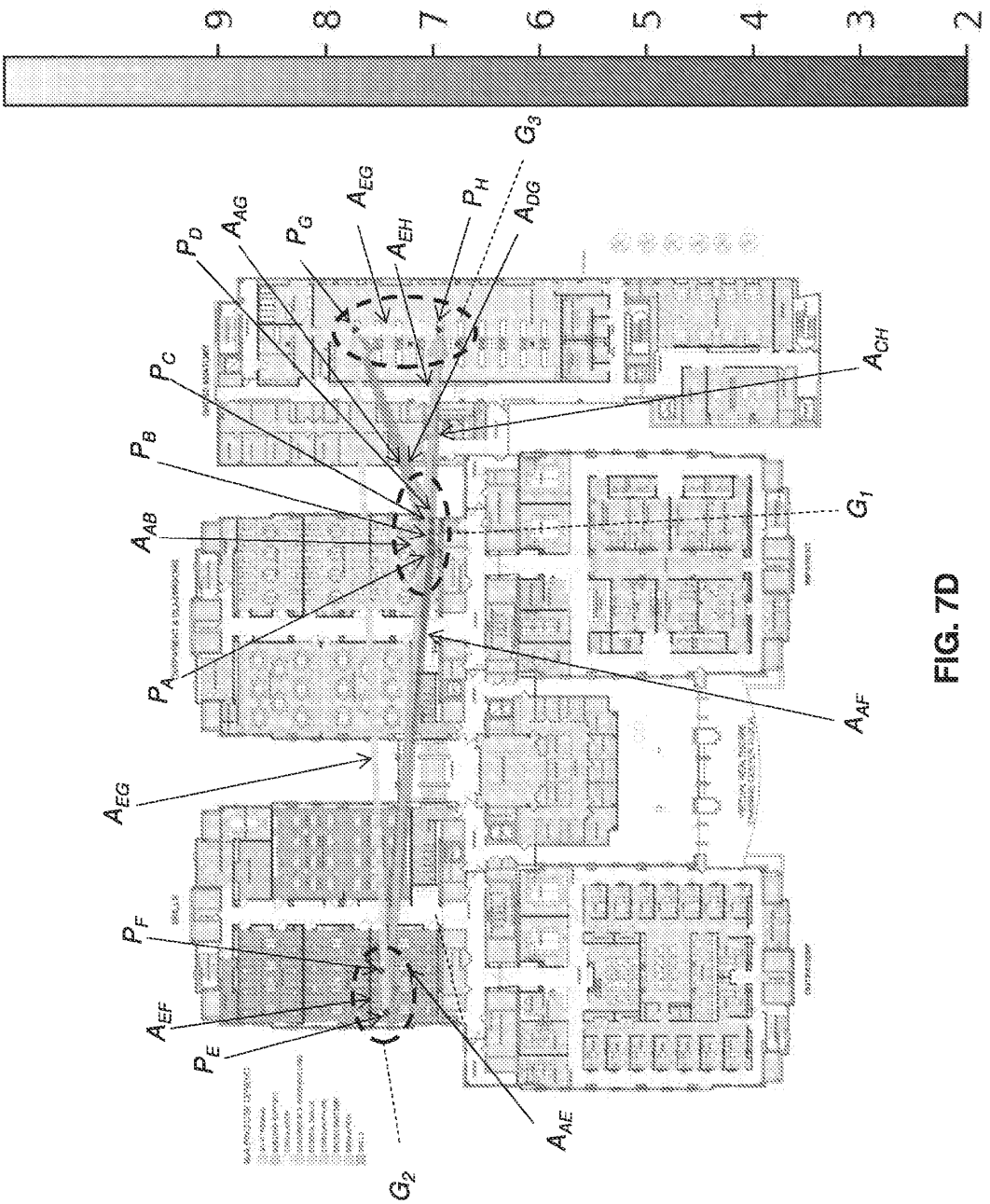

9
8
7
6
5
4
3
2
G_3
A_{EG}
P_H
A_{DG}
P_D
A_{AG}
P_G
A_{EH}
P_C
A_{CH}
P_B
G_1
A_{AB}
P_A
A_{AF}
A_{EG}
P_F
A_{EF}
P_E
A_{AE}
G_2

FIG. 7D

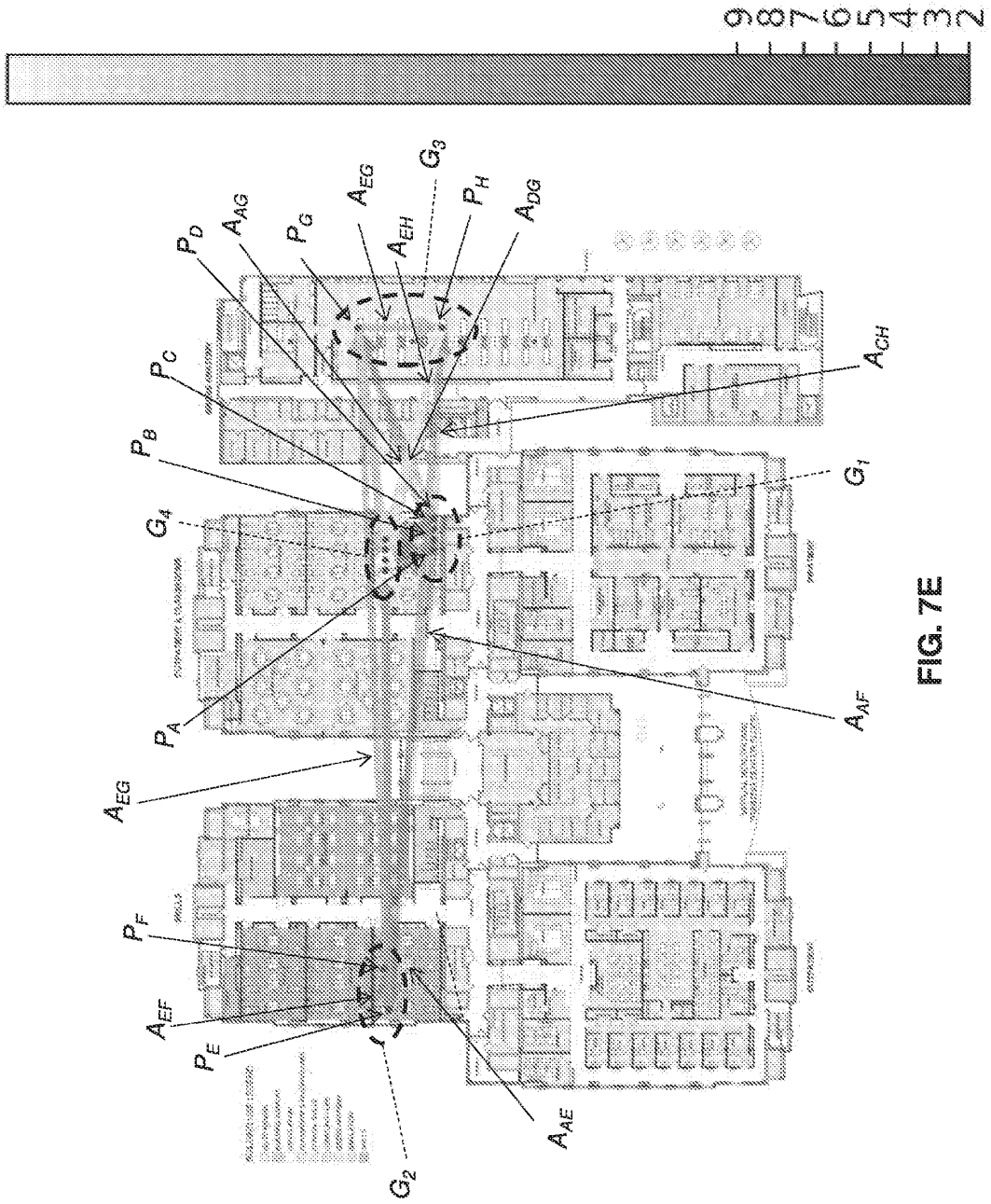

9 8 7 6 5 4 3 2
P_D
A_{AG}
P_G
A_{EG}
A_{EH}
G_3
P_H
A_{DG}
A_{CH}
P_C
P_B
G_1
G_4
P_A
A_{AF}
A_{EG}
P_F
A_{EF}
P_E
A_{AE}
G_2

FIG. 7E

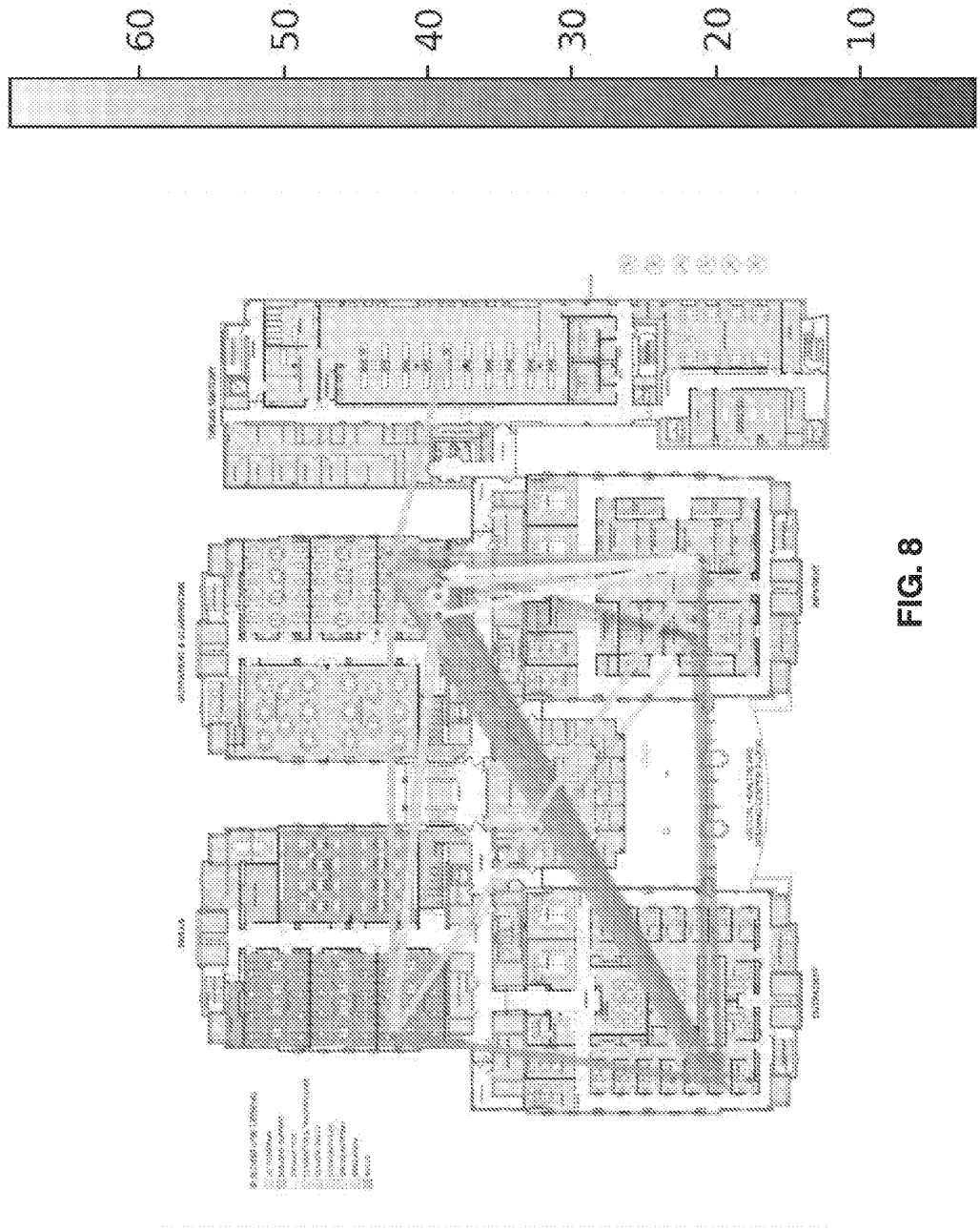


FIG. 8

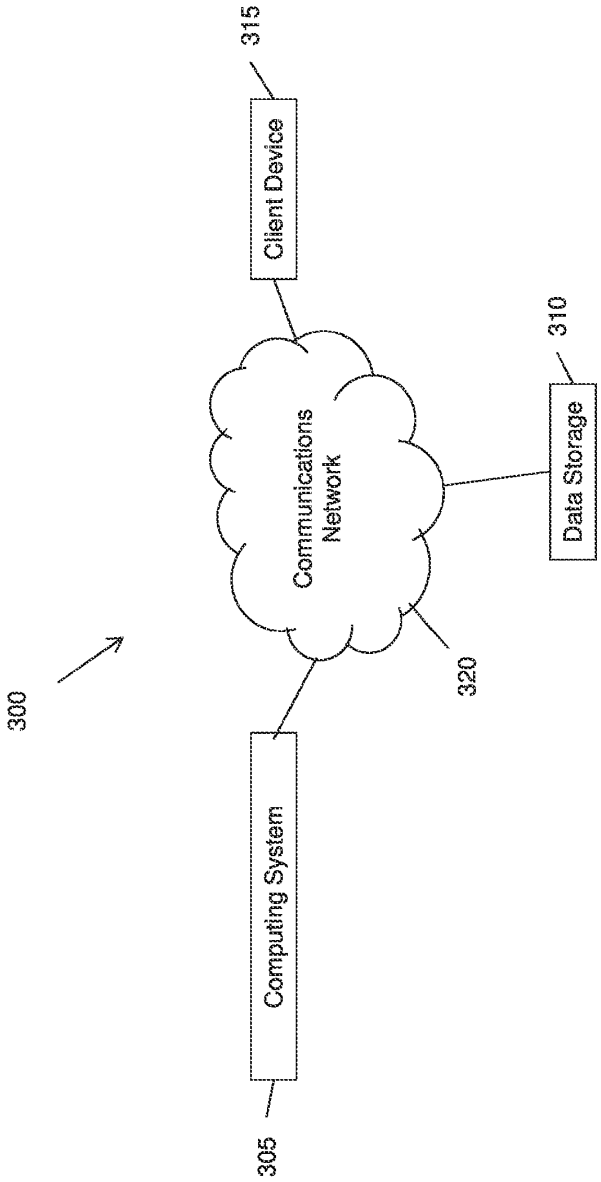

315
Client Device
310
Communications Network
Data Storage
320
300
Computing System
305

FIG. 9

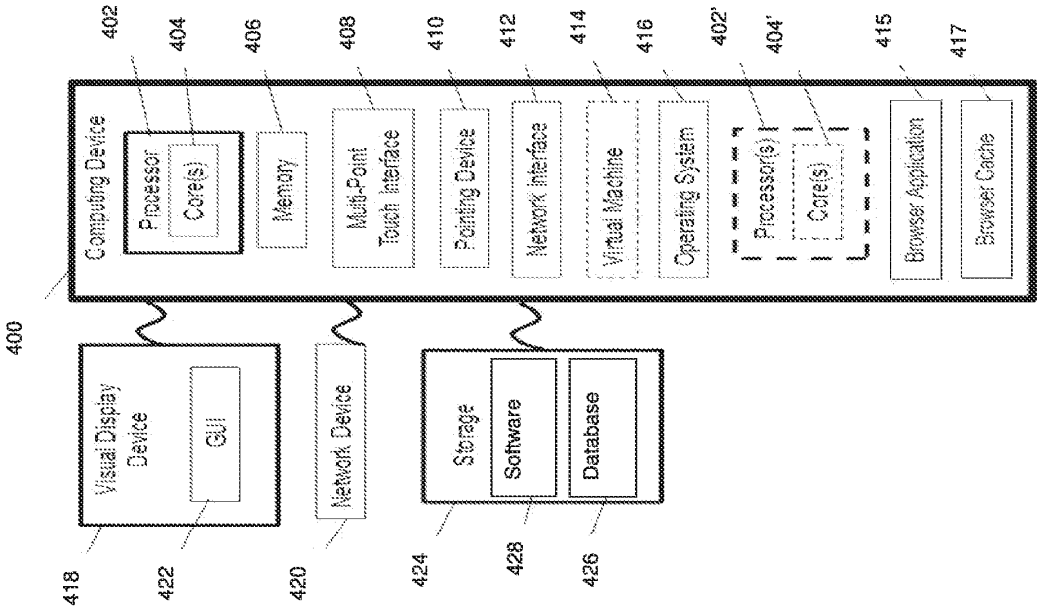

400
Computing Device
Processor
Core(s)
Memory
Multi-Point Touch Interface
Pointing Device
Network Interface
Virtual Machine
Operating System
Processor(s)
Core(s)
Browser Application
Browser Cache
402
404
406
408
410
412
414
416
402'
404'
415
417
Visual Display Device
GUI
Network Device
Storage
Software
Database
418
422
420
424
428
426

FIG. 10