Fig. 1A

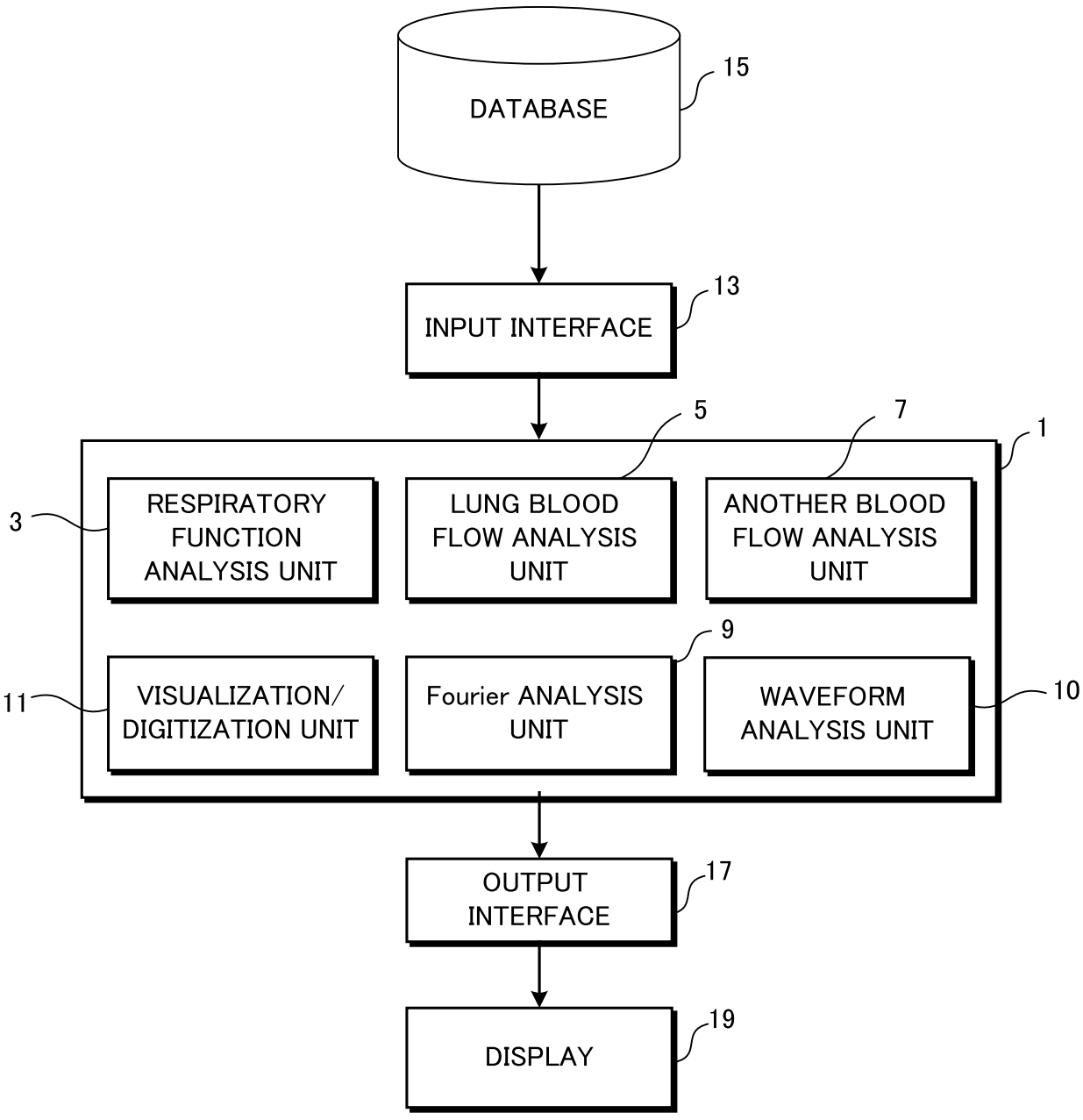

DATABASE
15
INPUT INTERFACE
13
5
7
1
3
RESPIRATORY FUNCTION ANALYSIS UNIT
LUNG BLOOD FLOW ANALYSIS UNIT
ANOTHER BLOOD FLOW ANALYSIS UNIT
9
11
VISUALIZATION/ DIGITIZATION UNIT
Fourier ANALYSIS UNIT
WAVEFORM ANALYSIS UNIT
10
OUTPUT INTERFACE
17
DISPLAY
19

Fig. 1B

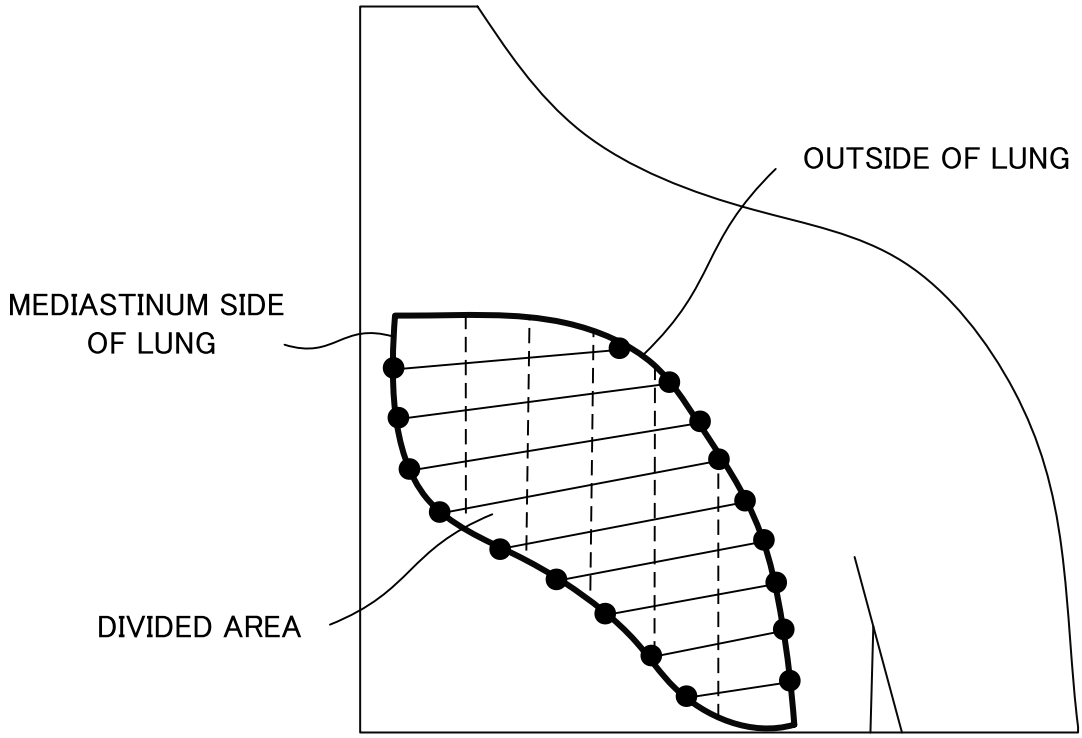

OUTSIDE OF LUNG
MEDIASTINUM SIDE OF LUNG
DIVIDED AREA

Fig. 1C

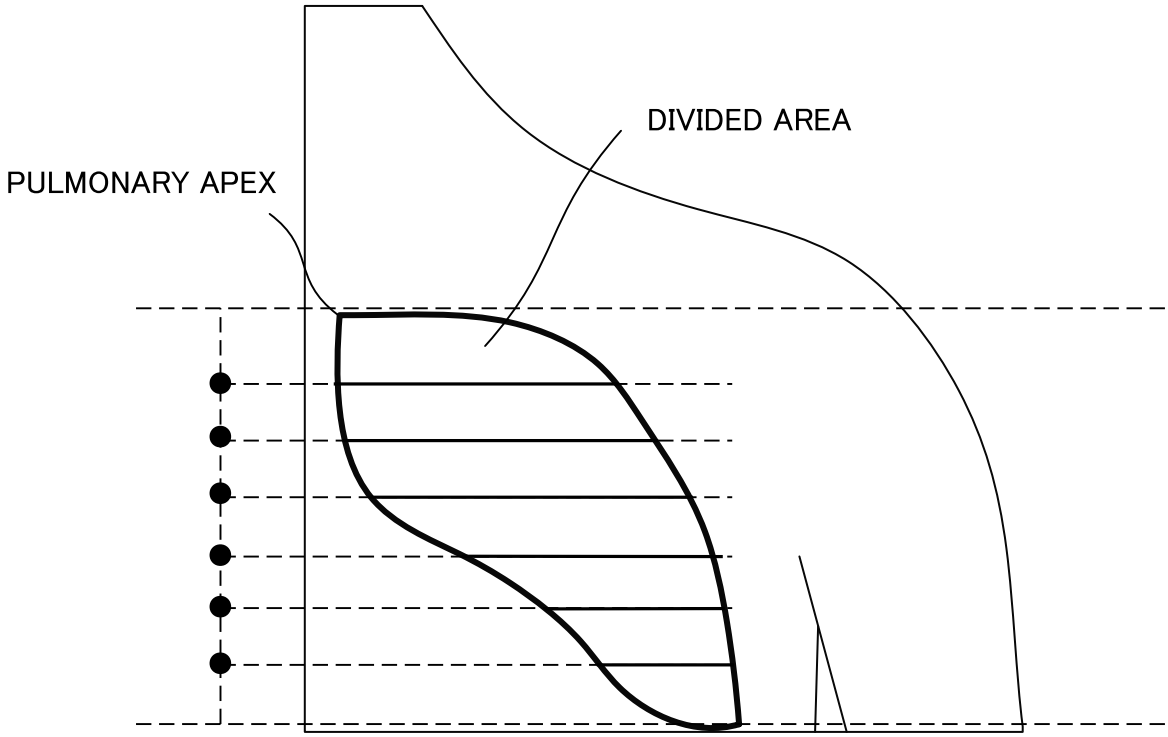

DIVIDED AREA
PULMONARY APEX

Fig. 1D

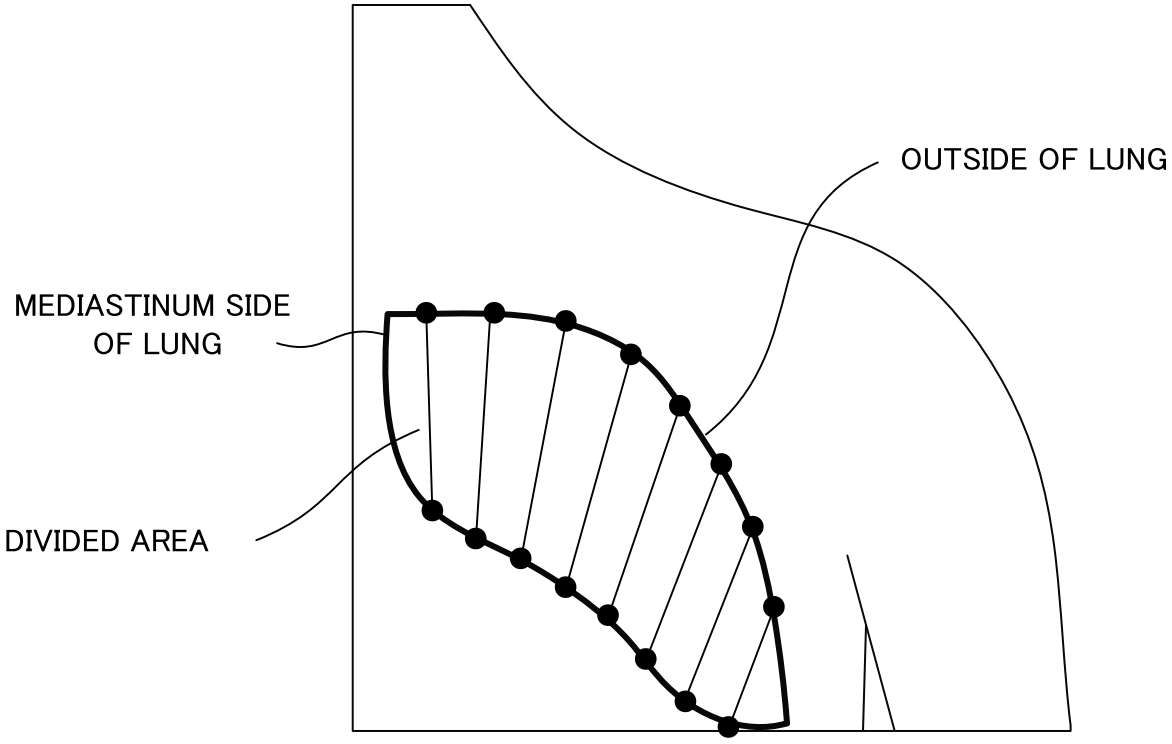

OUTSIDE OF LUNG
MEDIASTINUM SIDE
OF LUNG
DIVIDED AREA

Fig. 1E

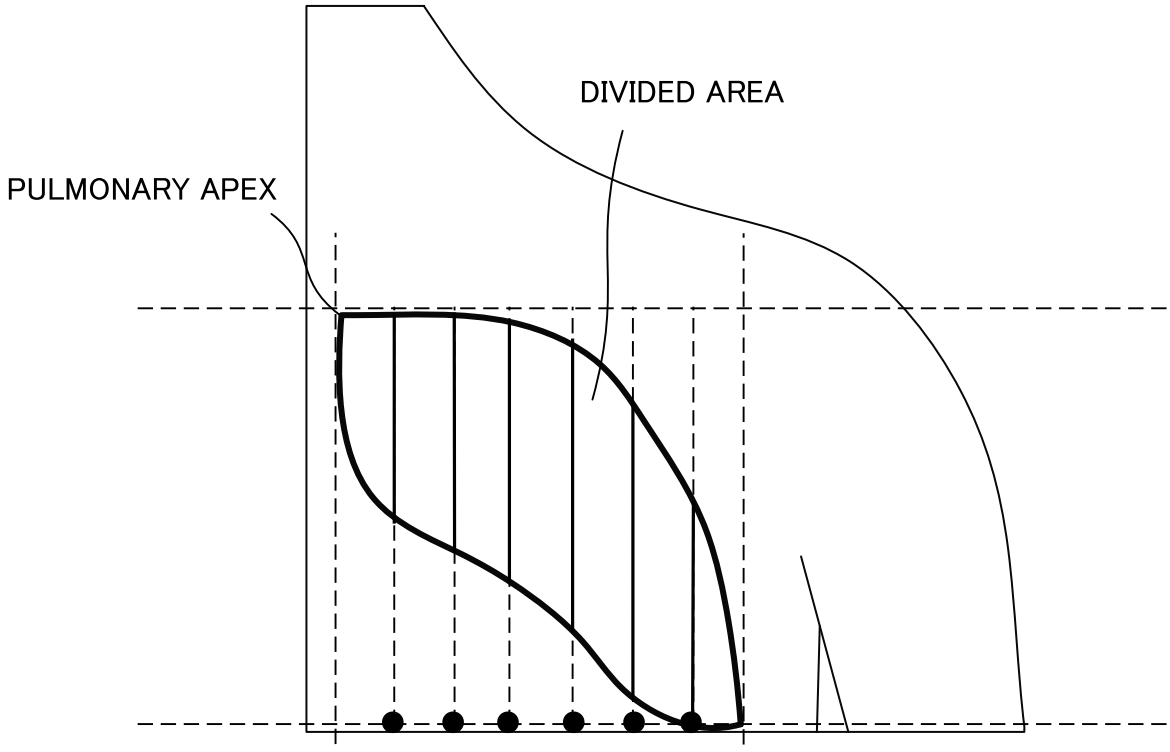

DIVIDED AREA
PULMONARY APEX

Fig. 1F

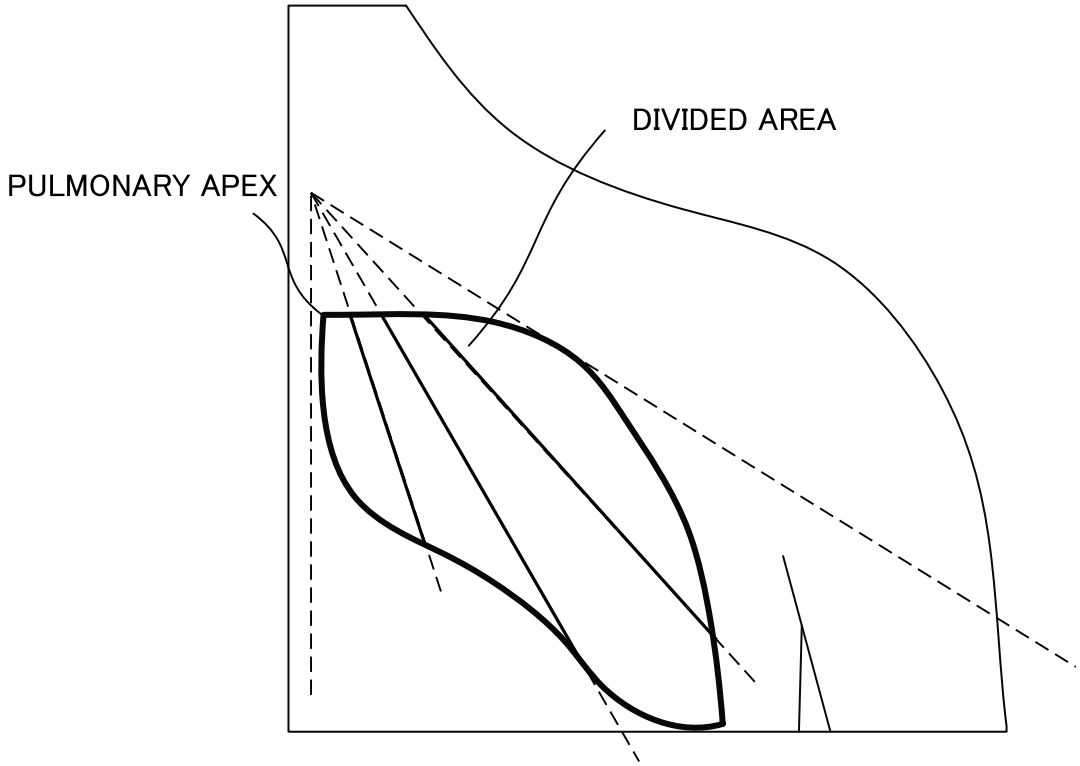

DIVIDED AREA
PULMONARY APEX

Fig. 1G

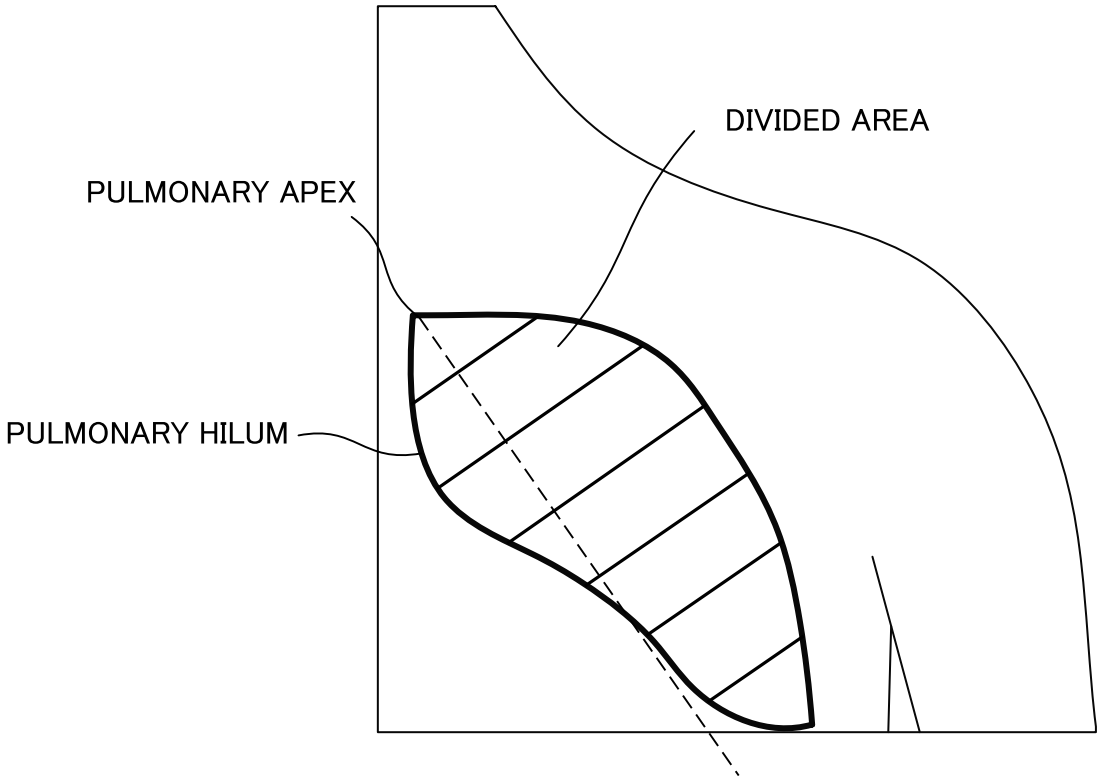

DIVIDED AREA
PULMONARY APEX
PULMONARY HILUM

Fig. 1H

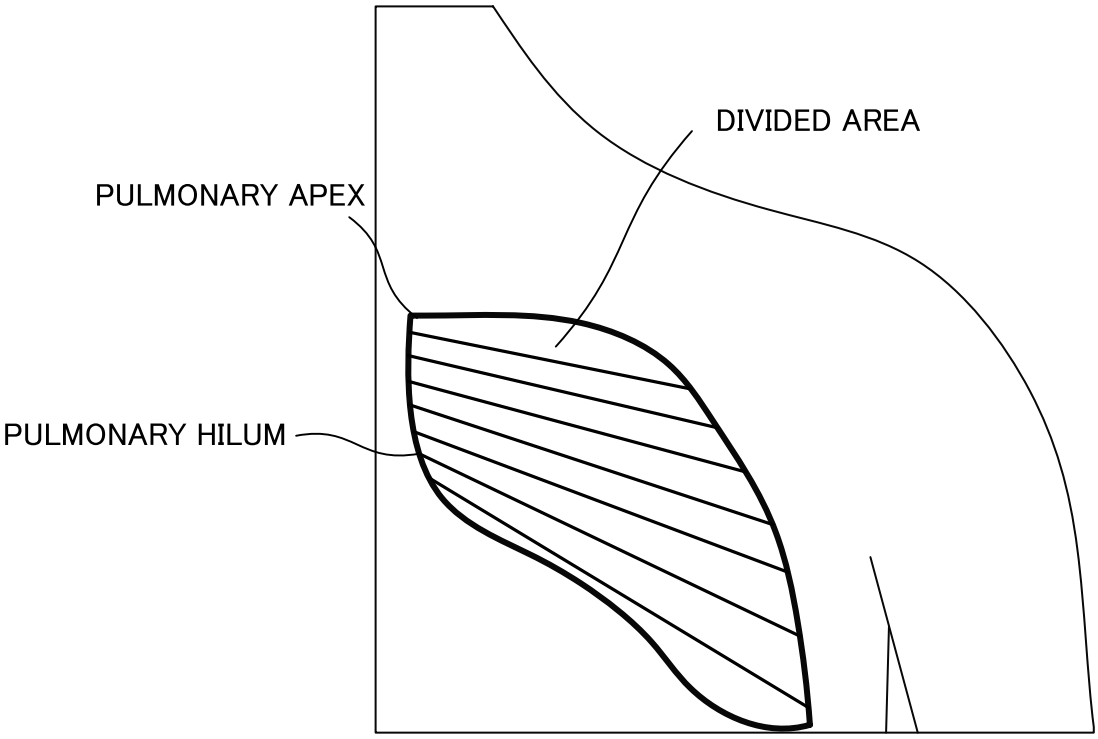

DIVIDED AREA
PULMONARY APEX
PULMONARY HILUM

Fig. 2A

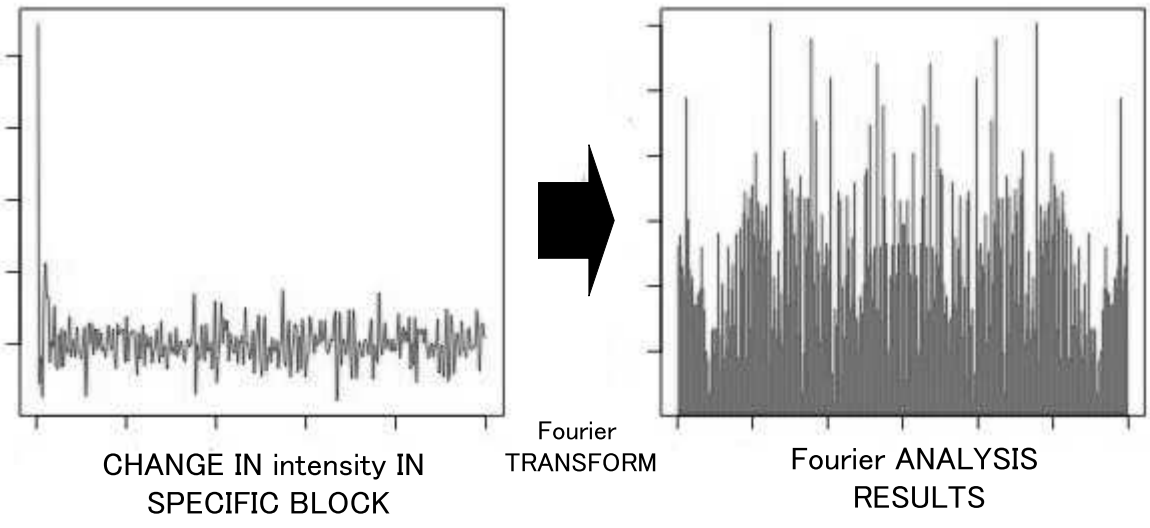

CHANGE IN intensity IN SPECIFIC BLOCK
Fourier TRANSFORM
Fourier ANALYSIS RESULTS

Fig. 2B

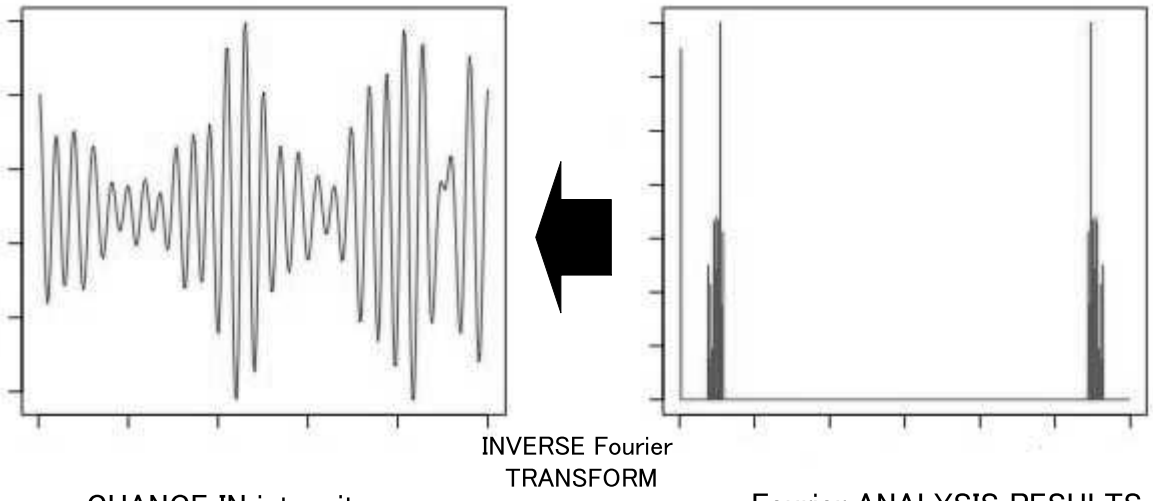

INVERSE Fourier
TRANSFORM
CHANGE IN intensity
OF FREQUENCY OMPONENTS
CLOSE TO HEARTBEAT
Fourier ANALYSIS RESULTS
INDICATING ONLY FREQUENCY COMPONENTS
CLOSE TO HEARTBEAT

Fig. 2C

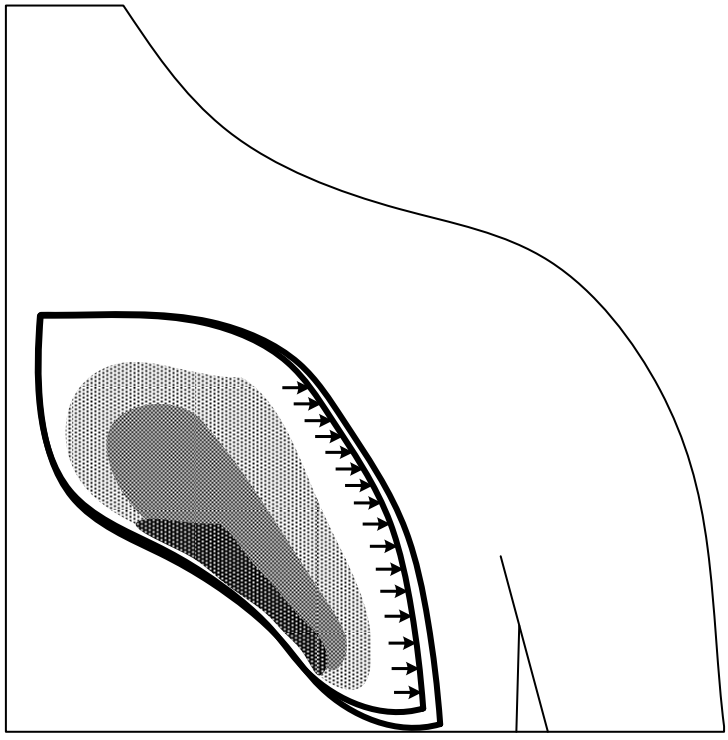


Fig. 3

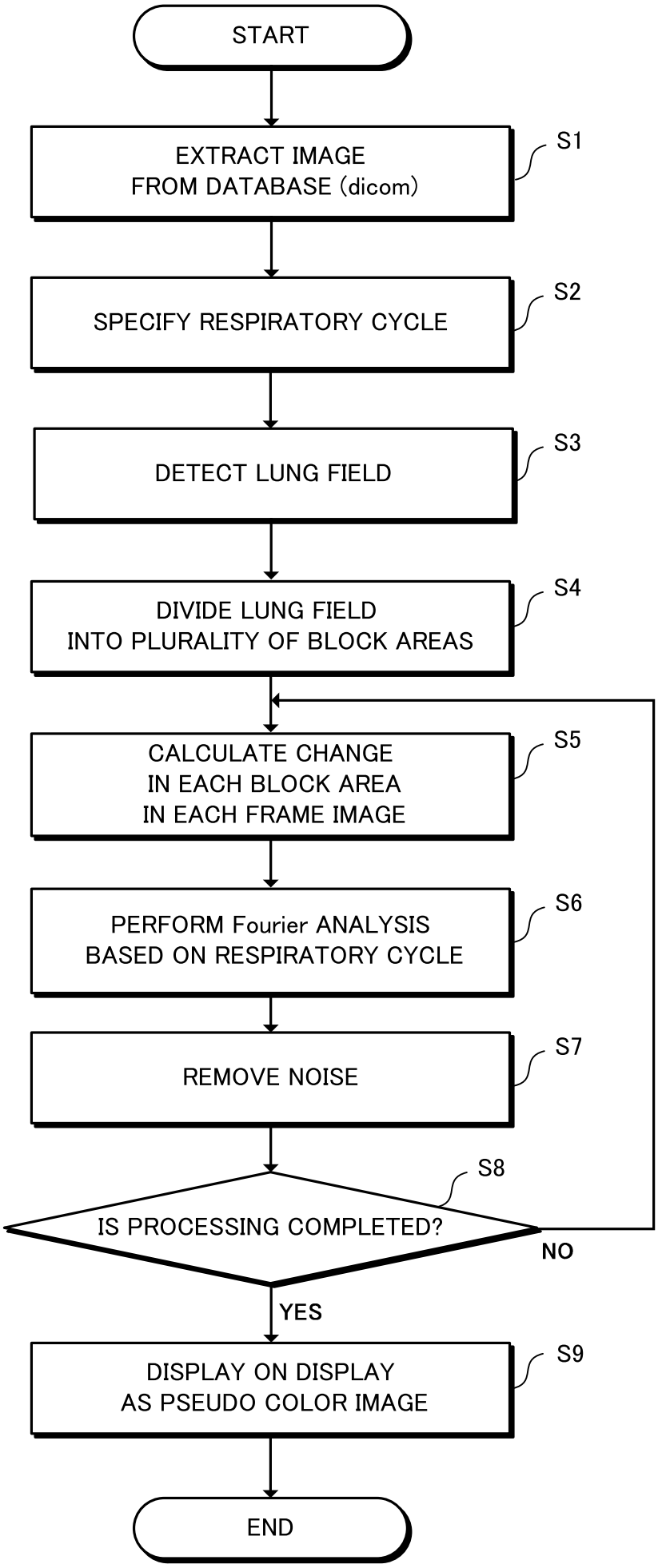

START
EXTRACT IMAGE FROM DATABASE (dicom)
S1
SPECIFY RESPIRATORY CYCLE
S2
DETECT LUNG FIELD
S3
DIVIDE LUNG FIELD INTO PLURALITY OF BLOCK AREAS
S4
CALCULATE CHANGE IN EACH BLOCK AREA IN EACH FRAME IMAGE
S5
PERFORM Fourier ANALYSIS BASED ON RESPIRATORY CYCLE
S6
REMOVE NOISE
S7
IS PROCESSING COMPLETED?
S8
NO
YES
DISPLAY ON DISPLAY AS PSEUDO COLOR IMAGE
S9
END

Fig. 4

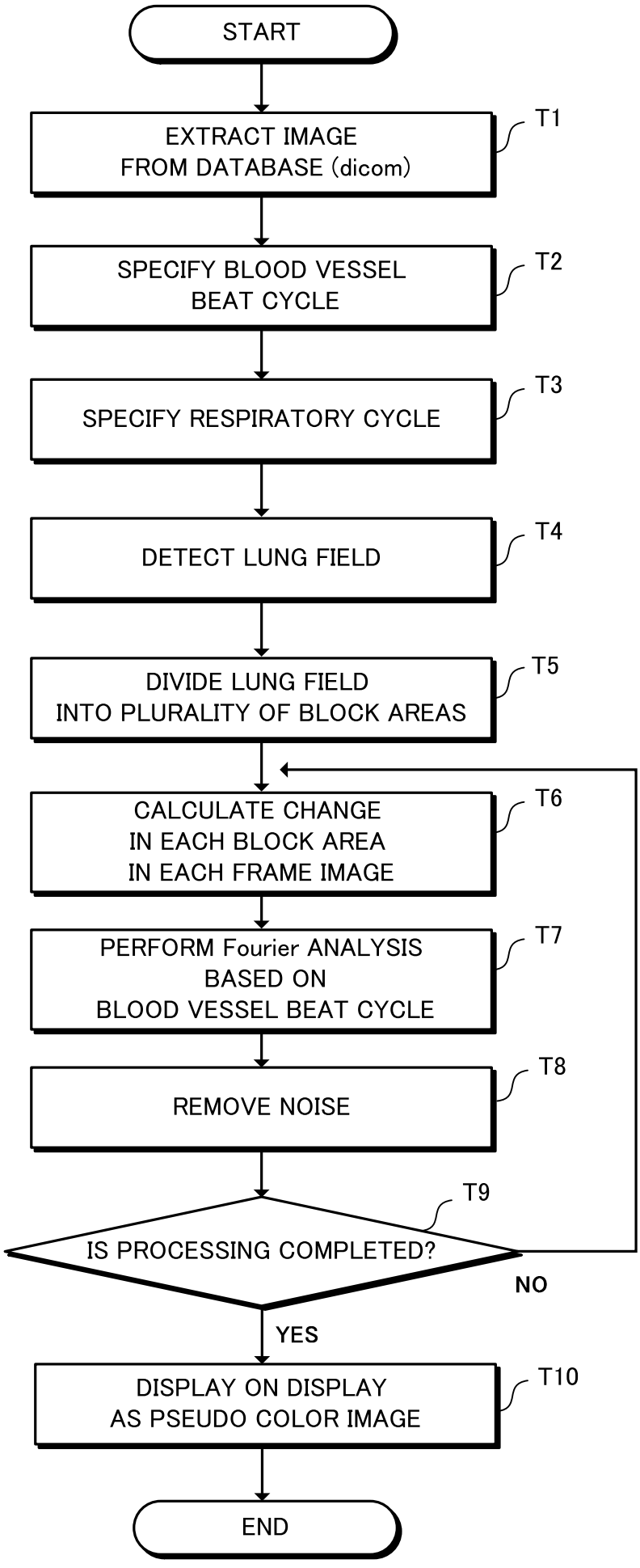
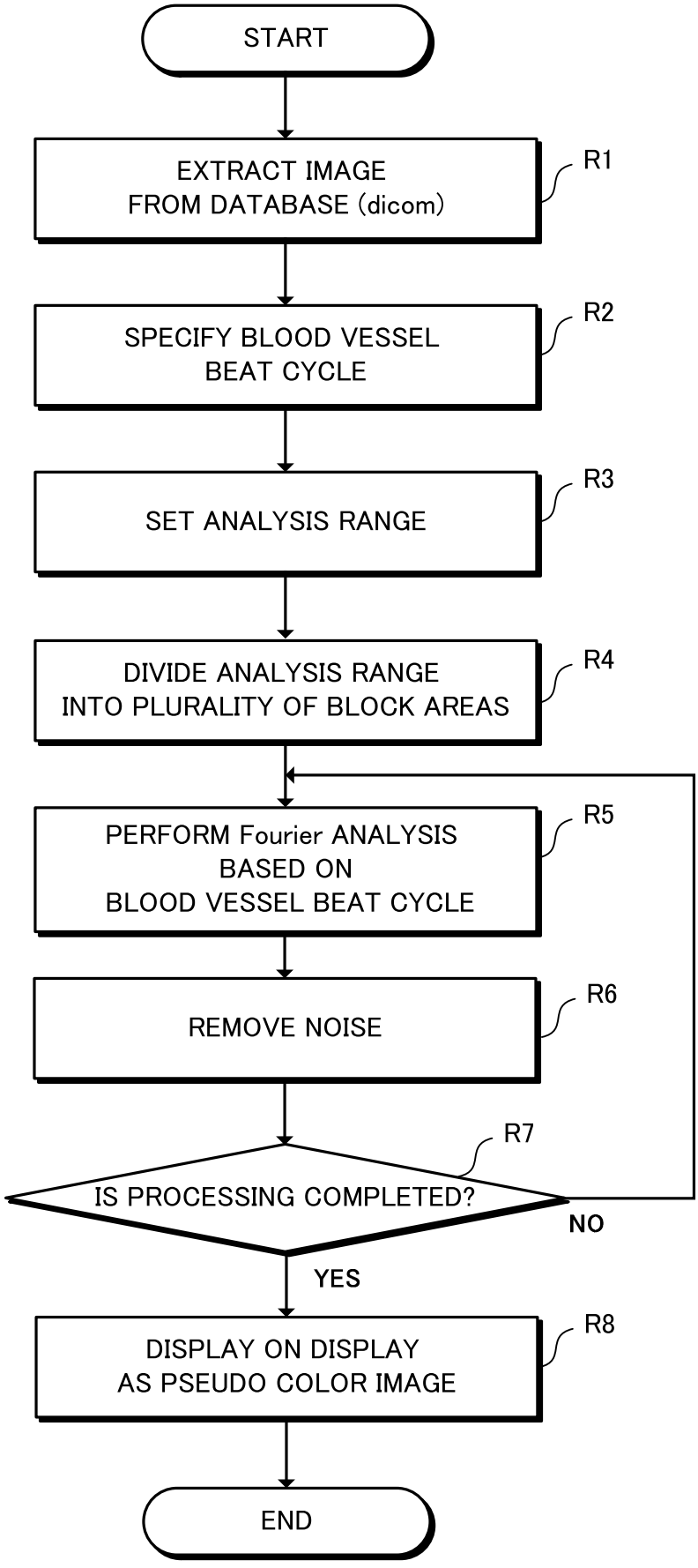

START
EXTRACT IMAGE FROM DATABASE (dicom)
T1
SPECIFY BLOOD VESSEL BEAT CYCLE
T2
SPECIFY RESPIRATORY CYCLE
T3
DETECT LUNG FIELD
T4
DIVIDE LUNG FIELD INTO PLURALITY OF BLOCK AREAS
T5
CALCULATE CHANGE IN EACH BLOCK AREA IN EACH FRAME IMAGE
T6
PERFORM Fourier ANALYSIS BASED ON BLOOD VESSEL BEAT CYCLE
T7
REMOVE NOISE
T8
IS PROCESSING COMPLETED?
T9
NO
YES
DISPLAY ON DISPLAY AS PSEUDO COLOR IMAGE
T10
END

Fig. 5


START
EXTRACT IMAGE FROM DATABASE (dicom)
R1
SPECIFY BLOOD VESSEL BEAT CYCLE
R2
SET ANALYSIS RANGE
R3
DIVIDE ANALYSIS RANGE INTO PLURALITY OF BLOCK AREAS
R4
PERFORM Fourier ANALYSIS BASED ON BLOOD VESSEL BEAT CYCLE
R5
REMOVE NOISE
R6
IS PROCESSING COMPLETED?
R7
NO
YES
DISPLAY ON DISPLAY AS PSEUDO COLOR IMAGE
R8
END