

FIG. 1

1 Sleep evaluation system on the basis of respiratory waveform

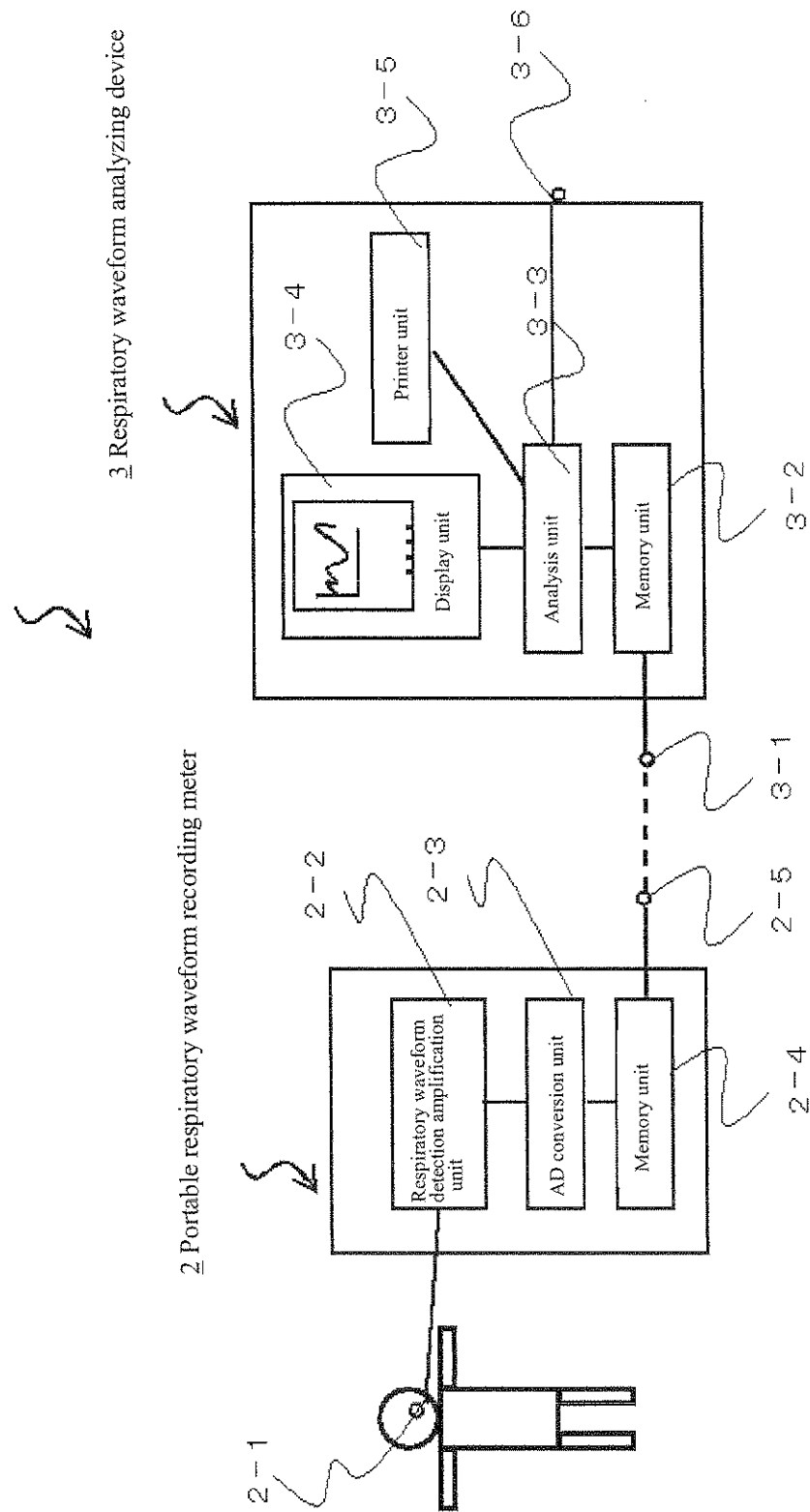


FIG. 2

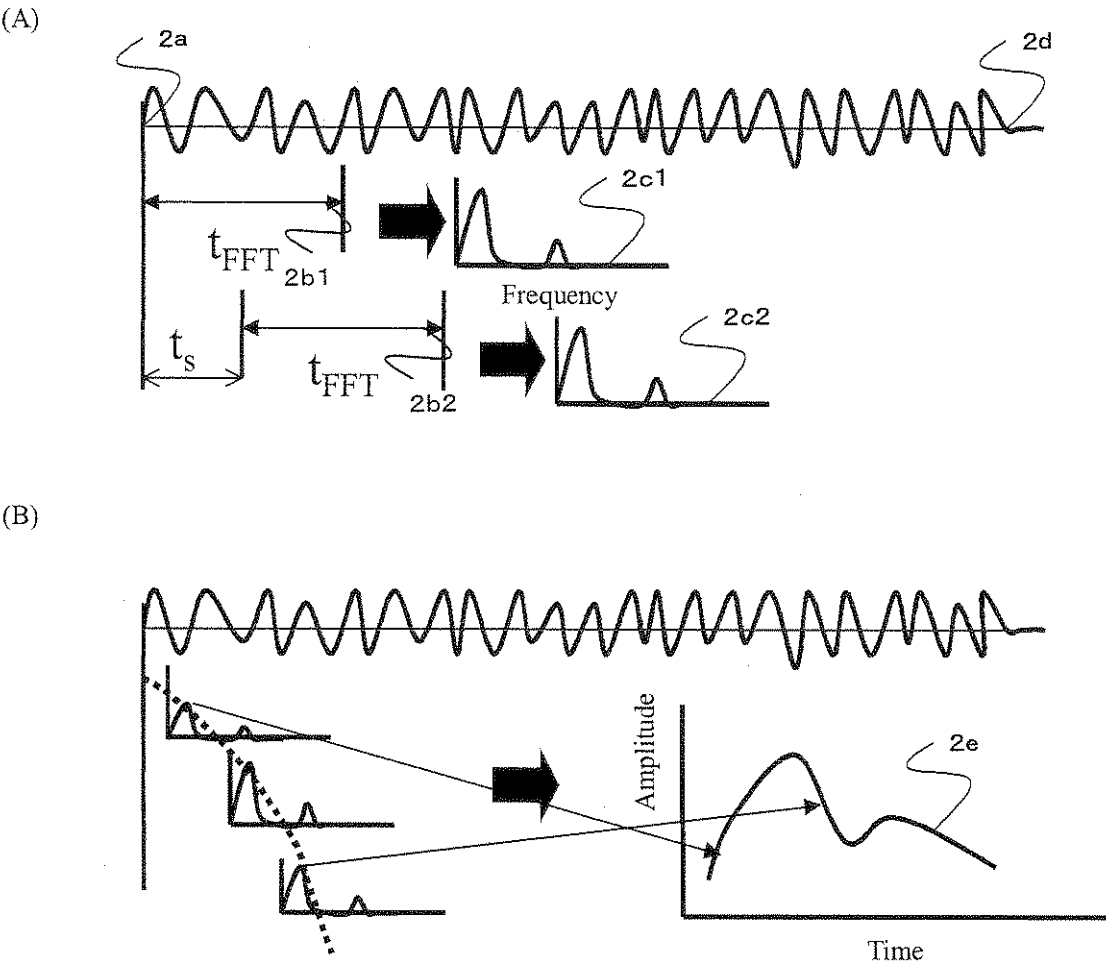


FIG. 3

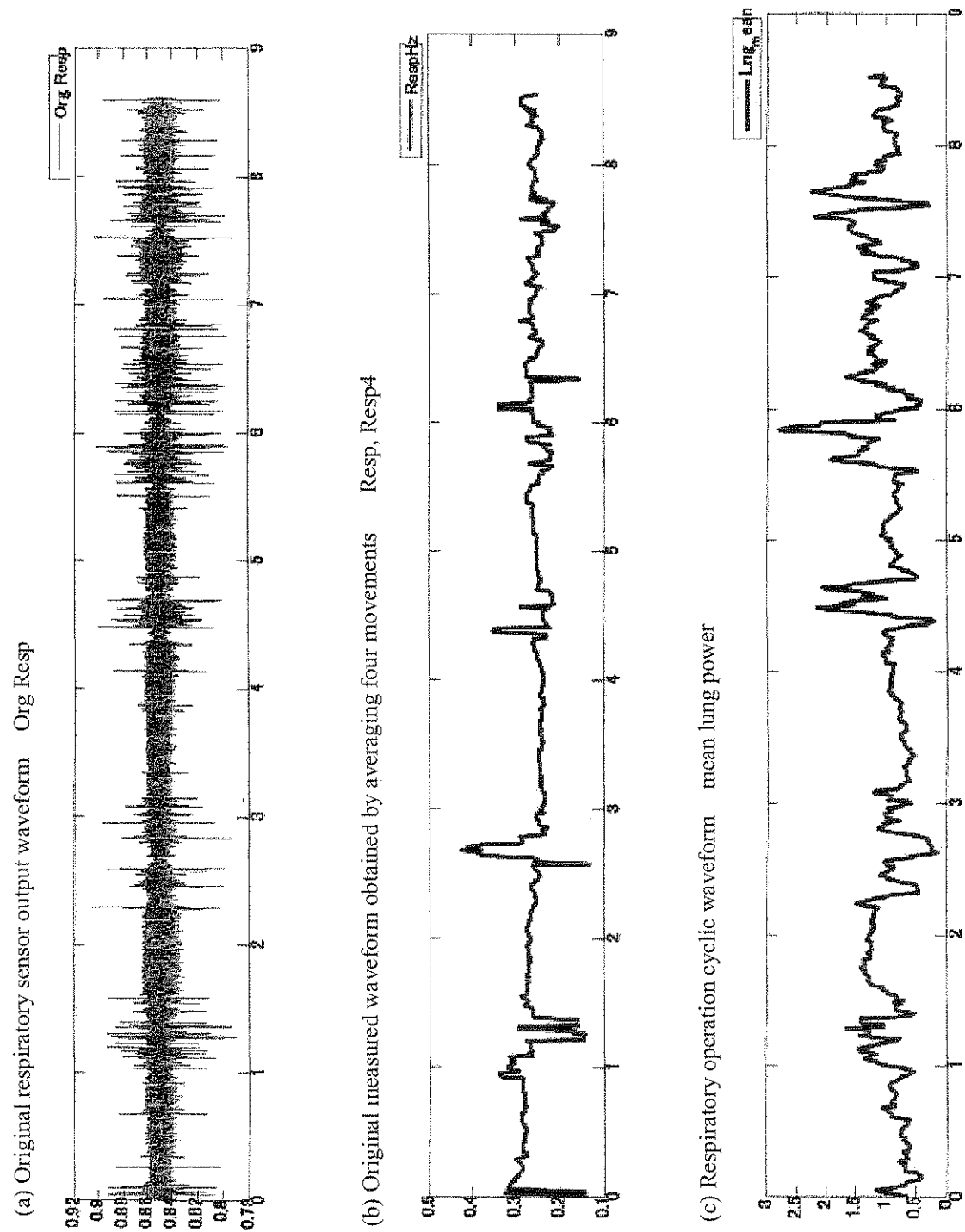


FIG. 4

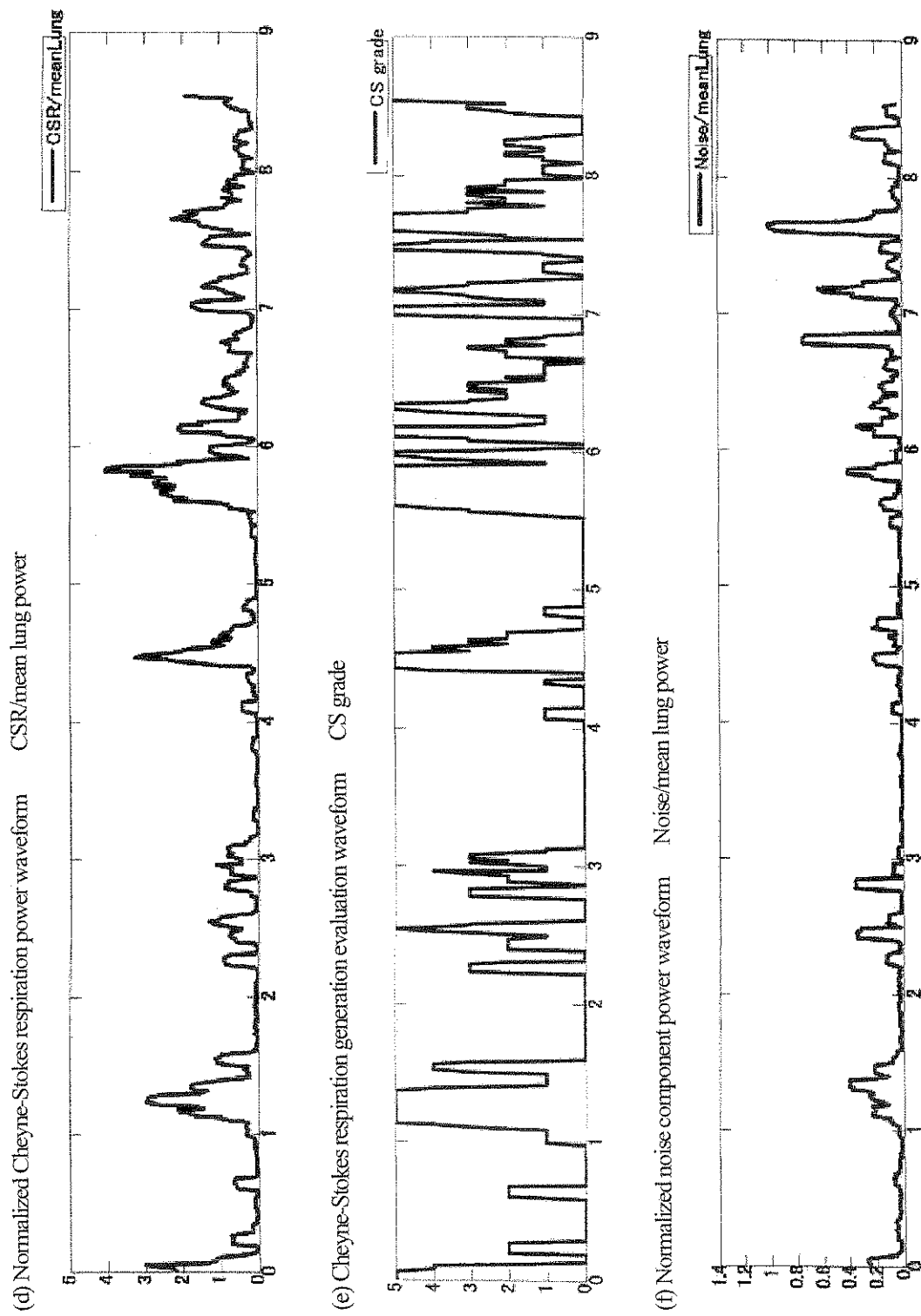


FIG. 5

Respiratory sensor output waveform obtained by averaging four measurements (resp4) and smoothing respiratory waveform obtained by moving average of past 5 seconds thereof (smooth)

The Original and Filtered Respiration data(4Hz) with the first 5-min data excluded to adjust the RR(4Hz)

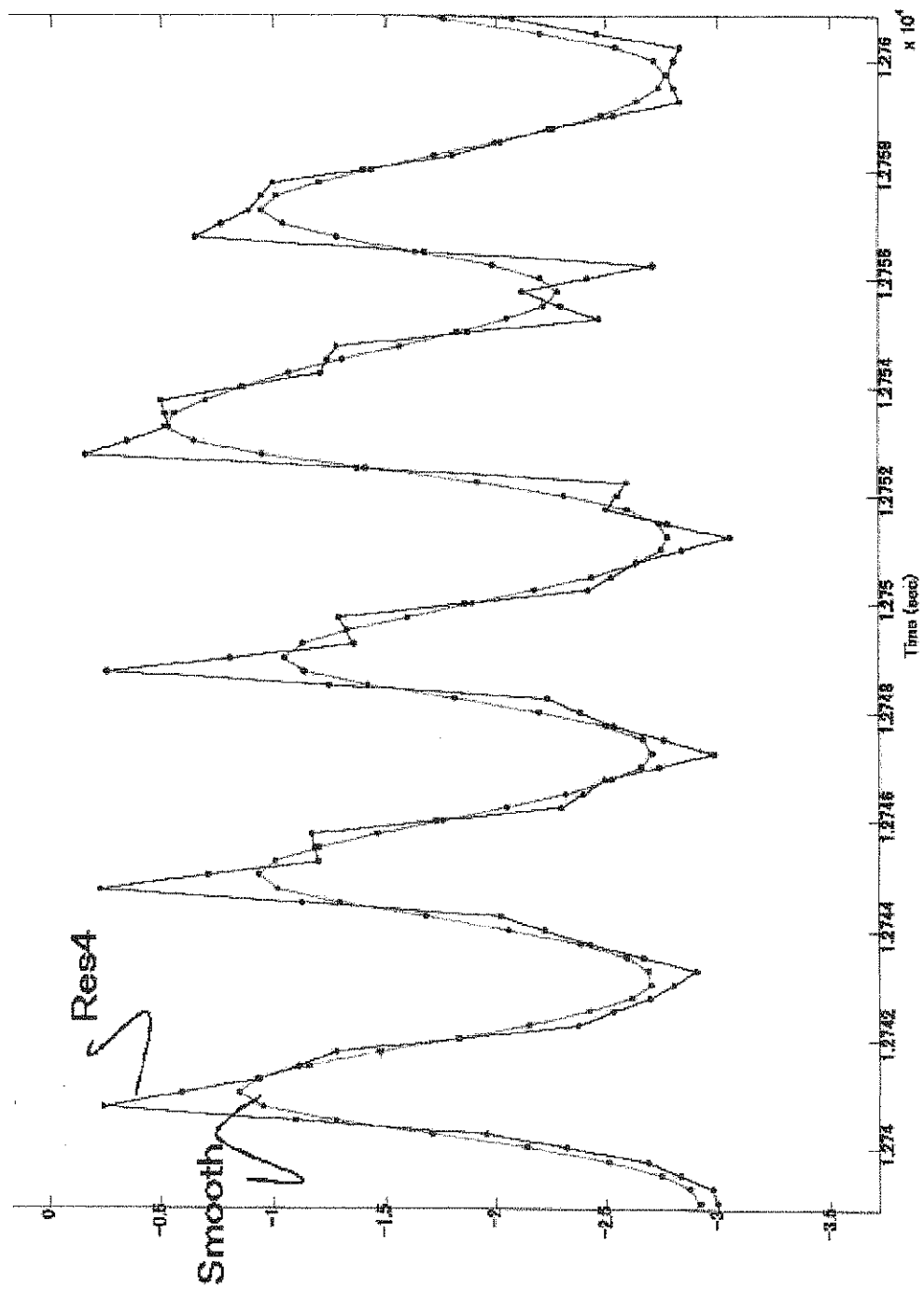


FIG. 6

Noise waveform (noise) is created by subtracting smoothing respiratory waveform (smooth) from lower envelope (bottom) of respiratory sensor output waveform (resp4) obtained by moving average four measurements

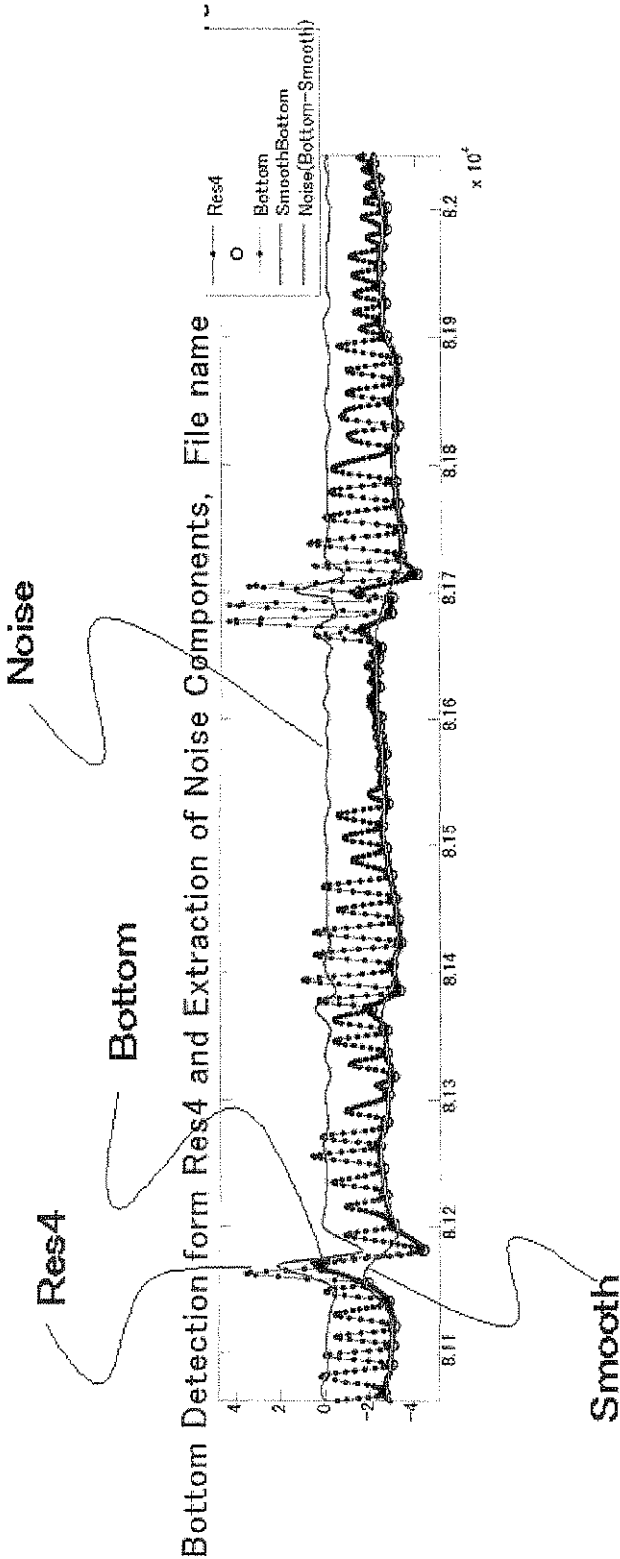


FIG. 7

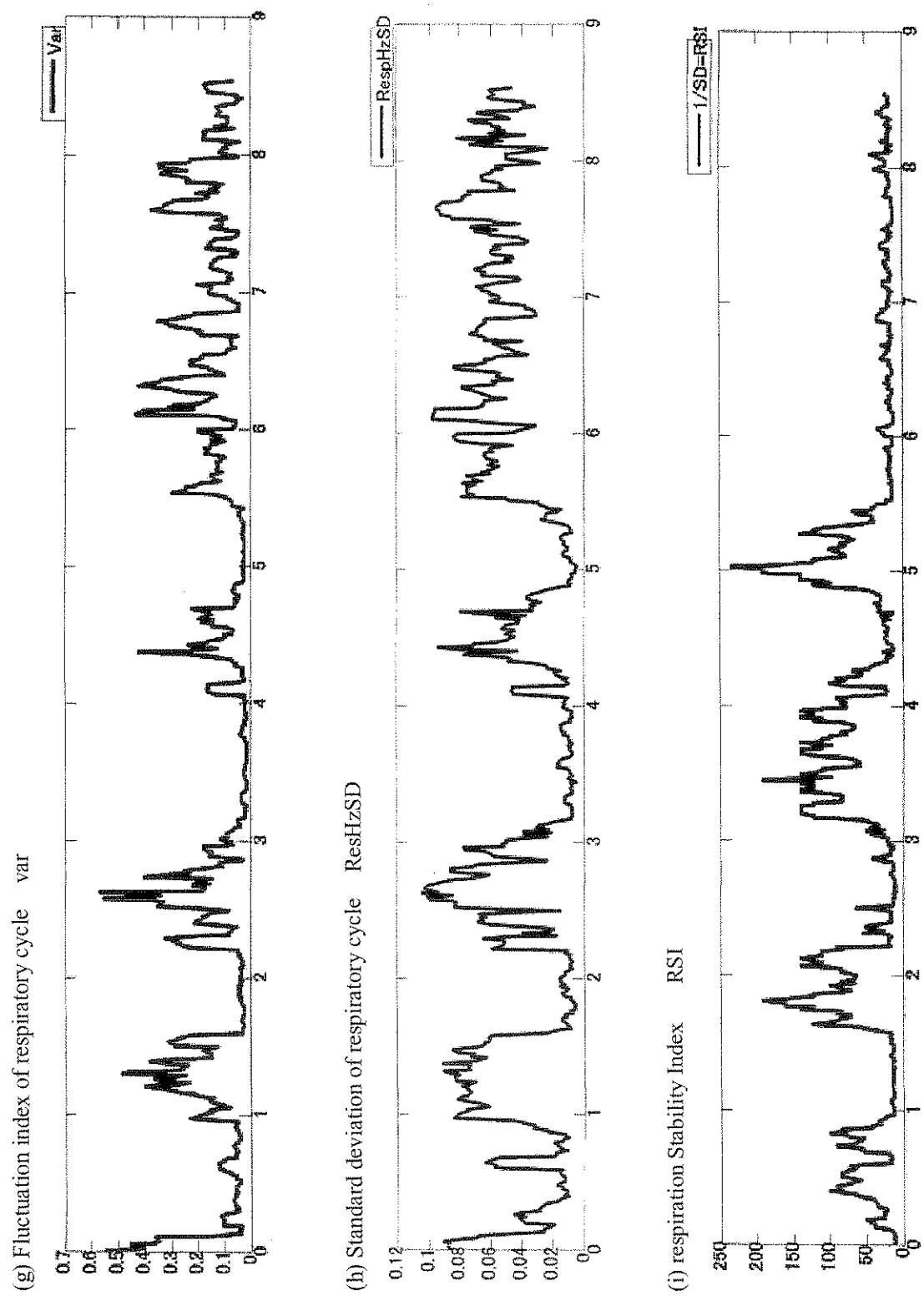


FIG. 8

Conceptual diagram of fluctuation index (var) of respiratory cycle

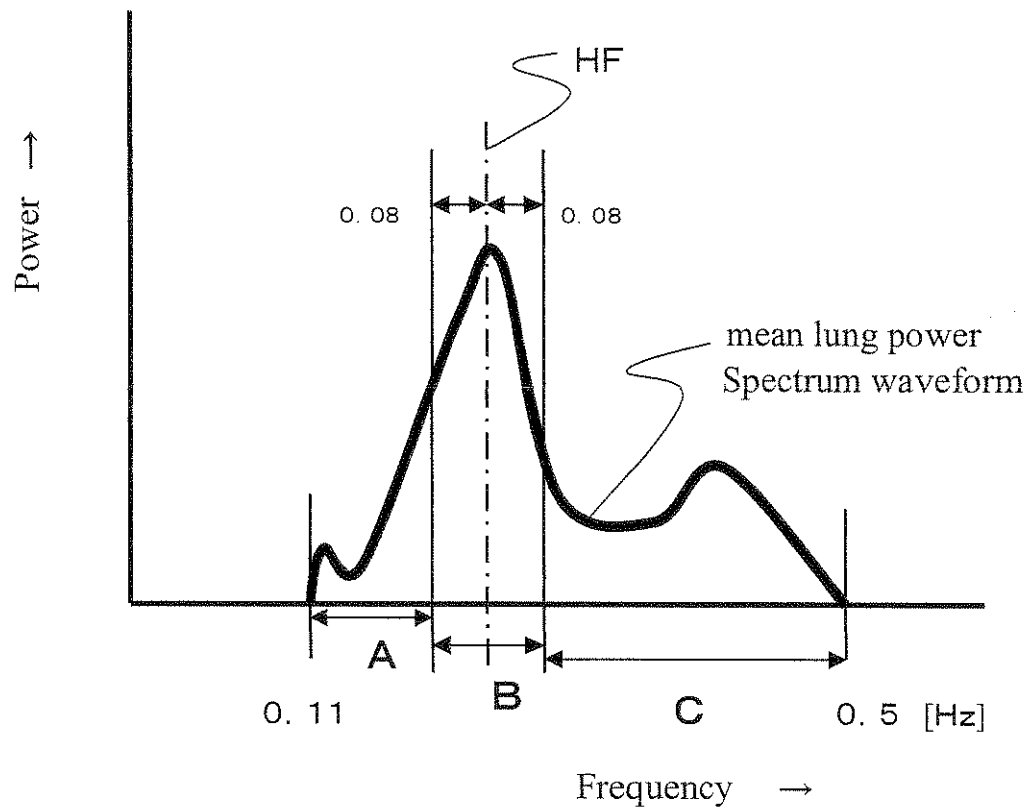


FIG. 9

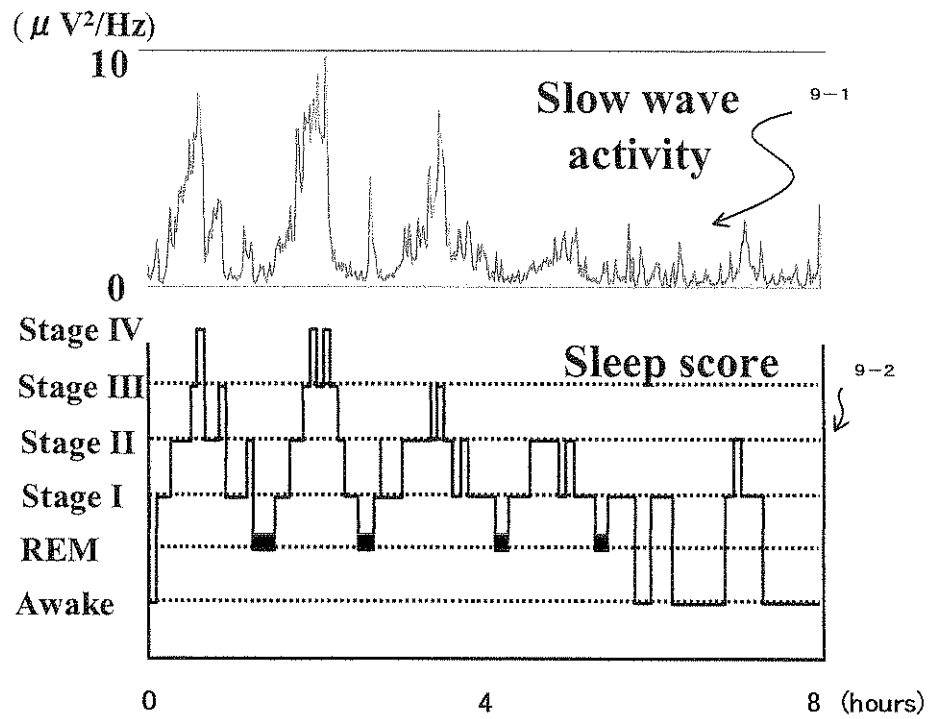


FIG. 10

Conceptual standard deviation of respiratory cycle ResHzSD

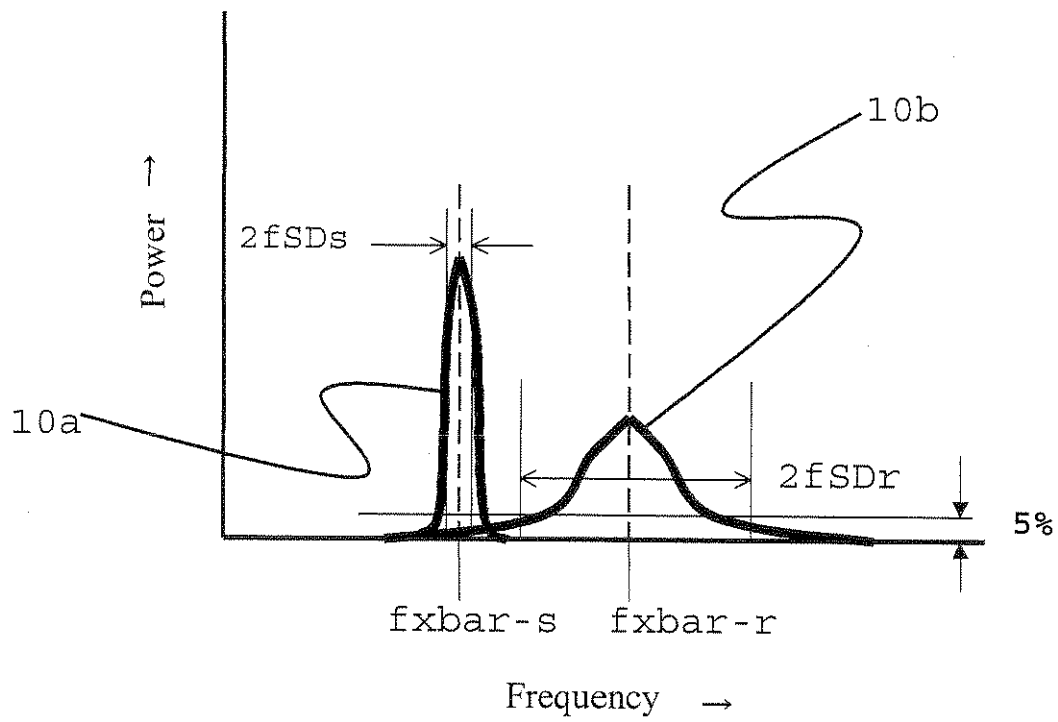
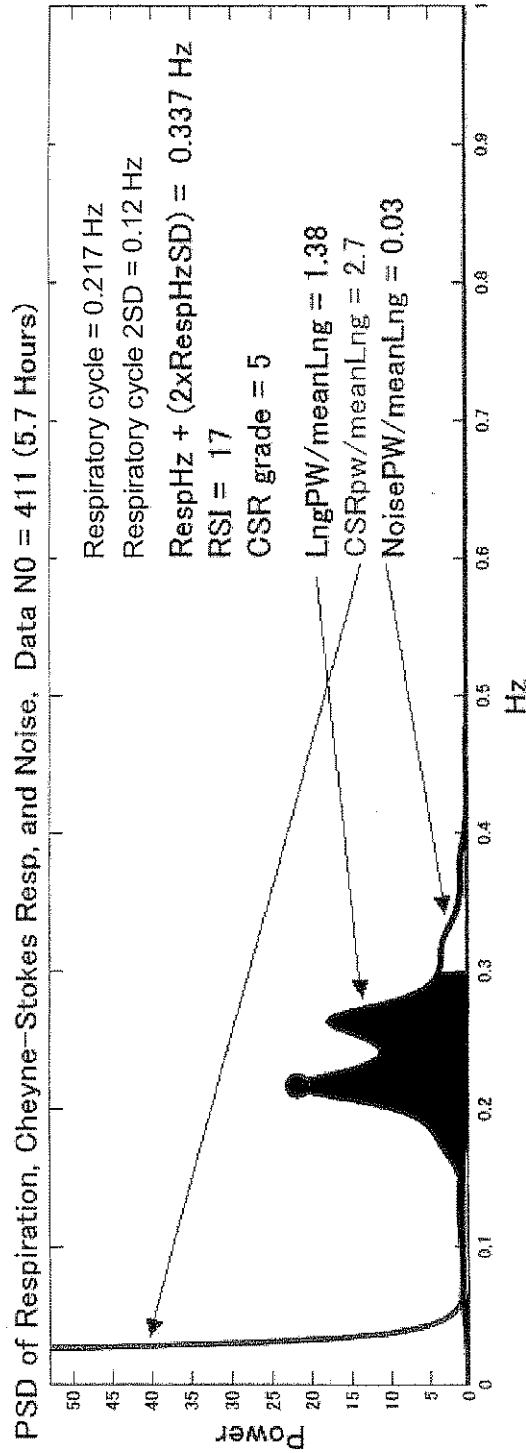


FIG. 11

(1) Waveform frequency spectrum graph in selected time domain



(2) Waveform graph enlarged in selected time domain

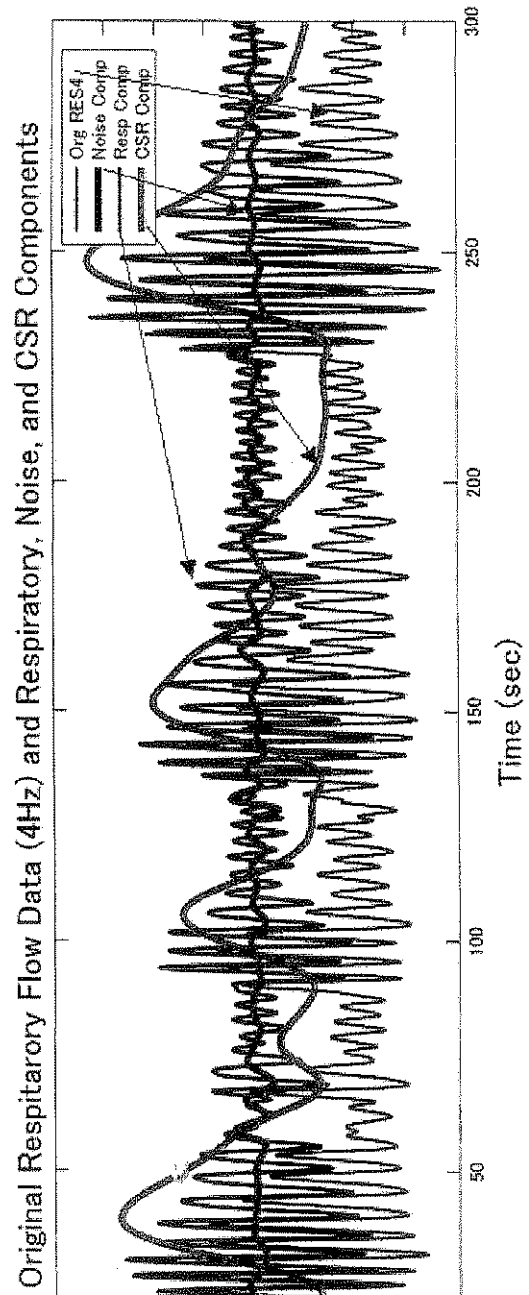
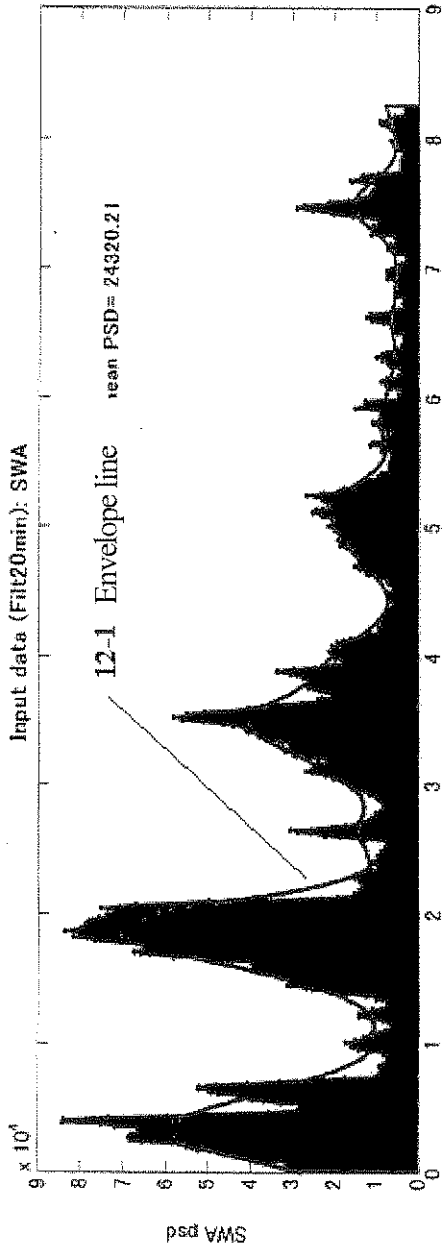
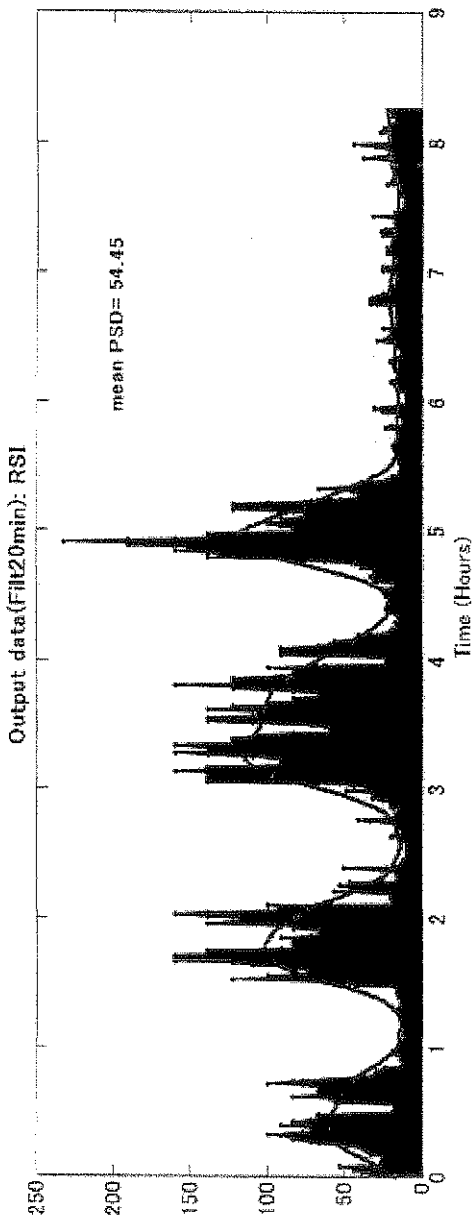


FIG. 12

First case (healthy person)



(i) Brain wave SWA trend



(ii) Respiratory cycle RSI trend

FIG. 13

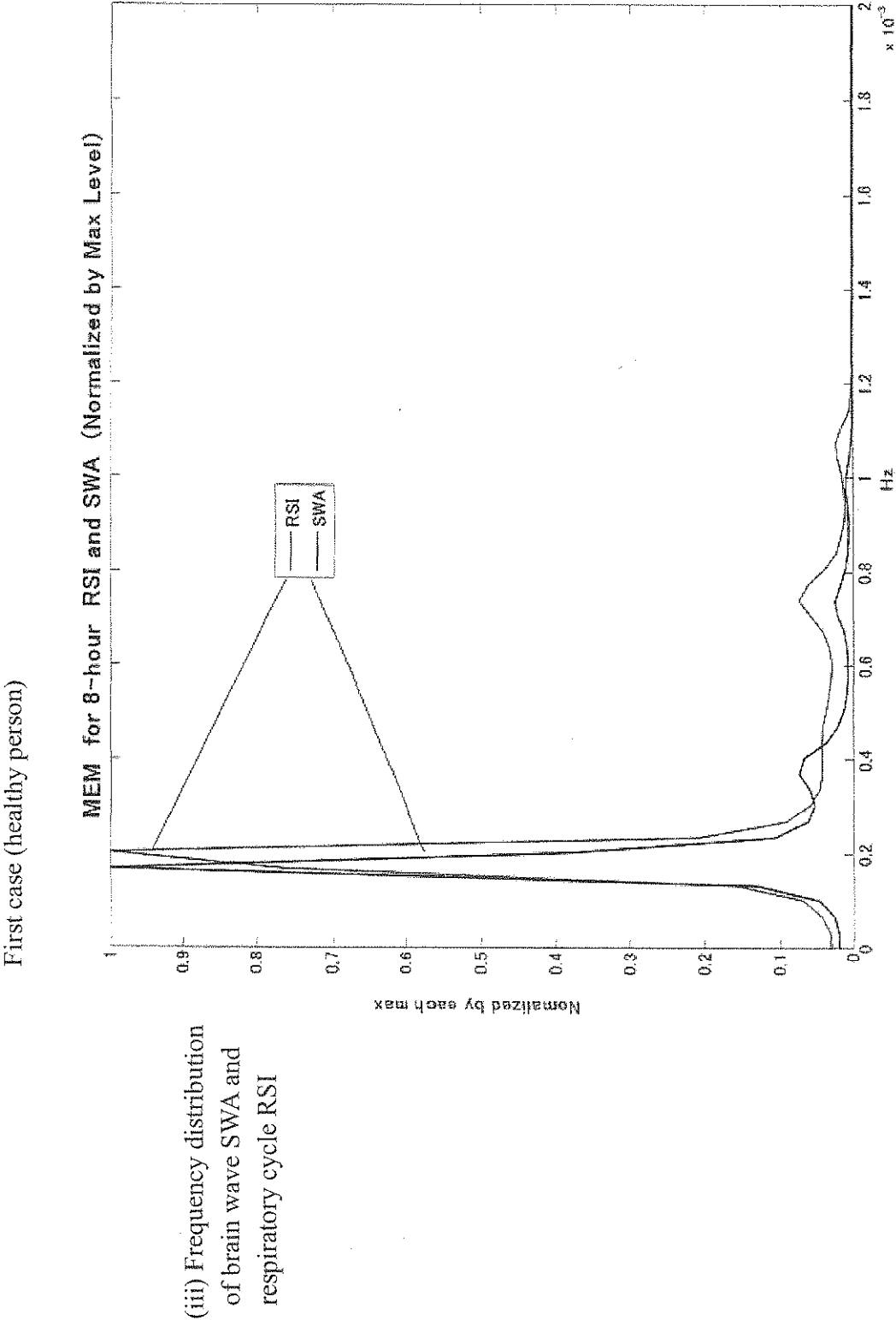
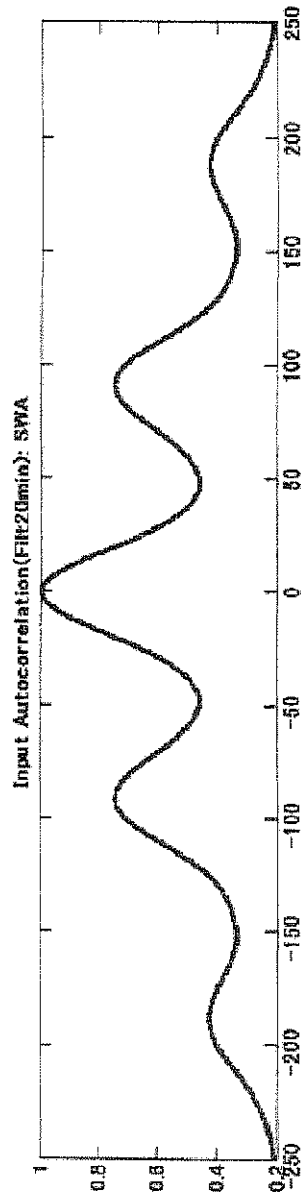


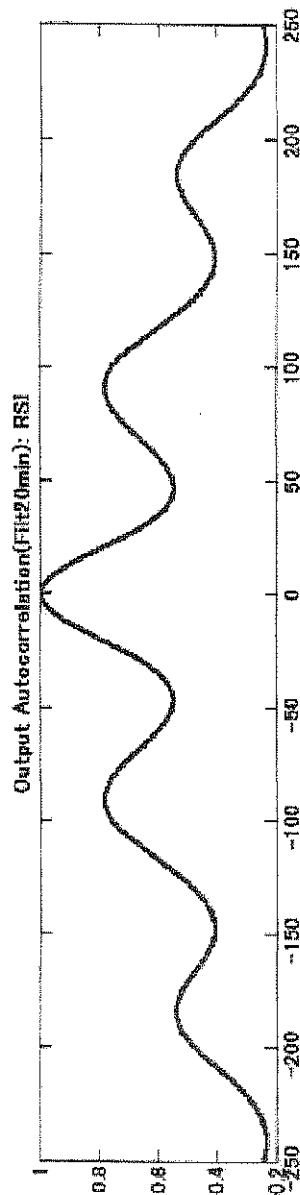
FIG. 14

First case (healthy person)

(iv) Brain wave SWA
Autocorrelation function



(v) Respiratory cycle
RSI autocorrelation
function



(vi) Cross-correlation
function of brain
wave SWA and
respiratory cycle RSI

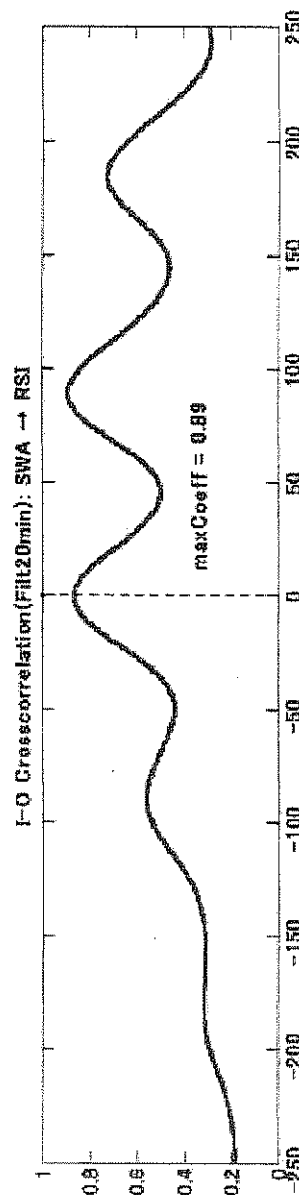
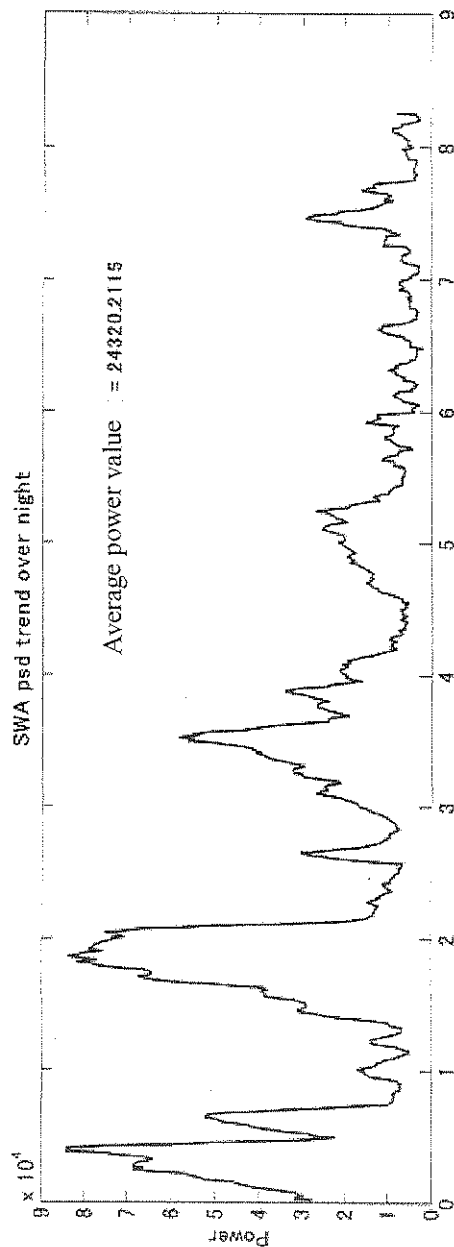
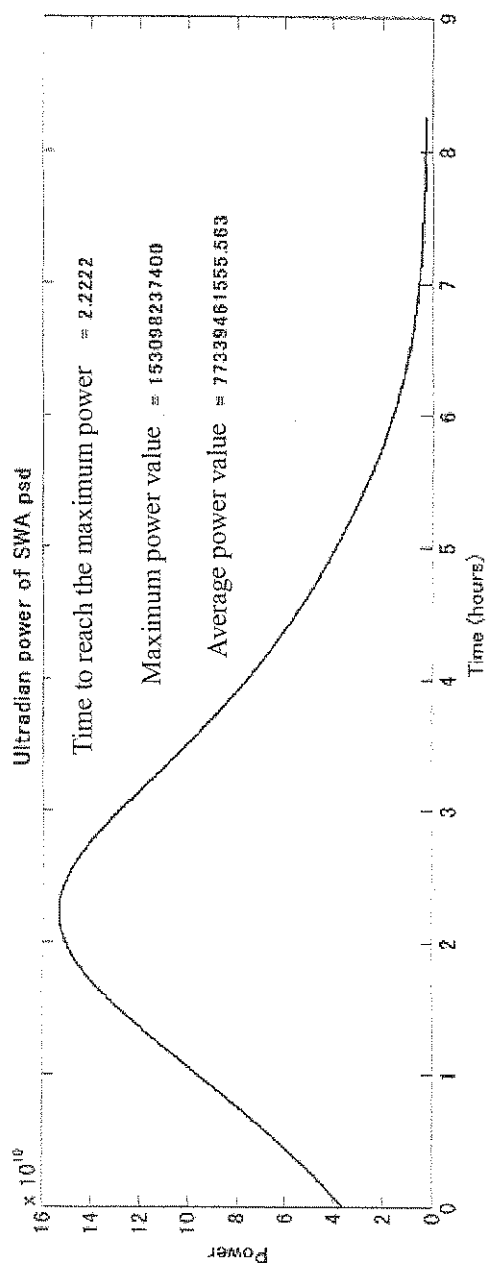


FIG. 15

First case (healthy person)



(vii) Brain wave swa trend



(viii) Trend of ultradian power included in brain wave SWA trend

FIG. 16

First case (healthy person)

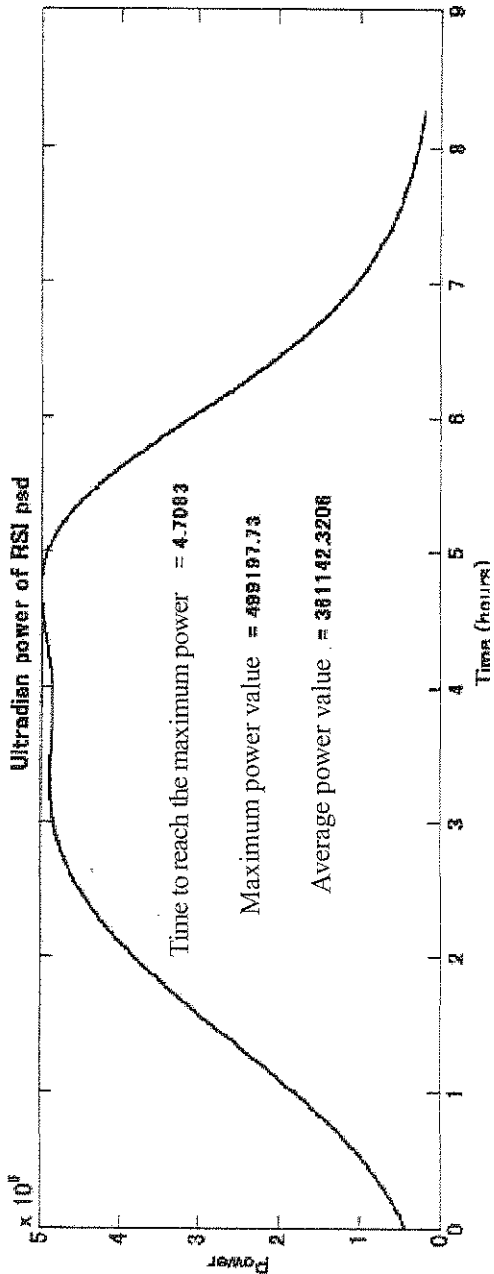
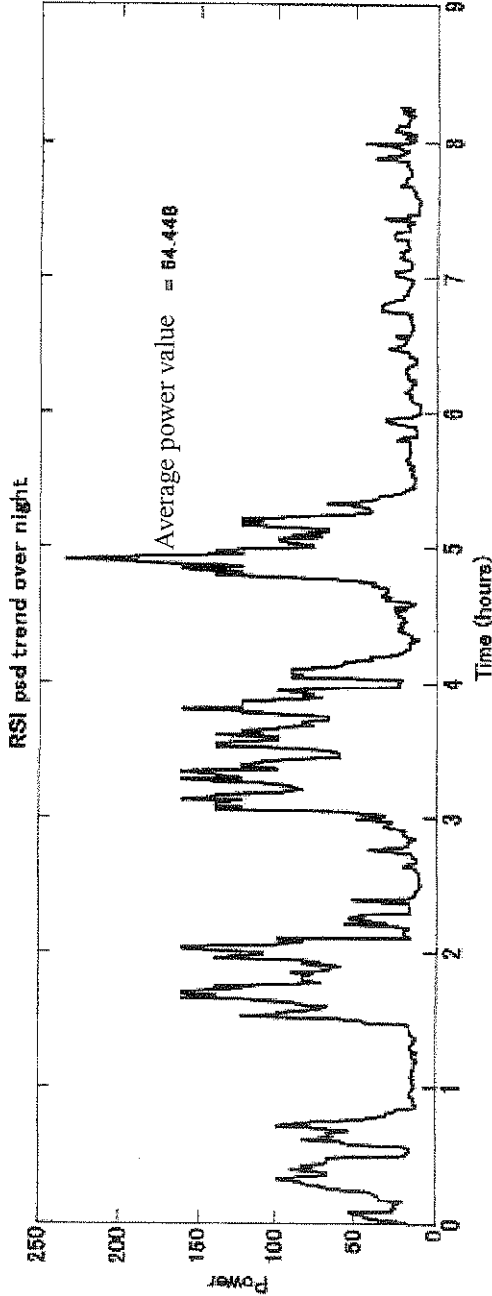
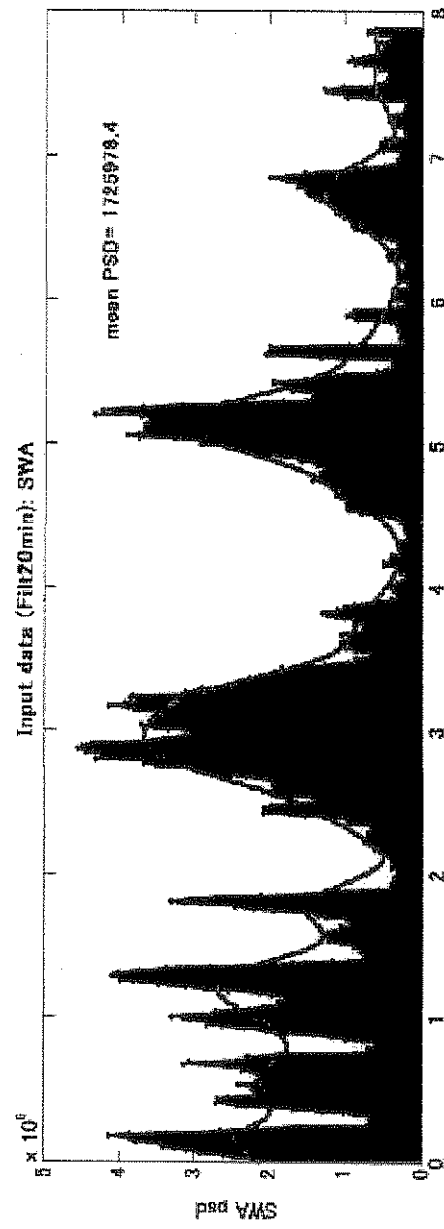
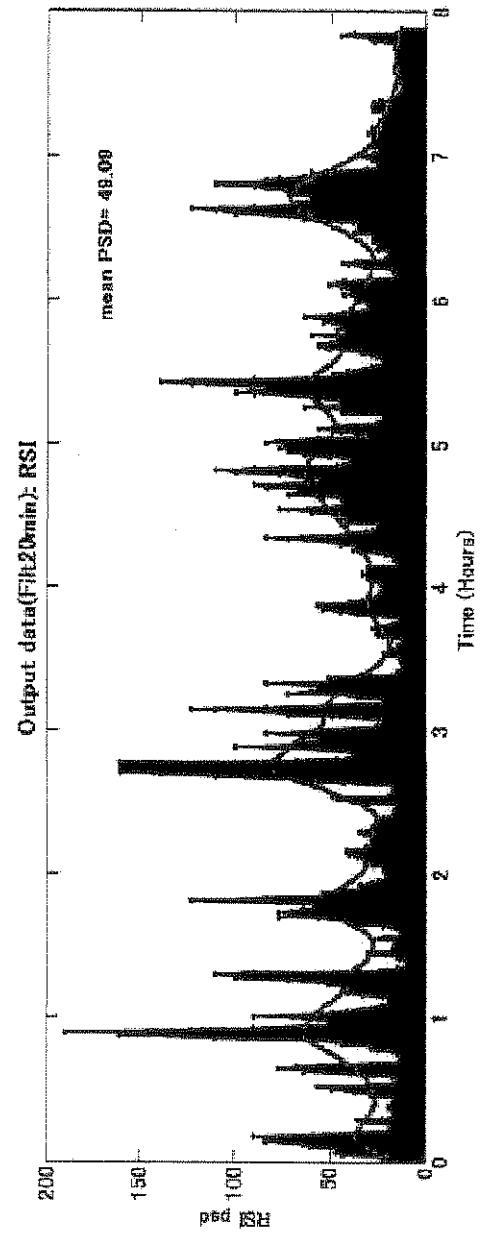


FIG. 17

Second case (NYHA I, BNP=47)

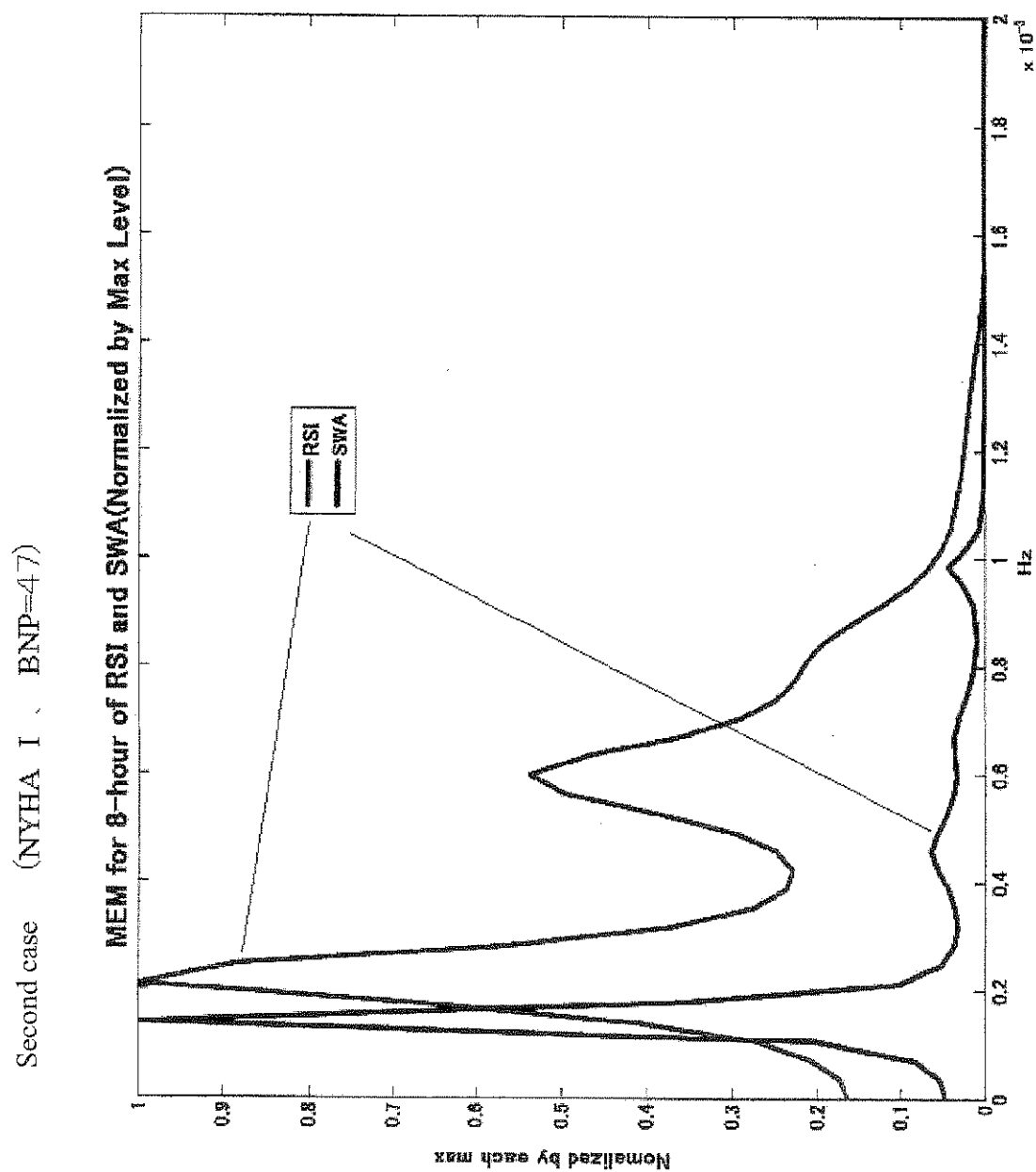


(i) Brain wave SWA trend



(ii) Respiratory cycle RSI trend

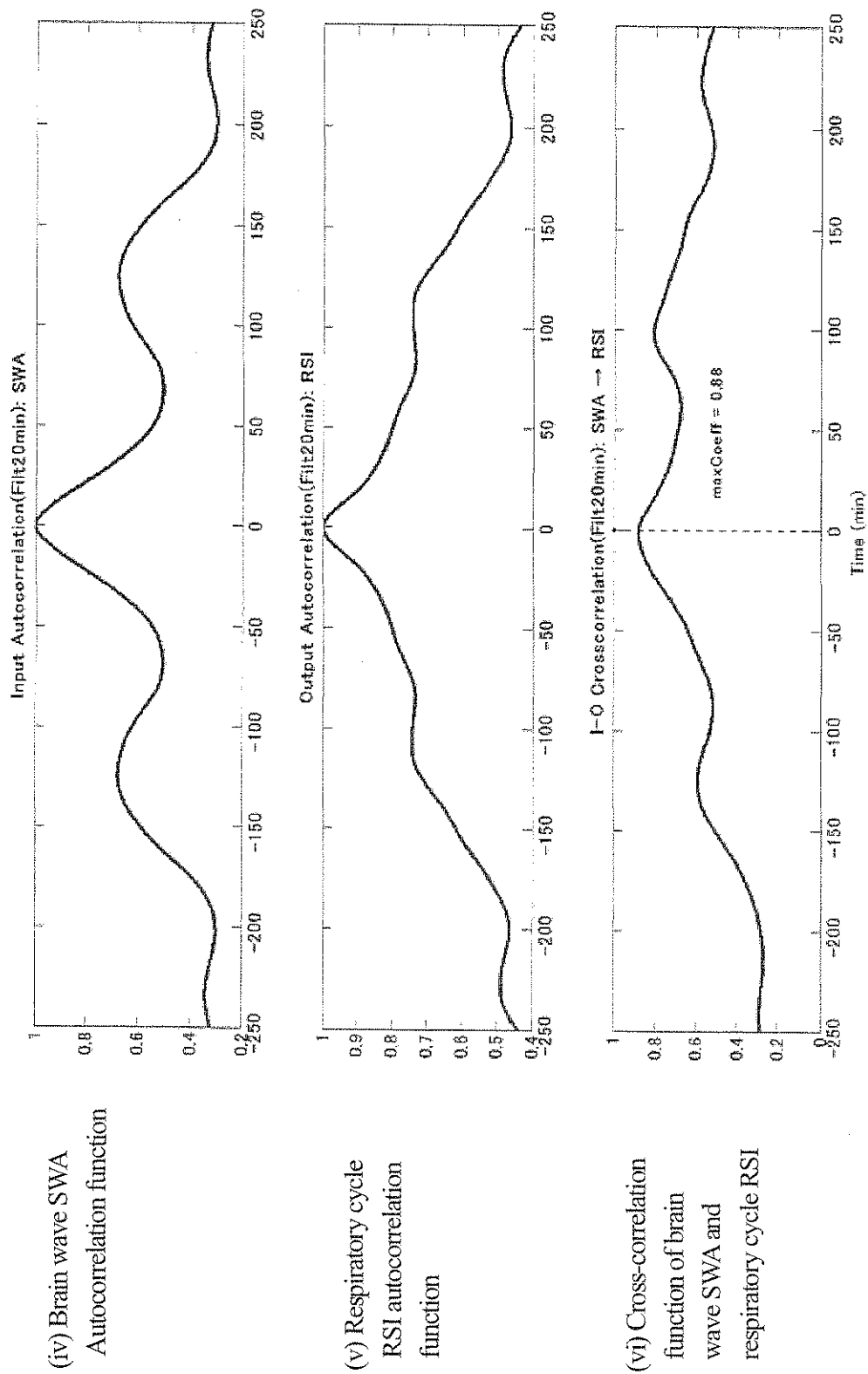
FIG. 18



(iii) Frequency distribution
of brain wave SWA and
respiratory cycle RSI

FIG. 19

Second case (NYHA I, BNP=47)



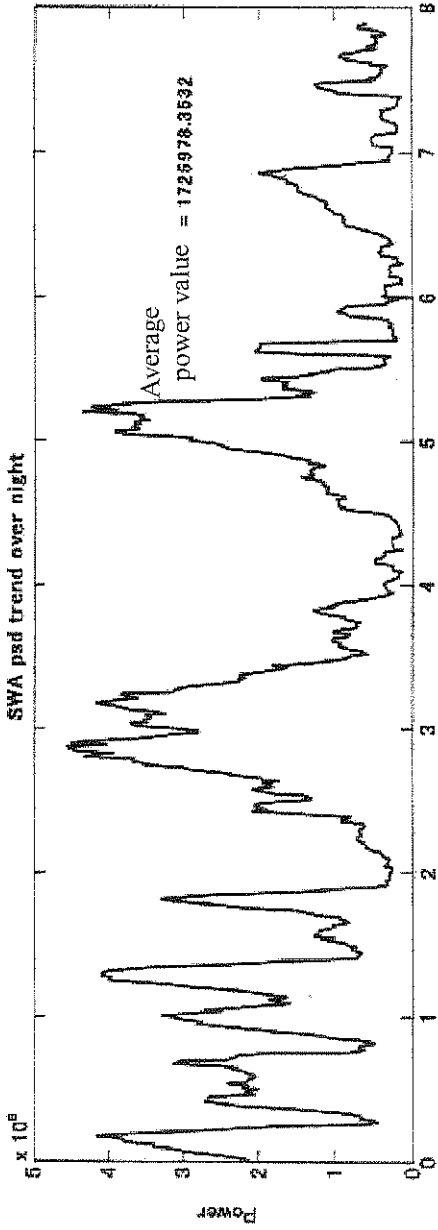
(iv) Brain wave SWA
Autocorrelation function

(v) Respiratory cycle
RSI autocorrelation
function

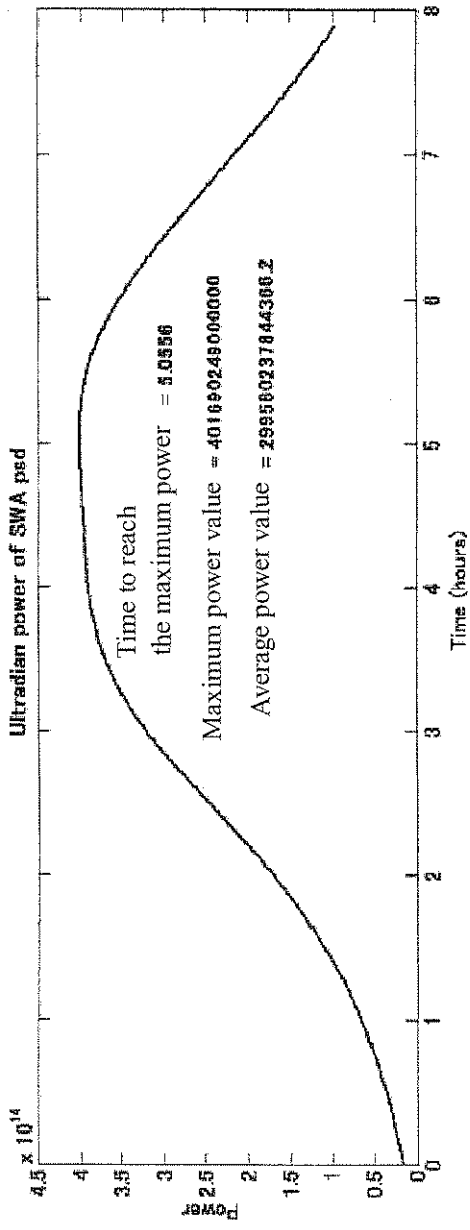
(vi) Cross-correlation
function of brain
wave SWA and
respiratory cycle RSI

FIG. 20

Second case (NYHA I , BNP=47)



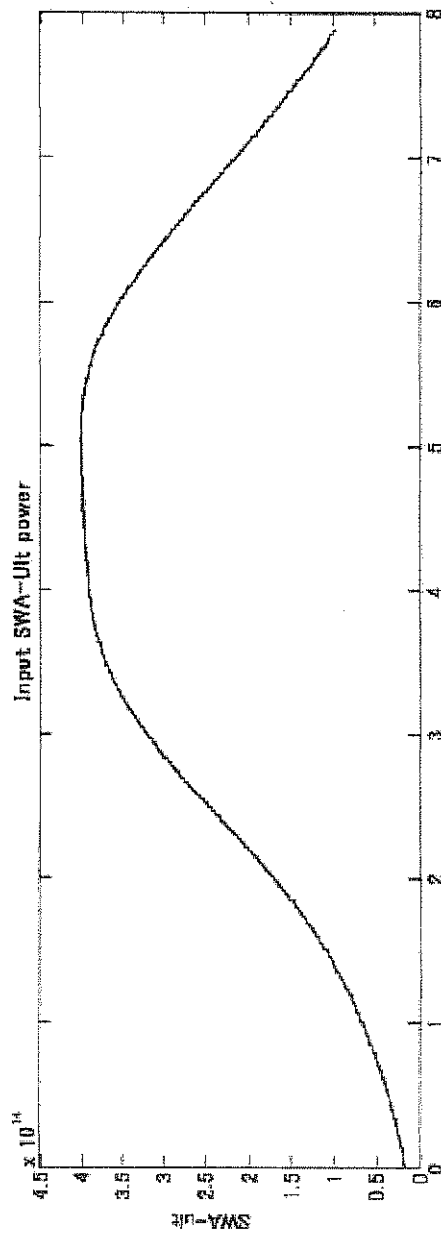
(vii) Brain wave SWA trend



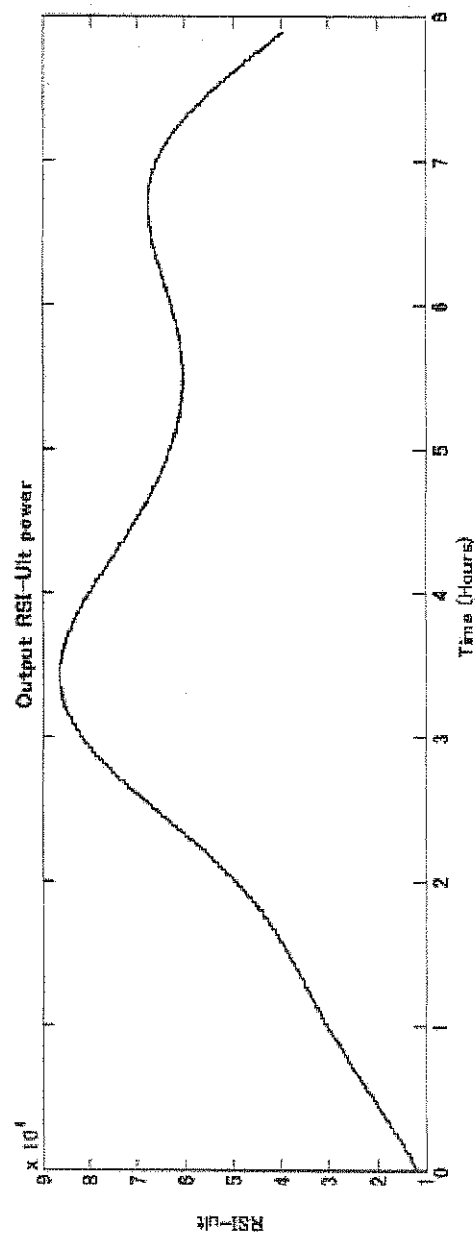
(viii) Trend of ultradian power included in brain wave SWA trend

FIG. 21

Second case (NYHA I, BNP=47)



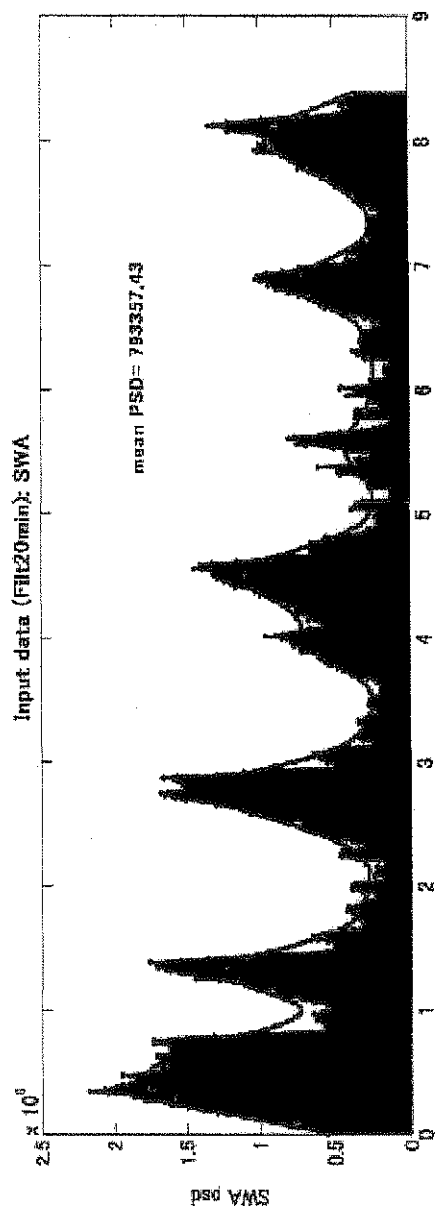
(xi) Change of
ultradian power
included in brain
wave SWA trend



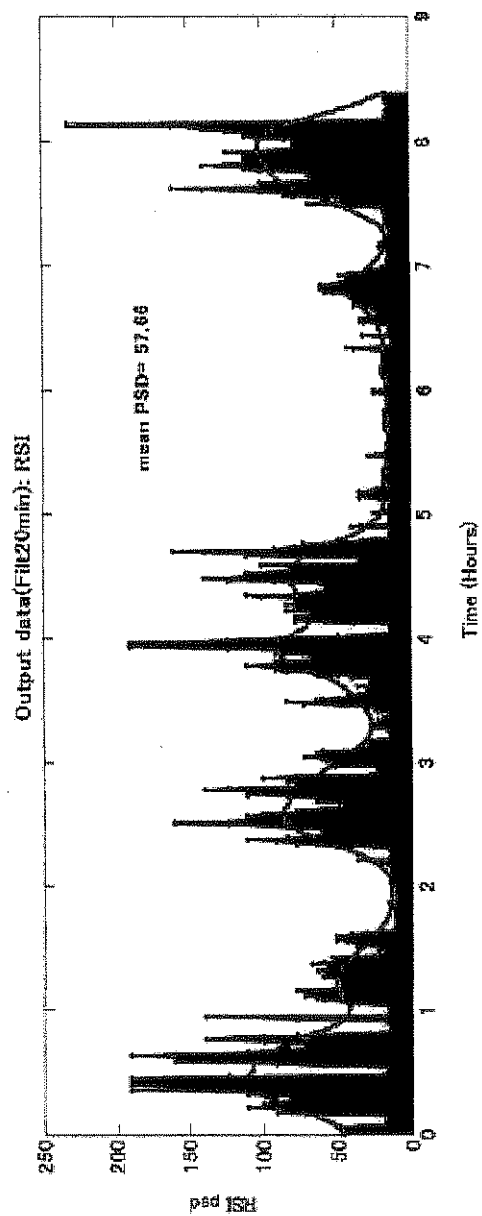
(xii) Change of
ultradian power
included in
respiratory
cycle RSI trend

FIG. 22

Third case (NYHA II, BNP=115)



(i) Brain wave SWA trend



(ii) Respiratory cycle RSI trend

FIG. 23

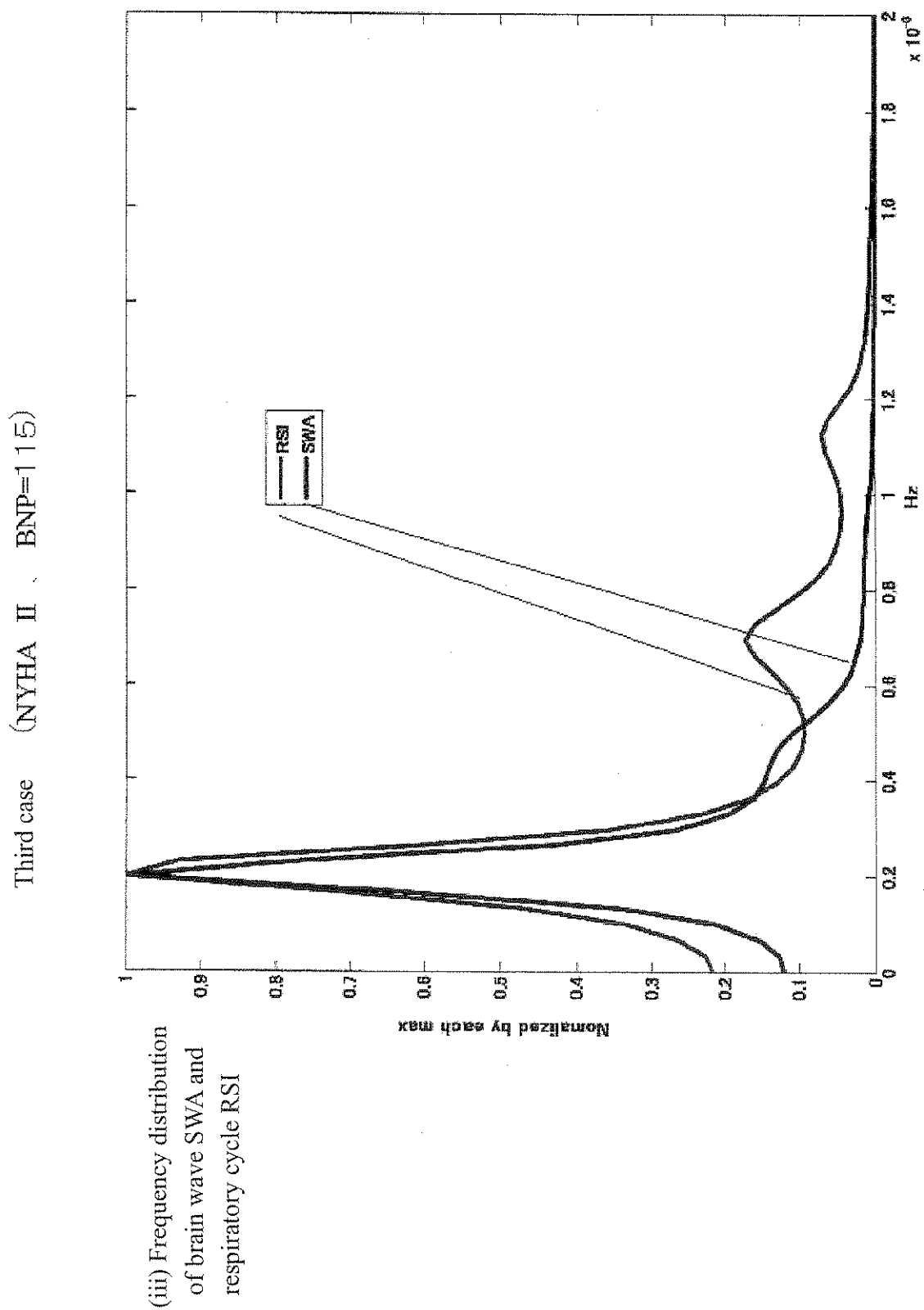
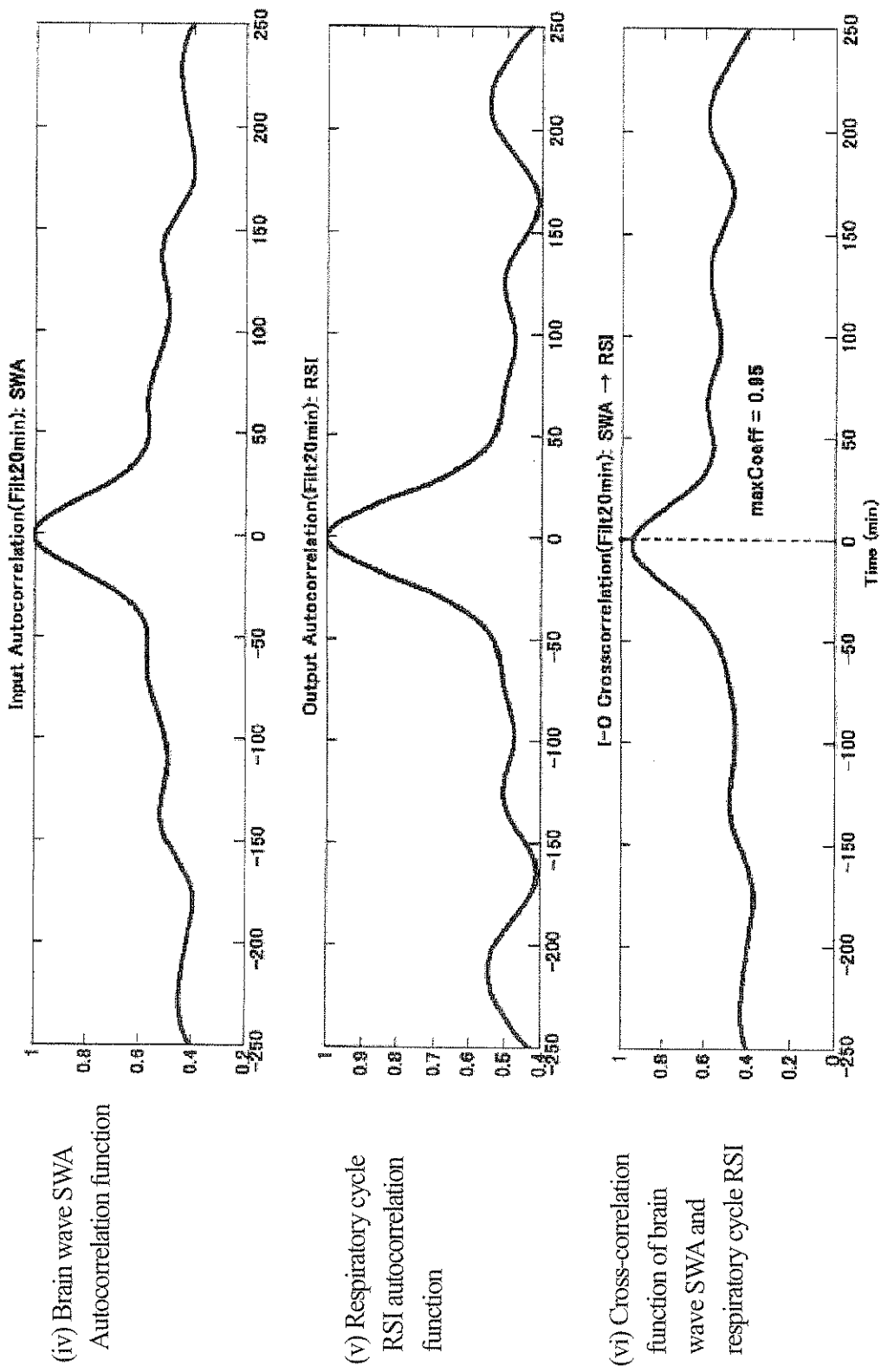


FIG. 24

Third case (NYHA II, BNP=115)



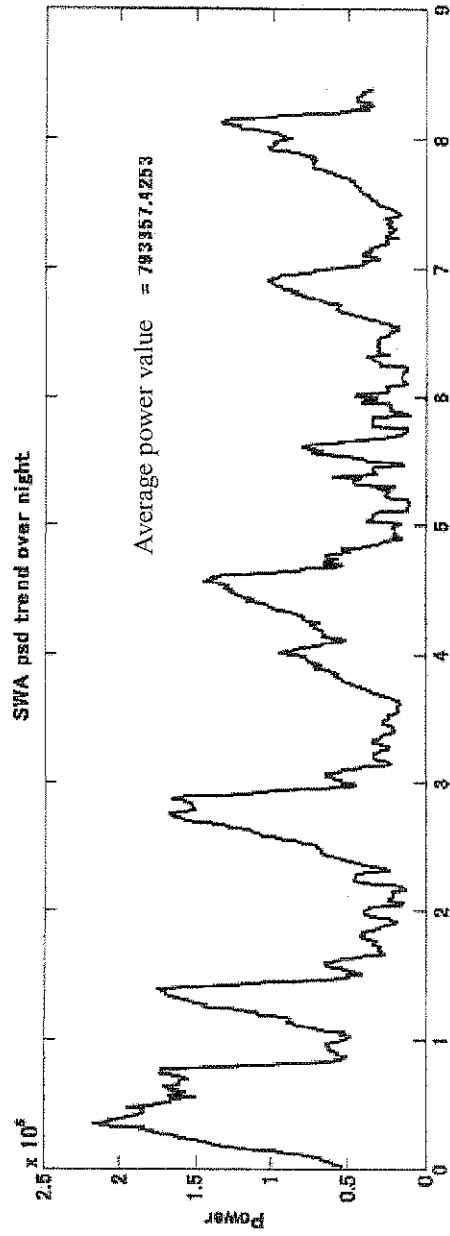
(iv) Brain wave SWA Autocorrelation function

(v) Respiratory cycle RSI autocorrelation function

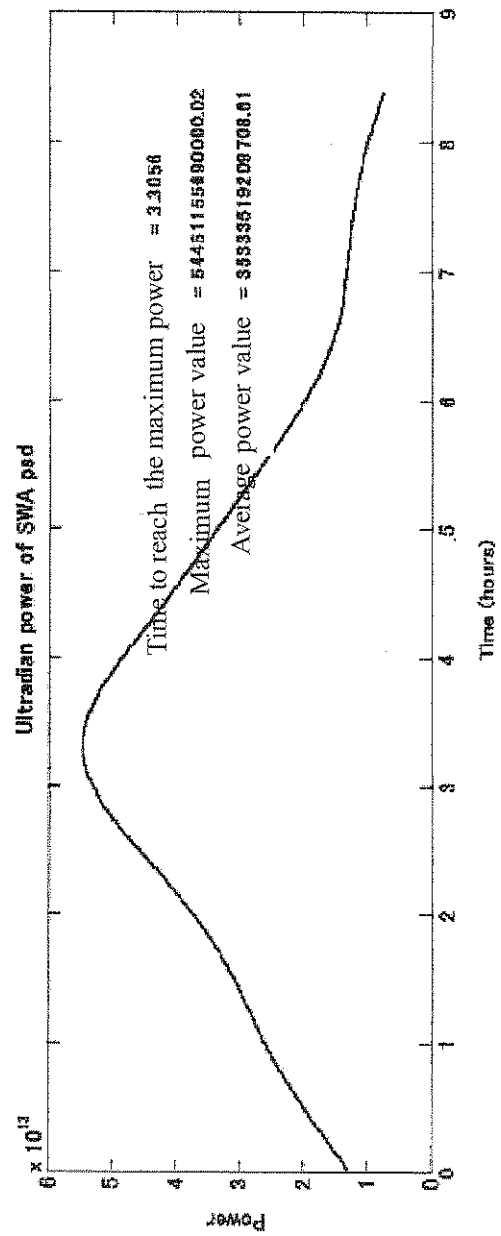
(vi) Cross-correlation function of brain wave SWA and respiratory cycle RSI

FIG. 25

Third case (NYHA II, BNP=115)



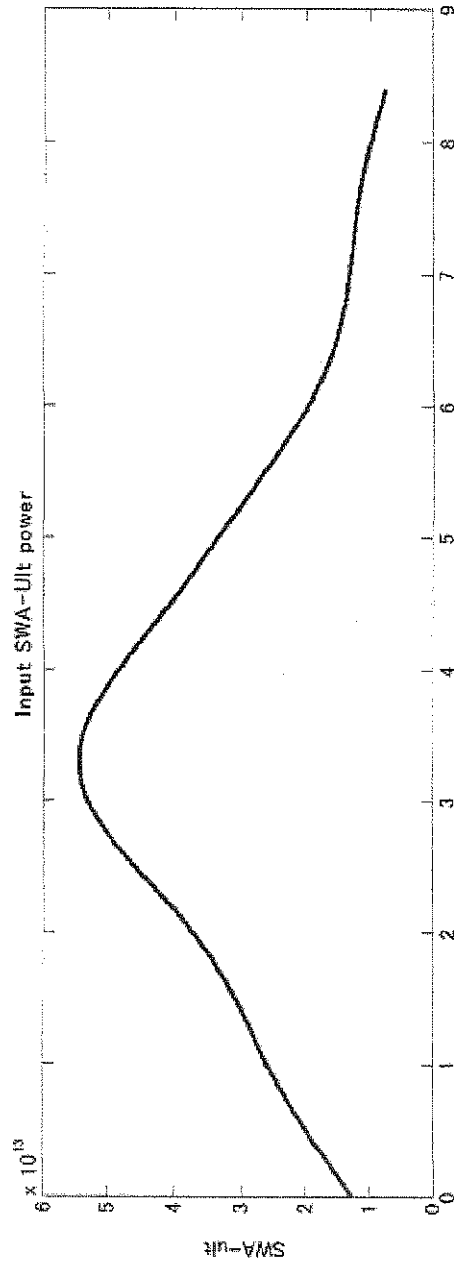
(vii) Brain wave SWA trend



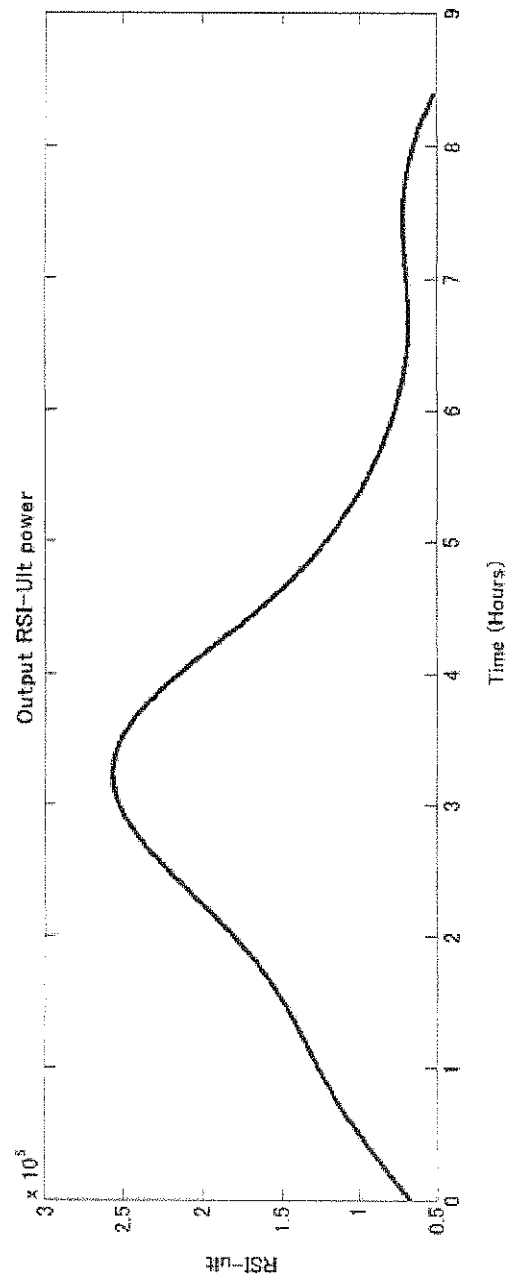
(viii) Trend of ultradian power included in brain wave SWA trend

FIG. 26

Third case (NYHA II, BNP=115)



(xi) Change of
ultradian power
included in brain
wave SWA trend

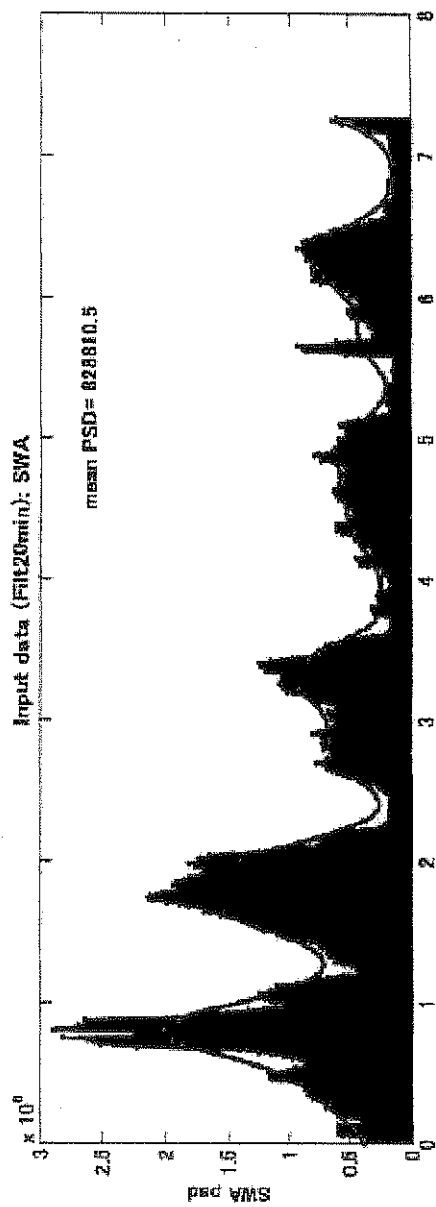


(xii) Change of
ultradian power
included in
respiratory
cycle RSI trend

FIG. 27

Fourth case (NYHA III, BNP=1000)

(i) Brain wave SWA
trend



(ii) Respiratory cycle
RSI trend

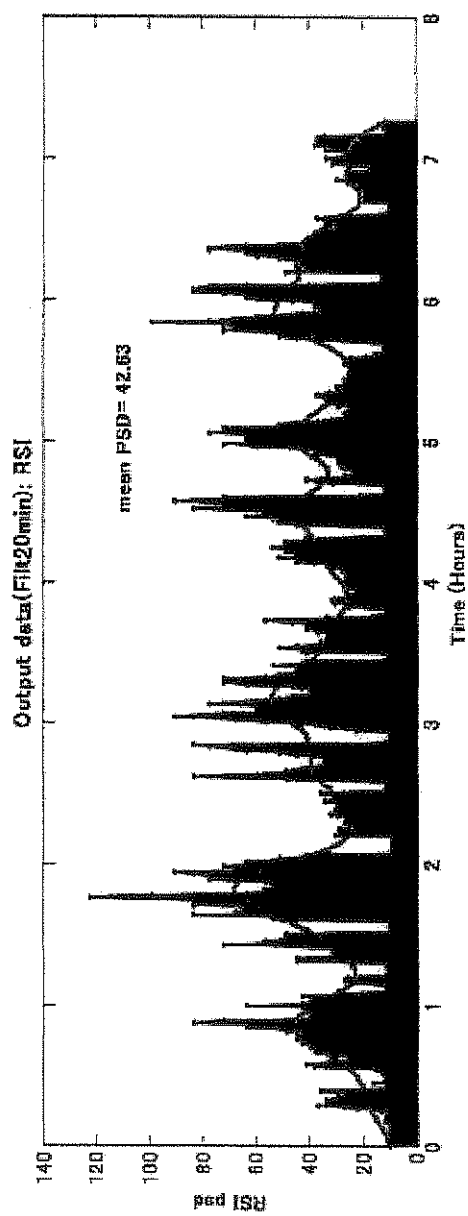
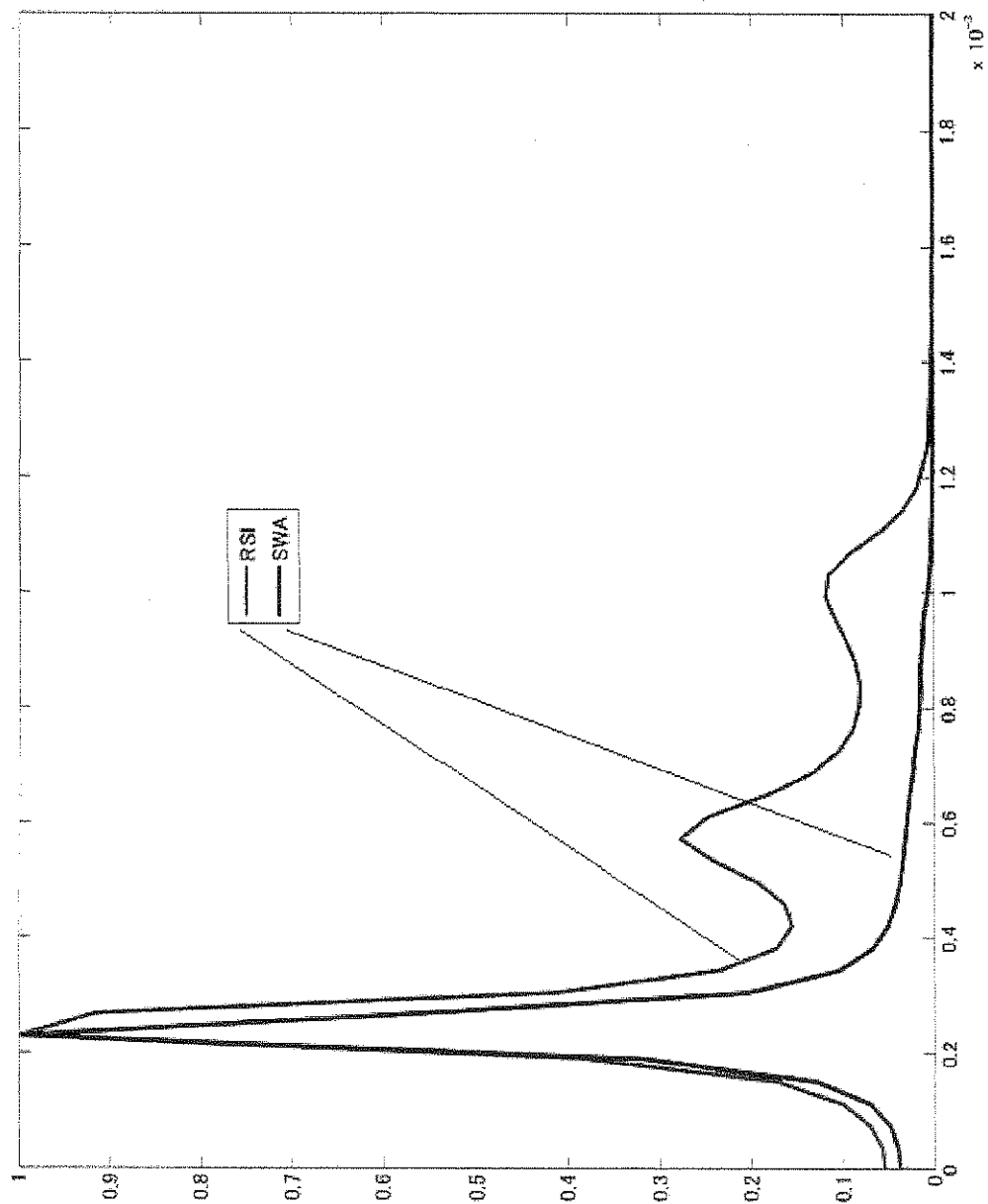


FIG. 28

Fourth case (NYHA III, BNP=1000)

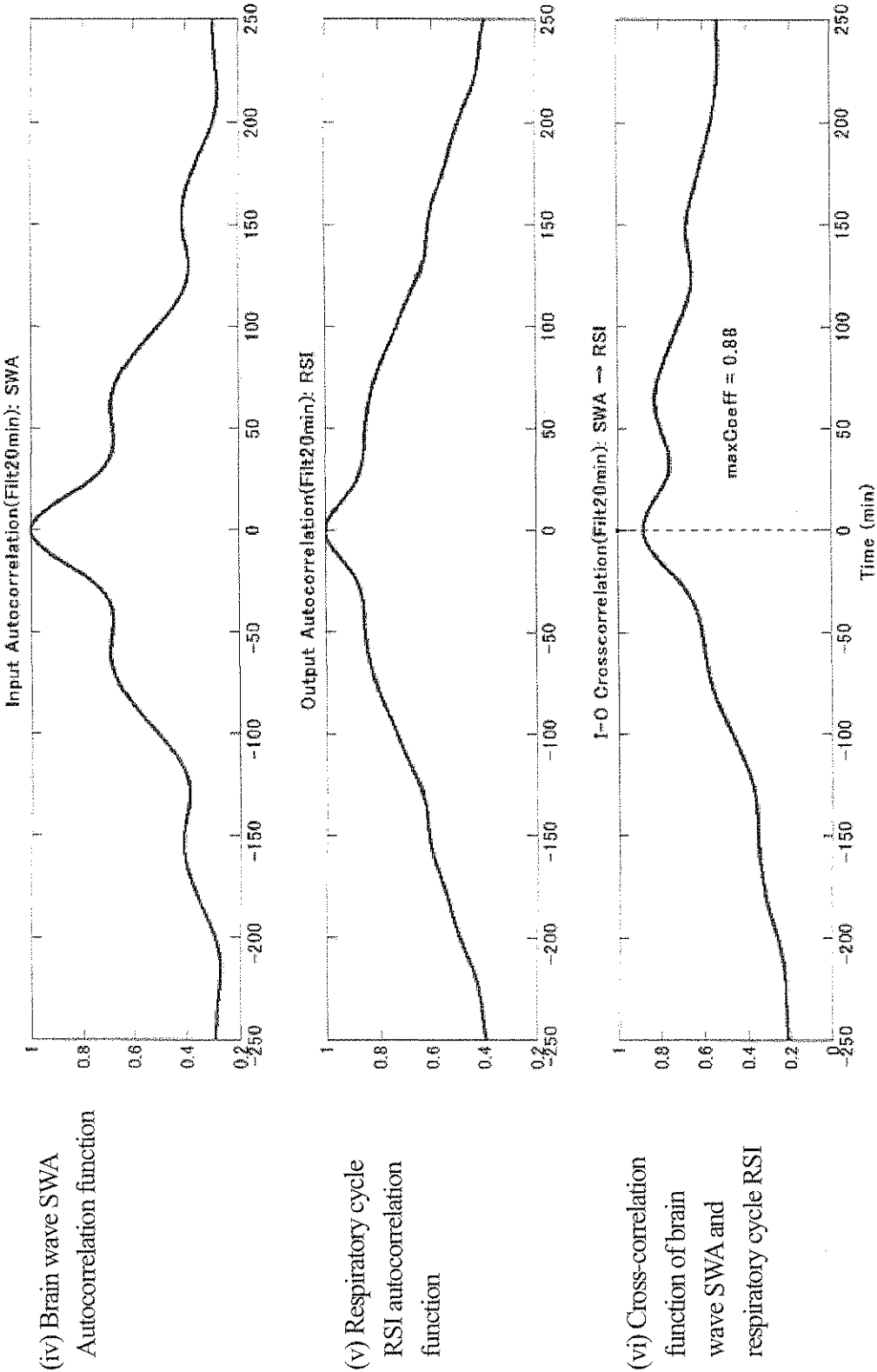
MEM for 8-Hour Trends of SWA and RSI (normalized by Max Level)



(iii) Frequency distribution of brain wave SWA and respiratory cycle RSI

FIG. 29

Fourth case (NYHA III, BNP=1 000)



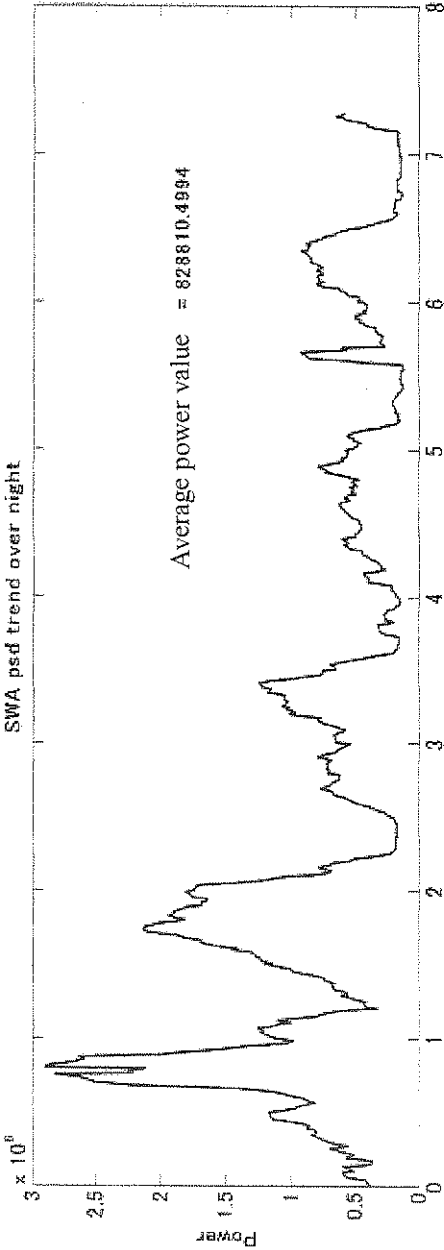
(iv) Brain wave SWA
Autocorrelation function

(v) Respiratory cycle
RSI autocorrelation
function

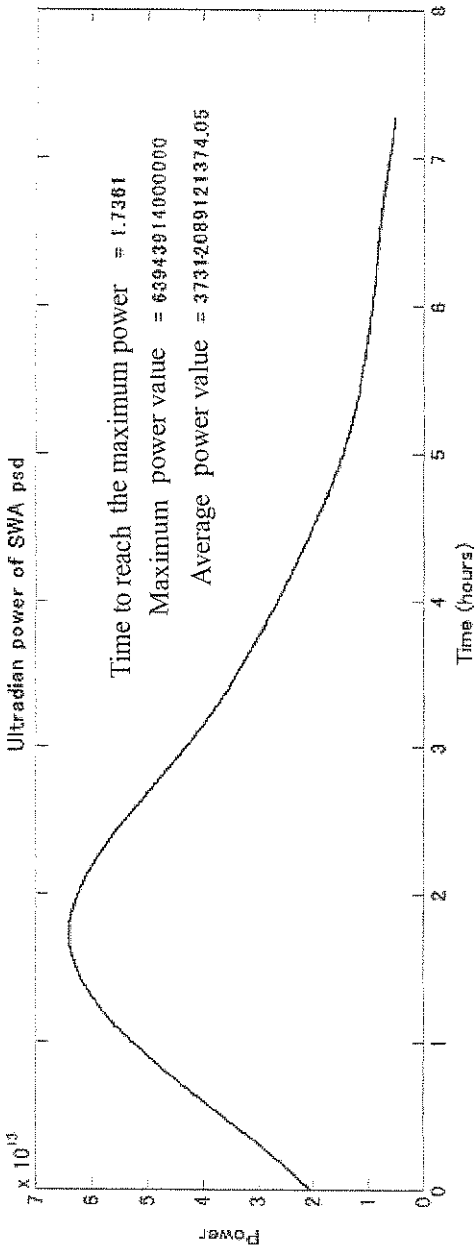
(vi) Cross-correlation
function of brain
wave SWA and
respiratory cycle RSI

FIG. 30

Fourth case (NYHA III , BNP=1000)



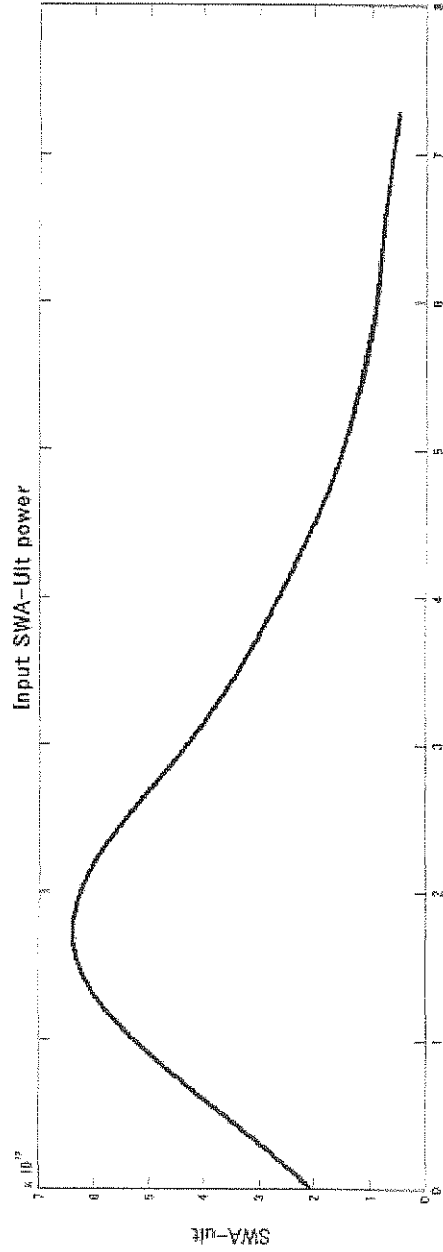
(vi) Brain wave SWA trend



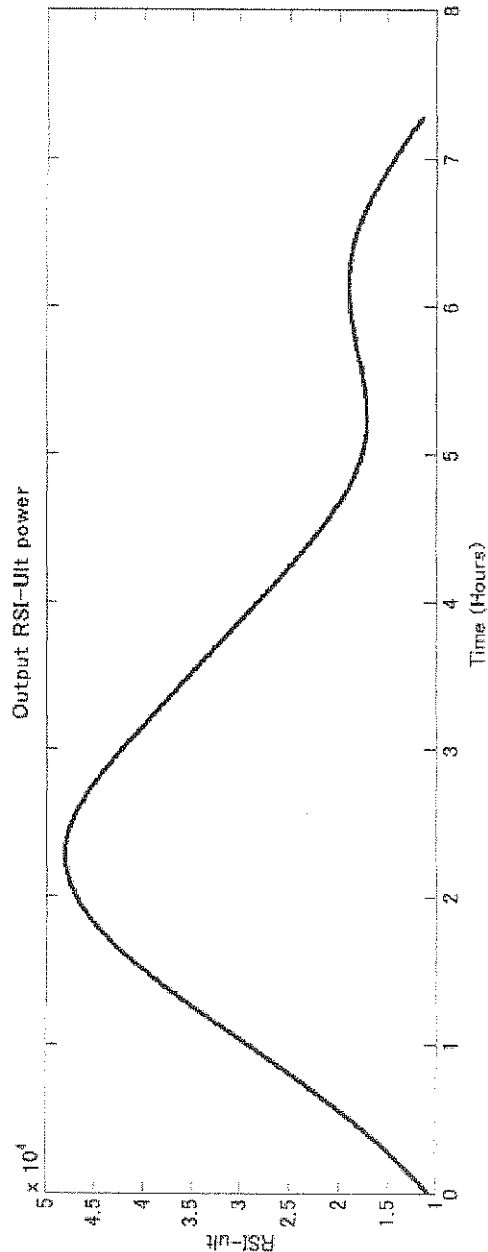
(viii) Trend of ultradian power included in brain wave SWA trend

FIG. 31

Fourth case (NYHA III , BNP=1000)



(xi) Change of ultradian power included in brain wave SWA trend

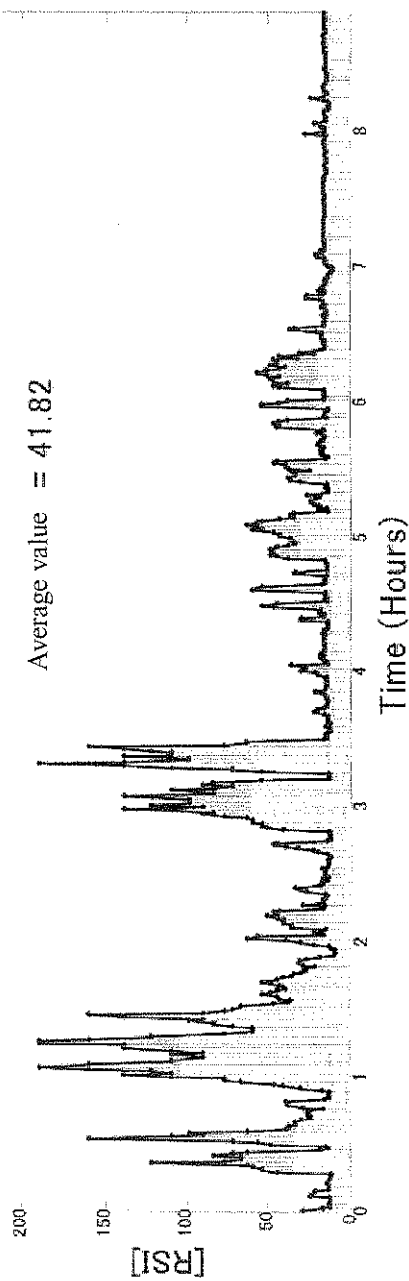


(xii) Change of ultradian power included in respiratory cycle RSI trend

FIG. 32

Change of RSI and ultradian power in fifth case (before oxygen therapy)

Respiratory Stability, trend over night File name = 010-00W [RSI]



Ultradian power of Respiratory Stability

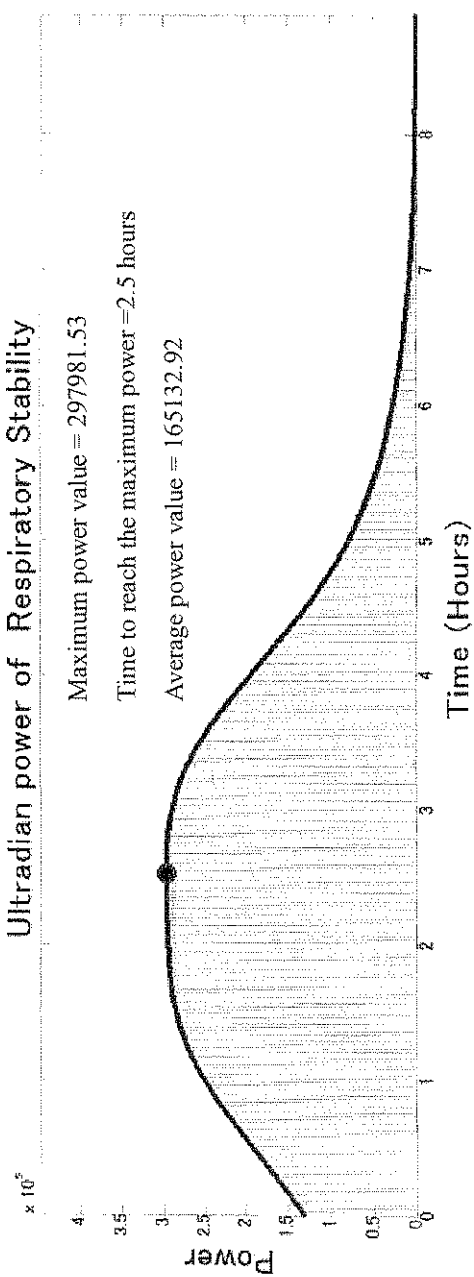


FIG. 33

Change of RSI and ultradian power in fifth case (during oxygen treatment)

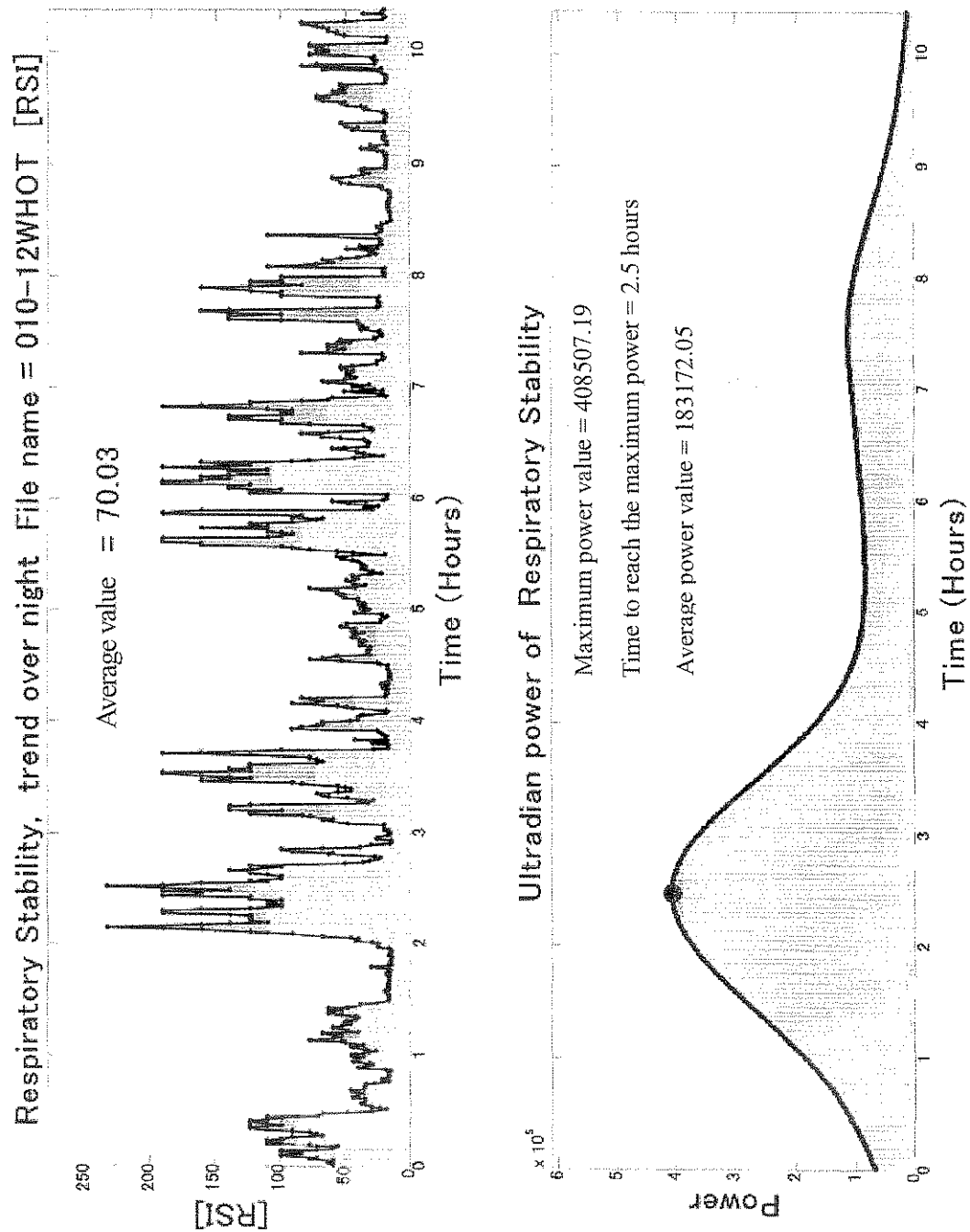


FIG. 34

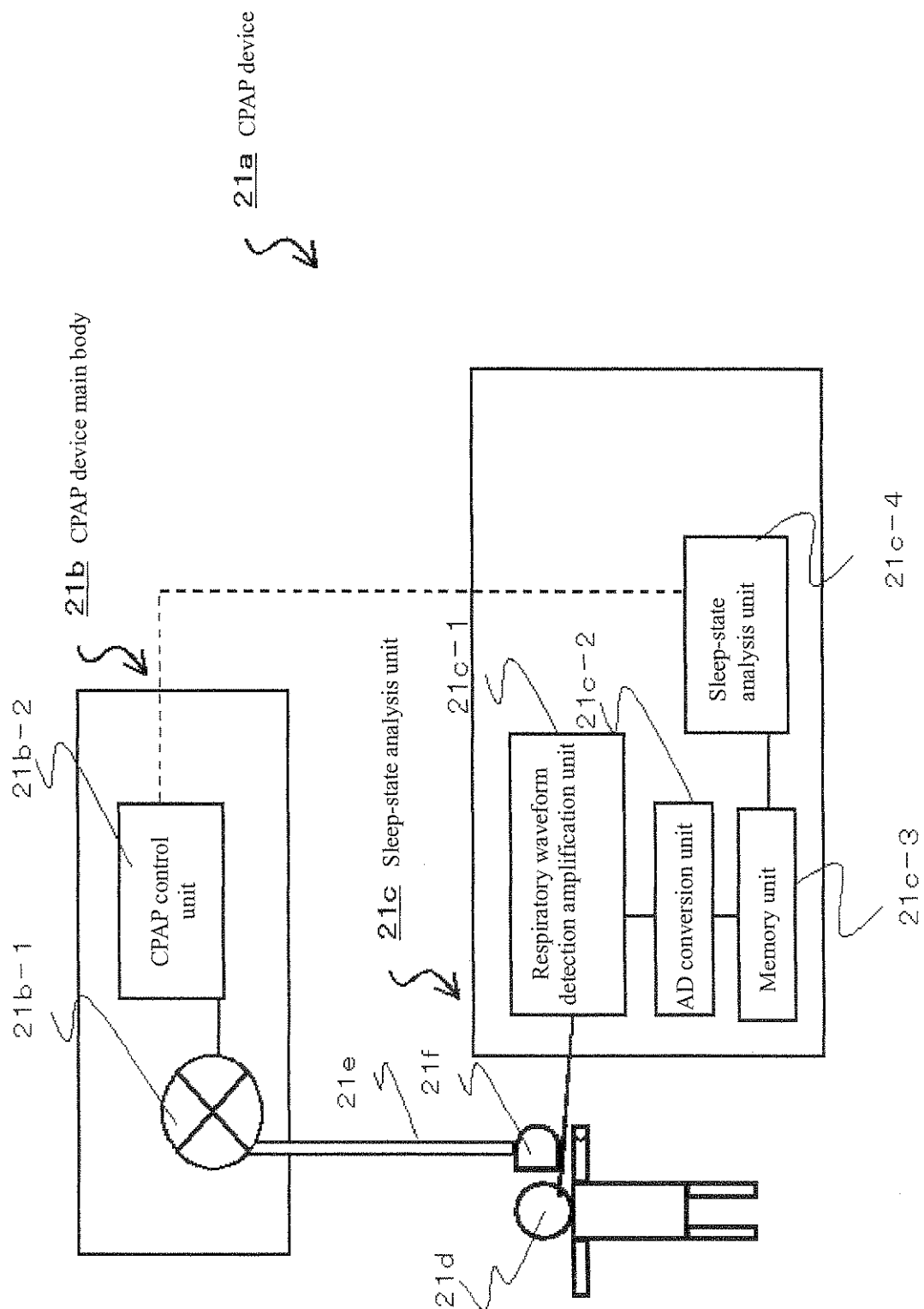


FIG. 35

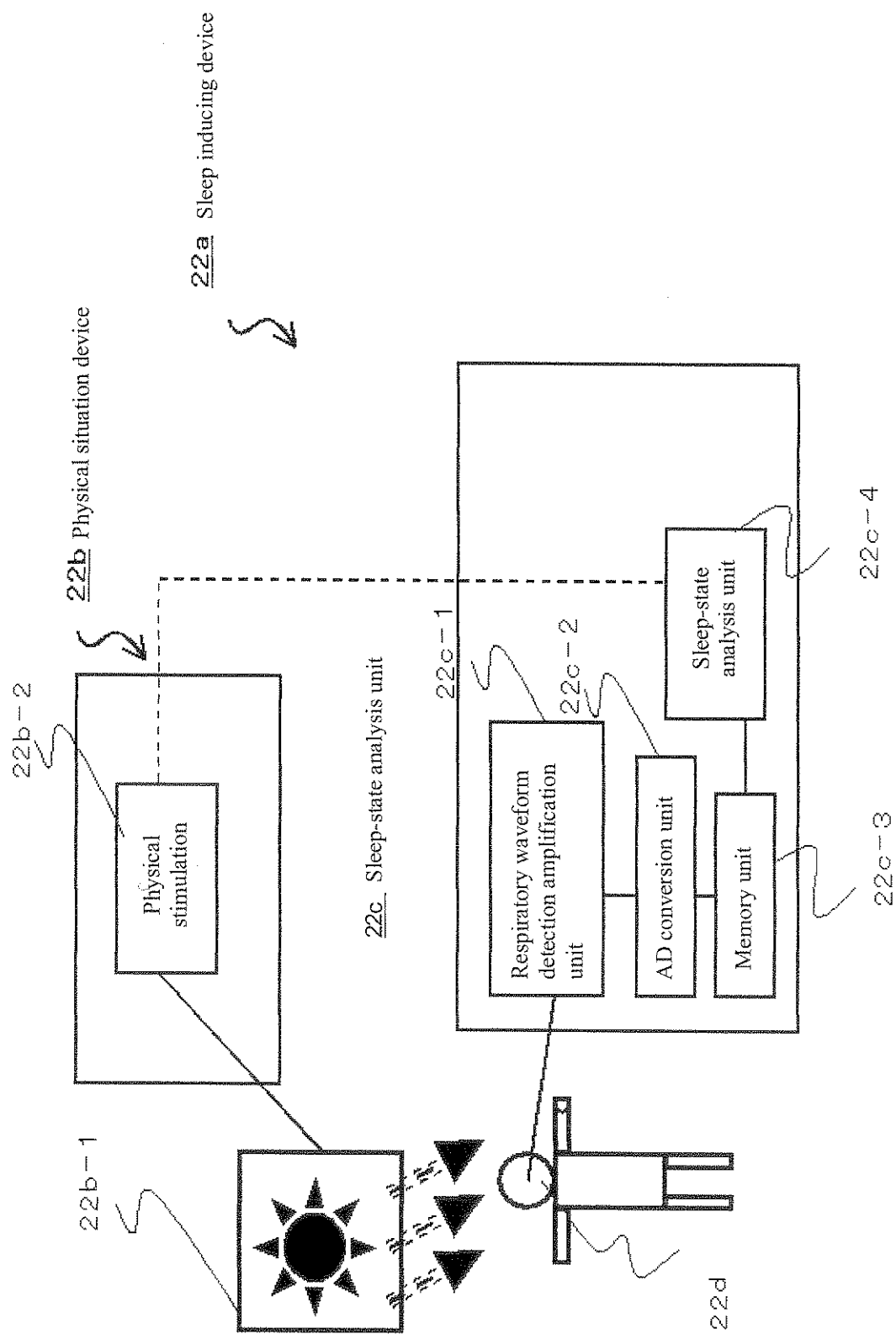


FIG. 36

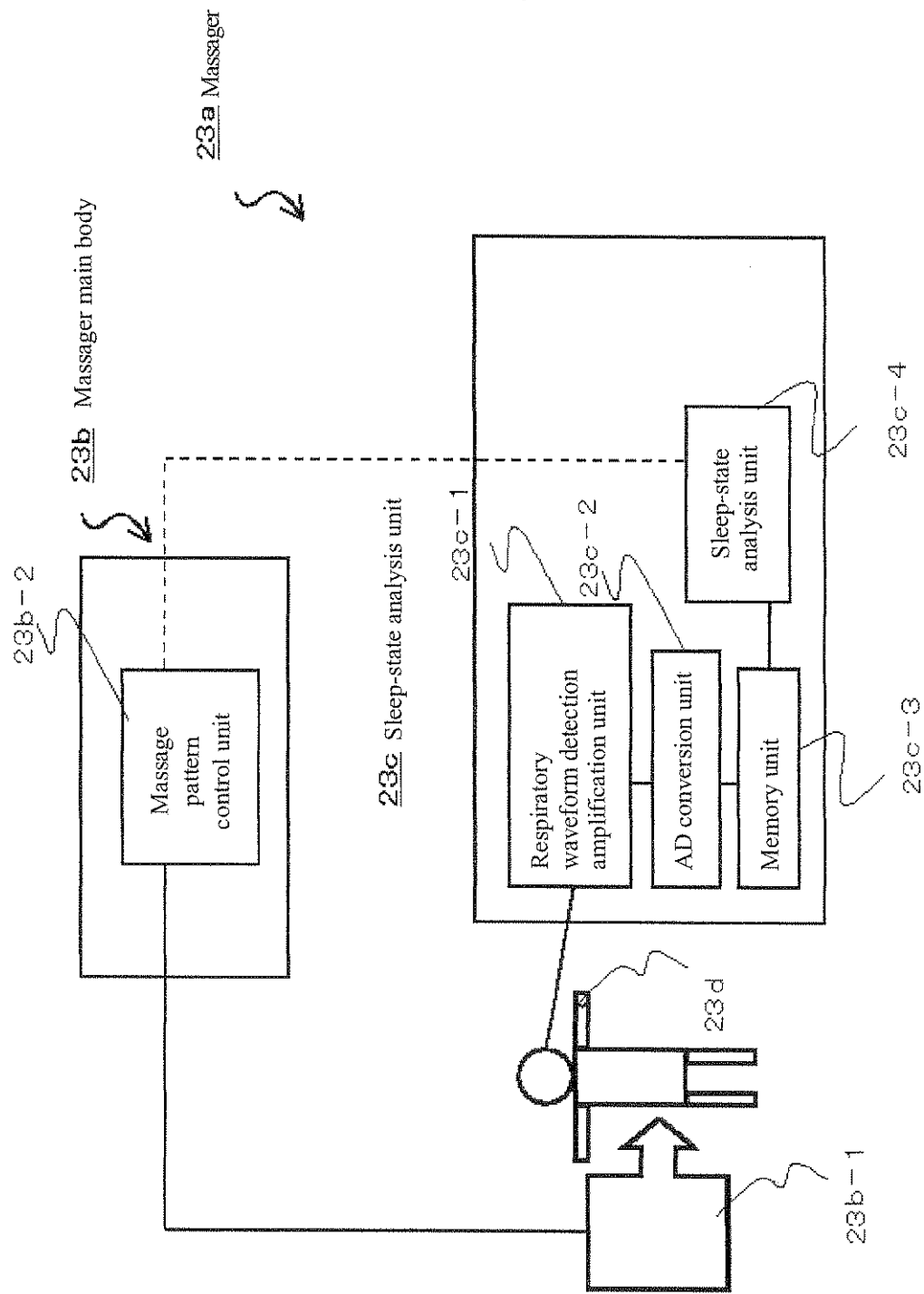


FIG. 37

24a Blood-pressure measurement system

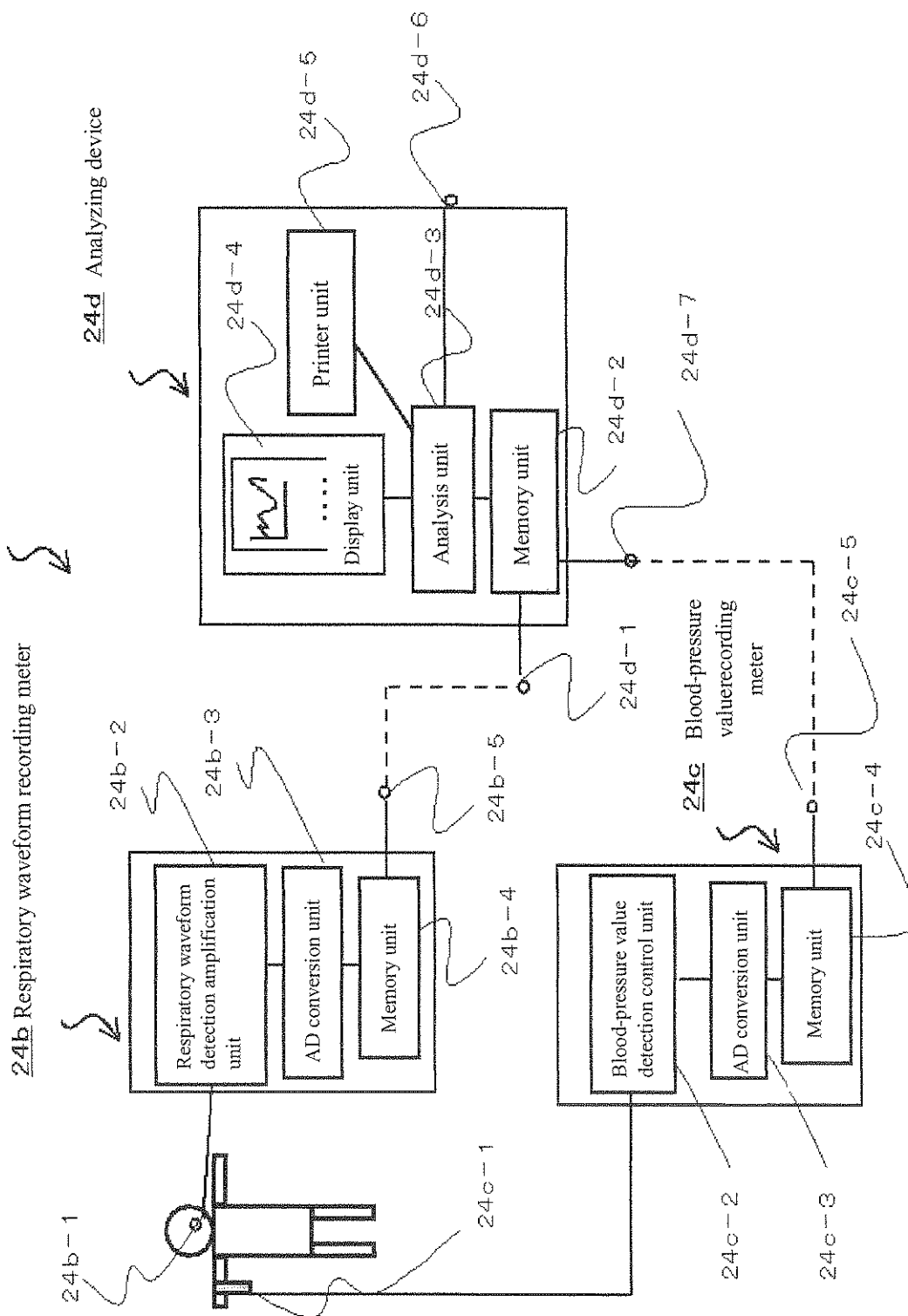


FIG. 38

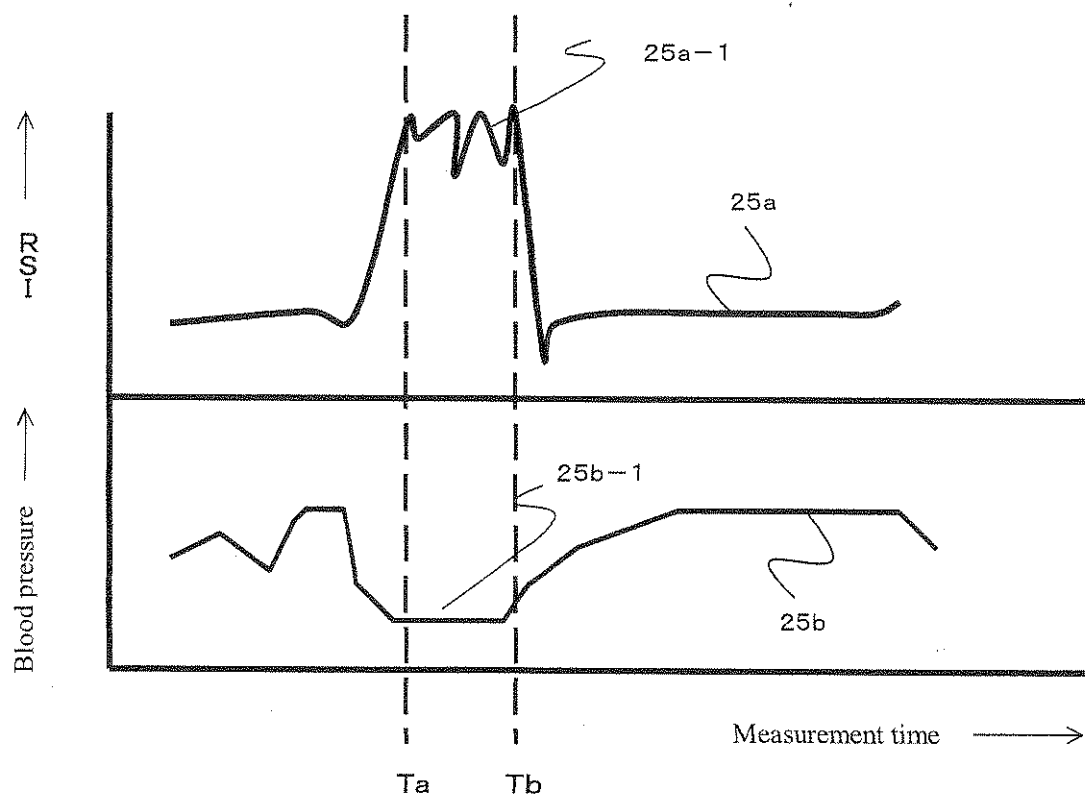


FIG.39

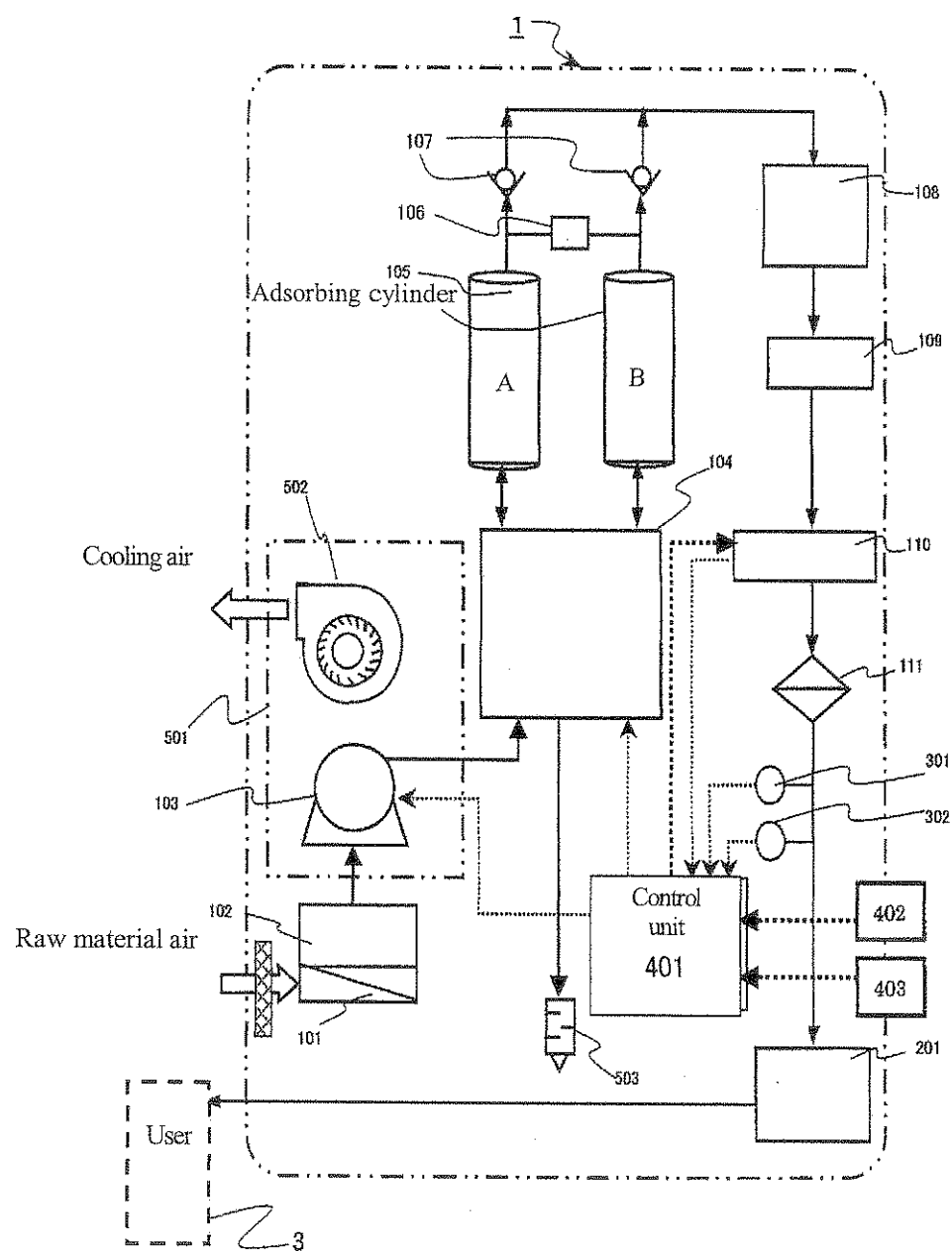


FIG. 40

