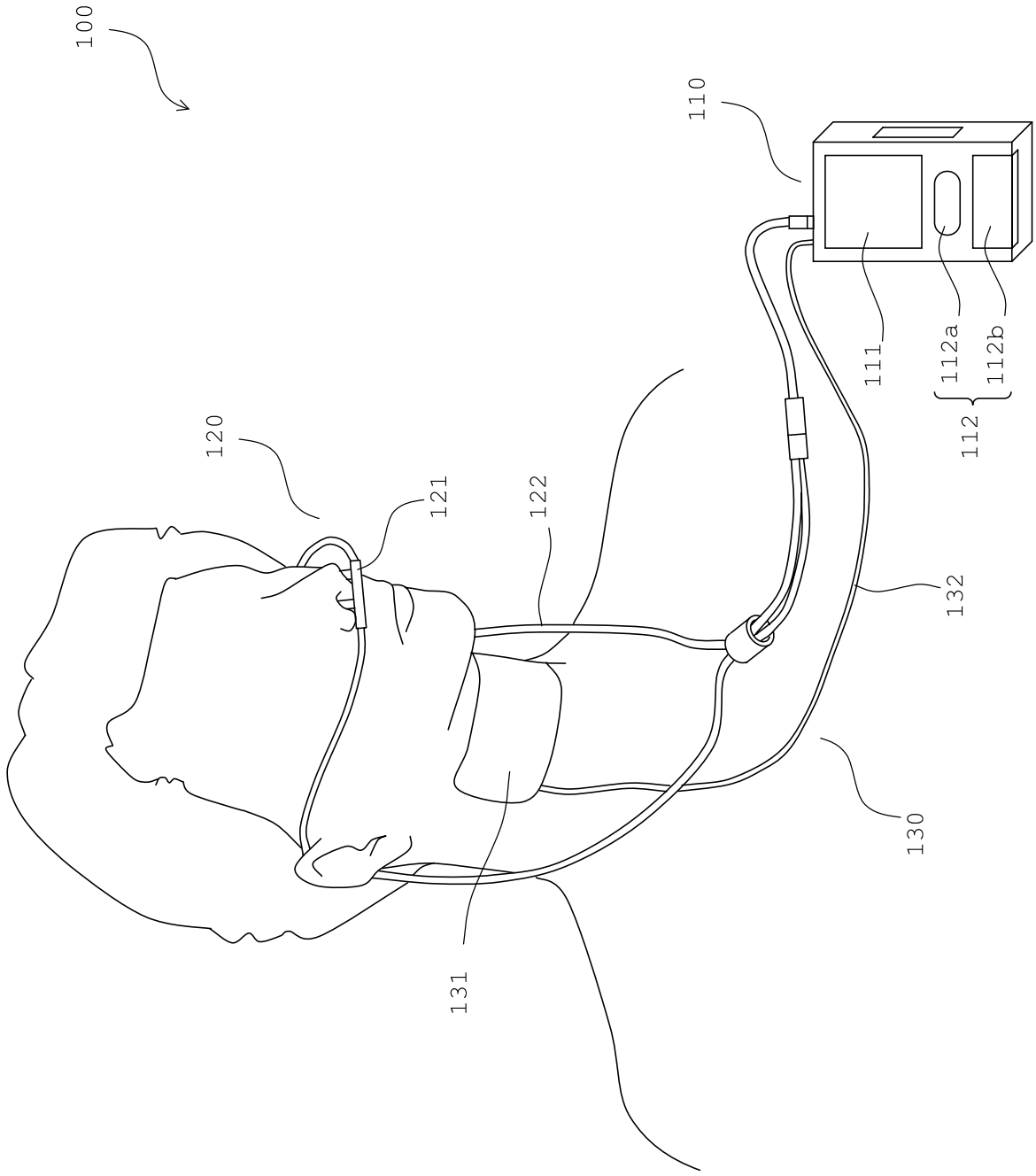
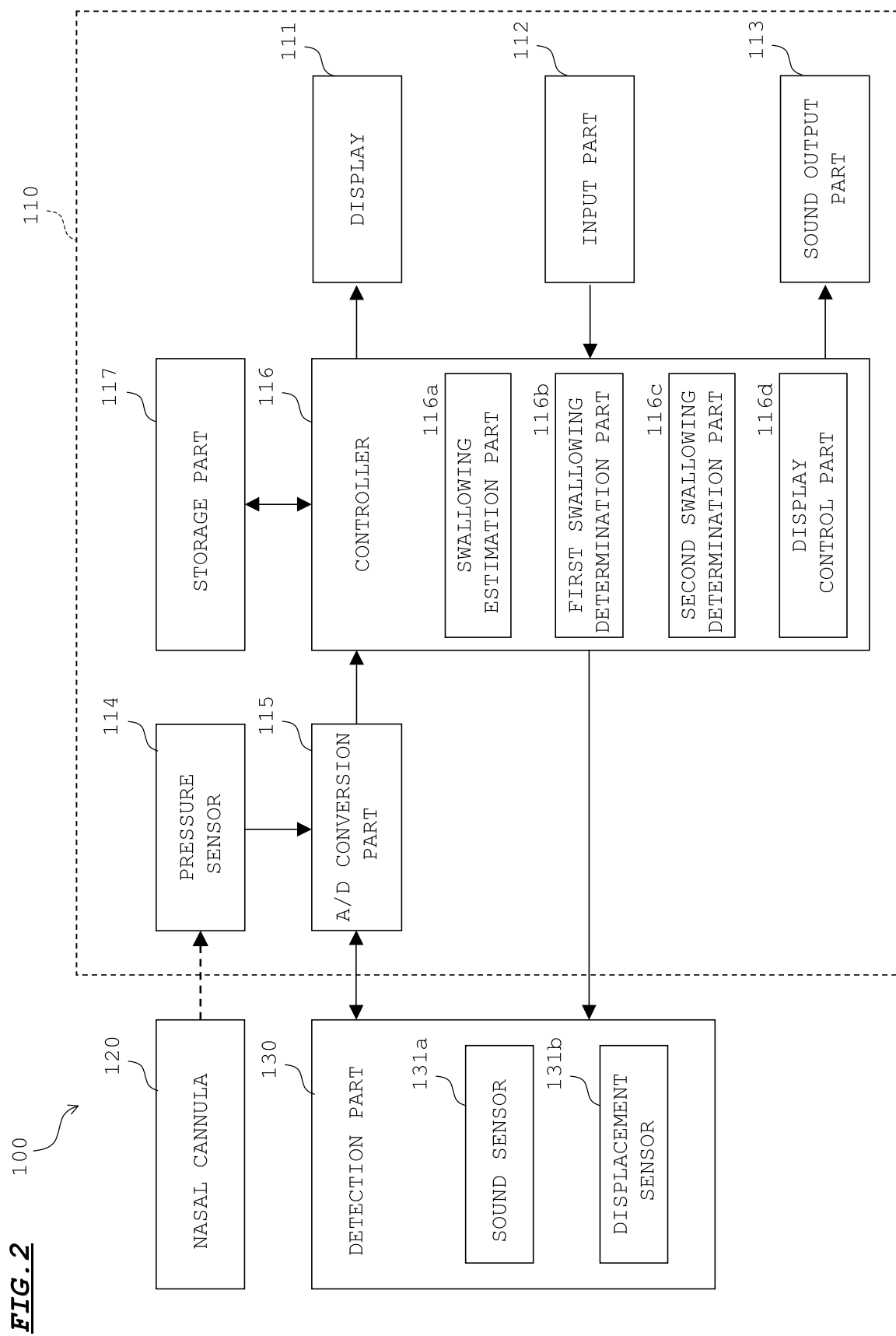


**FIG. 1**



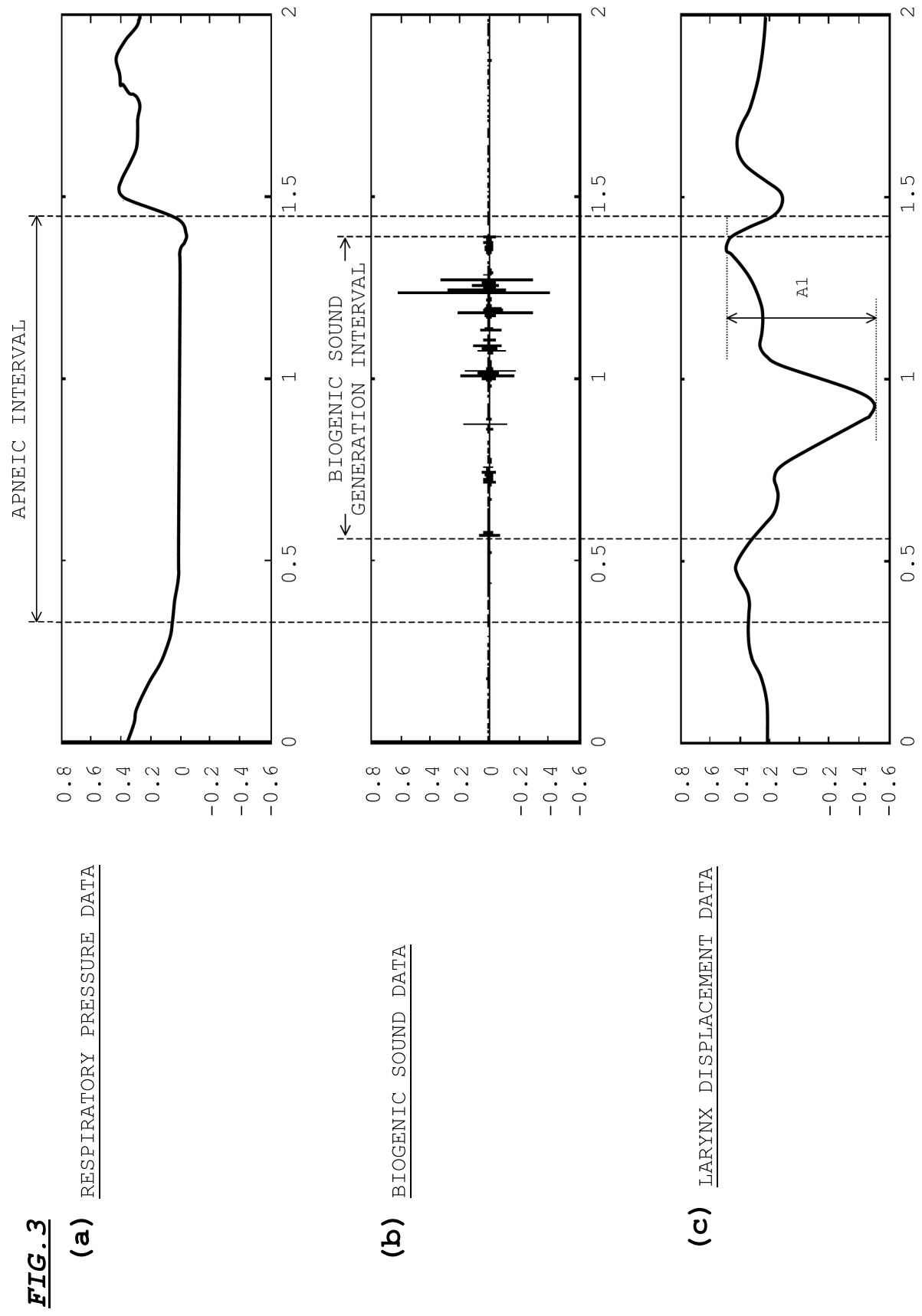


FIG. 4

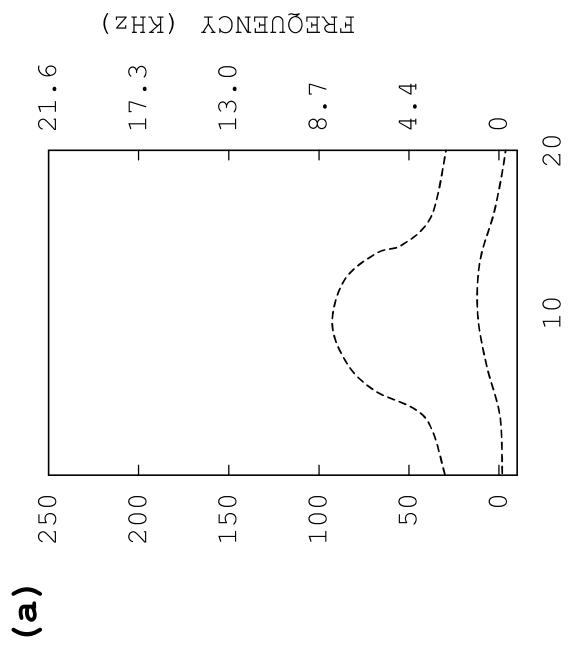
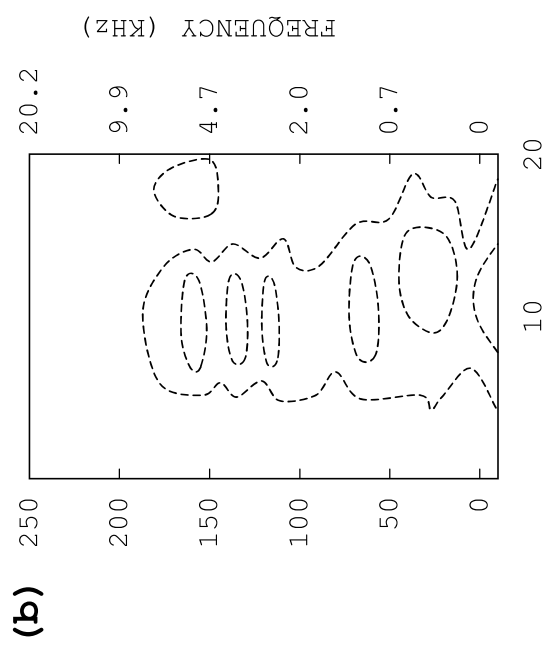
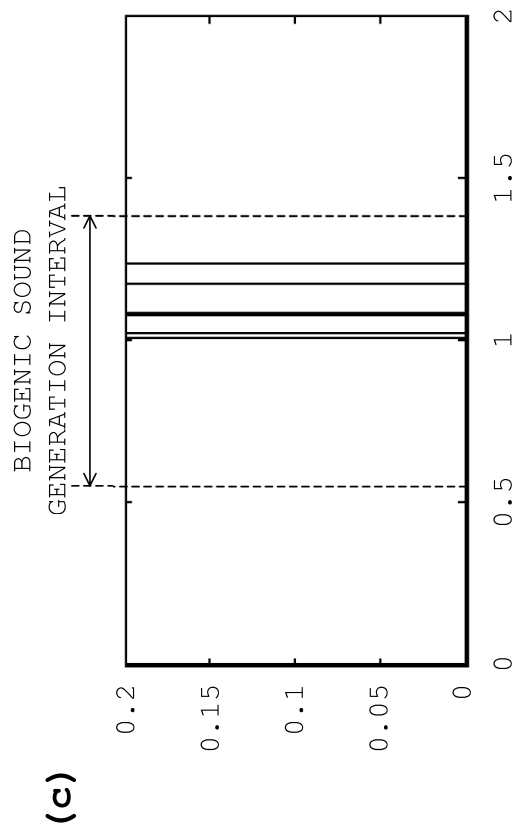
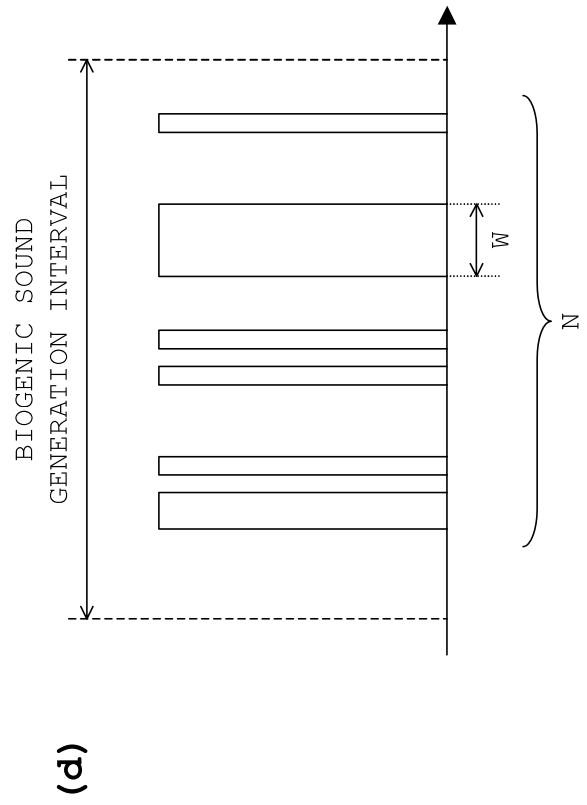
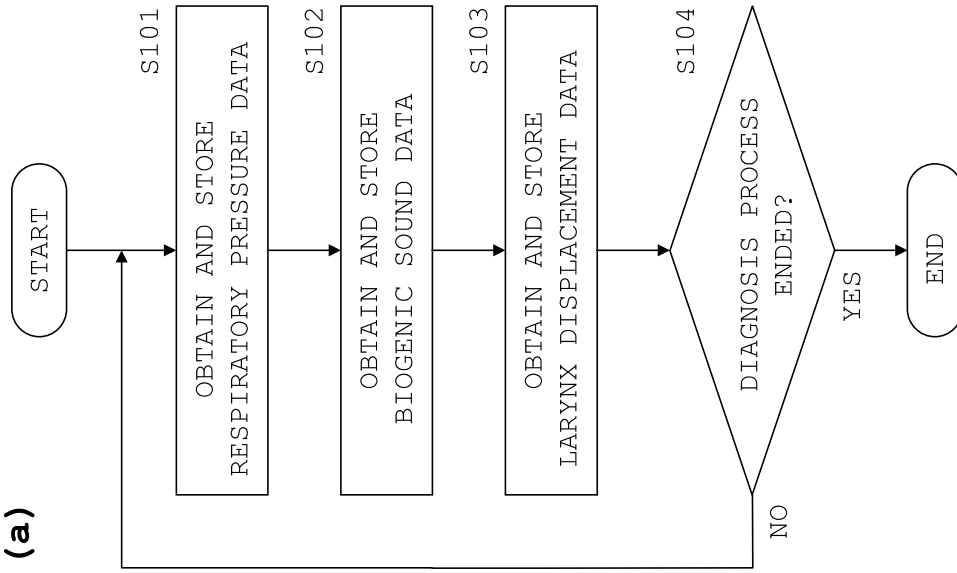


FIG. 5

(a)



(b)

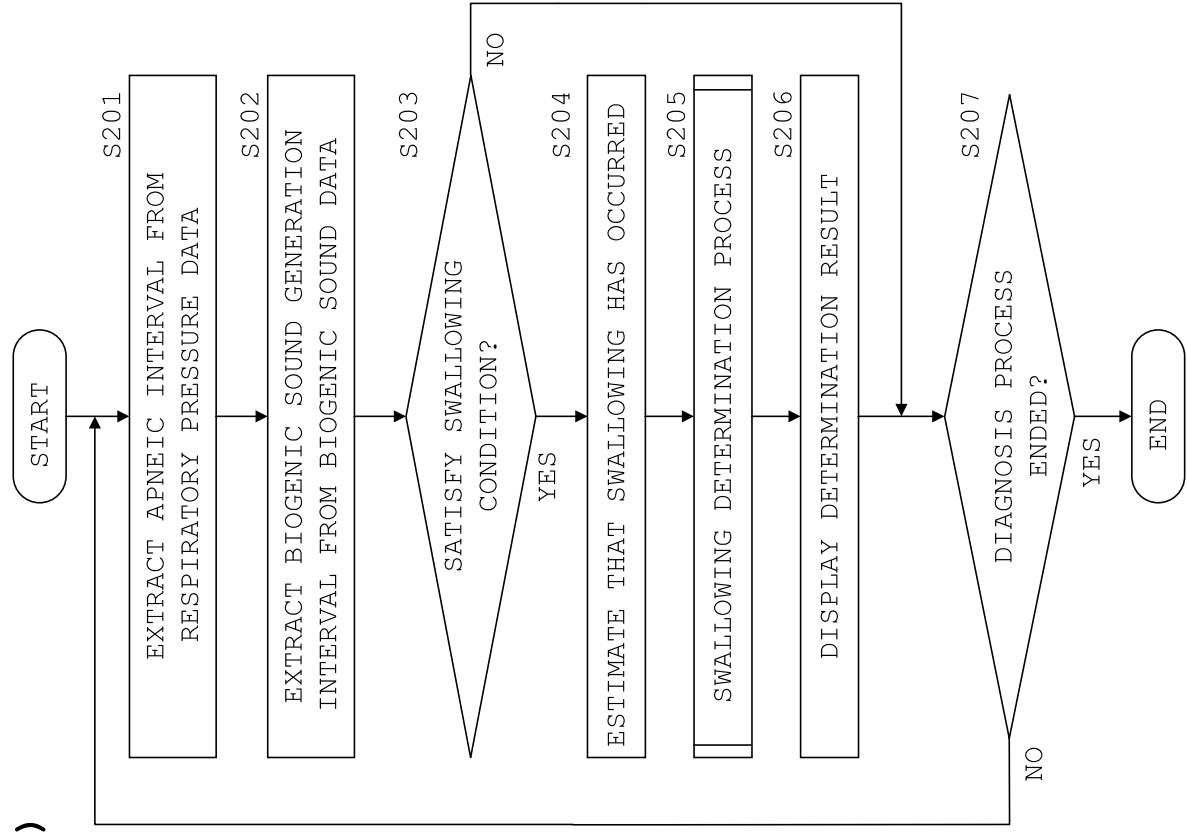


FIG. 6

FIRST SWALLOWING DETERMINATION PROCESS

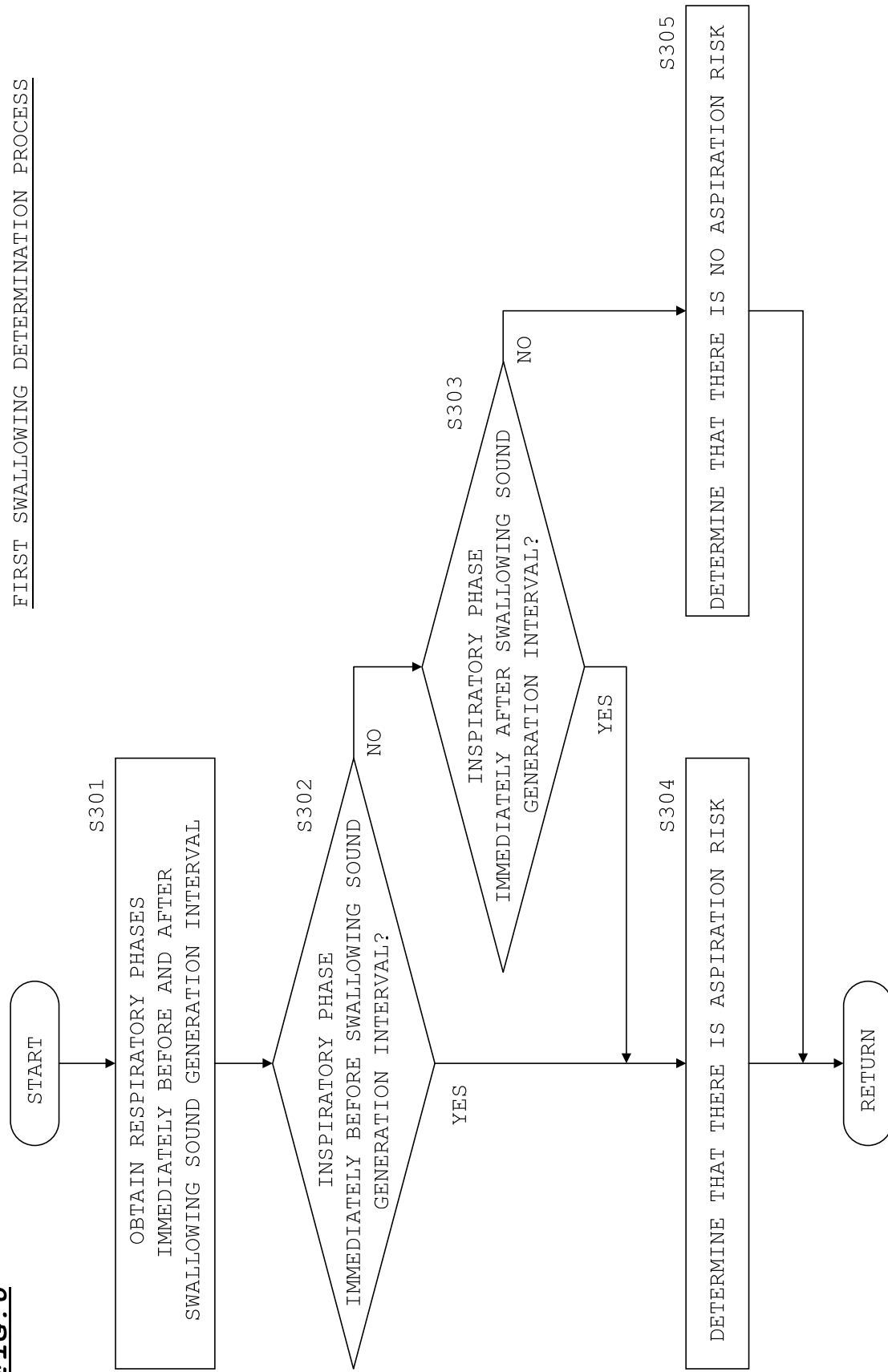


FIG. 7

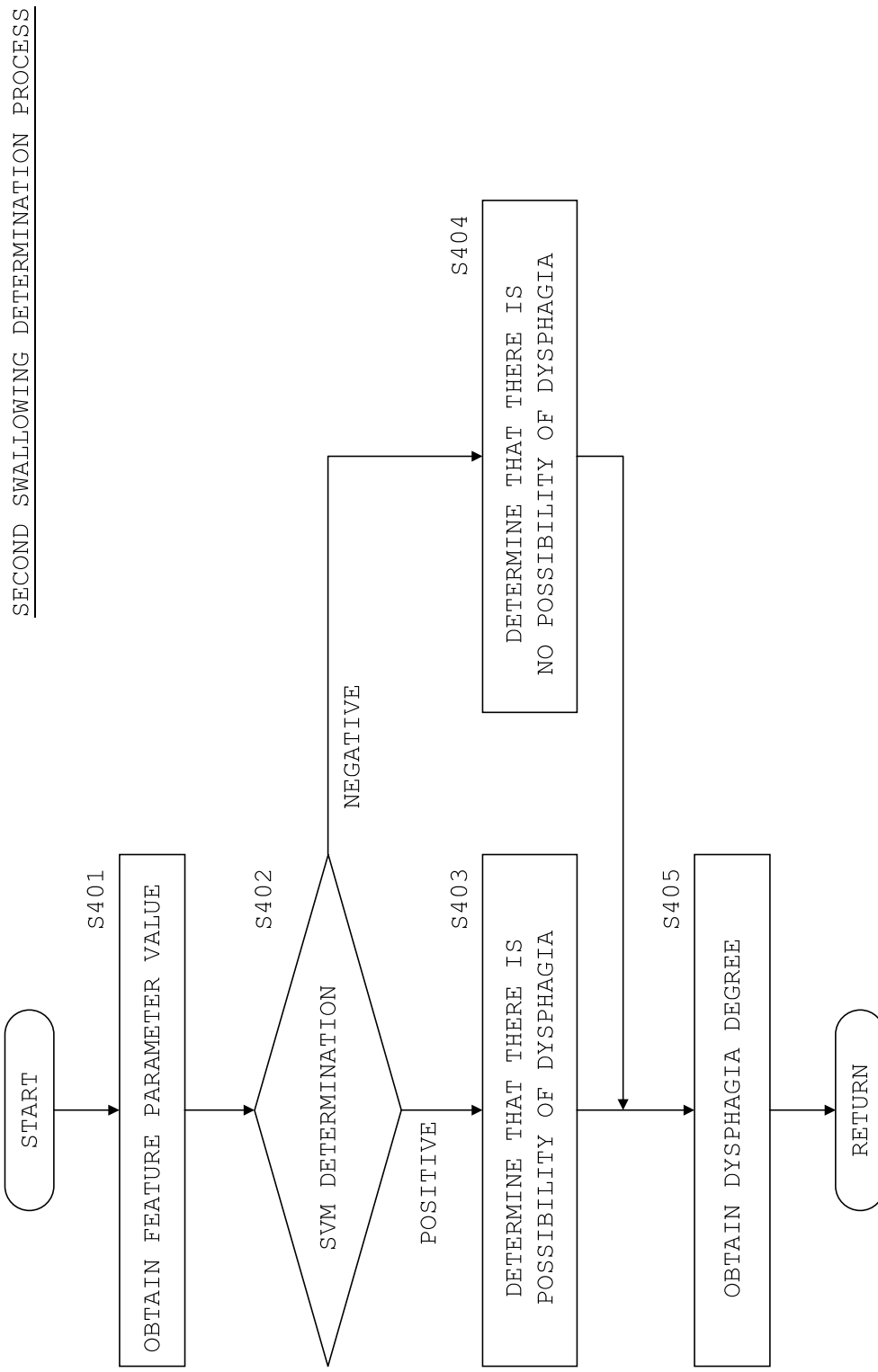


FIG. 8

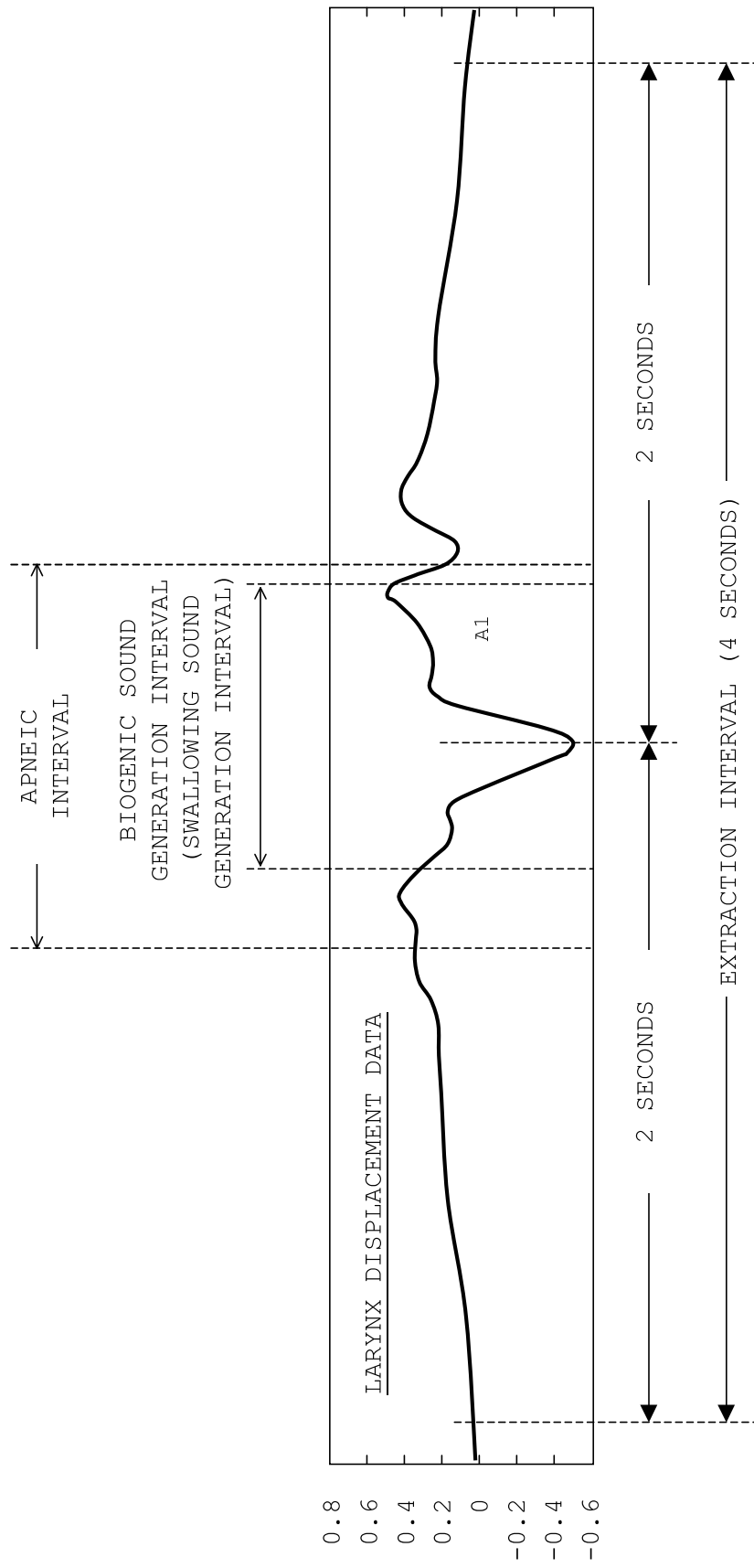
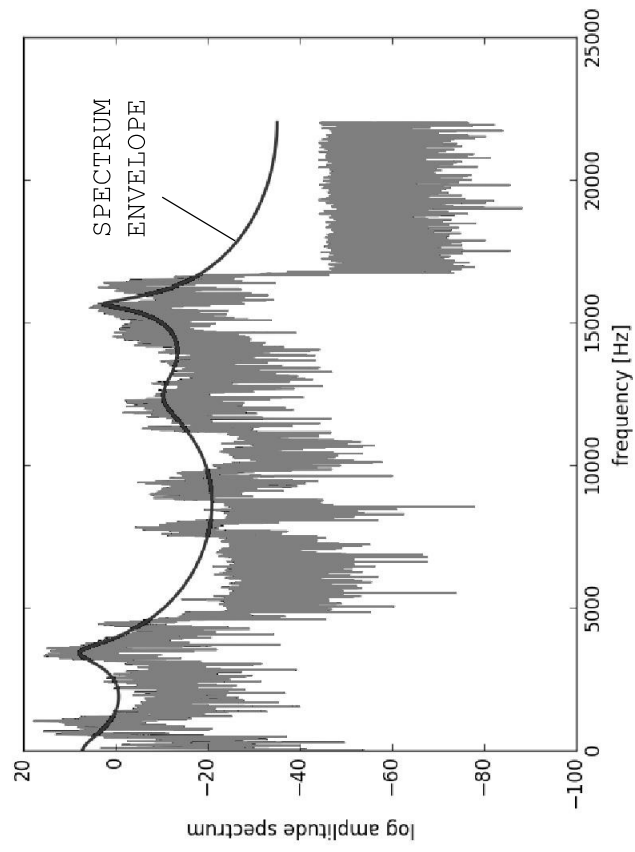


FIG.9

<EXAMINATION 1>

(a) LPC ORDER : 8



(b) LPC ORDER : 16

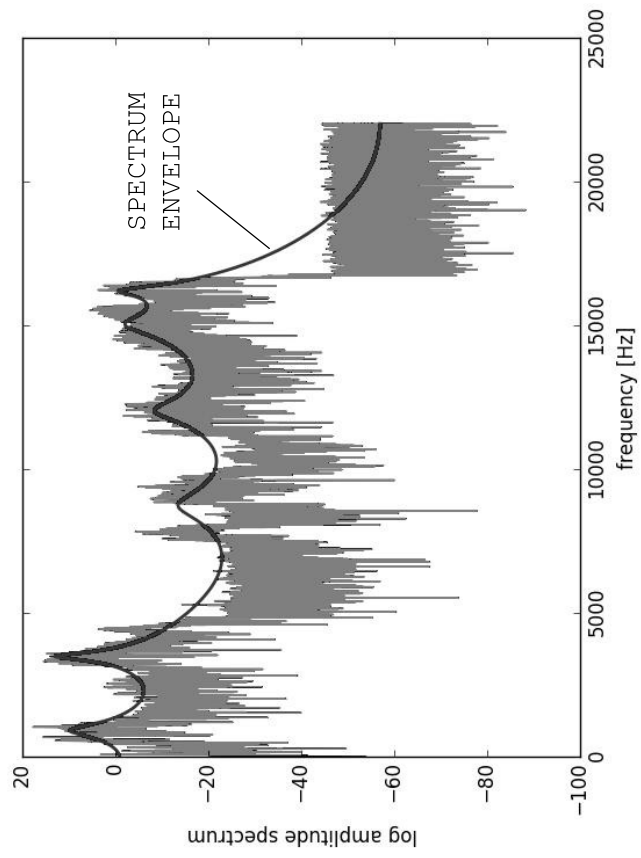


FIG.10

(a)

RESULT OF LARYNX DISPLACEMENT DATA (NUMBER OF GROUPS: 10)				<LPC SPECTRUM>	
DETERMINATION LABEL		ENTIRETY: 76.4% (LPC ORDER: 32)		CORRECT LABEL	
		HEALTHY SUBJECT			
		PATIENT		HEALTHY SUBJECT	PATIENT
				82.5%	34.4%
				17.5%	65.6%

(b)

RESULT OF RESPIRATORY PRESSURE DATA (NUMBER OF GROUPS: 10)				<LPC SPECTRUM>	
DETERMINATION LABEL		ENTIRETY: 87.6% (LPC ORDER: 32)		CORRECT LABEL	
		HEALTHY SUBJECT			
		PATIENT		HEALTHY SUBJECT	PATIENT
				96.5%	28.1%
				3.5%	71.9%

(c)

RESULT OF BIOGENIC SOUND DATA (NUMBER OF GROUPS: 10)				<LPC SPECTRUM>	
DETERMINATION LABEL		ENTIRETY: 79.2% (LPC ORDER: 32)		CORRECT LABEL	
		HEALTHY SUBJECT			
		PATIENT		HEALTHY SUBJECT	PATIENT
				89.5%	39.1%
				10.5%	60.9%

FIG.11

(a)

RESULT OF LARYNX DISPLACEMENT DATA (NUMBER OF GROUPS: 10)				<LPC COEFFICIENT>	
ENTIRETY: 69.7% (LPC ORDER: 16)				CORRECT LABEL	
DETERMINATION LABEL	HEALTHY SUBJECT			HEALTHY SUBJECT	PATIENT
	PATIENT			76.3%	42.2%
				23.7%	57.8%

(b)

RESULT OF RESPIRATORY PRESSURE DATA (NUMBER OF GROUPS: 10)				<LPC COEFFICIENT>	
ENTIRETY: 88.8% (LPC ORDER: 32)				CORRECT LABEL	
DETERMINATION LABEL	HEALTHY SUBJECT			HEALTHY SUBJECT	PATIENT
	PATIENT			93.9%	20.3%
				6.1%	79.7%

(c)

RESULT OF BIOGENIC SOUND DATA (NUMBER OF GROUPS: 10)				<LPC COEFFICIENT>	
ENTIRETY: 77.5% (LPC ORDER: 8)				CORRECT LABEL	
DETERMINATION LABEL	HEALTHY SUBJECT			HEALTHY SUBJECT	PATIENT
	PATIENT			88.6%	42.2%
				11.4%	57.8%

FIG.12

(a)

RESULT OF LARYNX DISPLACEMENT DATA (NUMBER OF GROUPS: 10)				<MFCC>	
DETERMINATION LABEL		ENTIRETY: 69.7%		CORRECT LABEL	
		HEALTHY SUBJECT			
		PATIENT		HEALTHY SUBJECT	PATIENT
				74.6%	39.1%
				25.4%	60.9%

(b)

RESULT OF RESPIRATORY PRESSURE DATA (NUMBER OF GROUPS: 10)				<MFCC>	
DETERMINATION LABEL		ENTIRETY: 86.5%		CORRECT LABEL	
		HEALTHY SUBJECT			
		PATIENT		HEALTHY SUBJECT	PATIENT
				94.7%	28.1%
				5.3%	71.9%

(c)

RESULT OF BIOGENIC SOUND DATA (NUMBER OF GROUPS: 10)				<MFCC>	
DETERMINATION LABEL		ENTIRETY: 69.7%		CORRECT LABEL	
		HEALTHY SUBJECT			
		PATIENT		HEALTHY SUBJECT	PATIENT
				77.2%	43.7%
				22.8%	56.3%

FIG.13

(a) <LARYNX DISPLACEMENT>

FEATURE QUANTITY	ACCURACY	HEALTHY SUBJECT DETERMINATION ACCURACY	PATIENT DETERMINATION ACCURACY
LPC SPECTRUM	76.4%	82.5%	65.6%
LPC COEFFICIENT	69.7%	76.3%	57.8%
MFCC	69.7%	74.6%	60.9%

(b) <RESPIRATORY PRESSURE>

FEATURE QUANTITY	ACCURACY	HEALTHY SUBJECT DETERMINATION ACCURACY	PATIENT DETERMINATION ACCURACY
LPC SPECTRUM	87.6%	96.5%	71.9%
LPC COEFFICIENT	88.8%	93.9%	79.7%
MFCC	86.5%	94.7%	71.9%

(c) <BIOGENIC SOUND>

FEATURE QUANTITY	ACCURACY	HEALTHY SUBJECT DETERMINATION ACCURACY	PATIENT DETERMINATION ACCURACY
LPC SPECTRUM	79.2%	89.5%	60.9%
LPC COEFFICIENT	77.5%	88.6%	57.8%
MFCC	69.7%	77.2%	56.3%

FIG.14

<LPC SPECTRUM/NON-TIME SERIES>

LPC ORDER	DATA	F VALUE	ACCURACY [%]	HEALTHY SUBJECT DETERMINATION ACCURACY [%]	PATIENT DETERMINATION ACCURACY [%]
8	ESPIRATORY PRESSURE	45.9	75.1	89.2	38.2
	LARYNX DISPLACEMENT	50.1	72.8	81.7	49.5
	BIOGENIC SOUND	55.7	76.2	84.5	54.2
16	ESPIRATORY PRESSURE	41.9	77.2	95.3	29.7
	LARYNX DISPLACEMENT	46.1	72.0	82.9	43.4
	BIOGENIC SOUND	62.4	79.4	86.2	61.8
32	ESPIRATORY PRESSURE	44	72.1	84.5	39.6
	LARYNX DISPLACEMENT	50.1	73.8	83.8	47.6
	BIOGENIC SOUND	61.7	80.7	90.1	56.1

FIG.15

<LPC SPECTRUM/TIME SERIES>

LPC ORDER	DATA	F VALUE	ACCURACY [%]	HEALTHY SUBJECT DETERMINATION ACCURACY [%]	PATIENT DETERMINATION ACCURACY [%]
8	ESPIRATORY PRESSURE	53.0	75.3	84.7	50.5
	LARYNX DISPLACEMENT	51.3	73.6	82.4	50.5
	BIOGENIC SOUND	55.3	76.0	84.5	53.8
16	ESPIRATORY PRESSURE	50.0	73.7	83.6	47.6
	LARYNX DISPLACEMENT	47.2	72.0	82.2	45.3
	BIOGENIC SOUND	56.8	78.6	89.2	50.9
32	ESPIRATORY PRESSURE	47.6	75.4	88.7	40.6
	LARYNX DISPLACEMENT	45.5	72.3	83.8	42.0
	BIOGENIC SOUND	64.1	80.6	87.4	62.7

FIG. 16

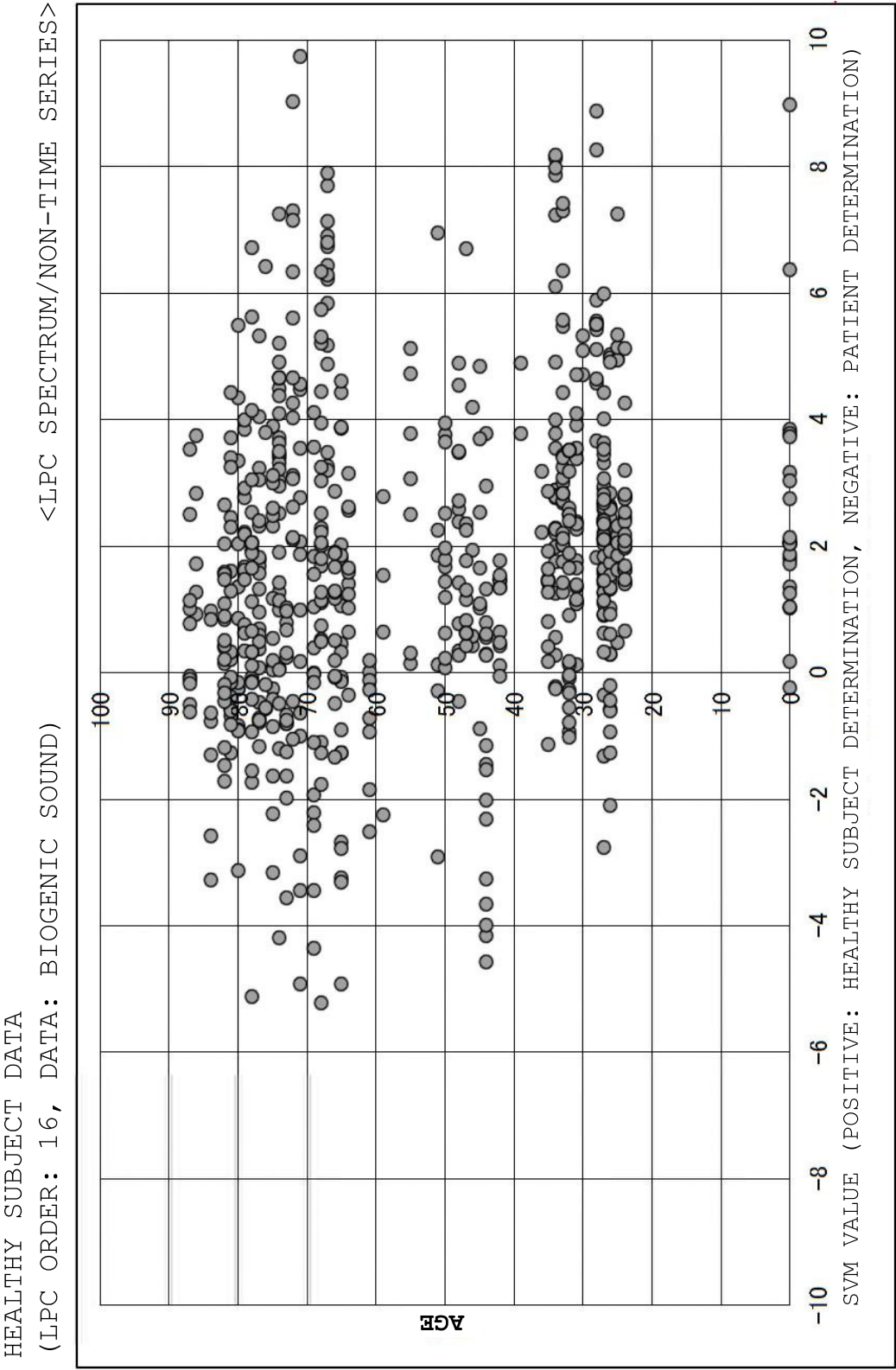


FIG. 17

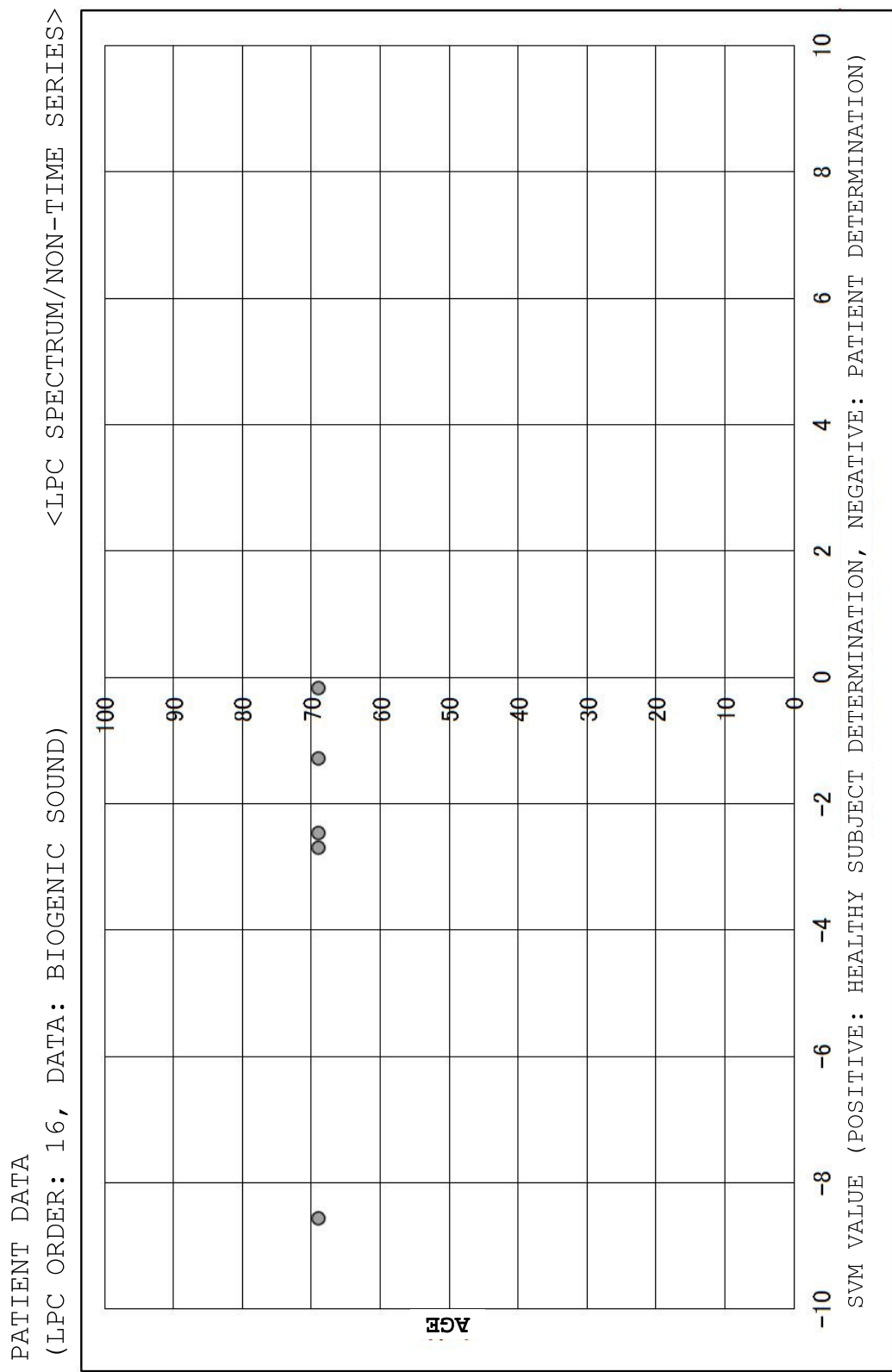


FIG. 18

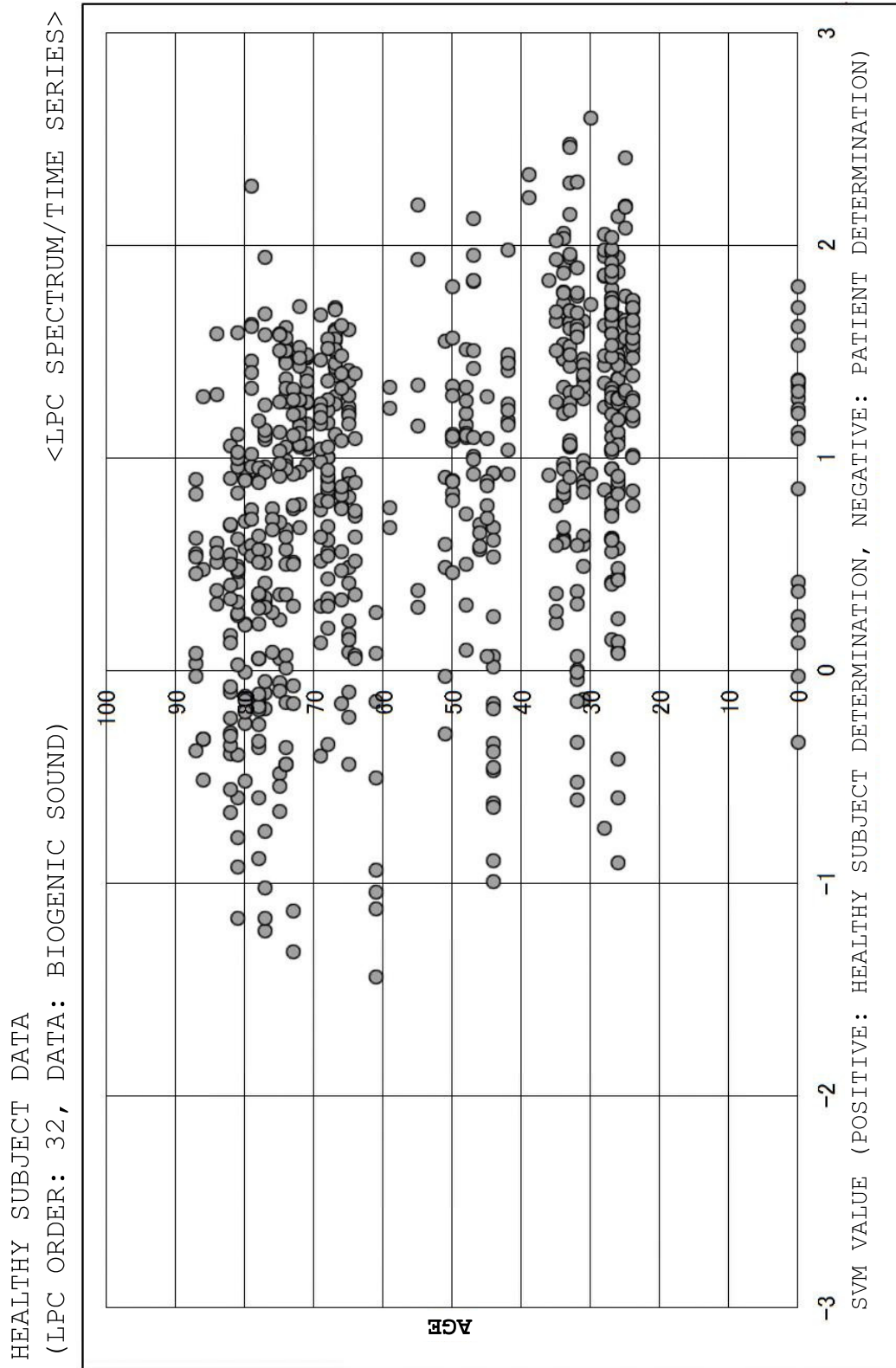


FIG. 19

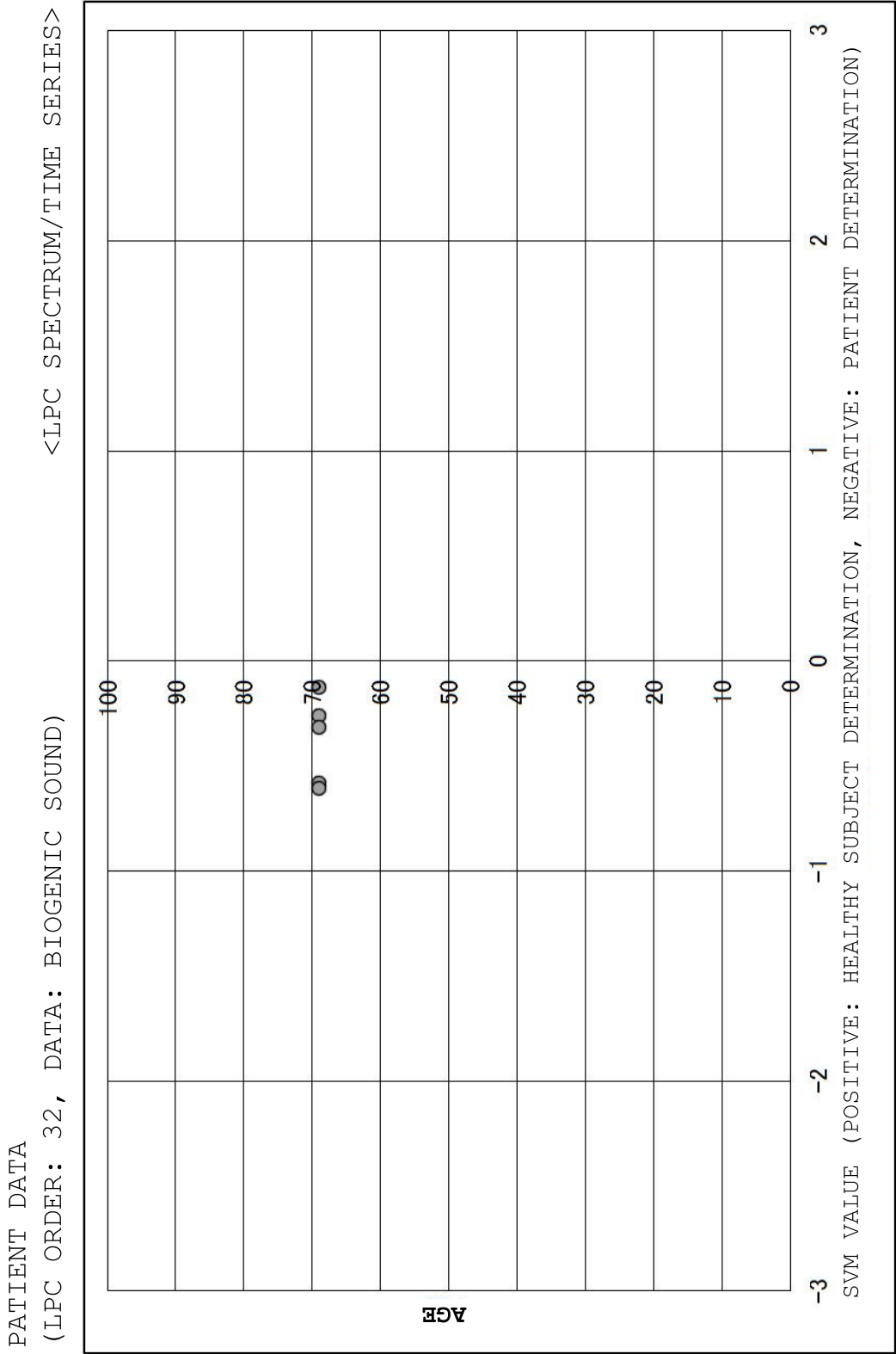


FIG.20

(a)

<LPC SPECTRUM>

PRESENCE OR ABSENCE OF TIME SERIES	F VALUE	ACCURACY [%]	HEALTHY SUBJECT DETERMINATION ACCURACY [%]	PATIENT DETERMINATION ACCURACY [%]
WITHOUT TIME SERIES	62.4	79.4	86.2	61.8
WITH TIME SERIES	64.1	80.6	87.4	62.7

(b) <EXAMINATION 3>

COMBINATION OF 3 DATA

<LPC SPECTRUM>

PRESENCE OR ABSENCE OF TIME SERIES	F VALUE	ACCURACY [%]	HEALTHY SUBJECT DETERMINATION ACCURACY [%]	PATIENT DETERMINATION ACCURACY [%]
8	70.8	85.2	92.8	65.1
16	71.2	85.2	92.3	66.5
32	73.7	86.6	93.7	67.9

FIG.21

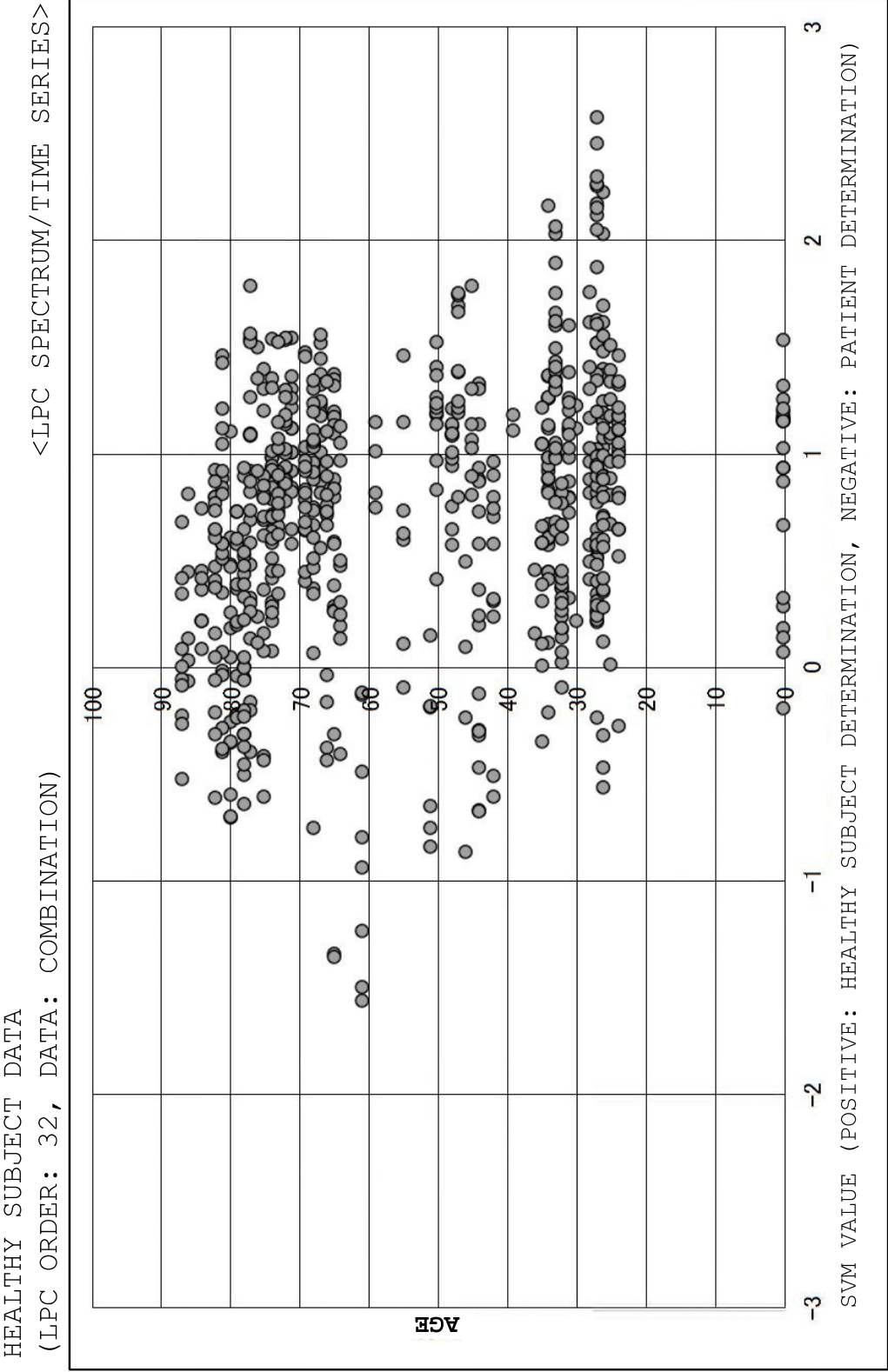


FIG.22

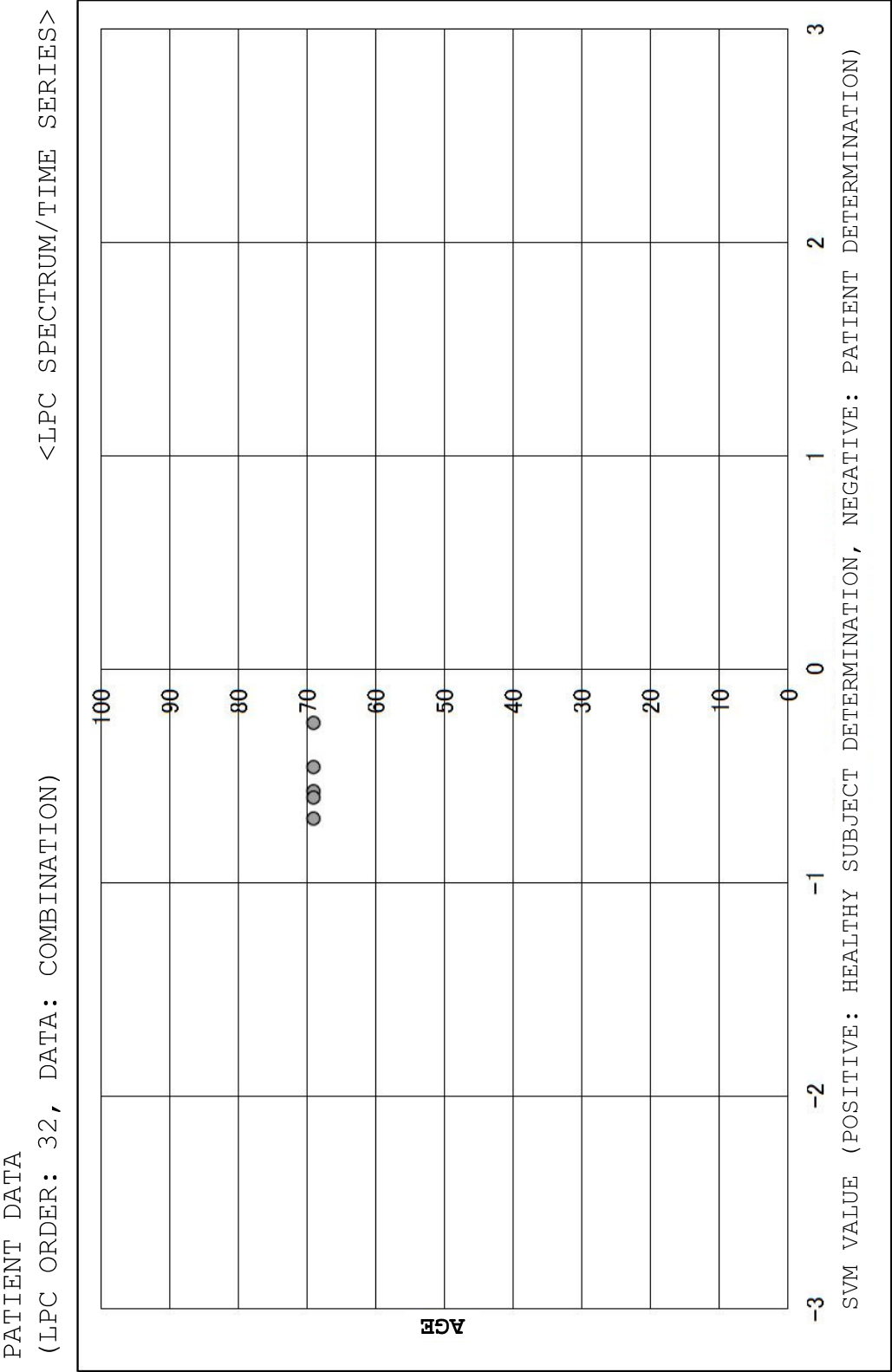


FIG. 23

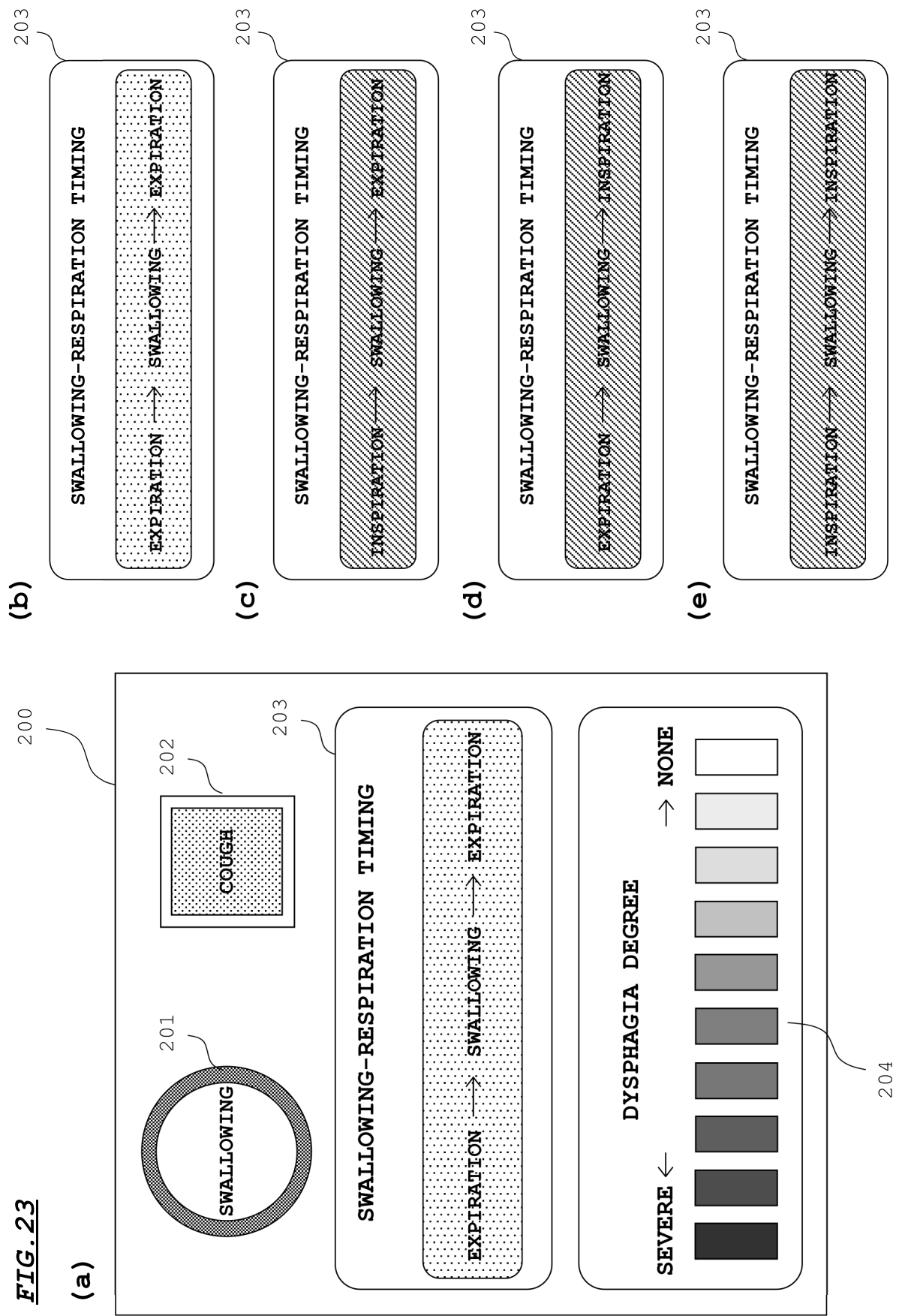
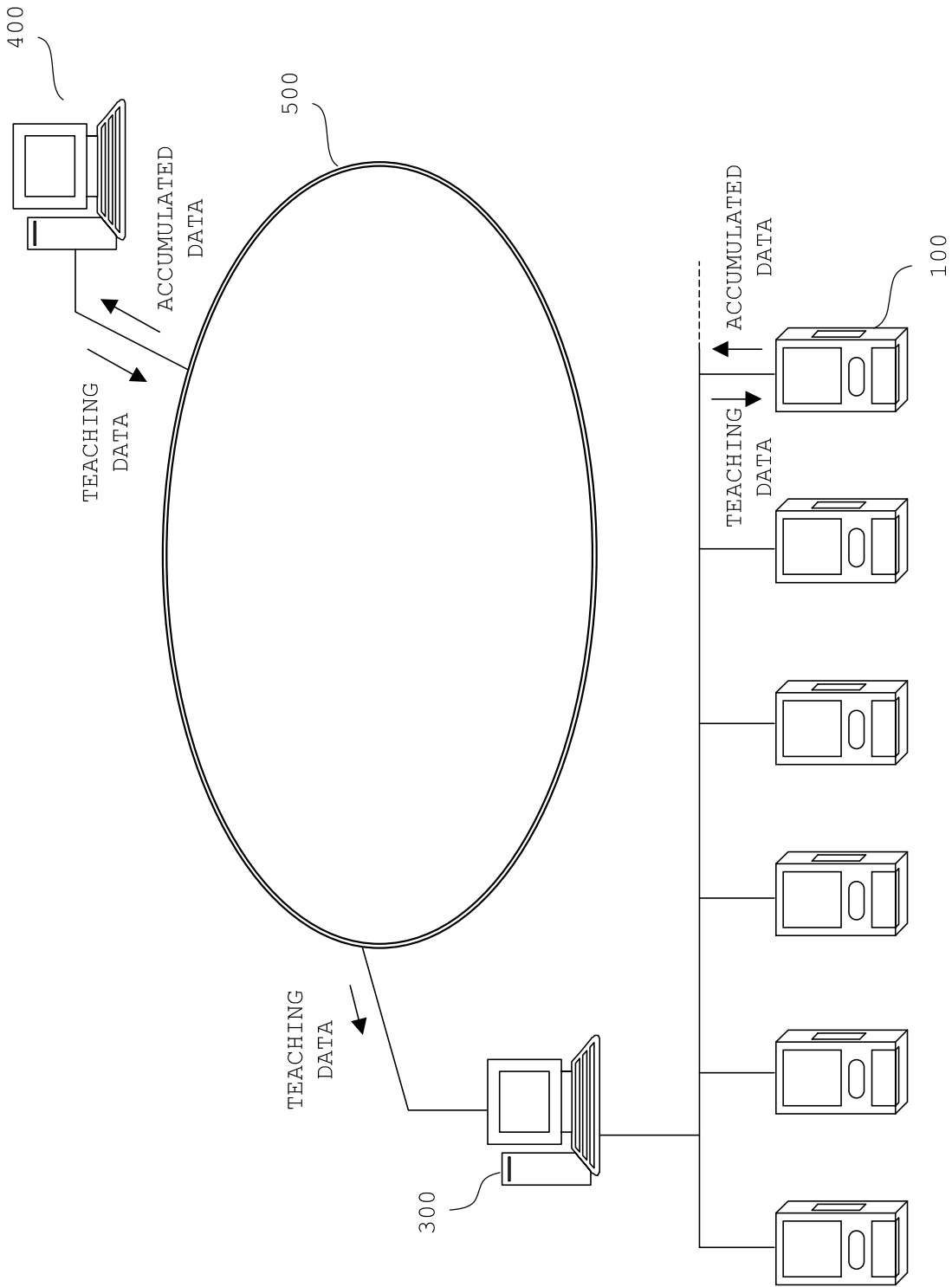


FIG. 24



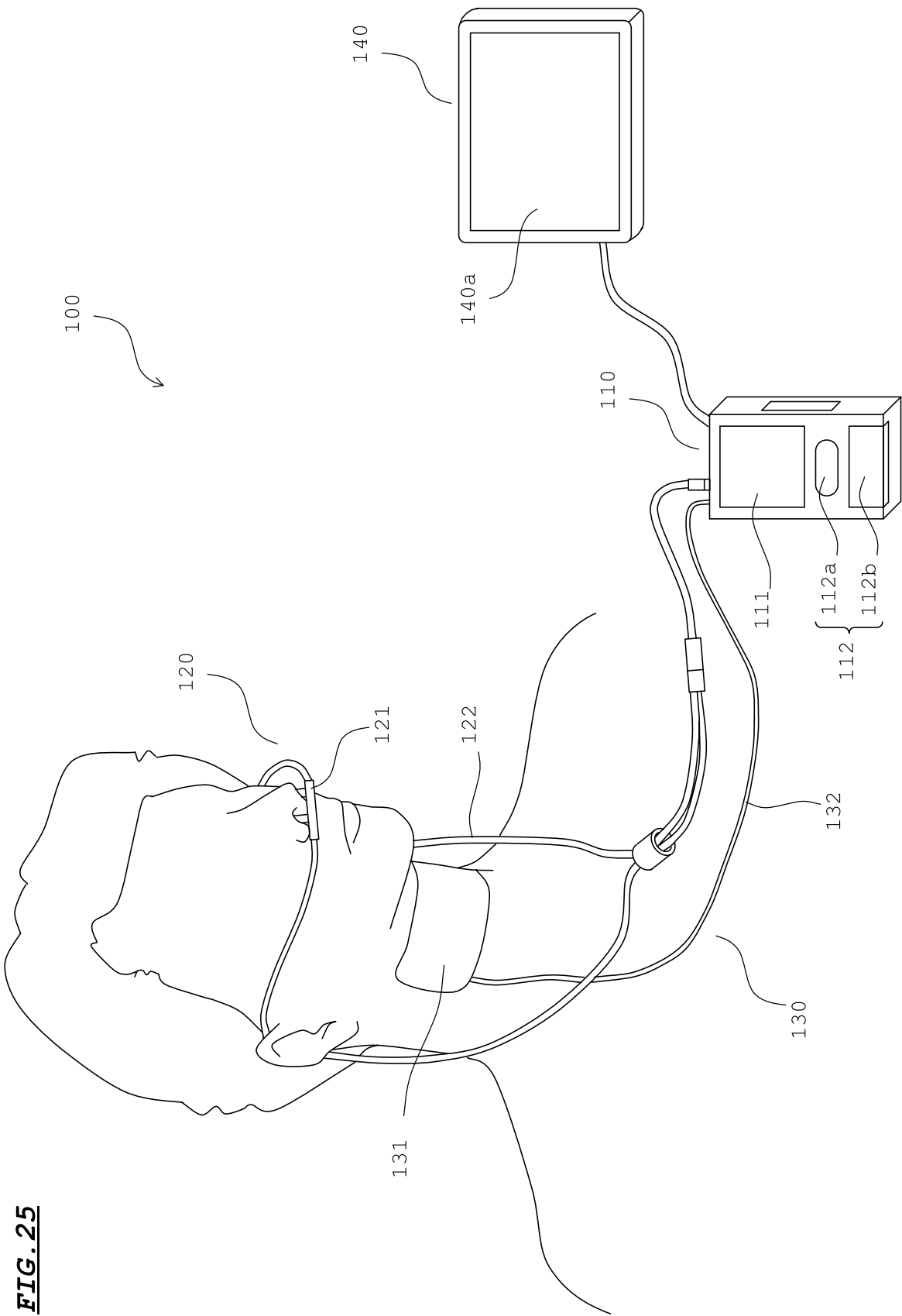


FIG. 25