

FIG. 1

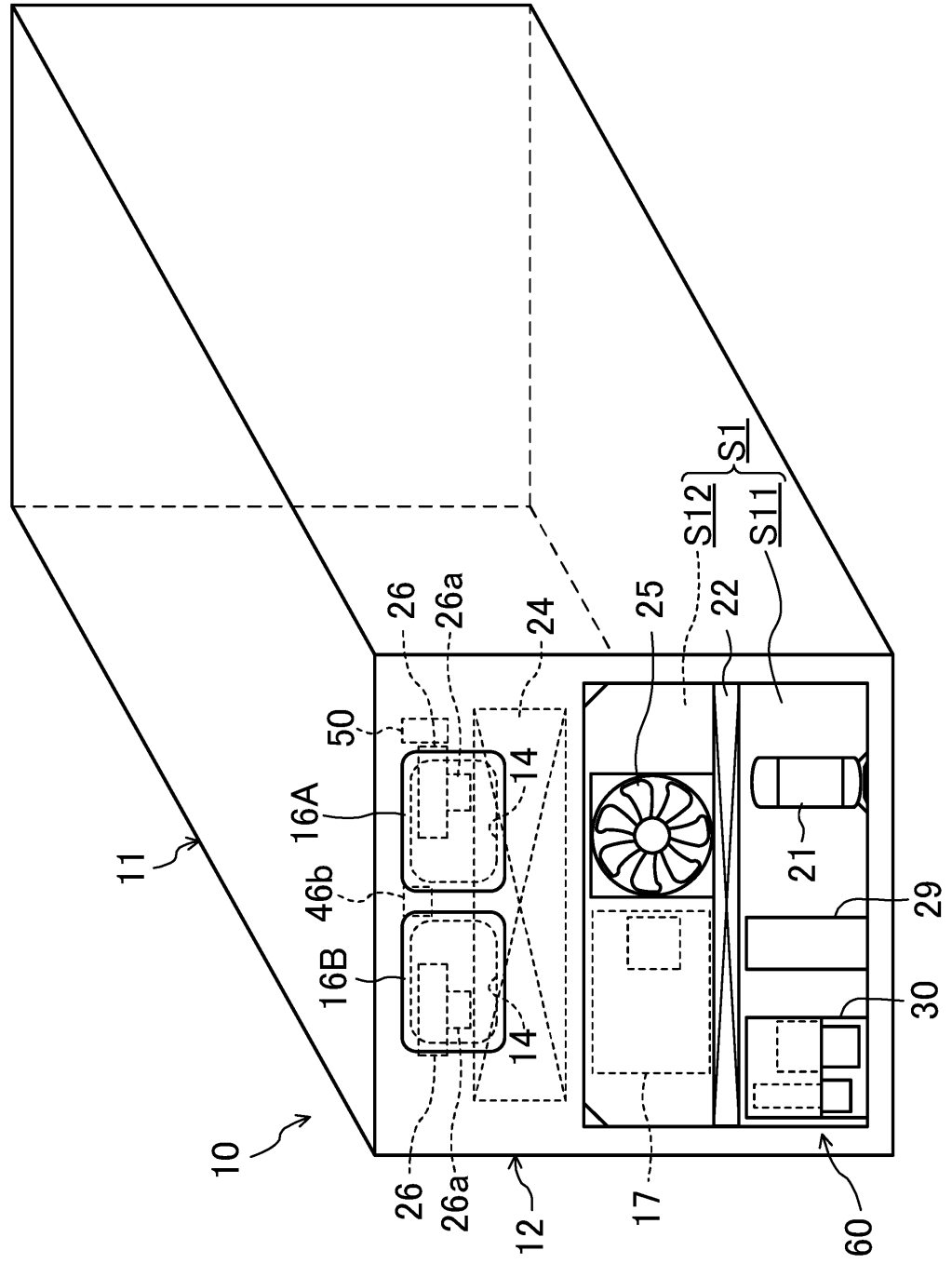


FIG.3

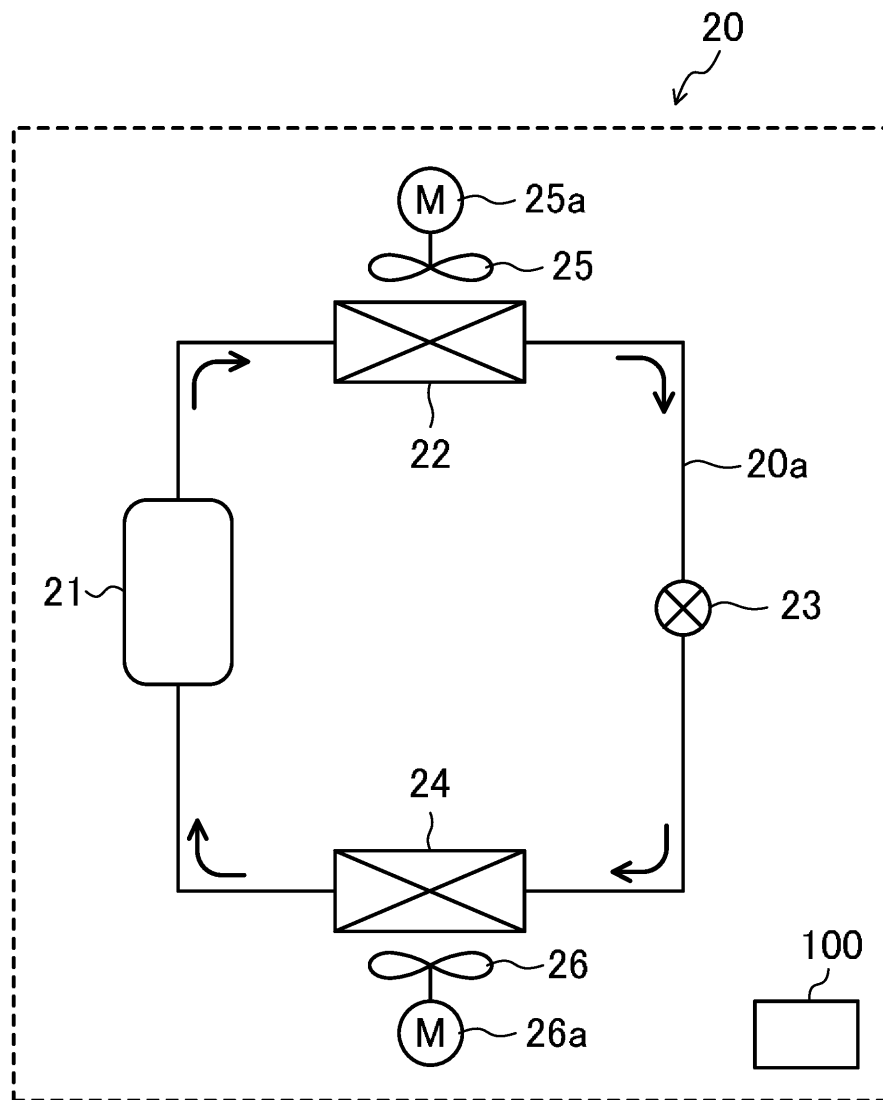
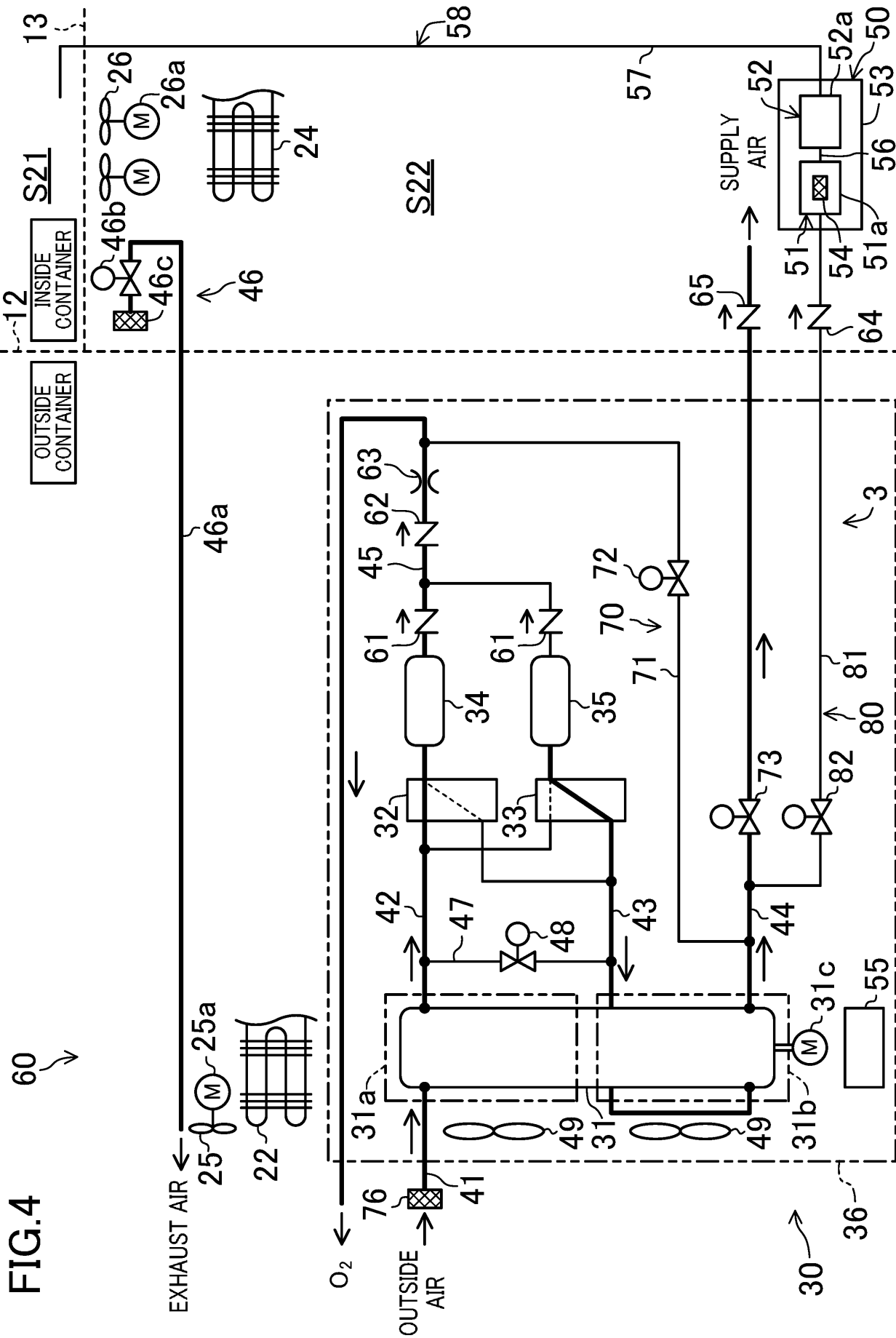


FIG.4



60 →



FIG. 6

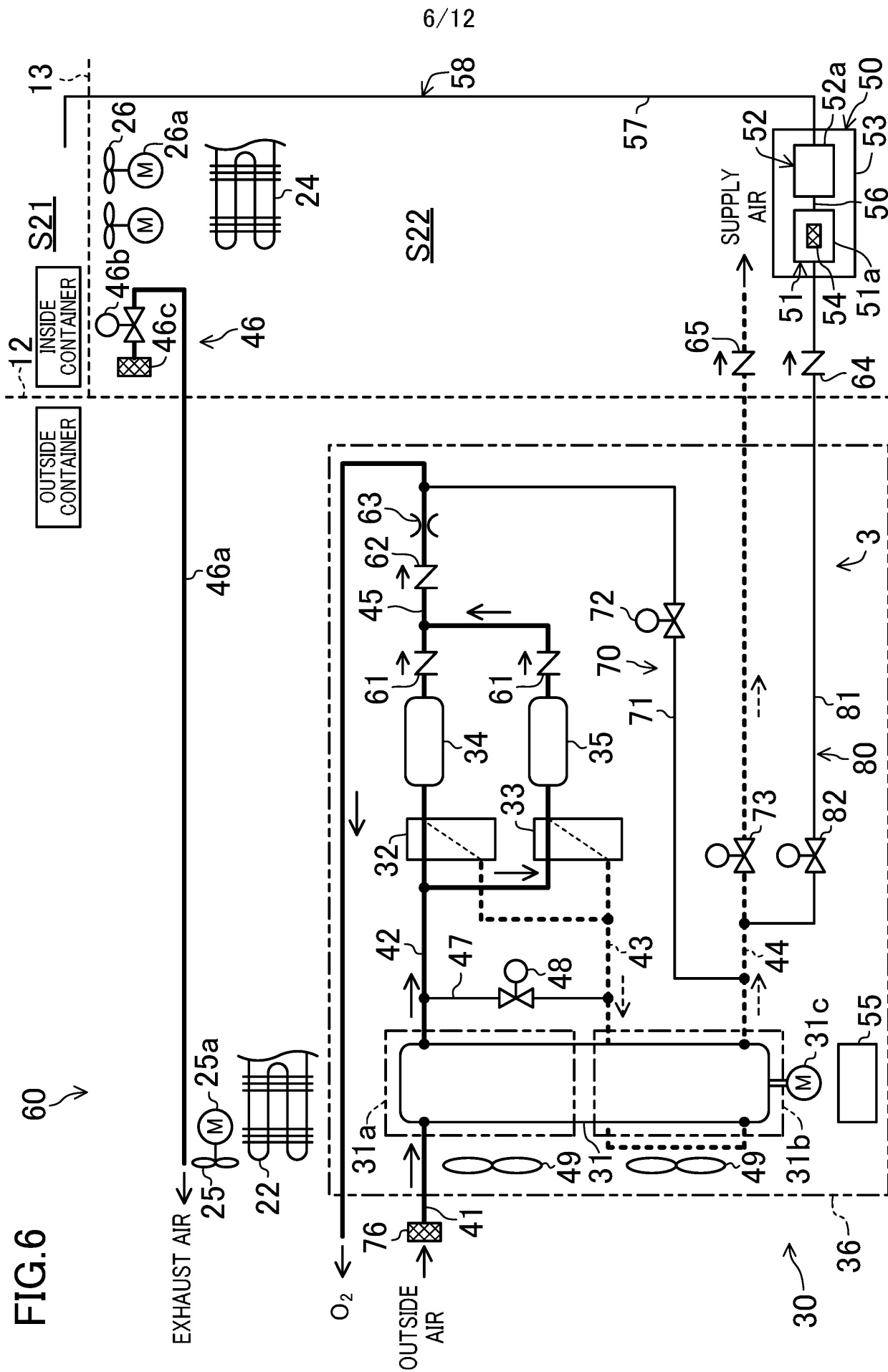


FIG. 7

60

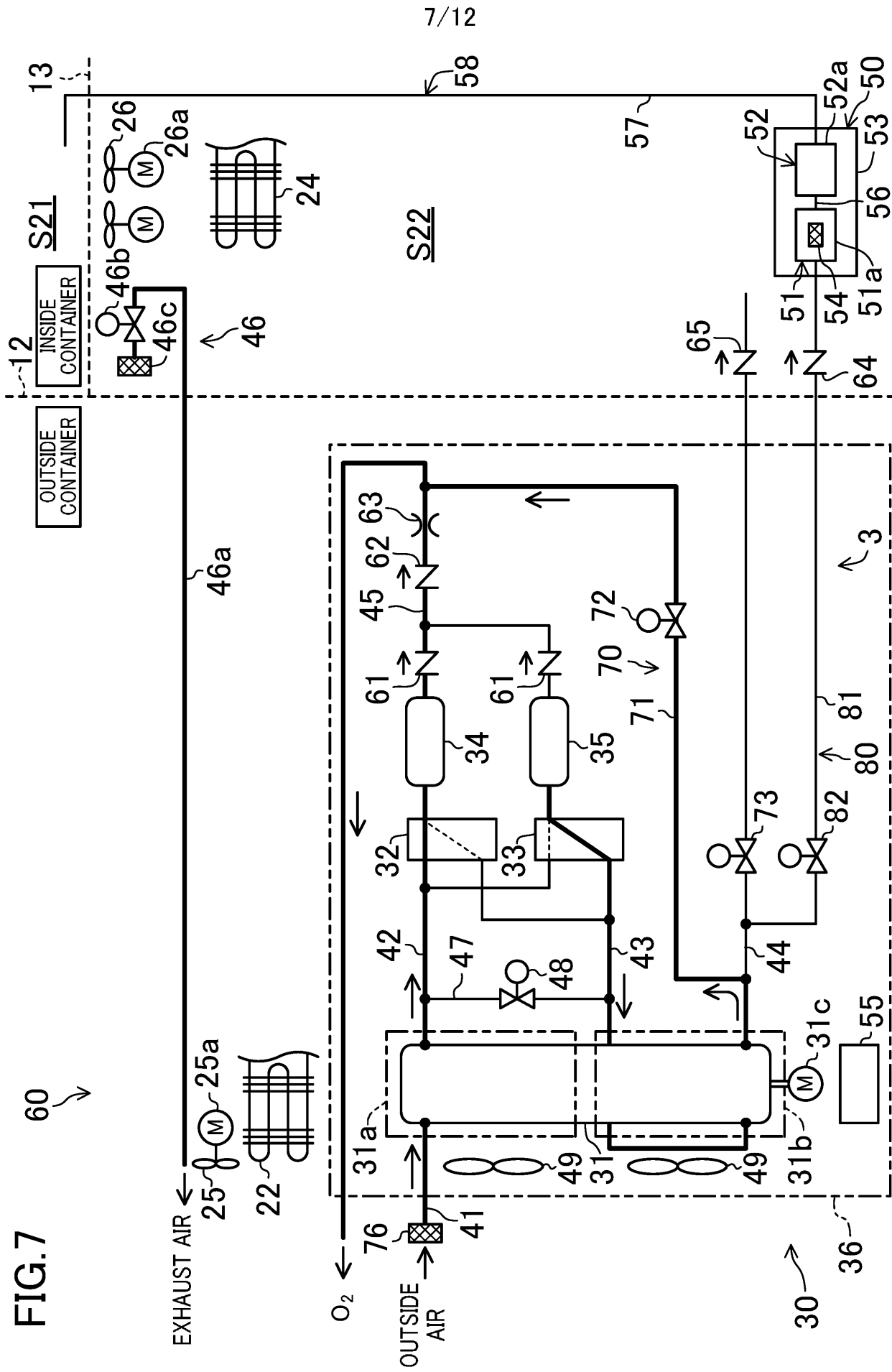


FIG.8

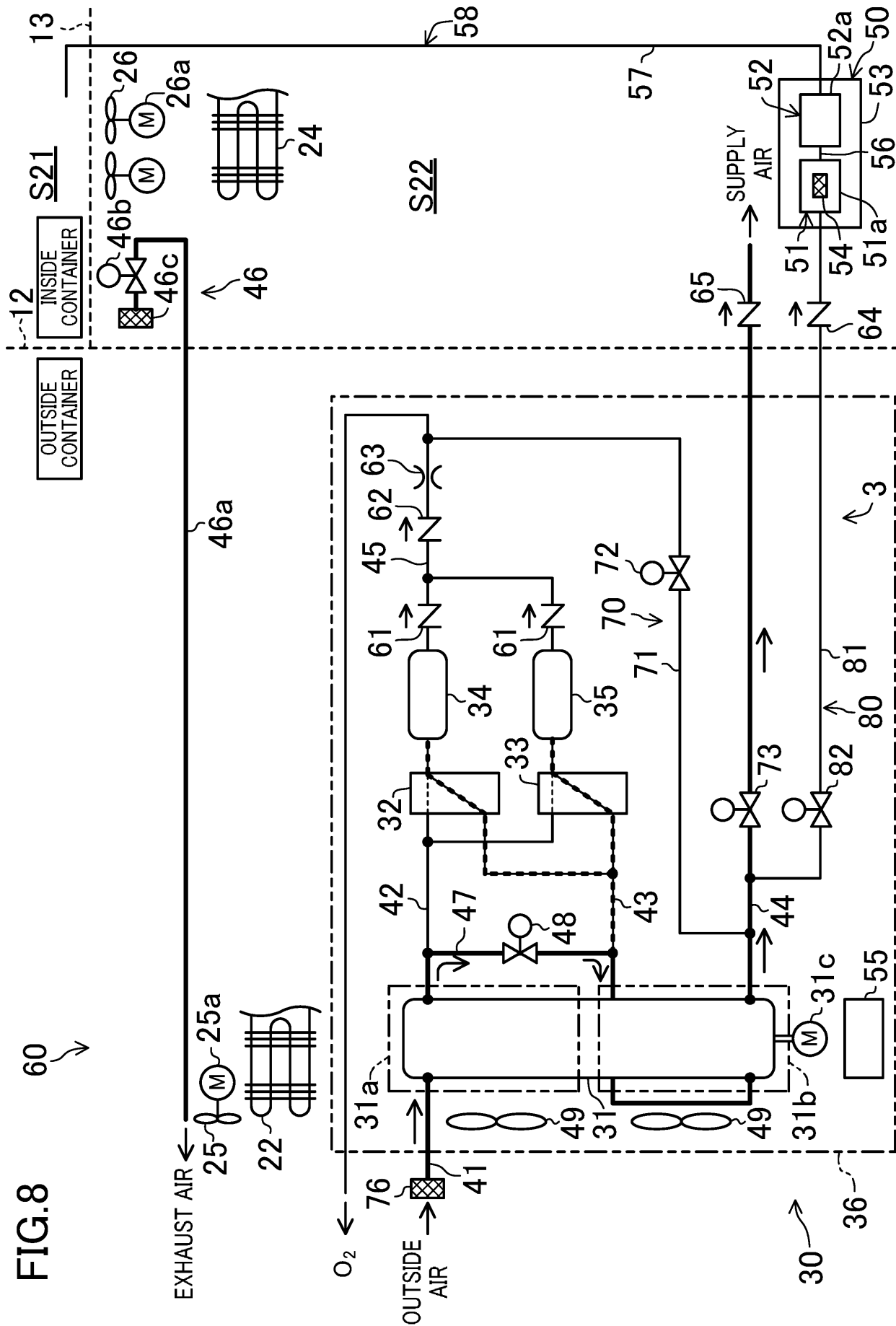


FIG.9

TIME POINTS AT WHICH VALVES SWITCH AND INTERNAL STATES OF ABSORPTION COLUMNS

OPERATION	FIRST OPERATION	PRESSURE EQUALIZATION OPERATION	SECOND OPERATION	PRESSURE EQUALIZATION OPERATION
FIRST DIRECTIONAL CONTROL VALVE	FIRST STATE		SECOND STATE	FIRST STATE
SECOND DIRECTIONAL CONTROL VALVE	FIRST STATE	SECOND STATE		
FIRST ADSORPTION COLUMN	PRESSURIZATION/ADSORPTION	PRESSURIZATION/ ADSORPTION	DEPRESSURIZATION/DESORPTION	PRESSURIZATION/ ADSORPTION
SECOND ADSORPTION COLUMN	DEPRESSURIZATION/DESORPTION	PRESSURIZATION/ ADSORPTION	PRESSURIZATION/ADSORPTION	PRESSURIZATION/ ADSORPTION

FIG.10

O₂ 5% MODE

OPERATION	FIRST OPERATION		PRESSURE EQUALIZATION OPERATION	SECOND OPERATION		PRESSURE EQUALIZATION OPERATION
EXHAUST ON-OFF VALVE	OPEN	CLOSED		OPEN	CLOSED	
SUPPLY ON- OFF VALVE	CLOSED	OPEN		CLOSED	OPEN	
NITROGEN- ENRICHED AIR	EXHAUSTED	SUPPLIED		EXHAUSTED	SUPPLIED	

FIG.11

O₂ 8% MODE

OPERATION	FIRST OPERATION	PRESSURE EQUALIZATION OPERATION	SECOND OPERATION	PRESSURE EQUALIZATION OPERATION
EXHAUST ON- OFF VALVE	CLOSED			
SUPPLY ON- OFF VALVE	OPEN			
NITROGEN- ENRICHED AIR	SUPPLIED			

FIG.12

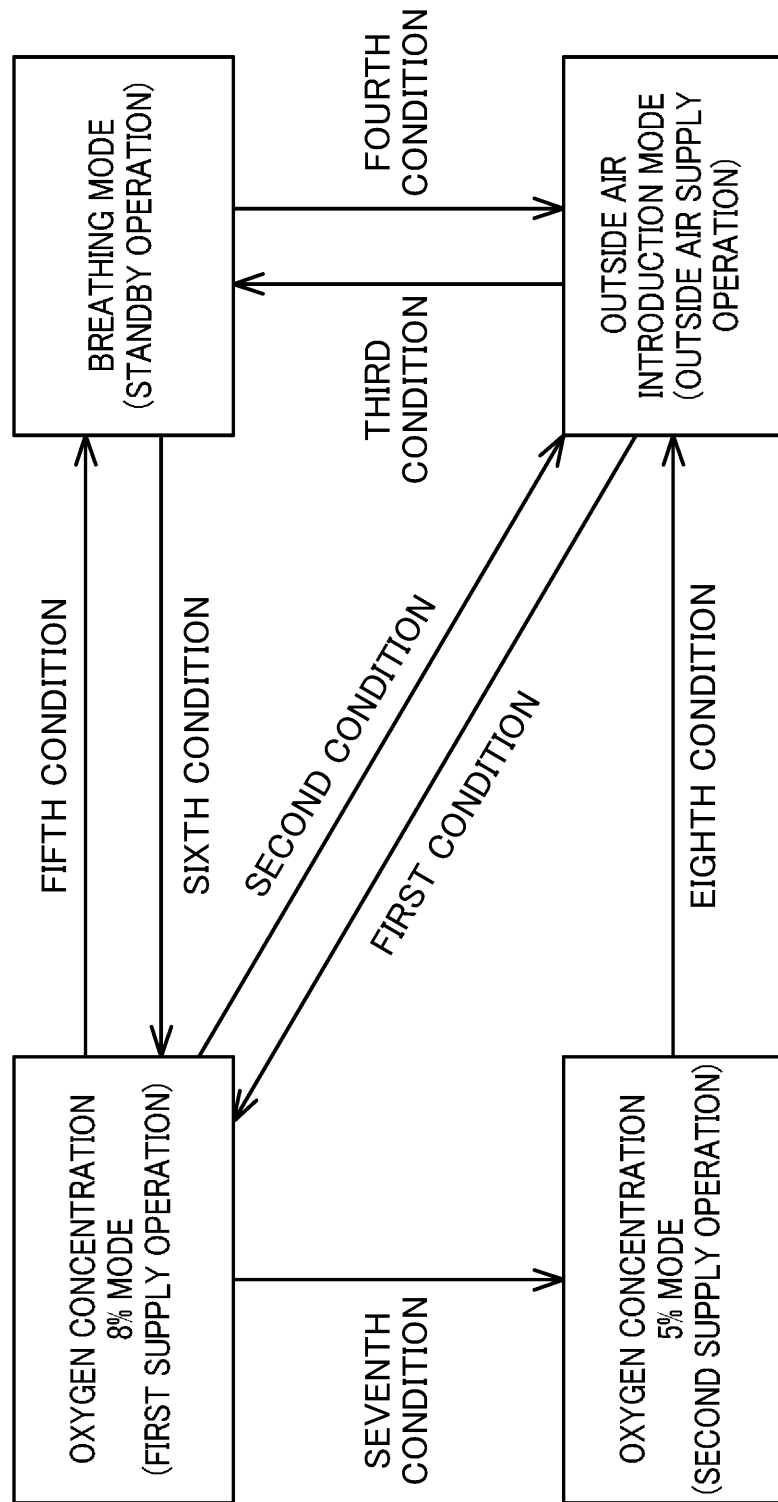
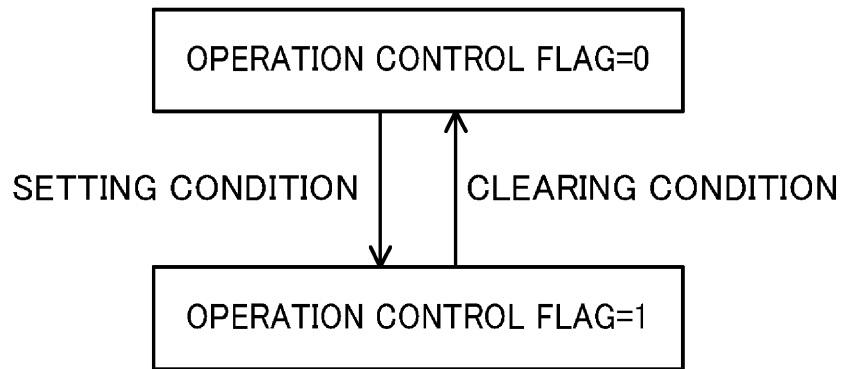


FIG.13

FIRST CONDITION (OUTSIDE AIR → OXYGEN 8%) $\text{or} \left[\begin{array}{l} \& \left[\begin{array}{l} \bullet \text{ OPERATION CONTROL FLAG}=0 \\ \bullet \text{ MV_O2} \geq \text{SP_O2}+p3 \\ \bullet \text{ MV_CO2} \geq \text{SP_CO2}+q2 \\ \bullet \text{ CONTINUED FOR 10 MINUTES} \end{array} \right] \\ \& \left[\begin{array}{l} \bullet \text{ OPERATION CONTROL FLAG}=1 \\ \bullet \text{ MV_O2} \geq \text{SP_O2}+p3 \\ \bullet \text{ CONTINUED FOR 10 MINUTES} \end{array} \right] \end{array} \right]$	FIFTH CONDITION (OXYGEN 8% → BREATHING) $\& \left[\begin{array}{l} \bullet \text{ OPERATION CONTROL FLAG}=0 \\ \text{or} \left[\begin{array}{l} \bullet \text{ MV_O2} \leq \text{SP_O2} \\ \bullet \text{ MV_CO2} \leq \text{SP_CO2} \\ \bullet \text{ CONTINUED FOR 10 MINUTES} \end{array} \right] \\ \& \left[\begin{array}{l} \bullet \text{ MV_O2} \geq \text{SP_O2}+p2 \\ \bullet \text{ CONTINUED FOR 10 MINUTES} \end{array} \right] \end{array} \right]$
SECOND CONDITION (OXYGEN 8% → OUTSIDE AIR) $\& \left[\begin{array}{l} \bullet \text{ MV_O2} \leq \text{SP_O2}-p3 \\ \bullet \text{ CONTINUED FOR 10 MINUTES} \end{array} \right]$	SIXTH CONDITION (BREATHING → OXYGEN 8%) $\text{or} \left[\begin{array}{l} \bullet \text{ OPERATION CONTROL FLAG}=1 \\ \& \left[\begin{array}{l} \bullet \text{ MV_O2} \leq \text{SP_O2}-p4 \\ \bullet \text{ MV_CO2} \geq \text{SP_CO2}+q2 \\ \bullet \text{ CONTINUED FOR 10 MINUTES} \end{array} \right] \end{array} \right]$
THIRD CONDITION (OUTSIDE AIR → BREATHING) $\& \left[\begin{array}{l} \bullet \text{ OPERATION CONTROL FLAG}=0 \\ \& \left[\begin{array}{l} \bullet \text{ MV_O2} \geq \text{SP_O2} \\ \bullet \text{ MV_CO2} \leq \text{SP_CO2}+q3 \\ \bullet \text{ CONTINUED FOR 10 MINUTES} \end{array} \right] \end{array} \right]$	SEVENTH CONDITION (OXYGEN 8% → OXYGEN 5%) $\& \left[\begin{array}{l} \bullet \text{ OPERATION CONTROL FLAG}=1 \\ \& \left[\begin{array}{l} \bullet \text{ MV_O2} \geq \text{SP_O2}+p1 \\ \bullet \text{ CONTINUED FOR 10 MINUTES} \end{array} \right] \end{array} \right]$
FOURTH CONDITION (BREATHING → OUTSIDE AIR) $\& \left[\begin{array}{l} \bullet \text{ OPERATION CONTROL FLAG}=0 \\ \& \left[\begin{array}{l} \bullet \text{ MV_O2} \leq \text{SP_O2}-p3 \\ \bullet \text{ CONTINUED FOR 10 MINUTES} \end{array} \right] \end{array} \right]$	EIGHTH CONDITION (OXYGEN 5% → OUTSIDE AIR) $\& \left[\begin{array}{l} \bullet \text{ OPERATION CONTROL FLAG}=1 \\ \& \left[\begin{array}{l} \bullet \text{ MV_O2} \leq \text{SP_O2}-p3 \\ \bullet \text{ CONTINUED FOR 10 MINUTES} \end{array} \right] \end{array} \right]$

FIG.14



SETTING CONDITION

- $SP_O2 - p3 \leq MV_O2 \leq SP_O2 + p3$
- & • $MV_CO2 \geq SP_CO2 + q1$
- CONTINUED FOR 10 MINUTES

CLEARING CONDITION

- $MV_O2 \leq SP_O2$
- & • $MV_CO2 \leq SP_CO2 + q2$
- CONTINUED FOR 10 MINUTES