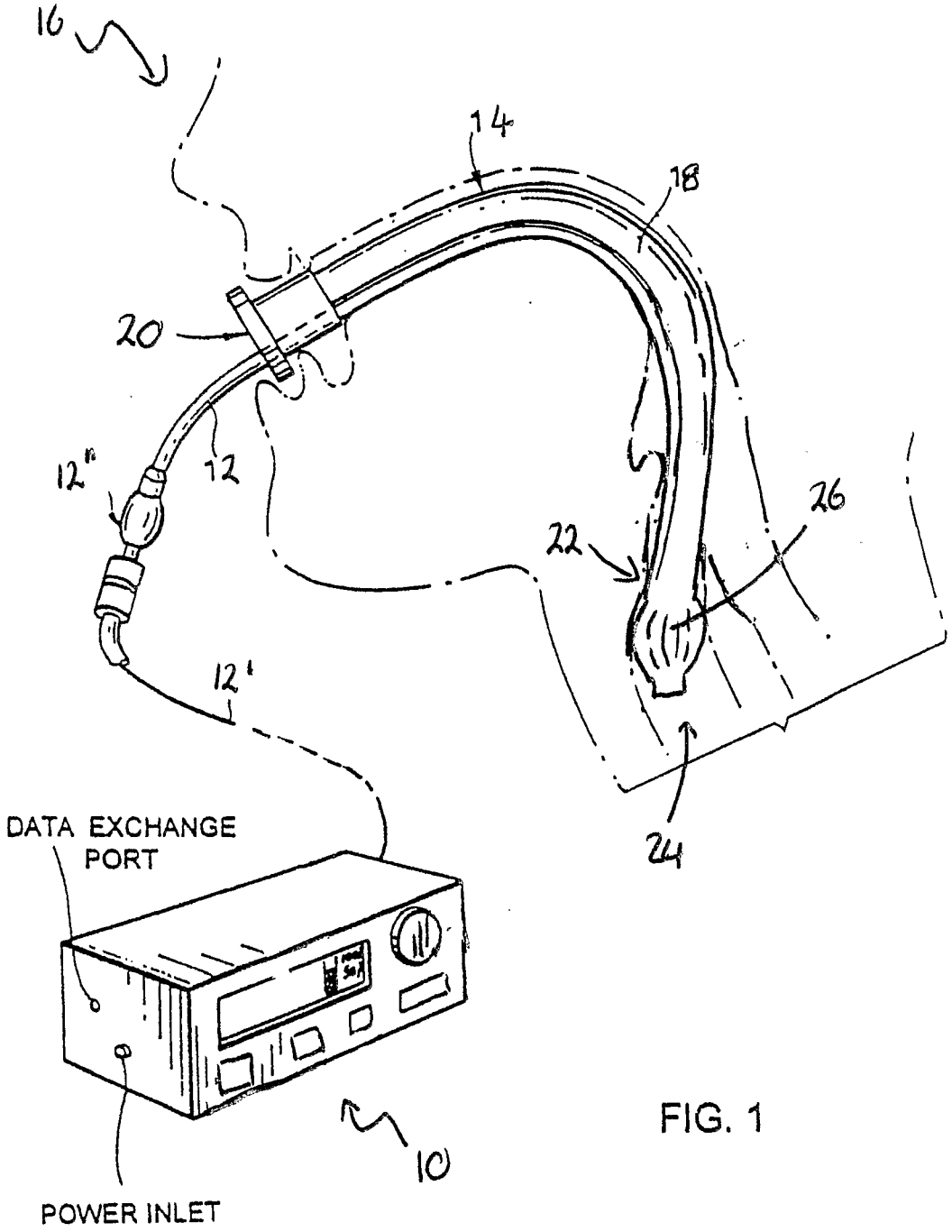


FIG. 1

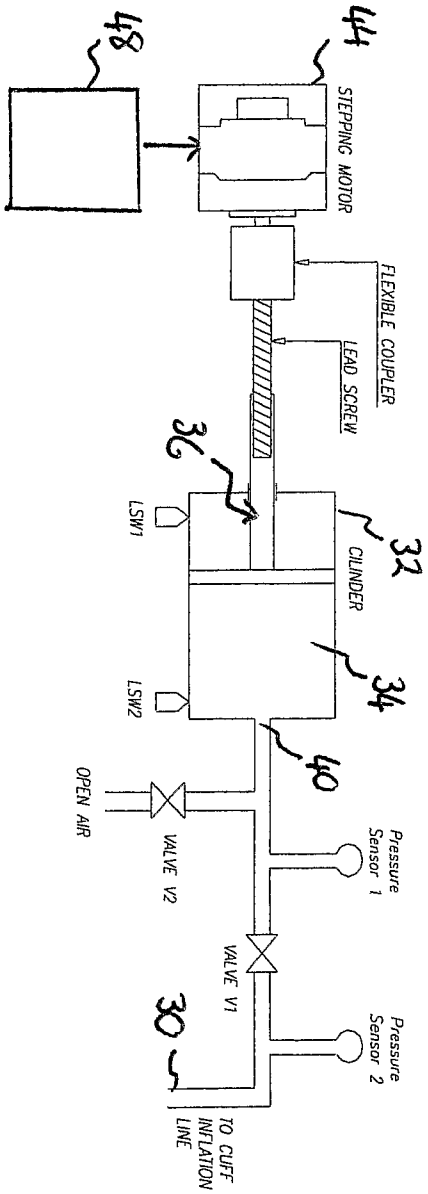

48
44
STEPPING MOTOR
FLEXIBLE COUPLER
LEAD SCREW
36
LSW1
32
CILINDER
34
LSW2
40
OPEN AIR
VALVE V2
Pressure Sensor 1
VALVE V1
30
Pressure Sensor 2
TO CUFF INFLATION LINE

FIGURE 2

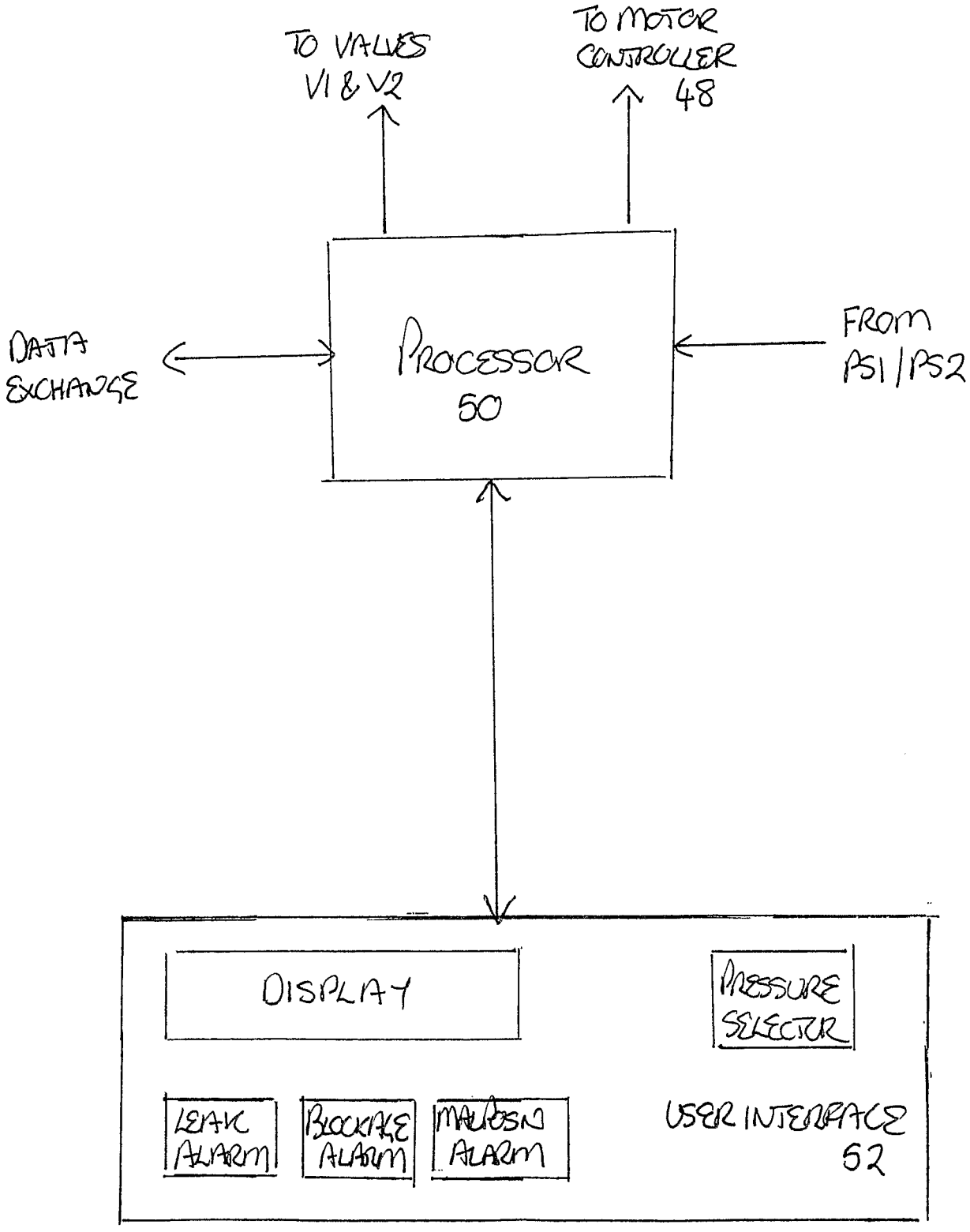

TO VALVES V1 & V2
TO MOTOR CONTROLLER 48
DATA EXCHANGE
PROCESSOR 50
FROM PS1/PS2
DISPLAY
PRESSURE SELECTOR
LEAK ALARM
BLOCKAGE ALARM
MALFUNCTION ALARM
USER INTERFACE 52

FIGURE 3

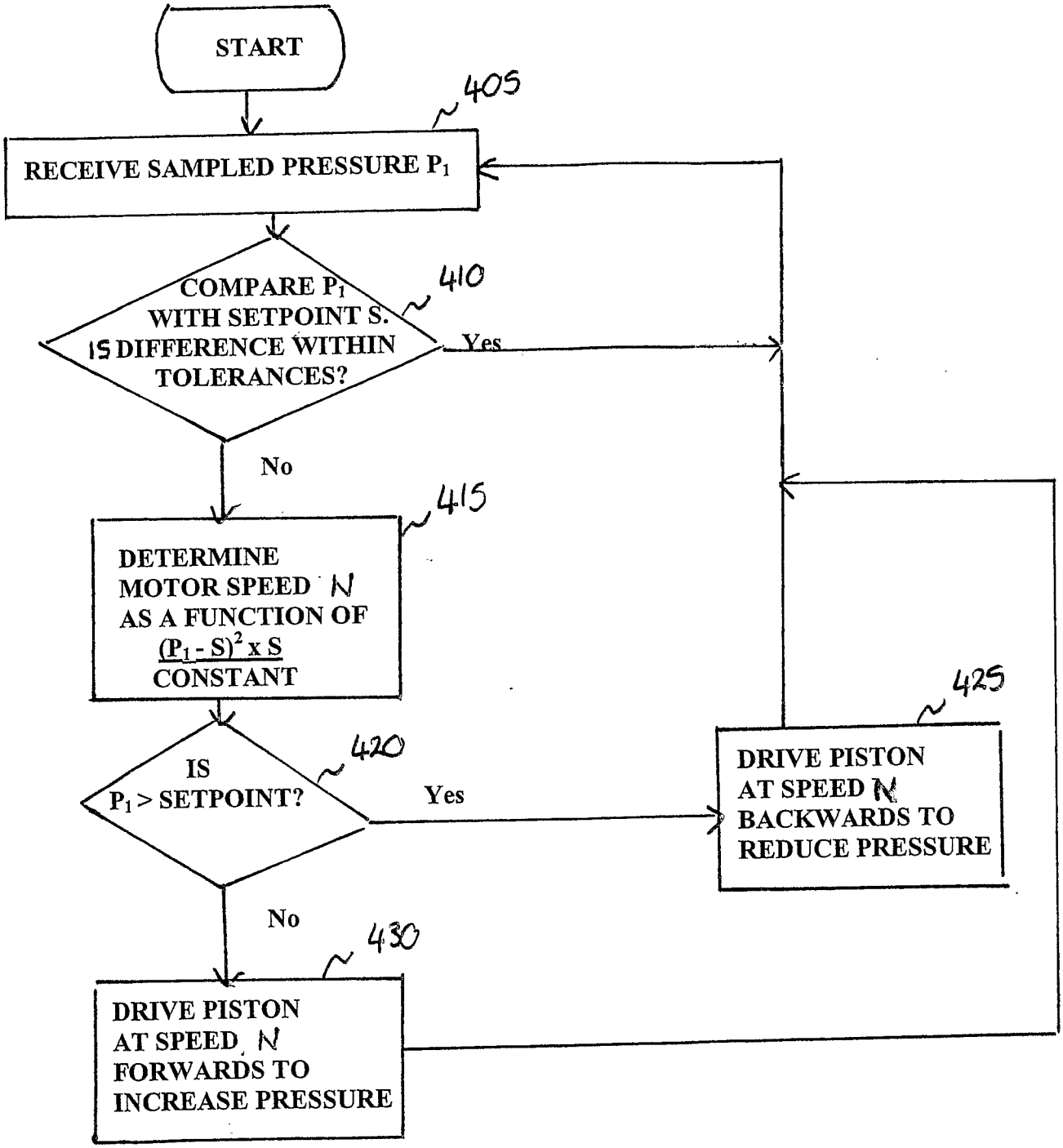

START
405
RECEIVE SAMPLED PRESSURE P_1
410
COMPARE P_1 WITH SETPOINT S. IS DIFFERENCE WITHIN TOLERANCES?
Yes
No
415
DETERMINE MOTOR SPEED N AS A FUNCTION OF $\frac{(P_1 - S)^2 \times S}{\text{CONSTANT}}$
420
IS P_1 > SETPOINT?
Yes
425
DRIVE PISTON AT SPEED N BACKWARDS TO REDUCE PRESSURE
No
430
DRIVE PISTON AT SPEED N FORWARDS TO INCREASE PRESSURE

FIGURE 4

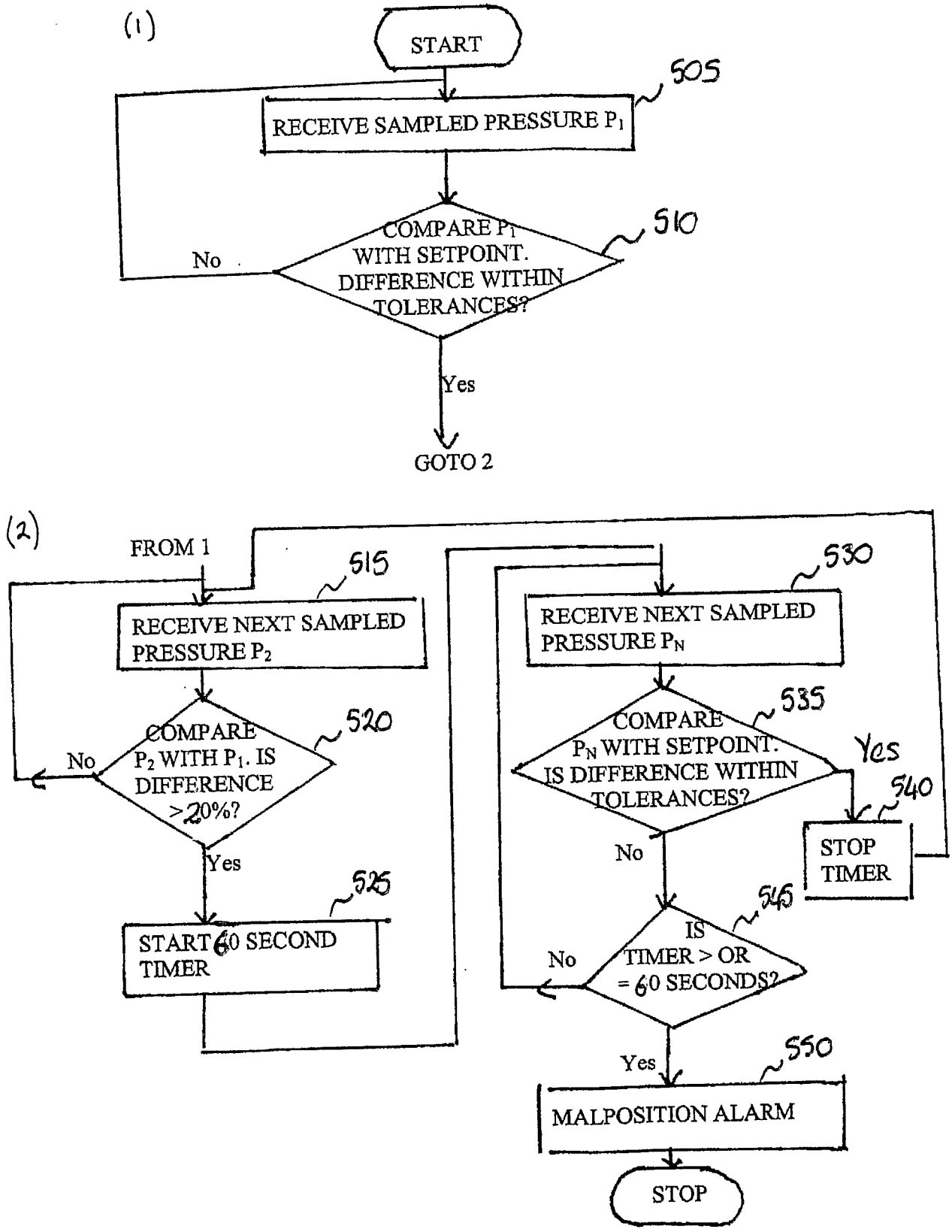

(1)
START
505
RECEIVE SAMPLED PRESSURE P_1
510
COMPARE P_1 WITH SETPOINT. DIFFERENCE WITHIN TOLERANCES?
No
Yes
GOTO 2
(2)
FROM 1
515
RECEIVE NEXT SAMPLED PRESSURE P_2
520
COMPARE P_2 WITH P_1. IS DIFFERENCE >20%?
No
Yes
525
START 60 SECOND TIMER
530
RECEIVE NEXT SAMPLED PRESSURE P_N
535
COMPARE P_N WITH SETPOINT. IS DIFFERENCE WITHIN TOLERANCES?
Yes
540
STOP TIMER
No
545
IS TIMER > OR = 60 SECONDS?
No
Yes
550
MALPOSITION ALARM
STOP

FIGURE 5A

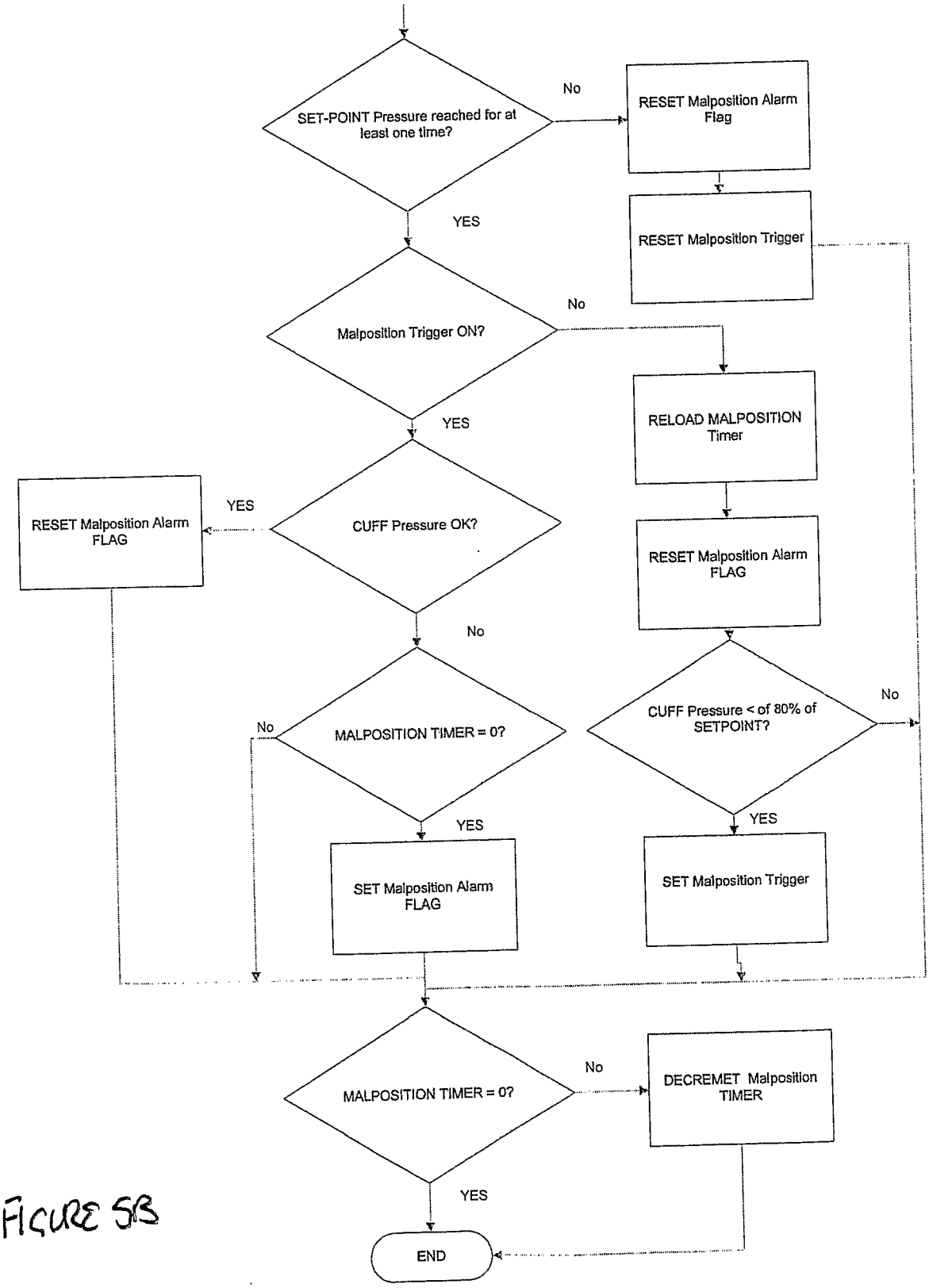

SET-POINT Pressure reached for at least one time?
No
RESET Malposition Alarm Flag
RESET Malposition Trigger
YES
Malposition Trigger ON?
No
RELOAD MALPOSITION Timer
YES
CUFF Pressure OK?
YES
RESET Malposition Alarm FLAG
RESET Malposition Alarm FLAG
No
MALPOSITION TIMER = 0?
No
CUFF Pressure < of 80% of SETPOINT?
No
YES
YES
SET Malposition Alarm FLAG
SET Malposition Trigger
MALPOSITION TIMER = 0?
No
DECREMET Malposition TIMER
YES
END

FIGURE 5B

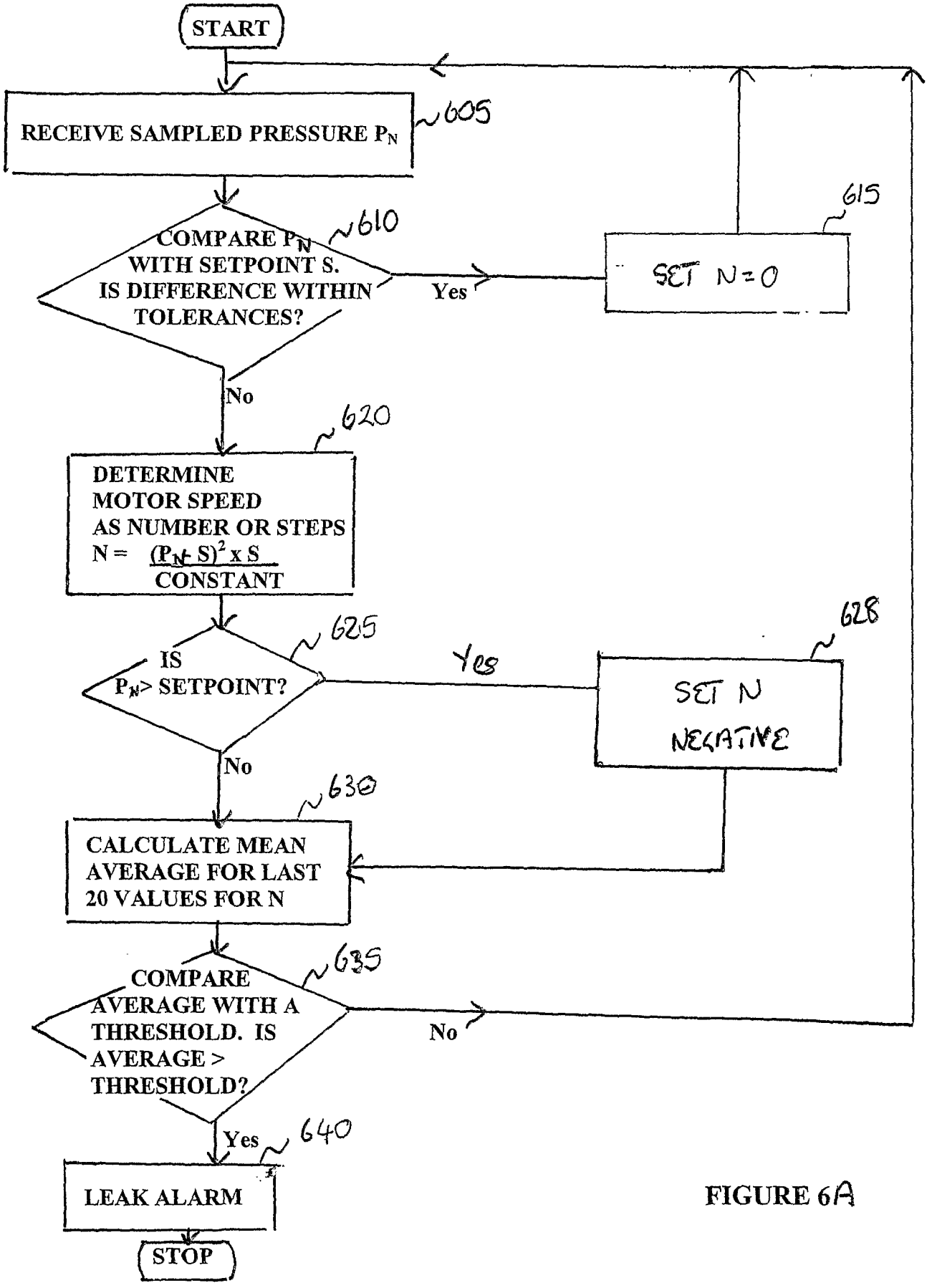

START
RECEIVE SAMPLED PRESSURE P_N
605
COMPARE P_N WITH SETPOINT S. IS DIFFERENCE WITHIN TOLERANCES?
610
Yes
SET N=0
615
No
DETERMINE MOTOR SPEED AS NUMBER OR STEPS
$N = \frac{(P_N - S)^2 \times S}{\text{CONSTANT}}$
620
IS P_N > SETPOINT?
625
Yes
SET N NEGATIVE
628
No
CALCULATE MEAN AVERAGE FOR LAST 20 VALUES FOR N
630
COMPARE AVERAGE WITH A THRESHOLD. IS AVERAGE > THRESHOLD?
635
No
Yes
LEAK ALARM
640
STOP

FIGURE 6A

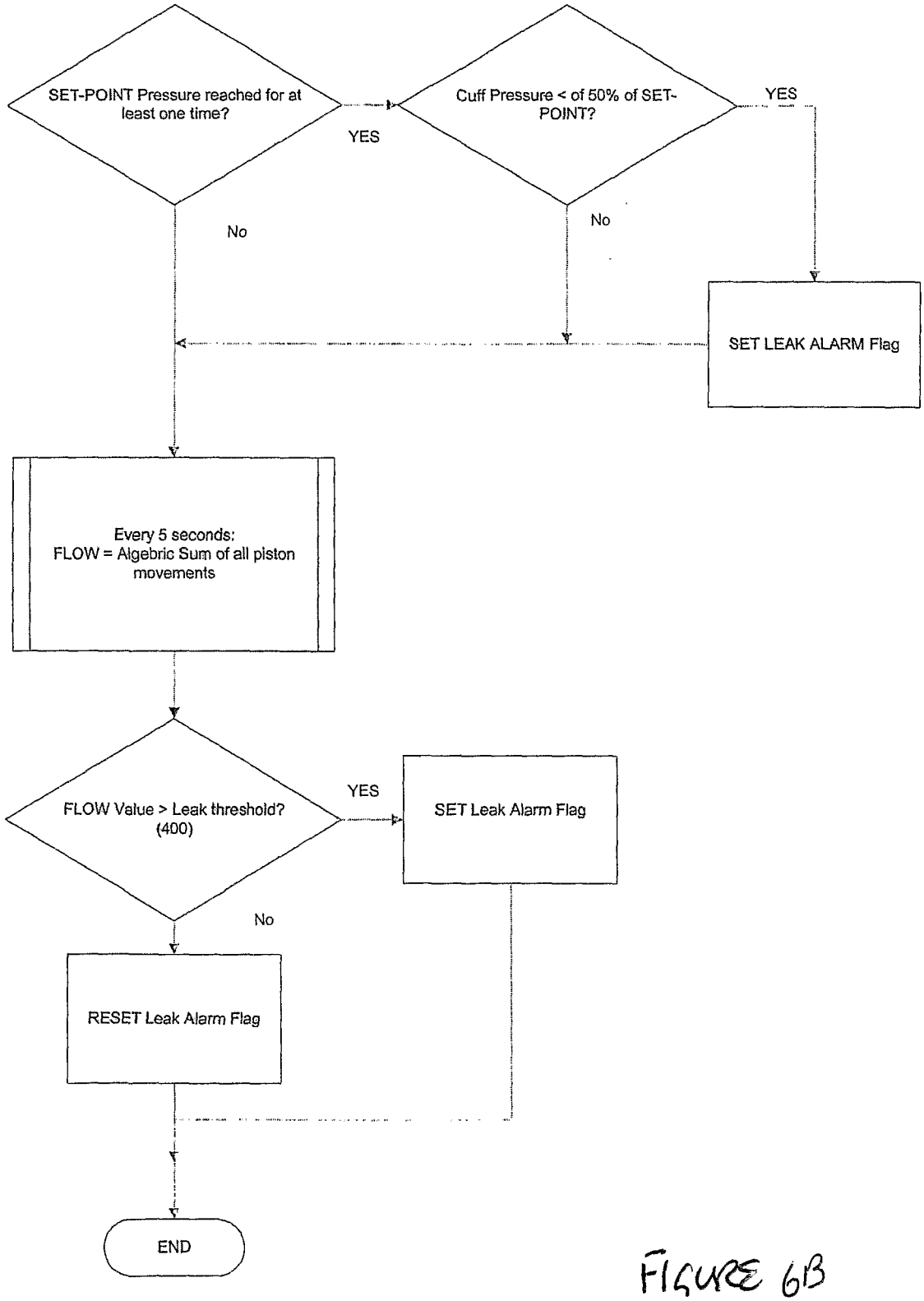

SET-POINT Pressure reached for at least one time?
YES
Cuff Pressure < of 50% of SET-POINT?
YES
No
No
SET LEAK ALARM Flag
Every 5 seconds:
FLOW = Algebric Sum of all piston movements
FLOW Value > Leak threshold? (400)
YES
SET Leak Alarm Flag
No
RESET Leak Alarm Flag
END

FIGURE 6B

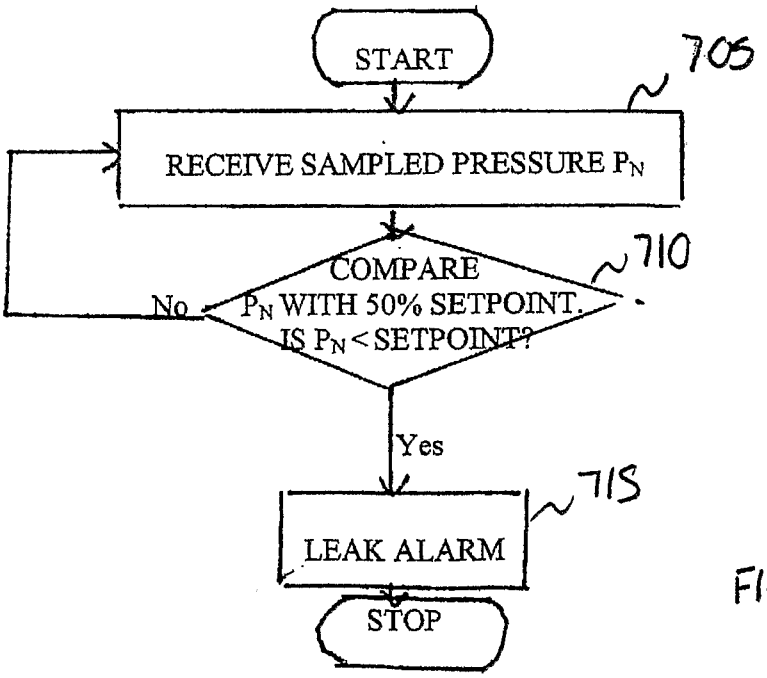

START
705
RECEIVE SAMPLED PRESSURE P_N
710
COMPARE
P_N WITH 50% SETPOINT.
IS P_N < SETPOINT?
No
Yes
715
LEAK ALARM
STOP

FIGURE 7

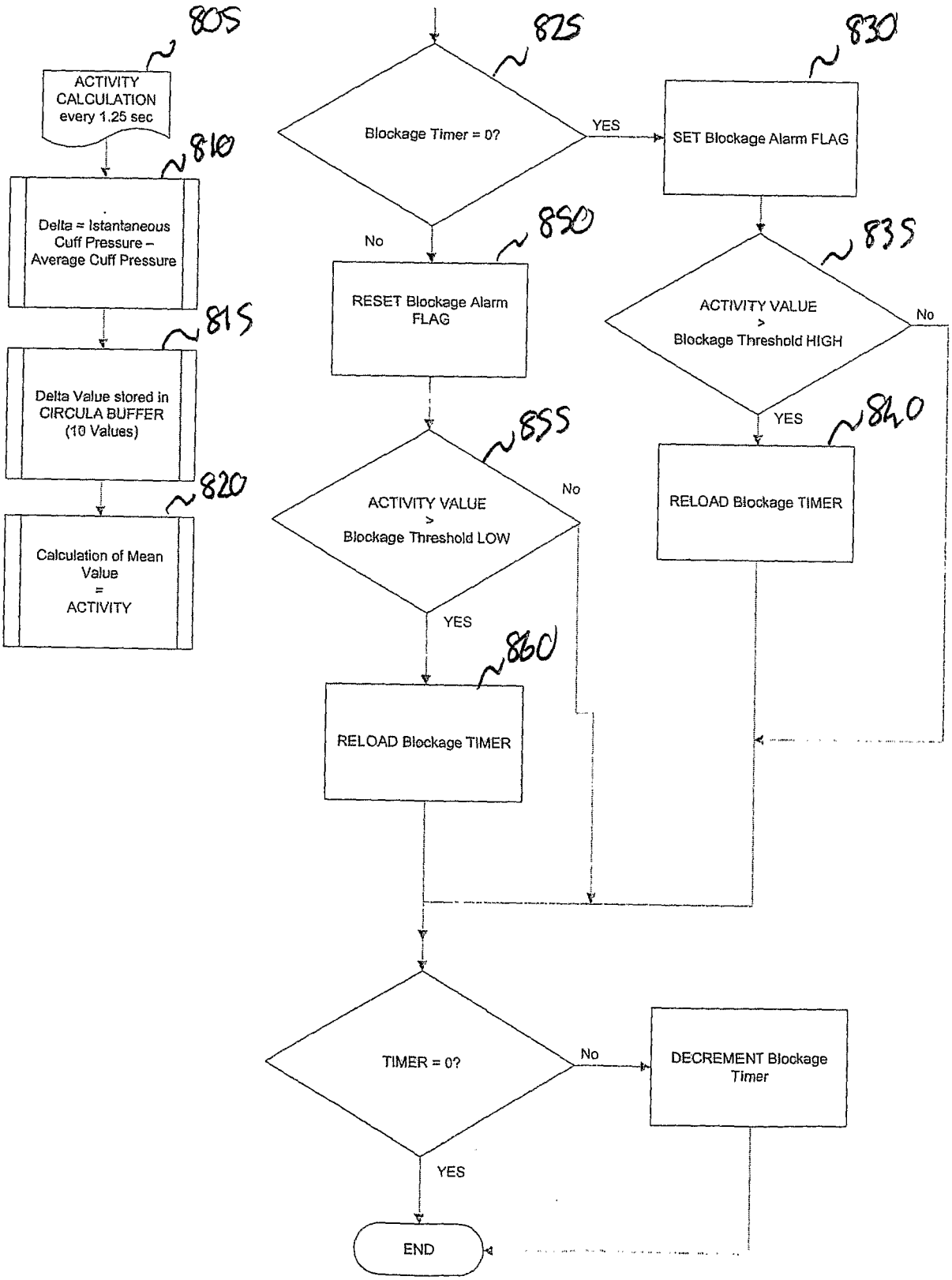

805
ACTIVITY CALCULATION every 1.25 sec
810
Delta = Istantaneous Cuff Pressure – Average Cuff Pressure
815
Delta Value stored in CIRCULA BUFFER (10 Values)
820
Calculation of Mean Value = ACTIVITY
825
Blockage Timer = 0?
YES
No
830
SET Blockage Alarm FLAG
835
ACTIVITY VALUE > Blockage Threshold HIGH
No
YES
840
RELOAD Blockage TIMER
850
RESET Blockage Alarm FLAG
855
ACTIVITY VALUE > Blockage Threshold LOW
No
YES
860
RELOAD Blockage TIMER
TIMER = 0?
No
DECREMENT Blockage Timer
YES
END

FIGURE 8