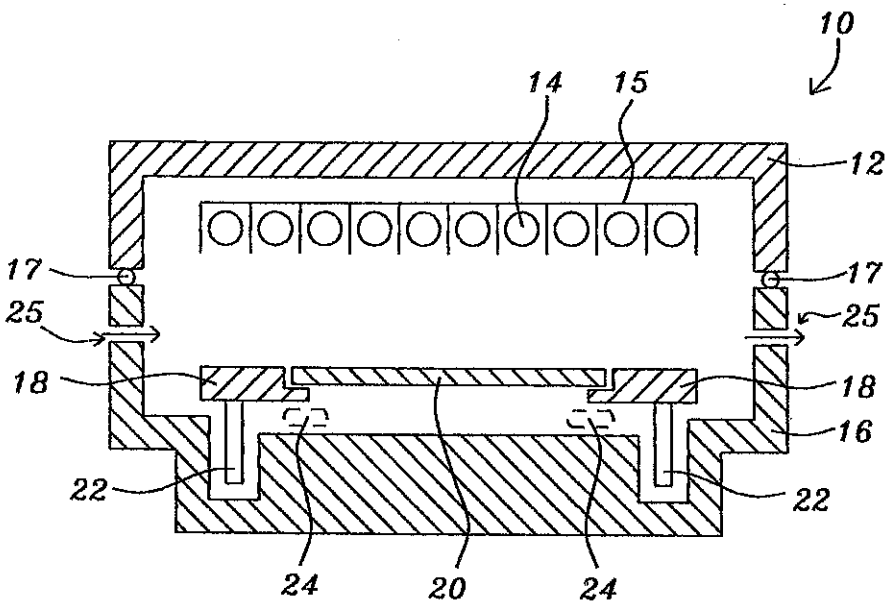


FIG. 1 – Prior Art

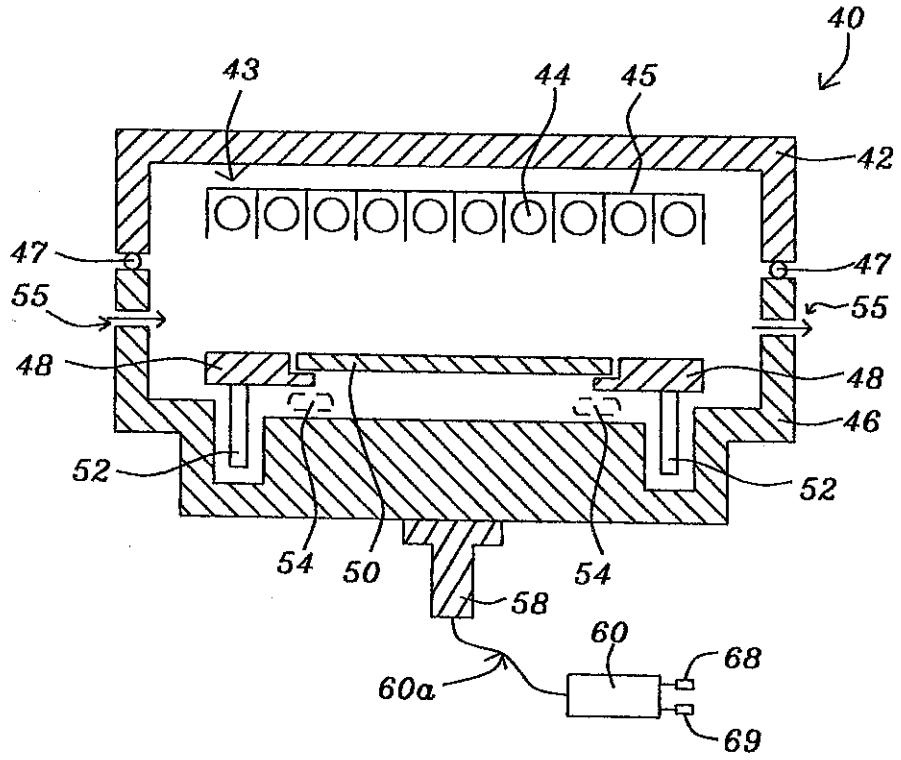


FIG. 2a

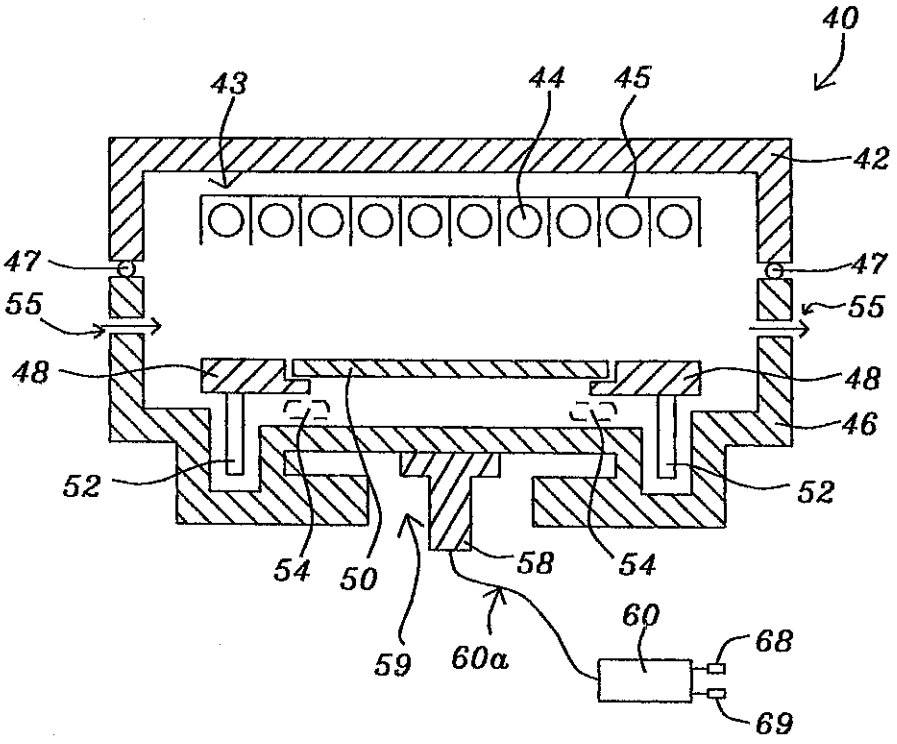


FIG. 2b

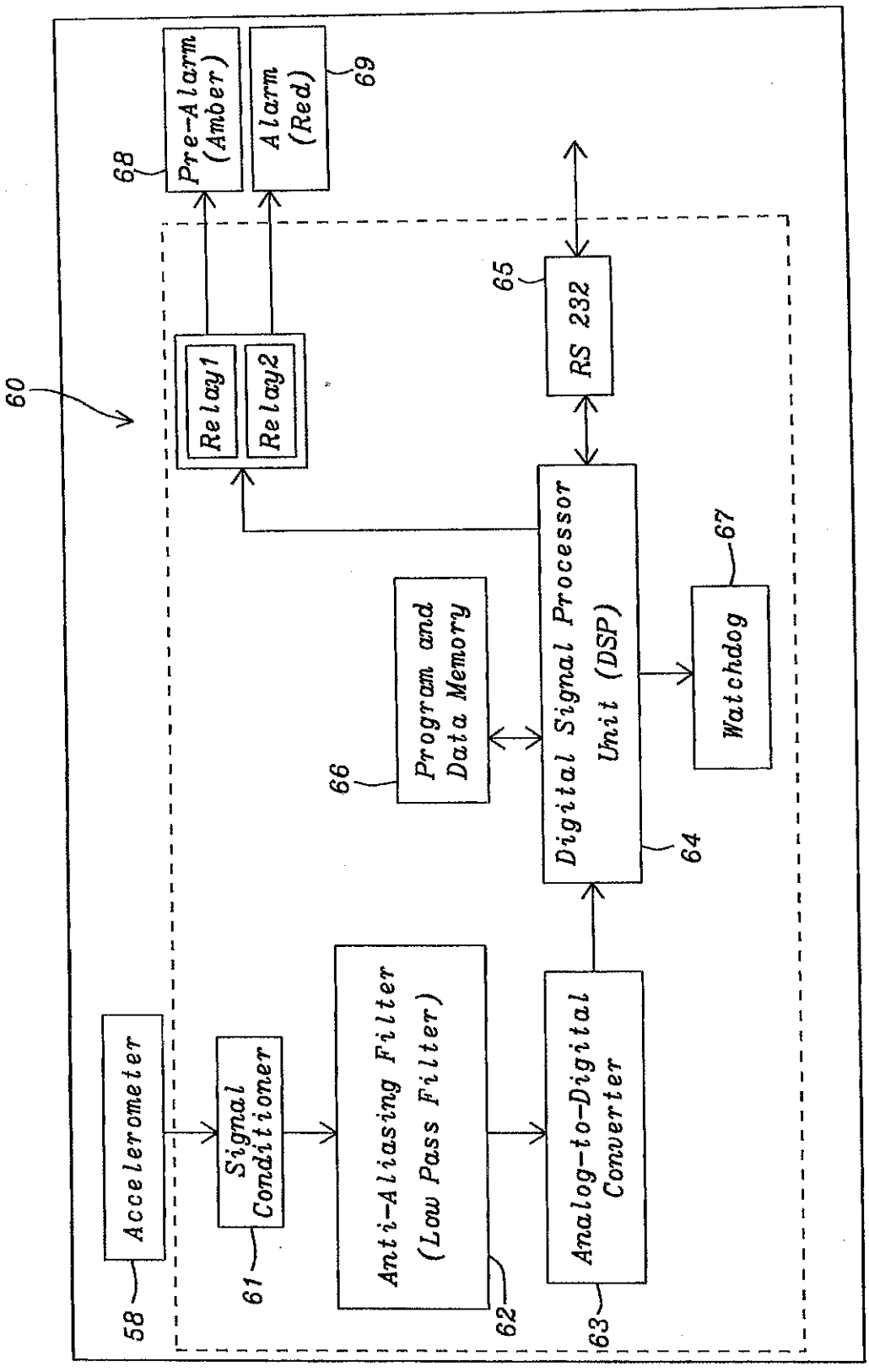

60
Accelerometer
58
Signal Conditioner
61
Anti-Aliasing Filter (Low Pass Filter)
62
Analog-to-Digital Converter
63
Digital Signal Processor Unit (DSP)
64
Program and Data Memory
66
Watchdog
67
RS 232
65
Relay1
Relay2
Pre-Alarm (Amber)
68
Alarm (Red)
69

FIG. 3

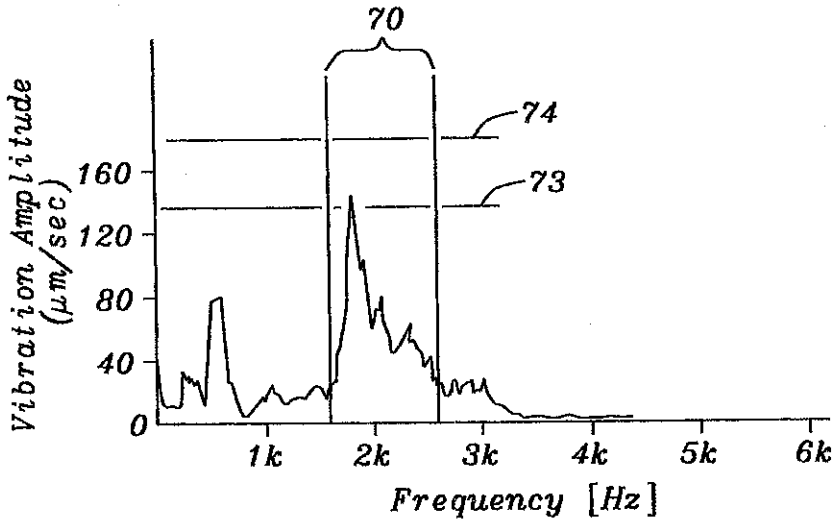

70
74
73
160
120
80
40
0
Vibration Amplitude (μm/sec)
1k
2k
3k
4k
5k
6k
Frequency [Hz]

FIG. 4

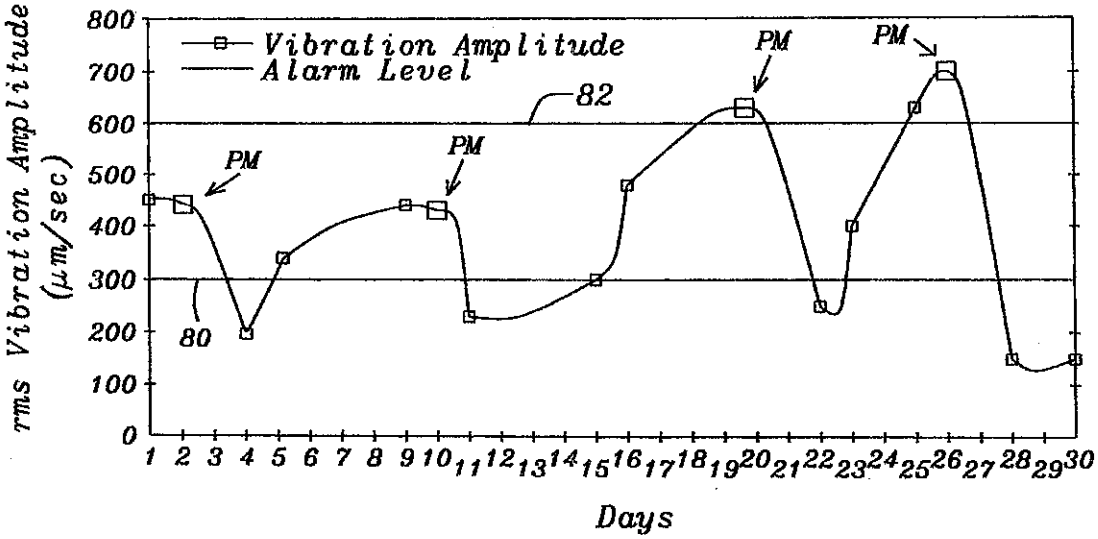

800
700
600
500
400
300
200
100
0
Vibration Amplitude
Alarm Level
82
PM
PM
PM
PM
80
rms Vibration Amplitude (μm/sec)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Days

FIG. 5

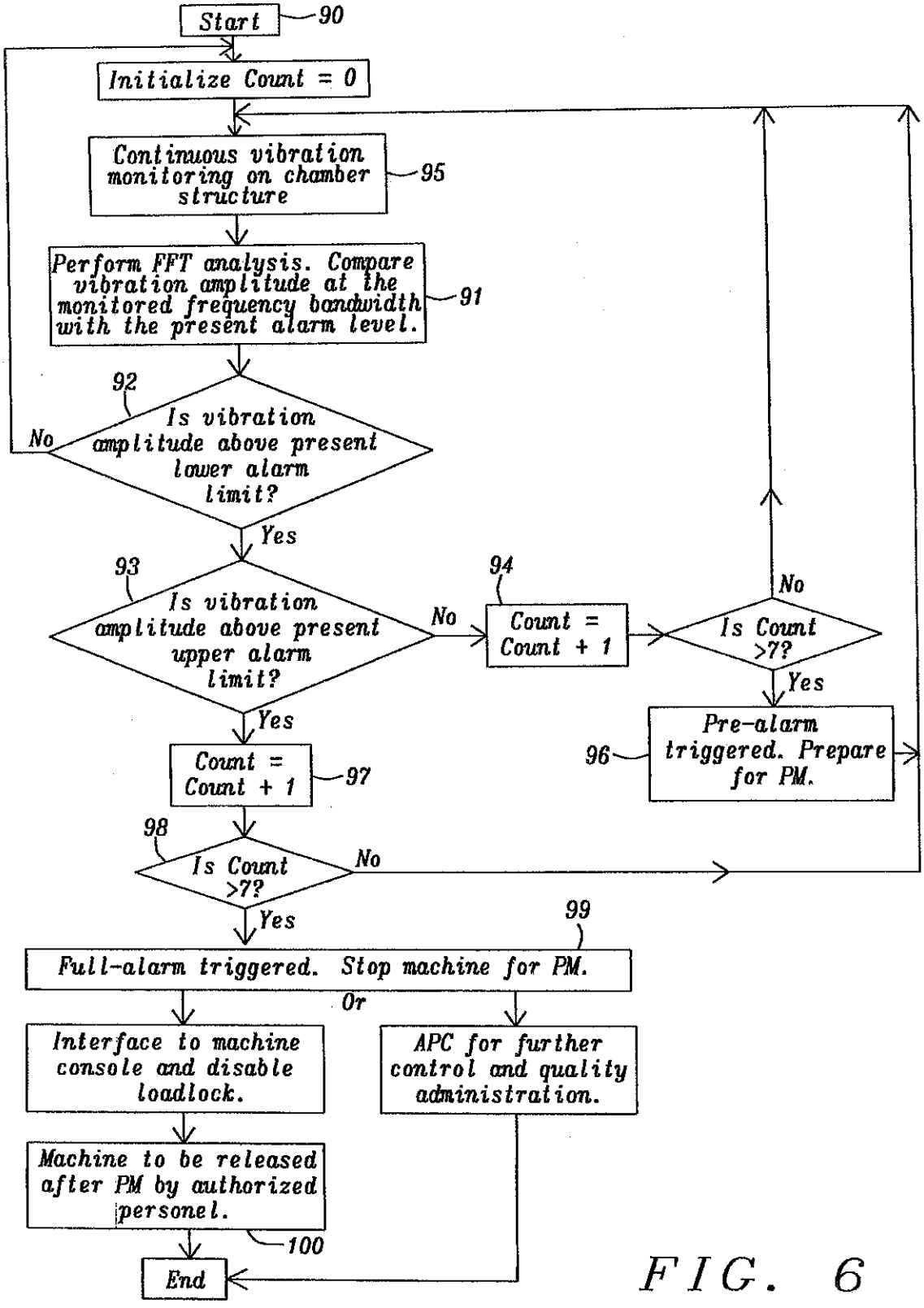

Start
90
Initialize Count = 0
Continuous vibration monitoring on chamber structure
95
Perform FFT analysis. Compare vibration amplitude at the monitored frequency bandwidth with the present alarm level.
91
92
Is vibration amplitude above present lower alarm limit?
No
Yes
93
Is vibration amplitude above present upper alarm limit?
No
94
Count = Count + 1
Is Count >7?
No
Yes
Pre-alarm triggered. Prepare for PM.
96
Yes
Count = Count + 1
97
98
Is Count >7?
No
Yes
99
Full-alarm triggered. Stop machine for PM.
Or
Interface to machine console and disable loadlock.
APC for further control and quality administration.
Machine to be released after PM by authorized personel.
100
End

FIG. 6