1/6

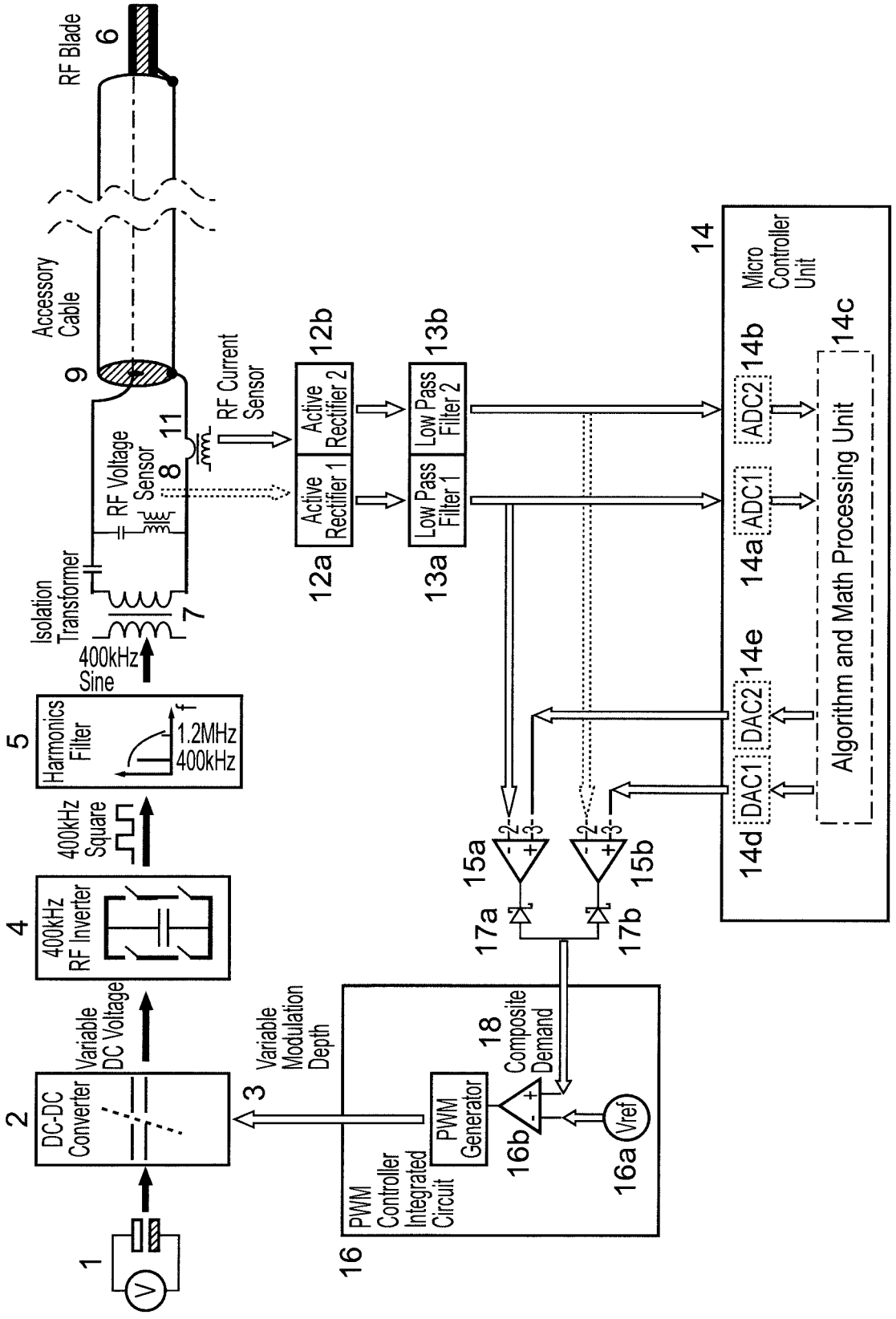

RF Blade
6
Accessory Cable
9
RF Current Sensor
11
RF Voltage Sensor
8
Isolation Transformer
7
400kHz Sine
Harmonics Filter
5
1.2MHz
400kHz
400kHz Square
400kHz RF Inverter
4
Variable DC Voltage
DC-DC Converter
2
1
Variable Modulation Depth
3
PWM Controller Integrated Circuit
16
PWM Generator
16b
Composite Demand
18
Vref
16a
Active Rectifier 1
12a
Active Rectifier 2
12b
Low Pass Filter 1
13a
Low Pass Filter 2
13b
15a
15b
17a
17b
Micro Controller Unit
14
ADC1
14a
ADC2
14b
Algorithm and Math Processing Unit
14c
DAC1
14d
DAC2
14e

FIG. 1

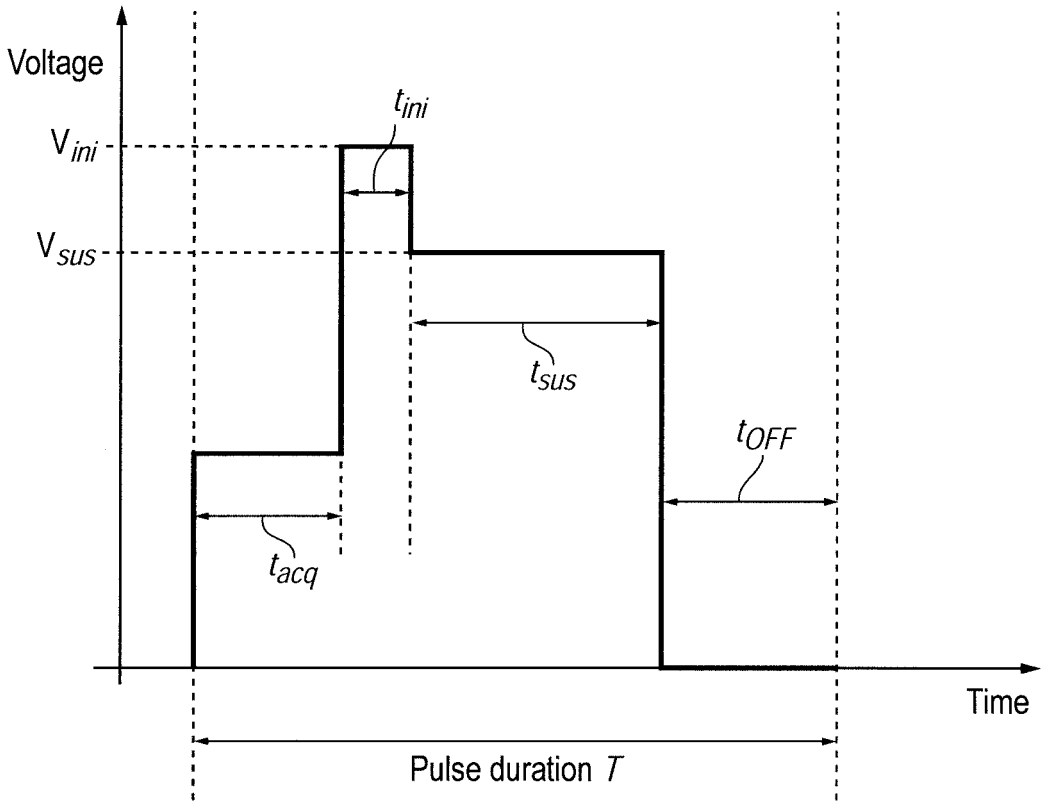


FIG. 2

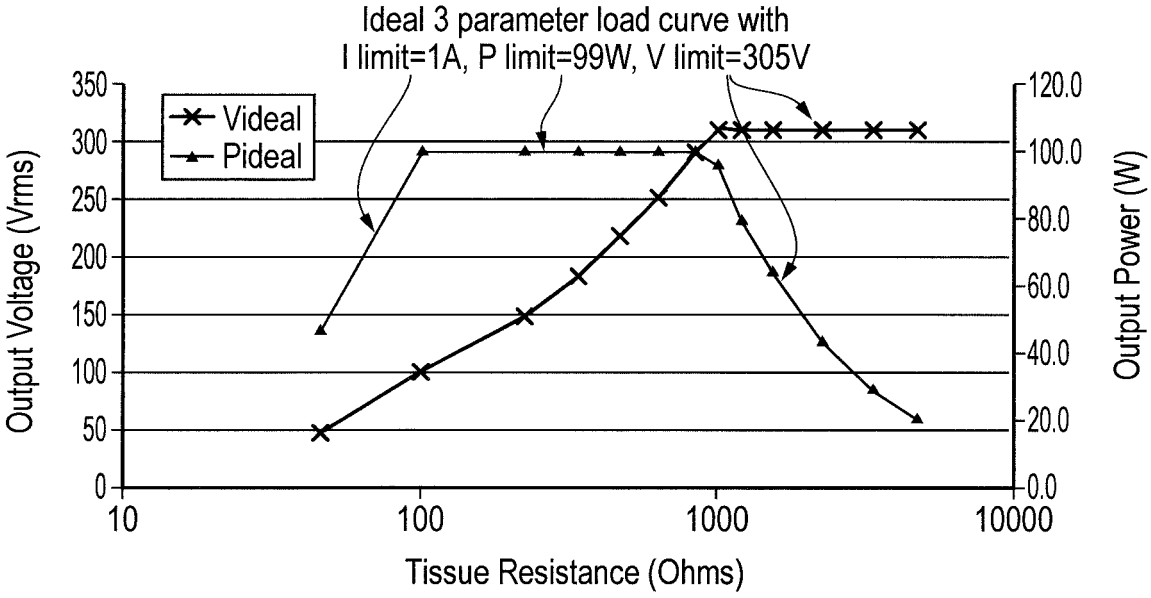


FIG. 3

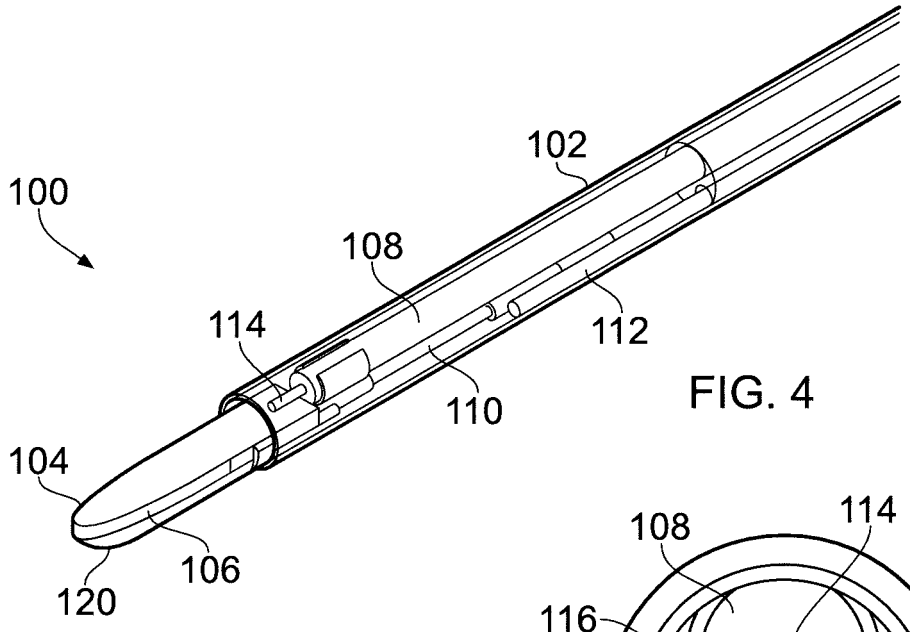


FIG. 4

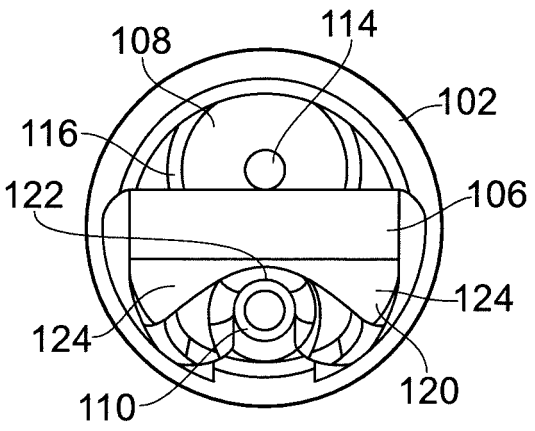


FIG. 5

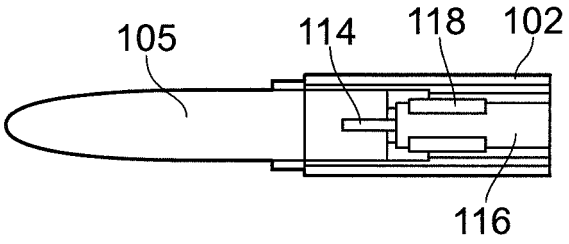


FIG. 6

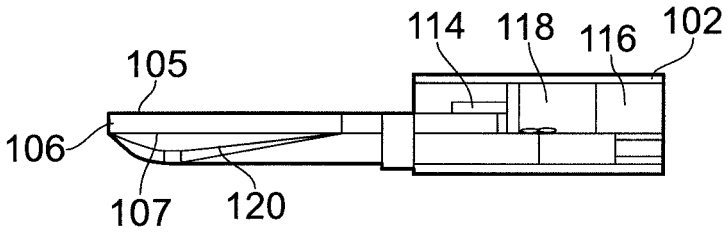


FIG. 7

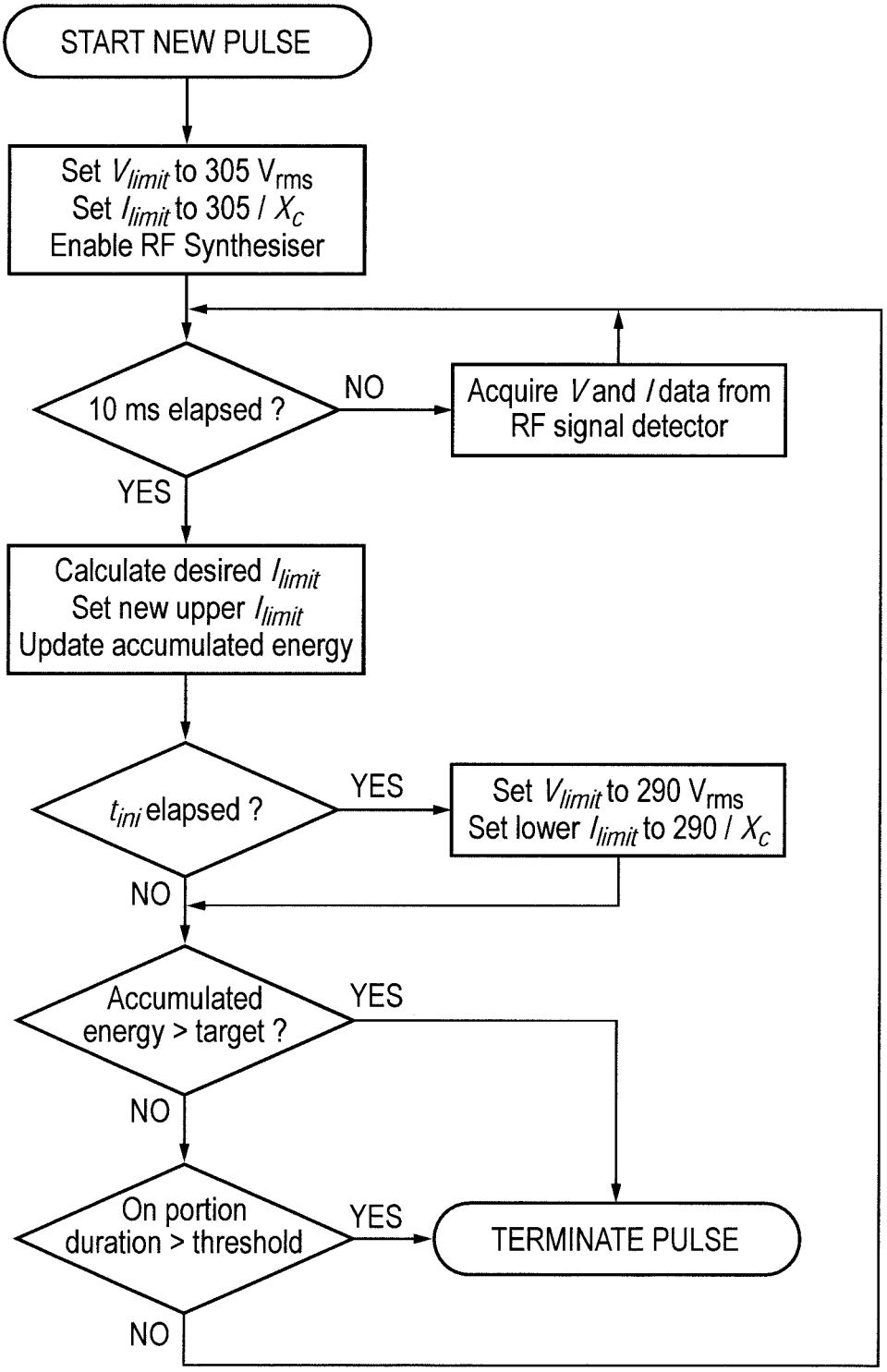

START NEW PULSE
Set V_{limit} to 305 V_{rms}
Set I_{limit} to 305 / X_C
Enable RF Synthesiser
10 ms elapsed ?
NO
Acquire V and I data from RF signal detector
YES
Calculate desired I_{limit}
Set new upper I_{limit}
Update accumulated energy
t_{ini} elapsed ?
YES
Set V_{limit} to 290 V_{rms}
Set lower I_{limit} to 290 / X_C
NO
Accumulated energy > target ?
YES
NO
On portion duration > threshold
YES
TERMINATE PULSE
NO

FIG. 8

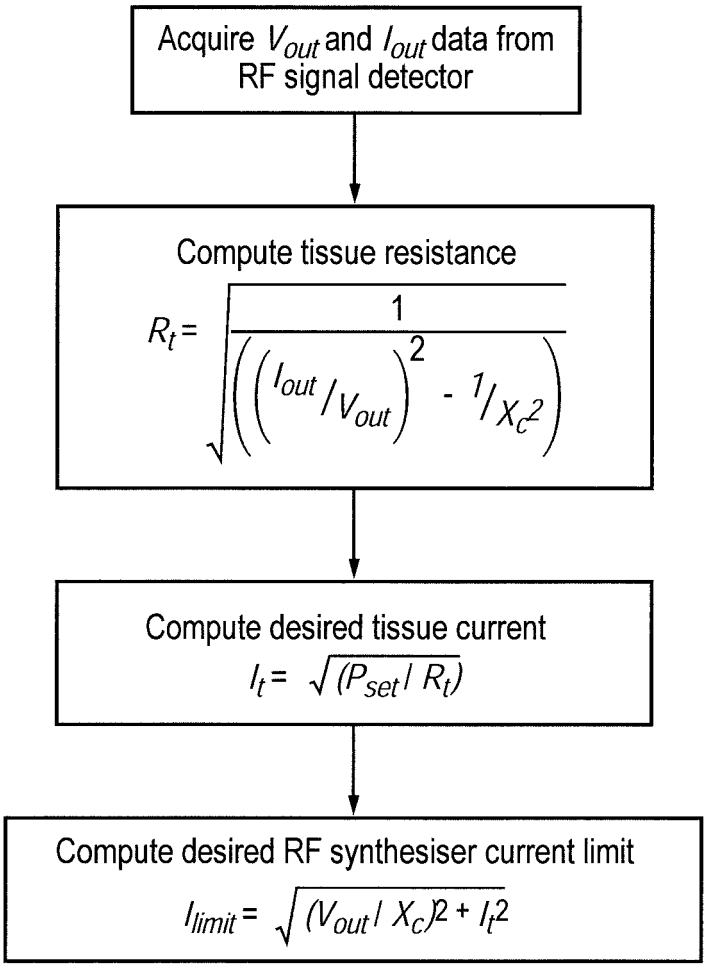

Acquire V_{out} and I_{out} data from RF signal detector
Compute tissue resistance
$R_t = \sqrt{\frac{1}{\left(\left(I_{out}/V_{out}\right)^2 - 1/X_c^2\right)}}$
Compute desired tissue current
$I_t = \sqrt{(P_{set}/R_t)}$
Compute desired RF synthesiser current limit
$I_{limit} = \sqrt{(V_{out}/X_C)^2 + I_t^2}$

FIG. 9