

[54] AUTONOMOUS LAWN MOWER

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[51] Int. Cl.⁵ G06F 15/50; B62D 1/28

[52] U.S. Cl. 364/424.02; 180/168

[58] Field of Search 364/424.01, 424.02;
180/167-170

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[57]

ABSTRACT

Disclosed is an automatic, self propelled lawn mower that references its position within a cutting area using electronically stored path and terrain information as a primary navigation system, senses a non magnetic, non-current carrying metallic guide path as a secondary navigation system, senses underground metallic references for use as position reference points as a further navigation system, incorporates an ultrasonic obstacle detection system to stop the vehicle if unexpected obstacles are encountered. The vehicle further includes a cow-catcher front bumper arrangement to divert small objects away from the cutting blades, contains bumper switches to shut off the vehicle upon contact with large objects, contains an inclinometer sensor to halt the vehicle during unexpected tilting, incorporates a radio communications link to notify an off-board monitoring system of problems, contains an on-board power generation system using an internal combustion engine, generator, and a battery arrangement. The lawn mower also provides a navigation controller and servo motor positioning system that plans path motion, using sensory data and stored map data and to turn the drive wheels to propel the vehicle in the desired manner.

28 Claims, 7 Drawing Sheets

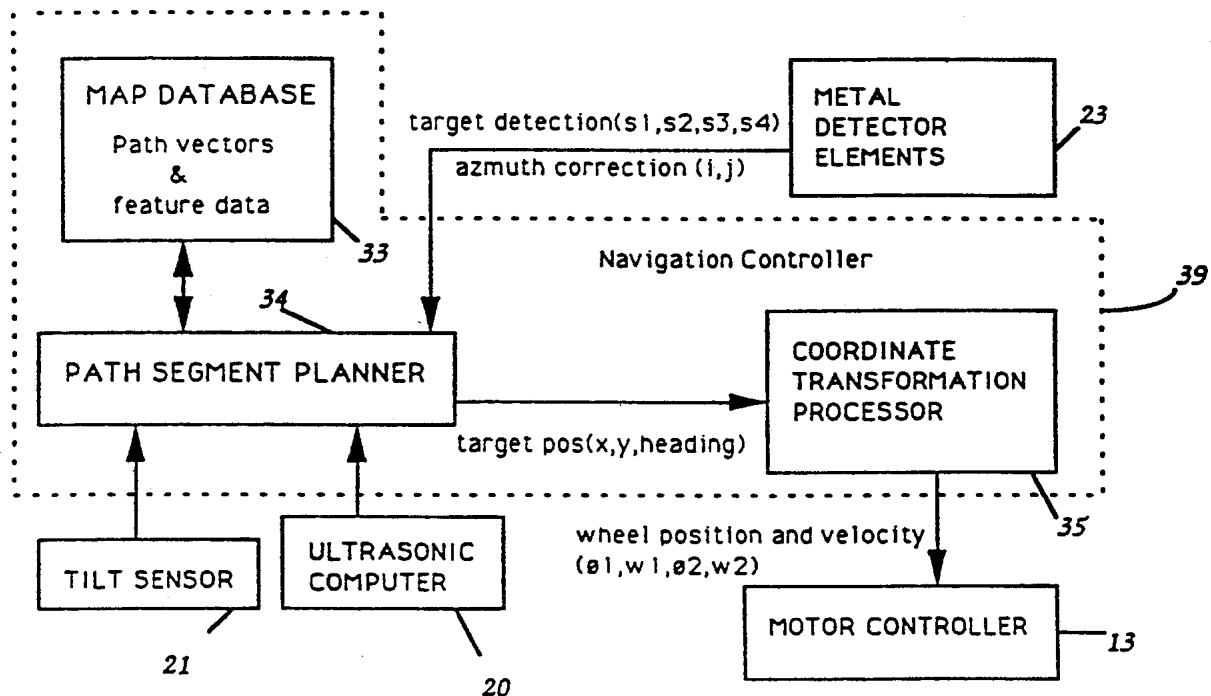


FIG. 1A

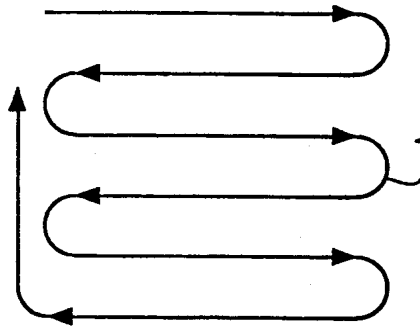


FIG. 1B

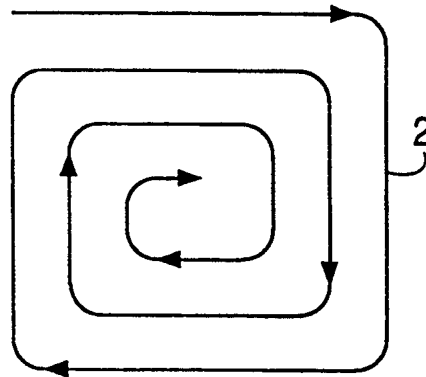


FIG. 1C

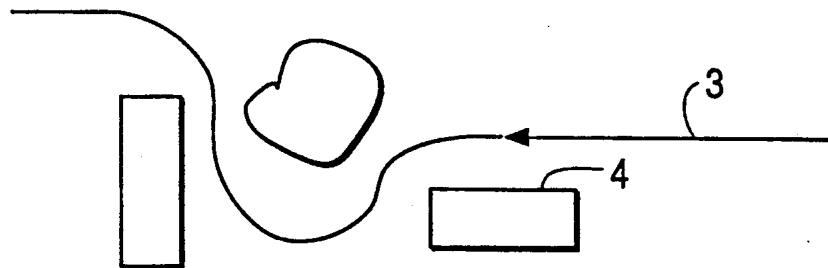


FIG. 2A

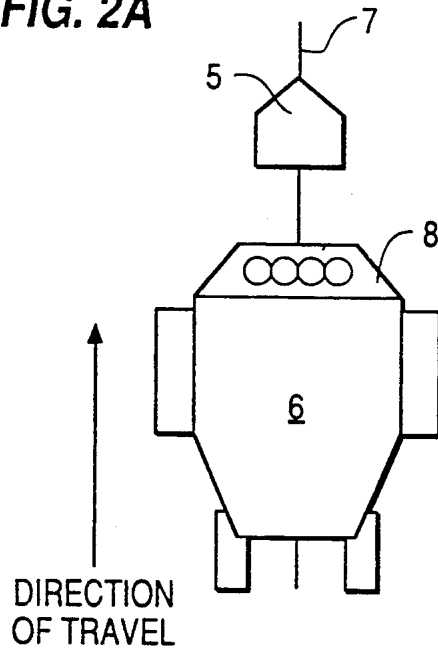


FIG. 2B

SENSOR NUMBER

	s1	s2	s3	s4
d1	0	0	0	0
d2	0	1	0	0
d3	0	1	1	0
d4	1	1	1	0
d5	1	1	1	1
d6	1	1	1	1
d7	0	0	0	0

SENSOR VALUES

FIG. 3

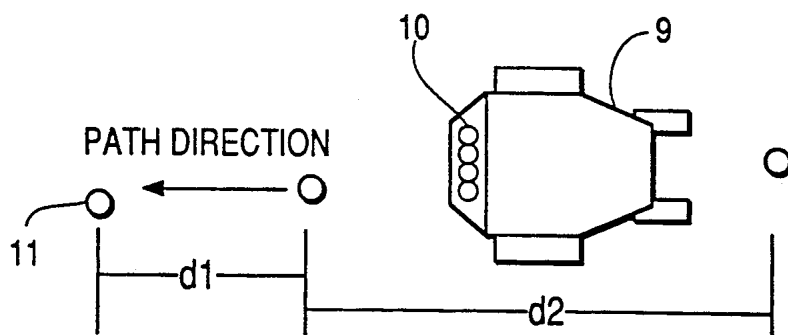


FIG. 4

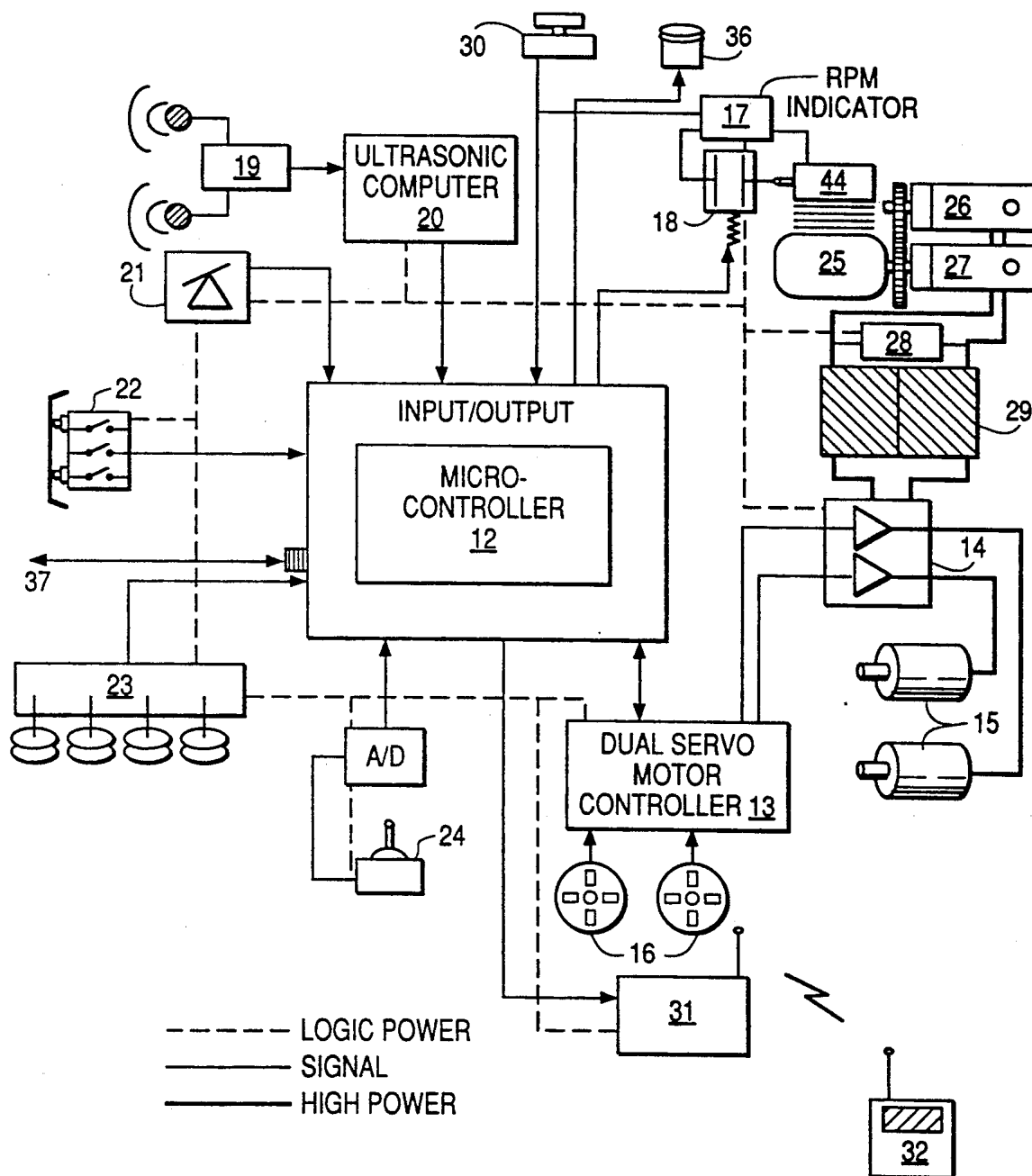
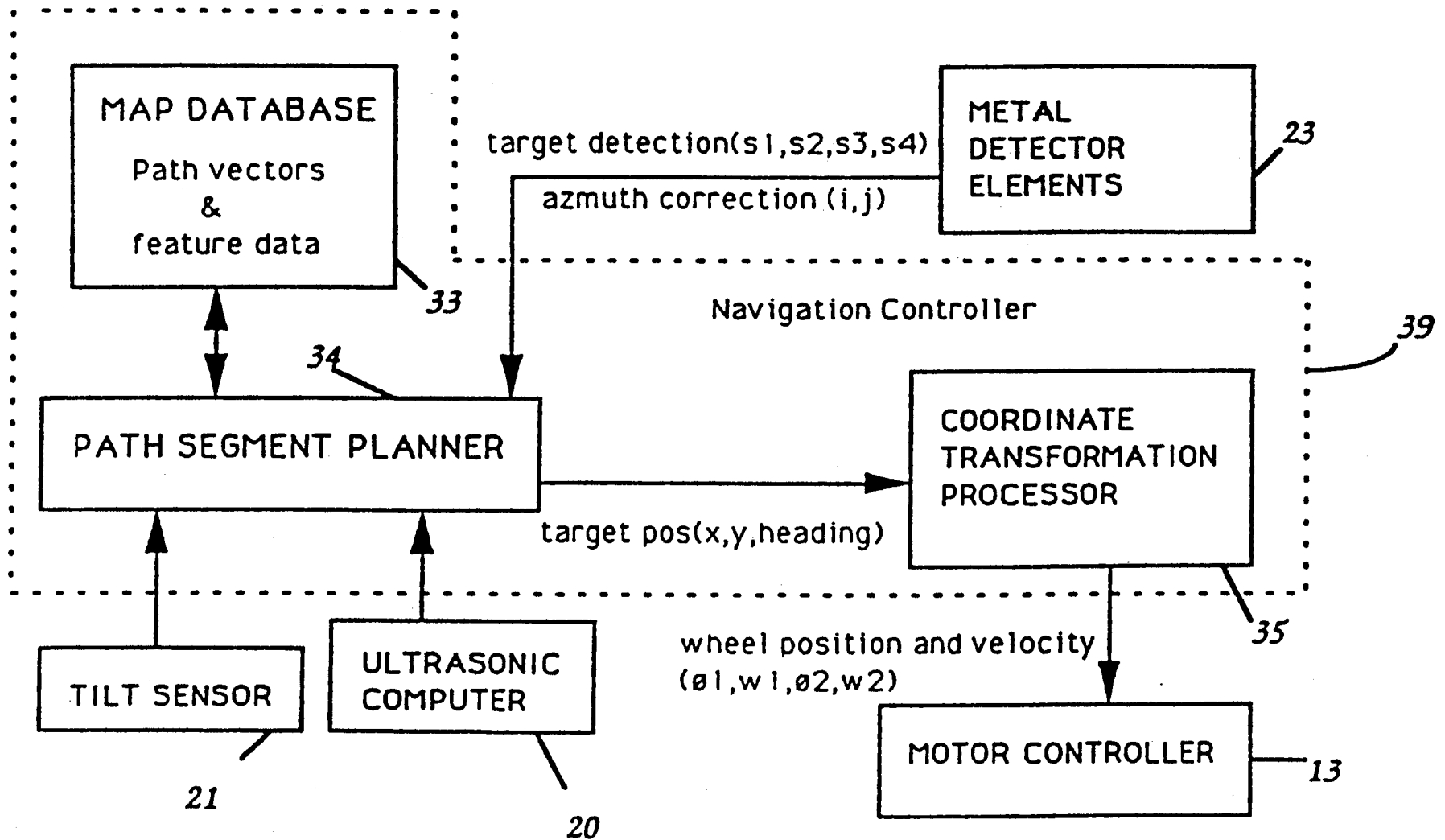


FIG. 5



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