FIG. 1

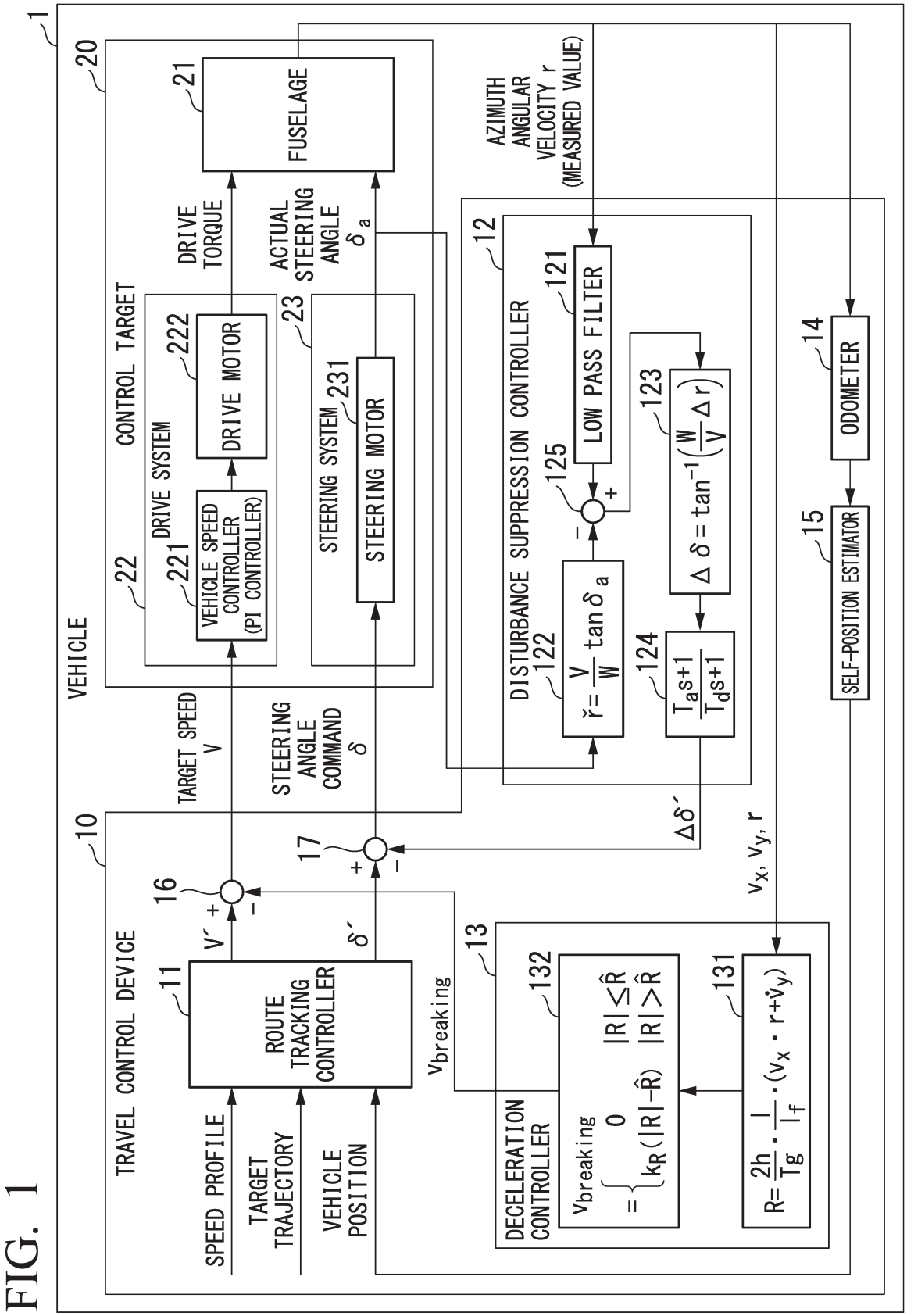

1
VEHICLE
20
CONTROL TARGET
21
FUSELAGE
22
DRIVE SYSTEM
221
VEHICLE SPEED CONTROLLER (PI CONTROLLER)
222
DRIVE MOTOR
23
STEERING SYSTEM
231
STEERING MOTOR
DRIVE TORQUE
ACTUAL STEERING ANGLE δa
AZIMUTH ANGULAR VELOCITY r (MEASURED VALUE)
TARGET SPEED V
STEERING ANGLE COMMAND δ
12
DISTURBANCE SUPPRESSION CONTROLLER
121
LOW PASS FILTER
122
$\check{r}=\frac{V}{W}\tan\delta_a$
123
$\Delta\delta=\tan^{-1}\left(\frac{W}{V}\Delta r\right)$
124
$\frac{T_a s+1}{T_d s+1}$
125
14
ODOMETER
15
SELF-POSITION ESTIMATOR
10
TRAVEL CONTROL DEVICE
11
ROUTE TRACKING CONTROLLER
16
17
Δδ′
δ′
V′
13
DECELERATION CONTROLLER
132
$v_{breaking}=\begin{cases}0 & |R|\le\hat{R}\\ k_R(|R|-\hat{R}) & |R|>\hat{R}\end{cases}$
131
$R=\frac{2h}{Tg}\cdot\frac{l}{l_f}\cdot(v_x\cdot r+\dot{v}_y)$
v_x, v_y, r
$v_{breaking}$
SPEED PROFILE
TARGET TRAJECTORY
VEHICLE POSITION

FIG. 2

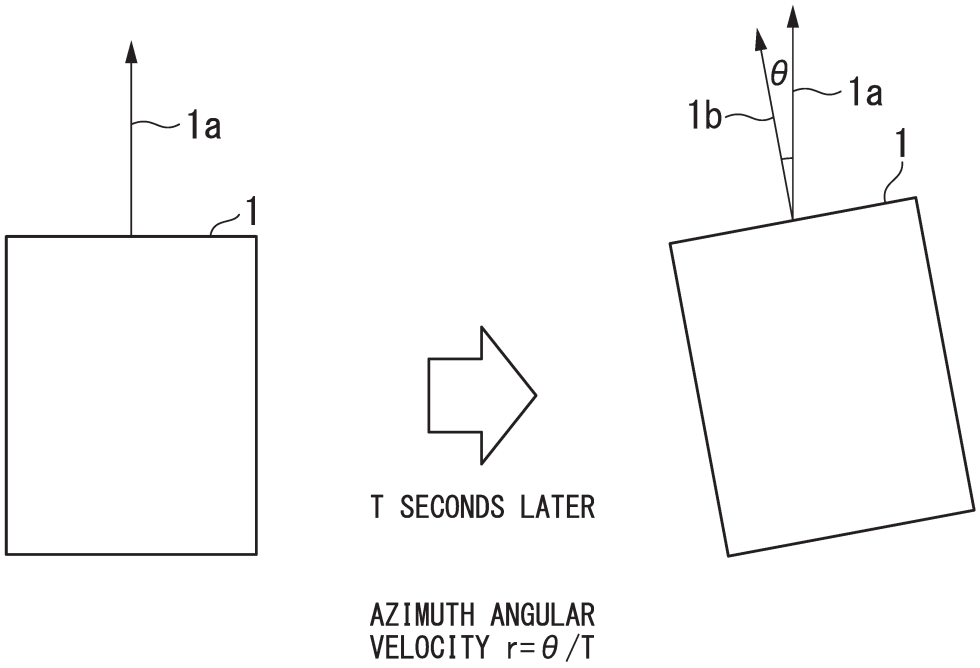

1a
1
θ
1b
1a
1
T SECONDS LATER
AZIMUTH ANGULAR
VELOCITY r=θ/T

FIG. 3A

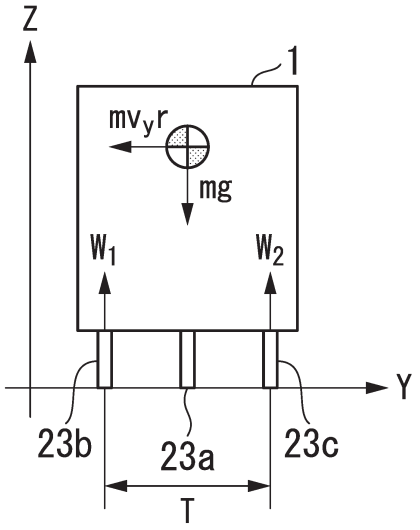

Z
1
mvyr
mg
W1
W2
Y
23b
23a
23c
T

FIG. 3B

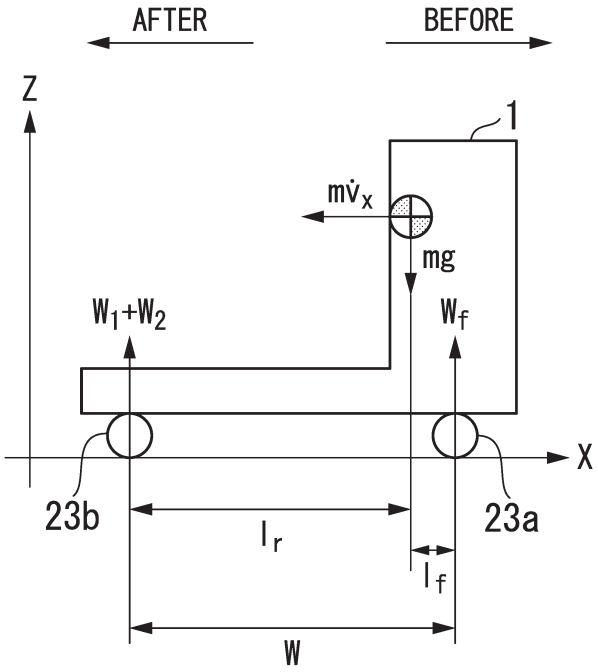

AFTER
BEFORE
Z
1
$m\dot{v}_x$
mg
W_1+W_2
W_f
X
23b
23a
l_r
l_f
W

FIG. 4

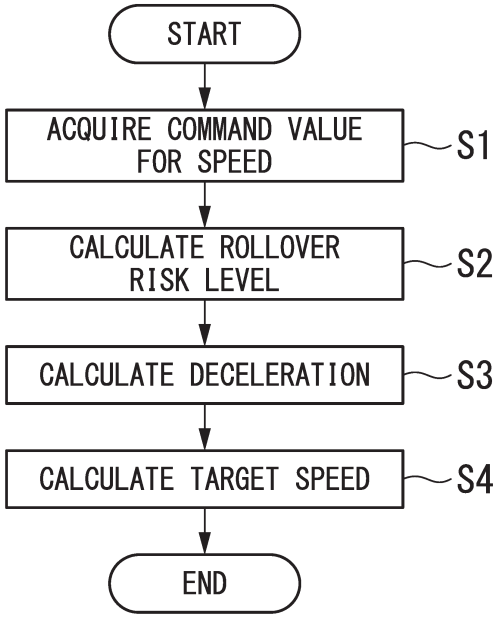

START
ACQUIRE COMMAND VALUE FOR SPEED
S1
CALCULATE ROLLOVER RISK LEVEL
S2
CALCULATE DECELERATION
S3
CALCULATE TARGET SPEED
S4
END

FIG. 5

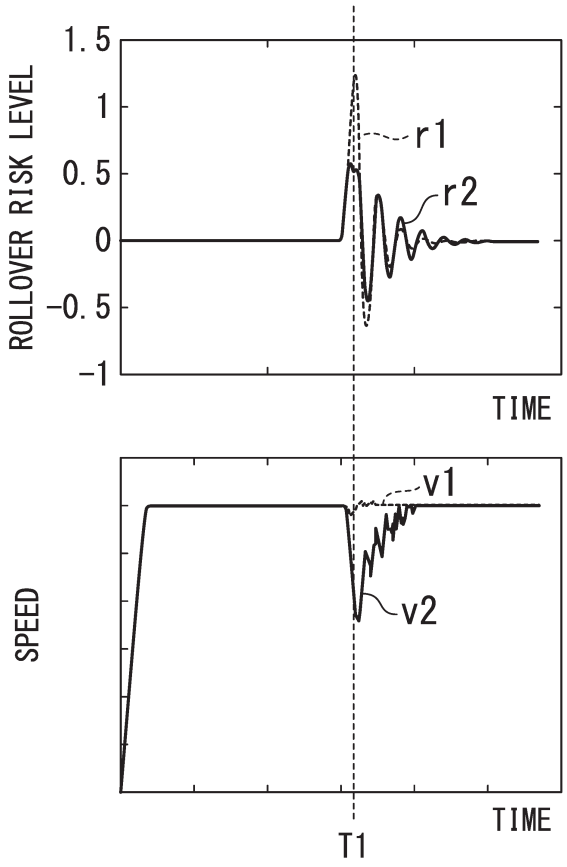

1.5
1
0.5
0
−0.5
−1
ROLLOVER RISK LEVEL
r1
r2
TIME
SPEED
v1
v2
TIME
T1

FIG. 6

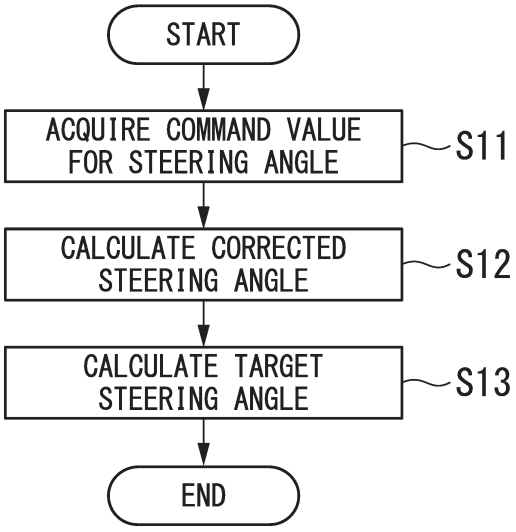

START
ACQUIRE COMMAND VALUE FOR STEERING ANGLE
S11
CALCULATE CORRECTED STEERING ANGLE
S12
CALCULATE TARGET STEERING ANGLE
S13
END

FIG. 7

