

a single GPS receiver for processing said GPS signals received by said GPS antenna and measuring the three-dimensional absolute position; and

a data recording unit for recording the position data relating to said three-dimensional position measured by said GPS receiver, wherein said GPS antenna, said GPS receiver, and said data recording unit are installed on said floating body;

wherein a transmitter for transmitting said position data is installed on said floating body; and

wherein a data processing unit is installed on said floating body for processing said position data extracted from said data recording unit and calculating the wave height and the current direction and speed at the point where said floating body is floating.

2. The GPS device for measuring wave height and current direction and speed according to claim 1, wherein said data processing unit conducts high-pass filter processing of said position data for extracting only the wave height components present in a high-frequency region in order to calculate said wave height, and conducts smoothing processing of said position data for extracting only the current direction and current speed components in order to calculate said current direction and current speed.

3. The GPS device for measuring wave height and current direction and speed according to claim 2, wherein said data processing unit is capable of setting a cut-off frequency of said high-pass filter and smoothing time of said smoothing processing for removing the errors contained in said position data.

4. The GPS device for measuring wave height and current direction and speed according to claim 1, wherein said transmitter is also for transmitting data relating to said wave height and said current direction and speed calculated by said data processing unit is installed on said floating body.

5. A GPS system for measuring wave height and current direction and speed comprising:

- a GPS device for measuring the wave height and the current direction and speed, comprising:
- a floating body capable of floating on water;
- a GPS antenna for receiving GPS signals;
- a single GPS receiver for processing said GPS signals received by said GPS antenna and measuring three-dimensional absolute position;
- a data recording unit for recording the position data relating to said three-dimensional position measured by said GPS receiver; and
- a transmitter for transmitting said position data, said GPS antenna, said GPS receiver, said data recording unit, and said transmitter being installed on said floating body, and
- a base station equipped with a receiver for receiving said position data transmitted from said transmitter and a data processing unit for processing said received position data and calculating the wave height and current direction and speed at the point where said floating body is floating.

6. The GPS system for measuring wave height and current direction and speed according to claim 5, wherein a pro-

cessing software for conducting said high-pass filter processing and smoothing processing of said position data is installed in said data processing unit for calculating said wave height and current direction and speed.

7. A GPS system for measuring wave height and current direction and speed comprising:

- a GPS device for measuring the wave height and the current direction and speed, comprising:
- a floating body capable of floating on water;
- a GPS antenna for receiving GPS signals;
- a single GPS receiver for processing said GPS signals received by said GPS antenna and measuring three-dimensional absolute position;
- a data recording unit for recording the position data relating to said three-dimensional position measured by said GPS receiver;
- a data processing unit for processing said position data and calculating the wave height and the current direction and speed at the point where said floating body is floating; and
- a transmitter for transmitting the computed data relating to said wave height and said current direction and speed, said GPS antenna, said GPS receiver, said data recording unit, said data processing unit and said transmitter being installed on said floating body, and
- a base station equipped with a receiver for receiving said computed data transmitted from said transmitter.

8. The GPS system for measuring wave height and current direction and speed according to claim 7, wherein a processing software for conducting said high-pass filter processing and smoothing processing of said position data is installed in said data processing unit for calculating said wave height and current direction and speed.

9. A GPS device for measuring wave height and current direction and speed, comprising:

- a floating body capable of floating on water;
- a GPS antenna for receiving GPS signals;
- a single GPS receiver for processing said GPS signals received by said GPS antenna and measuring three-dimensional absolute position; and
- a data recording unit for recording the position data relating to said three-dimensional position measured by said GPS receiver, wherein said GPS antenna, said GPS receiver, and said data recording unit are installed on said floating body;

wherein a data processing unit is installed on said floating body for processing said position data extracted from said data recording unit and calculating the wave height and current direction and speed at the point where said floating body is floating, and

wherein a transmitter for transmitting the computed data relating to said wave height and the current direction and speed calculated by said data processing unit is installed on said floating body.