laterally rotatable around a rotation supporting point and having two sides extending from the rotation supporting point. The area setting module is configured to set an area including the two sides constituting each of the one or more markers detected by the marker detector, as a detection area. The second detector is configured to detect a movement of a person or an object within the detection area set by the area setting module.

According to a first aspect, there is provided an image processing system comprising: an imaging means of capturing an image of a target including one or more markers, the one or more markers being used for setting a detection area in which a movement of a person or an object is detectable; a detection means of detecting the one or more markers from the image captured by the imaging means, each of the one or more markers being laterally rotatable around a rotation supporting point and having two sides extending from the rotation supporting point; an area setting means of setting an area including the two sides constituting the one or more markers detected by the marker detection means, as a detection area; and a detection means of detecting a movement of a person or an object within the detection area set by the area setting means.

According to a second aspect, there is provided a marker used for setting a detection area for detecting a movement of a person or an object, the marker comprising: a plurality of plate members having a shape of a sector; and a shaft member provided in proximity to center points of the plate members, wherein the plate members are connected to each other in a laterally rotatable manner by the shaft member, and a center angle of a sector formed of the plate members is adjustable to an arbitrary angle by rotating some or

all of the plate members laterally.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic diagram showing a structural example of an image processing system according to the first embodiment.

FIG. 2 shows the external appearance of a marker according to the embodiment.

FIG. 3 shows the case of providing the marker according to the embodiment in a wall surface corner.

FIG. 4 is another diagram showing the external appearance of the marker according to the embodiment.

FIG. 5 is another diagram showing the external appearance of the marker according to the embodiment.

FIG. 6 is another diagram showing the external appearance of the marker according to the embodiment.

FIG. 7 is another diagram showing the external appearance of the marker according to the embodiment.

FIG. 8 is an explanatory diagram showing a difference between the marker shown in FIG. 2 and the markers shown in FIGS. 4 to 7.

FIG. 9 is a flowchart showing an example of the procedure of detection area setting processing by an image processing device according to the embodiment.

FIG. 10 is an explanatory diagram providing a supplementary explanation on FIG. 9.

FIG. 11 is another explanatory diagram providing a supplementary explanation on FIG. 9.

CLAIMS

[Claim 1]

An image processing system comprising:

an imaging means of capturing an image of a target including one or more markers, the one or more markers being used for setting a detection area in which a movement of a person or an object is detectable;

a detection means of detecting the one or more markers from the image captured by the imaging means, each of the one or more markers being laterally rotatable around a rotation supporting point and having two sides extending from the rotation supporting point;

an area setting means of setting an area including the two sides constituting the one or more markers detected by the marker detection means, as a detection area; and

a detection means of detecting a movement of a person or an object within the detection area set by the area setting means.

[Claim 2]

The image processing system of Claim 1, wherein the marker has a shape of a sector, the sector having the two sides as side portions and the rotation supporting point as a center point.

[Claim 3]

The image processing system of Claim 2, wherein the detection means detects contour edge components of the detected marker, detects two line edge components corresponding to the side portions from the detected contour edge components, and

detects an intersection point of the detected two line edge components as the center point.

[Claim 4]

The image processing system of Claim 3, wherein the area setting means extends the detected two line edge components in directions opposite to a location in which the center point is detected, and sets an area defined by the acquired extended lines, as the detection area.

[Claim 5]

The image processing system of Claim 3, wherein the marker has an inner circle portion centered on the center point and painted in a first color, and an outer circle portion centered on the center point and painted in a second color different from the first color.

[Claim 6]

The image processing system of Claim 5, further comprising a marker designation direction determination means of designating an area to be set as the detection area based on a color of the inner circle portion of the marker.

[Claim 7]

The image processing system of Claim 6, wherein

if the inner circle portion of the marker has the first color, the marker designation direction determination means determines that the area to be set as the detection area is on a side on which the edge component corresponding to an arc among the detected contour edge components is located, when the detected two line edge components are considered as a border line, and

if the inner circle portion of the marker has the second color, the marker designation direction determination means determines that the area to be set as the detection area is on a side on which the edge component corresponding to an arc among the detected contour edge components is not located, when the detected two line edge components are considered as a border line.

[Claim 8]

A marker used for setting a detection area for detecting a movement of a person or an object, the marker comprising:

a plurality of plate members having a shape of a sector; and

a shaft member provided in proximity to center points of the plate members, wherein

the plate members are connected to each other in a laterally rotatable manner by the shaft member, and

a center angle of a sector formed of the plate members is adjustable to an arbitrary angle by rotating some or all of the plate members laterally.

[Claim 9]

The marker of Claim 8, further comprising stopper members projecting upward or downward from side portions of each of the plate members, wherein

the stopper member contacts the stopper member provided in the opposed plate member when the plate members are rotated laterally.

[Claim 10]

The marker of Claim 8, further comprising a convex

projection projecting from an upper surface or a lower surface of each of the plate members, wherein

the projection contacts the projection provided in the opposed plate member when the plate members are rotated laterally.

[Claim 11]

The marker of Claim 8, further comprising:

a projection provided on an upper surface or a lower surface of each of the plate members; and

a sliding groove provided along an arc of the sector of each of the plate members and engaged with the projection, wherein

the projection moves in the sliding groove provided in the opposed plate member and contacts the opposed plate member at an end of the sliding groove when the plate members are rotated laterally.

[Claim 12]

The marker of Claim 8, wherein the plate members are integrally formed with each other in a bellows-like manner.