



(11) **EP 1 928 178 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
04.06.2008 Bulletin 2008/23

(51) Int Cl.:
H04N 7/18^(2006.01) H04N 5/232^(2006.01)

(21) Application number: **06077138.3**

(22) Date of filing: **30.11.2006**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

Designated Extension States:
AL BA HR MK RS

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(54) **Automatic monitoring a game object or game participant**

(57) Method and system for monitoring, by means of one or more video cameras (1), a game object (2a) or game participant (2b, 2c) during e.g. a football match. The system comprises a game object or game participant with radar responsive means, e.g. a radar transponder (3a, 3b, 3c). Radar means (4) are provided which are arranged to monitor the radar responsive means and to

calculate dynamically the position of the game object or game participant or both to be monitored. Control means (5) are provided which are arranged to control (6) the video cameras to follow and record the game object or game participant or both.

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Description

Field and background of the invention

[0001] Method for monitoring, by means of one or more video cameras, a game object or game participant.

[0002] The location of a game object, e.g. the football in a football match, or a game participant, e.g. a football player, nowadays may be followed by one or more manually operated video cameras.

Summary of the invention

[0003] One aim of the present invention is to provide a method and means for automatic monitoring, by one or more video cameras, a game object or game participant.

[0004] The method preferably comprises next steps:

- provide the game object or game participant or both with radar responsive means;
- provide radar means which are arranged to monitor the radar responsive means and to calculate dynamically (or to trace) the position of the game object or game participant or both to be monitored (or traced);
- provide control means which are arranged to control said one or more video cameras to follow and record the game object or game participant or both.

[0005] A system for performing such a method as preferred by the present invention preferably comprises at least one game object or game participant - e.g. the game participant's clothes - or both with radar responsive means, and radar means which are arranged to monitor the radar responsive means and to calculate dynamically the position of the game object or game participant or both to be monitored, and control means which are arranged to control said one or more video cameras to follow and record the game object or game participant or both.

[0006] The radar responsive means preferably may comprise a radar transponder, i.e. and electrical device which is designed to receive a radar signal and automatically transmits a specific reply signal, e.g. an identification code for the game object, for each individual participant, to the radar means, to calculate the exact position of the (each) transponder.

Exemplary Embodiment

[0007] Figure 1 shows an exemplary embodiment of a system which is arranged to perform the method as presented in short in the preceding.

[0008] The system shown in figure 1 is arranged for monitoring (tracing, tracking), by means of a number of video cameras 1, a game object 2a and game participants 2b and 2c. In this exemplary embodiment, the system comprises one game object, a football, and 22 game par-

ticipants, two of which are drawn in figure 1. The football and (some of) the participants (players) are provided with radar responsive means. One goal for monitoring or tracing individual players may be to register and evaluate the (e.g. professionally paid) individual player's personal performance.

[0009] The radar responsive means may be formed by a state-of-the-art small and light radar transponder. A transponder 3a is mounted inside the football 2. The participants 2b and 2c may be provided with clothing, e.g. shirts, which include radar transponders 3b and 3c. In the practice of a football game e.g. all 22 participants may be followed individual by means of (22) individual radar transponders. All transponders are arranged to reflect an individual, unique identification code, which enables the radar means to calculate the position of each individual transponder and thus the position of the ball and the individual participants.

[0010] The radar means may comprise a number of FMCW (Frequency-Modulated Continuous Wave) radar transceivers 4 which are arranged to monitor the radar transponders 3a, 3b and 3c and to calculate dynamically (or to trace or track) the positions of the football 2a and participants 2b and 2c to be monitored (traced). Output signals from the radar transceivers 4 are fed to control means 5 which are arranged to control the various video cameras 1 to follow and record the game object 2a and game participants 2b and 2c. To that end control signals are fed to the cameras 1 - each of them having a camera controller 6 - to direct and to focus the camera to the football 2a and participants 2b and 2c in each position they may have during the football match. It will be clear that to trace the football and the (e.g. all) participants a great number of cameras 1 may be needed.

Claims

1. Method for monitoring, by means of one or more video cameras, a game object or game participant or both, the method comprising next steps:

- provide the game object or game participant or both with radar responsive means;
- provide radar means which are arranged to monitor the radar responsive means and to calculate dynamically the position of the game object or game participant or both to be monitored;
- provide control means which are arranged to control said one or more video cameras to follow and record the game object or game participant or both.

2. System for monitoring, by means of one or more video cameras (1), a game object (2a) or game participant (2b, 2c) or both, the system comprising at least one game object or game participant or both including radar responsive means (3a, 3b, 3c), and radar

means (4) which are arranged to monitor the radar responsive means and to calculate dynamically the position of the game object or game participant or both to be monitored, and control means (5) which are arranged to control (6) said one or more video cameras to follow and record the game object or game participant or both. 5

3. System according to claim 2, the radar responsive means comprising a radar transponder. 10
4. Football, arranged for use in the system according to claim 2, comprising radar responsive means (3a).
5. Clothing for a game participant, arranged for use in the system according to claim 2, comprising radar responsive means (3b, 3c). 15

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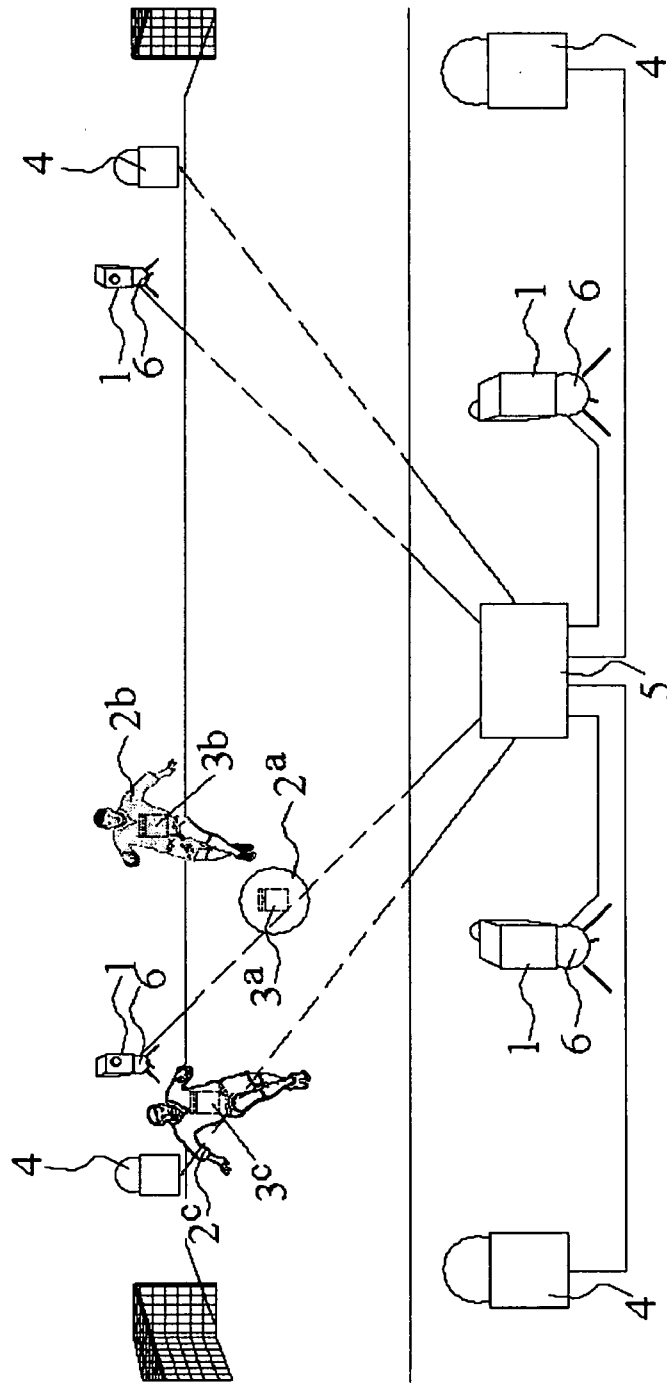


FIG. 1



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 06 07 7138

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2003/003925 A1 (SUZUKI RYO [JP]) 2 January 2003 (2003-01-02) * the whole document * * figure 15b * -----	1-5	INV. H04N7/18 H04N5/232
			TECHNICAL FIELDS SEARCHED (IPC)
			H04N
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 14 May 2007	Examiner Schneiderlin, Jean
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 07 7138

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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14-05-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003003925	A1	02-01-2003	NONE

EPC FORM P0458

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82