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(19) **United States**(12) **Patent Application Publication**  
**MARKS**(10) **Pub. No.: US 2013/0178312 A1**(43) **Pub. Date: Jul. 11, 2013**(54) **SYSTEM AND METHODS FOR INDICATING  
A REFEREE PENALTY FLAG**(71) Applicant: **Steven L. MARKS**, Akron, OH (US)(72) Inventor: **Steven L. MARKS**, Akron, OH (US)(21) Appl. No.: **13/734,565**(22) Filed: **Jan. 4, 2013****Related U.S. Application Data**

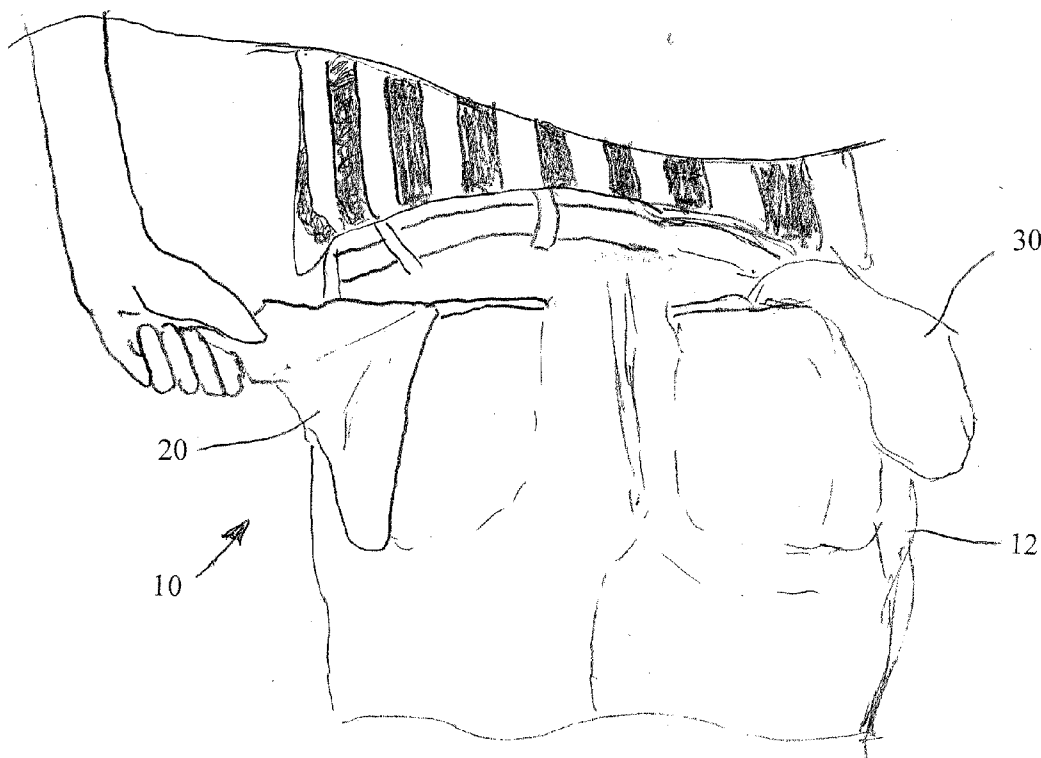
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(57)

**ABSTRACT**

There is provided systems and methods for enhancing the viewing enjoyment by spectators of a sports game conducted on a playing between two teams of opposing players, and in which at least one referee is present for the purpose of observing any infractions of rules of the game and indicating such an infraction and which team committed the infraction. The systems and methods may include automatic detection of a called penalty and which team is called for the penalty. The systems and methods may also use transmitters which are activated whenever a predetermined event, such as a penalty, is called, and receivers disposed around the playing field to detect that a penalty was called and on which team the call was made. An indication of the rules infraction and the team committing the infraction may then be displayed or communicated to viewers immediately.



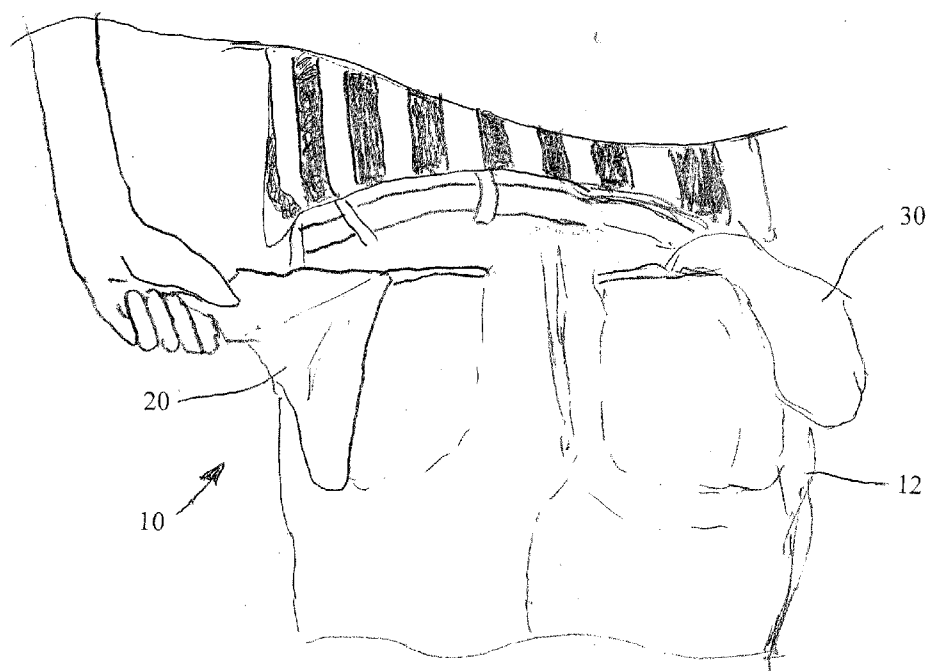


FIG. 1

FIG. 2

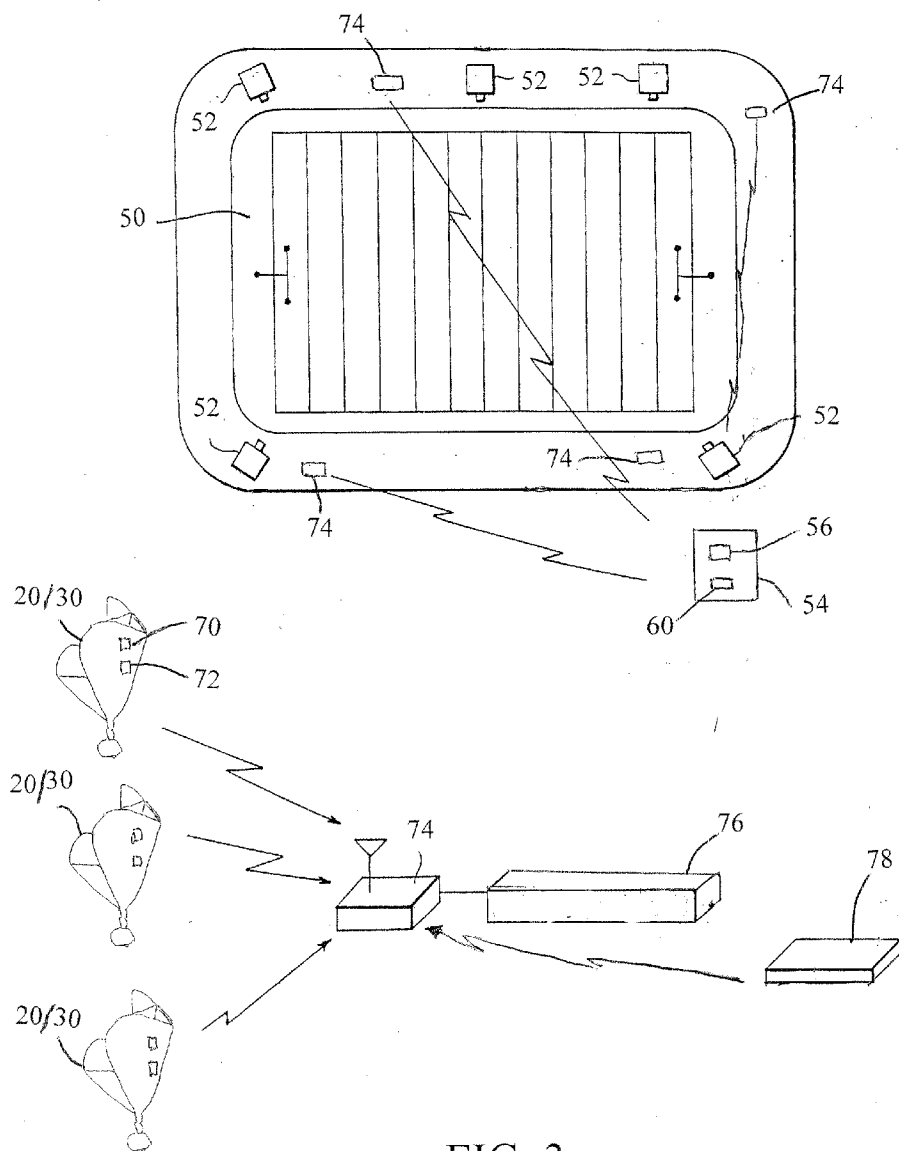


FIG. 3

## SYSTEM AND METHODS FOR INDICATING A REFEREE PENALTY FLAG

### CROSS REFERENCE TO RELATED APPLICATION

**[0001]** This application claims priority to and the benefit of U.S. Provisional Patent Application No. 61/583,240, filed on Jan. 5, 2012, and is incorporated herein by reference in its entirety.

### BACKGROUND OF THE INVENTION

**[0002]** In the game of American football as well as other games, after a play has commenced, there often occur rule infractions by one or more players of the competing teams. In football, referees are used to monitor the play of the game and call penalties for rules infractions. It has become customary for one or more referees to drop a flag on the ground upon the referee's observation of a rules infraction. However, the fans, audience, announcers or others viewing the game do not know which team the penalty is against, requiring the referee to take time to signal the infraction and team that it is against, either by hand signals and/or vocally via a broadcasting system. It also may be that the calling of a penalty may not be immediately seen by the viewers, either those spectators at the playing field, a television audience or others.

**[0003]** It would be desirable to provide a system and methods for communicating not only the occurrence of a rules infraction during a football game or the like, but also which team the rules infraction or penalty is called against in an immediate manner to better allow the fans and viewers to follow the game.

### SUMMARY OF THE INVENTION

**[0004]** According to the invention, a system and methods are set forth whereby the spectators are apprised of the action of one or more referees in throwing the flag on the playing field to indicate whether the penalty is an offensive or defensive penalty. Thus, the spectators immediately know of a rules infraction and which team it was on, to better follow and enjoy the game. In one example, the system and methods include using two distinct flags carried by the referee, one indicating an offensive penalty and one indicating a defensive penalty. For example, the referee may carry a first color flag which when thrown indicates an offensive penalty, and a second color flag indicating a defensive penalty. Alternatively or in addition, one or two penalty flags may have a switch and/or radio frequency transmitter, such that upon activation by a referee, a signal is communicated to a receiver of an offensive or defensive penalty, and an indication of the penalty and which team it is against is communicated to fans in the stadium or watching on television or the like. For example, the throwing of the flag may actuate the communication that may be sensed by a nearby receiver, with the receiver in turn coupled to the stadium scoreboard and/or to television system where an appropriate indication that an offensive or defensive penalty has been called. Similarly, other games also include referees or other officials to determine if violations of rules have been committed by opposing teams, such as in soccer. The invention may also allow for an indication of offensive/defensive penalty or against which team the infraction has been called for such games.

**[0005]** This invention thus relates to systems and methods for enhancing the viewing enjoyment of sports audiences,

particularly those viewing the game of football. The invention also exhibits utility in any sport wherein one or more referees signal the occurrence of an infraction of the rules of the game by the dropping of a flag or other object onto the ground. The invention is directed to transmitting the occurrence of an event upon a playing field, such as in football, to the live fans as well as to a television viewing audience.

**[0006]** These and other aspects of the invention will be understood in more detail in conjunction with the drawings.

### BRIEF DESCRIPTION OF THE DRAWING FIGURES

**[0007]** The figures in the drawings are briefly described as follows:

**[0008]** FIG. 1 is a schematic representation of first and second penalty flags carried by a referee for indicating an offensive/defensive penalty or against which team the infraction has been called.

**[0009]** FIG. 2 is a schematic diagram of a penalty communication system including transmitting and receiving systems for indicating an offensive/defensive penalty or against which team the infraction has been called.

**[0010]** FIG. 3 is a schematic diagram of an alternative example of the invention.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

**[0011]** In FIG. 1, there is shown an example of a system 10 according to the invention. A referee 12 carries a first penalty flag 20 and a second penalty flag 30. The flag 20 may be of a first color, such as yellow or red, while the second flag 30 may be of a second color, such as green or blue. The first flag 20 may be used by the referee 12 to indicate a penalty against the defensive team while the second flag 30 may be used to indicate a penalty against the offensive team. The system 10 enhances the viewing enjoyment of the sports audience, both in the stadium live, as well as for those viewing the game on television or the like. The invention also exhibits utility in any sport wherein one or more referees signal the occurrence of an infraction of the rules of the game by the dropping or using a flag or other object. The invention is directed to transmitting the occurrence of a penalty event upon a playing field, such as in football, and to indicate the team against which the infraction was called.

**[0012]** Although different color flags 20 and 30 may be used, other distinctive indicators may be used if desired, such as a flag or like object with different color LED's or other light source, which indicates the team on which the penalty is called. Other indicators may be used, such as an arrow or other directional indicator to point toward the team that the penalty is called on. Other suitable indicators may be used.

**[0013]** In a further example, the invention may be implemented by using indicators that electronically communicate the occurrence of and which team a penalty is called on by a referee. In FIG. 2, a playing field 50 (such as a football field) is surrounded by television cameras 52. Cameramen located at each camera view different parts of the play or view the same play but at different angles. Video images from television cameras 52 are transmitted to a control center 54. Each of the video images is viewable on a monitor 60, where an operator may watch the images from all the monitors. Upon the occurrence of a penalty, the operator may determine the team against which the penalty was called via a system 10,

and may cause an indication of the penalty and team against which it was called on the broadcast signal to provide information to the viewing audience. Particularly, for television viewers, the ability to provide this information as to the occurrence of and who a penalty was against greatly enhances the viewing experience, and alleviates possible confusion. Alternatively to the operator determining the occurrence of and who a penalty was against, this could be done automatically by a detection system 56 associated with the television or other image generating system. The detection system 56 could operate to automatically detect the color of the flag thrown by a referee to provide the indication to the viewers.

**[0014]** As shown in FIGS. 2 and 3, as another alternative, each flag 20 and 30 may have a switch 70 associated therewith, that is in turn coupled to a transmitter 72, such as an RF transmitter. The switch 70 may be activated by the referee upon calling a penalty and throwing the flag. Actuation of the switch 70 may be automatic upon removal from the referee's pocket for example, such as by a displacement switch that is biased to the open position upon becoming unrestrained in the referee's pocket or the like. Alternatively, a switch 70 may not be needed, and the removal of a flag from a stored position may be sensed to activate the signal indicating a penalty has been called, and which team has committed the penalty. In such an example, the referee may carry the transmitter 72, and sends a signal upon removal of the flag or indicator from the stored position. The sensing of removal of a flag from its stored position may be made in any suitable manner, such as by a switch or the unmaking of an electrical connection made between the flag and another connector when in the stored position. Any suitable arrangement may be used to activate the switch 70 and/or transmitter 72 if no switch is provided.

**[0015]** A penalty, or any other predetermined event, may occur anywhere on playing field 50. Therefore, various receivers 74 are provided around the areas of play on field 50, which are in turn coupled to a control system 76. Each transmitter 72 may emit electromagnetic radiation such as radio frequency waves, which are detected at one or more receivers. Upon detecting a transmission from a transmitter 72, the control system may provide an indication of a penalty and which team the penalty has been called on immediately. For example, the control system 76 may detect a signal from a transmitter 72 and generate a flag image and team indicator which is superimposed upon all of the images appearing on a television broadcast, and/or playing field or in-stadium communication system such as a scoreboard, video monitors, audio broadcast system or otherwise. Any other suitable indicator may be used as desired, which may be audible, visual, or otherwise. For example, whenever any transmitter is activated, a flag image and team indicator may be displayed to immediately indicate a penalty and team against which it was called. This indicator, such as a flag image may appear in any desired area of the video display. For the video (television) broadcast for example, the viewer will immediately be notified of a penalty being called, such as by seeing a video image of the flag image and team indicator. It should be understood that varying numbers of receivers 74 may be used according to the venue and/or game being played.

**[0016]** If multiple penalties are called, each of the transmitters 20 and 30 may be distinct, and the control system may generate flag images and team indicators for each. For example, each transmitter may be coded according to predetermined frequency, such that upon receiving a signal from a transmitter, the control system 76 can determine which trans-

mitter has been activated. Each transmitter may be made to operate on a different frequency if desired. Alternatively, coding may be accomplished by modulating each transmitted signal differently.

**[0017]** Modulation modes include amplitude modulation, frequency modulation, pulse width modulation, and any other modulation mode. This information may be transmitted to the control system 76. This system may also be useful in analyzing the calls of a particular referee over a game or multiple games, with a particular referees flags being individually identifiable. In this manner, data on a referee may be gathered and used in a variety of ways, such as for quality control, training or other purposes. For example, the information could be used in referee analysis, such as providing detailed statistical data, detailed performance trends or the like. The invention may also enable objective analysis of the performance of referee or game officials from game to game and across entire seasons. This may allow officials and others to identify areas in need of improvement and develop personalized training programs for individual referees or officials.

**[0018]** In some cases, it may also be desirable to indicate where the penalty was called on the field 50, and the control system 76 may be configured to determine this based on the location of the transmitter(s) 72 when activated. This location may be determined by triangulation techniques based on the transmitted signal being received at multiple receivers 74, by GPS or other suitable system. The location may be suitably indicated to the viewer such as on a video display or otherwise.

**[0019]** It also may be desirable to immediately indicate the player on whom the penalty was called, and the system may further include a transmitter 78 that may be carried by a referee, to communicate the number or other information to identify the player on whom the penalty was called. The control system 76 may then provide an indication of the offending player along with the indication of a penalty and which team it is on.

**[0020]** It should be clear that the invention provides a way of enhancing spectator enjoyment of football or other sports. The systems and methods according to the various examples of the invention allow for immediate recognition of both that a penalty has been called and on which team it is called. Thus, the spectators know that the play may be called back, even though the players themselves may not be aware that a flag has been dropped to signal a rules infraction.

**[0021]** The invention has been described with reference to alternate examples. Modifications and alterations will become apparent to those skilled in the art upon reading and understanding the detailed discussion of the invention provided herein. This invention is intended to include all such modifications and alterations insofar as they come within the scope of the present invention.

What is claimed is:

1. A system for enhancing the viewing enjoyment by spectators of a sports game having competitors in which at least one official is present for the purpose of observing any infractions of rules of the game, the official signifying an infraction of the rules, comprising,

- a first flag or other indicator carried by the official having a first distinctive characteristic,
- a second flag or other indicator carried by the official having a second distinctive characteristic,
- wherein upon observing any infractions of rules of the game, the official indicates such infraction by using the

first or second flag or other indicator, to indicate to viewers that an infraction has occurred and which competitor the infraction has been called upon.

2. The system of claim 1, wherein the first and second distinctive characteristics are first and second colors or patterns for indicating an offensive or defensive infraction or against which competitor the infraction has been called.

3. The system of claim 1, further comprising at least one camera for generating video images of the game, wherein an indication of the calling of a rules infraction is generated upon seeing the first or second flag or other indicator, and generating an indication on a display and/or playing field communication system to indicate to viewers that an infraction has occurred and which competitor the infraction has been called upon.

4. The system of claim 3, further comprising an image sensing system to automatically detect the calling of a rules infraction by determining the presence of the first and/or second flag or other indicator on the playing field, and generating the indication that an infraction has occurred and which competitor the infraction has been called upon.

5. The system of claim 1, wherein the game is football and the competitors are first and second teams, and the distinctive characteristics are first and second colors for indicating an offensive or defensive infraction or against which team the infraction has been called.

6. The system of claim 1, wherein the first and second indicators include a transmitter for transmitting a signal indicative of a rules infraction and the competitor which committed the rules infraction,

at least one receiver to receive the signal from the transmitter, being coupled to a control system,

wherein the control system generates an indication that a rules infraction has occurred and the competitor against which the infraction was called to the viewers of the game.

7. The system according to claim 6, wherein the transmitter is a radio transmitter carried by the at least one indicator, the radio transmitter being actuated upon removal of the indicator from a stored position.

8. The system according to claim 6, wherein the transmitter is a radio transmitter carried by the official, the radio transmitter being actuated by removal of the indicator from a stored position.

9. The system according to claim 1, further comprising a mechanism to sense the use of the at least one indicator by the official.

10. The system according to claim 1, further comprising a switch to sense removal of the at least one indicator from a stored position.

11. A system for indicating infractions of rules of a game between first and second competitors, comprising,

at least one indicator carried by an official monitoring the game for rules infractions to use to signify an infraction of the rules, the at least one indicator being capable of indicating an infraction by each of the first and second competitors and which competitor committed the infraction,

wherein upon observing any infractions of rules of the game, the official indicates such infraction by using the at least one indicator, to indicate to viewers that an infraction has occurred and which competitor committed the infraction.

12. The system of claim 11, wherein the at least one indicator is first and second indicators each having a distinctive characteristic relative to the other indicator.

13. The system of claim 12, wherein the game is football and the competitors are first and second competitors, and the distinctive characteristics are first and second colors for indicating an offensive or defensive infraction or against which competitor the infraction has been called.

14. The system of claim 11, wherein the at least one indicator includes a transmitter for transmitting a signal indicative of a rules infraction and the competitor which committed the rules infraction,

at least one receiver to receive the signal from the transmitter, being coupled to a control system,

wherein the control system generates an indication that a rules infraction has occurred and the competitor against which the infraction was called to the viewers of the game.

15. The system according to claim 14, wherein the transmitter is a radio transmitter carried by the at least one indicator, the radio transmitter being actuated upon removal of the indicator from a stored position.

16. The system according to claim 14, wherein the transmitter is a radio transmitter carried by the official, the radio transmitter being actuated by removal of the indicator from a stored position.

17. The system according to claim 11, further comprising at least one spectator viewed display, wherein the generated indicator is generated on the display.

18. The system according to claim 11, further comprising a mechanism to sense the use of the at least one indicator by the official.

19. The system according to claim 11, further comprising a switch to sense removal of the at least one indicator from a stored position.

20. A method for enhancing the viewing enjoyment by spectators of a sports game conducted on a playing field and two teams of opposing players thereon, and in which at least one official is present for the purpose of observing and indicating any infractions of rules of the game, comprising,

providing the referee with first and second indicators having first and second distinctive characteristics associated therewith, each of the first and second distinctive characteristics respectively,

wherein upon observing any infractions of rules of the game, the referee indicates such infraction by using the first or second indicator, to indicate to viewers that an infraction has occurred and which team the infraction has been called upon.

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