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(54) **AUTO-SCORER FOR MONITOR BOWLING**

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(57) **ABSTRACT**

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A bowling automatic scoring system so far did not have means for displaying an absent bowler, did not have means for calculating absent bowler's score, did not have means for comparing absent bowler's score, nor did not have means for judgment and display of absent bowler's win and loss, for a bowling automatic scoring system so far was to calculate score based on results of bowling identifying the pins fallen by a ball on each lane. Therefore it was impossible to bowl general match play or "frame by frame" match game alone when a bowler could not find other bowlers, for a bowling automatic scoring system so far did not have means for providing an opposition for a single bowler. This invention provides an absent bowler on monitor screen, having means for displaying a motion video of an absent bowler to bowl with, having means for displaying an absent bowler's results and score, having means for audio supply of the absent bowler, having means for determining handicaps for the game including the absent bowler from a pre-set percentage of the base score and randomly selected frames, and having means for comparison of scores, judgment of win and loss and display of the standings.

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Related U.S. Application Data

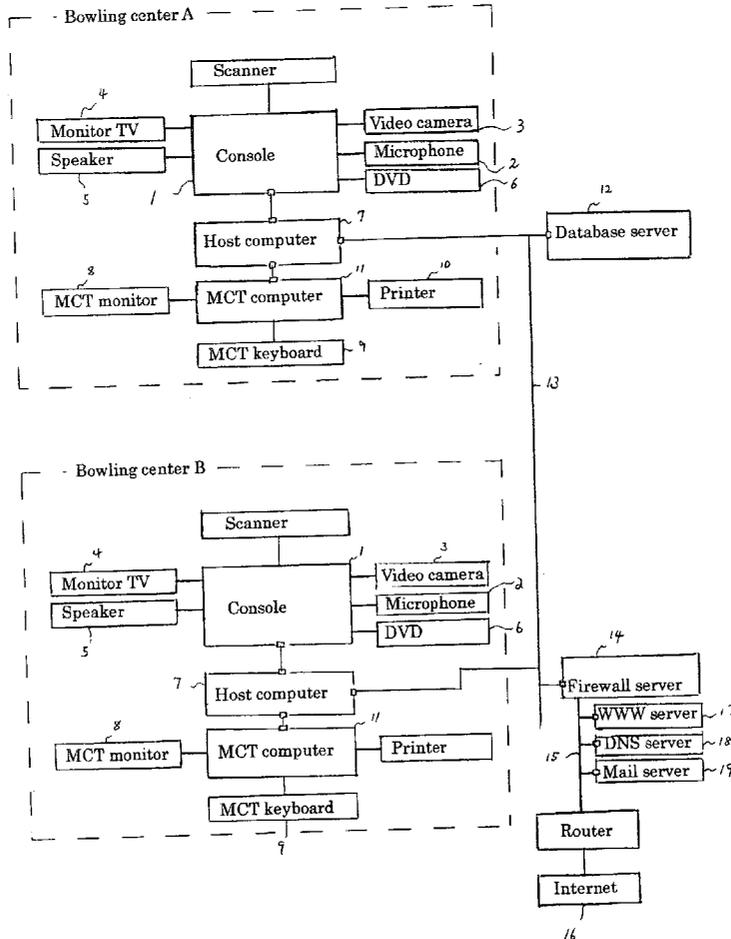
(63) Continuation-in-part of application No. 09/812,263, filed on Mar. 19, 2001.

(30) **Foreign Application Priority Data**

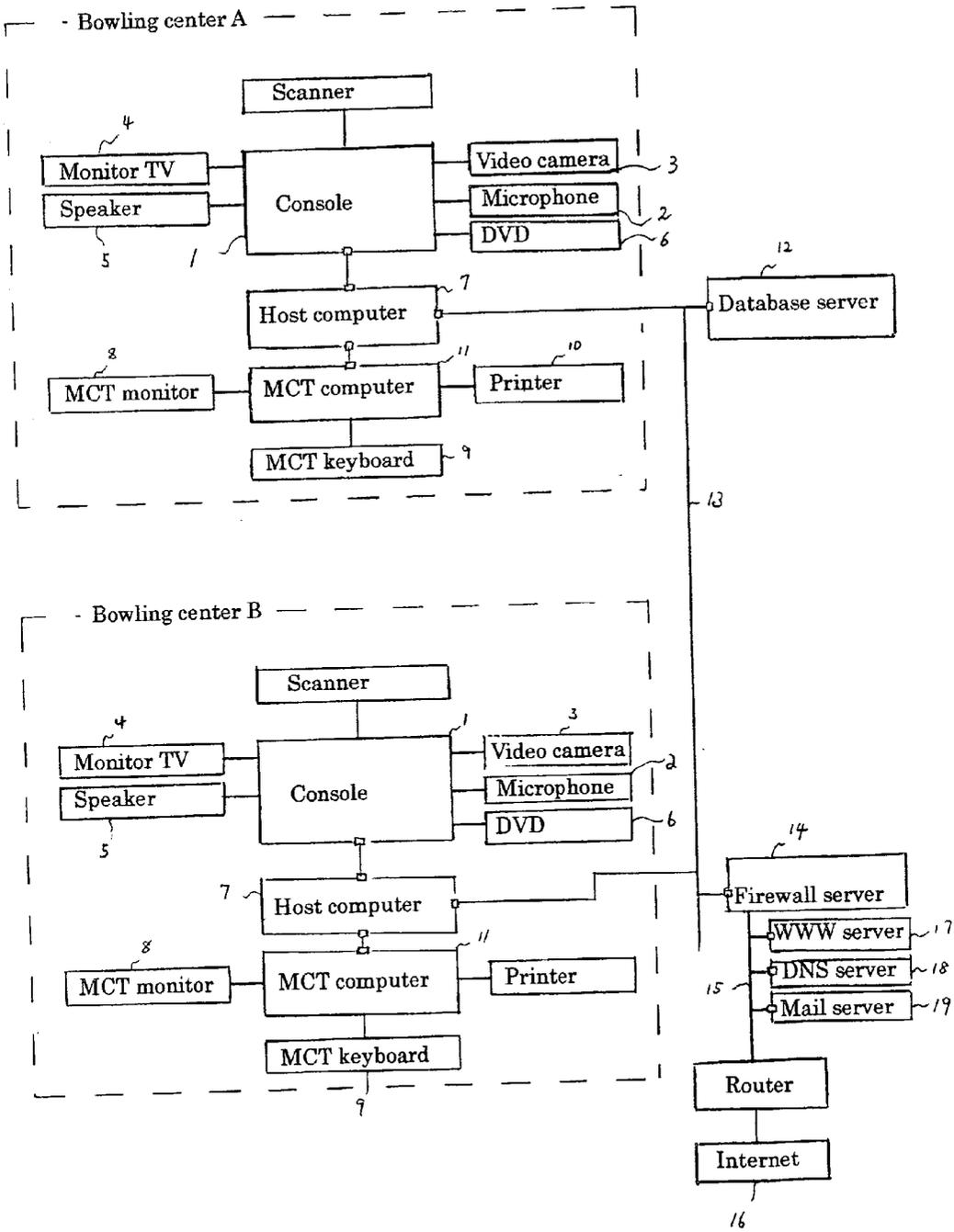
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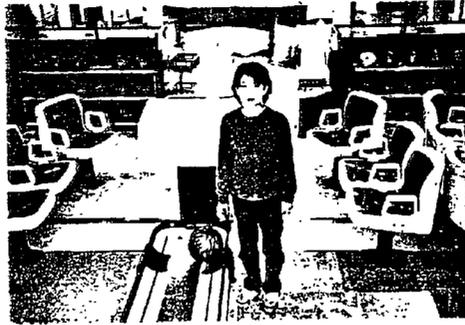
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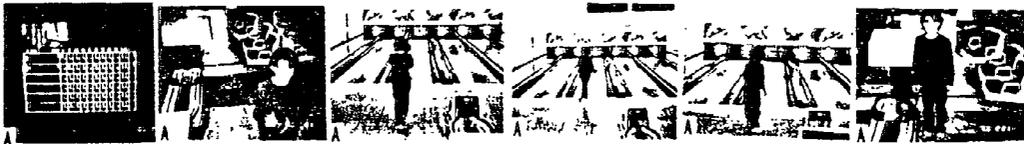
[Fig.1]



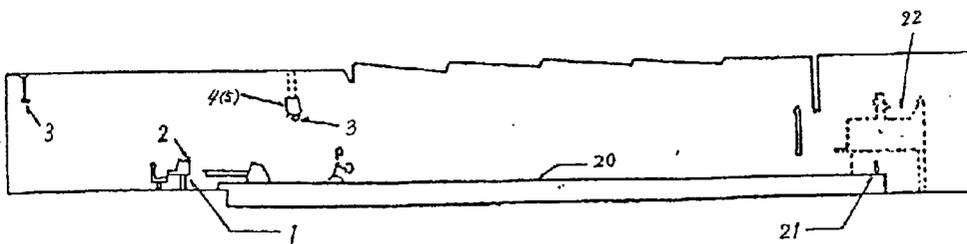
[Fig.2]



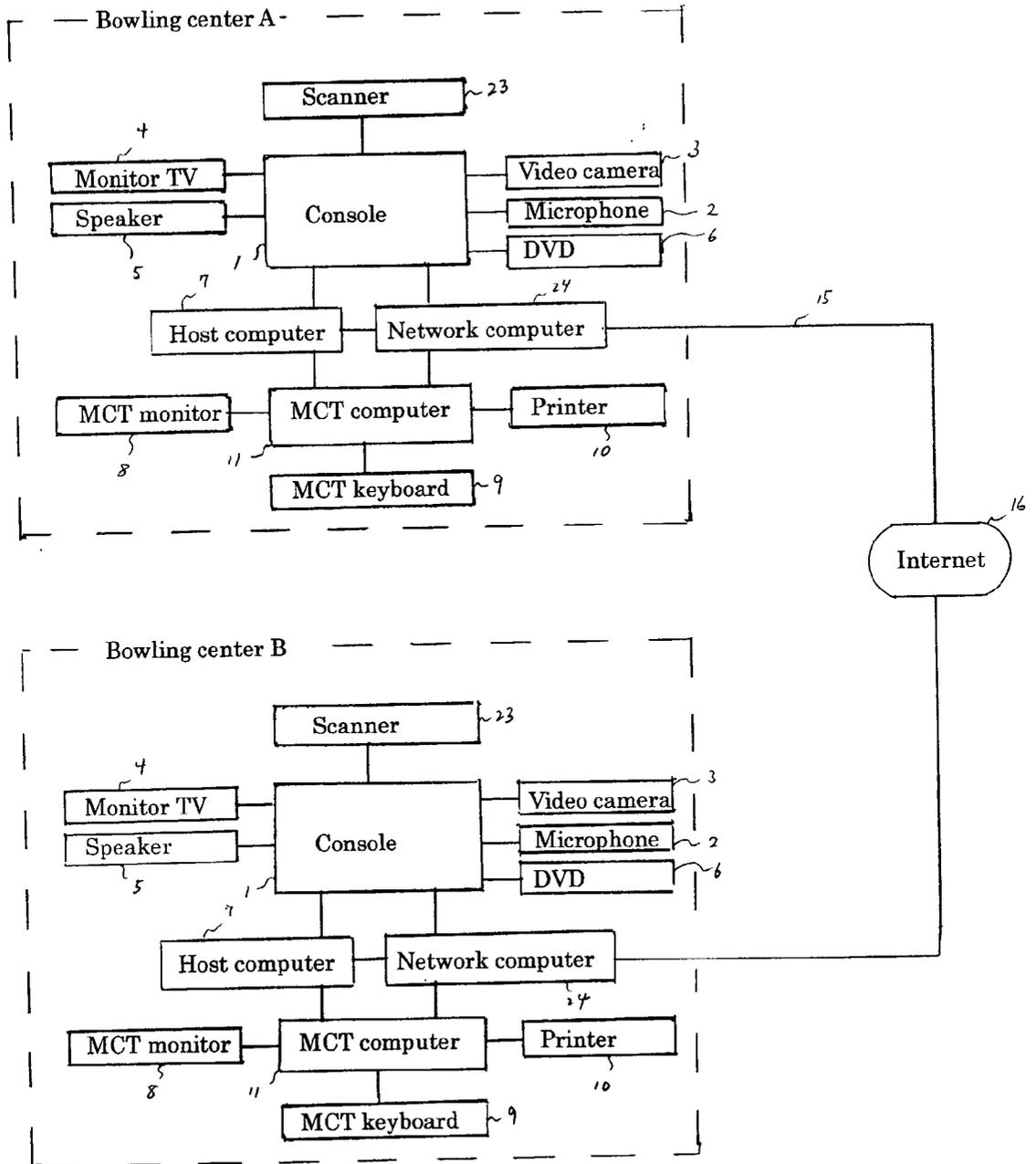
[Fig.3]



[Fig.4]



[Fig.5]



AUTO-SCORER FOR MONITOR BOWLING**CROSS-REFERENCE TO RELATED APPLICATIONS, IF ANY**

[0001] This application is a continuation in part of U.S. patent application Ser. No. 09/812,263, filed Mar. 19, 2001, which is hereby incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] This invention relates to an Auto-scorer for Monitor Bowling, which provides an absent bowler on monitor screen for bowling in a bowling center, having means for display of motion video and audio supply, and having means for automatic calculation and comparison of score and judgment of win and loss including handicaps.

[0004] 2. Background Information

[0005] A bowling automatic scoring system so far comprised consoles for each lanes; and a host computer connected to consoles, having means for detecting results of bowling on each lane, having means for data communication between consoles and a host computer, having means for calculating score of the bowler, having means for displaying the score, having means for frame by fame score comparison and judgment, and having means for displaying the score and judgment.

[0006] Also there was a bowling automatic scoring system having means for determining handicaps for the game from selected frames automatically.

[0007] A bowling automatic scoring system so far had defects as described below.

[0008] A) A bowling automatic scoring system so far did not have means for displaying an absent bowler, did not have means for calculating absent bowler's score, did not have means for comparing absent bowler's score, nor did not have means for judgment and display of absent bowler's win and loss, for a bowling automatic scoring system so far was to calculate score based on results of bowling identifying the pins fallen by a ball on each lane. Therefore it was impossible to bowl general match play or "frame by frame" match game alone when a bowler could not find other bowlers, for a bowling automatic scoring system so far did not have means for providing an opposition for a single bowler.

[0009] B) A bowling automatic scoring system so far did not have means for calculating, comparing, judging, nor displaying the score of the bowler in a distant bowling center, because the bowling data was only communicated between a host computer and lanes in a bowling center and it did not have means for communicating bowling data with host computers in other bowling centers. Therefore, bowlers had to gather at one bowling center to play general bowling games like a tournament or a league, or a "frame by frame" match game, and it was a burden for a heavy bowler to travel frequently.

[0010] C) Auto Handicap for Bowling which automatically determines handicaps from hidden frames

was available only for a small competition in one bowling center, for it was impossible to set common hidden frames with the bowlers in a distant bowling center.

[0011] To solve the defects described above, this invention provides an absent bowler on monitor screen, having means for displaying a recorded motion video of an absent bowler to bowl with, having means for displaying an absent bowler's results and score based on the recorded motion video, having means for audio supply of the absent bowler, having means for determining handicaps for the game including the absent bowler from a pre-set percentage of the base score and randomly selected frames, and having means for comparison of scores, judgment of win and loss and display of the standings.

[0012] This invention also provides an absent bowler on monitor screen, having means for data communication via Internet or via Network with distant bowling centers; having means for communicating data for bowling games, having means for communicating data for audio and motion picture of bowlers and having means for communicating data for bowlers' results and scores, and having means for displaying a motion video of an absent bowler to bowl with, having means for displaying absent bowler's results and score, and having means for audio supply of the absent bowler.

[0013] Furthermore, this invention provides an absent bowler on monitor screen, having means for data communication via Internet or via Network with distant bowling centers; having means for communicating data for bowling games, having means for communicating data for audio and motion picture of bowlers and having means for communicating data for bowlers' results and scores, and having means for displaying a motion video of an absent bowler to bowl with, having means for displaying absent bowler's results and score, having means for audio supply of the absent bowler, having means for determining handicaps for the game including the absent bowler from a pre-set percentage of the base score and randomly selected frames, and having means for comparison of scores, judgment of win and loss and display of the standings.

[0014] And for the case a bowler could not find the other bowler to play with in other bowling centers by data communication, this invention provides an absent bowler on monitor screen, having means for displaying a recorded motion video of an absent bowler to bowl with, having means for displaying an absent bowler's results and score based on the recorded motion video, having means for audio supply of the absent bowler, having means for determining handicaps for the game including the absent bowler from a pre-set percentage of the base score and randomly selected frames, and having means for comparison of scores, judgment of win and loss and display of the standings.

[0015] All U.S. patents and patent applications, and all other published documents mentioned anywhere in this application are incorporated by reference in their entirety.

BRIEF SUMMARY OF THE INVENTION

[0016] This invention sends bowling data like a name of bowler or handicaps to the Auto-scorer for Monitor Bowling in other bowling center via Internet or via Network.

[0017] When a bowler starts playing bowls, data of motion video, sound, bowling results and score is sent to the other

center. Motion video, bowling results and score are displayed on the monitor screen and speakers or headphones supply sound in the other bowling center.

[0018] The bowler and the absent bowler on monitor screen play bowls by turns.

[0019] Bowling results and score are sent to both sides, and are compared, judged, and displayed.

[0020] Command for selecting the common hidden frames is sent if the handicap is set by hidden frames.

[0021] An absent bowler is provided by a display of recorded motion video, results and score, and an audio supply when there is no data communication with other bowling centers.

[0022] The features, benefits and objects of the invention will become clear to those skilled in the art by reference to the following description, claims and drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0023] FIG. 1 is a drawing of a preferred embodiment of Data communication Network

[0024] FIG. 2 is a drawing of a concrete condition showing the use of a monitor TV screen by this invention.

[0025] FIG. 3 is a drawing of concrete conditions showing the use of monitor TV screens by this invention.

[0026] FIG. 4 is a drawing of a side elevation of bowling lane showing a preferred embodiment of this invention.

[0027] FIG. 5 is a drawing of an another embodiment of Data communication Network.

DETAILED DESCRIPTION

[0028] Preferred Embodiments are Described as Follows

[0029] In the accompanying drawings, FIG. 4 shows Microphone 2 on a Console 1 on each lane in a bowling center. Monitor TV 4 with Video camera 3 and Speaker 5 is equipped above each lane. Video camera 3 above each lane shoots a bowler and Video camera 3 behind each lane shoots Lane surface 20 and Pins 21.

[0030] Referring FIG. 1, scanner 23, Video camera 3 to shoot motion video, Microphone 2 to pick up sound, Monitor TV 4 to display motion video, bowling results and score, Speaker 5 for audio supply, DVD 6 recording absent bowler's motion video, sound, bowling results and score, are connected to Console 1 in Bowling center A. Console 1 is connected to Host computer 7. MCT computer 11 with MCT monitor 8, MCT keyboard 9 and Printer 10 is connected to Host computer 7.

[0031] Host computer 7 is connected to Host computer 7 in Bowling center B and Database server 12 via Network 13.

[0032] In the same way, scanner 23, Video camera 3, Microphone 2, Monitor TV 4, Speaker 5, DVD 6 are connected to Console 1 in bowling center B. Console 1 is connected to Host computer 7. Host computer 7 is connected to MCT computer 11, And MCT computer 11 with MCT keyboard 9 controls MCT monitor 8 and Printer 10.

[0033] Host computer 7 in bowling center B is also connected to Host computer 7 in Bowling center A and Database server 12 via Network 13.

[0034] Therefore, Host computer 7 in Bowling center A and Host computer 7 in Bowling center B are connected via Database server 12 for data communication.

[0035] Database server 12 is connected to Internet 16 via WWW server 17, DNS server 18, Mail server 19 and Firewall server 14 through telecommunication line 15, providing motion picture, sound, and score of bowling game in Bowling center A and Bowling center B on real time or by video to a third party by Database server 12.

[0036] And as shown in FIG. 5, each Bowling center are able to send and receive communication

[0037] Data by Network computer 24 via telecommunication line 15 and via Internet 16.

[0038] Description for the Case of Playing Bowls with a Bowler in Other Bowling Center by Competitions Like Pro-Challenge, Tournament, or League

[0039] (1) For instance, when a bowler a) in bowling center A and bowler b) in bowling center B play bowls, each motion video, bowling results, and score are sent and received at each sides by data communication between Host computer 7 in each Auto-scorer via Database server 12 as drawn in FIG. 1.

[0040] (2) Bowling data like a name of bowler, handicap are sent from Host computer 7 in Bowling center A to Host computer 7 in Bowling center B, and motion video and sound are sent from Host computer 7 in Bowling center B to Host computer 7 in Bowling center A, and motion picture of bowler B is displayed on the monitor screen as FIG. 2 and sound is supplied from speakers.

[0041] (3) When bowler a) starts playing bowls, motion picture, sound and score of bowler a)'s first frame are sent to Host computer 7 in Bowling center B. Then bowler b) starts playing bowls from the first frame and bowler b)'s motion video, sound and score are sent to Host computer 7 in Bowling center A. They are displayed by changeover of cameras as drawn in FIG. 3, or by division of the screen, or by overlapping of the motion video.

[0042] (4) When they play "frame by frame" Match Game, scores of both bowlers are compared, judged win and loss and displayed on the monitor screen.

[0043] (5) In the same way, two bowlers play bowls by turns. And the result of the game is printed by printer 10 in both bowling centers when the game is finished.

[0044] (6) Motion video of the bowler is shot by a video camera, or by plural video cameras as drawn in FIG. 4, and the motion video of the bowler is sent and received with changeover of pictures or division of pictures.

[0045] (7) Handicap is set if necessary, and it is displayed on the monitor screen from the start of the game if it is a preset handicap, and it is added to the score. If they use Auto-Handicap for Bowling which

automatically determines handicaps by hidden frames, common hidden frames are set for bowlers in both bowling centers for each game.

[0046] (8) The results of the bowling game are recorded in a Database server 12 and average, handicaps, and ranking data of win and loss are automatically calculated.

[0047] Next Description is for the Case a Bowler Could Not Find the Other Bowler to Play with in Other Bowling Centers

[0048] The recorded motion picture, bowling results and score of an absent bowler which are recorded in a hard disk of a computer or a recording device like DVD 6 are displayed on a monitor screen and also recorded sound is supplied.

[0049] Without data communication between bowling centers, bowling game is proceeded in the same way of the game with a bowler in other bowling center. After a bowler starts playing bowls in the first frame, recorded motion picture and sound of absent bowler are supplied, and bowling result and score of the recorded absent bowler for the first frame are displayed.

[0050] When a bowler plays "frame by frame" Match Game, scores of a bowler and an absent bowler are compared, judged win and loss and the judgment is displayed on the monitor screen.

[0051] In the same way, a bowler and an absent bowler play bowls by turns. And the result of the game is printed by Printer 10 when the game is finished.

[0052] The motion video of an absent bowler is a recorded play at a competition or a recorded refrain play. And also the score is the one that is recorded at the former competition, or a virtual score set by Auto-scorer.

[0053] Effect

[0054] It was impossible to bowl general match play or "frame by frame" match game alone when a bowler could not find other bowlers, for a bowling automatic scoring system so far was to calculate score based on results of bowling identifying the pins fallen by ball on each lane. This invention makes it possible to play alone, for motion video, bowling results, score and sound of recorded absent bowler is supplied by hard disk of a computer or a recording device like DVD.

[0055] Bowlers had to gather at a bowling center to play general bowling games like a tournament or a league, or a "frame by frame" match game, because the bowling data was only communicated between a host computer and lanes by a bowling automatic scoring system so far in a bowling center and it did not have means for communicating bowling data with host computers in other bowling centers, and it was a burden for a heavy bowler to travel many times. This invention solved the burden.

[0056] Auto Handicap for Bowling which automatically determines handicaps from hidden frames was available only for a small competition in one bowling center and it was not available for a nationwide big competition, for it was impossible to set common hidden frames with the bowlers in a distant bowling center. This invention solved the difficulty.

[0057] Description of Indicator Marks

[0058] 1 Console

[0059] 2 Microphones

[0060] 3 Video camera

[0061] 4 Monitor TV

[0062] 5 Speakers

[0063] 6 DVD

[0064] 7 Host computer

[0065] 8 MCT monitor

[0066] 9 MCT keyboard

[0067] 10 Printer

[0068] 11 MCT computer

[0069] 12 Database server

[0070] 13 Network

[0071] 14 Firewall server

[0072] 15 Telecommunication line

[0073] 16 Internet

[0074] 17 WWW server

[0075] 18 DNS server

[0076] 19 Mail server

[0077] 20 Surface of lane

[0078] 21 Pins

[0079] 22 Pinsetter

[0080] 23 Scanner

[0081] 24 Network computer

[0082] The descriptions above and the accompanying drawings should be interpreted in the illustrative and not the limited sense. While the invention has been disclosed in connection with an embodiment or embodiments thereof, it should be understood that there may be other embodiments which fall within the scope of the invention as defined by the claims. Where a claim, if any, is expressed as a means or step for performing a specified function it is intended that such claim be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof, including both structural equivalents and equivalent structures, material-based equivalents and equivalent materials, and act-based equivalents and equivalent acts.

1. An Auto-scorer for Monitor Bowling providing an absent bowler on monitor screen, having means for displaying a recorded motion video of an absent bowler to bowl with, having means for displaying an absent bowler's results and score based on the recorded motion video, having means for audio supply of the absent bowler, having means for determining handicaps for the game including the absent bowler from a pre-set percentage of the base score and randomly selected frames, and having means for comparison of scores, judgment of win and loss and display of the standings.

2. An Auto-scorer for Monitor Bowling providing an absent bowler on monitor screen, having means for data communication via Internet or via Network with distant bowling centers; having means for communicating data for bowling games, having means for communicating data for audio and motion picture of bowlers and having means for communicating data for bowlers' results and scores, and having means for displaying a motion video of an absent bowler to bowl with, having means for displaying absent bowler's results and score, and having means for audio supply of the absent bowler.

3. An Auto-scorer for Monitor Bowling providing an absent bowler on monitor screen, having means for data communication via Internet or via Network with distant bowling centers; having means for communicating data for bowling games, having means for communicating data for audio and motion picture of bowlers and having means for communicating data for bowlers' results and scores, and having means for displaying a motion video of an absent bowler to bowl with, having means for displaying absent bowler's results and score, having means for audio supply of the absent bowler, having means for determining handicaps for the game including the absent bowler from a pre-set percentage of the base score and randomly selected frames,

and having means for comparison of scores, judgment of win and loss and display of the standings.

4. An Auto-scorer for Monitor Bowling according to claim 3 providing an absent bowler on monitor screen, having means for displaying a recorded motion video of an absent bowler to bowl with, having means for displaying an absent bowler's results and score based on the recorded motion video, having means for audio supply of the absent bowler, having means for determining handicaps for the game including the absent bowler from a pre-set percentage of the base score and randomly selected frames, and having means for comparison of scores, judgment of win and loss and display of the standings, for the case a bowler could not find the other bowler to play with in other bowling centers.

5. An Auto-scorer for Monitor Bowling according to claim 3 having means for recording the results of the bowling game in a Database server and automatically calculates average, handicaps, and ranking data of win and loss.

6. An Auto-scorer for Monitor Bowling according to claim 2 providing motion picture, sound, and score of bowling game on real time or by video to a third party via Internet or via Network.

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