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The simulator for anticipation reaction training in different kinds of sport (by the example of tennis)

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Abstract: The research work substantiates the dependence of professional activity effectiveness on the level of a specialist's anticipation development in the sphere of sport. ***The aim*** of the study is the need for purposeful development of anticipation with the help of various simulators. They provide playing skills improvement and the time of reaction to the opponent's actions decrease. ***Practical significance.*** Regular use of the simulators will help to evaluate and then increase the time of anticipation, the percentage of the guessed zones and directions of the ball flight. They in the future will positively affect the results of the game in general. Materials and research methods. We analyzed scientific and methodological literature concerning the topic of research, pedagogical testing and pedagogical experiment. ***The result*** of the offered invention use is reliable information getting about the average time (Tav) and percentage (%), an athlete's anticipation, tracking the dynamics of indices and the training process correction. ***Conclusion.*** It has been determined that spatio-temporal anticipation among athletes is the dominant aspect of their professional training. It provides success and creates competitive advantages in sports activity.

Keywords: anticipation, simulator, professional activity, sport, tennis, analogue, light indicators, registration block, electric stopwatch, average time of anticipation.

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Introduction

Anticipation (from the Latin anticipatio - foreseeing) is the ability of the system in this or that form to foresee the events, phenomena, results of actions development.

Among the athletes the contingency of predicting is built during the process of their professional development taking into account not only the frequency of the event, but also the ability to analyze the course of events. For these skills improvement nowadays different simulators are used both in sport and in educational establishments [1, 2, 3].

The presented simulator belongs to the sphere of physical culture and sport [4, 5, 6], in particular to the devices for anticipation training. It is the ability of an athlete to foresee the actions and movements of the opponent before their real realization and can be used in tennis.

It is obvious that if a tennis-player foresees the direction of the ball flight, which the opponent sends and the zone, where the ball falls, he has more time (in milliseconds) for more precise ball serving.

The aim of the offered invention is anticipation time increase of opponent's response (before the moment of striking the ball) owing to the direction of the ball flight prediction and the zone of the ball fall. It as a result gives a tennis player time for more precise place determination for the ball serving.

Materials and methods

We analyzed scientific-methodical information sources concerning the topic of the research, pedagogical testing and pedagogical experiment.

Results and discussion

Technical result of the offered invention use is getting valid information about the average time (Tav) and percentage (%), an athlete's anticipation, tracking the dynamics of indices and the training process correction.

Technical result is achieved owing to the fact that the simulator for anticipation evaluation and training in tennis has a control console. Inside the control console the following things are located: electric stopwatch, radio receiver, radio transmitter, power source, two visual indicators. At the same time the simulator consists of the panel, which has the display with microprocessor connected with the

buttons of the indices of the made strikes, the button of foreseeing the directions of ball flight, the button of information display concerning the average time of anticipation, the percentage of the guessed zones of the ball fall and the amount of the made strikes on the ball and also the button of indices resetting.

The handle of a tennis racket has on/off button and the battery inside – strikes sensor, connected with the cords of the main part of the racket and radio transmitter, which sends to the control console the information about the amount of the ball strikes.

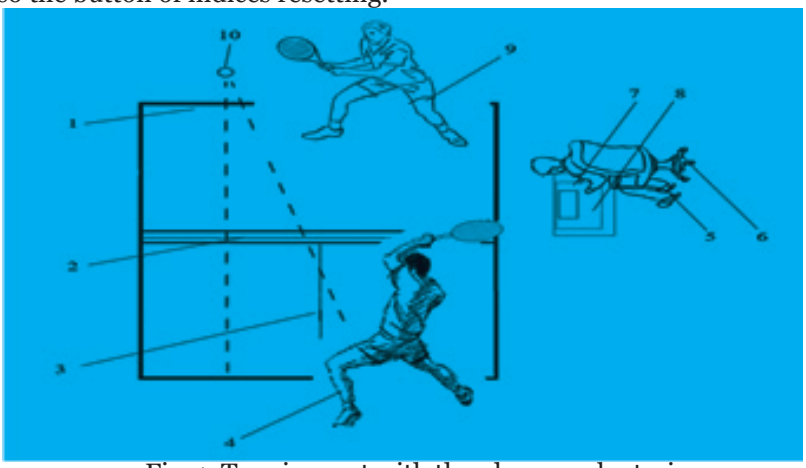

Fig. 1. Tennis court with the players, who train

Fig. 1 shows the tennis court (1) with the net (2), one part of the table is divided in the middle with the reference line (3), on the one side is the trainee (4), on one side of the court – a person, who trains (5), in the chair (6), at the table (7), with the control panel (8), on the other side we see the opponent (9), who serves the ball (10).

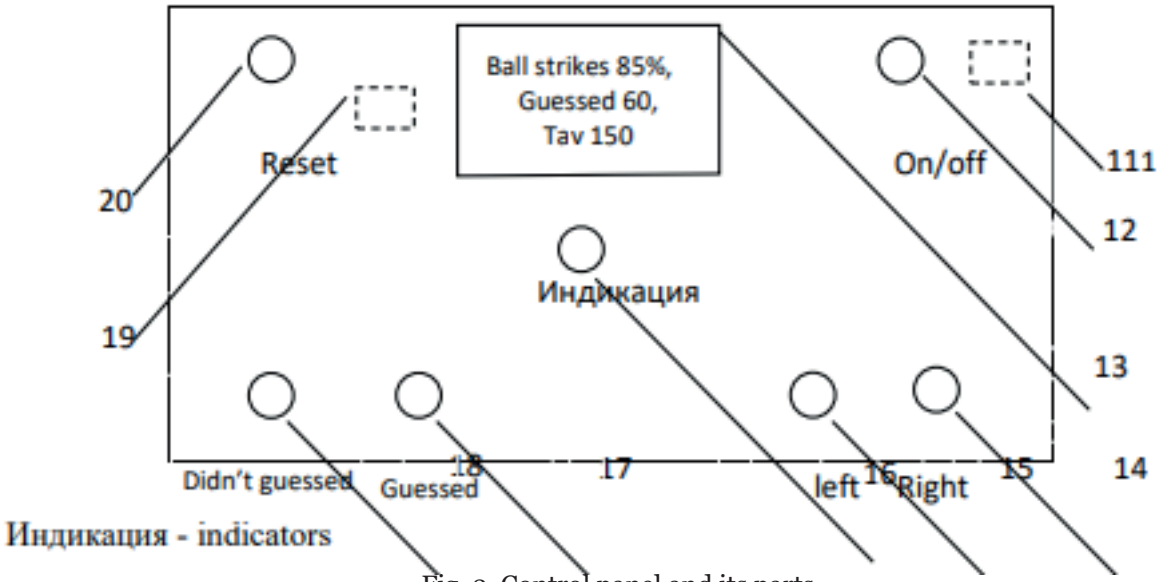

Fig. 2. Control panel and its parts

Fig. 2 shows the control panel (8) in a frame (11). It has the following: on/off button (12), display (13) connected with microprocessor and battery (not shown), "Right" button (14) (if the ball fell on the right part) and "Left" button (15) (if the ball fell on the left part), results "Indication" button (16), button (17) (if a person, who trains "Guessed", where the ball would be served;) button (18), if he "didn't guess"; button (19). It resets all indices on display. When the button of indication is pressed, the indices of ball strikes amount, the percentage of the guessed directions and the zones of the ball fall, the average time of foreseeing appear on display. For example, the amount of the ball strikes by the trainee is 85, the percentage of the guessed directions of the ball flight and the zone of its fall by the tennis player, who trains - 60, the average time of foreseeing – 150 m/sec. All buttons are connected with the microprocessor. There the whole information for handling is sent.

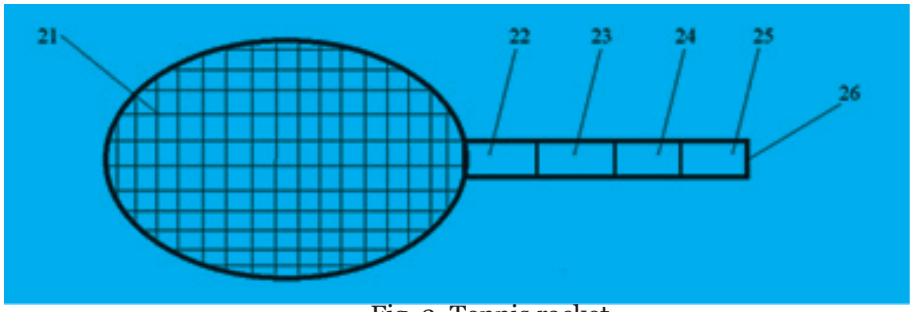

Fig. 3. Tennis racket

Fig. 3 shows a tennis racket with the cords (21) and the handle (22). They are rigidly connected with the strikes sensor (23). It sends impulses for the radio transmitter turning on (24) during the ball contact. The radio transmitter, which is charged on the battery (25), is connected with on/off button (26). The strikes sensor, radio transmitter, battery, on/off button are rigidly fixed inside the handle of a tennis racket, on/off button is placed on its end side.

Both in the training and educational process [5] the training simulator is used in the following way: the trainee (4) turns on the tennis racket with the help of on/off button (26), at the same time the person, who trains (5) in anticipation, turns on the panel (11) with on/off button (12). This way display is turned on (13). The simulator is ready for work, the training begins.

The opponent (9) serves the ball (10) on the other side of the tennis court. There the trainee (4) stands (the directions of the flight are marked with the dotted line). Before the moment of the strike (taking into account the tossing, backswing, slope of the opponent's body and other factors) the person, who trains (5) defines the part of the tennis court, where the ball would fly to. At the same time a person, who trains presses "Right" (14) or "Left" (15) button, turning on the millisecond timer, which is not shown (Fig. 2). During the moment of the strike the sensor (23) in the handle (22) (picture 3) sends the impulse to the radio transmitter (24). It stops the millisecond timer. Thus, this way the time of the ball flight direction anticipation is registered before the moment of the strike fulfillment by the opponent. With the left hand the person, who trains presses "Guessed" (17) or "Didn't guess" (18) button. If the ball fell on the reference line (3) or out, it is considered that the person, who trains didn't guess the zone of the ball fall and it is necessary to press "Didn't guess" button (18). Then the whole process repeats till the end of the game.

All signals go to microprocessor. It is in the panel, where the whole information is handled and in the end of the game the display (13) shows the following results in case if "Indication" (16) button is pressed: amount of strikes, percentage of the guessed directions of the ball flight and the zones of the ball fall, the average time (Tav) of anticipation. The person, who trains, shows the coach the results on the display (13) and then presses button 19 and resets all indices and the simulator is ready for work again. Then the tennis players, who took part both in the training and educational process [7, 8] exchange places and the game continues.

Using the simulator both in the training and educational process [9, 10], a coach has the opportunity to get valid information concerning the average time (Tav) and percentage (%) of the athlete's anticipation, follow the dynamics of indices and correct the training process. For example, Tav of the tennis player was 80 m/sec, and became 120 m/sec and on the contrary – first the person, who trained guessed 70% of the zones, and then started to guess 90%.

Conclusion

The simulator can be used in the training process by tennis players of different age and level of training, starting from the beginners and to highly-qualified athletes. Thus, regular use of the simulators will help to evaluate and then increase the time of anticipation, the percentage of the guessed zones and directions of the ball flight. It in the future will positively affect the results of the game in general.

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