

TABLE TENNIS TRAINING AID AND TRAINING SYSTEM

TECHNICAL FIELD

5 **[0001]** The present disclosure relates to a training aid suitable for use by a person to upgrade his skills in playing table tennis either on a stand-alone basis or with coaches/sparring partners. The present disclosure also discloses a training system comprising one or more automatic table tennis ball serving machine(s) to be used with the training aid.

10 **DESCRIPTION**

15 **[0002]** Table tennis has been gaining in popularity all over the world, and is played by children, teenagers, youths and adults. Many schools have introduced table tennis as part of their sporting curriculum to promote interests of the sports amongst their students. Specialized training academies have also been set up to train serious and professional players. Common interest groups have set up table tennis clubs to bring together players to hone their skills. Semi-professional and professional players participate in domestic and international tournaments, with some offering attractive prizes for the winners in competitions attended by spectators and broadcast on sports channels.

20 **[0003]** The playing skill amongst the table tennis players spans the full spectrum ranging from novice recreational playing, semi-professional serious playing, to professional competitive playing at the international level. To upgrade playing skills in table tennis, a serious player would employ personal coaching. These coaches may employ training aids to assist in training of the player.

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30 **[0004]** An example of a table tennis training accessory is disclosed in GB 2392100A. This table tennis training accessory is a table tennis training net that can be adjusted for height for use above an existing table tennis net. The table tennis training net is secured between two removable vertical struts secured at their base to the playing surface. This allows the ball to pass either between the

2 nets or over the combined height of the 2 nets. The two vertical struts are secured to the playing surface of the table tennis table at their base using a removable clamp or similar means. The training net can be raised or lowered on the vertical struts, and is secured at each end to the struts at any position
5 along the length of the struts by, for example, elastic, clips or similar means.

[0005] As described above, the table tennis training net disclosed in GB 2392100A is for use together with an existing table tennis net. An existing table tennis net is necessarily placed in the middle of the playing surface of a table tennis table when in use, with the net being in parallel with the width of the table
10 tennis table. In this regard, the table tennis training net described in GB 2392100A when in use is necessarily limited to the middle of the playing surface of a table tennis table, with the table tennis training net being in parallel with the width of the table tennis table.

[0006] The table tennis training net disclosed in GB 2392100A is also limited
15 in its use as the full length of the net stretches across the entire width of the table tennis table in the middle of the playing surface. This feature as disclosed in GB 2392100A necessarily limits the types and trajectories of the serving and returning balls that the opponent (for example, the coach of the trainee) of the trainee can execute in any training involving sparring with the trainee.

[0007] There exists a need to develop a table tennis training aid that can be used to complement a coach's training of a player, and on a stand-alone basis so that it can be used by a player conveniently to enhance his playing skills on his own. There also exists a need for a table tennis training aid that is not limited in its position on the playing surface of a table tennis table and that it can be
20 sufficiently flexible to incorporate different types and trajectories of the serving and returning balls that an opponent (for example, the coach of the trainee) of the trainee can execute in any training involving sparring with the trainee.
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[0008] Furthermore, there exists a need to further enhance the benefits that can be derived from the training aid in the stand-alone training of the player,

where one or more automatic table tennis serving machine(s) can be used together with the training aid to form a combined training system.

[0009] According to the first aspect of the present invention, there is provided a table tennis training aid adapted for use on a table tennis table comprising:

- 5 - two or more rods or sticks erected vertically and perpendicularly to the surface of a table tennis table, wherein the rods or sticks are marked with markings at the sides to indicate the vertical distances from the surface of the table, and holes are indented into the vertical rods or sticks in the immediate proximity of each of the markings;
- 10 - one or more string(s) or band(s) with hooks or clips at the ends of the strings or bands, wherein the strings or bands are attached to the holes on the vertical rods or sticks;
- two or more stand holders into which the rods or sticks are inserted to stand vertically and perpendicularly to the surface of the table tennis
15 table, such that stand holders provide stability to the table tennis training aid when in use; and
- two or more rods which are positioned horizontally to the surface of the table tennis table and which are attached to the rods or sticks standing
20 vertically and perpendicularly to the surface of the table tennis table, such that the first-mentioned rods provide stability to the table tennis training aid when in use.

[0010] In this aspect of the present invention, the player positions the table tennis training aid at any place on the playing surface of the table tennis table, with the vertical rods or sticks inserted into the stand holders and placed at a
25 distance between 100 mm to 1525 mm (the standard width of the table tennis table is 1525 mm) apart but preferably between 250 mm to 500 mm apart and linked by the horizontal rods. The player then attaches one or more string(s) or band(s) by hooking or clipping the ends of the strings or bands to the holes on the vertical rods or sticks preferably in parallel to the surface of the table tennis

table, to form a blocking barrier against any ball that hit the strings or bands, but the player leaves a gap of at least 40 mm (being the diameter of the table tennis ball) for the player to aim to get the ball into the gap as the objective of his training.

5 **[0011]** This aspect of the present invention enables a player to train his strokes to control the height of his serving and returning balls when playing table tennis. It should be appreciated that control of height of the ball is a critical element in the playing of table tennis. A player who can control the height of the ball such that it is played with height of mere centimeters above the table tennis
10 net gains advantage over his opponent as the opponent's strokes to return the ball would be restricted to a large degree and the opponent's reaction time to return the ball would be much reduced.

[0012] This aspect of the present invention also enables a player to train his strokes to control the placement of his serving and returning balls when playing
15 table tennis. It should be appreciated that the control of the placement of the ball is a critical element in the playing of table tennis. A player who can control the placement of the ball would allow him to dictate the direction and tempo of the play, thereby gaining advantage over his opponent.

[0013] A player using this aspect of the present invention can train with a
20 trainer or on his own, with or without automatic ball serving machine(s), in serving and returning of balls, with various strokes including forehand and backhand no-spin, topspin, backspin and sidespin, and practice repeatedly a single or combination of strokes or a repertoire of series of tactics.

[0014] This aspect of the present invention can be placed at different
25 positions on the playing surface of the table tennis table to suit different training needs of the player whereby through mastery of the strokes in controlling the height of the serving and returning balls, the player is able to enhance his playing skills in table tennis.

[0015] In this aspect of the present invention, the height of the vertical rods or sticks is at least 6 mm. In some embodiments of this aspect of the present invention, the height of the vertical rods or sticks is in the range of 25 mm to 500 mm.

5 **[0016]** In some embodiments of this aspect of the present invention, the distance between the markings at the sides of the vertical rods or sticks is in the range of 1 mm to 50 mm. The inter-marking distances of 2.5 mm and 5 mm are preferred. In some embodiments, special marking of 152.5 mm may be made to indicate the standard height of a table tennis net. In some
10 embodiments, further special markings are made to indicate the 1 x ball-length from the special marking of 152.5 mm at 192.5 mm, 2 x ball-length from the special marking of 152.5 mm at 232.5 mm, 3 x ball-length from the special marking of 152.5 mm at 272.5 mm and so on, as the diameter of a standard table tennis ball is 40 mm.

15 **[0017]** In some embodiments of this aspect of the present invention, the vertical rods or sticks are extendable and retractable, including by a telescopic design mechanism.

[0018] In some embodiments of this aspect of the present invention, the vertical rods or sticks are made of rigid materials including metal, alloys, plastic
20 or ceramic.

[0019] In some embodiments of this aspect of the present invention, the strings or bands with hooks or clips at their ends for attachment to the holes in the vertical rods or sticks are made of rubber, plastic, natural or artificial fiber, or metal including iron, steel or aluminum in wire form.

25 **[0020]** In some embodiments of this aspect of the present invention, the stand holders which provide stability to the vertical rods or sticks of the table tennis training aid when in use comprise two or more legs. In some embodiments, the stand holders can be cylindrical base, base of any polygonal shapes (rectangular, hexagonal, octagonal, etc.), bipod legs, tripod legs or

quadri-pod legs. In some embodiments of this aspect of the present invention, the stand holders are loaded with weights, evenly or unevenly. Where there is uneven distribution of the weights on the stand holders, the additional weights are distributed within the stand holders so that the vertical rods or sticks can
5 withstand the maximum force of the table tennis balls hitting the table tennis training aid.

[0021] In some embodiments of this aspect of the present invention, the stand holders incorporate clamps which can be used to clamp the table tennis training aid to the table tennis table.

10 **[0022]** In some embodiments of this aspect of the present invention, the length of the two or more horizontal rods attached to the vertical rods or sticks is in the range of 100 mm to 1525 mm. The range of 250 mm to 500 mm is preferred.

[0023] In some embodiments of this aspect of the present invention, the
15 horizontal rods are extendable and retractable, including by a telescopic design mechanism.

[0024] In some embodiments of this aspect of the present invention, the horizontal rods are made of rigid materials including metal, alloys, plastic or ceramic.

20 **[0025]** In some embodiments of this aspect of the present invention, the table tennis training aid includes one or more net(s), sheet(s), tag(s), screen(s) or veneer(s) made of materials including plastic or cloth that can be attached on the strings or bands, or the horizontal rods when the table tennis training aid is in use. The nets, sheets, tags, screens or veneers serve to indicate the zones
25 or other relevant information in which the player shall hit the balls into the gaps left open by the strings or bands as part of his training.

[0026] In some embodiments of this aspect of the present invention, the nets, sheets, tags, screens or veneers are fastened by Velcro fasteners or magnets.

[0027] In some embodiments of this aspect of the present invention, the table tennis training aid includes a bag made of materials including plastic or cloth that is attached on the vertical rods or sticks, or on the strings or bands, or on the horizontal rods, for the collection of table tennis balls that the player
5 successfully serves or returns through the gaps left open by the strings or bands when the table tennis training aid is in use.

[0028] In some embodiments of this aspect of the present invention, the bag is fastened by Velcro fasteners or magnets.

[0029] In some embodiments of this aspect of the present invention, one or
10 more sensor(s) are attached on the vertical rods or sticks, or on the strings or bands, or on the horizontal rods, or on the nets, sheets, tags, screens or veneers, for the detection of the speed, location, direction, spin and other attributes of the table tennis balls when the table tennis training aid is in use.

[0030] In the second aspect of this invention, one or more automatic table
15 tennis ball-serving machine(s) are used in conjunction and coordination with the table tennis training aid in the first aspect of this invention.

[0031] In some embodiments of the second aspect of the present invention, the one or more sensor(s) attached to the training aid are connected by wires or wirelessly to one or more controller(s) to analyze the speed, location,
20 direction, spin and other attributes of the table tennis balls when the table tennis training aid is in use.

[0032] In some embodiments of the second aspect of this present invention, the speed, location, direction, spin and other attributes of the table tennis balls when the table tennis training aid is in use can be captured remotely by imaging
25 devices.

[0033] In some embodiments of the second aspect of this present invention, the one or more controller(s) to which the sensors and imaging devices input the speed, location, direction, spin and other attributes of the table tennis balls also control the automatic table tennis ball-serving machines.

BRIEF DESCRIPTION OF THE DRAWINGS

[0034] Various embodiments are described, by way of example only, with reference to the accompanying drawings, in which:

5 [0035] Figure 1 illustrates a table tennis training aid according to the first aspect of the present invention.

[0036] Figures 1(a) to 1(f) illustrate the various uses and positioning of one or more of the table tennis training aid(s), according to the first aspect of the present invention.

10 [0037] Figure 2 illustrates an embodiment of the second aspect of the present invention, wherein the table tennis training system which includes one or more automatic table tennis ball serving machine(s) are used in conjunction and coordination with the table tennis training aid of the first aspect of the invention.

15 [0038] Other arrangements are possible, and it is appreciable that the accompanying drawings are not to be understood as superseding the generality of the preceding description of the disclosure.

DETAILED DESCRIPTION OF DRAWINGS

20 [0039] Embodiments are described with reference to the accompany drawings. The terminology used herein is for the purpose of describing particular embodiments only and is not intended to limit the scope of the present disclosure. Other definitions for selected terms used herein may be found within the detailed description of the disclosure and apply throughout the description. Additionally, unless defined otherwise, all technical and scientific terms used herein have the same meanings as commonly understood by one ordinary skilled in the art to which the present disclosure belongs. Where possible, the
25 same reference numerals are used throughout the figures for clarity and consistency.

[0040] Throughout the specification, unless the context requires otherwise, the word “comprise” or variations such as “comprises” or “comprising”, will be

understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

[0041] Throughout the specification, unless the context requires otherwise, the word “include” or variations such as “includes” or “including”, will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

[0042] Throughout the specification, unless the context requires otherwise, the word “have” or variations such as “has” or “having”, will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

[0043] According to the first aspect of the invention and with reference to Figure 1, the table tennis training aid comprises two rods (1) erected vertically and perpendicularly to the surface of a table tennis table, wherein the rods (1) are marked with markings (2) at the sides to indicate the vertical distances from the surface of the table, and holes (3) are indented into the vertical rods (1) in the immediate proximity of each of the markings (2).

[0044] According to the first aspect of the invention and with reference to Figure 1, the table tennis training aid further comprises one or more strings (4) with hooks (5) at the ends of the strings (4), wherein the strings (4) are attached to the holes (3) on the vertical rods (1).

[0045] According to the first aspect of the invention and with reference to Figure 1, the table tennis training aid further comprises two stand holders (6) into which the rods (1) are inserted to stand vertically and perpendicularly to the surface of the table tennis table, such that stand holders (6) provide stability to the table tennis training aid when in use.

[0046] According to the first aspect of the invention and with reference to Figure 1, the table tennis training aid further comprises two or more rods (7) which are positioned horizontally to the surface of the table tennis table and which are attached to the rods (1) standing vertically and perpendicularly to the

surface of the table tennis table, such that the rods (7) provide stability to the table tennis training aid when in use.

5 **[0047]** According to the first aspect of the invention and with reference to Figure 1(a), the table tennis training aid (11) is positioned in close proximity to the table tennis net, leaving a gap (12) between the lower edge of the mass of strings or bands (13) which form a blocking barrier, and the upper edge of the table tennis training net, with the objective that the player-trainee serves the table tennis balls through the gap (12).

10 **[0048]** According to the first aspect of the invention and with reference to Figure 1(b), the table tennis training aid (11) is positioned in parallel to and near to the edge of the width at the end of the table tennis table where the player-trainee has the objective of serving the table tennis balls through the gap (12) between the lower edge of the mass of strings or bands (13) which form a blocking barrier, and the upper surface of the table tennis table.

15 **[0049]** According to the first aspect of the invention and with reference to Figure 1(c), the table tennis training aid (11) is positioned in parallel to and near to the edge of the width at the opposite end of the table tennis table where the player-trainee has the objective of serving or returning the table tennis balls through the gap (12) between the lower edge of the mass of strings or bands
20 (13) which form a blocking barrier, and the upper surface of the table tennis table.

25 **[0050]** According to the first aspect of the invention and with reference to Figure 1(d), the table tennis training aid (11) is positioned at an angle to and near to the edges of the corner at the opposite end of the table tennis table where the player-trainee has the objective of serving or returning the table tennis balls through the gap (12) between the lower edge of the mass of strings or bands (13) which form a blocking barrier, and the upper surface of the table tennis table.

[0051] According to the first aspect of the invention and with reference to Figure 1(e), two table tennis training aids are positioned on the table tennis table, where the first table tennis training aid (11) is positioned in parallel to and near to the edge of the width at the end of the table tennis table where the player-trainee has the objective of serving the table tennis balls through the gap (12) between the lower edge of the mass of strings or bands (13) which form a blocking barrier, and the upper surface of the table tennis table, and the second table tennis training aid (14) is positioned in parallel to and near to the edge of the width at the opposite end of the table tennis table where the player-trainee has the objective of serving or returning the table tennis balls through the gap (15) between the lower edge of the mass of strings or bands (16) which form a blocking barrier, and the upper surface of the table tennis table. The overall objective is to train the player-trainee in serving of the table tennis balls so that he can control the trajectories in the height and placement of the table tennis balls.

[0052] According to the first aspect of the invention and with reference to Figure 1(f), two table tennis training aids are positioned on the table tennis table, where the first table tennis training aid (11) is positioned in close proximity to the table tennis net, leaving a gap (12) between the lower edge of the mass of strings or bands (13) which form a blocking barrier, and the upper edge of the table tennis training net, and the second table tennis training aid (14) is positioned at an angle to and near to the edges of the corner at the opposite end of the table tennis table leaving a gap (15) between the lower edge of the mass of strings or bands (16) which form a blocking barrier, and the upper surface of the table tennis table, so that the objective of the player-trainee is to serve the table tennis balls through the gap (12) of the first table tennis training aid (11) and when the table tennis balls are returned by the opponent (for example, the coach of the trainee) or by automatic table tennis ball serving machine(s), the player-trainee returns the table tennis balls through the gap (15) of the second table tennis training aid (14). The overall objective is to train the player-trainee in a pre-determined repertoire of strokes in serving and returning the table tennis balls played to him by the opponent.

[0053] According to the second aspect of the invention and with reference to Figure 2, a table tennis training system is illustrated comprising a table tennis training aid (21) of the first aspect of the invention, an automatic table tennis ball serving machine (22), and a controller (23) to coordinate the operation of the automatic table tennis ball serving machine (22). The table tennis training aid (21) is attached with a sensor (24) on the mass of strings (25) comprised in the table tennis training aid (21). The overall objective of using this second aspect of the invention is to train the player-trainee in a several sets of pre-determined repertoire of strokes in returning the table tennis balls played to him by the opponent.

[0054] It is to be appreciated by the person skilled in the art that variations and combinations of features described above, not being alternatives or substitutes, may be combined to form yet further embodiments falling within the intended scope of the invention.

CLAIMS

1. A table tennis training aid suitable for use on a table tennis table comprising:

- two or more rods or sticks erected vertically and perpendicularly to the surface of a table tennis table, wherein the rods or sticks are marked with markings at the sides to indicate the vertical distances from the surface of the table, and holes are indented in the immediate proximity of each of the markings;

- one or more string(s) or band(s) with hooks or clips at the ends of the strings or bands, wherein the strings or bands are attached to the holes on the vertical rods or sticks;

- two or more stand holders in which the rods or sticks are inserted to stand vertically and perpendicularly to the surface of the table tennis table, such that stand holders provide stability to the table tennis training aid when in use; and

- two or more rods which are positioned horizontally to the surface of the table tennis table and which are attached to the rods or sticks standing vertically and perpendicularly to the surface of the table tennis table, such that the first-mentioned rods provide stability to the table tennis training aid when in use.

2. A table tennis training aid of claim 1, wherein one or more sensor(s) are attached on the vertical rods or sticks, or on the strings or bands, or on the horizontal rods, for the detection of the speed, location, direction, spin and other attributes of the table tennis balls when the table tennis training aid is in use.

3. A table tennis training system comprising one or more table tennis training aid(s) of claim 1 or claim 2, one or more automatic table tennis ball serving machine(s), and one or more controller(s) to coordinate the operation of the automatic table tennis ball serving machine(s).