

## **TABLE TENNIS BAT**

### **TECHNICAL FIELD**

[0001] The present invention discloses a table tennis bat suitable for use by  
5 a person for playing table tennis.

### **DESCRIPTION**

[0002] Table tennis has been gaining in popularity all over the world, and is  
played by children, teenagers, youths and adults. Many schools have  
10 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  
15 international tournaments, with some offering attractive prizes for the winners  
in competitions attended by spectators and broadcast on sports channels.

[0003] Table tennis players span the full spectrum ranging from novice  
recreational playing, semi-professional serious playing, to professional  
competitive playing at the international level.

20 [0004] Table tennis playing has expanded to include players with physical  
and intellectual disabilities. These players are sometimes known as “para  
players”. The inclusivity movement in table tennis has gained popularity  
amongst the para players that it is a competitive event in the Paralympics.

[0005] The vast majority of table tennis bats are made with straight handles.  
25 Table tennis bats are also known as table tennis rackets and paddles. Most  
table tennis players, with the exception of some para players, hold their table  
tennis bats via the straight handles in one of two ways.

[0006] The first way of holding a table tennis bat is known as the penholder  
grip. The thumb and the index finger of one hand grip the top of the handle on

one side of the table tennis bat. The top of the handle is the part of the handle that attaches to the table tennis blade which is the playing surface of the table tennis bat. The remaining fingers of the hand are then curled or spread round the other side of the table tennis bat.

- 5    **[0007]**    The second way of holding a table tennis bat that is widely used by players is known as the shake-hand grip. In a shake-hand grip, the palm of a hand is placed on one side of the handle, the thumb of the hand grips either one edge or the other side of the handle, and the fingers of the hand curl round the other edge of the handle and grip the other side of the handle.
- 10    **[0008]**    The blade of a table tennis bat may be covered by various types of rubber on each side of the blade. International rules of table tennis require both sides of the blade, whether covered by rubber or left uncovered, to be of different colours, with one side of matt or black colour, and the other side of a bright colour clearly distinguishable from black and from the colour of the ball.
- 15    **[0009]**    Different playing skill levels, styles and emphasis dictate the choice and use of the table tennis blade and rubber, and the grip adopted by the player. For example, a player who emphasizes strength in playing and returning the table tennis ball may adopt the shake-hand grip while a player whose style is predominantly control of the spin of the ball may prefer a penholder grip.
- 20    **[0010]**    Table tennis players usually do not change grips of their table tennis bats in the course of a game/play. This can be partially attributed to the structure of a typical table tennis bat with one handle.
- 25    **[0011]**    The vast majority of table tennis players play table tennis by holding their table tennis bats with one hand, usually their master hands, and rarely change hands in the course of a game/play. This can be partially attributed to the structure of a typical table tennis bat with one handle.
- [0012]**    Therefore, the typical table tennis bat with one handle limits the playing styles of the player and this inflexibility in playing styles may reduce his chance of winning against an opponent in a table tennis match.

**[0013]** Para players with hand disability usually strap their fingers, palms or forearms to their table tennis bats by strapping tapes or elastic bandages. Para players without hands or severely deformed hands may grip the handles of their table tennis bats by their mouths. The typical table tennis bat with one handle  
5 limits the ability of para players to firmly grip their table tennis bats and restricts their flexibility to manoeuvre their table tennis bats.

**[0014]** There exists a need for a table tennis bat that can allow the player to:

- (a) develop new types of grips;
- (b) change and adopt various types of grips in the course of a game/play;  
10 and
- (c) change hands in the course of a game/play.

**[0015]** Furthermore, there exists a need for a table tennis bat that can enhance the grips of para players of their table tennis bats.

**[0016]** Additionally, there exists a need for a table tennis bat with sensors  
15 attached to, installed at or embedded in the handles of a table tennis bat to detect the grips used by the table tennis players, such that the information obtained from the sensors can be used to analyze the effectiveness and efficacy of the grips and strokes of the table tennis players.

**[0017]** According to the first aspect of the present invention, there is provided  
20 a table tennis bat comprising:

- a blade. Both sides of the blade surface may be covered by one or several layers of sponger and rubber; and
- a U-shaped handle.

**[0018]** In this aspect of the present invention, the U-shape handle consists of  
25 three arms - the two front arms which are parallel or substantially parallel with each other, and one rear arm which connects the two front arms. The U-shaped

handle is connected to the base of the blade, with the two front arms of the U-shaped handle being attached preferably at the two ends of the width of the blade.

5     **[0019]**     In this aspect of the present invention, the dimensions of the table tennis bat are, preferably, total length at 260 mm and total width at 150 mm, with the blade measuring at length 157 mm, width at 150 mm and thickness ranging from 5.5 mm to 6.0 mm.

10    **[0020]**     In this aspect of the present invention, the U-shaped handle measures preferably at length at, preferably, 103 mm, width at 150 mm and thickness ranging from 10 mm to 30 mm but preferably at 25 mm.

15    **[0021]**     In this aspect of the present invention, the width of each arm of the U-shaped handle ranges from 15 mm to 50 mm but preferably at 26 mm. The intersection of the front arms of the U-shaped handle and the base of the blade, and the intersection of the front arms and the rear arm of the U-shaped handle, may be tapered or rounded. The inner and outer edges of the U-shaped handle are also tapered or rounded.

**[0022]**     In this aspect of the present invention, there is a hollow space enclosed by the base of the blade and the three arms of the U-shaped handle, with dimensions of the hollow space preferably at 77 mm by 98 mm.

20    **[0023]**     It should be appreciated that the dimensions given for this present invention are indicative and illustrative, and the present invention is not limited by these dimensions. In particular, the present invention for junior and youth players are made of U-shaped handles with a smaller width of each arm.

25    **[0024]**     In the present invention, the U-Shaped handle is made of solid materials (such as wood) or is a hollow cavity into which sensors and electronic modules are inserted, embedded or integrated.

**[0025]**     In this aspect of the present invention, the U-shaped handle of the table tennis bat allows the player to hold the table tennis bat with a plurality of

grips. The player can adopt the penholder grip and shake-hand grip by holding either of the two front arms of the handle.

**[0026]** In this aspect of the present invention, the U-shaped handle further provides flexibility to the player to adopt new types of grips. As an illustration, the player can adopt a fist grip holding the rear arm of the U-shaped handle, whereby the player's four fingers grip the top side of the rear arm and the thumb supports the underside of the rear arm.

**[0027]** As a further illustration, a player can adopt a claw grip holding the rear arm of the U-shaped handle, whereby the player's index finger, middle finger and the ring finger grip the top side of the rear arm, and the thumb and the little finger support the underside of the rear arm.

**[0028]** As an additional illustration, a player can adopt a single-trigger grip holding the table tennis bat whereby the index finger and thumb hold the front arm and the remaining fingers wrap round the rear arm of the U-shaped handle with his palm in contact with the intersection between the front arm and rear arm. As a variation, there can be a double-trigger grip whereby the index finger, middle finger and thumb hold the front arm and the remaining fingers wrap round the rear arm of the U-shaped handle.

**[0029]** As a further illustration, a player can adopt a palm grip of the table tennis bat whereby his palm and four fingers protrude from the hollow space of the table tennis bat and grip one side of the blade while his thumb supports the other side of the blade. A para player with hand disability may adopt this palm grip with four or less fingers.

**[0030]** In this aspect of the present invention, the player may hold the table tennis bat with both his left and right hands, with a multitude of grips as illustrated in the foregoing paragraphs, in the course of a single game/play. By holding the table tennis bat with both hands, the player can impart more power to his strokes in returning the ball to his opponent.

**[0031]** This aspect of the present invention enables a player to adopt different types of grips of his table tennis bat thereby introducing variety and unpredictability in his strokes in returning the ball to his opponent including without limitation, forehand and backhand no-spin, topspin, backspin and sidespin. The different methods of holding the table tennis bat with a single hand or both hands allow wider reach and better coverage by the player in returning the ball to his opponent. With the present invention, the player can further adopt strokes commonly used in other racket sports such as tennis and badminton including tennis volley stroke and badminton smash stroke.

**[0032]** It should be appreciated that variety and unpredictability in strokes is a critical element in the playing of table tennis. A player who can vary his strokes in an unpredictable manner introduces a surprise element in his play and gains advantage over his opponent as the opponent's positioning, reaction time and strokes would be stymied by the unpredictability of the play.

**[0033]** A player using this aspect of the present invention can introduce further variety and unpredictability by combining the use of his left hand, right hand and both hands in holding the table tennis bat and using both surfaces of the blade to hit the ball, in a single play. It should be appreciated that the different combination of strokes is a critical element in the playing of table tennis, as this would allow the player to control the placement of the ball and dictate the direction and tempo of the play, thereby gaining advantage over his opponent.

**[0034]** In some embodiments of this aspect of this invention, the rear arm of the U-shaped handle is engraved with grooves, which model a mouthpiece. A para player who cannot use his arms and hands can hold the table tennis bat by the modelled mouthpiece in playing table tennis.

**[0035]** In the second aspect of this invention, sensors can be attached, inserted or embedded in the front arms and rear arm of the U-shaped handle. These sensors detect the holding grips of the player. These sensors include without limitation, one or more tactile sensors, acceleration sensors, speed

sensors, direction sensors and gyroscope sensors. The sensors are connected to a microprocessor module either within the table tennis bat or remotely through a Wi-Fi module.

5 [0036] In the second aspect of this invention, the grip, positioning, speed of movement, angle of movement, direction, orientation and other attributes of the table tennis bat can be captured and analyzed using computing devices and resources.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

10 [0037] Various embodiments are described, by way of example only, with reference to the accompanying drawings, in which:

[0038] Figure 1 illustrates a table tennis bat according to the first aspect of the present invention.

15 [0039] Figure 2 illustrates an embodiment of the second aspect of the present invention, wherein the table tennis bat includes one or more sensors and electronic modules connected to a microprocessor module.

[0040] 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 [0041] Embodiments are described with reference to the accompanying 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.

25 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

same reference numerals are used throughout the figures for clarity and consistency.

5     **[0042]** 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.

10    **[0043]** 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 ommr group of integers.

**[0044]** 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.

15    **[0045]** According to the first aspect of the invention and with reference to Figure 1, the table tennis bat comprises a blade (1) and a U-shaped handle (2).

20    **[0046]** According to the first aspect of the invention and with reference to Figure 1, the U-shaped handle comprises two front arms (3)(4) and a rear arm (5). The two front arms (3)(4) of the U-shaped handle attach to the base of the blade (1) at its two ends (6)(7). The two front arms (3)(4), rear arm (5) and the base of the blade frame a hollow space (8).

**[0047]** According to the first aspect of the invention and with reference to Figure 1-1, the U-shaped handle comprises two front arms (3)(4) and a rear arm (5) engraved with grooves which model a mouthpiece (5(a)).

25    **[0048]** According to the second aspect of the invention and with reference to Figure 2, a table tennis bat is illustrated comprising a blade (1) and a U-shaped handle (2) with two front arms (3)(4) and a rear arm (5). Sensors (9)(10)(11) are attached to, installed at or embedded in the two front arms (3)(4) and a rear

arm (5) of the handles of the table tennis bat. These sensors are connected to a microprocessor module (13) remotely through a Wi-Fi module (12) in the U-shaped handle (2).

- 5 **[0049]** 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 bat comprising:
  - one blade; and
  - one U-shaped handle comprising two front arms and one rear arm.
- 5 2. A table tennis bat of claim 1, comprising:
  - one blade; and
  - one U-shaped handle comprising two front arms and one rear arm engraved with grooves which model a mouthpiece.
- 10 3. A table tennis bat comprising:
  - one blade; and
  - one U-shaped handle comprising two front arms, one rear arm, one or more sensor(s) attached to, installed at or embedded in the handle.
- 15 4. A table tennis bat of claim 3, comprising:
  - one blade; and
  - one U-shaped handle comprising two front arms, one rear arm, one or more sensor(s) attached to, installed at or embedded in the handle, and one or more microprocessor(s) embedded within the handle.
- 20 5. A table tennis bat of claim 3, comprising:
  - one blade; and
  - one U-shaped handle comprising two front arms, one rear arm, one or more sensor(s) attached to, installed at or embedded in the handle, one or more Wi-Fi module(s) in the handle, and one or more external microprocessor module(s).