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(54) **CHOPSTICKS FOR STUDYING**

(57) A pair of training chopsticks comprises an upper chopstick member and a lower chopstick member. A thumb ergonomic device is provided, which does not directly contact the lower chopstick member, but fixed at the upside of the front surface of the lower chopstick member through a fixing element. The thumb ergonomic

device is shaped in a curve, the opening of which substantially directs to the head of chopsticks, so that when the chopsticks are held, the curve opening touches a region of the ulnar side of the thumb not touching the lower chopstick member, for maintaining the correct relative position between the thumb and the lower chopstick members.

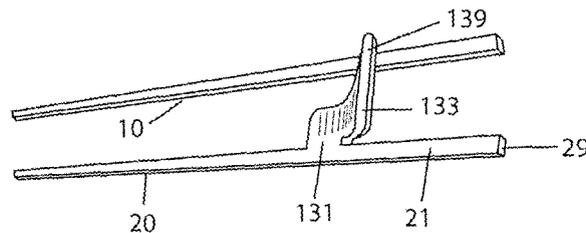


Fig.7

## Description

### Technical Field

[0001] The present invention relates to training chopsticks, especially ergonomic devices for chopsticks and a hinge for linking chopsticks.

### Background

[0002] For a history of three thousand years, Chinese people have been using chopsticks for eating. Chopsticks (as shown in Fig. 1) consist of a rod-shaped upper chopstick member 10 and a rod-shaped lower chopstick member 20. The head 18 of the upper chopstick member and the head 28 of the lower chopstick member are used for gripping food. The surfaces of the upper chopstick member and the lower chopstick member which touch the thumb are called the front surfaces 11, 21 (see Fig. 1); the surfaces on the top are called the top surfaces 12, 22; the surfaces touching the index finger are called the back surfaces 13, 23 (see Fig. 2); and the surfaces on the bottom (not shown) are called the bottom surfaces.

[0003] However, the specific shape of chopsticks is not limited to quadrangle. It may be polygon, circle, ellipse, etc. The side of the thumb near to the direction of the radius bone of the forearm is called the radial side of the thumb (indicated by reference number 33, Fig. 1), and the side of the thumb near to the direction of the ulna bone of the forearm is called the ulnar side of the thumb (indicated by reference number 34).

[0004] The correct holding posture of chopsticks is shown in Fig. 1. When the chopsticks are held, the first section 36 of the ring finger supports the lower chopstick member, the base 38 (and the location therebelow) of the third section of the index finger touches the back surface of the lower chopstick member, and the second section 32 of the thumb presses the front surface of the lower chopstick member. The lower chopstick member is firmly gripped through the three regions. The lower chopstick member cannot be movable relative to the hand. In contrast, the upper chopstick member 10 is movable. The first section of the index finger and the first section of the middle finger grip the upper chopstick member at a position near the head, allowing an up-and-down motion, such that the upper chopstick member can open and close towards the lower chopstick member. The first section 31 of the thumb presses the front surface of the upper chopstick member, and forms a fulcrum of the upper chopstick member. The two sections of the thumb cannot be movable relative to the lower chopstick member.

[0005] The two sections of the thumb are the only parts of the hand which can press the front surfaces of the chopsticks. Therefore, it is very important to maintain the correct position and direction of the thumb. The two sections of the thumb are both non-movable with respect to the lower chopstick member, and therefore an ergonomic device for the thumb should guide the fixed relative po-

sition of the two sections of the thumb with respect to the lower chopstick member.

[0006] In the past, there were some assistant chopsticks having thumb ergonomic devices, for example, grooves or thumb insertion rings. These devices are arranged on the body of the lower chopstick member, and cannot guide the region of the thumb which cannot directly touch the lower chopstick member.

[0007] For example, US 5277464 discloses a kind of training chopsticks, and CN 87205972U also discloses a similar correction device for holding chopsticks. The principle of these chopsticks is that some recessed areas conforming to the shape of fingers are provided on the surfaces of the chopsticks, for guiding the fingers of the chopstick-holding hand. The defect of these chopsticks is: since the recessed areas are located on the chopsticks themselves and there is no ergonomic device protruding from the chopsticks, these training chopsticks can only guide the regions of fingers touching the chopsticks, but cannot guide the regions of fingers not touching the chopsticks directly.

[0008] Also, as an example, WO2003/015589 discloses a kind of training chopsticks. The lower chopstick member of the training chopsticks is provided with a thumb insertion ring. The defect of these chopsticks is: the thumb insertion ring of the chopsticks is located on the body of the lower chopstick member, and cannot guide the regions of the thumb not touching the lower chopstick member directly, such as the first section of the thumb.

[0009] Beginners for using chopsticks would easily have a difficulty, that is, it is difficult to apprehend the relative position between the thumb and the third section of the index finger, causing a distorted posture of chopsticks holding (see Fig. 3). When chopsticks are held correctly (see Fig. 1), the thumb presses the front surface of the lower chopstick member, and the base 38 (and the location therebelow) of the third section of the index finger touches the back surface of the lower chopstick member, and the thumb is opposite to the third section of the index finger on the two surfaces of the lower chopstick member. However, they are at different distances from the head 28 of the lower chopstick member, specifically, the thumb is closer than the third section of the index finger to the head 28 of the lower chopstick member. Beginners could not easily apprehend this difference, and would easily misconstrue that they are directly opposite to each other. This misunderstanding would lead to an inclination of the thumb to the tail 29 of the lower chopstick member, and also an inclination of the third section of the index finger to the head 28 of the lower chopstick member. Therefore, the thumb would be wrongly too close to the third section of the index finger (see Fig. 3), so that the chopstick-holding posture is totally distorted and thus the chopsticks cannot be held correctly.

[0010] In order to prevent this problem, it needs to guide the thumb and the third section of the index finger at the same time, in order to help beginners to maintain

the correct relative position and distance for the two finger sections, preventing the chopsticks holding posture from distortion. However, these two finger sections must be guided at the same time in order to achieve the said effect.

**[0011]** In the past, there exist some assistant tools for holding chopsticks. Among others, one type of the tools has an ergonomic device for guiding the position of the thumb, and another type has an ergonomic device for guiding the position of the third section of index finger. Nevertheless, all of these assistant tools for chopsticks holding cannot guide the two finger sections at the same time, so that they cannot help beginners to correctly maintain the distance between the thumb and the third section of the index finger.

**[0012]** For example, in JP 2005-177183 titled "Assist tool for chopsticks", it discloses a pair of training chopsticks. The defect of the patent is that it can only guide the base of index finger, but cannot guide the thumb to press the lower chopstick member in the correct direction and position.

**[0013]** Also, as an example, WO2003/015589 mentioned above discloses a kind of training chopsticks, the lower chopstick member of which is provided with a thumb insertion ring for guiding the thumb. The defect thereof is it lacks a device for guiding the third section of the index finger.

**[0014]** From the above tools it can be seen that, current training chopsticks can guide either the thumb or the third section of the index finger alone, but cannot guide the two finger sections at the same time. Thus, these kinds of products in the prior arts cannot effectively help users to maintain the relative position and distance between the thumb and the third section of the index finger, in order to avoid a distorted chopstick holding posture (as shown in Fig. 3).

**[0015]** Some of current tools for training holding of chopsticks include a hinge connecting the upper chopstick member and the lower chopstick member (e.g., JP2005-177183 and W02003/015589). These hinges can open and close in one direction only, preventing the problem of distorted chopstick holding for beginners. However, the beginners will be obliged to rely on this hinge, so that coordination of various muscles of the hand cannot be trained to open and close the chopsticks correctly.

### Summary of the invention

**[0016]** The present invention aims to help users to learn the correct way for holding chopsticks, i.e. as shown in Fig. 1. For this purpose, the present invention provides training chopsticks for helping users to maintain the correct chopsticks holding posture as shown in Fig.1 and Fig. 2 by means of ergonomic devices that can guide the thumb and/or the third section of the index finger. In addition, in order to train muscles of the hand to control the chopsticks' correct opening and closing, the present invention also provides a hinge for chopsticks that can turn

sideway.

**[0017]** According to the first aspect of the present invention, a thumb ergonomic device for chopsticks is provided for guiding the thumb to maintain in a correct position. The thumb ergonomic device is connected fixedly to the lower chopstick member through a fixing element (such as a pillar), so that the thumb ergonomic device is relatively fixed with respect to the lower chopstick member for guiding the fixed relative position between the thumb and lower chopstick member. The characteristic of the thumb ergonomic device is that it *per se* does not directly touch the lower chopstick member, but is fixed on the lower chopstick member through the fixing element. Because that thumb ergonomic device does not touch the lower chopstick member directly, it can guide the region of the thumb not directly touching the lower chopstick member.

**[0018]** In contrast, those existing ergonomic devices directly arranged on the lower chopstick member (such as the thumb insertion ring of WO2003/015589) can only guide the region of the thumb directly touching the lower chopstick member. Therefore, with the present invention the position and direction of the thumb can be guided more effectively.

**[0019]** The present invention includes a curved thumb ergonomic device for the ulnar side of the thumb (as shown in Fig. 5, Fig. 6). The thumb ergonomic device is located on the upside of the front surface of the lower chopstick member, and fixed to the lower chopstick member 20 through a fixing element (such as the pillar 131 of Fig. 5). The ergonomic device can touch the ulnar side of the thumb only, but cannot guide both sides of the thumb at the same time. It is a little bit difficult for beginner to practice, but suitable for users who already have a certain level of skills to focus on training one side of the thumb. And its weight is lighter. Depending on the height of the fixing element, the thumb ergonomic device can be fixed in a position between the upper chopstick member and the lower chopstick member (as shown in Fig. 5), or be fixed at the front surface of the upper chopstick member (as shown in Fig. 6), or at the same time cover the front surface of the upper chopstick member and the location between the two chopstick members (as shown in Fig. 7). Also, extension parts extending towards the lower chopstick member can be arranged on the thumb ergonomic device, such that it would reach the front surface of the lower chopstick member (as shown in Fig. 9) or go beyond the front surface of the lower chopstick member (as shown in Fig. 10), thus forming a curved face in order to increase the range of coverage.

**[0020]** In addition to be applied for one side, the thumb ergonomic device can be constructed for both the ulnar side and the radial side (as shown in Fig. 11 and Fig. 12), in order to form an ergonomic device in the shape of a half-ring which is fixed on the upside of the front surface of the lower chopstick member through a fixing element. Depending on the height of the fixing element, the ergonomic device in shape of half-ring can be fixed in a po-

sition between the upper chopstick member and the lower chopstick member (as shown in Fig. 11), or fixed on the front surface of the upper chopstick member (as shown in Fig. 12), or at the same time cover the front surface of the upper chopstick member and the location between the two chopstick members (not shown). Also, extension parts can be added so that the thumb ergonomic device can reach the front surface of the lower chopstick member (as shown in Fig. 13), or go beyond the front surface of the lower chopstick member (as shown in Fig. 14 and Fig. 15), thus forming a half-barrel shape in order to increase the coverage. Or, the thumb ergonomic device for both the ulnar side and the radial side is located at front surface of the upper chopstick member (as shown in Fig. 41), and there is a gap separating them from each other, enabling the thumb can directly touch the upper chopstick member through this gap, and thus users can touch the correct position of the upper chopstick member.

**[0021]** On the other hand, the said thumb ergonomic device can be changed from the half-ring shape into a ring shape by adding a supplementary element (indicated by reference number 111 in Fig. 18). It can be fixed on the upside of the front surface of the lower chopstick member by a fixing element. Depending on the height of the fixing element, the thumb ergonomic device of ring shape can be fixed in a position between the upper chopstick member and lower chopstick member (as shown in Fig. 18), or fixed on the front surface of the upper chopstick member, or at the same time cover the front surface of the upper chopstick member and the location between the two chopstick members (not shown). Extension parts can also be added such that the ring shape thumb ergonomic device forms in a barrel shape, which reaches the front surface of the lower chopstick member (as shown in Fig. 19), or go beyond the front surface of the lower chopstick member (as shown in Fig. 20), in order to increase the coverage. Therefore, this structure is more suitable for beginners.

**[0022]** A blocking element can be arranged on the back surface of the ergonomic device or fixing element (indicated by reference number 145 in Fig. 12), for preventing the upper chopstick member and lower chopstick member from getting too close.

**[0023]** Protrusion(s) may be directly added on the front surface of the upper chopstick member and/or the lower chopstick member, in order to prevent the thumb from deflection (as shown in Fig. 21).

**[0024]** A first protrusion (indicated by reference number 201 in Fig. 21) is arranged on the front surface of the upper chopstick member at the ulnar side of the thumb in a position close to the tail of the upper chopstick member, for guiding the ulnar side of the thumb.

**[0025]** A second protrusion (indicated by reference number 202 in Fig. 21) is arranged on the front surface of the upper chopstick member at the radial side of the thumb in a position close to the head of the upper chopstick member, for guiding the radial side of the thumb.

**[0026]** A third protrusion (indicated by reference number 203 in Fig. 21) is arranged on the front surface of the lower chopstick member at the ulnar side of the thumb in a position close to the tail of the lower chopstick member, for guiding the ulnar side of the thumb.

**[0027]** A fourth protrusion (indicated by reference number 204 in Fig. 21) is arranged on the front of the lower chopstick member at the radial side of the thumb in a position close to the head of the lower chopstick member, for guiding the radial side of the thumb. The first protrusion and the second protrusion are a little far from the base of the thumb, so that they can guide the direction of the thumb more easily. The third protrusion is located on the lower chopstick at the ulnar side of the thumb, and thus can prevent the distortion of chopstick holding (as shown in Fig. 3) which is caused by the inclination of the thumb to the tail of the lower chopstick member.

**[0028]** The four protrusions can be arranged together (as shown in Fig. 21). However, for reducing weight, only one, two, or three protrusions can be provided instead. For example, chopsticks having the first protrusion or/and the third protrusion merely are suitable for users whose thumb often inclines to the ulnar side, in order to focus on training the ulnar side of the thumb of the users.

**[0029]** The third protrusion may extend beyond the lower chopstick member (Fig.22), in order to increase the coverage of the ulnar side of the thumb. In the same way, the fourth protrusion may also extend beyond the lower chopstick member (as shown in Fig. 23), in order to increase the coverage of the radial side of the thumb.

**[0030]** In another aspect of the present invention, an index finger ergonomic device is provided on the back surface 23 of the lower chopstick member (as shown in Figs. 24-27), for guiding the finger pad of the third section of the index finger and preventing that finger section from getting too close to the head of the lower chopstick member.

**[0031]** The index finger ergonomic device (indicated by reference number 60 in Fig. 24) is a projection bulging from the back surface of the lower chopstick member. It is arranged on the back surface 23 of the lower chopstick member, for cooperating with the base of the finger pad of the third section of the index finger and preventing that base from getting too close to the head of the lower chopstick member.

**[0032]** This projection 60 can connect to a first inclined plane 61 (as shown in Fig. 25). The first inclined plane inclines to the head of the lower chopstick member and directs towards the upper chopstick member, in order to cooperate with the finger pad of the third section of the index finger.

**[0033]** This projection 60 can connect to a second inclined plain 62 (as shown in Fig. 26). The second inclined plane inclines to the head of the lower chopstick member and directs away from the upper chopstick member, in order to cooperate with the joint of the base of the third section of the index finger.

**[0034]** The projection (as shown in Fig. 27) can connect to the lower chopstick member through a pillar 63 located between the upper chopstick member and lower chopstick member.

**[0035]** According to another aspect of the present invention, a pair of chopsticks is provided with two ergonomic devices arranged thereon at the same time, wherein the first ergonomic device is used for guiding the correction position of the ulnar side of the thumb and the second ergonomic device is used for guiding the correction position of the finger pad of the third section of the index finger.

**[0036]** The two ergonomic devices function together, for training the thumb and the third section of index finger to maintain at an appropriate relative position and distance, and maintain a correct chopsticks holding posture as shown in Fig. 1 and Fig. 2. Therefore, possibility of distortion of chopstick holding (as shown in Fig. 3) is reduced.

**[0037]** The present invention is not limited on the specific structures and installation methods of the two ergonomic devices. So any chopsticks with the two ergonomic devices would be acceptable. However, the two ergonomic devices must be arranged on the same pair of chopsticks.

**[0038]** The thumb and the third section of the index finger are neighboring finger sections. The two finger sections exert forces towards different directions, and they are separated by a certain distance. As soon as the two finger sections are guided to be situated in respective correct positions, they would lead the whole palm to be situated at a correct position and direction. In this way, every finger section connecting to the palm can be placed at correct positions quite easily, and provides users holding the chopsticks with great help. The function is exclusively available in the present invention.

**[0039]** For all the chopsticks mentioned above, the two chopstick members may be connected with or without a hinge.

**[0040]** Providing a hinge on chopsticks is a known idea. A current hinge for chopsticks is shown in Fig. 28, and includes a C-shaped element arranged on the lower chopstick member, and a hole 90 and a pivot 91 both arranged on the upper chopstick member. Starting from the existing hinge, the present invention designs a new hinge (as shown in Fig. 29), where the diameter of the pivot is intentionally made to be smaller than the inner diameter of the C-shaped element, enabling the C-shaped element loosely hooks onto that pivot. Therefore, the head of the upper chopstick member can rotate up and down around that pivot, and at the same time also can turn sideway slightly to the front or the back around the pivot. The advantage is that users cannot entirely rely on the hinge to avoid distortion of chopstick holding (as shown in Fig. 3), but need to coordinate, on their own initiative, each muscle of the hand in order to open and close the chopsticks correctly. Therefore, the users can get the opportunity to train coordination of the muscles

of the hand.

### Brief description of the drawings

5 **[0041]** Embodiments of the present invention can be better understood with reference to the attached Figures. It is understood that these Figures are only provided for illustrating the present invention in a convenient manner, and the present invention is not limited to the specific structures and arrangements as shown in the Figures.

10 Fig. 1 and Fig. 2 show the front side and the back side of the correct chopsticks holding posture according to the present invention;

15 Fig. 3 shows a distorted chopsticks holding posture when the thumb is too close to the third section of the index finger;

20 Fig. 4 shows a thumb insertion ring arranged on the front surface of the lower chopstick member;

25 Figs. 5 to 10 show ulnar-side thumb ergonomic devices and their extension parts arranged on the lower chopstick member;

30 Figs. 11 to 17 show half-ring shaped thumb ergonomic devices and their extension parts arranged on the lower chopstick member;

35 Figs. 18 to 20 show ring shaped thumb ergonomic devices and their extension parts arranged on the lower chopstick member;

40 Fig. 21 shows protrusions arranged on the front surface of chopsticks;

45 Fig. 22 shows the third protrusion extends downwardly beyond the lower chopstick member;

50 Fig. 23 shows the fourth protrusion extends downwardly beyond the lower chopstick member;

55 Fig. 24 shows a projection arranged on the back surface of the lower chopstick member;

Fig. 25 shows a projection arranged on the back surface of the lower chopstick member, and the first inclined plane thereof;

Fig. 26 shows the projection arranged on the back surface of the lower chopstick member, and the first inclined plane and the second inclined plane thereof;

Fig. 27 shows the projection is connected to the lower chopstick member through a pillar;

Fig. 28 shows a hinge for chopsticks;

Fig. 29 is the top view of the hinge of Fig. 28, showing a hinge for chopsticks which can turn sideways;

Fig. 30 shows another hinge for chopsticks;

Figs. 31 to 34 show a specific example where a hinge is arranged;

Figs. 35 to 37 show a specific example where no hinge is arranged;

Figs. 38 and 39 show another specific example;

Figs. 40 and 41 show another two specific examples of thumb ergonomic devices respectively; and

Fig. 42 shows another specific example where a thumb ergonomic device and an index finger ergonomic device are arranged.

### Detailed Description of Embodiments

**[0042]** In the followings the present invention will be described in details with reference to the Figures.

**[0043]** In the first example (as shown in Fig. 5), an ergonomic device 133 for the thumb is separated from the lower chopstick member 20, and fixed on the upside of the front surface of the lower chopstick member through a fixing element 131 (e.g., a pillar) at a position between the upper chopstick member and the lower chopstick member. The thumb ergonomic device is formed in a curved shape, and opens towards the head 28 of the chopsticks in order to prevent the ulnar side of the thumb from deflecting excessively to the tail 29 of the lower chopstick member, thus avoiding the distorted chopsticks holding posture as shown in Fig. 3. Because this thumb ergonomic device is fixed relative to the lower chopstick member, it can help the thumb to maintain at a correct position with respect to the lower chopstick member. Also, the ergonomic device does not directly contact the lower chopstick member, so that it can guide the direction of the thumb more effectively than those arranged on the lower chopstick member itself, such as an insertion hole (indicated by reference number 88 in Fig. 4). Fig. 8 shows a hand holding a pair of chopsticks with the thumb ergonomic device of the first example in the correct chopsticks holding posture. This example only guides the ulnar side of the thumb, and can help some users having a certain skills for holding chopsticks already to practice.

**[0044]** In the first example, the fixing element is a pillar 131. However, the fixing element can be formed into other shapes, such as a circular shaped part (not shown) or an artistic curved element (not shown), or other fixing elements. It is acceptable as long as it can fixedly connect this thumb ergonomic device on the lower chopstick member.

**[0045]** In the second example (as shown in Fig. 6), the

fixing element 131 is a pillar which is comparatively high, such that the thumb ergonomic device extends to reach the front surface of the upper chopstick member 10, thus increasing the distance between the thumb ergonomic device 133 and the lower chopstick member. Therefore, the direction of the thumb can be guided more effectively.

**[0046]** In the third example (as shown in Fig. 7), the thumb ergonomic device is comparatively long, such that it not only reaches the front surface of the upper chopstick member but also the zone between the upper chopstick member and lower chopstick member.

**[0047]** In the fourth example (as shown in Fig. 9), the thumb ergonomic device 133 is supplemented with an extension part 135, which extends towards and reaches the lower chopstick member for increasing the range of coverage.

**[0048]** In the fifth example (as shown in Fig. 10), the thumb ergonomic device 133 is provided with extension parts 135 and 137, which extend towards and beyond the lower chopstick member for further increasing the range of coverage. However, as the coverage increases, the weight of the thumb ergonomic device will increase also, so that it is more suitable for users whose muscles of the hand are strong.

**[0049]** In the sixth example (as shown in Fig. 11), a curve shaped thumb ergonomic device 103 is provided, which is fixed on the upside of the front surface of the lower chopstick member and located between the upper chopstick member and the lower chopstick member through a pillar 101. The thumb ergonomic device 103 has an additional curved part 102 for the radial side of the thumb, thus forming a half-ring shaped thumb ergonomic device.

**[0050]** In the seventh example (as shown in Fig. 12), there is a curve shaped thumb ergonomic device 143, which is fixed on the lower chopstick member through a pillar 141. Moreover, an additional curve shaped element 142 is provided, which opens substantially towards the tail of chopsticks, forming a half-ring thumb ergonomic device. The pillar is comparatively long, such that the half-ring shaped thumb ergonomic device is located in front of the upper chopstick member.

**[0051]** In the eighth example (as shown in Fig. 13), the half-ring thumb ergonomic devices 102 and 103 have extension parts 105 and 106 respectively, which reach the front surface of the lower chopstick member for increasing the contact area with the middle of the thumb in order to strengthen the stability of holding chopsticks. These extension parts 105 and 106 can merge into a single body with pillar 101.

**[0052]** In the ninth example (as shown in Fig. 14), the half-ring shaped thumb ergonomic devices 102 and 103 have extension parts 107 and 108 respectively, which extend beyond the front surface of the lower chopstick member, and merge with the pillar 101 into a single body.

**[0053]** In the tenth example (as shown in Fig. 15), the half-ring shaped thumb ergonomic devices 142 and 143 are located at the front surface of the upper chopstick

member, and have respective extension parts which extend beyond the front surface of the lower chopstick member. The pillar 141 forms into a single body with the extension parts.

**[0054]** In the eleventh example (as shown in Fig. 16), the half-ring shaped thumb ergonomic devices 102 and 103 extend upward individually, and forms respective extension parts 104 and 109 reaching the front surface of the upper chopstick member, in order to increase the touching area of the thumb. They can be also provided with respective extension parts 107 and 108 extending towards the lower chopstick member, as shown in Fig. 17.

**[0055]** In the twelfth example (as shown in Fig. 18), a half-ring shaped additional part 111 is further provided on the half-ring shape ergonomic device of the sixth example (as shown in Fig. 11). Two ends of the additional part 111 connect with two ends of the thumb ergonomic device respectively, forming a ring shaped thumb ergonomic device.

**[0056]** In the thirteenth example (as shown in Fig. 19), the ring shaped thumb ergonomic device of the twelfth example extends towards the lower chopstick member, forms a barrel shape and reaches the front surface of the lower chopstick member.

**[0057]** In the fourteenth example (as shown in Fig. 20), the ring shaped thumb ergonomic device of the twelfth example extends towards the lower chopstick member, forms a barrel shape and runs beyond the front surface of the lower chopstick member.

**[0058]** In the fifteenth example (as shown in Fig. 12), a blocking element 145 is arranged on the back of the thumb ergonomic device or the fixing element, preventing the upper chopstick member and the lower chopstick member from getting too close to each other.

**[0059]** As shown in Fig. 21, a protrusion 201 is arranged on the front surface of upper chopstick member 10 for guiding the ulnar side of the thumb; a protrusion 202 is arranged on the front surface of upper chopstick member 10 for guiding the radial side of the thumb; a protrusion 203 is arranged on the front surface of the lower chopstick member 20 for guiding the ulnar side of the thumb; and a protrusion 204 is arranged on the front surface of the lower chopstick member 20 for guiding the radial side of the thumb.

**[0060]** In Fig. 21, the two protrusions on the front surface of the upper chopstick member 10 can be reduced to one protrusion, in order to reduce weight. In Fig. 21, the two protrusions on the front surface of the lower chopstick member 20 can be reduced to one protrusion, in order to reduce weight. Protrusion(s) can be arranged on the front surface of only one chopstick member, in order to reduce weight.

**[0061]** In Fig. 22, the protrusion 203 of the lower chopstick member may extend beyond the lower chopstick member.

**[0062]** In Fig. 23, the protrusion 204 of the lower chopstick member may extend beyond the lower chopstick member.

**[0063]** In the sixteenth example (as shown in Fig. 24), there is a projection 60 bulging from the back surface of the lower chopstick member, which can, in cooperation with the base of the third section of index finger, prevent the base from being too close to the head 28 of the lower chopstick member.

**[0064]** Optionally, on the top of the projection 60 a first inclined plane 61 is connected, as shown in Fig. 25. This first inclined plane inclines to the head of the lower chopstick member and directs to the upper chopstick member, for cooperating with the finger pad of the third section of index finger.

**[0065]** Also, at the bottom of the projection 60 a second inclined plane 62 is connected, as shown in Fig. 26. The second inclined plane inclines to the head of the lower chopstick member and directs away the upper chopstick member, for cooperating with the joint of the base of the third section of the index finger.

**[0066]** The projection 60 may, as shown in Fig. 24, directly bulges from the back surface of the lower chopstick member, or connect to the lower chopstick member through a pillar between upper chopstick member and lower chopstick member (as shown in Fig. 27). The bottom end of the pillar connects to the lower chopstick member, and the top end thereof extends to a position between the upper chopstick member and the lower chopstick member and connects to the projection. The projection bulges from the back surface of the two chopsticks for guiding the finger pad of the third section of the index finger. A thumb insertion ring can be optionally arranged on the front surface of the lower chopstick member or on the front surface of the upper chopstick member. Also optionally, a first protrusion 201 is arranged on the front surface of the upper chopstick member, and a third protrusion 203 is arranged on the front surface of the lower chopstick member.

**[0067]** In the seventeenth example (as shown in Figs. 31 to 34), between the upper and lower chopstick members an ulnar side thumb ergonomic device 103 (as shown in Fig. 31) and an extension part 102 for the radial side are provided, forming a half-ring shaped thumb ergonomic device. There are further provided with extension parts 107 and 108 towards the lower chopstick member, which extend beyond the front surface of the lower chopstick member in order to increase the coverage for contacting the thumb. Moreover, a C-shaped element 93 is arranged on the lower chopstick member in the present example, and it is used for hooking on the pivot 91 of the upper chopstick member 10, thus forming a hinge connecting the upper and lower chopstick members. Fig. 32 shows the back side of the present example. On the back side a first inclined plane 61 is provided for guiding the third section of the index finger. The thumb ergonomic devices 102 and 103 thereof may be further provided with extension parts 104 and 109 extending upwards, as shown in Fig. 17.

**[0068]** As shown in Fig. 28, the hinge comprises a hole 90 and a pivot 91 in the upper chopstick member, and a

C-shaped element 93 arranged on the lower chopstick member; in this way, it may open and close upward and downward in one direction. Also, as shown in the hinge example in Fig. 29, the diameter of the pivot is selected as less than the inner diameter of the C-shaped element, so that the C-shaped element loosely hooks onto the pivot. In this manner, the upper chopstick member can turn sideway, training users to prevent the upper chopstick member from turning sideway merely by the coordination of muscles of the hand.

**[0069]** Figs. 33 and 34 show a hand correctly holding a pair of chopsticks in the present example. In the present example, a thumb ergonomic device and an index finger ergonomic device are both arranged for guiding the thumb and the third section of the index finger of the hand holding chopsticks. Thus the thumb can be maintained in a correct position relative to the index finger (as shown in Fig. 33), preventing the problem of distorted chopsticks holding as shown in Fig. 3.

**[0070]** The eighteenth example (as shown in Figs. 35 to 37) shows an example in which no hinge is arranged between the two chopstick members. Fig. 35 shows thumb ergonomic devices 102 and 103 arranged at the upside of the front surface of the lower chopstick member of the present example, and extension parts 107 and 108 extending toward the lower chopstick member. Fig. 36 shows the bottom surface 24 of the lower chopstick member of the present example, and a second inclined plane 62 for guiding the joint of the base of the third section of the index finger. Fig. 37 shows the back side of the present example, where a first inclined plane 61 is arranged on the back surface 23 of the lower chopstick member 20 for guiding the finger pad of the third section of index finger.

**[0071]** As to the nineteenth example (as shown in Fig. 38 and Fig. 39), Fig. 38 shows the front surface of the present example, which is provided with a thumb ergonomic device and its extension parts as in the tenth example (as shown in Fig. 15). Fig. 39 shows the back surface of the lower chopstick member of the present example, which is provided with a bulging projection 60, and a first inclined plane 61 which inclines from the projection to the head of the lower chopstick member and directs to the upper chopstick member for guiding the third section of the index finger. And there is provided with a C-shaped element for hooking an upper chopstick member with a pivot (e.g., the upper chopstick member with a hole and a pivot as shown in Fig. 28).

**[0072]** Fig. 40 shows the twentieth example, which includes an ulnar side thumb ergonomic device 143, an additional curved part 142 for the radial side of the thumb, and at the same time also includes an extension part 148 extending toward the lower chopstick member. Optionally, on the back surface of the lower chopstick member there are provided with a projection 60, a first inclined plane 61 and/or a second inclined plane 62. Also, the lower chopstick member is further arranged with a C-shaped element for hooking the pivot arranged in the

upper chopstick.

**[0073]** Fig. 41 shows the twenty-first example, which includes an ulnar side thumb ergonomic device 153 located at the front surface of the upper chopstick member, and a radial side thumb ergonomic device 152 located at the front surface of the upper chopstick member. The two thumb ergonomic devices are fixed on the lower chopstick member through a fixing element 151. The radial side thumb ergonomic device substantially opens towards the tail of chopsticks for guiding the radial side of the thumb. A gap is formed between the ulnar side thumb ergonomic device and the radial side thumb ergonomic device, exposing the front surface 11 of the upper chopstick member so that the thumb can touch the region of the upper chopstick member.

**[0074]** Optionally, a hinge, such as the hinge of Fig. 28 or a hinge which can turn sideway as shown in Fig. 29, can be added on the chopsticks of the present example. Alternatively, the hinge can be that of Fig. 30, which includes a convex connecting element 410 and a concave connecting element 420. The concave connecting element 420 engages with the convex connecting element 410, and can rotate around the axis of rotation 411.

**[0075]** Fig. 42 shows the twenty-second example. On the front surface of the upper chopstick member a second protrusion 202 is arranged, cooperating with and guiding the radial side of the thumb; and on the front surface of the upper chopstick member a first protrusion 201 is arranged, cooperating with and guiding the ulnar side of the thumb. One end of the pillar 63 connects to the lower chopstick member 20, and the other end thereof is arranged with a hinge, through which the upper chopstick member 10 and lower chopstick member 20 are connected with each other. On the pillar 63 there is provided with an index finger ergonomic device, which is structured as a projection 60 bulging from the back surface of the lower chopstick member, for cooperating with the base of the finger pad of the third section of the index finger and preventing the base from getting close to the head of the lower chopstick member. The projection connects to the first inclined plane 61 inclining to the head of the lower chopstick member and directing to the upper chopstick member, for cooperating with the finger pad of the third section of the index finger. The said hinge can be the hinge as shown in Fig. 28 or Fig. 29 or Fig. 30.

**[0076]** Although the attached Figures show the chopsticks for right hand, the present invention can be also applied for chopsticks for left hand.

**[0077]** In the foregoing some preferred examples of the present invention is explained in details. It can be understood that the present invention is not limited to the said examples mentioned above. Instead, those skilled in the art can, after reading the present invention, make modifications, changes or omissions, which certainly fall within the scope of the present invention.

## Claims

1. Chopsticks, comprising an upper chopstick member (10) and a lower chopstick member (20), **characterized in that**, a thumb ergonomic device is provided, wherein the thumb ergonomic device does not directly contact the lower chopstick member, but fixed at the upside of the front surface of the lower chopstick member through a fixing element, and the thumb ergonomic device is shaped in a curve, the opening of which substantially directs to the head of chopsticks, so that when the chopsticks are held, the curve opening touches a region of the ulnar side of the thumb not touching the lower chopstick member, for maintaining the correct relative position between the thumb and the lower chopstick members.
2. The chopsticks according to claim 1, **characterized in that**, an additional curved part is provided, the opening of which substantially directs to the tail of the chopsticks for guiding the radial side of the thumb, thus rendering the thumb ergonomic device being configured as a half ring shape perpendicular to the length of the chopsticks.
3. The chopsticks according to claim 2, **characterized in that**, a supplementary element (111) is provided, the two ends of which connect to two ends of the thumb ergonomic device respectively, forming a ring shaped thumb ergonomic device.
4. The chopsticks according to claim 1, **characterized in that**, said thumb ergonomic device (153) is used for the ulnar side and located at the front surface of the upper chopstick member, and a radial side thumb ergonomic device (152) is further provided, which is located at the front surface of the lower chopstick, fixed to the lower chopstick member through a fixing element (151), the opening of the radial side thumb ergonomic device substantially directing to the tail of the chopsticks for guiding the radial side of the thumb, wherein a gap is formed between the ulnar side thumb ergonomic device (153) and the radial side thumb ergonomic device (152), so that the thumb can directly touch the front surface (11) of the upper chopstick member (10).
5. The chopsticks according to claim 1, **characterized in that**, the ulnar side thumb ergonomic device extends toward the lower chopstick member, reaching at or beyond the front surface of the lower chopstick member and forming a curved face.
6. The chopsticks according to claim 2, **characterized in that**, the half ring shaped thumb ergonomic device extends toward the lower chopstick member, reaching at or beyond the front surface of the lower chopstick member and forming a half-barrel shape.
7. The chopsticks according to claim 1, **characterized in that**, that fixing element is a pillar.
8. The chopsticks according to any one of claims 1 to 7, **characterized in that**, an index finger ergonomic device is provided for cooperating with and guiding the finger pad of the third section of the index finger, preventing the section from getting too close to the head of the lower chopstick member.
9. The chopsticks according to claim 8, **characterized in that**, the index finger ergonomic device is structured as a projection (60) bulging from the back surface (23) of the lower chopstick member, for cooperating with the base of the finger pad of the third section of the index finger and preventing the base from getting too close to the head of the lower chopstick member.
10. The chopsticks according to claim 9, **characterized in that**, the projection connects to a first inclined plane (61) inclining to the head of the lower chopstick member and directing to the upper chopstick member, for cooperating with the finger pad of the third section of the index finger.
11. The chopsticks according to claim 9, **characterized in that**, the projection connects to the lower chopstick member through a pillar (63) between the upper chopstick member and lower chopstick member.
12. Chopsticks, comprising an upper chopstick member (10) and a lower chopstick member (20), having at least one of the following three features: a first protrusion (201) arranged on the front surface of the upper chopstick member for cooperating with and guiding the ulnar side of the thumb; a second protrusion (202) arranged on the front surface of the upper chopstick member for cooperating with and guiding the radial side of the thumb; and a third protrusion (203) arranged on the front surface of the lower chopstick member for cooperating with and guiding the ulnar side of the thumb.
13. The chopsticks according to claim 12, **characterized in that**, a fourth protrusion (204) is arranged on the front of the lower chopstick member for cooperating with and guiding the radial side of the thumb.
14. Chopsticks, comprising an upper chopstick member (10) and a lower chopstick member (20), **characterized in that**, an index finger ergonomic device is provided and configured as a projection (60) bulging from the back surface (23) of the lower chopstick member, for cooperating with the base of the finger pad of the third section of the index finger and preventing that base from getting close to the head of the lower chopstick member.

15. The chopsticks according to claim 14, **characterized in that**, the projection connects to a first inclined plane (61) inclining to the head of the lower chopstick member and directing to the upper chopstick member, for cooperating with the finger pad of the third section of the index finger. 5
16. The chopsticks according to claim 14, **characterized in that**, the projection connects to a second inclined plane (62) inclining to the head of the lower chopstick member and directing away from the upper chopstick member, for cooperating with the joint of the base of the third section of the index finger. 10
17. The chopsticks according to claim 14, **characterized in that**, the projection connects to the lower chopstick member through a pillar (63) located between the upper chopstick member and the lower chopstick member. 15  
20
18. The chopsticks according to any one of claims 14 to 17, **characterized in that**, a thumb ergonomic device is provided for cooperating with and guiding the ulnar side of the thumb. 25
19. The chopsticks according to claim 18, **characterized in that**, the thumb ergonomic device is structured as a thumb insertion ring (88) arranged on the front surface of the lower chopstick member and/or a thumb insertion ring arranged on the front surface of the upper chopstick member. 30
20. The chopsticks according to claim 18, **characterized in that**, the thumb ergonomic device is structured as a first protrusion arranged on the front surface of the upper chopstick member and/or a third protrusion arranged on the front surface of the lower chopstick member, for cooperating with and guiding the ulnar side of the thumb. 35  
40
21. Chopsticks, comprising an upper chopstick member (10) and a lower chopstick member (20), **characterized in that**, a thumb ergonomic device and an index finger ergonomic device are provided, the thumb ergonomic device touches and guides the ulnar side of the thumb while the index finger ergonomic device cooperates with and guides the finger pad of the third section of the index finger. 45
22. Chopsticks, comprising an upper chopstick member (10) and a lower chopstick member (20), and a hinge provided between the upper chopstick member and lower chopstick member, the hinge comprising a C-shaped element (93) arranged on the lower chopstick member, and a hole (90) and a pivot (91) both arranged on the upper chopstick member, wherein the C-shaped element is hooked on the pivot (91) so that the head of the upper chopstick member can rotate around the pivot, **characterized in that**, the diameter of the pivot (91) is less than the inner diameter of the C-shaped element (93), such that the C-shaped element loosely hooks onto the pivot, allowing the upper chopstick member not only can rotate around the pivot, but can also turn sideways. 55

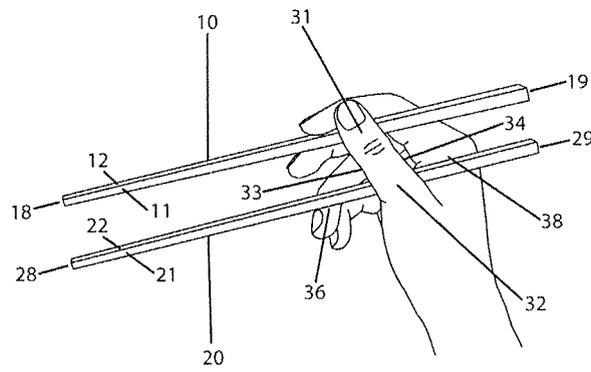


Fig.1

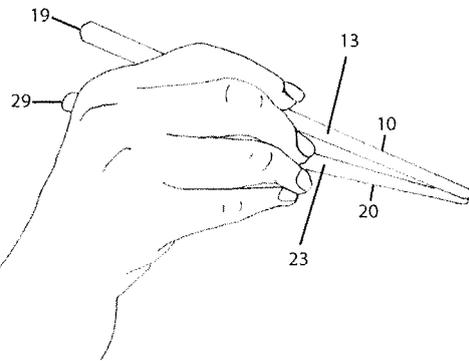


Fig.2

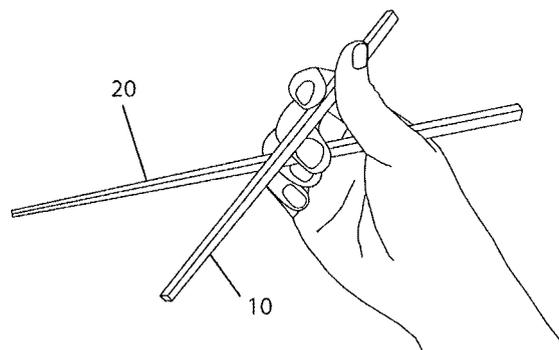


Fig.3

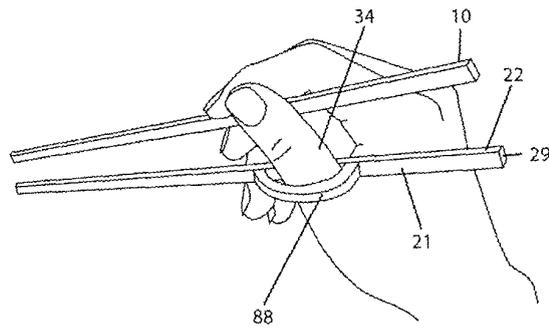


Fig. 4

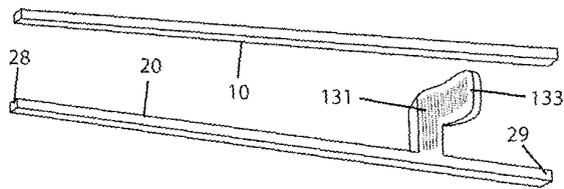


Fig. 5

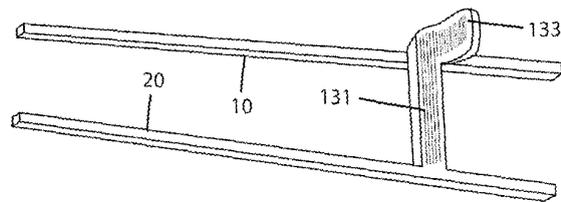


Fig. 6

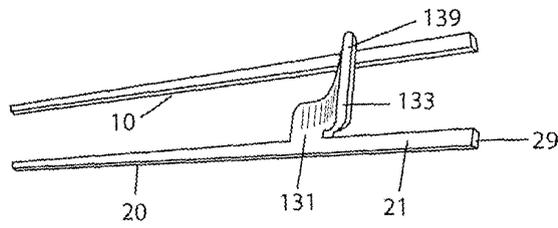


Fig. 7

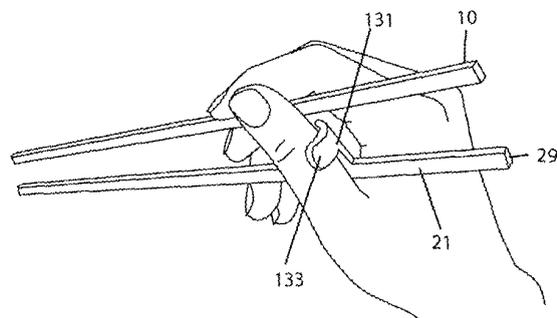


Fig. 8

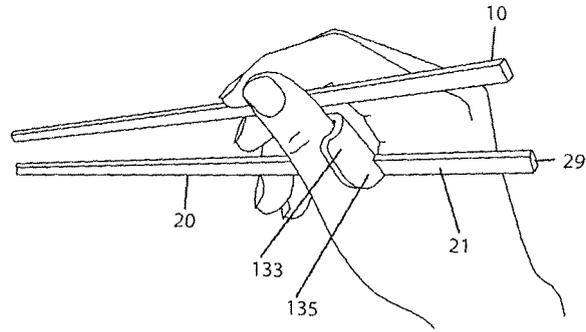


Fig.9

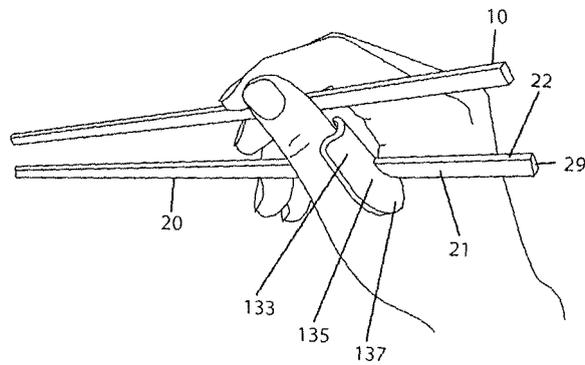


Fig.10

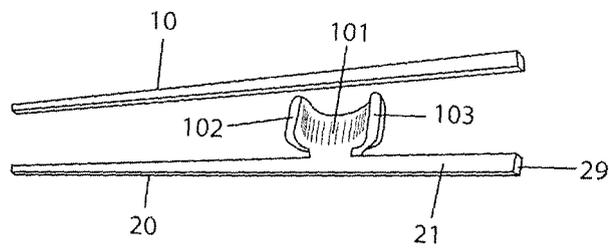


Fig.11

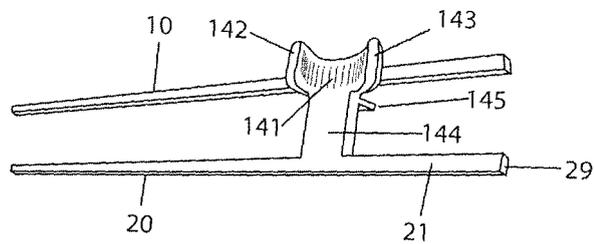


Fig.12

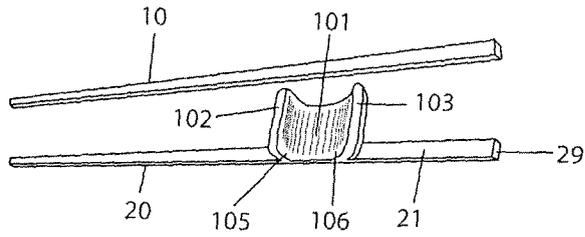


Fig.13

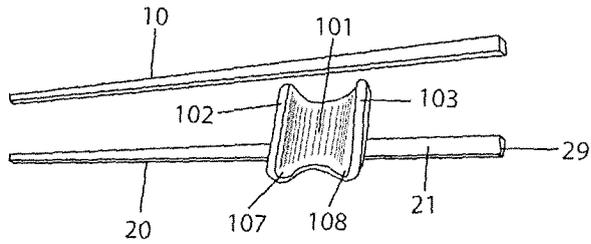


Fig.14

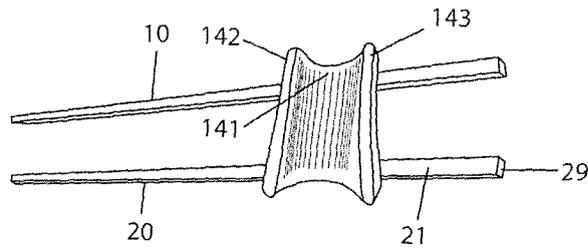


Fig.15

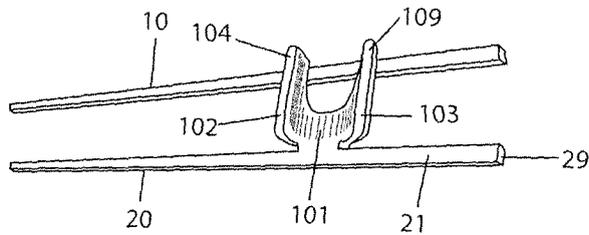


Fig.16

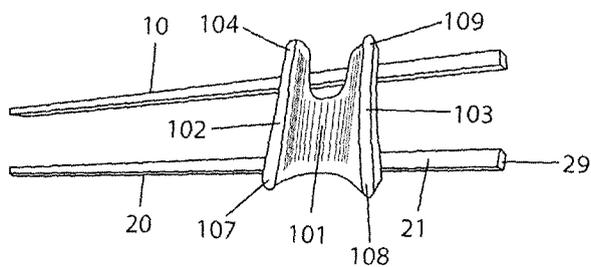


Fig.17

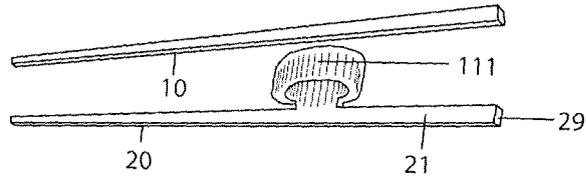


Fig.18

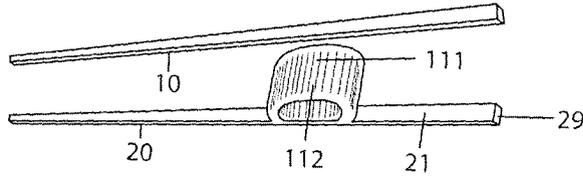


Fig.19

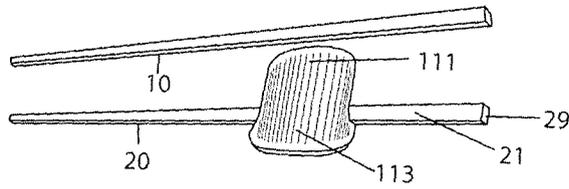


Fig.20

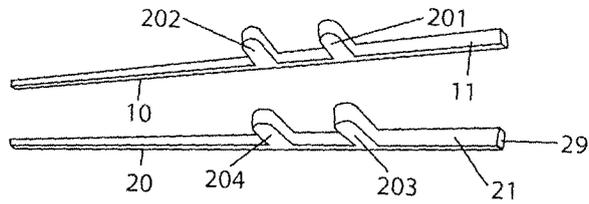


Fig.21

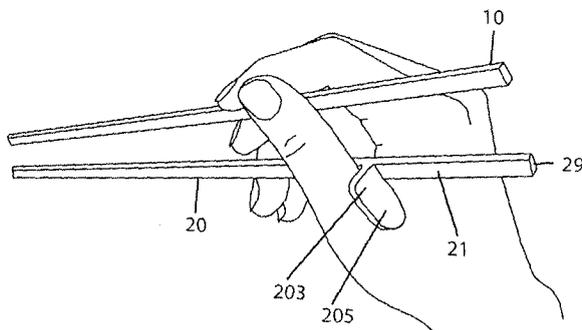


Fig.22

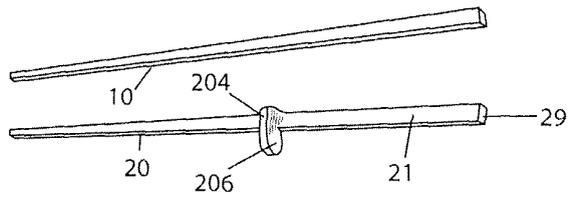


Fig.23

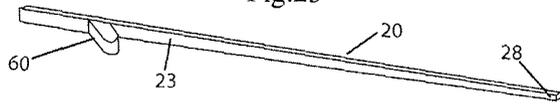


Fig.24

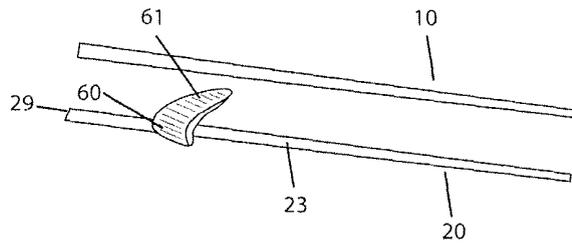


Fig.25

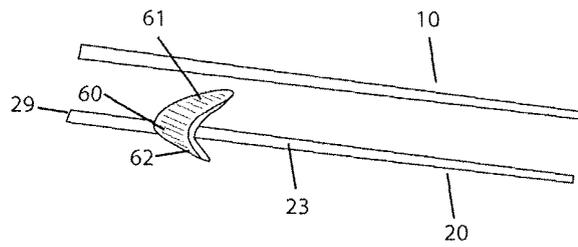


Fig.26

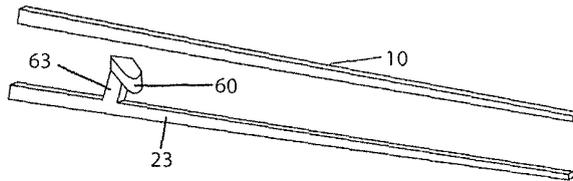


Fig.27

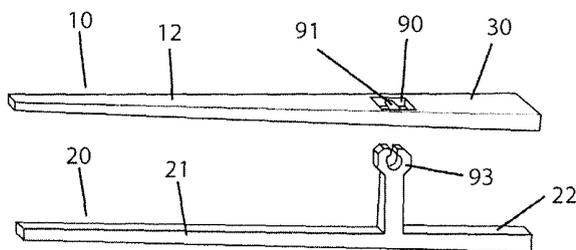


Fig.28

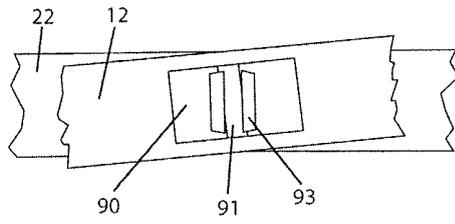


Fig.29

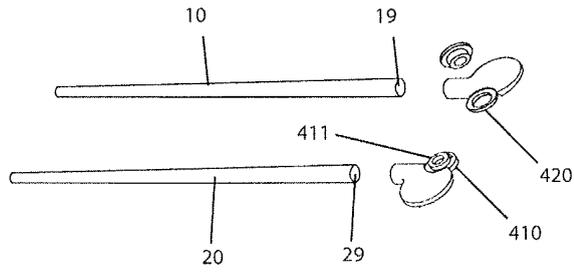


Fig.30

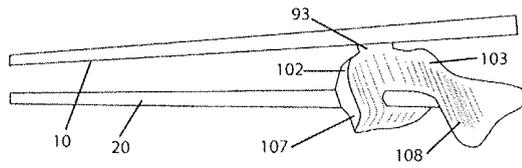


Fig.31

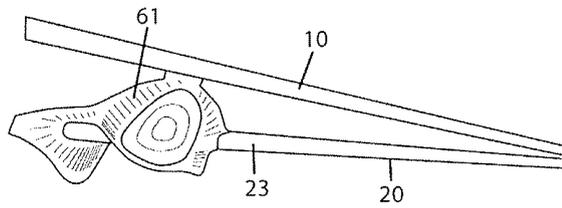


Fig.32

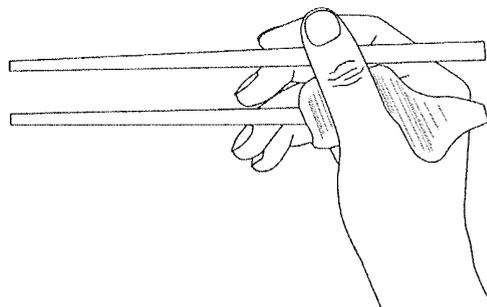


Fig.33

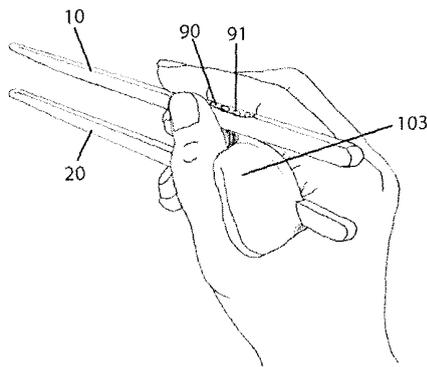


Fig.34

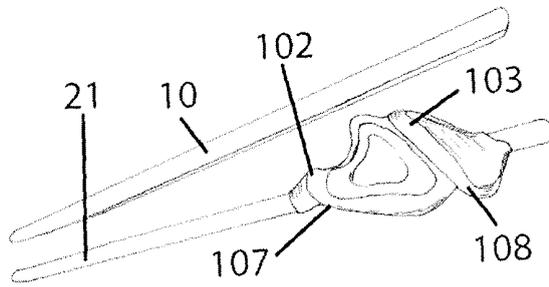


Fig.35

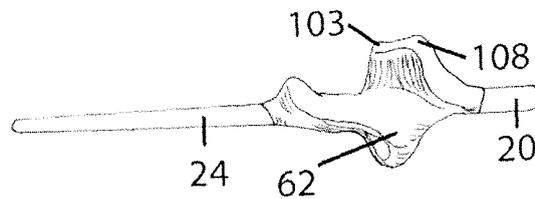


Fig.36

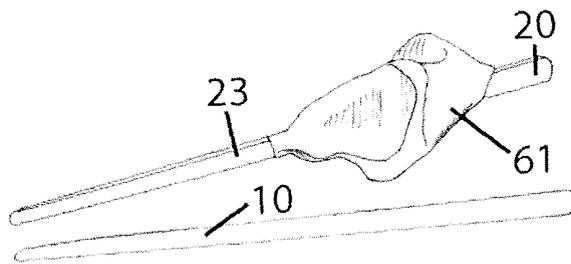


Fig.37

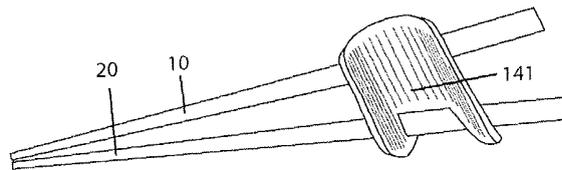


Fig.38

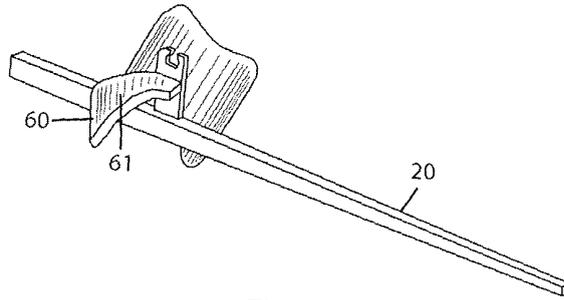


Fig.39

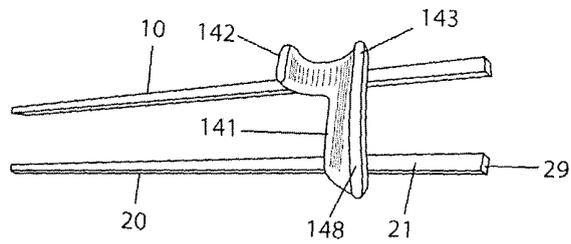


Fig.40

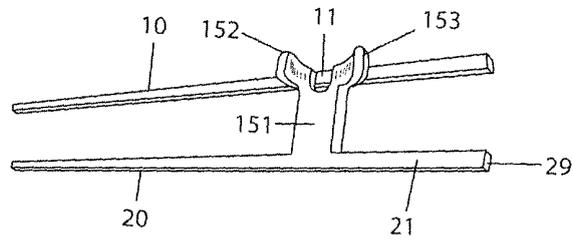


Fig.41

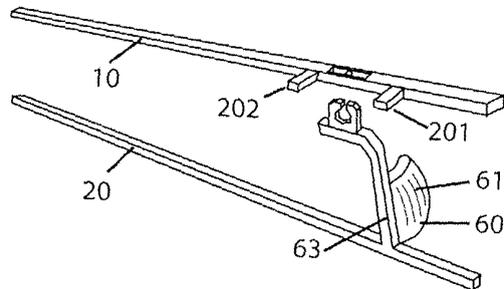


Fig.42

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2010/001155

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
A47G 21/10(2006.01)i		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
IPC: A47G 21/-,G09B19/-		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
CNPAT,CPRSABS,WPI,EPODOC: chopstick?, study+,learn+,finger?,thumb, first w finger, forefinger, index w finger, camber, arc, project???, protrud???, fastn???, fix+, secure???, radio, human 2d engineering, body 2d engineering, ergonomic?, barrel, gemel, hinge, pintle, pivot??. hole,C w shape		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO2006/004290A1 (YOUNG WOO CO LTD) 12 Jan.2006(12.01.2006) paragraphs [0041]-[0078] in description, and Figs. 1-10	1-3,5-7
Y	WO2006/004290A1 (YOUNG WOO CO LTD) 12 Jan. 2006(12.01.2006) paragraphs [0041]-[0078] in description, and Figs. 1-10	8-11,18-19,21
X	JP 10-228234A (JIDO KAKIKATA KENKYUSHO KK) 25 Aug. 1998 (25.08.1998) paragraphs [0008]-[0064] in description, and Figs. 1, 8	12-13
Y	JP 10-228234A (JIDO KAKIKATA KENKYUSHO KK) 25 Aug.1998 (25.08.1998) paragraphs [0008]-[0064] in description, and Figs. 1, 8	20
X	CN1628580A (COMBI CO) 22 Jun.2005 (22.06.2005) line 26 of page 3 - line 24 of page 6 in description, and Figs. 1-12	14-17
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
<p>* Special categories of cited documents:</p> <p>“A” document defining the general state of the art which is not considered to be of particular relevance</p> <p>“E” earlier application or patent but published on or after the international filing date</p> <p>“L” document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>“O” document referring to an oral disclosure, use, exhibition or other means</p> <p>“P” document published prior to the international filing date but later than the priority date claimed</p> <p>“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>“&amp;”document member of the same patent family</p>		
Date of the actual completion of the international search 21 Oct. 2010(21.10.2010)		Date of mailing of the international search report <b>11 Nov. 2010 (11.11.2010)</b>
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451		Authorized officer <b>YANG, Xue</b> Telephone No. (86-10)62085828

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2010/001155

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN1628580A (COMBI CO) 22 Jun.2005 (22.06.2005) line 26 of page 3 - line 24 of page 6 in description, and Figs. 1-12	8-11,18-21
A	CN2712200Y (HU, Denghuang) 27 Jul.2005 (27.07.2005) line 9 of page 1- line 9 of page 2 in description, and Figs. 1-3	22
A	KR20020088215A (CHEONG JAE UK et al.) 27 Nov.2002 (27.11.2002) whole document	1-22
A	CN101040752A (WU, Zengrong) 26 Sept.2007 (26.09.2007) whole document	1-22

Form PCT/ISA /210 (continuation of second sheet ) (July 2009)

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2010/001155

**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

This Authority considers that the same or corresponding technical feature between independent claim 22 and other independent claims is as follows: Chopsticks comprise an upper chopstick part (10) and a lower chopstick part (20).

CN2712200Y (27.07.2005) is considered to represent the most relevant state of the art to claim 22 (see line 9 of page 1 - line 9 of page 2 in description, and Figs. 1-3) and discloses: a kind of universal chopsticks comprises a pair of handles of the chopsticks (corresponding to the lower chopstick part (20) and the upper chopstick part (10)). The above feature is disclosed by the document CN2712200Y. Therefore, The same or corresponding technical feature of independent claim 22 and other independent claims does not make a contribution over the prior art and can not be considered as special technical features. The application, hence does not meet the requirements of unity of invention as defined in Rules 13.1 PCT.

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on protest**
- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
  - The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
  - No protest accompanied the payment of additional search fees.

Form PCT/ISA /210 (continuation of first sheet (2)) (July 2009)

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.

PCT/CN2010/001155

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
WO2006/004290A1	12.01.2006	KR20060044442A	16.05.2006
JP10-228234A	25.08.1998	none	
CN1628580A	22.06.2005	EP1543752A1	22.06.2005
		CN100562275C	25.11.2009
		US2005134065A1	23.06.2005
		US7182378B2	27.02.2007
		KR20050062408A	23.06.2005
		JP2005177183A	07.07.2005
		TW200528049A	01.09.2005
CN2712200Y	27.07.2005	none	
KR20020088215A	27.11.2002	none	
CN101040752A	26.09.2007	none	

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**REFERENCES CITED IN THE DESCRIPTION**

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

**Patent documents cited in the description**

- US 5277464 A [0007]
- CN 87205972 U [0007]
- WO 2003015589 A [0008] [0013] [0015] [0018]
- JP 2005177183 A [0012] [0015]