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GB 2527861 B

Figure 1

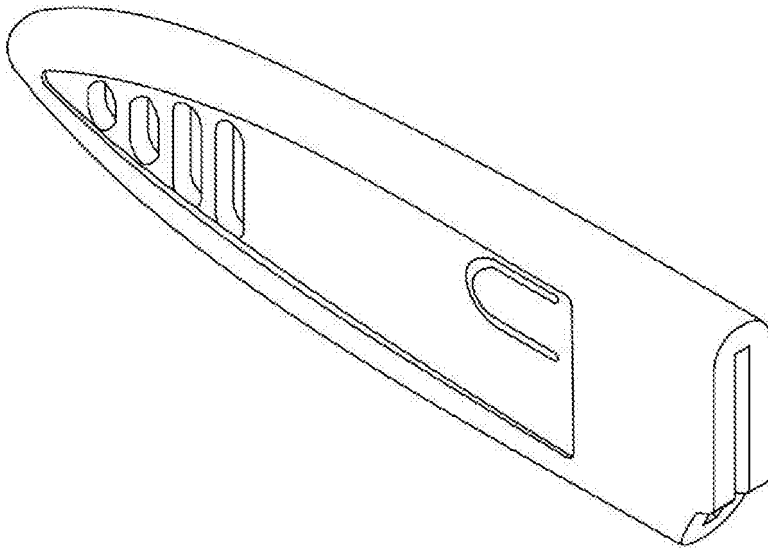


Figure 2

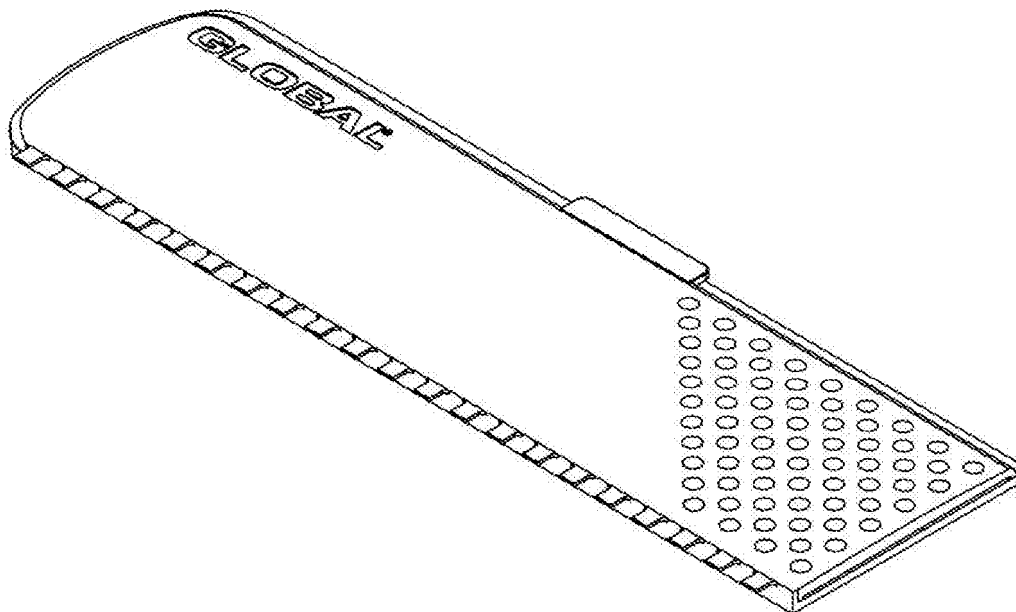


Figure 3

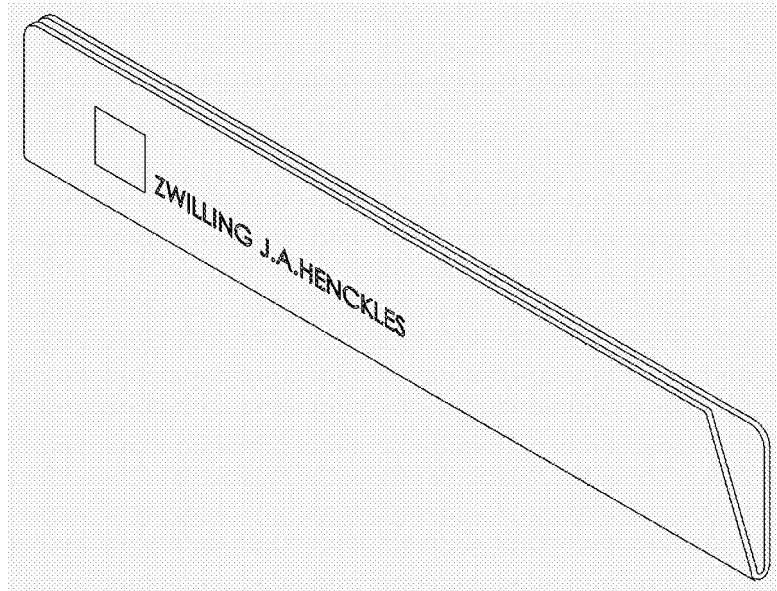


Figure 4

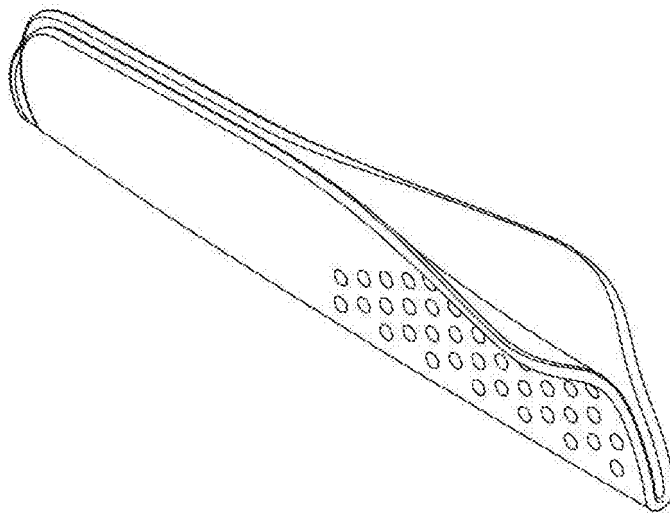


Figure 5

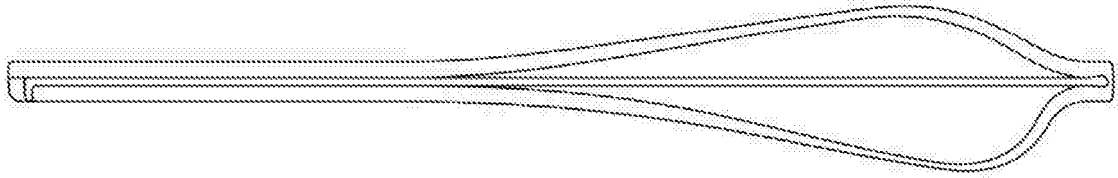


Figure 6

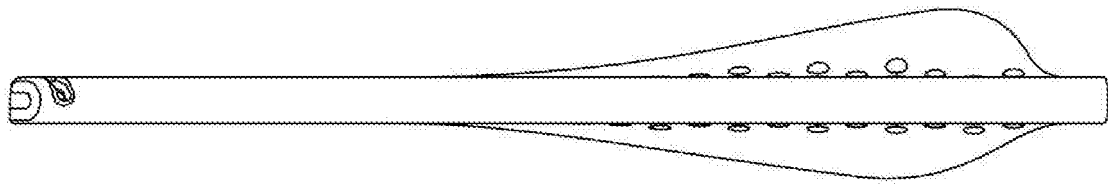


Figure 7

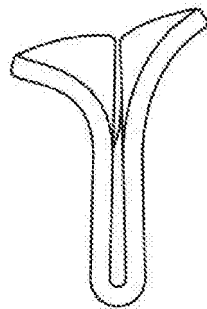


Figure 8

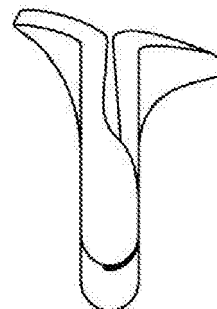


Figure 9

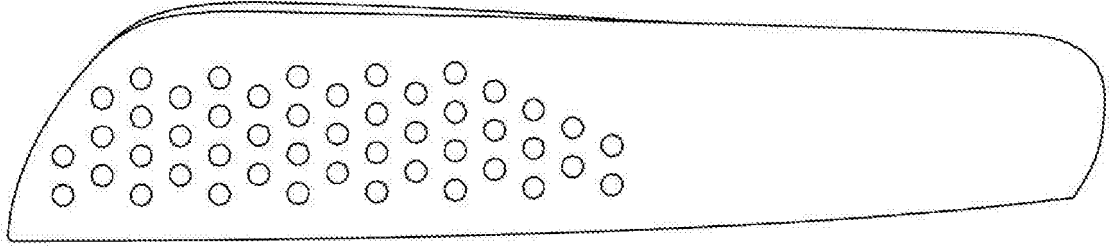


Figure 10

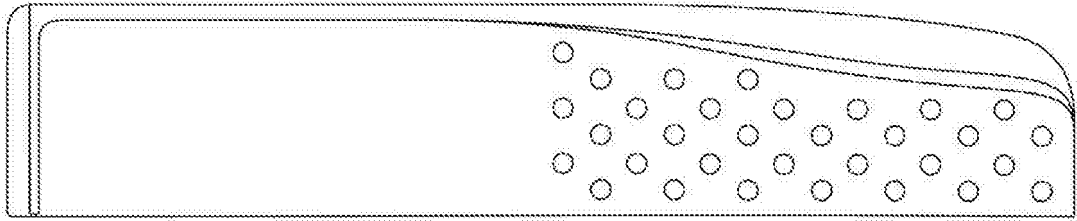


Figure 11

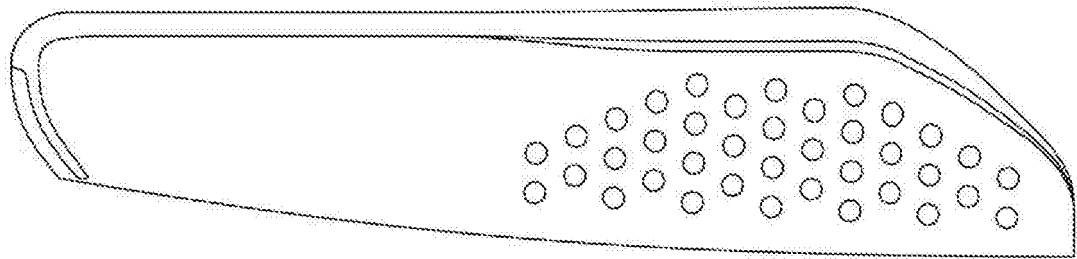
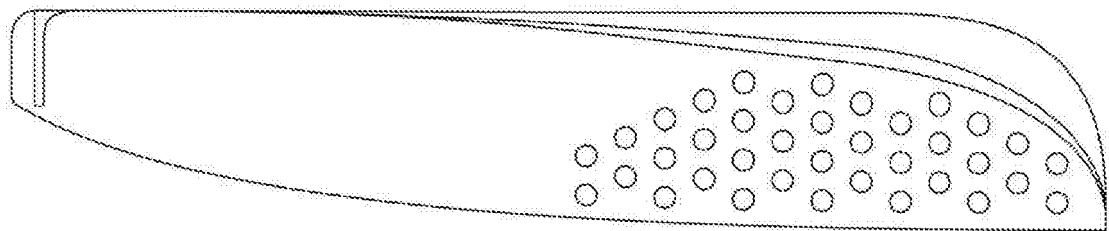


Figure 12



Knife guard

The present invention relates to a knife guard, that is a guard for protecting the blade of a knife when the knife is not in use.

5 Many types of knife guard are known, the basic configuration is a form of trough in which a knife blade is placed when not in use. Many knife guards are designed primarily for their aesthetic qualities or for ease of production. However, knives in professional catering, such as where a chef owns his or her own knife set, may be housed in a suitable box or block to give maximum protection. However, between these extremes is a need for an effective and practical knife guard for general
10 professional use such that a knife may be sheathed quickly and safely between uses and that the guard may be readily cleaned, such as in a dishwasher so that the stored knife does not become contaminated.

The present invention, in its various aspects is as set out in the appended claims.

15 The present invention provides a knife guard for protecting a single bladed knife having a handle end and a point end, the guard comprising:

an elongated trough of U shaped cross-section, such as having a length between 5 and 10 times its average height, with a handle end and a remote point end; characterised in that:

20 the U shaped cross-section provides walls such that the upper ends of the U point inward so that when not accommodating a knife blade said (notional) ends touch or approach with no more than 2mm separation;

that the height of said cross-section at the handle end is at least 1.5 times the height at the point end;

25 that said cross-section extends further upward beyond the U shaped cross-section on a first side, said wall extends beyond the U shaped cross-section by means of an outward curve having a first radius between 1 and 3 cm;

30 that said cross-section extends further upward beyond the U shaped cross-section on a second side, as viewed from the handle end, said wall extends beyond the U-shaped cross section by means of an outward curve having a second radius between 1.5 and 8cm;

wherein said first radius is less than said second radius:

that the level above the base at which said outward curves originate, (i.e. at the notional ends of the U-shape) is the same for both curves and is parallel with the base of the U-shape throughout the length of said curves;

- 5 wherein said curves extend from the handle end toward the point end for no more than half the length of the guard; and

at the point end the U-shaped cross section ceases and the wall on the aforementioned second side extends across said cross-section, from the second side to the first side, so as to close off the exit it to the trough.

- 10 As to the requirement that said ends touch or approach no more than 2mm separation, the separation is preferably between 1 and 2mm and preferably provides a contraction from the base of the U at 2 to 3mm, this assists in the drying and cleanliness features.

The combination of the above features has been found to give an optimal combination of ease-of-use, safety and cleanliness.

- 14 05 15
15 To evaluate these properties a number of comprising devices were tested and users repeatedly inserted a knife having a blade for which the prior art devices were advertised as being suitable and for which the invention was sized; the guards of the invention being made in a range of sizes depending upon specific blades. The test
20 blade was Taylor's eye witness, 13cm by 2.1cm pointed steel blade with a 11.5cm whetted edge and 11cm plastic moulded handle. The blade guard of the invention was 14cm long, the trough of width 6mm externally, 1mm internally at closest approach to 3mm at the base and of height 3cm. As measured from a section 15mm from the handle end the first radius is 9mm and the second radius is 20mm. Users
25 repeated this operation quickly and frequently in direct repetition, being protected by suitable gloves, and the number of missed insertions (potentially giving rise to injury) and the speed of insertion were measured. After 100 attempted insertions and removals:

Table 1, Misses:

| Knife Guard | Misses |
|-------------|--|
| A | 1 miss (As the knife is inserted point first, it could be said that the user is inclined to be more careful to avoid injury) |
| B | 3 misses (Scraping edge of knife again knuckles while inserting) |
| C | 9 misses |
| D | 0 misses |

References A, B and C are to prior art products as illustrated in the drawings.

Reference D is to a knife guard of the present invention specifically as illustrated in
 5 figures 4 to 8 of the drawings. Knife guards also according to the present invention
 as disclosed in figures 9 to 12 gave similar results.

Table 2, Time taken:

| Knife Guard | Time |
|-------------|-------|
| A | 3m17s |
| B | 2m59s |
| C | 2m18s |
| D | 1m24s |

10 The various knife guards were also used in a commercial kitchen, after comparative
 use the residual food waste present in the guard was assessed. Testing carried out
 on four blade guards to test if;

1. Food debris was removed when inserting into the guard
2. The guard could be cleaned in soapy water
- 15 3. The guard could be cleaned in a domestic dishwasher
4. Fitness for purpose after being contaminated and washed

It being found that the knife guard according to the invention although potentially
 retaining residues did not as insertion of the knife had a cleaning effect leading to
 removal of said residual material.

| test criteria | A | B | C | D |
|--|-----------------------------|---|---|-----------------------------|
| Food residue removed when inserting into guard (Image 1) | poor | poor | good | good |
| Food residue removed from guard when washed in hot soapy water (Image 2) | very good | poor | poor | very good |
| Product fit for purpose after washing in hot soapy water (image 2) | no damage - fit for purpose | permanent damage - glue failed to hold magnet- not fit for purpose | Lining held moisture and food residue after washing. Moisture may lead to blade corrosion- not fit for purpose | no damage - fit for purpose |
| Paper strip inserted into guard to examine contamination (image 3) | clean | clean | contaminated and wet | clean |
| Dishwasher test cleanliness | clean | clean | contaminated and wet | clean |
| Fit for purpose after washing in domestic dishwasher (image 4) | no damage - fit for purpose | more extreme permanent damage - glue failed to hold magnet- not fit for purpose | material lining held moisture and food residue after washing. Dampness next to blade may lead to blade corrosion- not fit for purpose | no damage - fit for purpose |

Table 3, Food Residues Knife Guards A to D using knife as specified above.

5 Summarising the results from table 3:

Guard 'A' Did not remove a high percentage of food debris when the contaminated knife was inserted but both knife and blade guard can be washed in soapy water or dishwasher and continue to be fit for purpose.

10 Guard 'B' Did not remove any debris when inserting a contaminated knife and cannot be cleaned in hot soapy water, or dishwasher. After either washing process the glue fails, rendering the item not fit for purpose.

Guard 'C' Removed most of the food debris when inserting a contaminated knife, however the material lining held moisture and debris following both cleaning processes. The moisture may lead to corrosion of steel blades if left in contact for prolonged periods of time.

- 5 Guard 'D' Removed most of the food debris when inserting a contaminated knife. The knife and blade can be washed in soapy water or dishwasher and continue to be fit for purpose.

Water egress

- 10 This test was conducted to establish how each design permits the egress of moisture in storage. 4 knives of identical design and construction were placed into each knife guard whilst wet, and stood vertically in a caddy for a period of 48 hours.

On removal of the knives (as above) from each guard the following results were noted

| Knife Guard | Result by observation |
|-------------|--|
| A | No discernible staining of the blade |
| B | Heavy staining to both sides of the surface of the blade |
| C | Moderate staining around the whetted edge of the knife, and damp odour on the guard itself |
| D | No discernible staining of the blade |

15

- The above results tables show that the various features of the present invention act in concert to provide a more effective device to individual devices which may be optimised for given uses but for which negatives arise. Given the long-standing and widespread use of knife guards achieving better performance overall than known devices, all of which are at the premium end of the market is clearly surprising.
- 20

The knife guard of the present invention is preferably made of stainless steel or polymer. The polymer is preferred as the stainless steel could blunt the knives even if it gave easier insertion. Trials with ABS, polypropylene, polyethylene and low-

density polyethylene show that low-density polyethylene is preferred as this gave good grip to the knife combined with relative ease of insertion.

The outer walls of the knife guard may be textured to improve grip.

5 There is preferably a gap between the termination of the trough and the beginning of the tip and where the right side extends across.

The above trials were carried out only with right-handed people, tests with left-handed people showed that the present design with non-optimal reversal of the handedness of the knife guard, when used with left-handed people provided results substantially equivalent to those for right-handed people.

10

The present invention is illustrated with reference to the following drawings in which:

figure 1 shows prior art knife guard A, a Kuhn Rikon Colori™ product;

figure 2 shows a prior art knife guard B, a Global Magnetic Blade Guard™ product;

figure 3 shows a prior art knife guard B, a Heckels Edge Guard™ product;

15 figure 4 shows a perspective view of a knife guard of the present invention (as used in the above tests);

figure 5 shows a plan view of a knife guard of the present invention as shown in figure 4 (the top is the second side, the bottom is the first side);

figure 6 shows an underside of view of the knife guard of figure 4;

20 figure 7 shows a handle end view of the knife guard of figure 4;

figure 8 shows a point end view of the knife guard of figure 4 and best illustrates the terminal; second wall which extends across said cross-section, from the second side to the first side, so as to close off the exit it to the trough;

25 figure 9 shows a side or front view of a left-handed version of the knife guard of figure 4;

figure 10 shows a side or front view of a further embodiment of the present invention;

figure 11 shows a side or front view of a yet further embodiment of the present invention; and

figure 12 shows a side or front view of a still further embodiment of the present invention.

Claims:

1) The present invention provides a knife guard for protecting a single bladed knife having a handle end and a point end, the guard comprising:

5 an elongated trough of U shaped cross-section, having a first, handle end and a remote point end; characterised in that:

the U shaped cross-section presents walls such that the upper ends of the U point inward so that when not accommodating a knife blade said ends touch or approach with no more than 2mm separation;

10 that the height of said cross-section at the handle end is at least 1.5 times the height at the point end;

that said cross-section extends further upward beyond the U shaped cross-section on a first side, said wall extends beyond the U shaped cross-section by means of an outward curve having a first radius between 1 and 3 cm;

01 02 16
15 that said cross-section extends further upward beyond the U-shaped cross-section on a second side, said wall extends beyond the U-shaped cross section by means of an outward curve having a second radius between 1.5 and 8cm;

wherein said first radius is less than said second radius:

20 that the level above the base at which said outward curves originate, i.e. at the notional ends of the U-shape, is the same for both curves and is parallel with the base of the U-shape throughout the length of said curves;

wherein said curves extend from the handle end toward the point end for no more than half the length of the guard; and

25 at the point end the U-shaped cross section ceases and the wall on the aforementioned second side extends across said cross-section, from the second side to the first side, so as to close off the exit it to the trough.

2) The knife guard according to claim one wherein the guard is made from polypropylene or polyethylene.

- 3) The knife guard according to claim two when the guard is made from low-density polyethylene.
- 4) A knife guard as herein described with reference to the description and all of figures 4 to 12.
- 5) A knife guard as herein described with reference to the description and any or all of figures 4 to 9.