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54 **Knives.**

57 The invention relates to knives and in particular to knives of the type of construction described and claimed in British Patent No 2108887, where the blade has a V-shaped cutting edge centrally located on a parallel sided blank with the edge flat ground to one side and ground with formulations such as serrations or serrations and scallops. The object of the invention is to improve such knives by increasing the strength at the cutting edge, which objective is met by a construction where along that side of the V-shaped cutting edge provided with formulations a number of interruptions are provided in spaced relationship along the length of the cutting edge. The interruptions can take the form of areas free from formulations or can take the form of single large serrations spaced along the length of the cutting edge.

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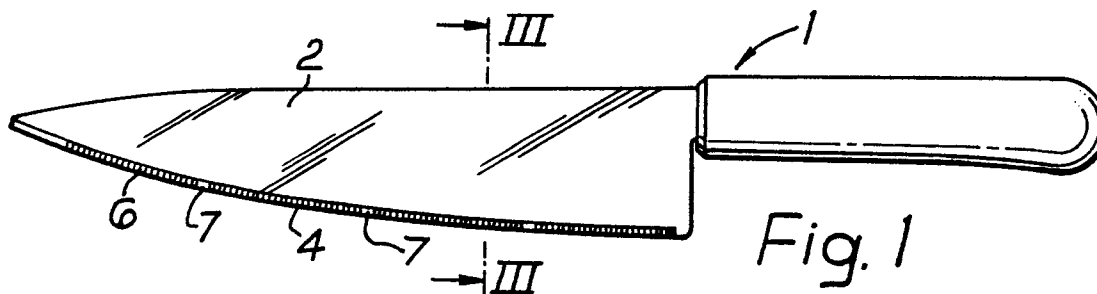


Fig. 1

KNIVES

This invention relates to knives, and is particularly, though not necessarily exclusively concerned with domestic knives such as would be used, e.g., in the kitchen.

It has been long recognised that the cutting performance of a knife can be enhanced or made to suit a particular cutting purpose by providing at the cutting edge a formulation such as serrations or scallops. However whilst such formulations can improve considerably the cutting action, they have the disadvantage of not readily being resharpenable and have a tendency to tear rather than cut clean. Because the creation of formulations such as serrations or scallops involves a separate grinding step in the production of knife blades, this has the effect of increasing production costs, and yet produces a blade which may not have the total life of a conventional blade by virtue of the difficulties of resharpening. It is, therefore, most important that the production costs of a blade with edge formulations are kept to a minimum, whilst providing adequate cutting life and improved cutting performance.

A construction embodying edge formations in the form of serrations and/or scallops is described and claimed in British Patent No. 2108887, where a blade has a V-shaped cutting edge, centrally located on a parallel-sided blank, the cutting edge being flat ground to one side of the Vee and ground with formulations to the opposite side of the Vee. Such a construction has proved to be most effective in providing an exceedingly sharp cutting edge that retains its sharpness for considerable periods, and can be resharpened.

The object of the present invention is to provide still further improvements to a knife blade of the type defined above.

According to the present invention, a knife comprises a blade having formations at its cutting edge to assist the cutting action, said edge being V-shaped and centrally located on a parallel sided blank, and being flat ground to one side of the Vee and ground with formations to the opposite side of the Vee, there being a number of interruptions to the formations, in spaced relationship along the length of the cutting edge.

Thus, the interruptions can take the form areas where no formations are provided, or can take the form of a number of single large serrations. In both instances, the interruptions add noticeably to the strength of the cutting edge at the tip of the Vee, assisting considerably in the prevention of flexing of the blade at the tip of the Vee as can occur particularly when cutting relatively tough materials. Both types of formations also assist in clearing

debris from the bottom of the cut being produced by the blade. Interruptions in the form of single large serrations have the still further advantage of providing a buffer between the material being cut and the cutting edge immediately alongside each large serration that gives protection to the cutting edge to maintain the sharpness of the cutting edge, but without impairing the cutting action.

Preferably, the formulations are scallops and/or serrations.

Thus, the invention utilises conventional parallel sided blanks, and has a centrally located cutting edge, with the grinding of edge formulations to one side only. Such a blade, therefore, combines relatively low costs of production with the retention of improved cutting performance.

It has been found that the angle of the V-shaped cutting edge, and the scallops and/or serrations ground to one side of the V-shaped cutting edge have a marked effect on the cutting performance of the blade. It is therefore an important aspect of the present invention that the V-shaped cutting edge has an included angle between 14° and 30°. Preferably the included angle lies between 16° and 22°, it being further preferred that the included angle lies between 18° and 20°.

It is yet another important aspect of the invention that serrations are ground to one side of the V-shaped cutting edge, there being from 25 to 50 serrations per inch and preferably 40 serrations per inch, between the interruptions, it being further preferred that the included angle of the serrations lies between 80° and 100° and still further preferably 90°. To ensure that the serrations do not produce a saw blade effect, great care has to be taken to produce serrations which, when viewed from the flat ground side of the blank, only marginally protrude above the general level of the edge of the blade. Because the V-shaped cutting edge is flat ground to one side, and the serrations only protrude marginally, the knife can be resharpened by regrounding by hand or otherwise, the flat ground surface of the V-shaped cutting edge.

It is a still further important aspect of the invention that in addition to serrations, scallops can be ground on the same side of the V-shaped cutting edge. Thus, to provide a general purpose knife, one scallop can be provided between adjacent, spaced interruptions, e.g. having a radius in the range 0.1" to 0.25". Preferably the radius is 0.16". The scallops may have pitch in the range 2.0 to 10 and preferably 5 T.P.I. It is further preferred that the serrations, when scallops are present, have an included angle between 50° and 90°, with a still further preference of 60°. When a heavier cutting

action is required, e.g. for bread and the like, again a single scallop can be provided between spaced interruptions, and when the scallops can have a radius of 0.15 to 0.5 inch, and preferably 0.25 inch, with a scallop pitch between 1.0 and 6.0 T.P.I. and preferably 4 T.P.I., and where the serrations may be between 25 and 50 T.P.I. and preferably 33 T.P.I.

More than one scallop can be provided between spaced interruptions. Thus, to provide e.g. a carving knife, two scallops can be provided between spaced interruptions, and which may each have, at the cutting edge, a radius in the range 0.625 inch to 1.25 inch and preferably 0.75 inch, and a scallop pitch in the range 1 to 4 T.P.I. and preferably 2 T.P.I. Here the serrations can be as has been mentioned above in relation to the serrated only construction or the single scallop general purpose embodiment.

Four embodiments of the invention will now be described, purely by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 is a side elevation of a knife displaying a cutting edge in accordance with one embodiment of the invention;

Figure 2 is an enlarged view of part of the cutting edge of Figure 1;

Figure 3 is a section on the line III-III of Figure 1;

Figure 4 is a side elevation of a knife displaying a cutting edge in accordance with a second embodiment of the invention;

Figure 5 is an enlarged view of part of the cutting edge of Figure 4;

Figure 6 is a side elevation of a third embodiment of knife displaying a cutting edge in accordance with the invention;

Figure 7 is an enlarged view of part of the cutting edge of Figure 6.

Figure 8 is a side elevation of a fourth embodiment of knife displaying a cutting edge in accordance with the invention; and

Figure 9 is an enlarged view of the cutting edge of Figure 8.

In Figures 1 to 3, a knife 1 has a blade 2 with parallel sides 3 and a centrally located "V"-shaped cutting edge 4 flat ground to one side 5 and ground with serrations 6 to the other side. The "V"-shaped cutting edge has an included angle between 14° and 30°, preferably 18° to 20° and the serrations are in the range 25 to 50 per inch, preferably 40 per inch. The included angle of the serrations at the cutting edge is between 80° and 100°, preferably 90°.

Along the length of the serrated side of the "V"-shaped cutting edge, a number of spaced interruptions 7 are formed, in this embodiment by leaving a portion of that side of the "V"-shaped

cutting edge unserrated. The presence of the unserrated portions or interruptions 7 adds noticeably to the strength of the cutting edge at the tip of the Vee, and provides considerable assistance in preventing any flexing of the blade at the very tip of the cutting edge particularly when cutting relatively tough materials.

In the second embodiment illustrated in Figures 4 and 5 and suited to use as a carving knife, for convenience the reference numerals of Figures 1 to 3 have been employed for like parts. Thus, again, the knife 1 has a blade 2 with parallel sides 3 and a central V-shaped cutting edge 4 flat ground to one side 5 and formed with serrations 6 to the other side (and is in this regard essentially similar to the construction shown in Figure 3). However, in addition to the serrations 6, that side of the V-shaped cutting edge is ground with scallops 8, each having a radius at the cutting edge between 0.625 inch and 1.25 inch preferably 0.75 inch, and a pitch in the range 1 to 4 and preferably 2 T.P.I. With such scallops present the serrations 6 have an included angle between 50 and 90°, preferably 60°. The interruptions spaced along the length of the central V-shaped cutting edge take the form of large single serrations 9. Adjacent serrations 9 contain two scallops.

Figures 6 and 7 show a third embodiment suited to use as a bread knife, and here again, for convenience, the reference numerals of Figures 1 to 3 have been retained for like parts. Thus, the knife 1 has a blade 2 with parallel sides 3 and a central V-shaped cutting edge 4, flat ground to one side 5 and formed with serrations 6 to the other side. The serrated side of the V-shaped cutting edge being ground with scallops 10. Along the length of the cutting edge large serrations 11 are provided, there being a single scallop 10 between adjacent large serrations. Here it is preferred that the scallops have a radius at the cutting edge in the range 0.15 inch to 0.5 inch and preferably 0.25, and a scallop pitch in the range 1.0 to 6 T.P.I., preferably 4 T.P.I. The serrations 6 are preferably in the range 25 to 50 T.P.I. and further preferably, 33 T.P.I.

Figures 8 and 9 show a fourth embodiment suited for use as a general purpose knife. Here again the reference numerals of Figures 1 to 3 have been retained for like parts.

Thus, a knife 1 has a blade 2 with parallel sides 3 and a central V-shaped cutting edge 4 flat ground to one side 5 and formed with serrations 6 to the other side. The serrated side of the cutting edge is formed with scallops 12, and along the length of the cutting edge, large serrations 13 are provided with a single scallop between adjacent large serrations 13. Here it is preferred that the scallops have a radius in the range 0.1 inch to 0.25

inch, and more preferably 0.16 inch, and a pitch in the range 2 to 10 T.P.I., more preferably 5 T.P.I., the serrations having an included angle between 50° and 90°, more preferably 60°.

As with the interruptions 7 of Figure 1, the large serrations 9 and 11 add noticeably to the strength of the blade, and are of considerable assistance in preventing flexing at the tip of the V-shaped cutting edge. The large serrations 9 and 11 have the additional advantage of providing a buffer between the material being cut and the serrations 6 immediately alongside the serrations 9 and 11 that give protection to the cutting edge without impairing the cutting action, and are effective in clearing debris from the bottom of the cut being produced.

Claims

1. A knife comprising a blade (2) having formations (6, 8) at its cutting edge to assist the cutting action, said edge being V-shaped and centrally located on a parallel sided blank, and being flat ground to one side (5) of the Vee and ground with formations (6, 8) to the opposite side of the Vee characterised in that there are a number of interruptions (7,9) to the formations (6, 8) in spaced relationship along the length of the cutting edge.

2. A knife as in Claim 1, characterised in that the interruptions (7) take the form of areas free from formations.

3. A knife as in Claim 1, characterised in that the interruptions (9) take the form of a number of single, large serrations.

4. A knife as in any of Claims 1 to 3, characterised in that the formations (6) are in the form of serrations.

5. A knife as in any of Claims 1 to 3, characterised in that the formations are in the form of serrations (6) combined with scallops (8), the serrations having an included angle of 60°.

6. A knife as in Claim 1, wherein the centrally located V-shaped cutting edge has an included angle between 14° and 30°, preferably 18° to 20°.

7. A knife as in Claim 4, characterised in that there are from 25 to 50 serrations (6) per inch, preferably 40, and the serrations (6) have an included angle between 80° and 100°, preferably 90°.

8. A knife as in Claim 5, characterised in that one scallop (8) is provided between spaced interruptions (9) the scallops having a radius in the range 0.1 inch to 0.25 inch, preferably 0.16 inch, and a pitch in the range 2 to 10 T.P.I., preferably 5 T.P.I.

9. A knife as in Claim 11, characterised in that the serrations (6) have an included angle between 50° and 90°.

10. A knife as in Claim 5, characterised in that a single scallop (8) is provided between spaced interruptions (9), and which have a radius between 0.15 inch and 0.5 inch, preferably 0.25 inch, with a scallop pitch between 1.0 and 6.0 T.P.I. preferably 4 T.P.I. and where the serrations are between 25 and 50 T.P.I., preferably 33 T.P.I.

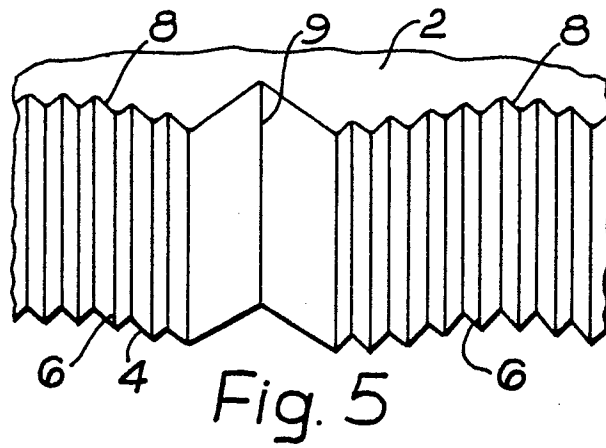
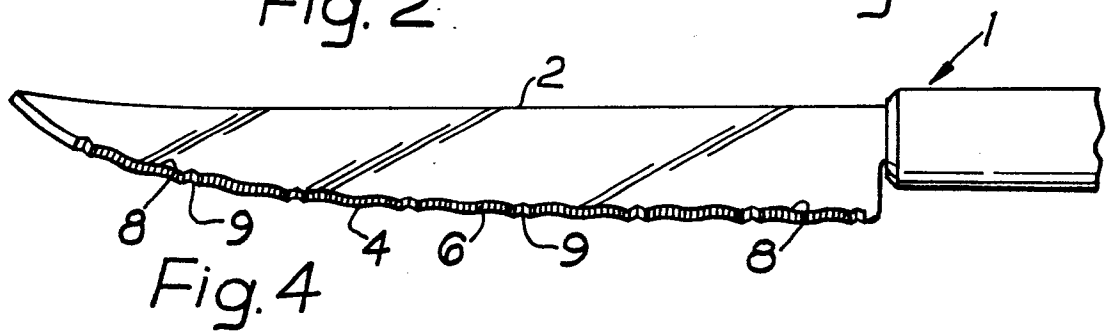
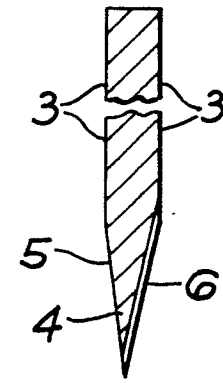
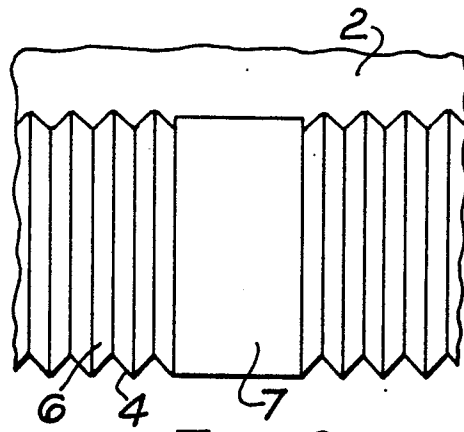
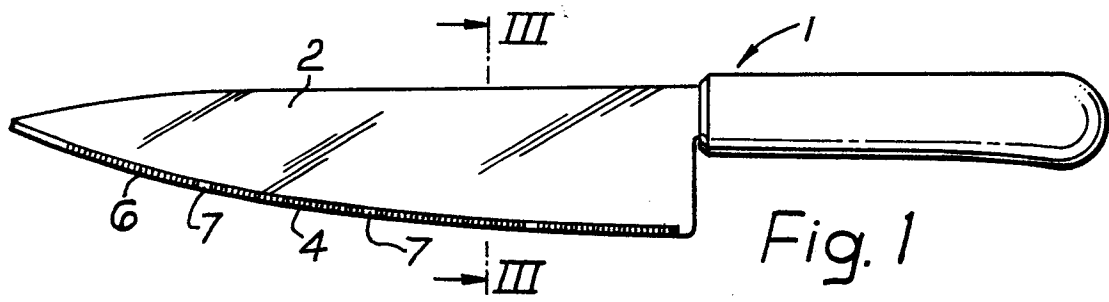
11. A knife as in Claim 5, characterised in that two scallops (8) are provided between spaced interruptions (9), the scallops (8) having a radius at the cutting edge in the range 0.025 inch to 1.25 inch preferably 0.75 inch and a pitch in the range 1 to 4 T.P.I., preferably 2 T.P.I.

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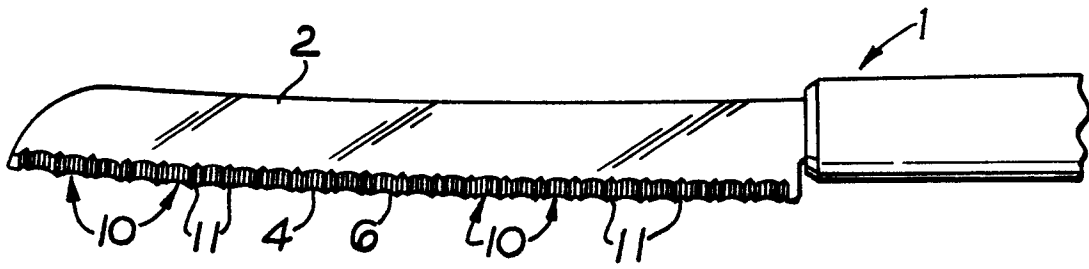


Fig. 6

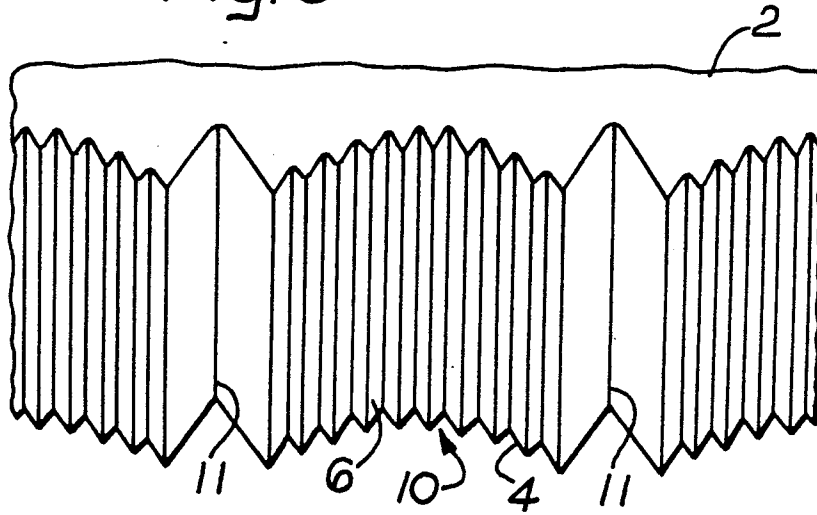


Fig. 7

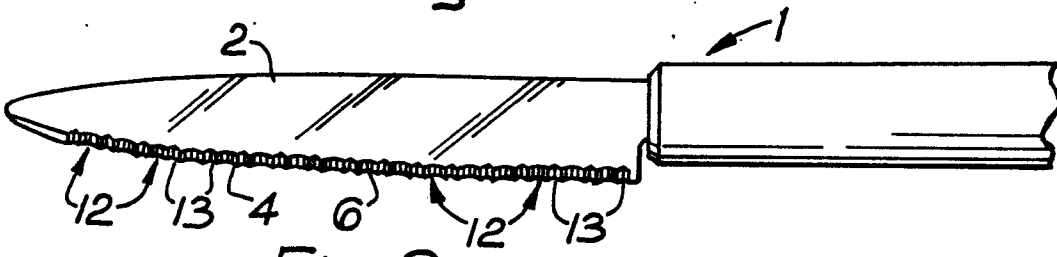


Fig. 8

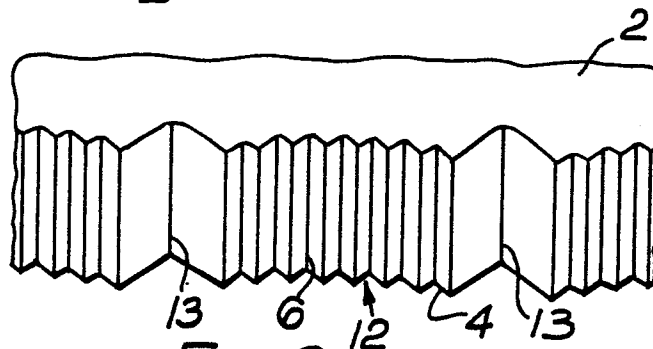


Fig. 9



DOCUMENTS CONSIDERED TO BE RELEVANT			EP 86104733.0
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	US - A - 2 059 414 (TAYLOR) * Totality * --	1,3,4	B 26 B 9/02
A	GB - A - 257 465 (GILLOTT) * Totality * --	2	
D,A	GB - A - 2 108 887 (WESTALL RICHARDSON LTD.) * Totality * ----	5,6,7, 8,9	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			B 26 B 9/00
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 13-01-1987	Examiner BRÄUER
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	