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GB-A- 257 465
GB-A- 2 108 887
US-A- 2 059 414

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Description

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 formation such as serrations or scallops. However whilst such formations 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 formations 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 formations 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 GB-A 2 108 887, 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 formations 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 of 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 formations 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 formations 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 a prefered embodiment 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 prefered embodiment 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 regrinding by hand or otherwise, the flat ground surface of the V-shaped cutting edge.

It is a still further prefered embodiment 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. (teeth per inch). 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 either as has been mentioned above in relation to the serrated only construction or as 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 are separated by 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 ser-

rations.

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. (teeth per inch), preferably 5 T.P.I.

9. A knife as in Claim 5, 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 has 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 0.625 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.

Patentansprüche

1. Messer mit einer Klinge (2), die an ihrer Schneide die Schneidwirkung unterstützende Ausbildungen (6, 8) aufweist, wobei die Schneide V-förmig gestaltet sowie zentral an einem Blatt mit parallelen Seitenflächen angeordnet ist und an einer Seite (5) des V flach sowie an der anderen Seite des V mit Ausbildungen (6, 8) geschliffen ist, dadurch gekennzeichnet, daß mehrere Unterbrechungen (7, 9) der Ausbildungen (6, 8) im Abstand voneinander längs der Schneide vorgesehen sind.

2. Messer nach Anspruch 1, dadurch gekennzeichnet, daß die Unterbrechungen (7) die Form von Flächen aufweisen, die frei von Ausbildungen sind.

3. Messer nach Anspruch 1, dadurch gekennzeichnet, daß die Unterbrechungen (9) die Form von mehreren großen Einzelkerben aufweisen.

4. Messer nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß die Ausbildungen (6) in der Form von Kerben ausgeführt sind.

5. Messer nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß die Ausbildungen in der Form von mit Ausbogungen (8) kombinierten Kerben (6) ausgeführt sind, wobei die Kerben einen eingeschlossenen Winkel von 60° aufweisen.

6. Messer nach Anspruch 1, dadurch gekennzeichnet, daß die zentral angeordnete V-förmige Schneide einen eingeschlossenen Winkel zwischen 14° und 30° , vorzugsweise von 18° bis 20° , aufweist.

7. Messer nach Anspruch 4, dadurch gekennzeichnet, daß 25 bis 50, vorzugsweise 40 Kerben (6) pro Zoll (= 2,54 cm), vorgesehen sind und die Kerben (6) einen eingeschlossenen Winkel zwischen 80° und 100°, vorzugsweise 90°, aufweisen.

8. Messer nach Anspruch 5, dadurch gekennzeichnet, daß eine Ausbogung (8) zwischen benachbarten Unterbrechungen (9) vorgesehen ist, und die Ausbogungen einen Radius im Bereich von 0,1 Zoll bis 0,25 Zoll, vorzugsweise 0,16 Zoll, und eine Teilung im Bereich von 2 bis 10 ZpZ (Zähne pro Zoll), vorzugsweise 5 ZpZ aufweisen.

9. Messer nach Anspruch 5, dadurch gekennzeichnet, daß die Kerben (6) einen eingeschlossenen Winkel zwischen 50° und 90° aufweisen.

10. Messer nach Anspruch 5, dadurch gekennzeichnet, daß eine einzige Ausbogung (8) zwischen benachbarten Unterbrechungen (9) vorgesehen ist, und einen Radius zwischen 0,15 Zoll und 0,5 Zoll, vorzugsweise 0,25 Zoll, mit einer Ausbogungsteilung zwischen 1,0 und 6,0 ZpZ, vorzugsweise 4 ZpZ aufweist, und daß die Kerben zwischen 25 und 50 ZpZ, vorzugsweise 35 ZpZ, sind.

11. Messer nach Anspruch 5, dadurch gekennzeichnet, daß zwei Ausbogungen (8) zwischen benachbarten Unterbrechungen (9) vorgesehen sind und die Ausbogungen (8) einen Radius an der Schneide im Bereich von 0,625 bis 1,25 Zoll, vorzugsweise 0,75 Zoll, sowie eine Teilung im Bereich von 1 bis 4 ZpZ, vorzugsweise 2 ZpZ aufweisen.

Revendications

1. Couteau comprenant une lame (2) possédant des formations (6, 8) sur son tranchant pour aider l'action de coupe, le tranchant étant en forme de V et positionné centralement sur une ébauche à côtés parallèles, et étant meulé plat sur un côté (5) du V et meulé avec des formations (6, 8) sur le côté opposé du V, caractérisé en ce qu'il existe un certain nombre d'interruptions (7, 9) des formations (6, 8), interruptions qui sont espacées sur la longueur du tranchant.

2. Couteau selon la revendication 1, caractérisé en ce que les interruptions (7) prennent la forme de zones exemptes de formations.

3. Couteau selon la revendication 1, caractérisé en ce que les interruptions (9) prennent la forme d'un certain nombre de larges dentelures uniques.

4. Couteau selon l'une quelconque des revendications 1 à 3, caractérisé en ce que les formations (6) sont en forme de dentelures.

5. Couteau selon l'une quelconque des revendications 1 à 3, caractérisé en ce que les formations sont en formes de dentelures (6) combinées avec des échancrures (8), les dentelures présentant un angle de dégagement de 60°.

6. Couteau selon la revendication 1, caractérisé en ce que le tranchant en forme de V positionné centralement présente un angle de dégagement compris entre 14° et 30°, et de préférence entre 18° et 20°.

7. Couteau selon la revendication 4, caractérisé en ce qu'il y a de 25 à 50 dentelures (6) par 25,4 mm (pouce), et de préférence 40, et les dentelures (6) présentent un angle de dégagement compris entre 80° et 100°, et de préférence égal à 90°

8. Couteau selon la revendication 5, caractérisé en ce qu'une échancrure (8) est prévue entre des interruptions espacées (9), les échancrures présentant un rayon compris entre 2,54 mm et 6,35 mm (0,1 et 0,25 pouce), et de préférence égal à 4,06 mm (0,16 pouce), et un pas compris entre 2 et 10 dents par 25,4 mm (pouce), et de préférence égal à 5 dents par 25,4 mm (pouce).

9. Couteau selon la revendication 5, caractérisé en ce que les dentelures (6) présentent un angle de dégagement compris entre 50° et 90° .

10. Couteau selon la revendication 5, caractérisé en ce qu'une seule échancrure est prévue entre des interruptions espacées (9), et présente un rayon compris entre 3,81 mm et 12,7 mm (0,15 et 0,5 pouce), et de préférence égal à 6,35 mm (0,25 pouce), avec un pas d'échancrure compris entre 1 et 6 dents par 25,4 mm (pouce), et de préférence égal à 4 dents par 25,4 mm (pouce), et les dentelures étant en un nombre compris entre 25 et 50 dents par 25,4 mm (pouce), et de préférence égal à 33 dents par 25,4 mm (pouce).

11. Couteau selon la revendication 5, caractérisé en ce que deux échancrures (8) sont prévues entre des interruptions espacées (9), les échancrures (8) présentant un rayon sur le tranchant compris entre 15,87 mm et 31,75 mm (0,625 et 1,25 pouce), et de préférence égal à 19,05 mm (0,75 pouce), et un pas compris entre 1 et 4 dents par 25,4 mm (pouce), et de préférence égal à 2 dents par 25,4 mm (pouce).

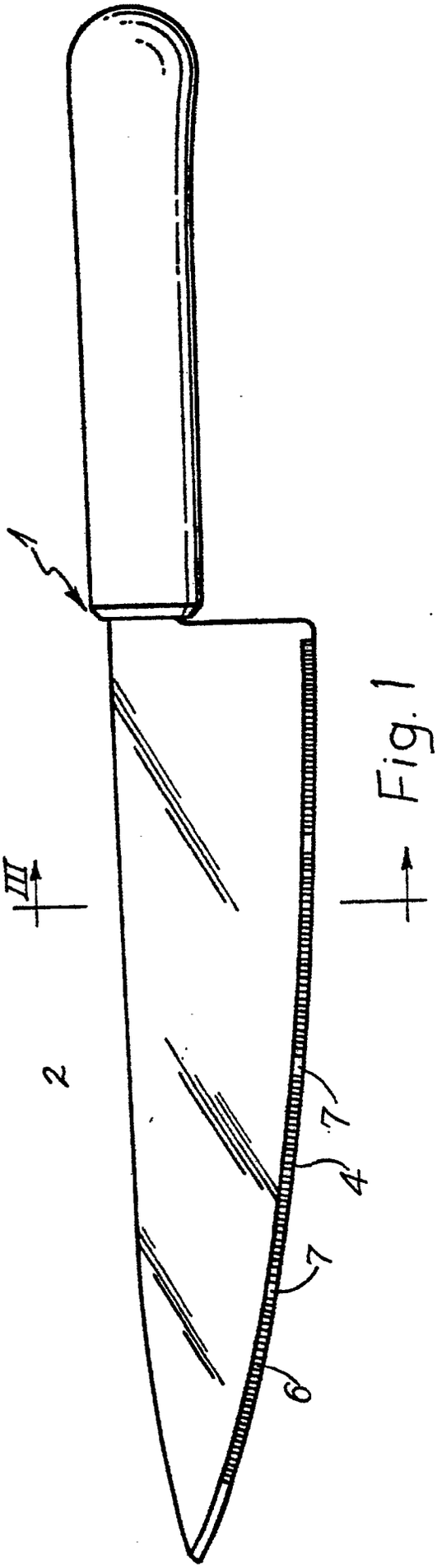

Fig. 1

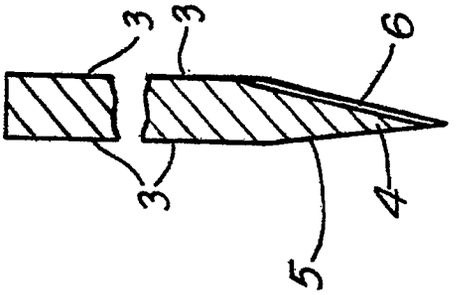

Fig. 3

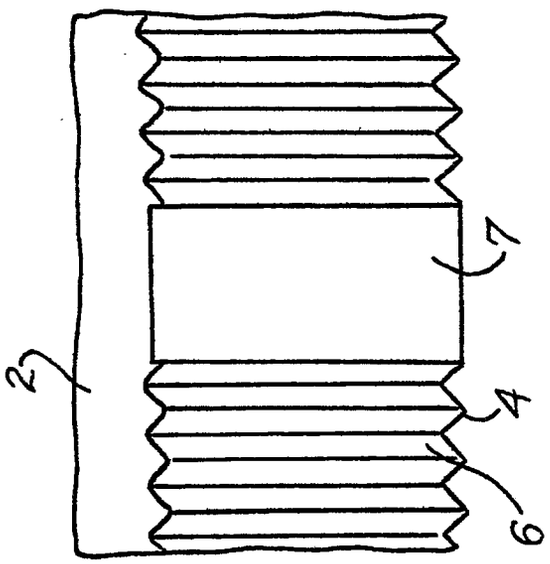

Fig. 2

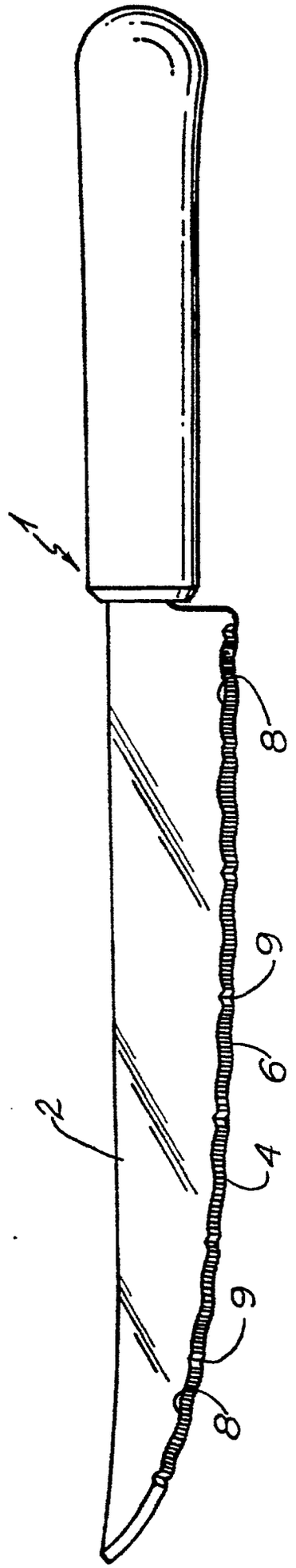

Fig.4

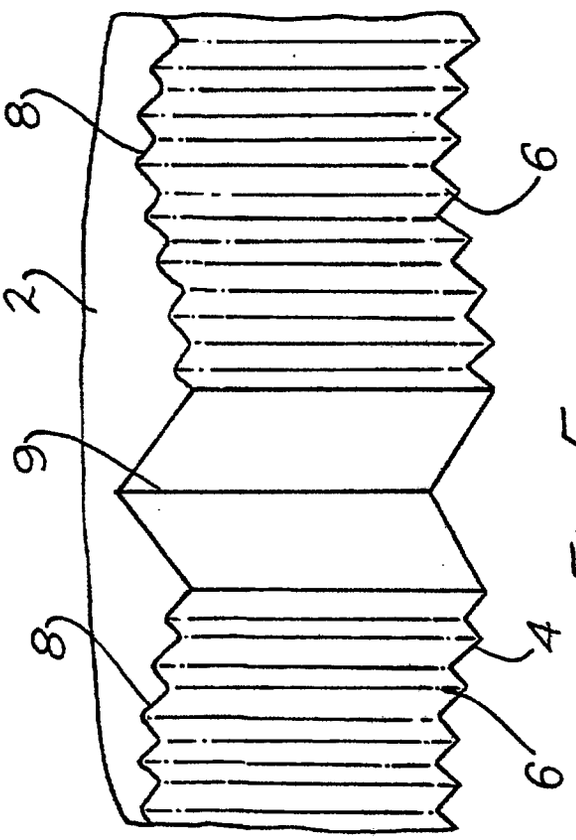

Fig.5

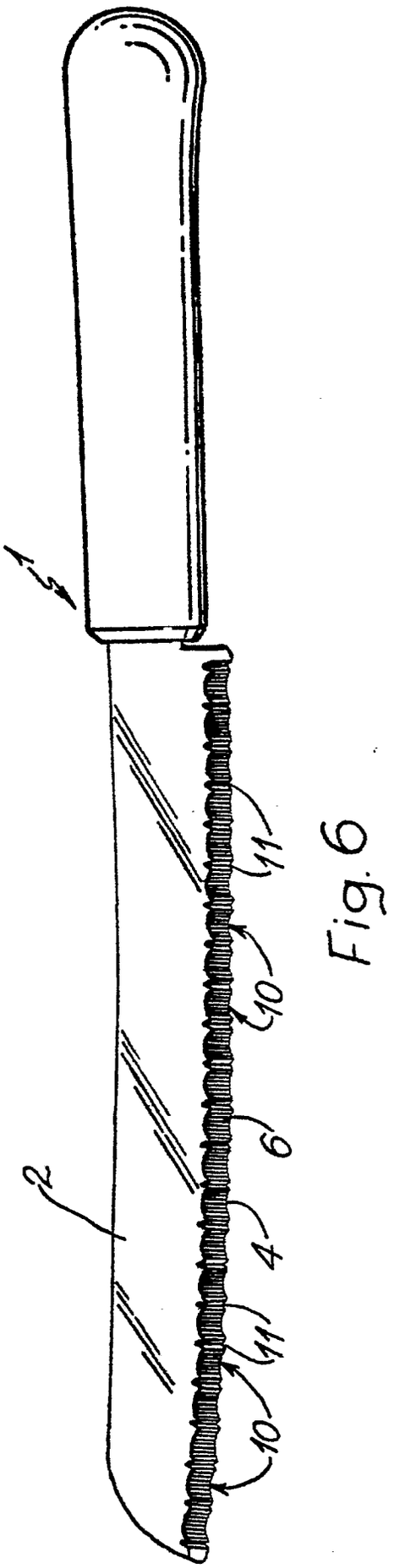

Fig. 6

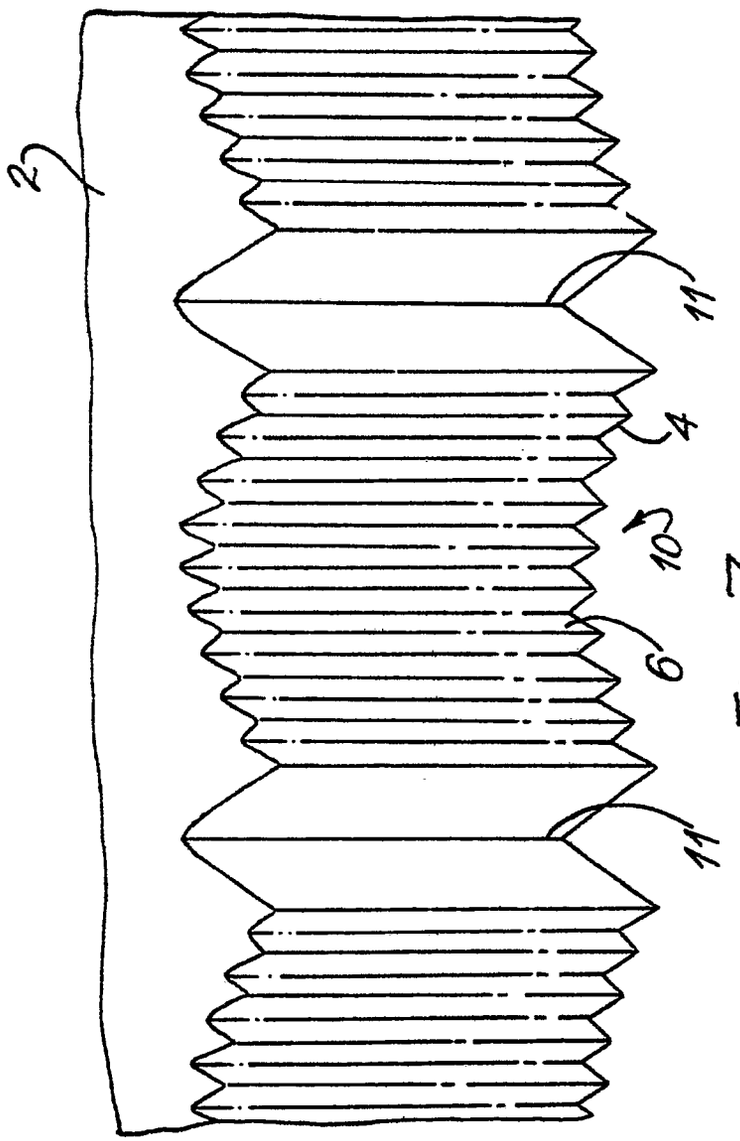

Fig. 7

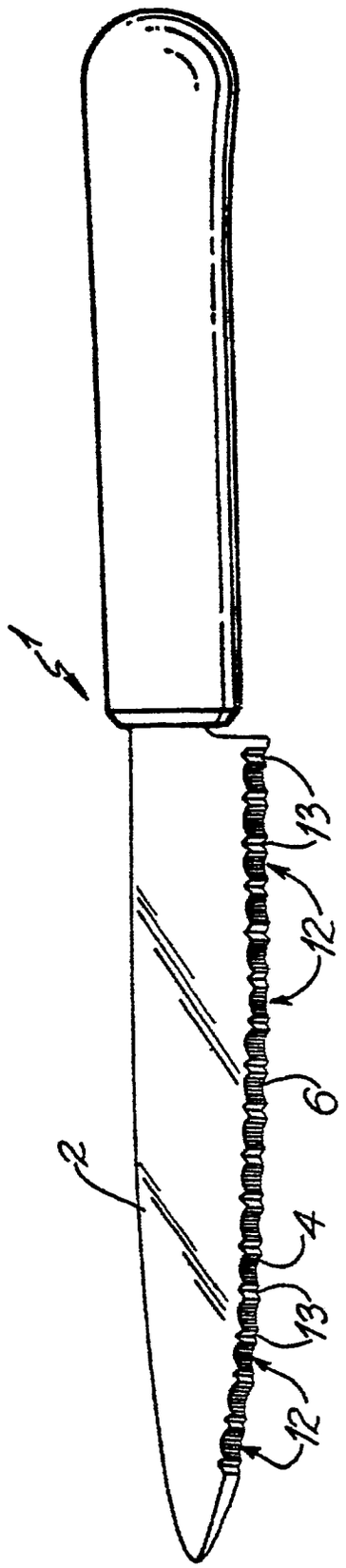

Fig.8

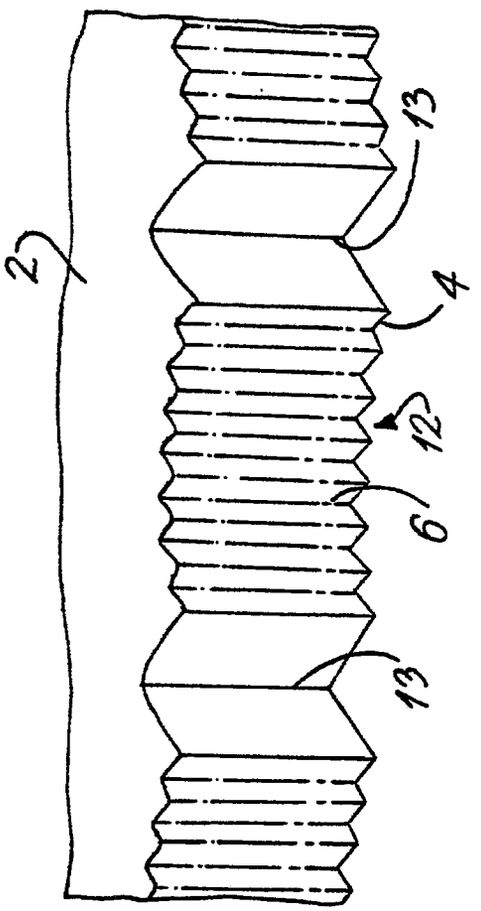

Fig.9