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(54) Cutting blade.

(57) A blade has asymmetric scallops arranged sequentially along a continuous cutting edge. The blade is better adapted for slicing in one direction of use and for cutting in the other direction of use.

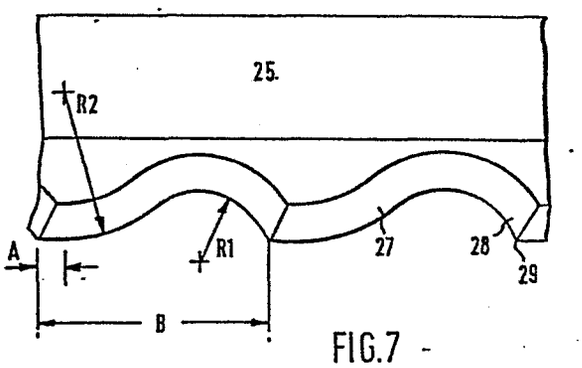

FIG.7

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TITLE MODIFIED
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Blade.

This invention relates to blades and particularly though not exclusively to blades for hand knives.

Smooth edged blades having a single substantially straight ground edge have been known for many years and are used particularly where neat precise cuts are required, for example in the slicing of meats and vegetables. A smooth edged blade is particularly effective when sharp but has the disadvantage that the edge is easily dulled by contact with a hard object such as the bone in a cooked joint of meat. Smooth edged blades also present difficulties in slicing through a hard skin or crust as might be found for example on a loaf of bread.

Scalloped edge blades are also well known and are generally formed by grinding with a wheel so as to produce uniform scallops with a substantially constant radius. Hand knives are often provided with scallops to increase their cutting effectiveness. Scallops may be provided on the tip of a knife only, for example on steak knives.

A particular advantage of scalloped blades is that points of the scallop can break through a hard crust or skin and thus provide a more penetrating action than is possible with a smooth edged blade. Furthermore, the points of the scallop to some extent protect the cutting edge of the curved part of the scallop from damage by contact with hard objects, such as meat bones, or inadvertent contact with a work bench or carving plate. Serrated blades are also known and have small closely spaced teeth to give a saw-like action. Both scalloped and serrated blades present difficulties in slicing certain foodstuffs as their action tends to tear and deform the food. Such blades also lack the smooth easy action of a straight edged blade.

It has been observed that the majority of knife

users generally prefer to adopt a different technique dependent on the task to be performed. For slicing a knife is gently drawn towards the user to effect a slow easy cutting action. The force the user can apply to a knife handle is limited by the drawing action and the user uses this to advantage to regulate slicing of cooked meats, soft foodstuffs etc.

For cutting through hard skins or crusts the user pushes a knife away with considerable force in a sawing action, easing the load applied on the return stroke. The cutting action away from the user is more difficult to control with low applied load. This action also has safety advantages since the blade is pushed away from the user on the cutting stroke.

It is however recognised that other users may prefer to use a knife in other ways, for example by moving the knife away from the body to slice.

The present invention provides an improved blade which combines the advantages of smooth edged and scalloped/serrated blades.

According to the invention there is provided a blade having a scalloped edge characterised thereby that a plurality of individual scallops have an asymmetric profile such that in use the blade is better adapted for slicing in one direction than the other.

One side of the scallop is better adapted for slicing since the length of scallop edge substantially in contact with the item to be cut is greater than the other side of the scallop. The other side of the scallop presents a steeper blade edge of the item giving a penetrating cutting effect.

The blade preferably provides a continuous cutting edge of substantially constant sharpness.

The blade may have repeated asymmetric scallops along its entire cutting edge. With this configuration

the trailing edge of each scallop makes a shallow angle with the item to be cut in one direction of blade movement and a relatively steeper angle in the other direction of blade movement. The trailing edges of the scallop may blend into one another or may terminate in a point as will be hereafter described. The total length of scallop edge substantially in contact with the item to be cut is greater for one direction of blade movement than the other, giving a better slicing action in said one direction. In the other direction the relatively steeper blade edges will rip or tear through a hard skin or crust.

The terms "shallow angle" and "relatively steeper angle" are intended to define a range of angles which give an easy slice when the scallop trailing angle is shallow and a penetrating cutting action when the trailing angle is relatively steeper. Clearly where the profile of an individual scallop is curved, the angle subtended by the trailing edge will change depending on the position of measurement.

For this reason use of the word "angle", in the absence of more specific description, should be taken to indicate the general scallop shape. Reference is directed to the specific examples disclosed in this specification hereafter for further guidance since the invention includes many asymmetrical scallop shapes which will give the intended result.

For the avoidance of doubt the invention includes scallops having very small radii of curvature and is intended to include large serrations in the nature of scallops having two substantially straight sides.

It is intended that the foregoing be construed purposively within the scope of the invention and by reference to its intended result.

Any reference to the direction of blade movement

should be construed as conventional movement substantially parallel to the longitudinal axis of the blade.

Preferably the profile of each of said asymmetric scallops comprises a substantially continuous curve which rises progressively from one end of the scallop to a peak and falls progressively from the peak to the other end of the scallop. The peak may be substantially to one side of the scallop mid-point.

In one preferred embodiment the asymmetric scallops comprise a convex blade portion and a concave blade portion only.

Intermediate plain blade portions may be provided between individual scallops or the scallops may be arranged in a regular pattern including intermediate plain blade portions or conventional uniform scallops.

To assist the cutting action a point may be provided between adjacent scallops, the point may be inset from the scallop base line so that with low applied force the blade slices easily without assistance from the points.

Other features of the invention are disclosed in the following description of preferred embodiments shown by way of example only with reference to the accompanying drawings in which:-

Figure 1 illustrates a straight edged knife blade;

Figure 2 illustrates a conventional scalloped edge knife blade;

Figures 3 and 4 show enlarged portions of a conventional scalloped edge blade having large and small scallops respectively;

Figure 5 shows a section through a conventional scalloped edge blade showing a grind line of the grinding wheel;

Figure 6 shows a portion of a blade according to one aspect of the present invention;

Figure 7 shows a portion of a blade according to a further aspect of the invention;

Figure 8 shows a portion of a blade according to yet another aspect of the invention; and

Figures 9 to 11 show three alternative scallop profiles according to the invention, each having a different cutting effect.

Referring to the drawings there is shown a conventional kitchen knife having a plain smooth edged blade 11 secured to a handle 12 by rivets 13. Figure 2 shows a similar knife 14 having a scalloped cutting edge.

Figures 3 and 4 show portions of knife blades having large and small scallops respectively.

Figure 5 illustrates the method of manufacture of a scalloped blade 15 whereby a grinding wheel having a grind line represented by chain-dot line 16 removes metal from the blade. The grinding wheel has a cutting edge of generally constant radius and operates against the blade to grind a scallop of somewhat smaller radius respectively shown as R and r in Figures 3 and 4. A single grinding wheel having many arcuate profiles may be used to grind a blade in a single pass. Both sides of the blade may be ground.

Figure 6 illustrates a scalloped blade 20 according to one aspect of the present invention. Asymmetrical scallops 21 are provided each having a shallow angle 22 to one side of the scallop and a steep angle 23 to the other side. Adjacent scallops meet at a point 24.

With this particular profile the scallop shape may be conveniently defined by the slope of the blade edge at the scallop ends, as shown; the leading and trailing edges of the scallop blending in a smooth curve.

In use, when the blade is moved in the direction

of arrow "A", the shallow angle to the trailing edge of the scallop gives an easy slice action. In movement of the blade in the other direction the steep trailing angle of the scallop gives a penetrating saw action. Preferably arrow "A" indicates movement towards the user and in this case the scallop design exploits the natural physiological limitations of the user whereby a gentle easy slice action is obtained by movement towards the user and a heavy forceful cut is obtained by movement away from the user.

Figure 7 shows an alternative blade 25 having a scallop profile in which the slicing portion 27 is convex.

In this case description of the scallop by measurement of an angle with respect to the slope of the scallop end is inappropriate although the tangent to the convex portion at its approximate mid-point gives a suitable indication of blade slope. The slicing portion of the scallop is indicated by numeral 27 and the cutting portion by numeral 28.

The shape of this particular scallop may be defined by the dimensions A and B and radii R1 and R2 as shown. Dimension A is a straight portion of blade, dimension B is the overall scallop length, R1 is the radius of the cutting portion of the scallop and R2 is the radius of the slicing portion of the scallop. Suitable proportions of A:B:R1:R2 are 1:8:2.5:5, the scallop depth being proportionally 1.6. In this embodiment an effective point 29 is provided for a cutting stroke only.

Figure 8 illustrates a blade having a further alternative profile having a straight shallow angle slicing portion 30 and a straight steep angled cutting portion 31 for breaking through skins or crusts.

Figures 9 to 11 show other alternative asymmetric

scallops each having a different profile.

In Figure 9 there is shown a generally curved scallop profile defined by radii R3 and R4. The profile has point 32 between adjacent convex and concave blade portions marking the change in curvature. In this embodiment the point 32 is set back from the scallop base line (line A-A) so that under light applied force, i.e. slicing, the point performs no cutting action. With greater applied force the item to be cut will be deformed and the point 32 brought into contact to perform a useful cutting function in breaking through a tough crust or skin. The mid-point of the scallop is indicated by dotted line 33, the scallop peak being substantially on the cutting side of the profile.

Figure 10 shows a generally concave profile connected by straight blade portions 34. The slicing and cutting edges of the scallop are indicated by reference numerals 35 and 36 and defined by angles 37 and 38 respectively; the cutting and slicing edges of the scallop blend smoothly into one another. The mid-point of the scallop is indicated by dotted line 39.

Figure 11 shows a convex/concave profile having a slicing portion 41, defined by R5, blending smoothly with a plain blade portion 40 and a cutting portion 42, defined by obtuse angle 43, giving a very effective cutting and scoring point 44. The mid-point of the scallop is indicated by dotted line 45.

Clearly the size and shape of individual scallops and the particular arrangement chosen will depend on the size, shape and/or specific requirements of an individual blade. For example the mid-point of the scallop may coincide with the scallop peak or in extreme circumstances may be on the slicing side of the scallop profile.

It may be desirable to mix different scalloped profiles, including for example symmetric and asymmetric

scallops in combination, to give the desired cutting actions in the respective directions of use. Asymmetric scallops may be provided over a portion of the blade length only, for example at the tip on steak knives. This arrangement allows the hard skin of a meat joint to be scored and cut into with the scalloped tip, the knife being used to slice using the plain portion of the blade and the scalloped tip being used to cut through the skin on the other side of the joint.

CLAIMS

1. A blade having a scalloped edge characterised thereby that a plurality of individual scallops have an asymmetric profile such that in use the blade is better adapted for slicing in one direction than the other.

2. A blade according to Claim 1, characterised thereby that the profile of a plurality of said asymmetric scallops comprises a substantially continuous curve which rises progressively from one end of the scallop to a peak and falls progressively from the peak to the other end of the scallop.

3. A blade according to Claim 2, characterised thereby that said scallop peak is substantially to one side of the scallop mid-point.

4. A blade according to Claim 2 or Claim 3, characterised thereby that said asymmetric scallops comprise a convex blade portion (27) and a concave blade portion (28) only.

5. A blade according to Claim 2 or Claim 3, characterised thereby that said asymmetric scallops comprise a concave (21) blade portion only.

6. A blade according to any preceding claim, characterised thereby that a plurality of the blade scallops are arranged in a regular pattern with intermediate plain blade edge portions (34).

7. A blade according to any preceding claim characterised thereby that a point (24, 29) is provided between each of a plurality of adjacent scallops.

8. A blade according to Claim 7, characterised thereby that said point (32) is inset from the scallop

base line.

9. A blade according to any preceding claim, characterised thereby that each scallop is asymmetric and of a substantially similar profile.

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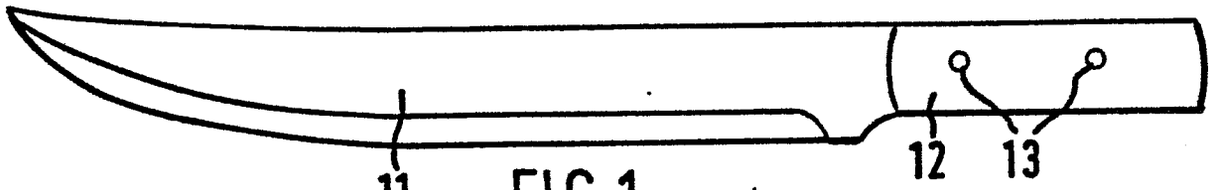

FIG.1

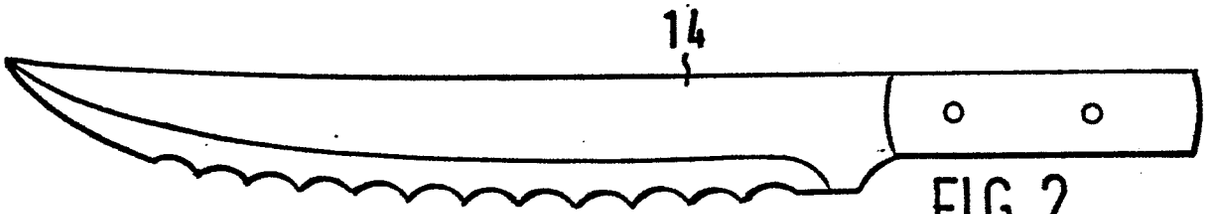

FIG.2

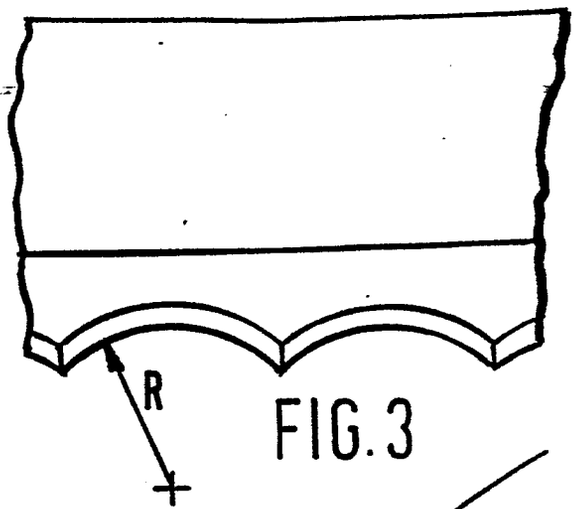

FIG.3

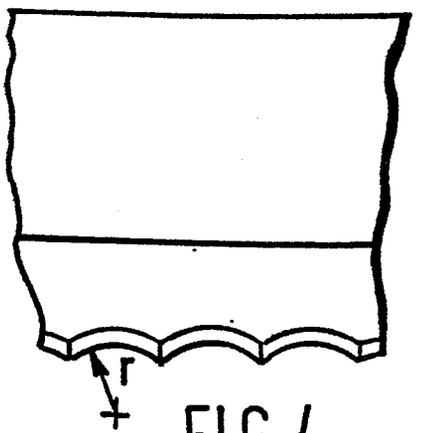

FIG.4

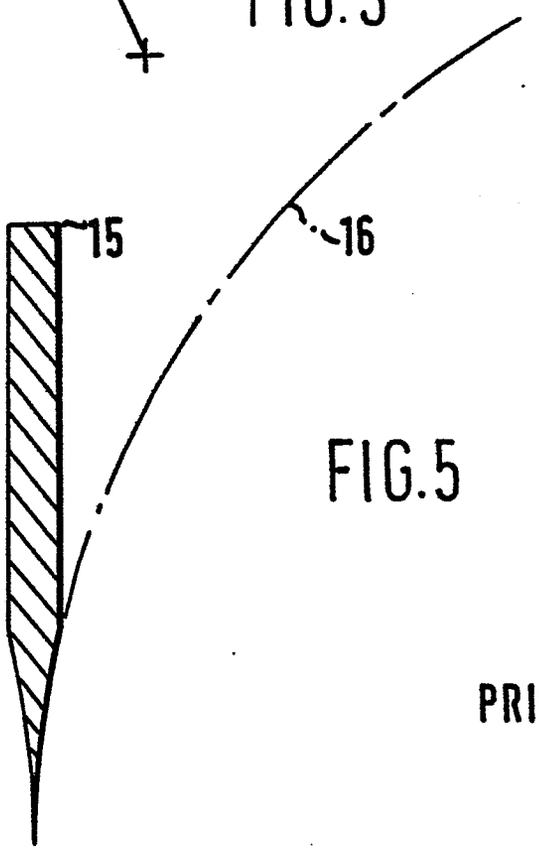

FIG.5

PRIOR ART

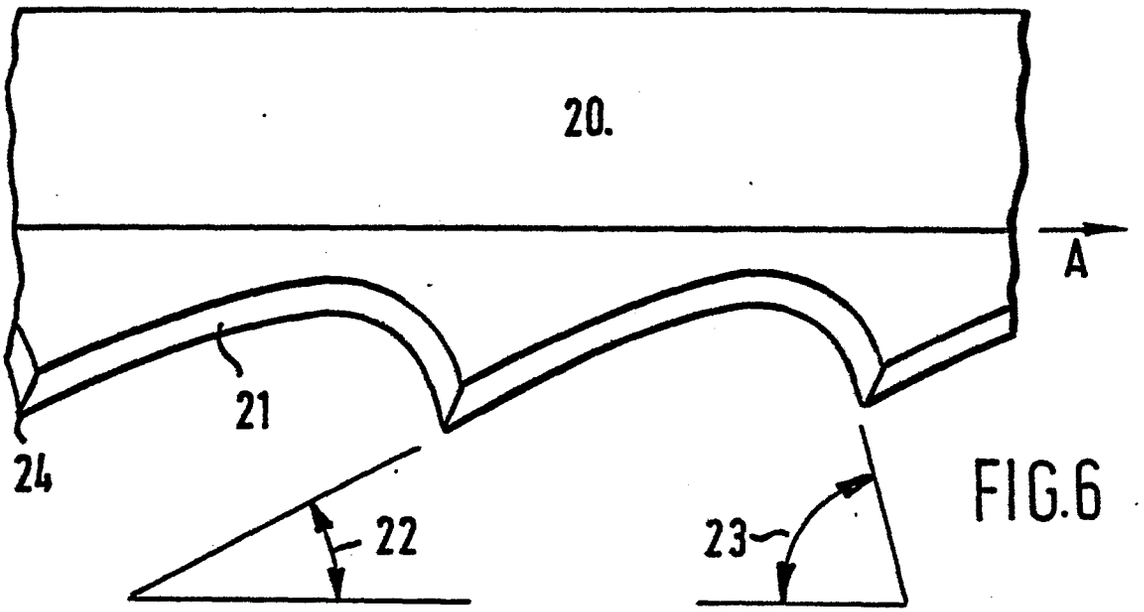

FIG.6

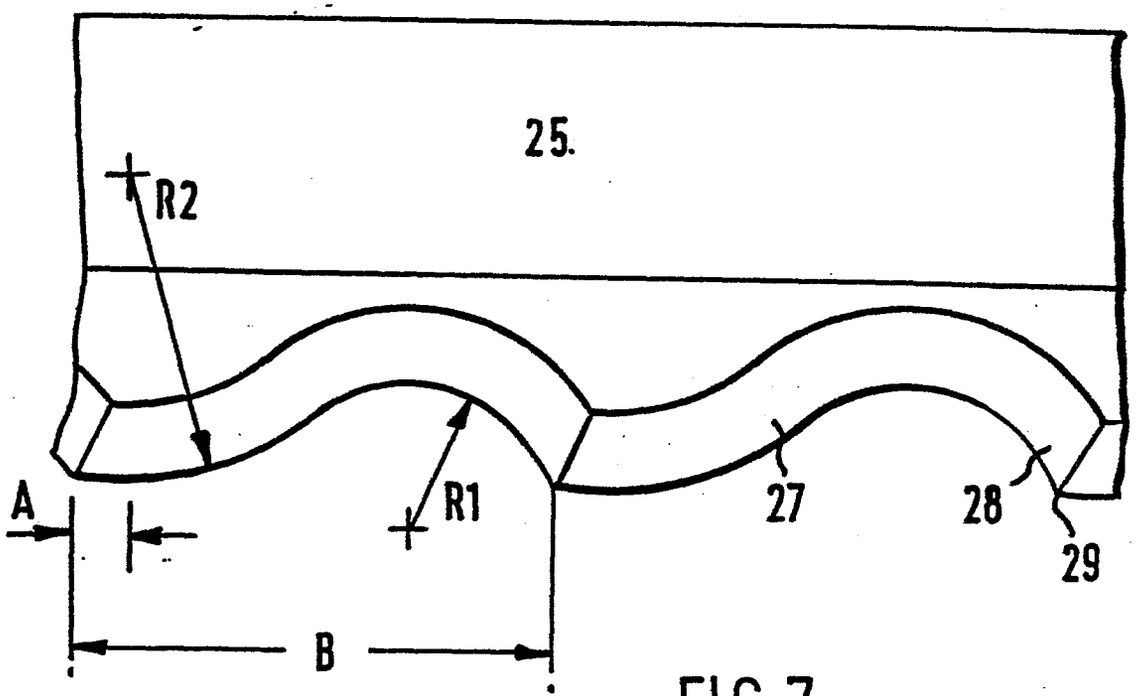

FIG.7

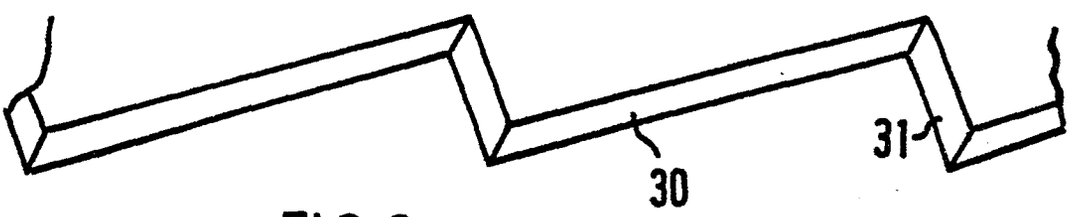

FIG.8

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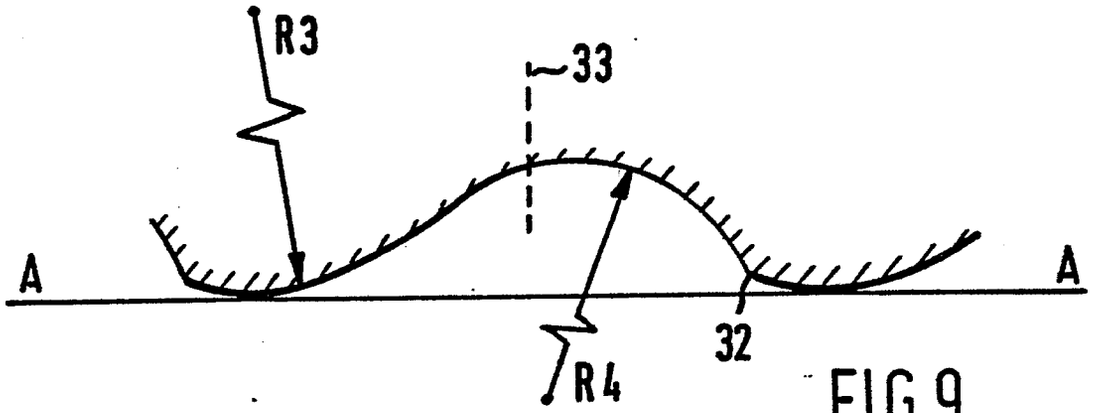

FIG.9

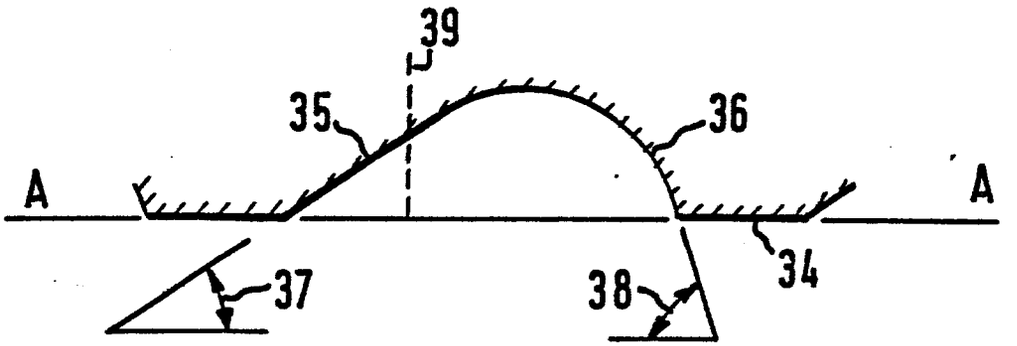

FIG.10

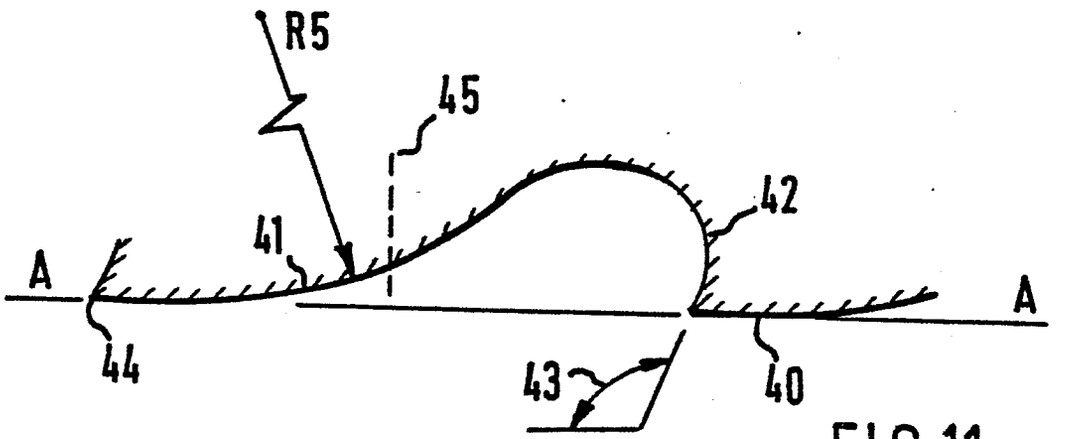

FIG.11