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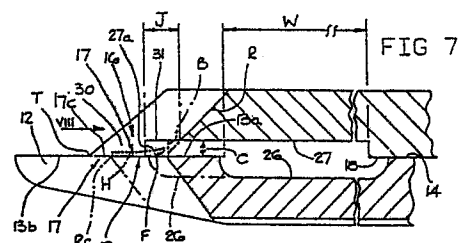
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⑤ A clipper blade.

⑤ A cutter blade (15), in use, is assembled with a comb blade (10) for movement relative to the comb to clip hair. Each blade has a leading edge formed as a row of teeth (12, 16) and the cutter has a bearing surface (17) adjacent the leading edge which engages a bearing surface (13) of the comb. The bearing surface (17) of the cutter blade (15), comprises separate surface sections (17c) with spaces (S) defined therebetween dimensioned such that hair (H) trapped between a said surface section (17c) and the interengaging bearing surface (13) of the comb in one relative position of the blades (10, 15) will enter the space (S) when the blades take up a different relative position and thereby disengage the bearing surfaces.



Description

A CLIPPER BLADE

The invention relates to a clipper blade which, in use, is assembled with a second clipper blade and mounted on a handpiece for clipping, e.g., animal hair.

Animal hair clipping devices usually include lower and upper blades known as a comb and a cutter provided with rows of teeth. The comb is normally attached to a stationary body section of a handpiece and the cutter is mounted for side-to-side reciprocal movement relative to the comb; drive for the cutter being effected by drive means on or connected to the handpiece.

In order to cut efficiently, it is important that the cutter and comb be in mutual contact and interengaging bearing surfaces are formed accurately for that purpose. Those bearing surfaces normally comprise first interengaging bearing surfaces formed on the teeth and adjacent portions of the blades and second interengaging bearing surfaces which are spaced from the first bearing surfaces. The cutter is urged against the comb, e.g., by spring means, to ensure close contact. Despite accurate forming of the bearing surfaces and such loading, the cutting action can be impaired if sections of clipped hair become trapped between the cutter and comb along the interengaging first bearing surfaces of the blades. The sections of hair can tend to act like tiny needle roller bearings which urge the cutter and comb apart slightly despite the aforesaid spring loading. Such a condition is frustrating for users of clippers as the only positive way of clearing the trapped hair is by dismantling the blades, cleaning them and re-assembling them on the handpiece. Not only is that a time consuming exercise, the loading (or "tension" as it is known in the art) needs to be re-set.

An object of the present invention is to provide a clipper blade which will assist in overcoming the above problem.

According to a first aspect of the invention there is provided a clipper blade which, in use, is assembled with a second clipper blade for movement one relative to the other to clip hair, each of which blades has a leading edge formed as a row of teeth and has a bearing surface adjacent the leading edge which engages a bearing surface of the other blade characterised in that the bearing surface of the first blade comprises separate surface sections with spaces defined therebetween dimensioned such that hair trapped between a said surface section and the interengaging bearing surface of the other blade in one relative position of the blades will enter the space when the blades take up a different relative position to enable the hair to disengage the bearing surfaces.

According to a second aspect of the invention there is provided a clipper blade which, in use, is assembled with a second clipper blade each of which blades has a row of teeth and spaced apart bearing surfaces which engage respective bearing surfaces of the other blade, one bearing surface of

one of the blades being defined by spaced apart sections of the teeth of said one blade to enable hair trapped between said one bearing surface and the co-operable bearing surface of the other blade to enter the space between the sections during use so as to disengage the bearing surfaces.

By using spaced separate sections to form the bearing surface the problem caused by trapped hair as outlined above is greatly reduced.

According to a third aspect of the invention there is provided a clipper blade which, in use, is assembled with a second clipper blade for movement one relative to the other to cut hair, each of which blades has a leading edge formed as a row of teeth and has a bearing surface adjacent the leading edge which interengages a bearing surface of the other blade, the bearing surface of the second blade including a continuous section adjacent the teeth, the entire bearing surface of the first blade being made non-continuous by spaces formed therein dimensioned such that hair trapped between the interrupted bearing surface of the first blade and part of the bearing surface of the second blade in one relative position of the blades will enter the spaces when the blades take up a different relative position to enable the hair to disengage the bearing surfaces.

It is preferred to form the first blades as a cutter. The advantage to be gained by forming the cutter in that way is that it is normally the smaller blade of the cutter and comb assembly and lies within the periphery of the comb. The teeth are thus well protected by the edge of the comb against knocks. Also all the teeth can be made identical on the cutter thereby simplifying manufacture, whereas on the comb the outer teeth are normally made very much wider than the rest to form terminal surfaces on which the cutter terminates its outward movement and to withstand damage due to dropping or otherwise striking a surface.

Each space between the teeth is preferably substantial and may have a dimension in the direction of relative blade movement which is at least half the maximum width of the respective teeth in that direction. The use of such large spaces is very useful in that there is virtually no chance whatsoever of clipper hair bridging the gap between the separate surface sections even when rolling between the blades at a slightly oblique angle.

In order to maximise the size of the spaces, they may extend rearwardly for a substantial distance into a part of the first blade which is spaced from the bearing surface of the second blade. Preferably the distance is in excess of half the length of the separate surface sections which form the bearing surfaces of the first blade. The substantial length of the spaces not only provides good hair clearing capability but effectively increases the root to tip distance for the teeth giving the teeth an optimum degree of flexibility towards the root which helps to resist tooth fracture at the root region.

The teeth on the first blade may comprise first portions defining the separate surface sections and second portions extending rearwardly away from the first portions and spaced from the adjacent bearing surface or a surface to the rear of that bearing surface of the second blade. The second portions are preferably separated by the aforesaid spaces and form teeth sections extending between the surface sections and the roots.

Preferably the bearing surface on the second blade comprises portions formed by surfaces of the teeth and a continuous portion adjacent the teeth and extending substantially edge to edge of the blade. In such a case, the second portions of the teeth of the first blade and the spaces therebetween may extend rearwardly across the said continuous portion of the bearing surface of the second blade and/or across a further portion of the second blade to the rear of said continuous portion.

The arrangement of the second portion and spaces in that way provides good clearance between the first blade and the continuous bearing surface portion of the second blade to optimise disengagement of trapped hair from the bearing surfaces.

Preferably the second portions of the teeth on the first blade are defined by a surface of a groove formed in the blade. The groove preferably extends between the spaced apart bearing surfaces and may have its edge adjacent the leading edge of the first blade terminating at the first portions of the teeth on the first blade. The edge adjacent the leading edge may be inclined at an angle corresponding to the angle of inclination of the leading edges of the teeth. The groove may extend towards the leading edge so as to overlie root sections of the teeth of the second blade.

For optimum bearing area and tooth strength coupled with good clipping characteristics, each separate surface section forming the first bearing surface may be in the form of a triangle having e.g., two straight sides extending transversely of the blade between said converging sides. The bases are preferably aligned end to end so as to form an intermittent wall defining the edge of the aforesaid groove which is adjacent the leading edge.

With reference to the aforesaid second aspect of the invention, the teeth of the first blade may comprise said sections defining collectively the first bearing surface and second sections spaced, in use, from the bearing surface of the second blade.

The first sections preferably extend from a leading end of the teeth on the first blade.

Preferably said second sections of the teeth on said first blade are defined by the surface of a groove formed in that blade. The groove preferably extends generally parallel with the row of teeth on said first blade. The groove preferably extends from one edge of said first blade to an opposite edge thereof. The groove preferably extends into the first blade rearwardly of the teeth.

According to a fourth aspect of the invention there is provided a clipper including a cutter according to any of the fourteen immediately preceding paragraphs.

Clipper blades in accordance with the invention will now be described by way of example with reference to the accompanying drawings in which:-

Fig.1 is a perspective view of an assembled cutter and comb of known kind shown partly broken away, the cutter constituting the aforesaid first blade,

Fig.2 is a cross-section through the cutter and comb of Fig.1 in position on a handpiece,

Fig.3 is a cross sectional side view drawn to a large scale of part of the cutter and comb of Fig.1 with hair trapped therebetween,

Fig.4 is a side view of a cutter in accordance with the invention in which parts corresponding to parts in Figs.2 to 8 have corresponding reference numerals,

Fig.5 is a plan view of the cutter of Fig.4 showing only four of the teeth,

Fig.6 is an underneath plan view of the cutter of Fig.4,

Fig.7 is a cross-sectional view drawn to a larger scale of part of a cutter blade in accordance with the invention assembled with a comb,

Fig.8 is a diagrammatic view of the assembly of Fig.7 looking in the direction of arrow VIII in Fig.7 with hair between the cutter and comb,

Fig.9 is a view similar to Fig.8 showing the cutter and comb in different relative positions, illustrating release of the hair,

Fig.10 is a view similar to Fig.4 of a different cutter blade,

Fig.11 is a plan view of the cutter of Fig.10, and

Fig.12 is an underneath plan view of the cutter of Fig.10.

Referring first to Figs.1 and 2 a comb 10 has locating holes 11 which receive locating pins 2 on a clipper head 3 secured to a handpiece 4. The comb has a row of teeth 12 along its front or leading edge and is formed with front and rear bearing surfaces 13, 14. The bearing surface 13 is formed partly by a continuous surface 13a and partly by upper surfaces 13b of the teeth 12. The outer teeth 12a are widened to form terminal surfaces on which the cutter terminates its outward movement and to withstand impacts against hard surfaces. The bearing surfaces 13, 14 support a cutter 15 which has a row of teeth 16 at its leading edge. The cutter has front and rear bearing surfaces 17, 18. The bearing surface 17 is formed partly by a continuous surface 17a and partly by lower surfaces 17b of the teeth 16. The cutter is slidable along the bearing surfaces of the comb in known manner.

The comb and cutter are held together by means of a bolt 19 having a shank which passes through an aperture 20 in the comb, through a slot 22 in the cutter and through a bore 5 in the clipper head 3. A nut 23 is applied to the bolt with a spring 24 disposed between the nut and the clipper head. By tightening the nut to compress the spring, the cutter is urged against two spaced bearing fingers 6, the comb is urged against an abutment surface 7 and the cutter and comb are urged against each other so as to ensure close contact of the bearing surfaces 13, 17

for efficient clipping action. The cutter is reciprocated from side to side over the comb by means of a drive peg 8 on a shaft 9 extending from the handpiece. The drive peg 8 locates in a drive socket 25 on the cutter. The pitch of the teeth 13 is normally selected so as to correspond with or to be a multiple of the pitch of teeth 16. A groove 26 is defined between bearing surfaces 13, 14 of the comb and a similar groove 27 is defined between bearing surfaces 17, 18 of the cutter. Each groove extends from one edge to the opposite edge of its blade.

In use, the clipper may typically be used to cut short hair on animals such as horses or cattle and occasionally a section of clipped hair H (Fig.3) can become trapped between the bearing surfaces 13a, 17a. The section of hair tends to act after the fashion of a tiny needle roller bearing which urges the adjacent teeth of the comb and cutter slightly apart by distance X thereby impairing cutting. Once in position between the bearing surfaces 13a, 17a the hair section H can roll virtually indefinitely or at least until it disintegrates. Moreover once the teeth are urged apart it is easier for more hairs to become trapped. The only positive way of removing the trapped hair is to dismantle the cutter and comb.

With reference to Figs.4 to 7 the present invention reduces the problem of trapped hair by increasing the width W of the groove 27 from its previous position (shown in broken lines in Fig.7) so that it terminates at a position at or beyond the notional intersection of roots R of the cutter teeth and the plane containing bearing surface 17e.g., at the full line position F shown in Fig.7 or at the broken line position B. In that way the bearing surface 17 on first portions 30 of the cutter consists only of spaced apart triangular blade surface sections 17c between tips T of the teeth and front edges 27a of the groove 27 which slidably engage the teeth of the comb to cut hair. Each section 17c is triangular having two straight sides 5 and a base defined by edge 27a. Where the front edges 27a of groove 27 are positioned at F, the teeth 16 define second portions 31 extending rearwardly for distance J and which clear the teeth 12 by clearance C and assist further in clearing hair. The sections 17 are spaced apart as indicated at S (Fig.6) the spacing S extending rearwardly for distance J which is greater than half the length G of the sections 17c. The minimum width Sm of the spacing S will vary depending on the position of the groove edge 27a in Figs.5 to 9 but preferably is between substantially half and the full tooth width Tw at the edge 27a in order to provide a wide enough gap for the escape of hair whilst leaving sufficient collective tooth area 17c to form an adequate bearing. A typical space Sm is around 1.45mm and a typical tooth width Tw is 2.66mm.

Only four of the teeth are shown in Figs.5 and 6, the remainder, which are identical to those shown, being omitted.

In use, clipped hair H may become positioned between the surface 17c of a tooth 16a of the cutter and the bearing surface part 13a of the comb as in Fig.8 thereby forming a gap X between the cutter and comb. However as the cutter reciprocates, the tooth 16a moves sufficiently to cause the hair H to

roll into the space S between the cutter teeth so that the gap X closes. If the hair H projects rearwardly of the first portion 30 prior to release, as shown in broken lines in Fig.7, it simply lies within the clearance C between the blades and so once the hair enters the space S it is no longer mechanically retained between the blades. Such an arrangement provides extremely rapid clearing of trapped hair.

It will be appreciated that if the continuous bearing surface 13a on the comb were to extend further forwards by positioning the root Rc of the comb teeth as indicated in broken lines in Fig.7, hair trapped between the surface 13a and the bearing surface sections 17c of the cutter would still be able to escape. Groove 26 could be extended forwardly in such a case as in broken lines. Therefore the fore-and-aft positioning of the surfaces sections 17c on the comb bearing surface 13 is not critical in that respect.

If clipped hair happens to become trapped between the bearing surfaces 14, 18 it can also cause these surfaces to separate. However such separation will not have an adverse effect on clipping.

Reference is now made to Figs.10 to 12 in which parts corresponding to parts in Figs.4 to 6 carry the same reference numerals.

The teeth 16 are shaped differently from those shown in Figs.4 to 6 and define therebetween U-shaped spaces S. The spaces S extend rearwardly from the lowermost edges 27a of groove 27 for a distance greater than half the fore-and-aft length G of each tooth section 17c. The front edges 27a of the groove 27 are inclined so as to be parallel with the inclined leading edges 40 of the teeth 16. In that way, the fore-and-aft length G of each tooth section 17c will remain constant when the bearing surfaces 17, 18 of the blade are ground away to sharpen the teeth. The tooth section 17c is again triangular having converging straight sides 5 and a base formed by the groove edge 27a. The relationship between Tw and Sm, and J and G is the same as for the blade in Figs.4 to 7. The cutter blade of Figs.10 to 12 is used in conjunction with a comb in the same way as the cutter blade shown in Fig.7.

Claims

1. A clipper blade (15) which, in use, is assembled with a second clipper blade (10) for movement one relative to the other to clip hair, each of which blades has a leading edge formed as a row of teeth (12, 16) and has a bearing surface (17) adjacent the leading edge which engages a bearing surface (13) of the other blade characterised in that the bearing surface (17) of the first blade (15) comprises separate surface sections (17c) with spaces (S) defined therebetween dimensioned such that hair (H) trapped between a said surface section (17c) and the interengaging bearing surface (13) of the other blade in one relative position of the blades (10, 15) will enter the space (S) when the

blades take up a different relative position to enable the hair to disengage the bearing surfaces.

2. A clipper blade according to Claim 1 characterised in that the first blade is a cutter (15) and the second blade a comb (10). 5

3. A clipper blade according to Claim 1 or 2 characterised in that each space (S) between the teeth (16) has a dimension in the direction of relative blade movement which is at least half the maximum width of the respective teeth (16) in that direction. 10

4. A clipper blade according to Claim 1, 2 or 3 characterised in that the spaces (S) extend rearwardly for a substantial distance (J) into a part of the first blade which is spaced from the bearing surface (13) of the second blade (10). 15

5. A clipper blade according to Claim 4 characterised in that the said distance (J) is greater than half the length of the surface sections (17c) forming the bearing surfaces (17) of the first blade. 20

6. A clipper blade according to any preceding Claim characterised in that the teeth (18) of the first blade (15) comprise first portions (30) defining the separate surface sections (17c) and second portions (31) extending rearwardly away from the first portions (30) and spaced from the adjacent bearing surface (13) or a surface (26) to the rear of that bearing surface of the second blade. 25 30

7. A clipper blade according to Claim 6 characterised in that the bearing surface (13) on the second blade (10) comprises portions (13a) formed by surfaces of the teeth (16) and a continuous portion (13a) adjacent the teeth and extending substantially edge-to-edge of the blade, and in that the second portions (31) of the teeth (16) of the first blade extend rearwardly across the said continuous portion (13a) of the bearing surface (13) of the second blade (10) and/or across a further portion (26) of the second blade to the rear of said continuous portion. 35 40

8. A clipper blade according to Claim 6 or 7 characterised in that the second portions (31) of the teeth (16) on the first blade (15) are defined by a surface of a groove (27) formed in the blade. 45

9. A clipper blade according to any preceding Claim characterised in that each separate surface section (17c) forming the first bearing surface is in the form of a triangle having two sides (5) converging towards the leading end and a base (27a) extending transversely of the blade between said converging sides. 50 55

10. A clipper blade according to any preceding Claim characterised in that the outermost teeth (16a) of the row of teeth (16) are substantially identical to the remaining teeth of the row. 60

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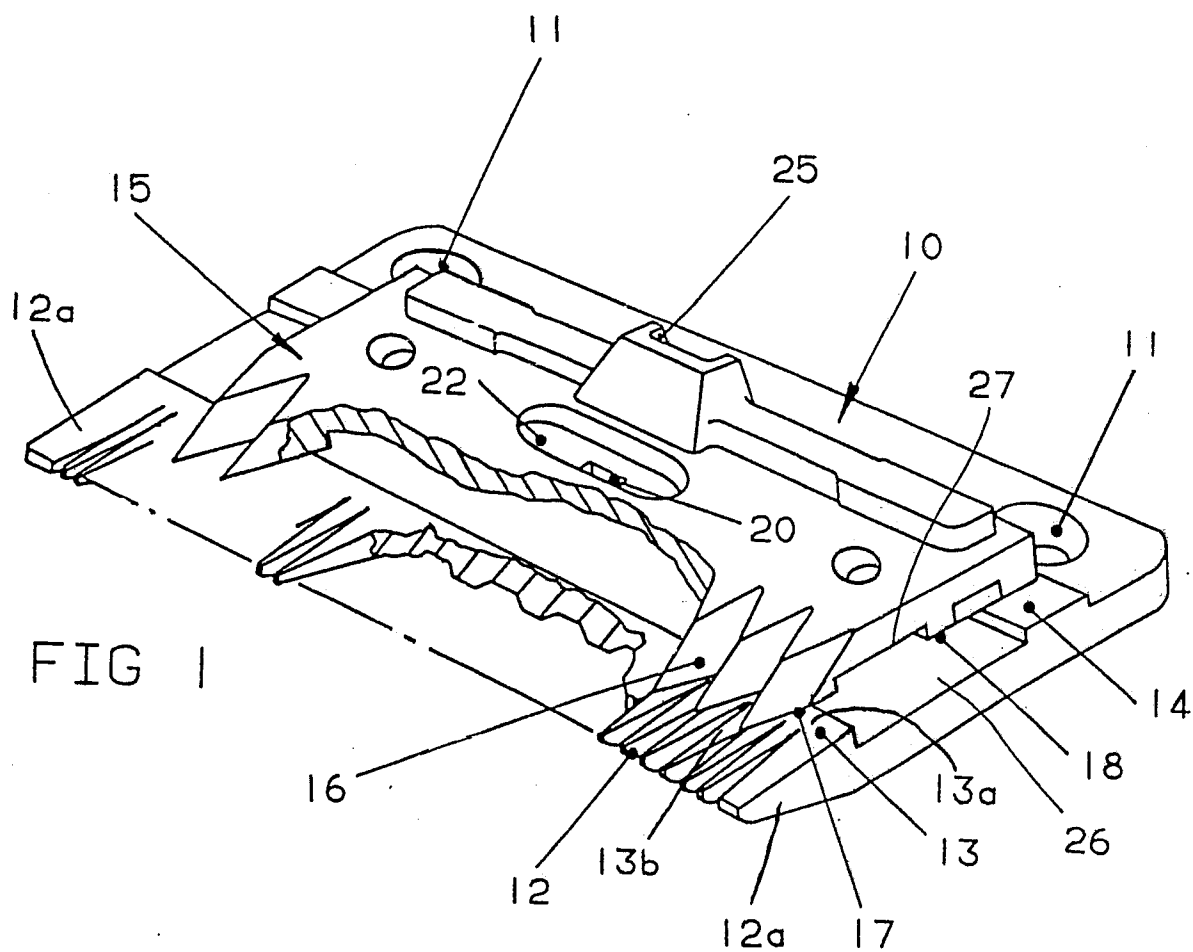


FIG 1

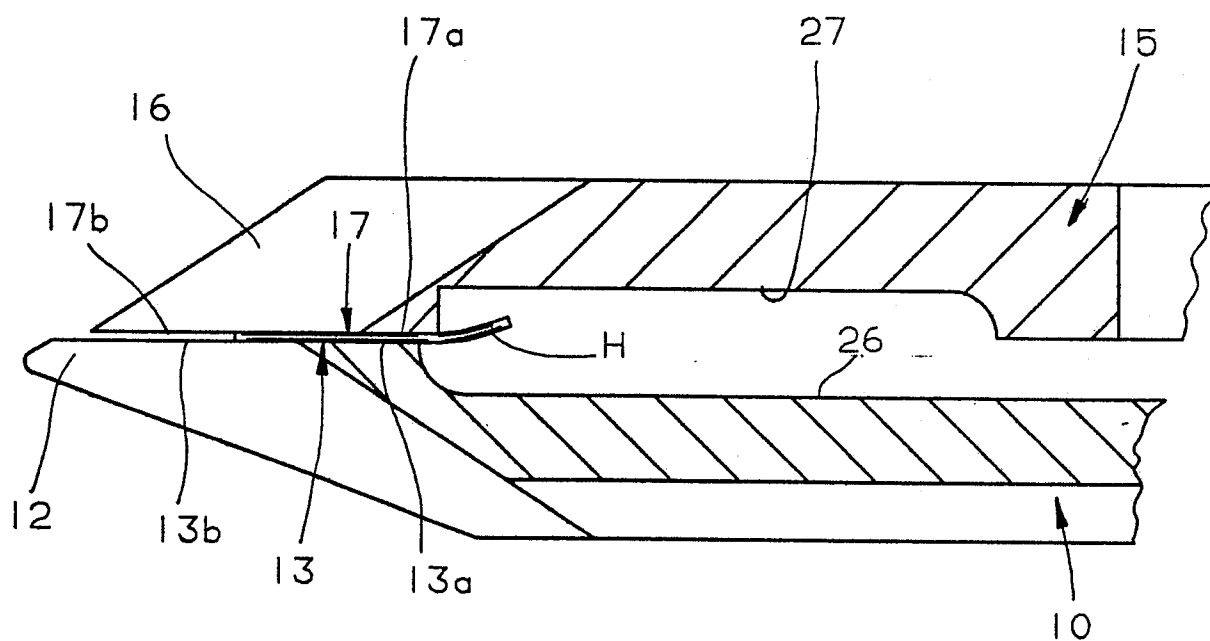
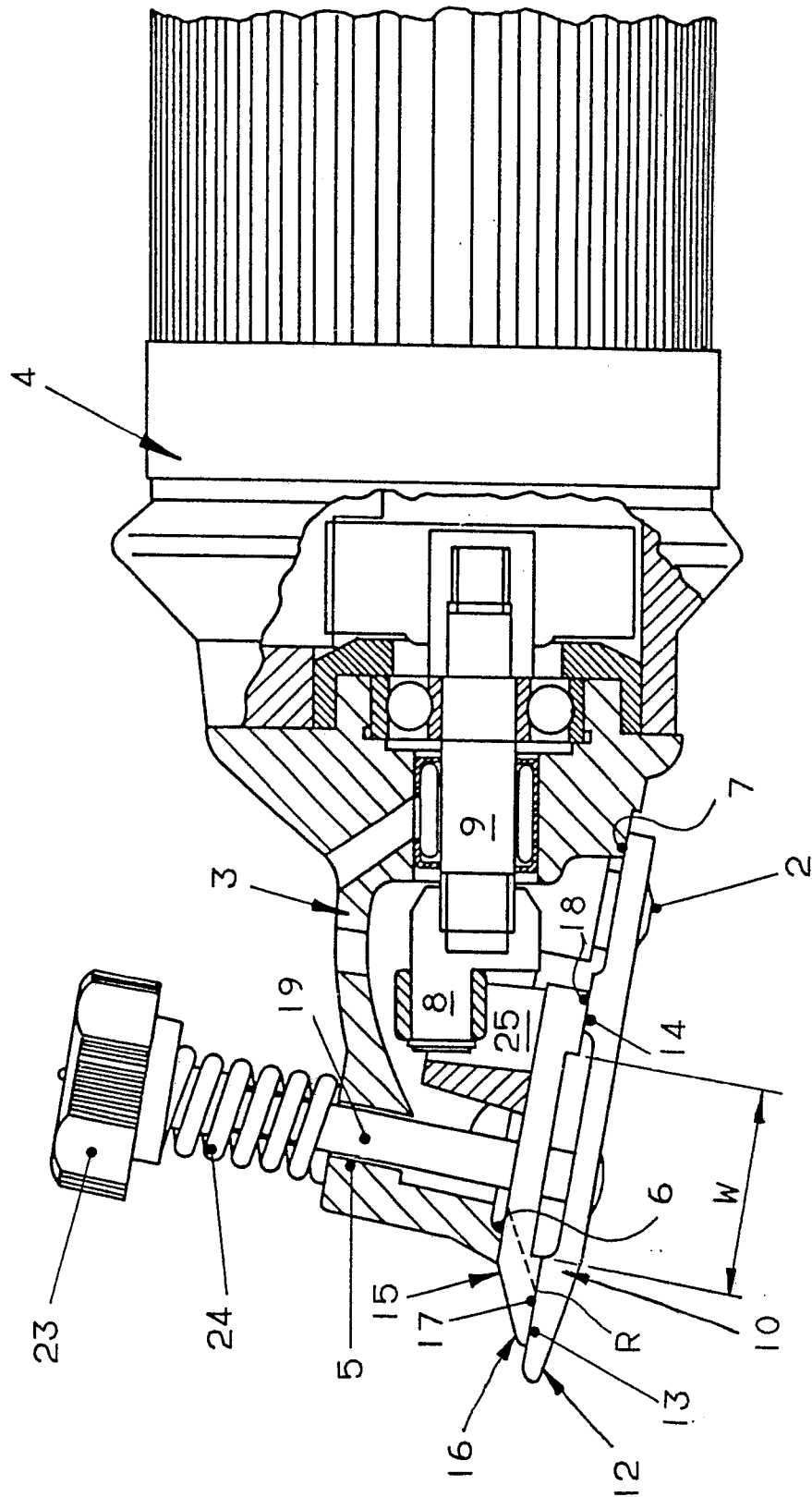


FIG 3

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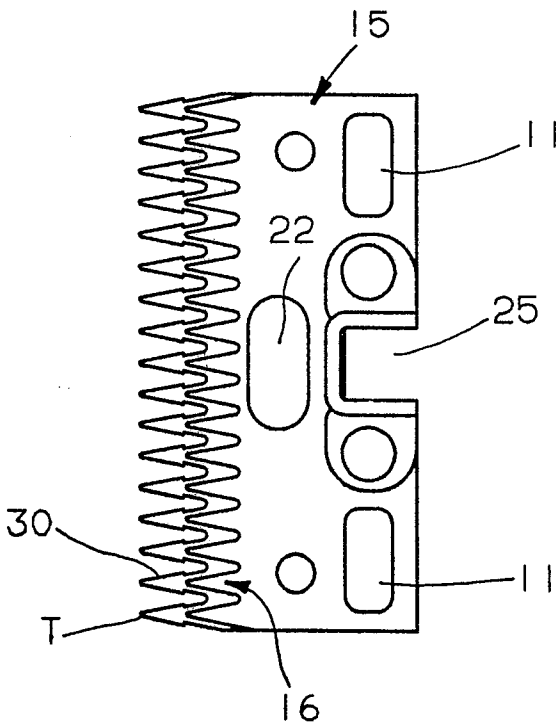


FIG 5

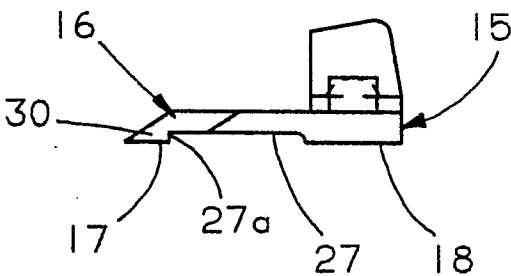


FIG 4

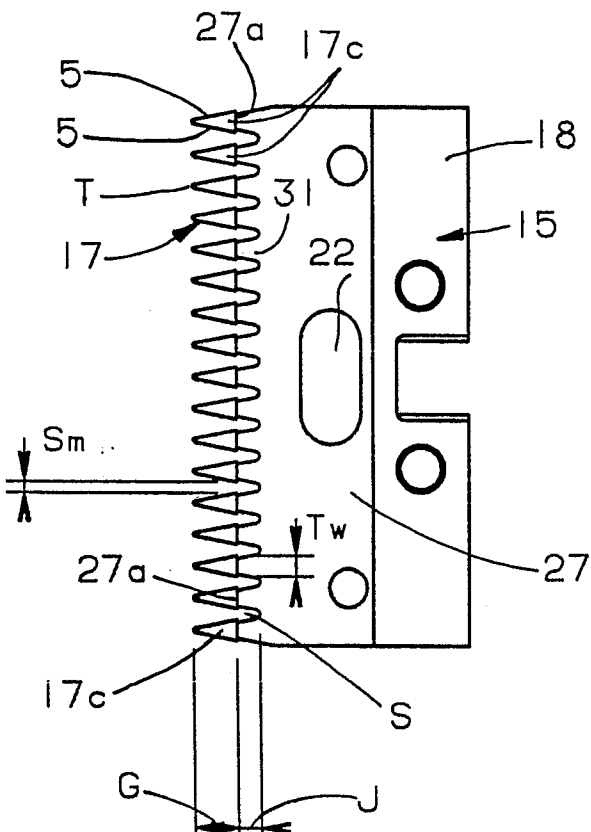


FIG 6

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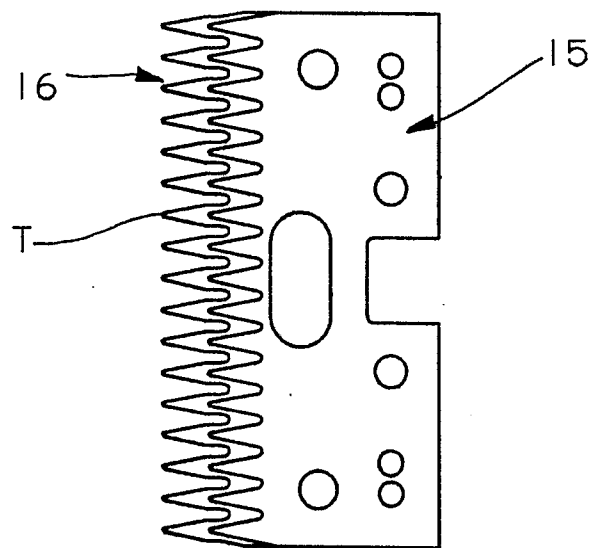


FIG 11

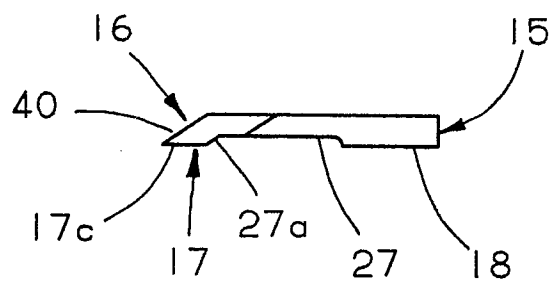


FIG 10

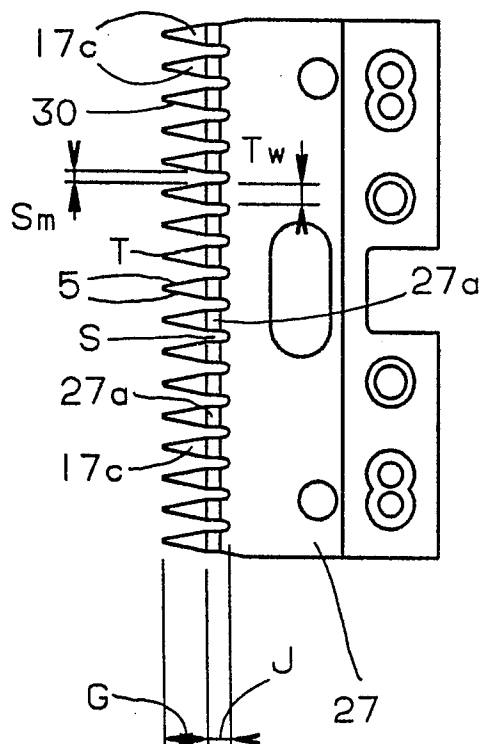


FIG 12



DOCUMENTS CONSIDERED TO BE RELEVANT			EP 88301132.2
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
A	US - A - 2 035 632 (ANDIS) * Claim 1; fig. 3,4,5 * --	1,2,4, 5,6,8	B 26 B 19/24
A	DE - A1 - 2 848 046 (N.V. PHILIPS 'GLOEILAMPENFABRIEKEN') * Fig. 1,3,4 * --	1,2,4, 5,6,8, 10	
A	US - A - 3 093 902 (ANDIS) * Claims 1,2; fig. 1,2,3,5,6,9,10 * --	1,2,9	
A	DE - C - 672 785 (RÖHNER) * Fig. 1,2 * --	1,4,5, 6,8	
A	US - A - 2 713 718 (HUDSON) * Fig. 1,3 * ----	1,2,3, 7,9,10	TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
The present search report has been drawn up for all claims			B 26 B 19/00
Place of search VIENNA		Date of completion of the search 29-03-1988	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	