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DESCRIPTION

BACKGROUND OF THE INVENTION

[0001] This invention pertains to pet grooming tools of the type used to remove loose hair from pets without cutting or pulling non-loose hair from the pets.

[0002] US 19,188 discloses a curry comb made of india rubber.

[0003] US 6,782,846 relates to a pet grooming tool with a blade portion and a plurality of teeth.

SUMMARY OF THE INVENTION

[0004] In a first aspect in accordance with the invention, there is provided a pet grooming tool according to claim 1.

[0005] In a second aspect in accordance with the invention, there is provided a method according to claim 5.

[0006] Preferred embodiments are detailed in the dependent claims.

[0007] While the principal features of the invention have been described above, a more complete and thorough understanding of the invention may be obtained by referring to the drawing figures and the detailed description of the preferred embodiments, which follow.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The accompanying drawings, which are incorporated in and form a part of the specification, illustrate the preferred embodiment of the present invention and together with the description, serve to explain the principles of the invention. Reference numerals in the written specification and in the drawing figures indicate corresponding items. In the drawings:

Figure 1 is a perspective view of an embodiment of a pet grooming tool in accordance with the invention.

Figure 2 is a side view of the pet grooming tool shown in Figure 1.

Figure 3 is a rear view of the pet grooming tool shown in Figures 1 and 2.

Figure 4 is a top view of the pet grooming tool shown in Figures 1-3.

Figure 5 is a bottom view of the pet grooming tool shown in Figures 1-4.

Figure 6 is a front view of the pet engageable portion of the pet grooming tool shown in Figures 1-5.

Figure 7 is a side projection view of the pet engageable portion of the pet grooming tool shown in Figure 7.

Figure 8 is a cross-sectional view of the pet engageable portion of the pet grooming tool shown in Figures 6 and 7 taken about the line 8-8 shown in Figure 6.

Figure 9 is a side view of the handle and pet engageable portions of the pet grooming tool shown in Figures 1-5 shown without the grip portion attached to the handle portion.

Figure 10 is a perspective view of an alternative embodiment of the pet engageable portion of a pet grooming tool in accordance with the invention.

Figure 11 is a front view of the pet engageable portion shown in Figure 10.

Figure 12 is a rear view of the pet engageable portion shown in Figures 10 and 11.

Figure 13 is a detail view of Figure 12.

Figure 14 is a cross-sectional view of the teeth of the pet engageable portion shown in Figures 10-12 and is taken about the line 14-14 shown in Figure 13.

Detailed Description of the Preferred Embodiments

[0009] An embodiment of a pet grooming tool in accordance with the invention is shown in Figures 1-5 and indicated by reference numeral 10. The pet grooming tool 10 comprises a pet engageable portion 12, a handle portion 14, and a grip portion 16.

[0010] The pet engageable portion 12 of the pet grooming tool 10 is formed of a polymeric material, preferably by using an injection molding process. Preferably but not necessarily, the polymeric material that forms the pet engageable portion 12 is either polycarbonate or acetal, which have relatively high tensile yield strength and good creep resistance as compared to other less expensive polymeric materials. As shown most clearly in Figures 6-8, the pet engageable portion 12 preferably is generally rectangular in shape and preferably comprises a planar rear surface 18 and a parallel planar front surface 20. Preferably, an arcuate surface 22 of the pet engageable portion 12 extends down from the front surface 20 and tapers therefrom toward the rear surface 18.

[0011] A plurality of teeth 24 are preferably formed in a row along the bottom of the pet engageable portion 12. Each tooth 24 is preferably bound in front by the arcuate surface 22, in

the rear by the rear surface 18 and, except for the first and last teeth in the row, by two tooth side surfaces 26. An intersecting surface 28 is preferably formed between each adjacent pair of the teeth 24. Each intersecting surface 28 is preferably planar and preferably extends from the arcuate surface 22 to the rear surface 18 in a manner creating an acute horizontal edge segment 30 with the rear surface. Each edge segment 30 preferably has an edge angle of between forty-five degrees and seventy-five degrees, and more preferably of approximately sixty degrees.

[0012] The tooth side surfaces 26 of each tooth 24 acutely intersect the side tooth surfaces of each adjacent tooth at the root of the tooth. It is from such intersections that the intersecting surfaces 28 extend downward toward the edge segments 30. The tooth side surfaces 26 of any given tooth 24, excluding the first and last teeth 36, also preferably acutely intersect each other at the tip 32 of said tooth in a manner forming an acute edge 34 that extends horizontally and generally perpendicular to the edge segments 30. The tips 32 of the first and last teeth 36 in the row preferably do not have acute edges. Additionally, the first and last teeth 36 are preferably wider than the other teeth to reduce the likelihood of damaging the teeth in the event that the pet grooming tool is dropped. Preferably there are between 5.1 and 5.5 of the teeth 24 per cm (thirteen and fourteen of the teeth 24 per inch) along the row of teeth and preferably the tips 32 of the teeth are approximately 0.3175 cm (an eighth of an inch) below the edge segments 30 of the pet engageable portion 12.

[0013] The upper portion of the pet engageable portion 12 may optionally comprise one or more openings 38 or other indentations. Such openings 38 or indentations create cavities in the pet engageable portion 12 that allow the handle portion 14 of the pet grooming tool 10 to be secured to the pet engageable portion via interlocking geometry, but are not necessary if the handle portion is melt bonded to the pet engageable portion.

[0014] After the pet engageable portion 12 has been formed, it is preferably placed in another mold into which another polymeric material is injection molded to form the handle portion 14. The polymeric material used to form the handle portion 14 can be any one of commonly used engineering plastics such as ABS, nylon, and polypropylene, and is preferably less expensive than the polymeric material used to form the pet engageable portion. Notably, the material used to form the handle portion 14 needs not be as creep resistant nor have as high a yield strength as the material used to form the pet engageable portion 12. Preferably however, the polymeric material used to form the handle portion 14 has a melt temperature close to that of the polymeric material used to form the pet engageable portion 12 such that the materials become melt-bonded to each other when the handle portion is formed. Alternatively, the pet engageable portion 12 can be provided with cavities, such as the openings 38 shown in Figure 6, so that the handle portion 14 becomes geometrically interlocked with the pet engageable portion when formed therearound.

[0015] The mold used to form the handle portion 14 is preferably shaped such that, when formed, the handle portion comprises a base portion 40 that encircles the upper portion of the pet engageable portion 12, and an elongate portion 42 extending therefrom. The elongate

portion 42 of the handle portion 14 is preferably shaped to be grasped comfortably by hand. Additionally, the elongate portion 42 preferably comprises a plurality of recessed areas 44 and a through-hole 46 at its distal end. The through-hole is provided simply to provide means for hanging the pet grooming tool 10 from a hook or the like, and for provided means for attaching a lanyard to the pet grooming tool.

[0016] After forming the handle portion 14 of the pet grooming tool 10, the assembly of the handle portion 14 and the pet engageable portion 12 is then placed in yet another mold. This mold preferably has a shape similar to the mold used to form the handle portion 14, except at areas where the recesses on the handle portion are located. This mold is configured so that yet another polymeric material, such as thermoplastic polyurethane, styrene-ethylene/butylene-styrene copolymer, copolyesters, copolyamides, thermoplastic rubber, or thermoplastic vulcanate, can be injected molded into the recessed areas 44 of the handle portion 14 to form the grip portion 16 of the pet grooming tool 10. The grip portion 16 preferably has an outer contour that meets flush with the outer contour of the handle portion adjacent the recessed areas 44. The polymeric material used to form the grip portion 16 preferably is softer than the polymeric material used to form the handle portion 14 and preferably has a higher coefficient of friction. As such, the grip portion 16 increases the comfort and improves the grip when grasping the pet grooming tool 10.

[0017] The pet grooming tool 10 is preferably utilized to remove loose hair from a furry pet, such as a dog or cat, without cutting or pulling non-loose hair from the pet. In use, a person grasps the handle portion 14 of the pet grooming tool 10 and presses the pet engageable portion 12 of the tool into the fur of a pet. Preferably the pet grooming tool 10 is held in a manner such that rear surface 18 of the pet engageable portion 12 is generally perpendicular to the skin of the furry pet. The pet grooming tool is then preferably pulled in a manner such that the front surface 20 of the pet engageable portion 12 trails behind the rear surface 18 of the pet engageable portion. As the pet grooming tool 10 is pulled, both loose and non-loose hair passes between the teeth 24 of the pet engageable portion 12. The acute angle of edge segments 30 facilitates the ability of the pet engageable portion 12 to pull the loose hair from the pet without also cutting or pulling non-loose hair from the pet. Additionally, the acute shape of the tips 32 of the teeth 24 helps channel hair into the voids between the teeth 24, whereas blunter teeth would otherwise tend to mash hair against the skin of the pet.

[0018] A preferred embodiment of the pet engageable portion 100 in accordance with the invention is shown in Figures 10-14. This pet engageable portion 100 is also preferably formed out of a plastic material and is adapted to be joined to a handle portion in a manner similar to that described above. The alternative pet engageable portion 100 is preferably generally rectangular and comprises a front surface 102 and a rear surface 104. The front surface 102 is preferably parallel to the rear surface and space about 0.3429 cm (0.136 inches) therefrom. A plurality of teeth 106 extend downward at the bottom of the pet engageable portion 100. There are between 7.1 and 8.7 teeth 106 per cm (eighteen and twenty-two teeth 106 per inch), and preferably 7.87 per cm (twenty per inch). Each tooth of an adjacent pair of teeth intersects the other at a root 108. Each tooth become narrower as it extends downward and ultimately

terminates at a rounded or otherwise blunted tip 110.

[0019] As shown in Figure 14, the roots 108 are angled obliquely from the rear surface 104 of the pet engageable portion 100 to form an edge 112 having an acute inside angle. This angle is between thirty and fifty degrees, and preferably between thirty-five and forty-five degrees, and more preferably about forty degrees. As is also shown in Figure 14, the lowermost surface of each tooth tip 110 is also angled obliquely from the rear surface 104 of the pet engageable portion 100. As such, the cross-section of the tip 110 of each tooth 106, taken at the plane of symmetry of the tooth, has a corner at the lowermost portion of the rear surface 104 that has an acute angle. This angle is between fifty and seventy degrees, and preferably between fifty-five and sixty-five degrees, and more preferably about sixty degrees. The corner of the cross-section of the tip 110 of each tooth 106 is preferably between 0.3175 and 0.4445 cm (0.125 and 0.175 inches) below the acute edge of the roots 108 between the teeth.

[0020] While the present invention has been described in reference to a specific embodiment, in light of the foregoing, it should be understood that all matter contained in the above description or shown in the accompanying drawings is intended to be interpreted as illustrative and not in a limiting sense and that various modifications and variations of the invention may be constructed without departing from the scope of the invention defined by the following claims. Thus, other possible variations and modifications should be appreciated.

[0021] Furthermore, it should be understood that when introducing elements of the present invention in the claims or in the above description of the preferred embodiment of the invention, the terms "comprising," "including," and "having" are intended to be open-ended and mean that there may be additional elements other than the listed elements. Additionally, the term "portion" should be construed as meaning some or all of the item or element that it qualifies. Moreover, use of identifiers such as first, second, and third should not be construed in a manner imposing any relative position or time sequence between limitations. Still further, the order in which the steps of any method claim that follows are presented should not be construed in a manner limiting the order in which such steps must be performed.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US19188A [0002]
- US6782846B [0003]

Patentkrav**1.** Husdyrsplejeværktøj (10) omfattende:

5 en husdyr-indgribelig del (100), der har en flerhed af tænder (106), hvor flerheden af tænder (106) er anbragt på en række, hvor hver af flerheden af tænder har et symmetriplan og en spids (110), hvor symmetriplanet definerer et tværsnit af spidsen af tanden (106), hvor tværsnittet af spidsen (110) af tanden har et hjørne ved en nederste del af en bagflade af den husdyr-indgribelige del, hvor hjørnet har en indre vinkel, hvor mindst 10 to af flerheden af tænder (106) er tilstødende hinanden og krydser ved en rod (108), og roden har en indre kant (112) der har en indre vinkel, og en håndtagsdel (14) fastgjort til den husdyr-indgribelige del (100),

kendetegnet ved at:

- 15 - den husdyr-indgribelige del (100) er dannet af et første polymermateriale;
- rækken har mellem 7,1 og 8,7 tænder per cm (atten og toogtyve tænder per tomme);
- hjørnets indre vinkel er mellem halvtreds og halvfjerds grader;
- 20 - håndtagsdelen (14) er dannet af et andet polymermateriale, hvor det andet polymermateriale er forskelligt fra det første polymermateriale, og den indre kants indre vinkel er mellem tredive og halvtreds grader.

2. Husdyrsplejeværktøj (10) ifølge krav 1, hvor den indre vinkel af den indre kant 25 (112) er mellem femogtredive og femogfyrre grader.

3. Husdyrsplejeværktøj ifølge krav 1, hvor den indre vinkel af hjørnet er mellem femoghalvtreds og femogtres grader.

4. Husdyrsplejeværktøj ifølge krav 1, hvor den indre vinkel af den indre kant (112) er mellem 0,3175 og 0,4445 cm (0,125 og 0,175 tommer) fra hjørnet af tanden (106) nærmest den indre kant.
- 5 5. Fremgangsmåde til fremstilling af husdyrsplejeværktøj, hvilken fremgangsmåde omfatter:
- 10 at sprøjtestøbe en husdyr-indgribelig del (100) af husdyrsplejeværktøjet (10) ud af et første polymermateriale på en måde således at den husdyr-indgribelige del (100) omfatter en flerhed af tænder (106) anbragt i en række, hvor rækken har mellem 7,1 og 8,7 tænder per cm (atten og toogtyve tænder per tomme), hver af flerheden af tænder (106) har et symmetriplan og en spids (110), hvor symmetriplanet definerer et tværsnit af spidsen (110) af tanden, tværsnittet af spidsen af tanden (106) har et hjørne, der har en indre vinkel af mellem halvtreds og halvfjerds grader;
- 15 at placere den husdyr-indgribelige del (100) i et sprøjtestøbningshulrum;
- 20 at indsprøjte et andet polymermateriale i støbeformshulrummet, mens den husdyr-indgribelige del (100) er i støbeformshulrummet på en måde der danner en håndtagsdel (14) ud af det andet polymermateriale, der er fastgjort til den husdyr-indgribelige del, hvor det andet polymermateriale er forskelligt fra det første polymermateriale, hvor sprøjtestøbningen af den husdyr-indgribelige del (100) sker på en måde således at mindst to af flerheden af tænder (106) tilstøder hinanden og krydser ved en rod (108), og roden har en indre kant (112), der har en indre vinkel på mellem tredive og halvtreds grader.
- 25
6. Fremgangsmåde ifølge krav 5, hvor sprøjtestøbningen af den husdyr-indgribelige del (100) sker på en måde således at den indre vinkel af den indre kant (112) er mellem femogtredive og femogfyrre grader.

7. Fremgangsmåde ifølge krav 5, hvor sprøjtestøbningen af den husdyr-indgribelige del (100) sker på en måde således at den indre vinkel af hjørnet er mellem femoghalvtreds og femogtres grader.
- 5 8. Fremgangsmåde ifølge krav 5, hvor sprøjtestøbningen af den husdyr-indgribelige del (100) sker på en måde således at den indre vinkel af den indre kant (112) er mellem 0,3175 og 0,4445 cm (0,125 og 0,175 tommer) fra hjørnet af tanden (106) nærmest den indre kant.
- 10 9. Fremgangsmåde ifølge krav 5, hvor støbeformshulrummet udgør et første støbeformshulrum og hvor fremgangsmåden yderligere omfatter trinnene:
- at placere håndtagsdelen (14) og den husdyr-indgribelige del (100) i et andet støbeformshulrum; og
- 15 at indsprøjte et tredje polymermateriale i det andet støbeformshulrum, mens den husdyr-indgribelige del (100) og håndtagsdelen (14) er i det andet støbeformshulrum på en måde der danner mindst en håndgrebsdel (16) dannet ud af det tredje polymermateriale og på en måde således at det tredje polymermateriale smelter mindst en overflade af håndtagsdelen (14), idet det tredje polymermateriale sprøjtes ind i støbeformshulrummet
- 20 og derved skaber mindst en smeltebinding mellem håndtagsdelen (14) og den mindst ene håndgrebsdel (16), hvor det tredje polymermateriale er forskelligt fra det første og andet polymermateriale.

DRAWINGS

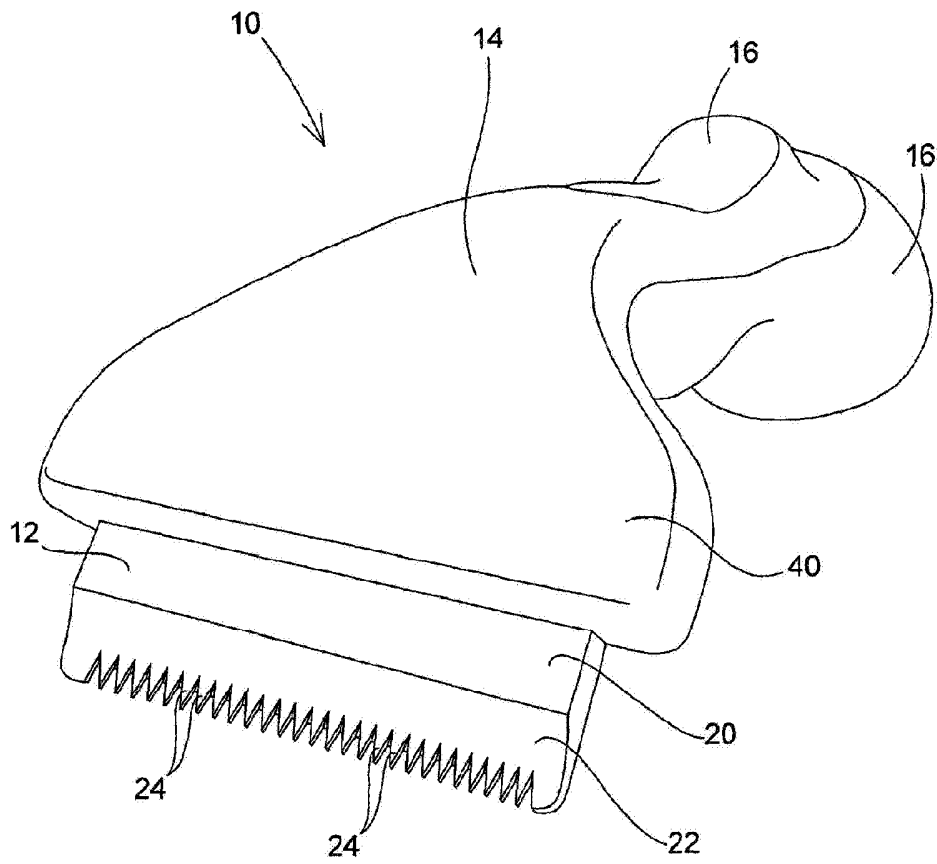


Figure 1 / 14

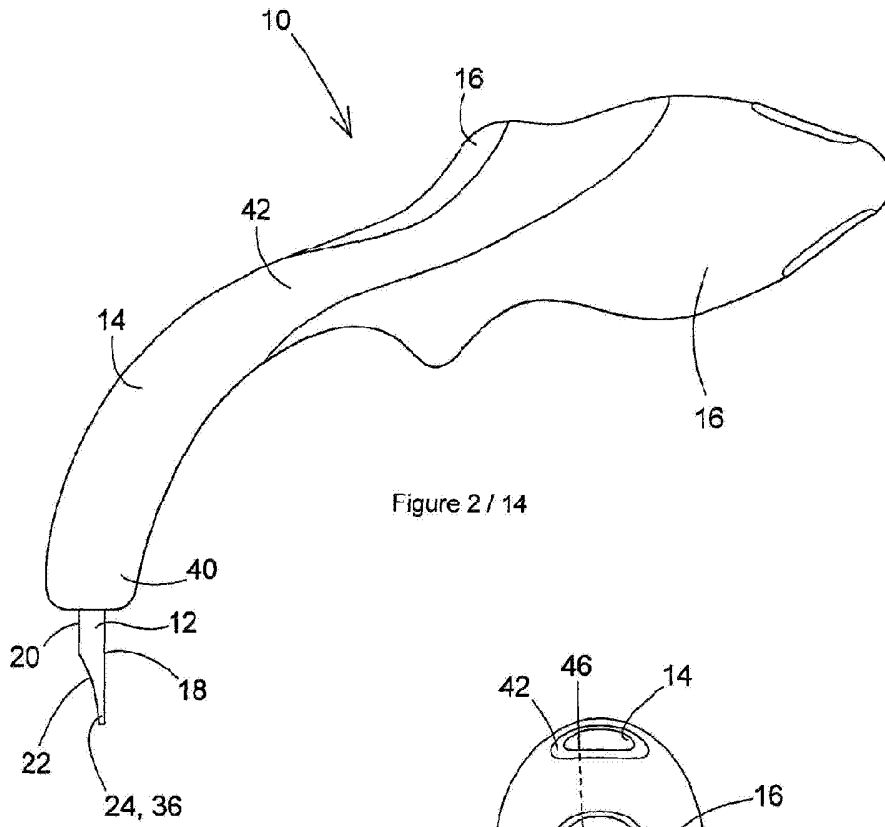


Figure 2 / 14

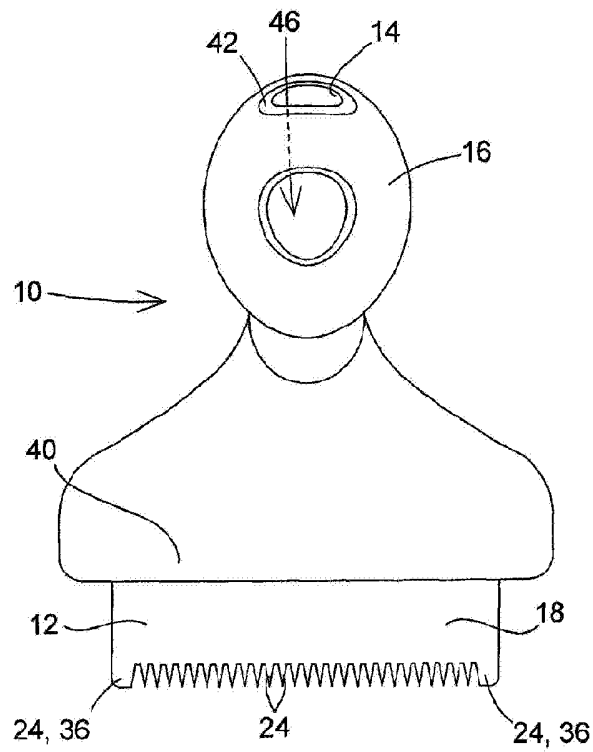


Figure 3 / 14

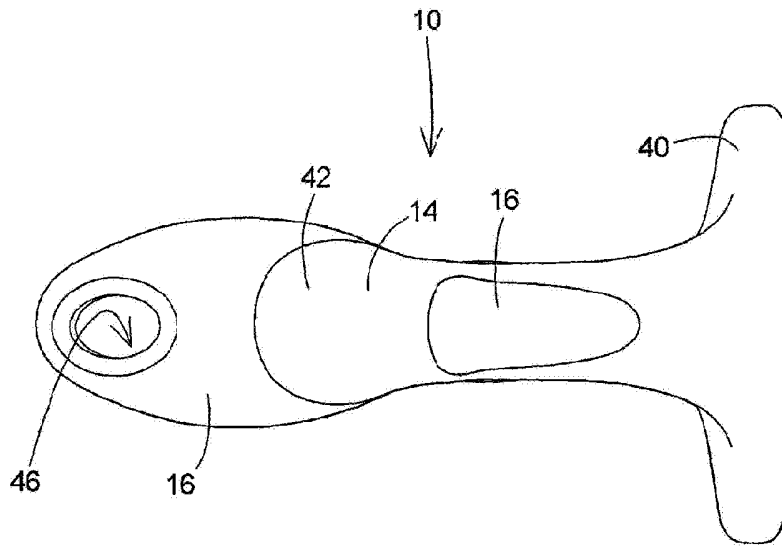


Figure 4 / 14

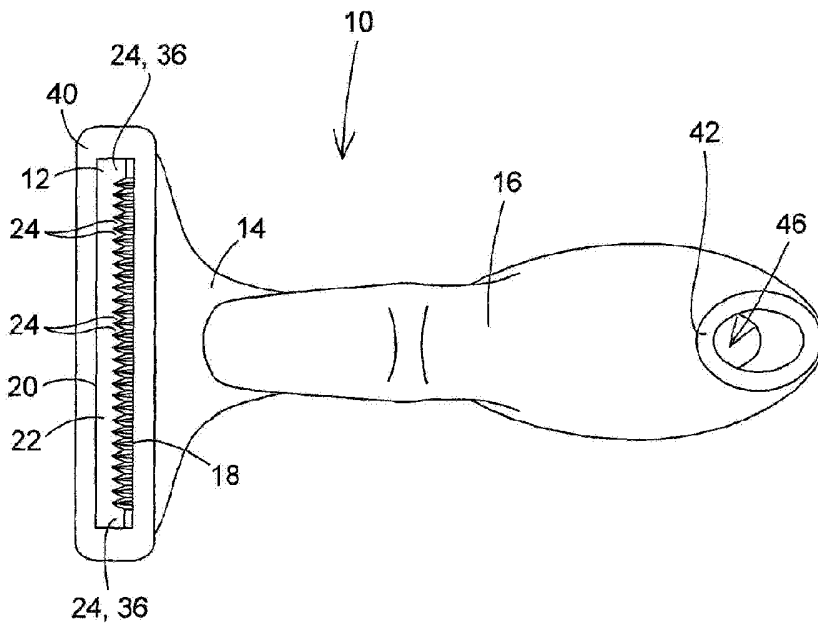


Figure 5 / 14

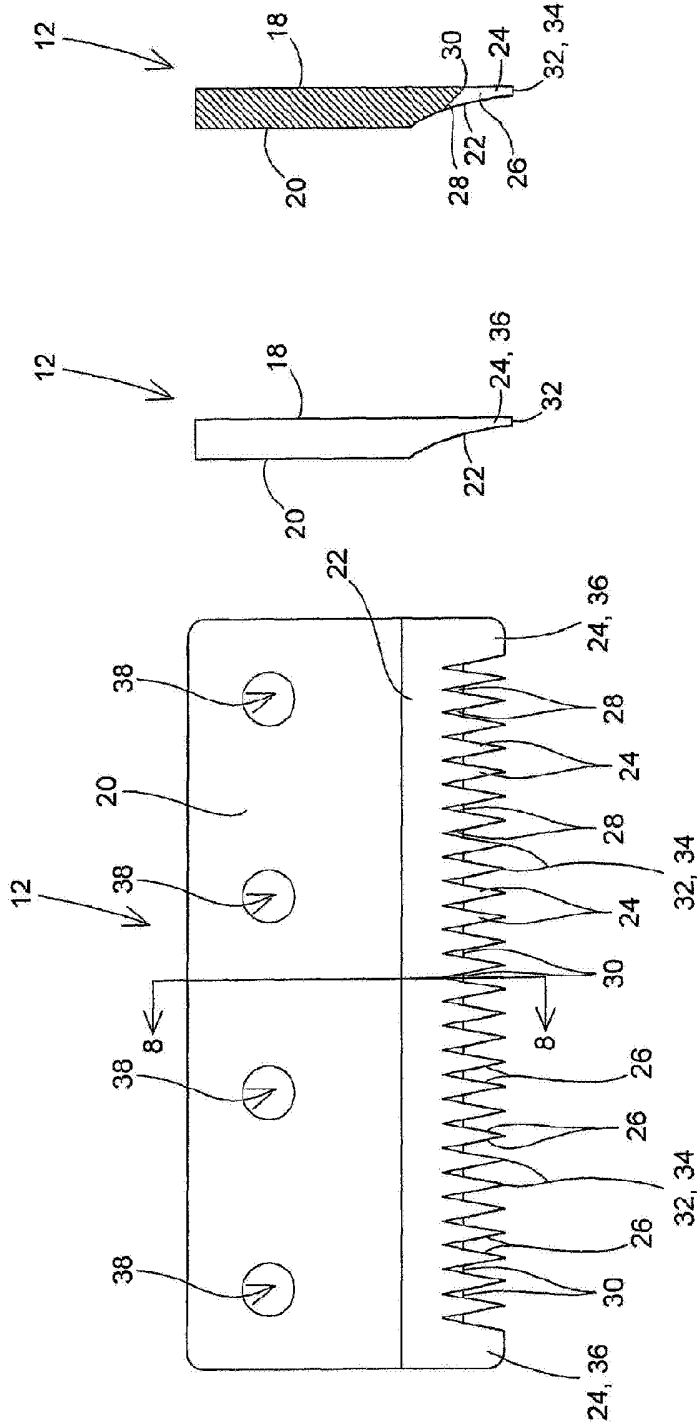


Figure 6 / 14

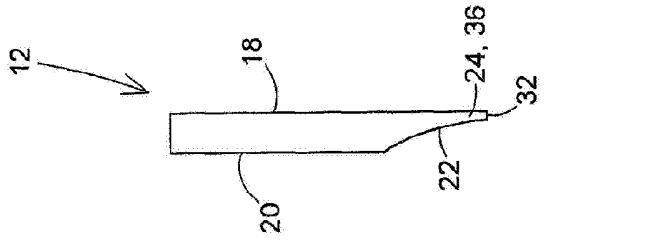


Figure 7 / 14

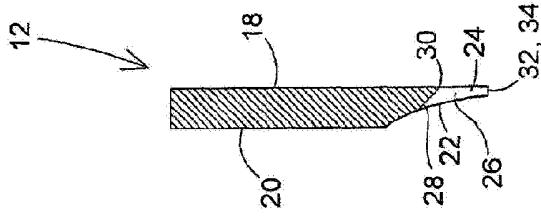


Figure 8 / 14

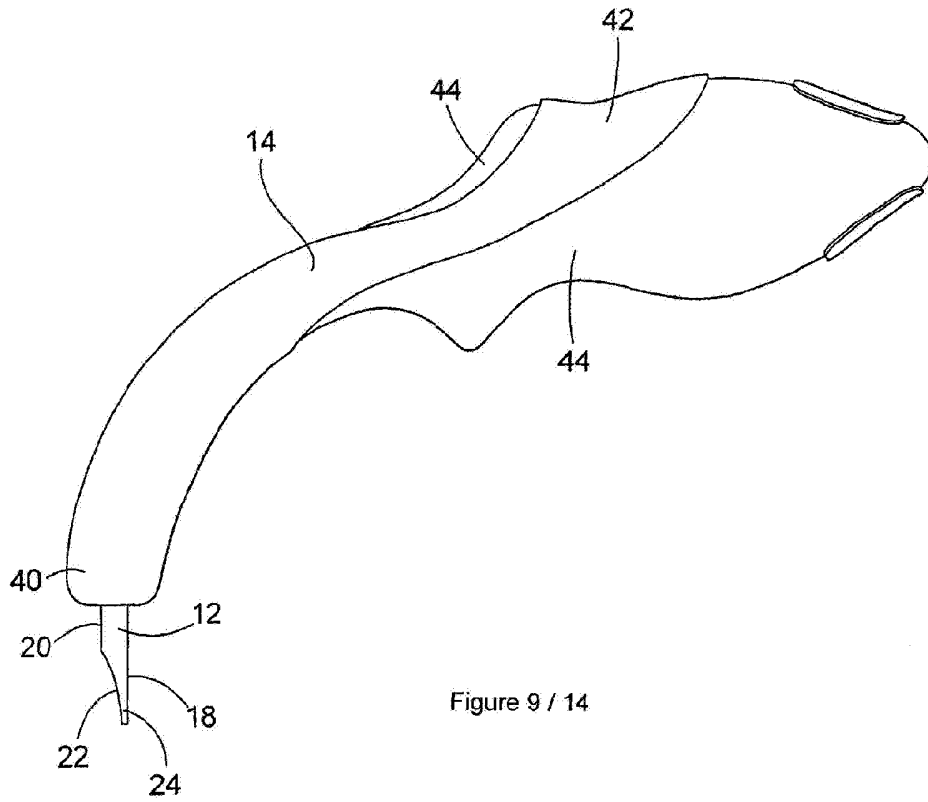


Figure 9 / 14

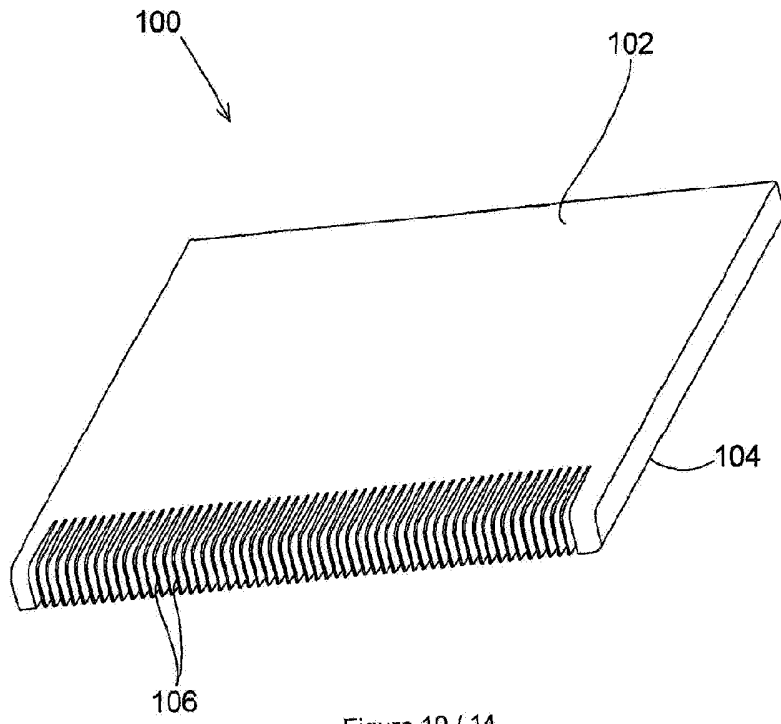


Figure 10 / 14

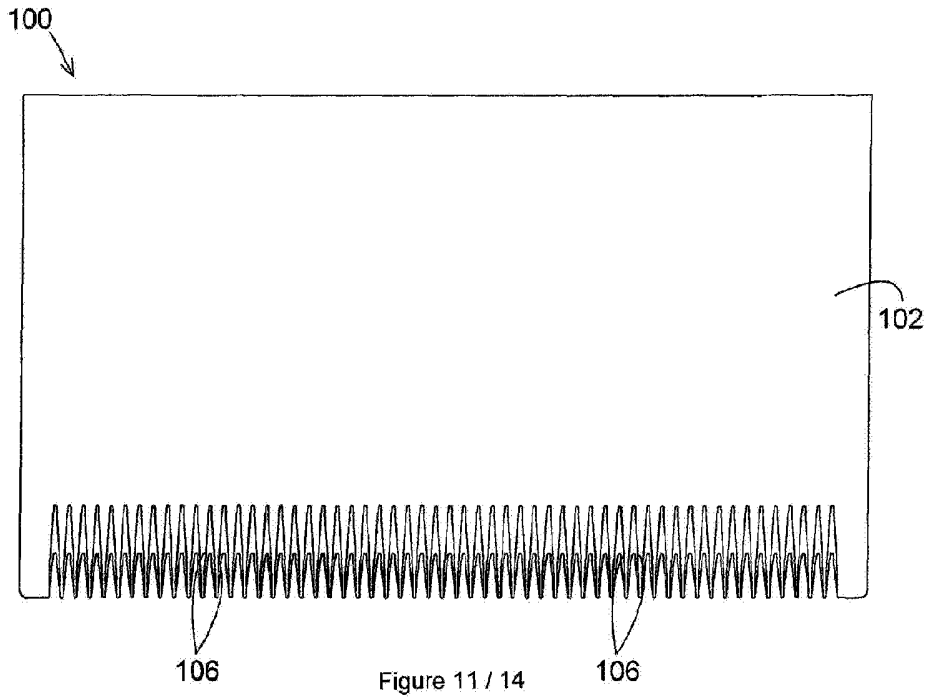


Figure 11 / 14

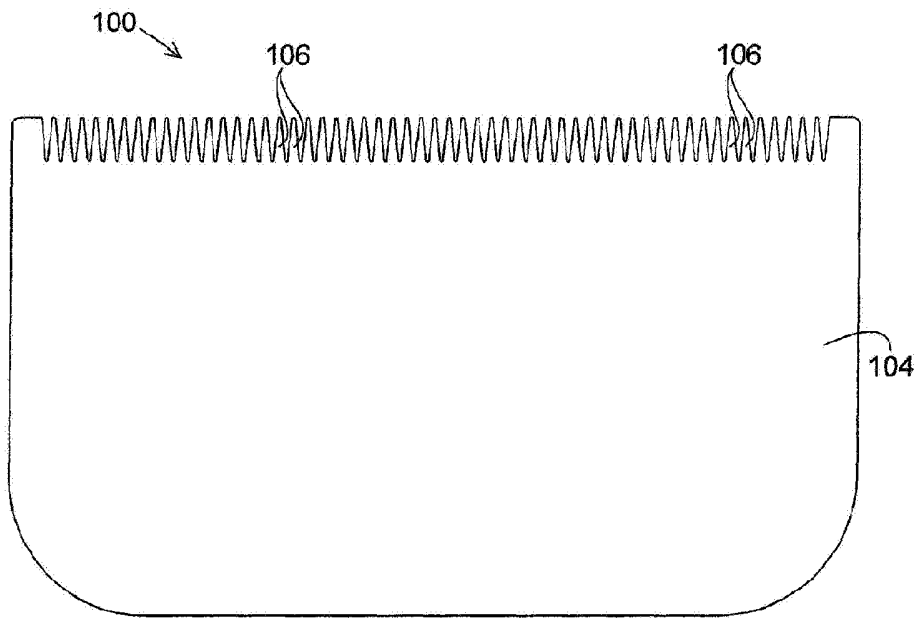


Figure 12 / 14

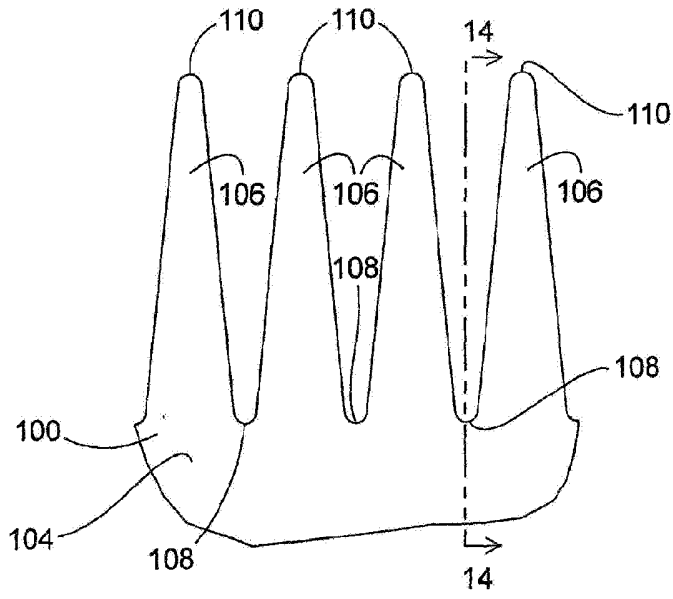


Figure 13 / 14

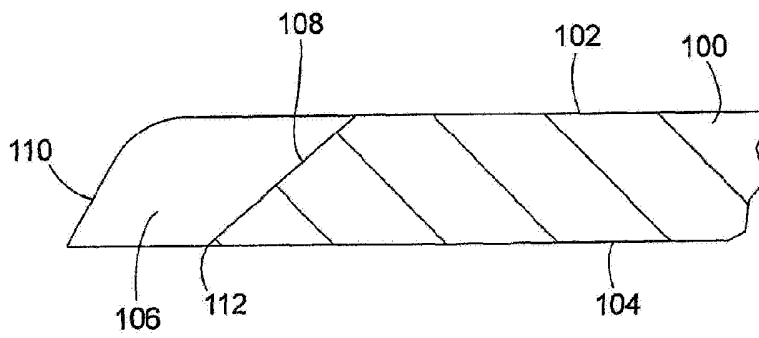


Figure 14 / 14