May 24, 1960 J. D. HOLLINGSWORTH 2,937,413

CARDING TOOTH

Filed Sept. 27, 1956 2 Sheets-Sheet 1

FIG. 1.

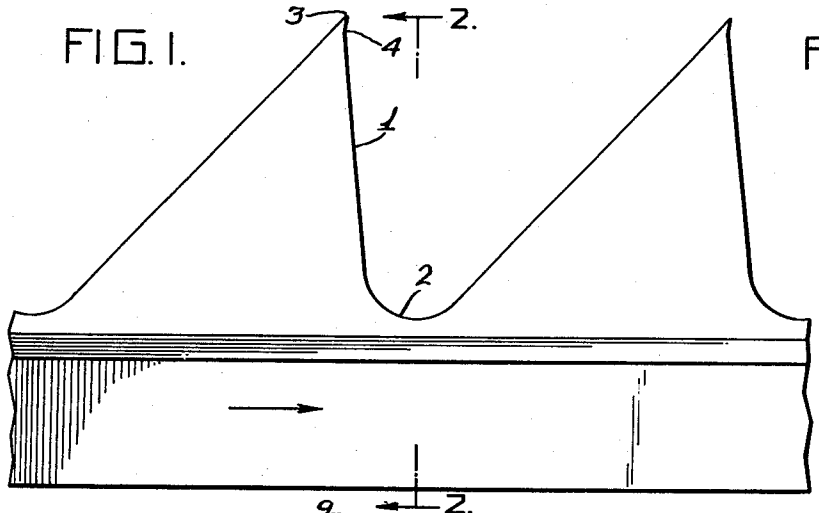


FIG. 2.

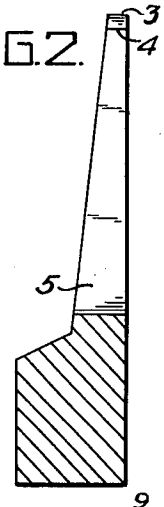


FIG. 3.

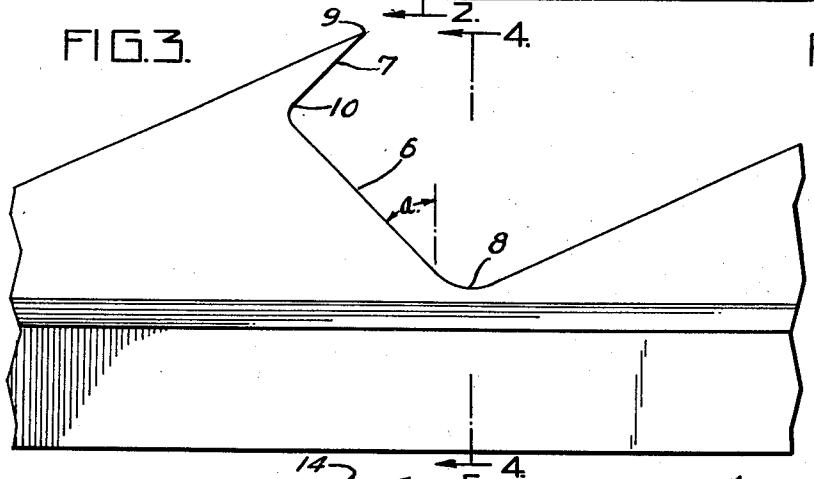


FIG. 4.

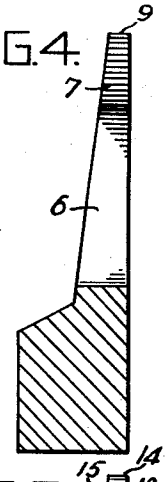


FIG. 5.

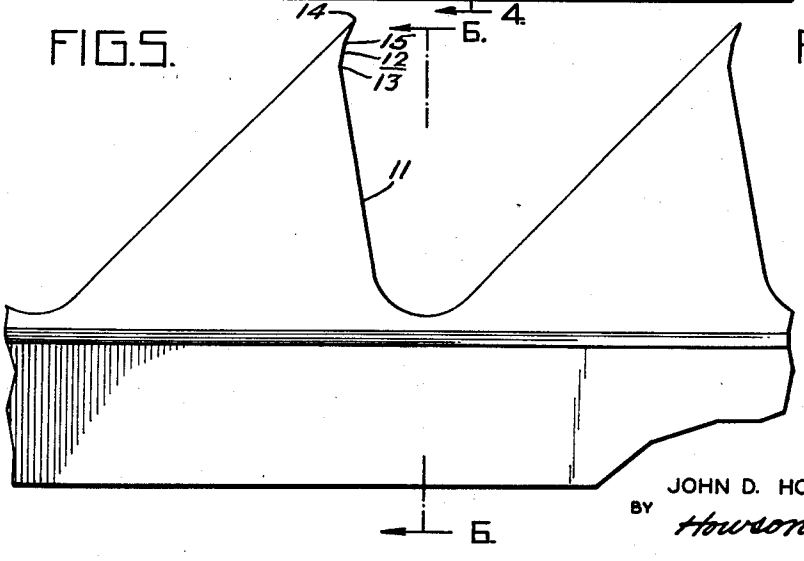
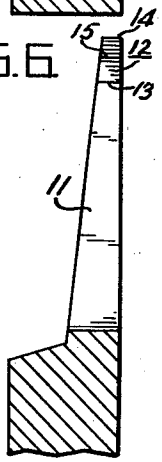


FIG. 6.



INVENTOR:
JOHN D. HOLLINGSWORTH
BY Howson & Howson
ATTYS.

May 24, 1960 J. D. HOLLINGSWORTH 2,937,413

CARDING TOOTH

Filed Sept. 27, 1956 2 Sheets-Sheet 2

FIG. 7.

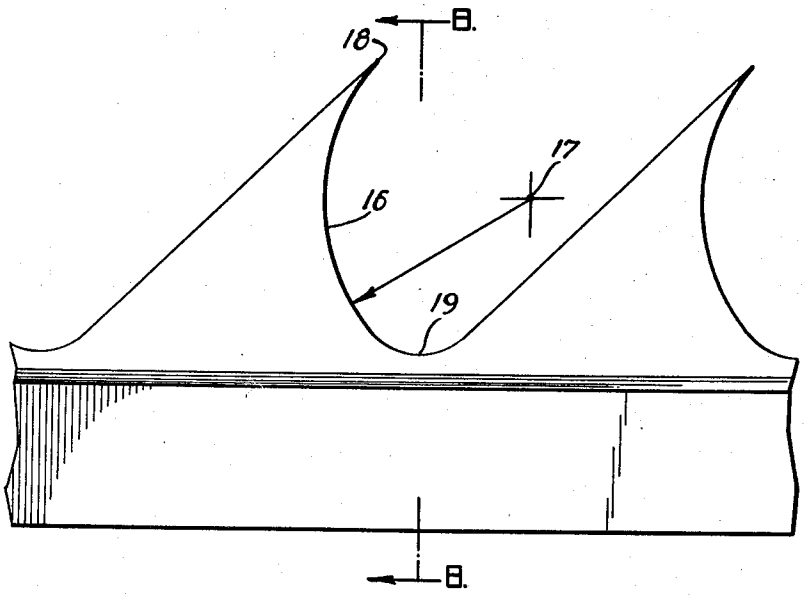


FIG. 8.

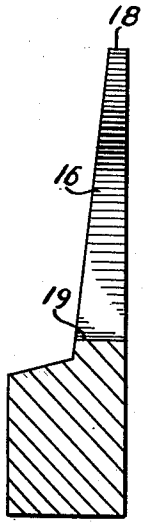


FIG. 9.

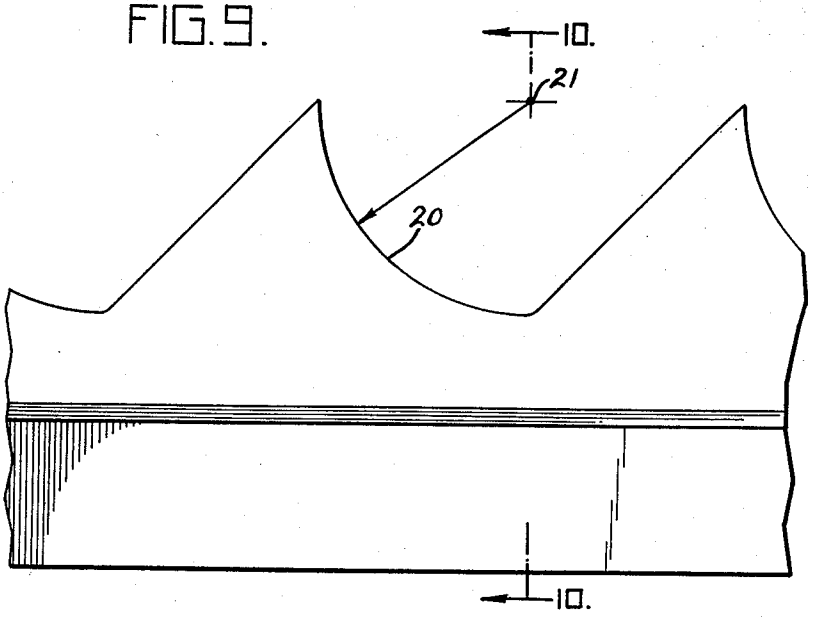
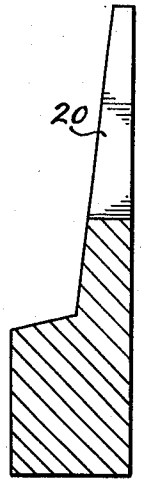


FIG. 10.



INVENTOR:
JOHN D. HOLLINGSWORTH
BY Howson & Howson
ATTYS.

United States Patent Office 2,937,413 Patented May 24, 1960

2,937,413

CARDING TOOTH

John D. Hollingsworth, P.O. Box 516, Greenville, S.C.

Filed Sept. 27, 1956, Ser. No. 612,514

2 Claims. (Cl. 19—114)

This invention relates to teeth used in carding, garnetting and similar working of natural and synthetic fibers.

Prior to this invention, such teeth have been made with the front or working edges thereof at various angles to the direction of tooth movement. In some instances, the said front or leading edges lean forwardly or in the direction of tooth movement. In other cases, the tooth edge leans backwardly; and in still other cases, the forward edge of the tooth is normal to the direction of movement. If the angle of lean is too great in the forward direction, there is a tendency for some staples to load on the tooth. If the angle of leaning is too great to the rear, less carding, garnetting, or working of the staple takes place. If the forward edge of the tooth is normal to the direction of tooth movement, too little carding will take place with some staples and with other staples the tooth will tend to load.

I have invented a tooth form which has the combined advantages of a tooth with a forwardly leaning working edge and one having its leading edge leaning backwards but without the disadvantages of either of these forms of tooth. The tooth is superior functionally also to teeth whereof the leading or working edge is normal to the direction of carding movement.

The invention will be more readily understood by reference to the attached drawings wherein:

Fig. 1 is a side view of a fragment of tooth card wire showing in profile a tooth made in accordance with the invention;

Fig. 2 is a sectional view on line 2—2, Fig. 1;

Fig. 3 is a fragmentary side view of a tooth card wire showing in profile a tooth constituting another embodiment of the invention;

Fig. 4 is a sectional view on the line 4—4, Fig. 3;

Fig. 5 is a fragmentary side view of a tooth card wire showing in profile a tooth constituting still another embodiment of the invention;

Fig. 6 is a sectional view on the line 6—6, Fig. 5;

Fig. 7 is a side view of a fragment of tooth card wire showing in profile a tooth constituting another embodiment of the invention;

Fig. 8 is a sectional view on the line 8—8, Fig. 7;

Fig. 9 is a side view of a fragment of tooth wire showing in profile a tooth constituting another embodiment of the invention, and

Fig. 10 is a sectional view on the line 10—10, Fig. 9.

With reference to Fig. 1 which shows in side elevation a section of toothed wire of a type used in metallic clothing for cards and the like, the leading edges 1 of the teeth from the base or gullet 2 leans away from the direction of wire movement (indicated by the arrow) at an angle of approximately five degrees. The rearwardly inclined edge section terminates short of the tip 3 of the tooth, the point of termination in the present instance being approximately .005" below the tip. From this point, indicated by the reference numeral 4, the angle of the leading edge of the tooth changes so that the

section of the edge between the points 3 and 4 has a forward inclination of approximately five degrees with reference to the aforesaid direction of movement. In this case, therefore, the major portion of the leading or working edge of the tooth from its base comprises an edge section having a negative angle with respect to the direction of movement whereas the extreme outer end portion of the edge over a length of approximately .005" comprises an end section having a positive angle of approximately five degrees to said direction of movement. The result is a material reduction in tendency for the teeth to "load" without material loss of carding capacity.

In respects other than the angular relations of the leading edge, the tooth form may be conventional. By reference to Fig. 2 it will be noted that the base portion 5 of the tooth is relatively thick—transversely—and tapers uniformly toward the blunt tip 3.

The principle of the invention may be embodied in other forms of tooth best adapted to the working of the various textile and other fibers. In the modified tooth of Figs. 3 and 4 for example, the leading edge of the tooth exhibits also a base section 6 of negative angle and an outer terminal section 7 of positive angle. The section 6, extending outwardly from the gullet 8 exhibits an angle, α, of approximately forty-five degrees. This section terminates approximately .046" from the tip 9 of the tooth at a point indicated by the reference numeral 10 and between this point and the tip the forward edge exhibits the positive angle of approximately forty-five degrees. As shown in Fig. 4 the transverse or sectional form of the tooth is similar to that of the tooth shown in Fig. 1.

It will be apparent that in this case the wedging action on the fibers of the base section 6 of the working edge of the tooth will be more pronounced and that the tip section 7 of the edge being both longer and describing a greater positive angle will be more positive in their carding action.

In the embodiment of Figures 5 and 6, the forward edge of the tooth exhibits a base section 11 of negative angularity approximately ten degrees and an outer edge section 12 which from the point 13 to the tip 14 exhibits two different positive angles. The angularity immediately adjoining the point 13 is approximately ten degrees and this terminates at the midpoint 15 in an edge section of approximately twenty degrees. The two sections are of approximately the same length namely .01". The cross sectional form of the tooth is shown in Fig. 6 and is substantially the same as those of the teeth previously described.

Figures 7 and 8 show a tooth form according to the invention which exhibits the typical leading edge 16 having sections of both negative and positive angularity, said edge being generated by a radius of indicated length drawn in the present instance from a center 17 between the tip 18 of the tooth and the gullet 19. The edge describes a negative angle in its base section which gradually changes along the arc of the curve to a positive angle in the section toward the working tip 18.

In the embodiment of Figures 9 and 10 the leading edge 20 lacks a section having positive angularity. The edge is concave throughout but since the center of curvature 21 lies at the tooth tip level the tip section of the edge is approximately normal to the direction of tooth movement. In effect, the edge 20 has combined a section of negative angularity and a section of normal angularity.

It will be apparent that a tooth according to the invention can be made to assume a variety of profile configurations and that the invention is not limited to the specific embodiments shown.

I claim:

1. Metallic card clothing comprising a continuous card wire formed into a plurality of substantially rigid teeth separated by gullets, each of said teeth having a leading edge extending from the adjacent gullet substantially to the tip of the tooth, one section of said leading edge of each tooth adjacent said gullet being rectilinear and having negative angularity and the other section of said leading edge of each tooth adjacent the tip thereof being rectilinear and having positive angularity, said one section of the leading edge being of substantially greater length than the other section thereof and constituting the major portion of the leading edge of the tooth, and said other section of the leading edge comprising the remaining portion of the length thereof.

2. Metallic card clothing as claimed in claim 1 wherein the negative and positive angularity of the respective rectilinear sections of the leading edge of each tooth is at least approximately five degrees.

References Cited in the file of this patent

UNITED STATES PATENTS

795,946	Thielmann	Aug. 1, 1905
1,811,549	Langer	June 23, 1931

FOREIGN PATENTS

2,001	Great Britain	of 1870
17,982	Great Britain	of 1914
24,245	Great Britain	of 1896
499,210	Great Britain	Jan. 16, 1939
12,982	Germany	Mar. 10, 1881
47,701	Austria	May 10, 1911