

[54] **ARTICLE WITH SPIKES OR BRISTLES
 MADE OF THERMOPLASTICS**

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[51] Int. Cl..... A45d 2/02

[58] Field of Search..... 132/39, 40, 42

[56] **References Cited**
UNITED STATES PATENTS
 3,050,070 8/1962 Sidelman 132/39

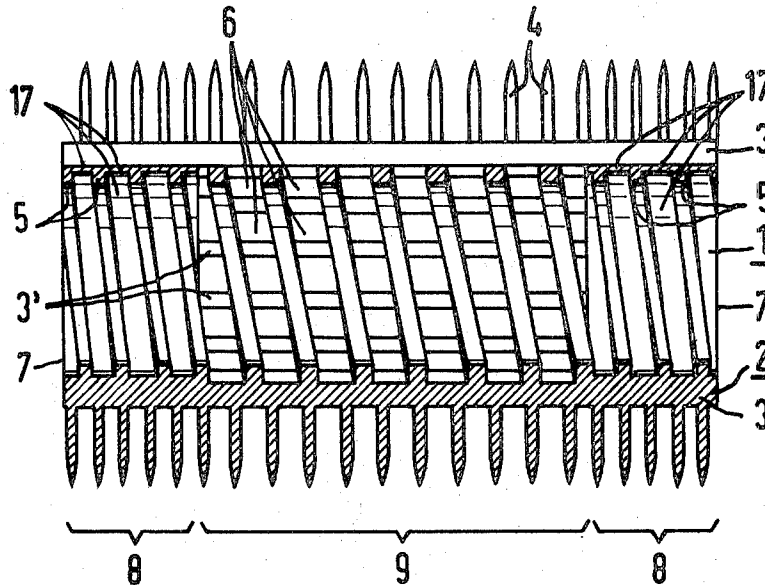
3,209,766	10/1965	Dannat	132/40
3,417,760	12/1968	Silver	132/40
3,419,018	12/1968	Solomon	132/40

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[57] **ABSTRACT**

The new article is provided with bristles or spikes of thermoplastic material in the form of an extruded tube-like carrier profile, the outer surface of which bearing a plurality of longitudinal ribs cut at their outer ends into bristles or spikes, while said tube-like carrier profile is cut from the inside up to the foot-level of said ribs to form a continuous helix, said tube-like carrier having rim zones with closed inner surfaces and smooth endfaces.

2 Claims, 3 Drawing Figures



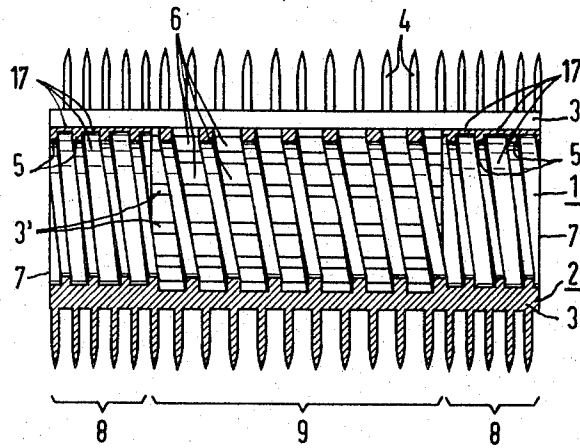


Fig. 1

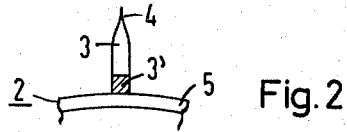


Fig. 2

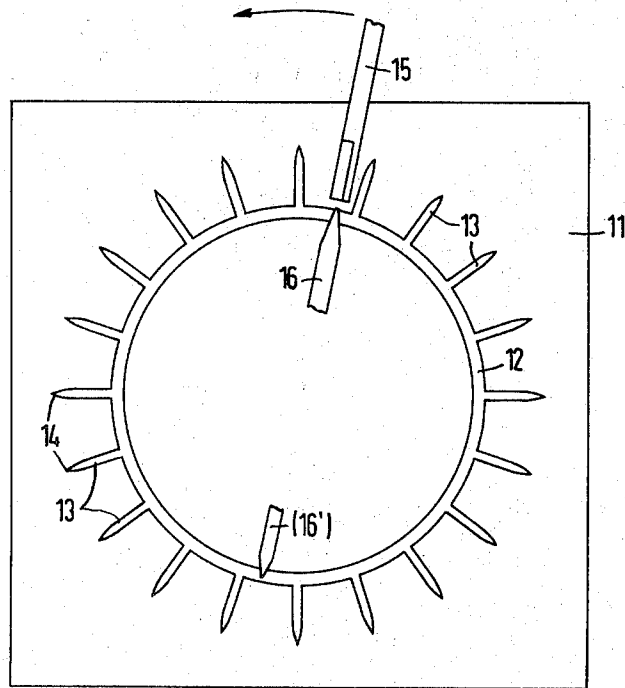


Fig. 3

ARTICLE WITH SPIKES OR BRISTLES MADE OF THERMOPLASTICS

The present invention is related to articles with spikes or bristles, made by an extrusion process of a thermoplastic material in the form of a rod-, tube- or ribbon-like carrier profile with a plurality of longitudinal ribs or fine tapering radially, and cut by a blade into spikes or bristles. The carrier profile, if hollow, is also cut from the inside by another blade up to the foot level of the external ribs thus forming a helical groove. The result is a grid-like structure with a plurality of openings and a helix supporting the whole round body, as shown, e.g., in U.S. Pat. No. 3 387 069. The extruded profileform, while still in a plastic state, is repeatedly cut from both sides transversely to the extruding direction and simultaneously stretched by pulling longitudinally. Thereafter, it is cooled and cut into articles of desired length.

A disadvantage of that manufacturing process is that the helical cut fails to render smooth edges and rim zones. If the articles produced are to be used as hair curlers or for similar purposes, this may cause grappling. The hair will tend to cling to the rim of the curler, which makes it difficult and inconvenient to remove the latter.

It is the principal object of the invention to avoid this disadvantages and to provide an article of the type described which is not likely to hook on unintendedly.

According to the invention, the article has a closed inner surface at the rim zones, and smooth edges. To achieve that, the internal cutting of the tube-like carrier profile may be modified in such a way that the cut is brought up to the foot level of the external ribs in the center portion of the article only, while at the rim zones the blade will just slightly cut the tube and produce no openings. Preferably the pitch of the helix is made less at the rim zones than in the center portion of the profileform.

Other objects and features of the invention will become apparent from the following description of a preferred embodiment, a hair curler, with reference to the accompanying drawing in which

FIG. 1 is a longitudinal cross section;

FIG. 2 shows a detail in transverse cross section;

FIG. 3 shows the blade and die arrangement of an extruder capable of producing the new article.

As shown, the hair curler 1 has a tube-like carrier 2 with a plurality of longitudinal ribs 3 arranged at its outer surface. The ribs are cut transversely into spikes or bristles 4. A remnant 3' of each rib remains uncut and is stretched to produce the desired longitudinal distance between the bristles 4.

The tube-like carrier 2 is cut from the inside up to the remnants 3' of the ribs to form a continuous helix 5 and a grid-like structure with openings 6. If the carrier is

then cut into articles of desired length, the free ends of the ribs 3 would project at the cut edges giving no smooth edges and rim zones.

This is avoided according to the invention by providing closed inner surfaces at the rim zones 8 of the carrier tube 2 with helix 5. Thus it is possible to make both endfaces 7 of ribs 3 and helix 5 smooth. The continuous helix 5 is only slightly cut or scratched at the rim zones 8 avoiding the forming of openings 6 as in the center portion 9 of the curler. The individual turns of the helix 5 are still connected by a plastic web 7. The carrier tube therefore remains imperforate at the rim zones. It is also of advantage to give the helix less pitch at the rim zones than in the center portion, which increases the stability of the rim zones.

For a better understanding of the invention, FIG. 3 shows schematically an extruder die and blade arrangement useful for the production of hair curlers. The die 11 has a circular opening 12. To produce tubular forms (as in FIG. 2), slits 13 are regularly distributed over the circumference of the opening 12. The slits taper radially into thin slit ends 14. The die, when inserted into an extruder, produces a carrier tube 2 with longitudinal ribs tapering into thin ends, as shown in FIG. 2.

Adjacent the die, a blade 15 is revolving in the direction of the arrow shown, transversely to the extruding direction. It is cutting the ribs with the thin ends into bristles 4 while still in a plastic state. The blade 15 does not quite reach the foot level of the ribs, and there remains a remnant 3' of the rib 3. This will be stretched to provide the desired longitudinal distance of the bristles 4. The tube is cut from the inside in the center portion 9 by a second revolving blade 16 to form openings 6 and a helix 5 supporting the remnants 3'. A hair curler of that design has an excellent permeability to air. At the spots of the extruded form where it is to be cut into individual articles, the blade 16 is somewhat retracted, as shown in FIG. 3 at 16', and thus will only slightly cut the helix 5.

I claim:

1. An article with bristles or spikes in the form of an extruded tube-like carrier profile, the outer surface of which bearing a plurality of longitudinal ribs cut at their outer ends into bristles or spikes, while said tube-like carrier profile is cut from the inside up to the foot-level of said ribs to form a continuous helix, said tube-like carrier having rim zones with closed inner surfaces and smooth end faces, and the pitch of said helix being less at the rim zones than in the center portion of said tube-like carrier.

2. An article as claimed in claim 1, wherein said continuous helix being only slightly cut at the rim zones, the turns of the helix there being interconnected by webs of plastic material and showing no openings.

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