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(54) APPARATUS FOR PROCESSING TOP ENDS OF ROD-LIKE RESIN
 ARTICLES, FOR EXAMPLE BRISTLES

(71) We, KAO SOAP COMPANY LIMITED, a Japanese Company, of 1, 1-chome, Nihonbashi-Kayabacho, Chuo-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an apparatus for treating the ends of elongate rod-like articles, for example, rounding or sharpening such ends or applying another substance to such ends.

Bristles of hair brushes and the like are now commonly made of synthetic resins. When relatively thick bristles are used, long resin rods are formed by moulding and they are cut into prescribed lengths in order to form bristles. If the cut faces of such bristles are not rounded, there is a risk that the user's head skin will be scratched by these bristles. However, there has not been developed a fully satisfactory apparatus for rounding the ends of such rod-like resin articles. Further, although it is often required to coat or apply a medicinal composition or the like to the ends of these rod-like articles, there has not yet been developed an apparatus for performing such a process at high efficiency.

In accordance with the present invention, there is provided apparatus for treating the aligned ends of a plurality of elongated articles, which comprises a circular table rotatable about a horizontal axis and having a plurality of indentations spaced around its periphery, each indentation being capable of receiving a single article, means for feeding one article into each indentation while that indentation is moving upwardly, a burner positioned adjacent one end wall of the table for directing a flame substantially parallel to that wall for heating an end of each article projecting beyond that wall of the table, and a pair of positioning means above and downstream of the feeding means but upstream of the burner and adjacent the opposite end walls of the table for engaging the ends of the articles and

positioning the articles in fixed axial positions within the indentations.

The table is preferably in the form of a cylindrical disc. Apparatus for rounding the ends of rod-like resin articles and embodying the present invention will now be described, by way of example, and with reference to the accompanying drawings in which:—

Fig. 1 is a schematic front view of the apparatus, and

Fig. 2 is a developed plan view of the main parts of the apparatus.

As shown in Fig. 1, the apparatus of the present invention comprises a cylindrical rotatable table in the form of a disc having a plurality of circumferentially spaced indentations 2 formed on its periphery so that each indentation 2 can receive one rod-like resin article 7. The table 1 is supported by a shaft 11 for rotation about a horizontal axis. A hopper is provided for storing the rod-like resin articles 7 and supplying them to the table 1. A vibrator 6 is connected to the hopper 4 to assure proper feeding of the articles 7 to the table 1. A gas burner 8 is disposed for directing a flame against one end 8 of the articles 7, as said articles move with the table 1, in order to melt and round off the end of said resin articles. An air nozzle 9 is positioned for cooling the rod-like resin articles 7 after they have been rounded off. Positioning devices such as cams 3 are provided for positioning the rod-like resin articles 7 within the indentations. A cover 5 is provided for holding the rod-like resin articles 7 in the indentations at least during the treating steps.

The lower side wall of the hopper 4 is open and is in close sliding contact with the circumference of the rotatable table 1. The rod-like resin articles 7 are moved into the indentations one by one and are lifted up by the indentations 2 as the table 1 rotates. Cams 3 and 3' are arranged on opposite sides of the upper portions of the table 1 for positioning the resin articles in the indentations so that corresponding ends of

the articles project a fixed distance beyond the end surface of the table. The cover 5 is fixed above the upper portion of the path of travel of the table 1 for retaining the resin articles in the indentations.

The gas burner 8 and the air nozzle 9 are provided adjacent one end of the table 1 in the portion of the path of travel of the indentations that is covered by the cover 5. The burner 8 and the nozzle 9 are mounted on a support 10. The cover 5 is a fixed arcuate member that is positioned a small distance radially outwardly of the table 1 so that the rod-like resin articles 7 do not move out from the indentations 2 even when they are contacted by the flame or the air blast. In the embodiment illustrated, the uppermost end of the cover 5 is located in trailing relationship to the cams 3 and 3', but in general, it is preferred that the cover 5 be extended up to the leading ends of the cams 3 and 3'. As shown in Fig. 2, the cams 3 and 3' are a pair of oppositely inclined plates arranged so that the leading side, with respect to the advancing direction of the table 1, of each inclined plate is spaced from the table 1 and the trailing end thereof is positioned close to the rotary member 1 at a prescribed position. The end 7' of the rod-like resin article to be treated contacts the trailing end of the guide 3' and is positioned thereby in position for contact by the treating tool.

When the table 1 is rotated in the direction of the arrow in Fig. 1, the articles 7 stored in the hopper 4 are moved one by one into the indentations 2 formed on the periphery of the table 1. In order to arrange the articles 7 parallel to the indentations 2, it is preferred that a vibrator 6 be attached to the hopper 4. The articles 7 thus received in the indentations 2 are aligned by the cams 3 and 3' so that each article 7 projects from the end surface of the table 1 by a length *l* as shown in Fig. 2. When the articles 7 are thus arranged at prescribed positions and are moved upwardly by rotation of the table 1, they are retained in the indentations by the cover 5 and the projecting ends of the articles 7 are melted and thus rounded by the flame from the gas burner 8 and then cooled by a jet of air from the nozzle 9. Then, the treated articles 7 are discharged from the table 1.

If it is desired to treat both ends of the rod-like articles 7, a gas burner 8 is disposed adjacent both ends of the table 1. If it is desired to use two rod-like resin articles

simultaneously during a subsequent treatment step, two processing apparatuses, each having the above structure, may be disposed symmetrically and the processed rod-like resin articles are brought together in a single discharge zone.

As will be apparent from the foregoing description, according to the processing apparatus of the present invention, rod-like articles can be processed one by one continuously and hence, the processing can be accomplished with high efficiency.

WHAT WE CLAIM IS:—

1. Apparatus for treating the aligned ends of a plurality of elongated articles, which comprises a circular table rotatable about a horizontal axis and having a plurality of indentations spaced around its periphery, each indentation being capable of receiving a single article, means for feeding one article into each indentation while that indentation is moving upwardly, a burner positioned adjacent one end wall of the table for directing a flame substantially parallel to that wall for heating an end of each article projecting beyond that wall of the table, and a pair of positioning means above and downstream of the feeding means but upstream of the burner and adjacent the opposite end walls of the table for engaging the ends of the articles and positioning the articles in fixed axial positions within the indentations.

2. An apparatus according to Claim 1, wherein the indentations are equally spaced around the periphery of the table and extend parallel to the axis of rotation of the table.

3. A process according to Claim 1 or Claim 2 comprising a nozzle located downstream of the burner for directing cooling fluid against the heated ends of the articles, and an arcuate cover plate radially spaced a small distance from the periphery of the table for holding the articles in the indentations, said cover plate at least extending from adjacent the nozzle to adjacent the positioning means.

4. An apparatus substantially as herein described, with reference to the accompanying drawings.

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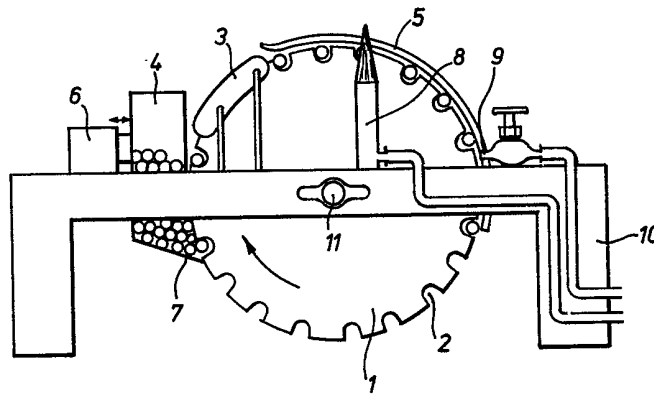


FIG. 1.

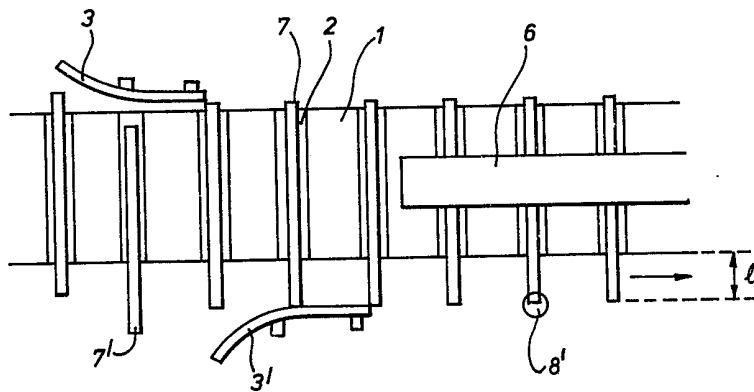


FIG. 2.