

**United States Patent** [19]

[11] **Patent Number:** **5,648,031**

**Sturtevant et al.**

[45] **Date of Patent:** **Jul. 15, 1997**

- [54] **METHOD OF FORMING ANTISLIP SURFACES ON THERMOFORMED PRODUCTS**
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- [73] Assignee: **Custom Plastics Molding, Inc.**, Benton, Me.

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*Primary Examiner*—Catherine Timm  
*Attorney, Agent, or Firm*—W. G. Fasse; W. F. Fasse

- [21] Appl. No.: **282,219**
- [22] Filed: **Jul. 28, 1994**
- [51] **Int. Cl.**<sup>6</sup> ..... **B29C 51/02; B29C 51/10**
- [52] **U.S. Cl.** ..... **264/80; 264/134; 264/510; 264/512; 264/309; 264/DIG. 72; 296/39.2**
- [58] **Field of Search** ..... 264/510, 511, 264/512, 134, 309, DIG. 72, 131, 132, 80; 427/256, 261, 264, 270, 272, 276, 421, 422, 426; 296/39.2

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[57] **ABSTRACT**

A process for selectively forming an antislip surface on a product thermoformed from a plastic sheet is applied to truck bed liners, for example. The surface of the plastic sheet of HDPE or other thermoplastic material is cleaned and masked, to prepare a good molecular bonding surface on selected surface areas. A sprayable or liquid polymer selected to achieve desired characteristics of hardness and toughness without brittleness, such as a thermosetting elastomeric polymer, is formed into droplets, which are sprayed or otherwise applied onto the selected surface area. The droplets form a stippled pattern of primarily separate bumps across the selected surface area to be treated, occupying substantially less than 50% of the exposed area. After partial hardening of the bumps, the plastic sheet is thermoformed at thermoforming temperatures to produce the thermoformed product. Thermoforming tightly bonds the bumps or droplets to the thermoplastic sheet material, hardens the droplets forming macroscopic asperities, increases or enhances the three dimensional surface relief, and explodes some droplets with entrapped air to increase surface roughness.

**55 Claims, 4 Drawing Sheets**

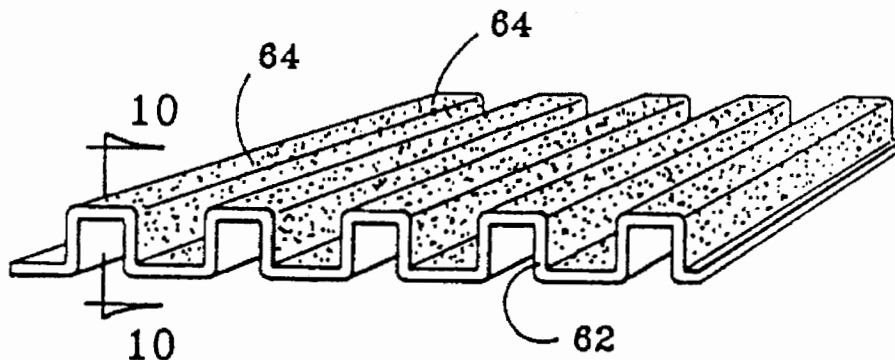


FIG. 1

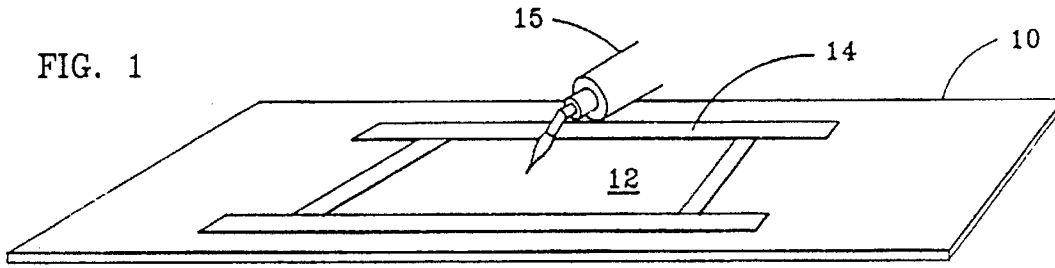


FIG. 2

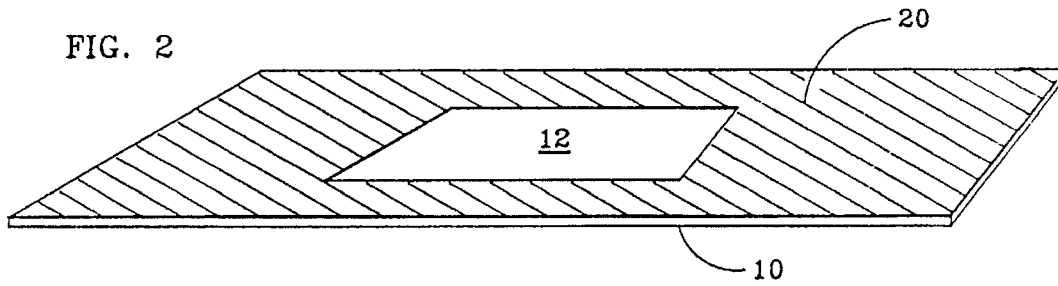
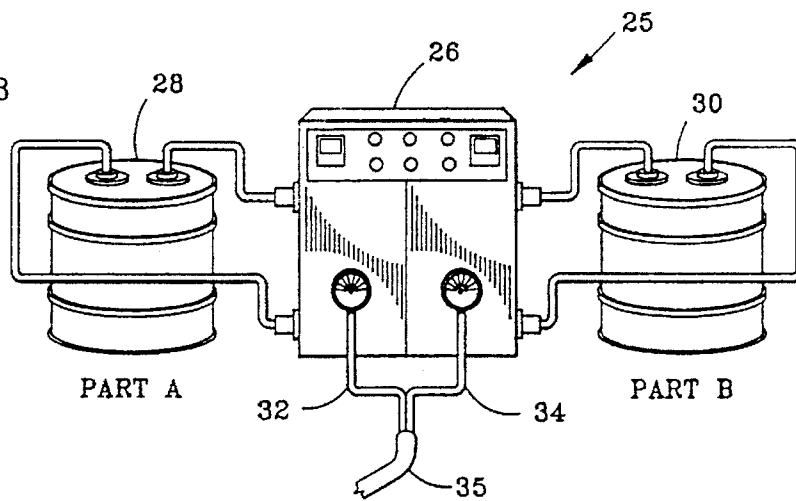
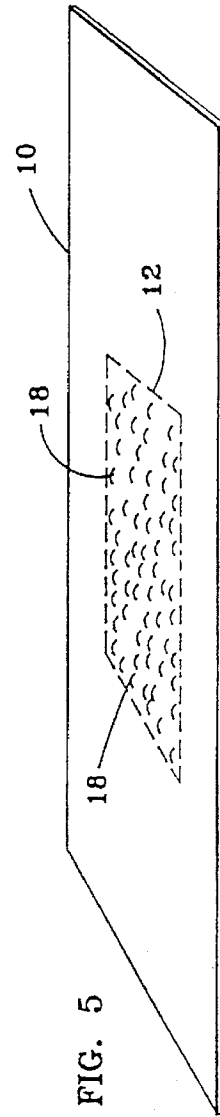
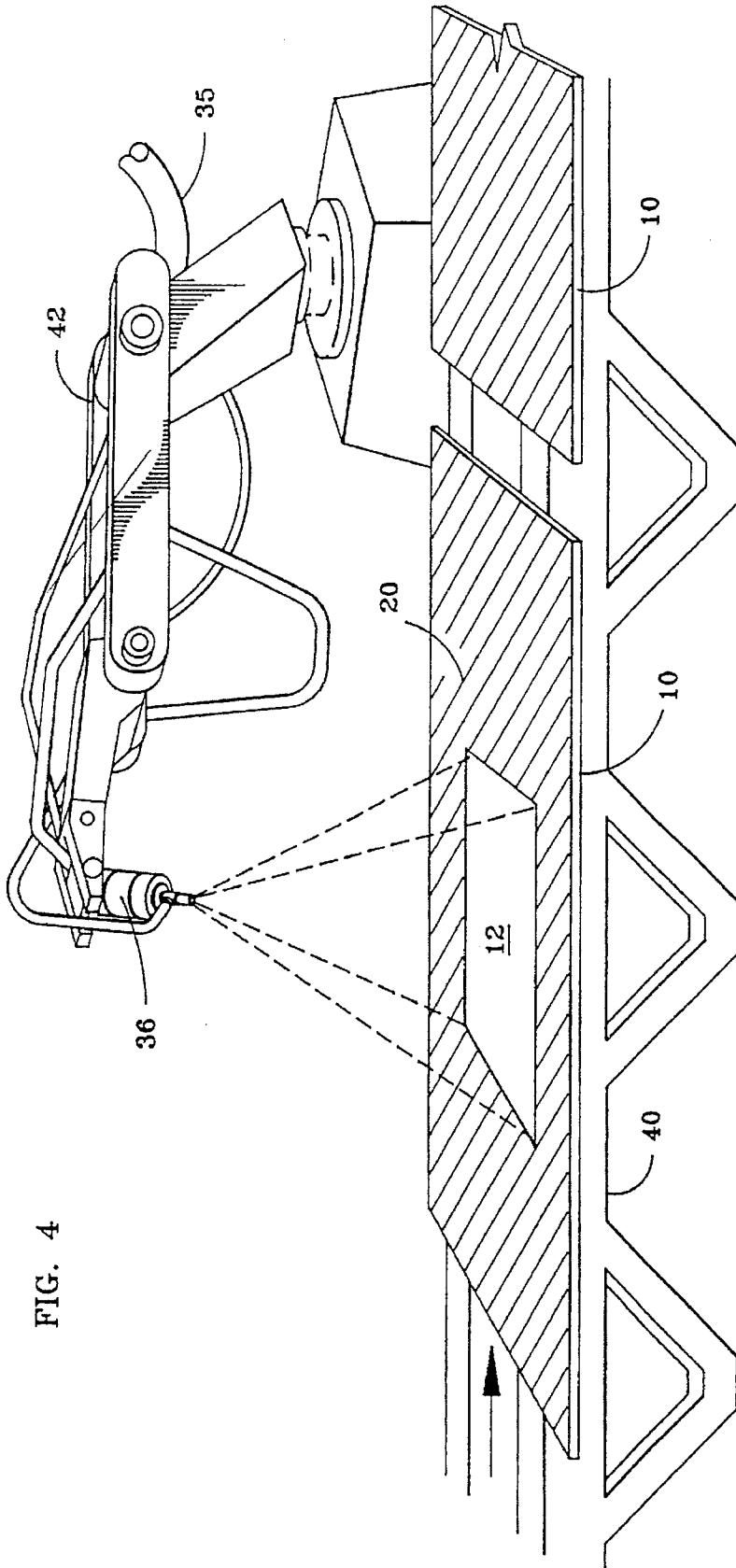


FIG. 3





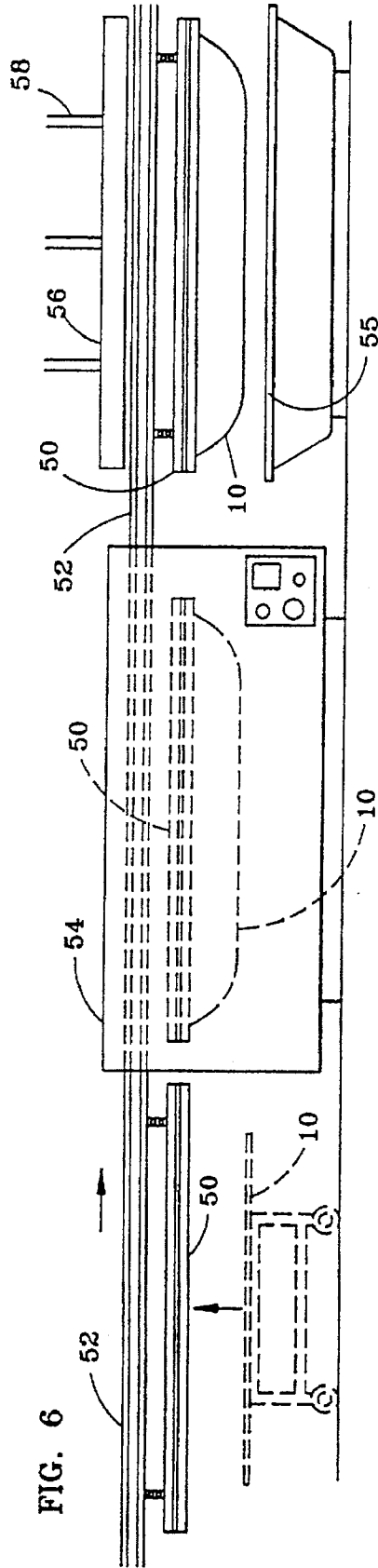


FIG. 6

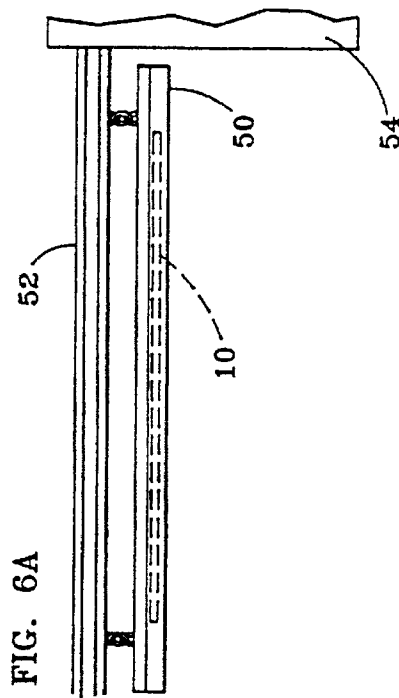


FIG. 6A

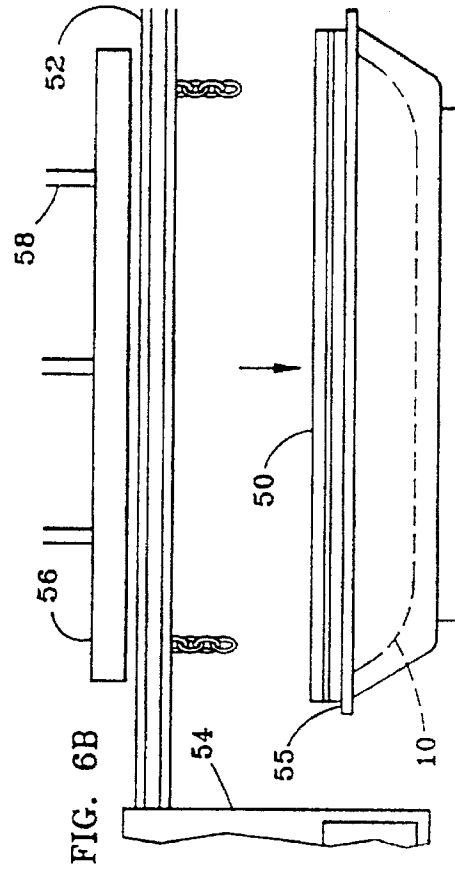


FIG. 6B

FIG. 7

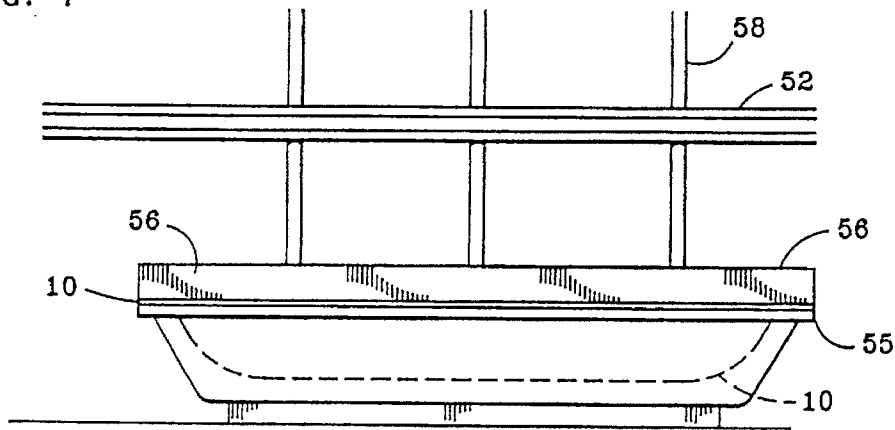


FIG. 8

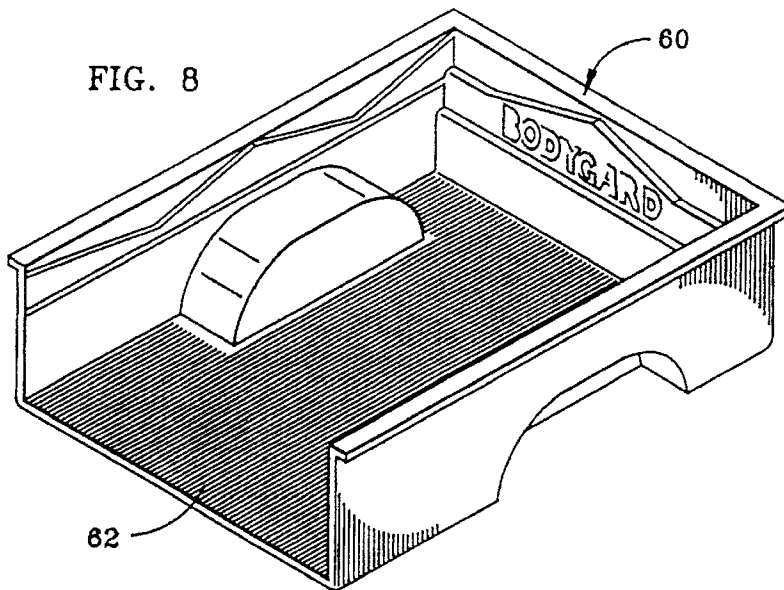


FIG. 9

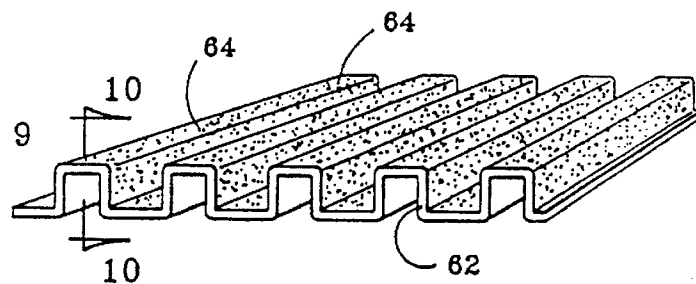
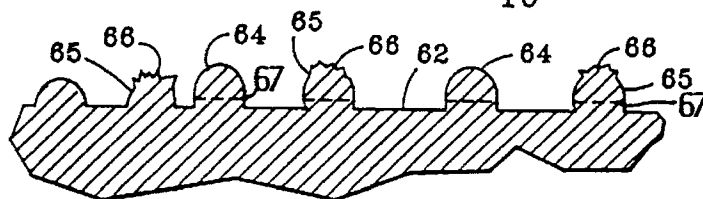


FIG. 10



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