

[54] CONTROLLED ELASTOMERIC TOOLING FOR PLASTIC FABRICATION

[75] Inventor: John Prunty, San Diego, Calif.

[73] Assignee: General Dynamics Corp./Convair Division, San Diego, Calif.

[21] Appl. No.: 311,102

[22] Filed: Oct. 13, 1981

[51] Int. Cl.<sup>3</sup> ..... B29D 3/02; B29C 1/12; B29C 1/02

[52] U.S. Cl. .... 264/257; 249/127; 264/137; 264/313; 425/406; 425/DIG. 14; 425/DIG. 44

[58] Field of Search ..... 264/257, 337, 258, 338, 264/313, 314; 425/DIG. 44, 440, 547, 417, 457, 425/DIG. 14, 406, 407, 384, 385; 100/93 P, 295, 100/211; 249/127

[56] References Cited

U.S. PATENT DOCUMENTS

248,322	10/1881	Jacobs	100/295
260,083	6/1882	Bowker	100/257
374,748	12/1887	Netter et al.	100/257
457,482	8/1891	Royle et al.	425/192
2,714,226	8/1955	Axelrad	264/337
3,204,550	9/1965	Swiderski et al.	100/295
3,284,858	11/1966	Taccone	100/211
3,295,559	3/1967	Horn et al.	264/313
3,546,221	12/1970	Johnson	264/249
4,111,024	9/1978	Dahlman et al.	100/211
4,133,626	1/1979	Schubart	425/417
4,167,430	9/1979	Arachi	264/313

FOREIGN PATENT DOCUMENTS

197803	3/1978	Fed. Rep. of Germany	425/385
1060296	5/1954	France	100/211
54-43961	4/1979	Japan	425/440

Primary Examiner—Willard E. Hoag  
Attorney, Agent, or Firm—John R. Duncan

[57] ABSTRACT

Fiber reinforced thermoplastic resin composites are molded and cured in a system using controlled elastomeric tooling to apply molding pressure only after temperature has been increased to a selected point. A composite material to be molded and cured is typically placed between a fixed mold surface and a movable reaction block. A container is mounted on a fixed support behind the block in a manner permitting movement toward the block. The container has an interior base generally parallel to the block and an upstanding edge extending toward the block. A pad of an elastomeric material having a positive coefficient of thermal expansion is retained in the container by the edges. The pad extends beyond the edges into contact with the block. A gap of selected size lies between the pad and the container base. As the assembly is heated during molding, the pad expands into the gap without exerting significant pressure on the block. As heating continues, the gap becomes filled and the pad expands against the block exerting the selected molding pressure at the selected temperature. Adjustment means are provided permitting uniform molding pressures and pressure application temperatures over a large number of pads in complex mold assemblies despite variations in pad dimensions, age, etc.

9 Claims, 6 Drawing Figures

