

warmed laminate 19 is then placed between cold opposing dies 200a, 200b (that is, at a temperature of from about 40°F (4.4°C) to about 60°F (15.6°C)) in a mold, see Figs. 6A and 6B, or other cold shaping tool. The dies 200a, 200b are capable of moving relative to each other between open (Figure 6A) and closed (Figure 6B) positions (see action arrows in Figs. 6A and 6B). Each mold half is connected to a hydraulic or pneumatic press or like motive device capable of moving these halves, and hence, the dies 200a, 200b towards each other.

When the dies 200a, 200b are brought together by the press, the laminate 19 is thus compressed or compacted in a first section to a first thickness T_1 of from about 0.25 mm to about 3 mm so as to form the first region 28, yet is preferably only compressed in a second section to a second thickness T_2 of from about 0.8 mm to about 19 mm so as to form the second region 30. The compressed laminate 19 along with fabric layer 40 and vinyl or leather layer 42 comprise the integral unit 10.

A multi-layer substrate 190, formed in accordance with a second embodiment of the present invention and adapted to be used to form a vehicle trim panel/radiator element integral unit, is illustrated in Fig. 7, where like reference numerals indicate like elements. The substrate 190 comprises a core layer 22 and first and second outer layers 240 and 250. Only a single outer layer 240 or 250 is provided on each side of the core layer 22. The first and second outer layers 240 and 250 are preferably of a greater thickness than any one of outer layers 24-27 of the Fig. 3 embodiment so as to give the substrate 190 and resulting vehicle trim panel/radiator element integral unit sufficient strength. For example, each outer layer 240 and 250 may comprise six layers such as first, third, fourth and sixth layers 230, 232, 233 and 235 formed from polyethylene and having the same density and thickness as each polyethylene layer in the Fig. 4A embodiment and further comprise second and fifth glass veil or carbon fiber mat layers 231 and 234, which are of the same density and thickness as the glass veil or carbon fiber mat layer in the Fig. 4A embodiment.

The substrate 19 or 190 may also be formed of a size sufficient to allow it to be molded into a headliner 90, see Fig. 8, or other vehicle component, such as a trunk liner (not shown). The headliner 90 is molded so as to have at least one first region 28 having a first thickness T_1 and defining a radiator element 28a and a second region 30 having a second thickness T_2 , which is greater than the first thickness T_1 . The first region(s) 28