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McIntosh et al.

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(54) **VEHICLE FLOOR COVERING WITH INTEGRAL THREADED DRAIN TUBE AND METHOD OF MAKING SAME**

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(51) **Int. Cl.**⁷ **B62D 25/20**

(52) **U.S. Cl.** **296/97.23; 220/235; 52/302.7; 470/906**

(58) **Field of Search** 296/38, 39.1, 39.3, 296/97.23, 208; 220/235, 288; 52/302.1, 302.7; 470/906

(56) **References Cited**

U.S. PATENT DOCUMENTS

936,444 A	*	10/1909	Gillon	220/288
1,649,734 A		11/1927	Roberts et al.	156/221
1,764,662 A		6/1930	Tomlin	264/255
2,032,832 A		3/1936	Blair et al.	180/90.6
2,258,238 A		10/1941	Collins	156/156
2,336,423 A		12/1943	Rieser	264/318
2,650,855 A		9/1953	Peirce	296/97.23
3,042,974 A		7/1962	Gerstenmaier et al.	264/552
3,050,329 A		8/1962	Pagan	296/97.23
3,061,888 A		11/1962	Wadham	264/437
3,082,032 A		3/1963	Stata	296/97.23
3,143,373 A	*	8/1964	Fordyce	296/107.01
3,149,875 A		9/1964	Stata	296/97.23
3,284,836 A		11/1966	Ioppolo	15/313
3,450,429 A		6/1969	Stata	296/97.23
4,071,273 A	*	1/1978	Hack et al.	296/208
4,280,976 A		7/1981	Von Holdt	264/152

4,508,771 A	4/1985	Peoples, Jr. et al.	428/95
4,579,764 A	4/1986	Peoples, Jr. et al.	428/95
4,958,743 A	* 9/1990	Hatton et al.	220/288
4,978,004 A	* 12/1990	Silverstein et al.	206/224
5,322,335 A	6/1994	Niemi	296/97.23
5,518,679 A	5/1996	Junk	264/318
5,527,081 A	* 6/1996	Rauch et al.	296/186
5,673,956 A	* 10/1997	Emery	296/39.2
5,957,154 A	* 9/1999	Olaker	137/296

FOREIGN PATENT DOCUMENTS

JP	03 284 432	12/1991
JP	07 010 039	1/1995
JP	08 156 669	6/1996

OTHER PUBLICATIONS

International Search Report, European Patent Office, Oct. 2000, PCT/US00/40112.

* cited by examiner

Primary Examiner—Stephen T. Gordon

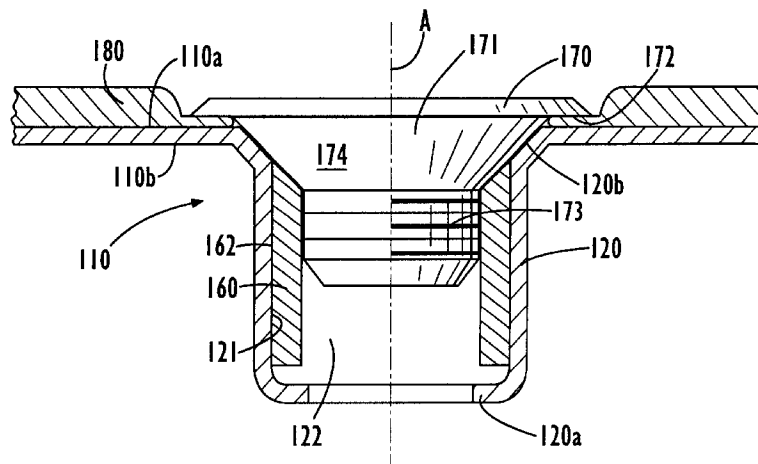
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(57) **ABSTRACT**

A molded floor covering for a vehicle floor includes a thermoplastic polymer layer with an integral, threaded drain tube extending therefrom. The drain tube is configured such that a distal end thereof can extend through a drain hole in a vehicle floor when the floor covering is installed within a vehicle. The drain tube includes a threaded bore that is configured to receive a correspondingly-threaded drain plug therein. A method of producing a molded floor covering having an integrally formed, threaded drain tube includes providing a mold having a contour of a vehicle floor with an outwardly projecting threaded member. A layer of thermoplastic polymer is vacuum formed over the mold and around the threaded member such that the layer follows the contours of the mold and threaded member to form an elongate tube extending therefrom.

5 Claims, 4 Drawing Sheets



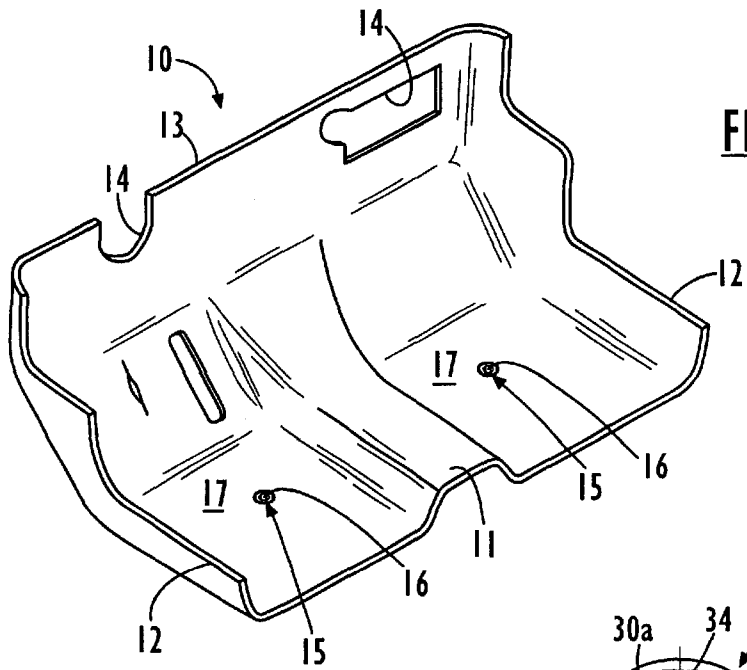


FIG. 1.

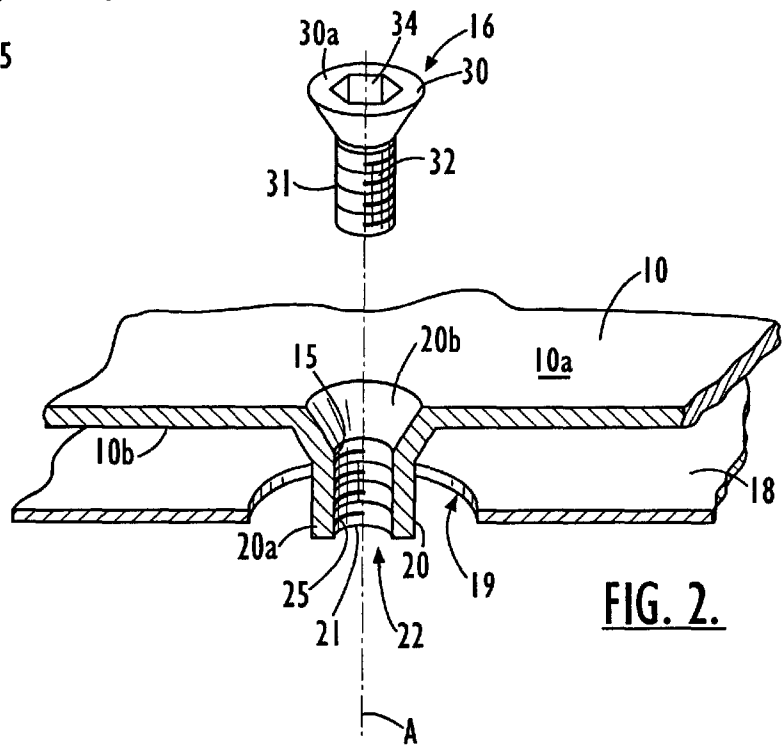


FIG. 2.

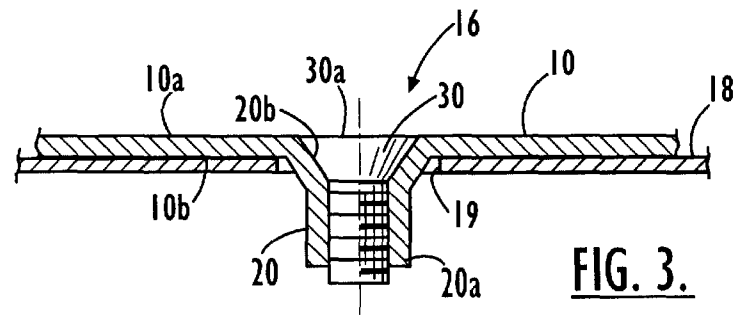


FIG. 3.

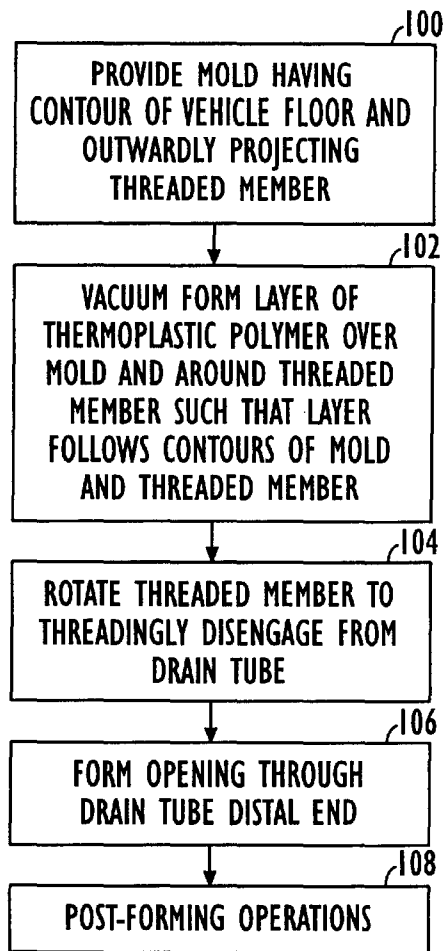


FIG. 4.

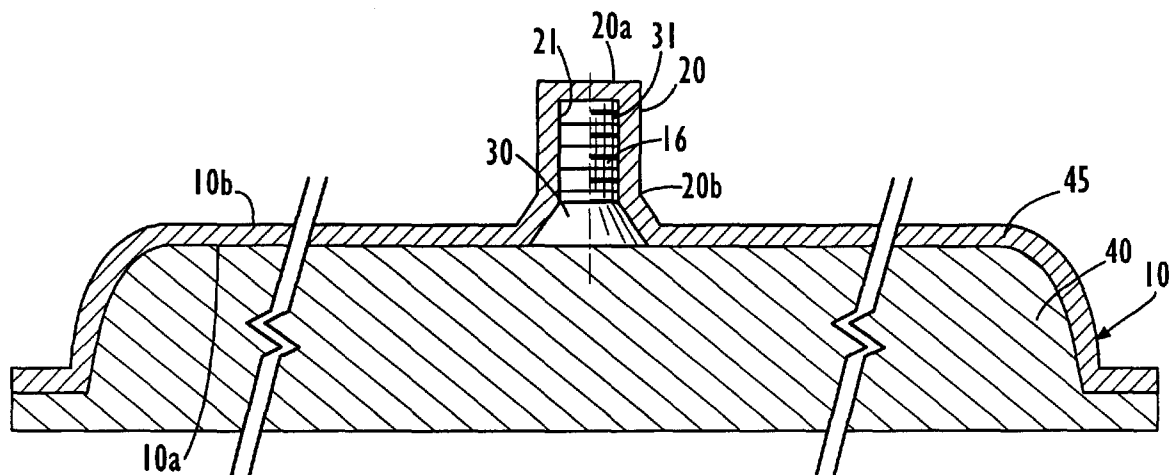


FIG. 5.

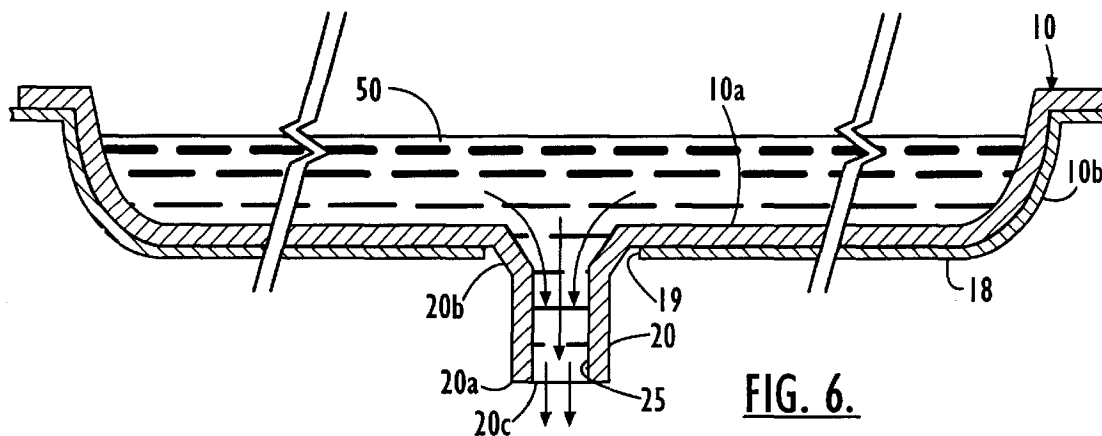


FIG. 6.

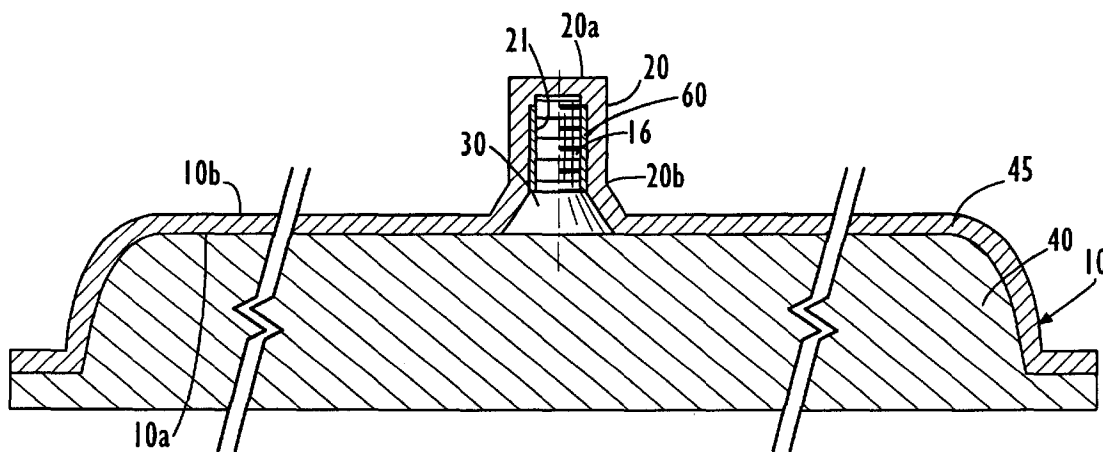


FIG. 7A.

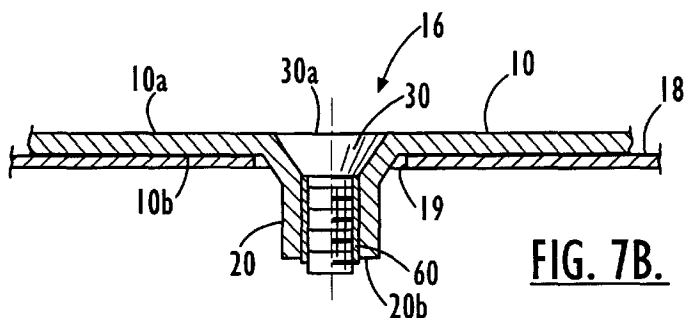


FIG. 7B.

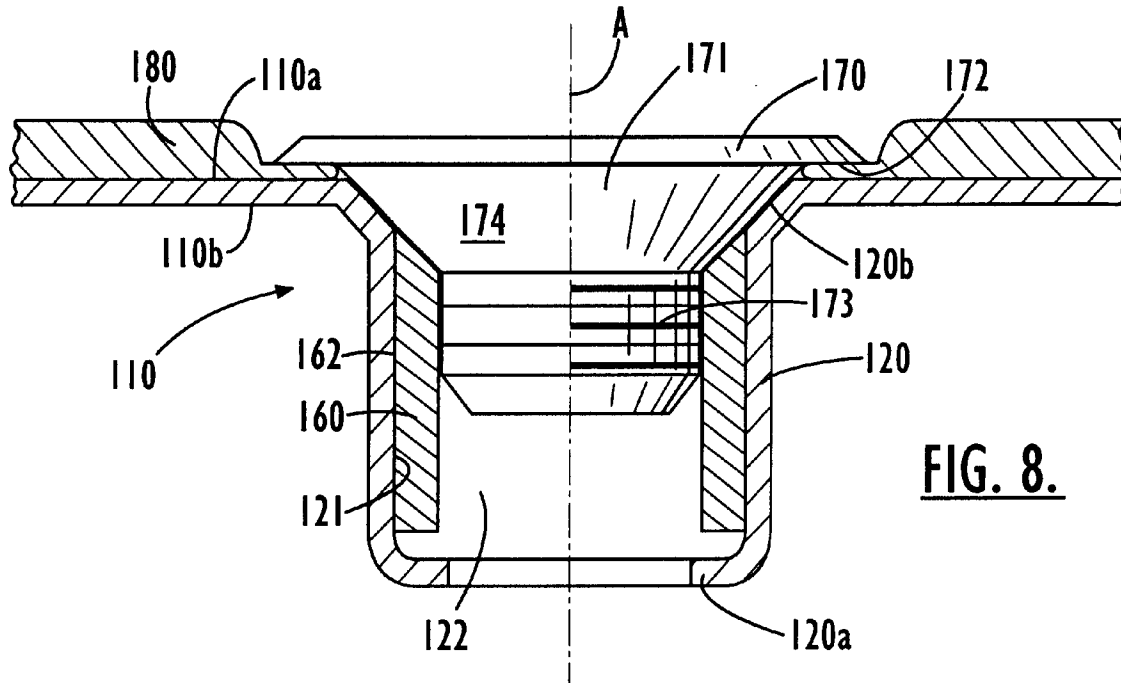


FIG. 8.

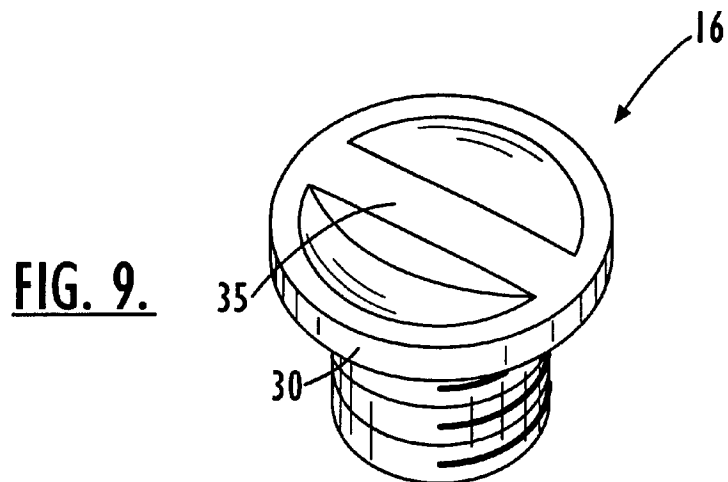


FIG. 9.

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