ponent) when the first and second mold components are coupled to form a mold cavity and liquid plastic is injected within the mold cavity.

FIG. **5** illustrates a porous medium within a mold component, according to one embodiment. Coolant flows from a coolant inlet **120** and into a porous medium **504** via a porous medium inlet **506**. Likewise, coolant flows out of the porous medium **504** and through a coolant outlet **122** via a porous medium outlet **508**. Although only one mold protrusion is illustrated in the embodiment of FIG. **5**, in practice, any number of mold protrusions can be implemented within a mold component.

In the embodiment of FIG. **5**, a mold protrusion **502** within a mold component includes an impermeable outer surface and an internal porous medium **504** filling the mold protrusion from a porous medium inlet to the impermeable outer surface. As the porous medium provides structural support within the mold protrusion **502**, the mold protrusion does not need a separate and additional mold wall (such as the mold wall **304** of FIG. **4**) to provide structural support (though it should be appreciated that the impermeable outer surface of the mold protrusion **502** has some necessary thickness). In addition to providing structural support within the mold protrusion **502**, the absence of a mold wall can beneficially increase the transfer of thermal energy from a liquid plastic injected within a mold cavity to the coolant within the porous medium **504**.

It should be noted that the mold protrusion **502** of FIG. **5** can be implemented within any mold component, such as the male mold component **112** of the embodiment of FIG. **4**. Further, it should be noted that the shape of any mold protrusion and mold component illustrated herein is for the purposes of illustration only. The porous medium-based coolant system described herein can be implemented within mold protrusions and mold components of any shape or size accordingly to the principles described herein.

FIG. **6** is a flow chart illustrating a process for cooling molded plastic in an injection molding environment, according to one embodiment. Mold components are securely coupled **600**, forming a mold cavity between the mold components. Liquid plastic is injected **610** into the mold cavity. Coolant is pumped **620** into a porous medium thermally coupled to the mold cavity, such as a porous medium within a mold component protrusion. Thermal energy is transferred from the injected plastic to the coolant within the porous medium. Responsive to the temperature of the injected plastic falling below a solidifying threshold, the mold components are decoupled **630**.

Additional Considerations

Reference in the specification to "one embodiment" or to "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiments is included in at least one embodiment. The appearances of the phrase "in one embodiment" or "an embodiment" in various places in the specification are not necessarily all referring to the same embodiment.

In addition, the language used in the specification has been principally selected for readability and instructional purposes, and may not have been selected to delineate or circumscribe the inventive subject matter. Accordingly, the disclosure is intended to be illustrative, but not limiting, of the scope of the embodiments.

While particular embodiments and applications have been illustrated and described herein, it is to be understood that the embodiment is not limited to the precise construction and components disclosed herein and that various modifications, changes, and variations may be made in the arrangement, operation, and details of the methods and apparatuses without departing from the spirit and scope.

What is claimed is:

1. A cooling system for an injection molding device, comprising:

a cooling system inlet configured to receive coolant pumped into the cooling system inlet;

a cooling system outlet configured to provide coolant pumped out of the cooling system outlet;

a porous medium disposed within an injection molding device component, the injection molding device component comprising a mold wall and thermally coupled to a mold cavity formed when the injection molding device component is coupled to a reciprocal injection molding device component and configured to receive injected liquid plastic, the porous medium thermally coupled to the mold cavity via the mold wall;

a porous medium inlet coupled to the cooling system inlet and the porous medium, the porous medium inlet configured to allow coolant to flow from the cooling system inlet and into the porous medium via the porous medium inlet; and

a porous medium outlet coupled to the cooling system outlet, the porous medium outlet configured to allow coolant to flow from the porous medium and out of the cooling system outlet via the porous medium outlet, the porous medium inlet extending into the porous medium through a boundary between the porous medium outlet and the porous medium.

2. The cooling system of claim **1**, further comprising:

a coolant supply tank configured to maintain coolant within the coolant supply tank at or below a pre-determined threshold temperature, the coolant supply tank coupled to the cooling system outlet; and

a pump coupled to the coolant supply tank and the cooling system inlet and configured to pump coolant from the coolant supply tank into the cooling system inlet.

3. The cooling system of claim **2**, further comprising:

a controller communicatively coupled to the pump and configured to cause the pump to pump coolant from coolant supply tank and into the cooling system inlet in response to the injection of liquid plastic into the mold cavity and until the temperature of the injected liquid plastic falls below a solidifying threshold.

4. The cooling system of claim **3**, further comprising:

one or more temperature sensors thermally coupled to the mold wall and to the controller, and configured to provide the temperature of liquid plastic injected within the mold cavity to the controller.

5. The cooling system of claim **1**, wherein the porous medium inlet is disposed within the porous medium such that the porous medium inlet is not directly coupled to the mold wall.

6. The cooling system of claim **1**, further comprising:

a second porous medium disposed within the injection molding device component, the second molding device component comprising a second mold wall and thermally coupled to a second mold cavity formed when the injection molding device component is coupled to the reciprocal injection molding device component and configured to receive injected liquid plastic, the second porous medium thermally coupled to the second mold cavity via the second mold wall;

a second porous medium inlet coupled to the cooling system inlet and the second porous medium, the second porous medium inlet configured to allow coolant to flow