surface as defined herein. In one embodiment, the adhesive may be formed to itself include the layer **75** and structured surface **76** thereon.

[**0100**] The substrate **100** may assume any form suitable for support of the layer **75**, and may be formed from a rigid material or a flexible material. For example, the substrate may be metal, wood or formed from a polymer material, and may serve as a portion of a floor, wall or an exterior or interior machine or structure surface. Depending upon the desired application, the fluid transport device **74** may include a cap layer **92** and/or connector **86** for collecting liquid.

[**0101**] In some applications, an alternative form of a liquid collection system is desired. **FIG. 4** illustrates one such system. The layer **75** has the structured surface **76** on its top side and adhesive means **102** on its bottom side. The structured surface **76** has a plurality of channels **82** therein (shown as parallel linear channels in **FIG. 4**). One or more cross-channels are formed in the structured surface **76**, such as cross-channels **105**, **106**, **107** and **108**. The cross-channels are added to the structured surface **76** after its initial formation (e.g., after the structured surface **76** has been molded into the layer **75** of polymeric material). Each cross-channel may be formed by removing portions of the peaks **90** between adjacent channels **82**, such as by cutting those portions away or removing them by the application of heat and/or pressure, or by overlaying a strip of material capable of transporting liquid therethrough on top of the structured surface **76**.

[**0102**] A post embossing method (after the microstructured layer **75** has been applied to the substrate) achieves a preferred embodiment for liquid communication along the channels on the face of the fluid transport device **75**. The structured surface **76** may be embossed with a hot wire to define each cross-channel in order to provide a means for liquid communication between the channels **82** to existing or newly defined liquid outlets in application. Such a liquid outlet may include a central liquid removal aperture **110** (as seen in **FIG. 4**) or, in the case where the cross-channels do not intersect, a separate liquid removal aperture for each cross-channel. Each liquid removal aperture extends through the layer **75**, adhesive **102** and the substrate **100**.

[**0103**] As illustrated in **FIG. 5, a** liquid collection system may be fluidly coupled to the aperture **110**. In some applications, the liquid collector may include a reservoir **112** for liquid, coupled to the aperture **110** by a suitable conduit **114**. Further, the system may include a source **116** for providing a potential to the system for moving liquid over the structured surface **76** (through channels **82**, cross-channels **105**, **106**, **107** or **108**, aperture **110**, conduit **114** to the reservoir **112**). The reservoir **112** may simply be a collector site or sump, and the source **116** (if employed) may be a vacuum pump or any of the other types described herein. In applications where multiple apertures **110** are provided (e.g., one aperture for each cross-channel), multiple conduits **114** may likewise be provided, with each conduit **114** connecting one or more of the apertures **110** to the reservoir **112** (or to separate reservoirs).

[**0104**] As also seen in **FIG. 5**, the structured surface **76** may take a form similar to that illustrated in **FIG. 2***c*, wherein some channel peaks **90***a* are higher than other channel peaks **90***b*. Thus, when removing peak material to define a cross-channel (such as cross-channel **105** in **FIG. 5**), only an upper portion **120** of each peak **90***a* need be removed in order to define the cross-channel and define a means for controlled liquid flow across the channels **82** of the structured surface **76**. In one preferred embodiment, the upper portion **120** of each higher peak **90***a* is formed from a material having a lower melting temperature than a lower portion **122** of the peak **90***a*, and the cross-channel is formed by applying heat to a temperature high enough to melt the upper portion **120** of the peak **90***a*, but not melt its lower portion **122**. While a cap layer would typically be employed in the active fluid transport device illustrated in **FIGS. 4 and 5**, the cap layer has been not shown in those figures for purposes of illustration.

[**0105**] While parallel channels (e.g., **FIG. 5**) may be preferred, alternate channel patterns are contemplated, as mentioned above. **FIGS. 6***a* and **6***b* schematically illustrate alternate channel configurations in plan views that may define a structured surface in a fluid transport device of the present invention. As shown in **FIG. 6***a*, the structured surface may have multiple discrete non-parallel converging channels **130** to provide for intermediate collection of liquid. These converging channels **130** connect to a single discrete channel **132** which may, in turn, be connected to an outlet port or liquid removal aperture (not shown). As shown in **FIG. 6***b*, a central channel **134** connects to a plurality of channel branches **136** that may be designed to cover a particular area for similar reasons. Again, generally any channel pattern is contemplated in accordance with the present invention as long as a plurality of discrete channels are provided over a portion of the structured surface from a first point to a second point. Like the above embodiments, the patterned channels shown in **FIGS. 6***a* and **6***b* are preferably covered with a cap layer for further defining discrete flow channels that allow the potential to be accommodated along a particular channel essentially independent of its neighboring channels.

[**0106**] As to any of the channels contemplated above and in accordance with the present invention, such channels are defined within a structured layer by the structured surface of a first major surface of the layer. The channels in accordance with the present invention are configured to be discrete to allow any one channel to receive liquid from the ambient environment independently of the other channels. The microstructured size of each channel encourages single-phase flow of liquid in bulk volumes. Without having air entrained in the liquid, noise generation is significantly reduced and less stress can be placed on liquids that are transported through the active fluid transport device.

[**0107**] The individual flow channels of the microstructured surfaces of the invention are substantially discrete. That is, liquid can move through the channels independent of liquid in adjacent channels. The channels independently accommodate the potential relative to one another to direct a liquid along or through a particular channel independent of adjacent channels. Preferably, liquid that enters one flow channel does not, to any significant degree, enter an adjacent channel, although there may be some diffusion between adjacent channels. It is important to effectively maintain the discreteness of the micro-channels in order to effectively transport the liquid and maintain advantages that such channels provide. Not all of the channels, however, may need to be discrete for all embodiments. Some channels may