entry into the blood system, these avenues have been considered rather insignificant. See, e.g., Aulton, Pharmaceutics: The Science of Dosage Form Design (2d edition, Churchill Livingston, Harcourt publishers, 2002).

[005] The transdermal route has become one of the most successful and innovative focus's for research in drug delivery. Over 35 therapeutic agents have now been approved for sale in the U.S., and approximately 16 active ingredients have been approved for use globally. However, there is still a need for better ways to deliver a therapeutic agent by the transdermal route. For example, transdermal delivery systems on the market today are limited to small molecular weight drugs with very small daily dosages often companied by various patient discomforts. The present specification discloses a transdermal delivery system that uses a device to administer a vapor comprising liquid particles including a supersaturated amount of a dissolved therapeutic agent that enters the circulatory system via the sweat gland pore and duct system.

SUMMARY

[006] ~~Thus, aspects of the present specification disclose a transdermal device. A transdermal delivery device disclosed herein can comprise a pressure cylinder, a permeation valve, an exchange chamber and a treatment chamber. The above components can be fitted within a housing.~~An aspect of the present invention provides a method of producing a substance comprising a supersaturated amount of dissolved gas using a transdermal delivery device, the method comprising the steps of: a) placing the substance in an air-tight container; and b) exposing the substance to carbon dioxide, wherein upon exposure, the carbon dioxide dissolves into the substance in an amount greater than the substance could dissolve at 25 °C and 1 atm, wherein the substance is a liquid or a colloid and wherein the transdermal delivery device comprises: a) a housing including i) an external body shell comprising a fluid chamber assembly access cover movably engaged with the external body shell; ii) an interior compartment including an open-ended delivery outlet and a vapor producing assembly compartment; and iii) a cartridge retaining container comprising an external covering shell and an internal cartridge compartment configured to hold a compressed gas cartridge, wherein the cartridge retaining container is detachably engaged with the external body shell; wherein the vapor producing assembly compartment is located in between the open-ended delivery outlet and the cartridge retaining container; and b) a vapor producing assembly including i) a fluid chamber assembly comprising a fluid container and a removable fluid container cap; and ii) a permeation valve configured to reduce the pressure of a gas removed from the compressed gas cartridge and delivered to the fluid chamber assembly; wherein the vapor producing assembly is substantially contained within the vapor producing assembly compartment.

[007] ~~Other aspects of the present specification disclose a vapor producing assembly within the exchange chamber. A vapor producing assembly disclosed herein can comprise a permeation valve and a fluid chamber assembly. A vapor producing assembly disclosed herein may optionally comprise a control switch assembly.~~Another aspect of the present invention provides a transdermal delivery device comprising a cylinder containing pressurized carbon dioxide; a permeation valve configured to reduce the pressure of the pressurized carbon dioxide; a chamber configured to supersaturate a liquid in the chamber with carbon dioxide thereby forming a therapeutic vapor wherein the carbon dioxide dissolves into the liquid in an amount greater than the liquid could dissolve at 25 °C and 1 atm; and a treatment chamber configured to deliver the therapeutic vapor to an individual.

[008] ~~Yet other aspects of the present specification disclose a method of producing a substance comprising a supersaturated amount of dissolved gas. A method of producing a substance disclosed herein comprises the steps of placing a substance as disclosed herein into an air-tight container; and exposing the substance to gas, wherein upon exposure, the gas dissolves into the substance in an amount greater than the substance could dissolve at 25 °C and 1 atm. The gas may be carbon dioxide. The resulting substance supersaturated with the dissolved gas can then be administered to an individual to treat a condition as disclosed herein. In another aspect, the present specification discloses a use of a substance comprising a supersaturated amount of dissolved gas to manufacture a medicament. Such a medicament can then be administered to an individual to treat a condition as disclosed herein.~~

[009] ~~Still other aspects of the present specification disclose a method of transdermally administering a therapeutically effective amount of therapeutic agent to an individual. A method of transdermal administration disclosed herein comprises the step of administering a substance comprising a supersaturated amount of dissolved gas to an individual using a transdermal delivery device disclosed herein. In another aspect, a method of transdermal administration disclosed herein comprises the step of administering a substance comprising a supersaturated amount of dissolved gas at a rate set by a~~

~~permeation valve and a therapeutic agent to an individual using a transdermal delivery device disclosed herein. Administration of the gas and/or the therapeutic agent typically treats a symptom associate with a condition. In an aspect, the present specification discloses a use of a substance including a supersaturated amount of dissolved gas to treat a condition using a transdermal device disclosed herein. Aspects also include use of a transdermal delivery device disclosed herein to transdermally administer a therapeutically effective amount of therapeutic agent to an individual.~~

[010] ~~Further aspects of the present specification disclose a method of treating a condition using a transdermal device disclosed herein. A method of treating a condition disclosed herein comprises the step of administering a composition comprising a substance including a supersaturated amount of dissolved gas using a transdermal delivery device as disclosed herein to a body part of the individual suffering from a condition, wherein the administration of the composition reduces a symptom associated with condition. A method of treating a condition disclosed herein also comprises the step of administering a composition comprising a substance including a supersaturated amount of dissolved gas and a therapeutic agent using a transdermal delivery device as disclosed herein to a body part of the individual suffering from a condition, wherein the administration of the composition reduces a symptom associated with condition. A substance may be a liquid aerosol, foam, emulsion, gel, sol, or other substance that can become supersaturated with an amount of dissolved gas. A condition includes, without limitation, an ischemia, a hypertension, a cardiovascular disorder, treating a diabetic disorder, a wound, a chronic inflammation, an arthritis, a migraine, a cellulite disorder, a pale skin disorder, and a cosmesis disorder. In an aspect, the present specification discloses a use of a substance including a supersaturated amount of dissolved gas to treat a condition. A transdermal device disclosed herein may be used to administer the substance over a set period of time at a set rate based on gas cylinder pressure and permeation valve rate. Aspects also include use of a transdermal delivery device disclosed herein to transdermally administer a therapeutically effective amount of therapeutic agent to treat a condition in an individual to an individual.~~

BREIF DESCRIPTION OF THE DRAWINGS

[011] The figures are exemplary of different embodiments of the subject matter disclosed herein. Each illustrated embodiment is not intended to limit the scope of the subject matter disclosed herein, but rather, be exemplary to the scope and spirit of it. Like components in the figures share identical numbering.

[012] FIG. 1 illustrates a block flow chart of components of an example delivery device described herein.

[013] FIG. 2 illustrates a cross-section view of an exemplary housing.

[014] FIG. 3A illustrates an exemplary permeation valve and fluid chamber configuration. FIG. 3B illustrates another exemplary permeation valve and fluid chamber configuration. FIG. 3C illustrates yet another exemplary permeation valve and fluid chamber configuration including an actuator assembly.