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(54) **PRESSURIZED CARTOMIZER**

(57) The present invention relates to an electronic smoking system comprising an aerosol generating device with a compressed fluid reservoir and a tank mount and as well as a tank to be mounted in the tank mount. The tank (1) comprises a cavity (7), which comprises at least a first compartment (8), which is fillable with a vaporizable liquid and a second compartment (9) in which a pressure generator and a pressure regulator is arranged. In a state in which the tank is mounted in the tank mount, the compressed fluid reservoir is in fluid communication with the second compartment with the fluid communication preferably to be controllable by the pressure regulator.

The invention also relates to a method of pressurizing vaporizable liquids in a tank of an aerosol generating device. The device comprises a cavity that is defined by at least one wall, which comprises an orifice, through which a vaporizable liquid is pressable. The cavity comprises at least a first compartment, which is fillable with the vaporizable liquid and a second compartment in which a pressure generator is arranged. The method comprises the steps of: a) Generating a pressure directed from the second compartment to the orifice, b) regulating the pressure by using a mechanical and/or electrical operated pressure regulator and c) transferring the pressure from the pressure generator to the vaporizable liquid.

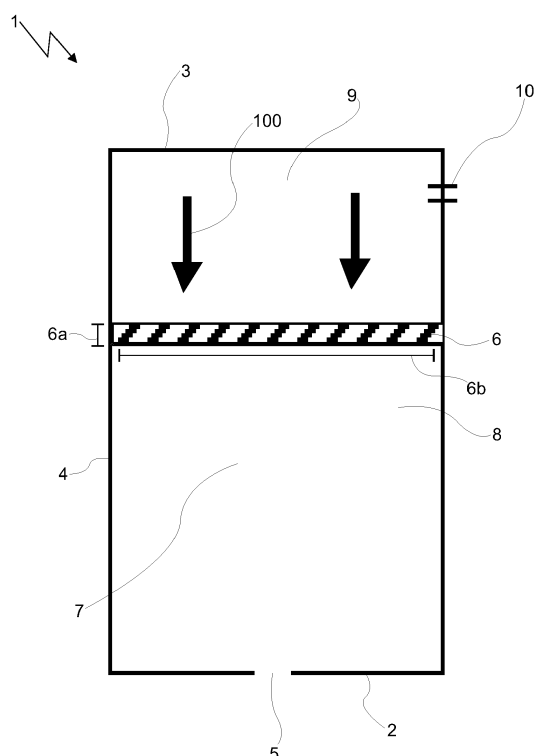


Fig. 1

Description

[0001] The present invention relates to an electronic smoking system comprising an aerosol generating device with a compressed fluid reservoir and a tank mount and as well as a tank to be mounted in the tank mount. The tank comprises a cavity, which comprises at least a first compartment, which is fillable with a vaporizable liquid and a second compartment in which a pressure generator and a pressure regulator is arranged. In a state in which the tank is mounted in the tank mount, the compressed fluid reservoir is in fluid communication with the second compartment with the fluid communication preferably to be controllable by the pressure regulator. The invention also relates to a method of pressurizing vaporizable liquids in said electronic smoking system.

[0002] Electronic cigarettes (e.g. e-cigarettes / inhaler / vaporizer) are popular and widespread. They came with the need and possibility for novel tobacco products to be vaporized and inhaled by smokers. Usually those electronic devices like electronic pipes are designed to generate an aerosol by heating a liquid containing flavors, an aerosol forming agent, such as water and optionally nicotine. Typically these devices comprise at least two parts, one part to supply power to the other part which usually contain at least one electronic unit such as vaporizer that is able to vaporize a liquid.

[0003] Containers connected to the electronic unit are suitable to be filled with those liquids to be vaporized. Commonly a combination of such a vaporizer (or atomizer), a container for liquids and a mouth piece are called cartridge or tank. Despite an increasing demand for those aerosol generating devices, efforts are still required to develop the performance of these devices, especially in view of improved products.

[0004] In general, improvements are related to the aerosol and/or vapor generation to increase its efficiency, aerosol and/or vapor delivery to increase smoking/vaping experience. Usually, the liquid from the container is delivered to the vaporizer (or atomizer) by a flow of the liquid to the vaporizer (or atomizer) caused by gravity. Thus, such mechanism works fine, when consumers hold their devices in a vertical position allowing the liquid to flow down to the vaporizer (or atomizer).

[0005] However, when using an aerosol generating device most consumers hold their devices in a horizontal position. Thus a liquid flow is hindered, especially in a state where liquid is depleted and thus only little liquid remains in the container. This results in a decreasing aerosol and/or vapor generation with decreasing amount of liquid in the tank and moreover it reduces the smoking/vaping experience.

[0006] It is therefore the object of the invention to provide an aerosol generating system, which is able to provide a continuous smoking/vaping experience during the whole smoking/vaping session. Moreover, such aerosol generating system should also provide a constant aerosol generating efficiency. Furthermore the smoking ex-

perience should not depend on a position in which the aerosol generating system is held.

[0007] The afore-mentioned problems are eliminated by an aerosol generating device for generating an aerosol comprising a tank mount, suitable for removably mounting a tank for vaporizable liquids. The device comprises a compressed fluid reservoir, which is fillable with compressed fluid and which is connected in fluid communication to at least a device pressurization port, wherein the pressurization port is arranged at the tank mount.

[0008] Ideally, the device comprises a first channel, which is preferably arranged between the compressed fluid reservoir and the device pressurization port and which preferably is in fluid communication with both the compressed fluid reservoir and the device pressurization port. The compressed fluid can then directed from the compressed fluid reservoir through the first channel to the device pressurization port to leave the device and to enter e.g. a tank. According to a preferred embodiment, the device comprises at least one device pump. Preferably, the device pump comprises or is a micropump, in particular a mechanical or non-mechanical micropump. It may be possible that a driving force of the device pump is generatable by utilization of one of the following, piezoelectric, electrostatic, thermo-pneumatic, pneumatic, magnetic, or light effects. Preferably, the device pump is arranged at the device pressurization port or between the device pressurization port and the compressed fluid reservoir. The device pump allows the transportation of the fluid out of the compressed fluid reservoir and/or the pressurization port.

The present invention also relates to an aerosol generating device with a tank for vaporizable liquids comprising a cavity that is defined by at least one wall, which comprises an orifice, through which a vaporizable liquid is pressable. The aerosol generating device also comprises a cavity, which comprises at least a first compartment, which is fillable with the vaporizable liquid and a second compartment in which a pressure generator is arranged. The pressure generator directs a pressure of the vaporizable liquid against the orifice to create a flow of the vaporizable liquid from the second compartment through the orifice and out of the tank. Due to the pressure generator which presses the vaporizable liquid out of the tank, a constant flow of the vaporizable liquid is realized to provide a constant aerosol generating efficiency and therefore to enhance the vaping experience.

[0009] Preferably the device pressurization port is a part of an interface between the device and the tank, whereby the interface is suitable to allow a fluid communication between the device and the tank in a state, where the device pressurization port is connected to a tank pressurization port. It is also possible that the device pressurization port is or comprises an opening allowing the fluid to pass through device pressurization port. Ideally a pressurization port is formed from the combination of both parts, the tank pressurization port and the device

pressurization port. In this way, the compressed fluid is directable from the compressed fluid reservoir of the device through the pressurization port into the tank.

[0010] It is further conceivable that the device comprises a pressure regulator arranged between the device pressurization port and the compressed fluid reservoir. The pressure regulator may comprise a valve, an aperture and/or a flap. It is possible that the pressure regulator is regulated manually by activating e.g. a button or automatically by an electronic measuring system. With a valve, a release of compressed fluid out of the device is controllable. The compressed fluid is then able to remain within the compressed fluid reservoir during a change of the tank to be mounted on the tank mount.

[0011] The afore-mentioned problems are also eliminated by a tank to be removably mounted on a tank mount of an aerosol generating device, which comprises a cavity that is defined by at least one wall and which comprises an orifice, through which a vaporizable liquid is pressable. The cavity comprises at least a first compartment, which is fillable with a vaporizable liquid and a second compartment in which a pressure generator is arranged. The tank comprises a pressure regulator, which regulates a pressure of the vaporizable liquid directed from the pressure generator against the orifice to create a flow of the vaporizable liquid from the second compartment through the orifice and out of the tank. Due to the pressure generator which presses the vaporizable liquid out of the first compartment of the tank, a constant flow of the vaporizable liquid is realized to provide a constant aerosol generating efficiency and therefore to enhance the vaping experience.

[0012] It is also possible that the tank for vaporizable liquids comprises a cavity that is defined by at least one wall, which comprises an orifice, through which a vaporizable liquid is pressable. Preferably, the pressure generator is arranged in the second compartment such that it directs a pressure of the vaporizable liquid against the orifice to create a flow of the vaporizable liquid from the second compartment through the orifice and out of the tank. Preferably, the wall with the orifice is arranged at or forms the base of the tank. Ideally, the first compartment in which the vaporizable liquid is situated is arranged at the base of the tank to allow the liquid to be released directly out of the first compartment and through the orifice of the base.

[0013] According to a preferred embodiment, the tank comprises a separator separating the first compartment and the second compartment, wherein this separator is preferably at least partially movable with respect to the cavity. Ideally, the separator is arranged between the base and a top of the tank. Preferably, the separator is movable parallel to the base and the top of the tank such that a volume of the first and second compartment together remains the same.

[0014] However, when the separator moves to the base, a first volume of the first compartment decreases, while a second volume of the second compartment in-

creases. If the separator moves to the top the second volume of the second compartment decreases, while the first volume of the first compartment increases. The separator is therefore movable with increasing and decreasing amount of liquid, so that the first volume of first compartment is adjustable with respect to the amount of liquid within the first compartment.

[0015] In a preferred embodiment, the separator is able to transfer the pressure from the pressure generator to the vaporizable liquid by being movable. This is beneficial because the pressure generated by the pressure generator is then transferable to the vaporizable liquid to press it out of the tank. The separator is further able to separate the liquid from the pressure generator so that the pressure generator is protected from contamination by the liquid. The separator may be formed as a round, oval or polygonal piston, a spherical body, a flat body, or a body that is especially shaped to fit into the tank.

[0016] In a preferred embodiment, the pressure generator comprises or is a compressed gas. When using a compressed gas the pressure is adjustable depending how much gas is filled into the second compartment. This means, that the pressure is adjustable during the release of liquid and therefore during the use of the tank. Preferably, the amount of gas to be filled into the second compartment is variable. The more gas, the higher the pressure to be exerted on the liquid.

[0017] According to a preferred embodiment, the pressure generator comprises a spring and the separator comprises a piston. Preferably, the spring is a linear, progressive rate or dual rate spring, in particular formed in the shape of an hourglass, barrel or cone. A spring provides a characteristic curve so that the pressure rate, with which the fluid is pressed out of the tank is fixed to guarantee a liquid flow until the tank is empty.

[0018] In a preferred embodiment, the spring is arranged between the piston and a wall of the compartment. Preferably, said wall is a top wall of the tank to ensure that the piston transfers the pressure from the spring to the vaporizable liquid.

[0019] In a further preferred embodiment, the separator and/or the spring is made of a metallic and/or plastic material. The use of metallic or plastic materials is beneficial due to their impermeability to fluids so that fluids e.g. gas or vaporizable liquids do not leak. Moreover, the flexibility of metallic and plastic materials is low so that the separator remains in its original shape when exposed to pressure.

[0020] In another preferred embodiment, the tank has an oval or cylindrical shape, preferably with the sidewall being a lateral area, a first wall being a first base area and a second wall being a second base area. It is also possible that the tank has a polygonal shape. A cylindrical, oval or polygonal shape provides a good resistance against deformation when the tank is exposed to pressure. Ideally, the first base area represents the base of the tank situated at the first compartment and/or the second base area represents the top of the tank situated at

the second compartment.

[0021] In another preferred embodiment, the separator comprises at least one sealant, that seals a contact area between the separator or the piston and the wall against liquids and/or gases. Ideally, said wall is the sidewall or lateral area. Preferably, the sealant is arranged at the separator or piston to reduce material during production of the tank. However, it is also possible that the sealant is arranged at the wall, in particular the lateral area. With a sealant, the risk of a contamination of the second compartment and therefore the pressure generator by the vaporizable liquid is reduced.

[0022] In a further preferred embodiment, the pressure regulator comprises at least one of a screw, a compressor or a valve. A screw enables a stepless manual adjustment of the pressure, which means that a user can define the pressure by simply operating the screw. Ideally, the pressure regulator comprises or is a valve which comprises an aperture, check valve, ball valve, poppet valve, gate valve, butterfly valve or expansion valve. A valve allows an electronic adjustment of the pressure to be exerted on the liquid.

[0023] In a preferred embodiment, the regulator comprises a valve and/or is able to synchronize with an electronic unit between a battery and a heater of the aerosol generating device the tank is arranged to. A regulator synchronized with an electronic unit allows an electronic adjustment of the pressure to be exerted on the liquid depending on specific parameters e.g. the amount of liquid to be heated or the amount of fluid situated within the second compartment.

[0024] In another preferred embodiment, the tank comprises at least a tank pressurization port, which is in fluid connection to the second compartment and is preferably removably connectable to a countering device pressurization port. Ideally, a second channel is arranged between the tank pressurization port and the second compartment to form a fluid connection between the tank pressurization port and the second compartment. A fluid e.g. gas is then able to pass the device pressurization port, the tank pressurization port and the second channel so that it lastly enters the second compartment. The second compartment of the tank is therefore fillable with a fluid, which is originally situated in a compressed fluid reservoir of the device or an external fluid reservoir.

[0025] According to a preferred embodiment, the tank comprises at least one tank pump. Preferably, the tank pump comprises or is a micropump, in particular a mechanical or non-mechanical micropump. It may be possible that a driving force of the tank pump is generatable by utilization of one of the following, piezoelectric, electrostatic, thermo-pneumatic, pneumatic, magnetic, or light effects. Preferably, the tank pump is arranged at the tank pressurization port or between the tank pressurization port and the second compartment. The tank pump allows the transportation of the fluid from the tank pressurization port into the second compartment, and in particular presses the fluid into the second compartment to

generate pressure.

[0026] In another preferred embodiment, the pressure regulator is arranged between the tank pressurization port and the second compartment. A pressure regulator, which is arranged between the tank pressurization port and the second compartment regulates a fluid flow from the tank pressurization port into the second compartment so that the pressure in the second compartment do not exceed a critical value.

[0027] In a preferred embodiment, the pressure regulator is able to regulate an opening and/or closing of the valve. That way the flow of fluids through the valve is preferably controllable and/or regulatable. Ideally, the size of the opening e.g. diameter, length or/and width is regulated by the regulator so that e.g. a small opening allows a low/slow flow and a large opening provides a high/fast flow of the fluid.

[0028] In a preferred embodiment, the tank comprises a gauge for detecting a filling level of the vaporizable liquid and/or pressure of the liquid. The gauge is preferably linked to the pressure generator and/or regulator via data technology, wherein preferably the gauge is able to send a regulation signal to the pressure regulator in order to trigger the opening of the valve. With a gauge linked to the pressure generator and/or the pressure regulator, the pressure exerted on the vaporizable liquid is automatically controllable with respect to the filling level of the vaporizable liquid. Depending on the filling level of the vaporizable liquid in the tank the pressure can be regulated such that e.g. the pressure increases with decreasing filling level so that a constant amount of liquid is flowable through the orifice of the tank, in particular when the tank and the device is used in a horizontal position.

[0029] In a preferred embodiment, the tank comprises at least one sealing element, preferably arranged at a connection site at which the tank is connected to the aerosol generating device to seal up the connection of the tank and the aerosol generating device. A sealed connection of the tank and the aerosol generating device protects the device from becoming contaminated by vaporizable liquids and reduces a possible leakage of the said liquid out of the tank.

[0030] The afore-mentioned problems are also eliminated by an electronic smoking system comprising an aerosol generating device according to the above description and a tank according to the above description, wherein the tank is mounted in the tank mount. The tank is further fluidically and/or electronically connected to the aerosol generating device so that the compressed fluid reservoir is in fluid communication with the second compartment. Preferably the fluid communication is controllable by the pressure regulator. With such a system the fluid flow from the compressed fluid reservoir to the second compartment, and therefore the pressure exerted on the vaporizable liquid is automatically controllable with respect to the filling level of the liquid within the tank so that a constant amount of liquid is flowable through the

orifice of the tank.

[0031] In a preferred embodiment, the electronic smoking system comprises a window and/or a display able to show a level of the pressure and/or a filling level of the vaporizable liquid. With a display or a window the use can easily check whether the tank should be refilled or the pressure should be increased. A display or window is also helpful in terms of checking the state or expected remaining duration of a vaping session.

[0032] In a preferred embodiment, the device and/or the tank comprise a refill port, to temporarily connect an external fluid reservoir. With an external fluid reservoir the second compartment of the tank and/or the compressed fluid reservoir is refillable with a fluid and/or a compressed fluid. The electronic smoking system, the tank and/or the device can therefore be used multiple times.

[0033] The afore-mentioned problems are also eliminated by a method of pressurizing vaporizable liquids in a tank of an aerosol generating device. The device comprises a cavity that is defined by at least one wall, which comprises an orifice, through which a vaporizable liquid is pressable. The cavity comprises at least a first compartment, which is fillable with the vaporizable liquid and a second compartment in which a pressure generator is arranged. The method comprises the steps of:

- a. Generating pressure directed from the second compartment to the orifice,
- b. Regulating the pressure by using a mechanical and/or electrical operated pressure regulator,
- c. Transferring the pressure from the pressure generator to the vaporizable liquid.

[0034] In a first step (a.) a pressure is generated by a pressure generator arranged within the second compartment. Preferably, a pressure generator as described above is used, which ideally comprises or is a compressed gas. Preferably, said compressed gas is in fluid communication with a pressure regulator and a compressed fluid reservoir positioned within the device. It is possible, that a pump as described above and placed in/at the device and/or the tank at least provide a support for pressure generation by pumping compressed gas into the second compartment. When using a compressed gas the pressure can be adjusted depending on how much gas is filled into the second compartment.

[0035] In a second step (b.) the pressure is ideally regulated by using an electrical operated pressure regulator. Ideally the pressure regulator is linked to a gauge, preferably via data technology, whereby preferably the gauge is able to send a regulation signal to the pressure regulator in order to trigger an opening of a valve. With a gauge linked to the pressure generator and/or regulator, the pressure exerted on the vaporizable liquid can be automatically controlled with respect to the filling level of the vaporizable liquid.

[0036] In a third step (c.) the generated pressure is

transferred from the second compartment to the first compartment by a separator. The separator transfers the pressure from the second compartment to the vaporizable liquid in the first compartment to set liquid under pressure such that a constant flow of the liquid to the orifice is realized.

[0037] In a preferred embodiment, the method comprises two additional steps. In a fourth step (d.) the orifice is opened to allow the pressurized vaporizable liquid to flow through the orifice and out of the tank. In a fifth step (e.) the pressure is released by allowing the vaporizable liquid to flow from the first compartment through the orifice and out of the tank.

[0038] Further advantages, objectives and features of the present invention will be described, by way of example only, in the following description with reference to the appended figures. In the figures, like components in different embodiments can exhibit the same reference symbols.

Examples

[0039] The present invention will now be described in detail with reference to examples thereof. However, these examples are illustrative and do not limit the scope of the invention.

Example 1:

[0040] An exemplary embodiment of an electronic smoking system comprises a combination of an aerosol generating device and a tank to be removably mounted on the device. Ideally, the device comprises a tank mount, suitable for removably mounting a tank, a power chamber for housing at least one battery and electrical contacts suitable for transferring power from the battery to electrical counterparts of the tank in state, the tank is mounted on the tank mount. Therefore, the electrical contacts are preferably arranged at the tank mount.

[0041] Ideally, the device also comprises compressed fluid reservoir suitable for housing, and at least releasing a compressed fluid and in particular suitable to be refilled with a fluid, ie a compressed fluid. Preferably, a pressure regulator is provided and is preferably arranged between a device pressurization port and the compressed fluid reservoir, whereby the device pressurization port is preferably arranged at the tank mount. Further, at least one device and/or tank pump is arranged between the compressed fluid reservoir and the second compartment. Preferably, the device and/or tank pump is a micropump, in particular a mechanical or non-mechanical micropump. It may be possible, that the device and/or tank pump is arranged at the device and/or tank pressurization port, or at a pressure regulator of the tank.

[0042] The device pressurization port may be formed and arranged such that a countering tank pressurization port fits on the device pressurization port to ensure a fluid communication between the device and the tank trough

both the device pressurization port and the tank pressurization port. Thus, the device pressurization port may be a part of an interface between the device and the tank such that it is connectable to the tank pressurization port. Preferably, the device pressurization port is or comprises an opening allowing the compressed fluid to pass through device pressurization port, such that the compressed fluid is directable from the compressed fluid reservoir of the device through the device pressurization port into the tank. It may be beneficial that a first channel is arranged between the compressed fluid reservoir and the device pressurization port in order to direct the compressed fluid.

[0043] It is possible that the pressure regulator is arranged at the device pressurization port or between the device pressurization port and the compressed fluid reservoir. The pressure regulator may comprise a valve, an aperture or a flap, wherein the valve of the device may comprise at least one of a check valve, ball valve, poppet valve, gate valve, butterfly valve or expansion valve. The pressure regulator of the device is automatically regulated by an electronic gauge system of the tank, which is connected to the pressure regulator of the device preferably via data technology. Preferably, the pressure regulator of the device is suitable to hold the compressed fluid within the compressed fluid reservoir and to release the fluid out of the compressed fluid reservoir.

[0044] The tank comprises a base being a first wall, a top being a second wall and at least one lateral area being a sidewall. Preferably, the first and second wall are arranged parallel to each other and/or perpendicular to the sidewall. Further the tank has an oval or polygonal shape, but is preferably shaped cylindrically. An orifice suitable for releasing vaporizable liquids, electrical contacts that counter electrical contacts of the device and/or the tank pressurization port are ideally arranged at the base of the tank.

[0045] A separator is arranged such that it faces the base and/or the top. Ideally, the separator separates a cavity of the tank into a first and a second compartment so that the cavity comprises a first compartment with a first volume and a second compartment with a second volume. The separator is further preferably shaped as a plate, disc or panel with a thickness smaller than the diameter, width and/or length and in particular with a shape of a cross section equal to a cross section of the tank and especially with a cylindrical, polygonal or oval cross section.

[0046] The separator is further at least partially movable with respect to the cavity to be suitable to transfer the pressure from the pressure generator in the second compartment to a vaporizable liquid, which is preferably situated in the first compartment. Ideally, the separator is movable in a direction perpendicular to the first and/or second wall. Preferably the interface between the separator and the sidewall is sealed by a material impermeable to fluids, which is arranged at the separator or at the sidewall.

[0047] In a state at which the tank is mounted on the

tank mount of the device, the tank pressurization port is connected to the device pressurization port to ensure a fluid communication between the compressed fluid reservoir of the device and the second compartment of the tank. To realize that fluid communication, a second channel is ideally arranged between the tank pressurization port and the second compartment to connect the tank pressurization port with the second compartment. Preferably, a length of the second channel is arranged perpendicular to a top and/or base face of the separator, which faces the top and base of the tank respectively. That way, the second compartment is fillable with the compressed fluid from the compressed fluid reservoir of the device. The fluid in the second compartment may then act as the pressure generator so that the pressure generator in the second compartment may be a compressed gas.

[0048] Preferably, the tank pressurization port is an opening allowing the compressed fluid to pass through the tank pressurization port, such that the compressed fluid is directable from the tank pressurization port through the second channel into the second compartment.

[0049] It is possible, that the pressure regulator of the tank is arranged at the tank pressurization port, or between the tank pressurization port and the second compartment. The pressure regulator may comprises a valve, an aperture or a flap, wherein the valve of the device may comprises at least one of a check valve, ball valve, poppet valve, gate valve, butterfly valve or expansion valve. The pressure regulator of the tank is preferably automatically regulated by an electronic gauge system, which is connected to the pressure regulator of the tank via data technology. Preferably, the pressure regulator of the tank is suitable to let a compressed fluid flow into the second compartment and to hold the compressed fluid within the second compartment.

[0050] Preferably the gauge comprises at least one sensor suitable for detecting a filling level of the vaporizable liquid and/or a pressure of the liquid or the fluid in the second compartment. Ideally, the gauge is linked to the pressure regulator of the device and/or the tank via wired and/or wireless data technology. The gauge may be suitable to send a regulation signal to the pressure regulator of the device and/or the tank in order to trigger a size of an opening of the valve of the device and/or the tank.

[0051] The tank may also comprise at least one sealing element arranged at a connection site at which the tank is connected to the tank mount of the device to seal up the connection of the tank and the tank mount.

Example 2:

[0052] A second exemplary embodiment comprises an electronic smoking system as described in the first example, wherein the tank and/or the device comprise a refill port. The refill port is suitable to temporarily connect

an external fluid reservoir to refill the compressed fluid reservoir of the device and the second compartment of the tank. Ideally, the refill port is arranged at the first channel or the compressed fluid reservoir of the device and/or at the second channel or second compartment of the tank respectively. Preferably, the refill port/s comprise/s a valve suitable to control a fluid communication between an external fluid reservoir and the compressed fluid reservoir of the device and/or the second compartment of the tank. The valve/s of the refill port/s comprise/s a ball, an aperture, a check valve, a ball valve, a poppet valve, a gate valve, a butterfly valve or an expansion valve.

Example 3:

[0053] A third example of the invention describes a method of pressurizing vaporizable liquids in an electronic smoking system as described in the first or second example.

[0054] In a first step a pressure is generated by a pressure generator, which is arranged in the second compartment of the tank. Preferably, a pressure generator as described above is used, which ideally comprises or is a compressed gas filling or being the second volume. The compressed gas is in fluid communication with the pressure regulator of the device and/or tank and the compressed fluid reservoir of the device.

[0055] In a second step the pressure is ideally regulated by using an electrical operated pressure regulator, such as a valve. Ideally the pressure regulator is linked to a gauge via wired and/or wireless data technology. In the second step the gauge may send a regulation signal to the pressure regulator in order to trigger a size of an opening of the valve of the pressure regulator. Through the open valve the compressed fluid/gas may flow from the compressed fluid reservoir through the first channel, the device pressurization port, the tank pressurization port and/or the second channel into the second compartment to generate pressure within the second compartment by filling the second volume with fluid/gas.

[0056] In a third step the generated pressure is transferred from the second compartment to the first compartment by the separator. The separator transfers the pressure from the second compartment to the first compartment by moving in a direction to the base of the tank with the effect that the first volume, which is filled with vaporizable liquid, is reduced with progressive movement of the separator.

[0057] In a fourth step the orifice of the tank is opened to allow the pressurized vaporizable liquid to flow through the orifice and out of the tank. In a fifth step the pressure, which was generated in the first compartment is released by allowing the compressed vaporizable liquid to flow from the first compartment through the orifice and out of the tank.

[0058] The figures show:

Fig. 1 a tank for an electronic smoking device com-

prising a separator.

Fig. 2 a tank for an electronic smoking device without a separator.

Fig. 3 a tank for an electronic smoking device with a spring.

[0059] Figure 1 shows a tank 1, which comprises a base being a first wall 2, a top being a second wall 3 and at least one lateral area being a sidewall 4. Preferably, the first 2 and second wall 3 are arranged in parallel to each other and/or perpendicular to the sidewall 4. An orifice 5 is positioned at the first wall 2 and/or arranged such that the orifice 5 opposes a separator 6 and/or the second wall 3.

[0060] The separator 6 separates a cavity 7 of the tank 1 into a first 8 and second 9 compartment, in particular so that the separator 6 is positioned between the first 8 and second 9 compartment. Preferably, the separator 6 is arranged perpendicular to the sidewall 4 and/or parallel to the first 2 and second 3 wall. Ideally, the separator 6 is shaped as a plate, disc or panel with a thickness 6a smaller than its diameter 6b. The shape of a cross section, especially a cylindrical, polygonal or oval cross section of the separator 6 is equal to a cross section of the tank 1, which is parallel to the cross section of the separator 6. The separator 6 is further arranged such that it faces the first 2 and/or the second 3 wall.

[0061] The first compartment 8 is fillable and/or filled with a vaporizable liquid, which is pressable through the orifice 5 due to a directed pressure 100. Ideally, the pressure is directed perpendicular to the first 2 and second 3 wall and/or parallel to the sidewall 4. Preferably, the pressure 100 is generated by a pressure generator, which is situated in the second compartment 9. The pressure generator is a compressed fluid, whose decompression force generates the pressure 100. A valve 10 is arranged at the sidewall, or the second wall, such that it defines an opening into the second compartment.

[0062] Ideally, the separator 6 is movable in and against the direction of the pressure 100. At best, the valve 10 is positioned such that it defines an opening into the second compartment 9 independently of the variable position of the separator 6.

[0063] Figure 2 shows the tank as described in figure 1 without the separator. In this configuration, the pressure 100 generated by compressed fluid exerts its pressure on the vaporizable liquid in the first compartment 8. The first 8 and second 9 compartment are separated by the boundary 20 of the compressed fluid and the vaporizable liquid.

[0064] Figure 3 shows the tank as described in figure 1 without a valve 10, but with a spring 11 as pressure generator, instead of a compressed fluid. Ideally, the spring 11 is arranged between the separator 6, which in particular is formed as a piston, and the second wall 3. Preferably, the spring 11 exerts pressure 100 onto the

separator 6, in particular such that the pressure is directed to the first wall 2. The spring may be formed as a linear, progressive rate or dual rate spring. The applicant reserves his right to claim all features disclosed in the application document as being an essential feature of the invention, as long as they are new, individually or in combination, in view of the prior art. Furthermore, it is noted that in the figures features are described, which can be advantageous individually. Someone skilled in the art will directly recognize that a specific feature being disclosed in a figure can be advantageous also without the adoption of further features from this figure. Furthermore, someone skilled in the art will recognize that advantages can evolve from a combination of diverse features being disclosed in one or various figures.

List of reference symbols

[0065]

1	Tank
2	First wall of the tank
3	Second wall of the tank
4	Sidewall of the tank
5	Orifice
6	Separator
6a	Thickness of the separator
6b	Diameter of the separator
7	Cavity
8	First compartment
9	Second compartment
10	Valve
11	Spring
20	Boundary
100	Directed pressure

Claims

1. Aerosol generating device for generating an aerosol comprising a tank mount, suitable for removably mounting a tank for vaporizable liquids,
characterized in that,
the device comprises a compressed fluid reservoir, which is fillable with compressed fluid and which is connected in fluid communication to at least a device pressurization port, wherein the pressurization port is arranged at the tank mount.
2. Aerosol generating device according to claim 1,
characterized in that
it comprises a pressure regulator arranged between the device pressurization port and the compressed fluid reservoir.
3. Tank to be removably mounted on a tank mount of an aerosol generating device, comprising a cavity that is defined by at least one wall, which comprises

an orifice, through which a vaporizable liquid is pressable, wherein the cavity comprises at least a first compartment, which is fillable with a vaporizable liquid and a second compartment in which a pressure generator is arranged,

characterized in that,

the tank comprises a pressure regulator, which regulates a pressure of the vaporizable liquid directed from the pressure generator against the orifice to create a flow of the vaporizable liquid from the second compartment through the orifice and out of the tank.

4. Tank according to claim 3,

characterized in that

it comprises a separator separating the first compartment and the second compartment, wherein this separator is at least partially movable with respect to the cavity.

5. Tank according to the preceding claim,

characterized in that

the separator is able to transfer the pressure from the pressure generator to the vaporizable liquid by being movable.

6. Tank according to at least one of the preceding claims,

characterized in that,

the pressure generator comprises or is a compressed gas.

7. Tank according to at least one of the preceding claims,

characterized in that,

the pressure regulator comprises at least one of a screw, a compressor or a valve.

8. Tank according to at least one of the preceding claims,

characterized in that,

It comprises at least a tank pressurization port, which is in fluid connection to the second compartment and is preferably removably connectable to a countering device pressurization port.

9. Tank according to the preceding claim,

characterized in that,

The pressure regulator is arranged between the tank pressurization port and the second compartment.

10. Tank according to at least one of claims 7-9,

characterized in that,

The pressure regulator is able to regulate an opening of the valve.

11. Tank according to at least one of the preceding claims,

characterized in that,

It comprises a gauge for detecting a filling level of the vaporizable liquid and/or pressure of the liquid, wherein the gauge is preferably linked to the pressure regulator via data technology, wherein preferably the gauge is able to send a regulation signal to the pressure regulator in order to trigger the opening of the valve. 5

12. An electronic smoking system comprising an Aerosol generating device according to claim 1-2 and a tank according to claim 3-11, wherein the tank is mounted in the tank mount, 10

characterized in that,

the tank is fluidically and/or electronically connected to the aerosol generating device so that the compressed fluid reservoir is in fluid communication with the second compartment, wherein preferably that fluid communication is controllable by the pressure regulator. 15 20

13. An electronic smoking system according to the preceding claim, **characterized in that,** 25
it comprises a window and/or a display able to show a level of the pressure or a filling level of the vaporizable liquid.

14. Method of pressurizing vaporizable liquids in a tank of an aerosol generating device comprising a cavity that is defined by at least one wall, which comprises an orifice, through which a vaporizable liquid is pressable, wherein the cavity comprises at least a first compartment, which is fillable with the vaporizable liquid and a second compartment in which a pressure generator is arranged, comprising the steps of: 30 35

- a. Generating pressure directed from the second compartment to the orifice, 40
- b. Regulating the pressure by using a mechanical and/or electrical operated pressure regulator,
- c. Transferring the pressure from the pressure generator to the vaporizable liquid. 45

15. Method according to claim 14, **characterized by,** 50
two additional steps:

- d. opening the orifice,
- e. releasing the pressure by allowing the vaporizable liquid to flow from the first compartment through the orifice and out of the tank. 55

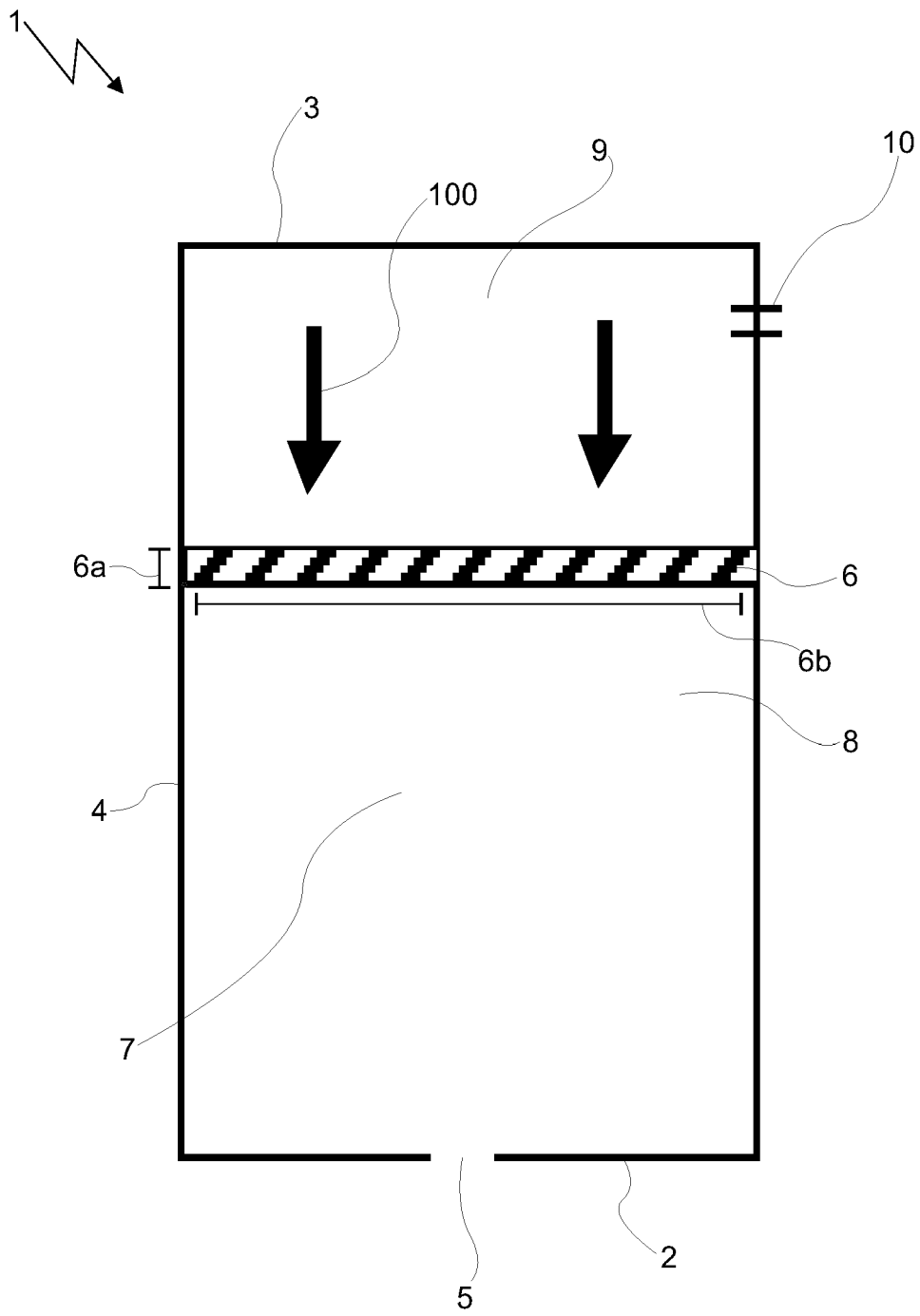


Fig. 1

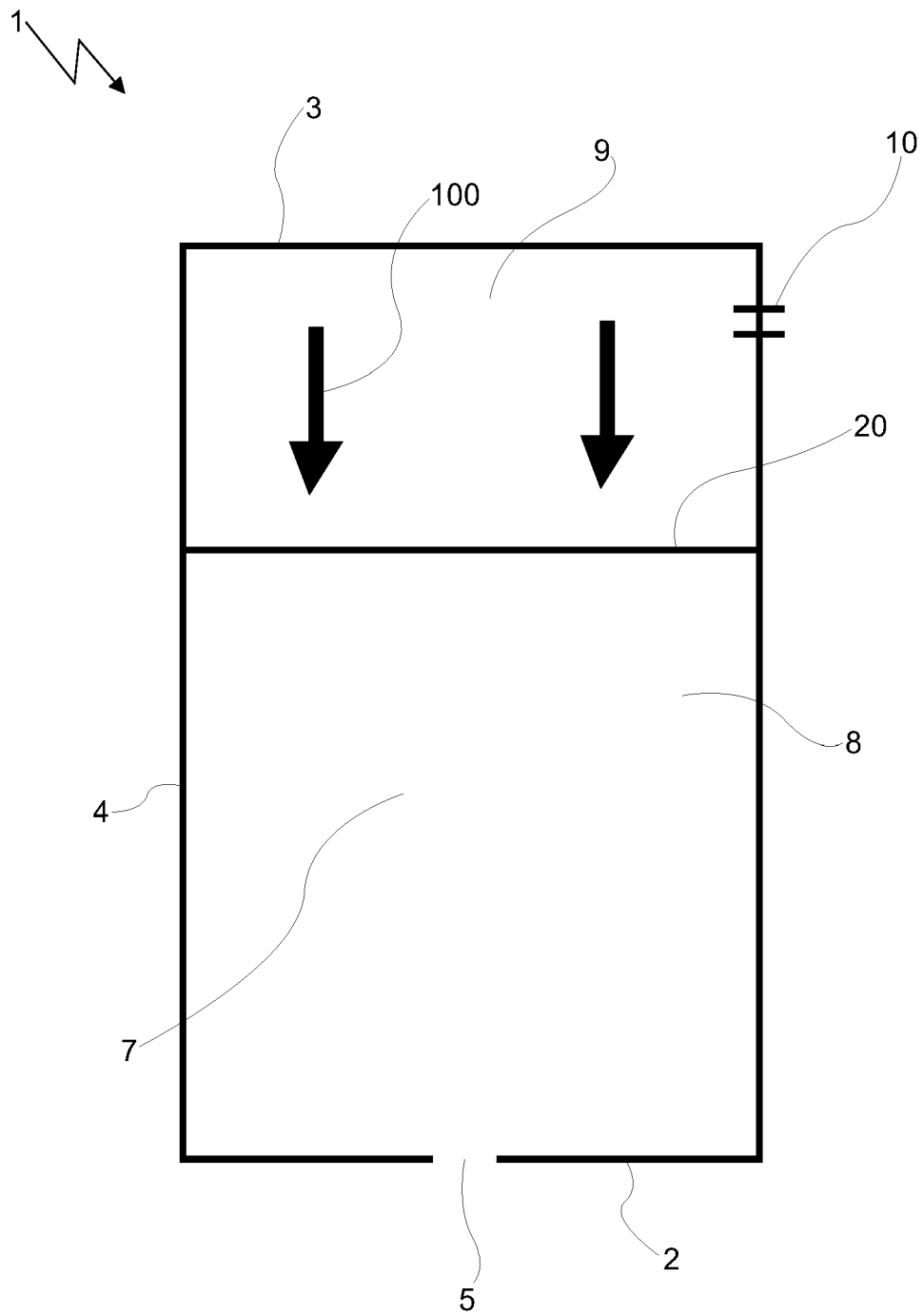


Fig. 2

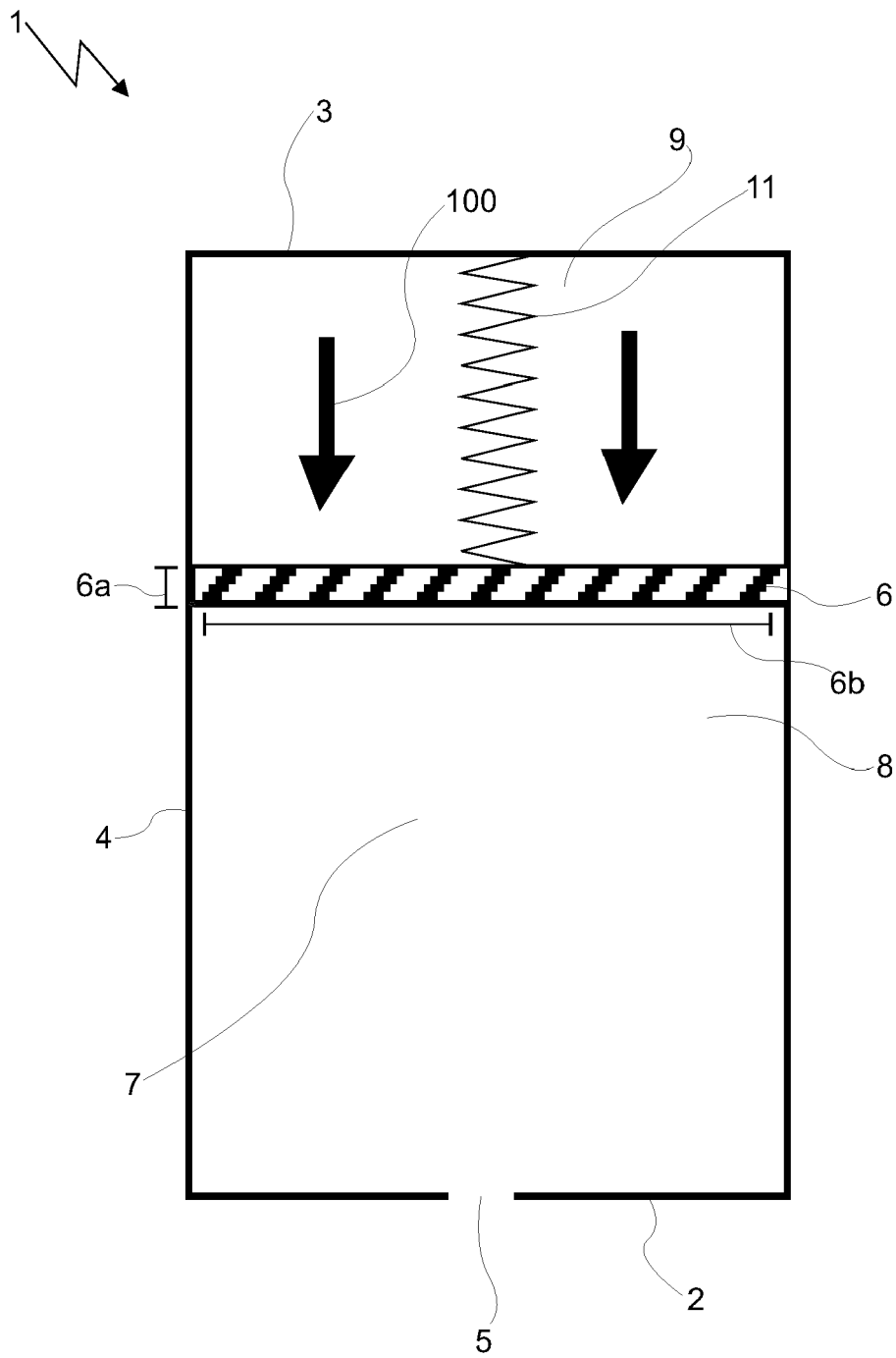


Fig. 3



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Place of search Munich		Date of completion of the search 29 July 2020	Examiner Kirchmayr, Katrin
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