CLAIMS

1. Smoking device for aerosol-generation of a liquid aerosol-forming substrate, the smoking device comprising:

- a device housing comprising a liquid storage portion comprising a housing for holding liquid aerosol-forming substrate;

- a surface acoustic wave atomizer (SAW-atomizer) comprising an atomization region, at least one input transducer for generating surface acoustic waves to propagate along a surface of the SAW-atomizer including the atomization region, and at least one output transducer for converting surface acoustic waves into an electrical signal representative of physical information of the atomization region;

- a supply element arranged to supply liquid aerosol-forming substrate from the liquid storage portion to the atomization region on the SAW-atomizer; and

- a control system configured to operate the SAW-atomizer for atomizing the liquid aerosol-forming substrate in the atomization region to generate an aerosol, wherein the control system is configured to control operation of the SAW-atomizer according to the electrical signal.

2. Smoking device according to claim 1, wherein at least one of the input and output transducers is an interdigital transducer comprising electrodes arranged on a piezoelectric substrate.

3. Smoking device according to any one of the preceding claims, further comprising a heater arranged to heat liquid aerosol-forming substrate.

4. Smoking device according to claim 3, wherein the control system is configured to operate the heater to heat liquid aerosol-forming substrate to a predetermined temperature.

5. Smoking device according to any one of claims 3 or 4, wherein the heater is arranged on a surface of the SAW-atomizer next to the atomization region or on a surface of the SAW-atomizer opposite the atomization region.

6. Smoking device according to any one of the preceding claims, wherein a portion of the supply element is arranged adjacent the atomization region of the SAW-atomizer and another portion of the supply element is fluidly connectable to the liquid storage portion.

7. Smoking device according to any one of the preceding claims, wherein the supply element is a capillary element having a capillary action for liquid aerosol-forming substrate to be

supplied to the atomization region of the SAW-atomizer.

8. Smoking device according to any one of the preceding claims, wherein the at least one input transducer comprises a plurality of input transducers for generating surface acoustic waves.

9. Smoking device according to any one of the preceding claims, wherein the liquid storage portion, the SAW-atomizer and the supply element form parts of a cartridge, and wherein the device housing comprises a cavity for receiving the cartridge.

10. Method for generating an aerosol in a smoking system, the method comprising:

- providing a surface acoustic wave atomizer (SAW-atomizer) comprising an atomization region, at least one input transducer and at least one output transducer;

- providing a liquid aerosol-forming substrate to the atomization region of the SAW-atomizer;

- operating the SAW-atomizer, thereby generating surface acoustic waves with the at least one input transducer, the surface acoustic waves propagating along a surface of the SAW-atomizer into the atomization region and into the liquid aerosol-forming substrate in the atomization region, thereby atomizing the liquid aerosol-forming substrate and generating the aerosol,

- converting the surface acoustic waves into an electrical signal representative of physical information of the atomization region, using the at least one output transducer,

- outputting the electrical signal with the at least one output transducer; and

- using the electrical signal for controlling operation of the SAW-atomizer.

11. Method according to claim 10, further comprising the step of heating the liquid aerosol-forming substrate in the atomization region to a temperature above room temperature.

12. Method according to any one of claims 10 to 11, wherein the step of providing a surface acoustic wave atomizer comprises providing a plurality of input transducers, and wherein the step of operating the SAW-atomizer is carried out by generating surface acoustic waves with the plurality of input transducers, the surface acoustic waves propagating along the surface of the SAW-atomizer into the atomization region and into the liquid aerosol-forming substrate in the atomization region.

13. Aerosol-generating smoking system comprising a smoking device according to any one

of claims 1 to 9, and a liquid aerosol-forming substrate, wherein a supply element is in fluid connection with the liquid aerosol-forming substrate comprised in a housing of a liquid storage portion of the smoking device and with an atomization region on a surface acoustic wave atomizer (SAW-atomizer).

14. Aerosol-generating system according to claim 13, wherein the liquid aerosol-forming substrate comprises at least one aerosol former and a liquid additive.

15. Cartridge for smoking devices for aerosol-generation, the cartridge comprising:

a liquid storage portion comprising a housing for holding liquid aerosol-forming substrate;

a surface acoustic wave atomizer (SAW-atomizer) comprising an atomization region, at least one input transducer for generating surface acoustic waves to propagate along a surface of the SAW-atomizer including the atomization region, and at least one output transducer for converting surface acoustic waves into an electrical signal representative of physical information of the atomization region;

a supply element arranged to supply liquid aerosol-forming substrate from the housing of the liquid storage portion to the atomization region on the SAW-atomizer.