Claims

1. Apparatus (10) for absorbing precipitation water from rain events or driving rain events and for water discharge by evaporation, characterized by at least one textile element (12) for absorbing water from rainwater drops and/or for discharging water by evaporation, wherein the textile element (12) is designed as a three-dimensional textile structure (13), with a first, water-permeable layer (14) and a second, water-guiding layer (16), wherein these layers (14, 16) are connected to one another by means of water-guiding, connecting threads (18), wherein the textile element (12) is fluidically connected to a water discharge conduit (20) and/or to a water supply conduit (22).

2. Apparatus (10) according to claim 1, characterized in that a water collecting device (24) is provided which is flow-connected to the textile element (12) and/or to the water discharge conduit (20).

3. Apparatus (10) according to claim 1 or 2, characterized in that a water supply device (26, 67) is provided which is flow-connected to the textile element (12) and/or to the water supply conduit (22).

4. Apparatus (10) according to one of the preceding claims, characterized in that the apparatus (10) and/or the textile element (12) comprises hydrophilic and/or hydrophobic modifications.

5. Apparatus (10) according to one of the preceding claims, characterized in that the textile element (12), i.e. the three-dimensional textile structure (13) is formed from synthetic fibre, polymer fibre, glass fibre, metal fibre and/or other appropriate materials, being embodied as monofilaments or multifilaments.

6. Apparatus (10) according to one of the preceding claims, characterized in that the first layer (14) has a water-attracting and/or hydrophilic lamination, coating, finishing, filament shape optimization and/or that a water-attracting layer is applied to the first layer (14), wherein this layer and/or the first layer (14) are of finer-pored design than the spacing structure (19) formed by the connecting threads (18) between the first layer (14) and the second layer (16).

7. Apparatus (10) according to one of the preceding claims, characterized in that the second layer (16) has a water-guiding and/or hydrophobic lamination, coating, finishing and/or filament shape optimization and/or that a water-guiding layer is applied to the second layer (16), wherein this layer and/or the second layer (16) are water-tight or perforated.

8. Apparatus (10) according to one of the foregoing claims, characterized in that the apparatus (10) and/or the textile element (12) are planar, curved, folded and/or adaptable in shape.

9. Apparatus (10) according to one of the preceding claims, characterized in that the first layer (14) and/or the second layer (16) are actuatable by one or more actuators along a direction parallel to the plane of the first layer (14) or the second layer (16), so that the first layer (14) and the second layer (16) can be displaced relatively to one another.

10. Apparatus (10) according to one of the preceding claims, characterized in that the apparatus (10) and/or the textile element (12) comprise folding structures (28, 28', 28'') which divide the apparatus (10) and/or the textile element (12) into several foldable, folded, pivotable and/or rotatable sections (30, 30', 30'', 30''').

11. Apparatus (10) according to claim 10, characterized in that the folding structures (28, 28', 28'') have a mechanical substructure (57) and/or are introduced into the textile element (12) by means of additive or subtractive manufacturing methods e.g. (3D) printing on textile substrate fabric and/or in that the folding structures (28, 28', 28'') are embodied by textile connecting devices.

12. Apparatus (10) according to claim 10 or 11, characterized in that actuators (32, 32', 32'') are provided, by means of which the foldable, folded, pivotable and/or rotatable sections (30, 30', 30'', 30''') can be operated.

13. Apparatus (10) according to one of the preceding claims, characterized in that sensors are provided, by means of which climate and/or environmental data are recorded e.g. for a control unit.

14. Apparatus (10) according to claim 12 or 13, characterized in that a control unit for operating and/or regulating the actuators (32, 32', 32'') is provided, wherein the control unit is configured in such a way that the apparatus (10) and/or the textile element (12) and/or sections (30, 30', 30'', 30''') thereof are oriented towards precipitation and/or solar radiation.

15. Apparatus (10) according to one of the preceding claims, characterized in that a holding device is provided to which the components of the apparatus (10) are attached or attachable.

16. Apparatus (10) according to one of claims 2 to 15, characterized in that the water collecting device (24) comprises a frame profile (34, 34’) and/or a water storage (33) for storing precipitation water.

17. Apparatus (10) according to one of the preceding claims, characterized in that a filter (36) for filtering precipitation water is provided, wherein the filter (36) is integrated into the textile element (12) and/or arranged in or on the water collecting device (24) and/or in the building.

18. Apparatus (10) according to one of the preceding claims, characterized in that a pump (38) and/or a water temperature control device (40) are provided, which are each flow connected with the water supply device (26, 67) and/or with the water collecting device (24).

19. Apparatus (10) according to one of claims 2 to 18, characterized in that the water supply device (26, 67) and/or the water collecting device (24) is connected to a heat exchanger (42, 120).

20. Usage of an apparatus (10) according to one of the preceding claims as a construction element in, on or outside a building or a civil engineering structure (50, 60, 70).

21. Usage of at least one apparatus (10) according to one of claims 1 to 19 on or in the façade of a new building and/or of an existing building (80) as additive element on a conventional existing façade (82).

22. Façade system (100) for separating a building interior (inside) I from an exterior space (outside) O, including an apparatus (10) according to one of claims 1 to 19, whereas the façade system (100) is optionally constructed in one or more layers (104, 106, 108, 110) and/or modularly.

23. Façade system (100) according to claim 22, characterized in that on the side on which the second

textile layer (16) of the textile element (12) of the apparatus (10) is located, the façade system (100) has at least one fluid-flow-through layer (104, 108) and/or an insulation layer (106) and/or an inner layer (110).

24. Façade system (100) according to claim 22 or 23, characterized in that two fluid-flow-through layers (104, 108) are provided, wherein the first fluid-flow-through layer (104) is arranged on one side of the insulation layer (106) and the second fluid-flow-through layer (108) is arranged on the other side of the insulation layer (106).

25. Façade system (100) according to one of claims 22 to 24, characterized in that one of the two or both fluid-flow-through layers (104, 108) are configured and intended as a thermal collector and/or used for temperature control of the building interior wall surfaces, for regulation of the air humidity, for regulation of the acoustic and sound insulation properties and/or for active fire protection measures.

26. Façade system (100) according to one of claims 22 to 25, characterized in that a further apparatus (10') according to one of claims 1 to 19 is provided, said further apparatus (10') forming an inner layer of the façade system, wherein the first layer (14') of the textile element (12') of the further apparatus (10’) faces the building interior (inside) I.

27. Façade system (100) according to one of claims 22 to 26, characterized in that the façade system (100) comprises a preferably modular profile system (102, 102’) to which the components of the façade system (100) and/or the holding device of the apparatus (10) according to claim 15 and/or the frame profile (34, 34’) of the apparatus (10) according to claim 16 are attached or attachable.

28. Method for operating an apparatus (10) according to one of claims 1 to 19 and/or a façade system (100) according to one of claims 22 to 27 on a building, characterized in that precipitation water is supplied to a use in, on or outside the building.

29. Method according to claim 28, characterized in that water and/or precipitation water is discharged via the textile element (12), in particular by evaporation.

30. Method according to claim 28 or 29, characterized in that the precipitation water is supplied to consumer in, on or outside the building in the form of raw water and/or that the precipitation water is processed into drinking water.

31. Method according to one of claims 28 to 30, characterized in that the precipitation water is used for interior conditioning of buildings in terms of temperature and air humidity regulation, for regulation of the acoustic and sound insulation properties and/or for active fire protection measures.

32. Method according to one of claims 28 to 31, characterized in that the precipitation water is discharged to the public water supply network and/or delivered to neighbouring buildings and/or civil engineering structures, especially in the case of excess precipitation water yields.