Claims

1. Agglomeration system for continuously producing soluble agglomerated food powder comprising plant-based powder, said system comprises
   - an air-drying system (10),
   - a pre-wetting unit (1) comprising
     a powder inlet (11) and a powder outlet (12),
     a continuous mixer (13) and
     a first steam nozzle (14) for injecting steam into the continuous mixer (13),
   - a connection element (7) connecting the powder outlet (12) to an inlet (8),
   - a fluidization unit (2) comprising
     the inlet (8) and an outlet (16), and
     conveying means (15) for receiving powder from the pre-wetting unit powder outlet (12) via the connection element (7),
   - a second steam nozzle (3) comprising
     a powder inlet (17) for receiving the pre-wetted powder,
     a steam injection orifice arranged for spraying steam onto the pre-wetted powder at a powder outlet (19), and
   - a binder nozzle (4) arranged below the second steam nozzle (3), and comprising a supply pipe (6) adapted to spray liquid binder with compressed air into the powder at the powder outlet (19) of the second steam nozzle (3) and injecting agglomerated powder from outlet (19) into the air-drying system (10).

2. Agglomeration system according to claim 1, wherein the air-drying system (10) is a drying or agglomeration tower, a fluidized bed or a combination thereof.

3. Agglomeration system according to claim 2, wherein the air-drying system (10) is a drying or agglomeration tower which is connected to a continuous

fluidized bed (21) for powder after-drying and/or cooling.

4. Agglomeration system according to any of the preceding claims, wherein the fluidization unit is a fluidization cone and the conveying means (15) is a cone shaped hopper.

5. Agglomeration system according to any of the preceding claims, wherein the continuous mixer (13) is a vertical continuous mixer.

6. An agglomeration system according to claim 4, wherein the cone hopper (15) in the fluidization cone (2) reduces its cross section from an outlet of the continuous mixer (13) to the powder inlet (17) of the steam nozzle (3).

7. Agglomeration system according to any of the preceding claims, wherein the fluidization unit (2) is jacketed and comprises a membrane to allow fluidization with compressed air.

8. Agglomeration system according to any of the preceding claims, wherein a liquid binder supply pipe (6) is arranged at the outlet (12) of pre-wetting unit (1) for supplying binder liquid to the binder liquid nozzle (4) at the outlet of second steam nozzle (3).

9. Agglomeration system according to any of the preceding claims, wherein a milling unit (23) for the ingredient mix is arranged before the continuous mixer.

10. A method for continuously producing a soluble agglomerated food powder comprising plant-based powder, said method comprises the steps of

-providing an agglomeration system according to claims 1 to 9,

-providing food powder,

-pre-agglomerating the food powder by pre-wetting the food powder with steam in the continuous mixer (13),

-providing a liquid binder,

-feeding the pre-wetted powder via the second steam nozzle (3) into the air-drying system while spraying the liquid binder via the binder liquid nozzle (4) onto the pre-wetted powder and injecting steam via the second steam nozzle (3) into the pre-wetted powder in at the same time to form agglomerates of the pre-wetted powder,

- drying and cooling the soluble agglomerated food powder.

11. A method for producing agglomerated food powder according to claim 10, wherein the agglomerated powder is dried with hot air in the air-drying system, and optionally further dried in the fluidized bed (21).

12. A method for producing agglomerated food powder according to claim 10 or 11, wherein the cooling takes place in the fluidized bed (21), preferably with dry cold air.