

Novel Technologies and Processes for Manufacturing Starch-Based Snack Foods

DESCRIPTION

An American Fortune 500 company is seeking novel, differentiating technologies and processes in food and adjacent industries for use in the manufacture of unique and novel snack foods from starch. Viable manufacturing solutions that can be applied for non-starch ingredients including sugars, lipids, proteins and others are also of significant interest.

BACKGROUND

The company is continually developing new process technologies to manufacture foods and snacks that are differentiated from existing offerings from the food industry. There are currently four key steps used to prepare common snacks:

- Preparation (such as grinding, mixing, slicing, etc.)
- Shaping (such as sheeting rolls, cutting rolls, extrusion dies, etc.)
- Cooking (such as frying, baking, extrusion with heating through viscous dissipation or cooking in a pressure vessel, etc.)
- Dehydration (such as processes concurrent with cooking during frying or baking, steam flash-off at extruder die or pressure release from a pressure vessel, oven drying, freeze drying, etc.)

The company implements wide-ranging combinations of these technologies and processes to create snack foods of common shapes and textures. Common examples include snacks such as potato chips, tortilla chips, and other extruded snacks. Other snack types can similarly be realized by combining novel variations of the said technologies. For example, popcorn and kernel-based snacks act as natural intermediate-moisture shelf-stable products. Preparation of the kernels occurs via extrusion to produce semi-finished products (via both cooking and dehydration) that are then finished by frying / hot-air popping / pressure-cooking. Conversely, confectionery goods are an entirely separate variety of snack, wherein processes such as enzyme driven liquefaction (truffles), spinning sugar fibers (cotton candy) and slow dehydration of starch jellies in starch molds can all be employed as differentiating manufacturing techniques.

Given the substantial variability in manufacturing technologies employed throughout the industrial landscape, the company believes that there is significant opportunity for cross-industrial application and optimization. Possible examples could include:

- Modulation of material density via injection molding to achieve palatable snacks
- Use of honeycombing and other micro-structuring technologies to create porous snacks
- Modular assembly or point of use technologies to create unique or customized snack items

KEY SUCCESS CRITERIA

The successful technology will:

- Create a snack that is differentiated from currently available products in at least one (several preferred) of the following dimensions:
 - Appearance
 - Shape
 - Texture
 - Porosity
 - Density
 - Crunch or hardness
 - Result in foods/snacks that are not extremely hard or dense
 - Upper limit of hardness equivalent to hard-boiled sugar candy
 - Employ materials/ingredients characterized as edible and safe by the authorized regulatory body.
 - GRAS in the US; listed as safe to consume by EFSA or by Codex Alimentarius
 - At a minimum, the ingredients must be non-toxic.
 - Processes used should not be severely harmful to humans.
 - Radioactivity, harsh chemical treatments or use of biohazards should be avoided.
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POSSIBLE APPROACHES

Possible approaches might include, but are not limited to:

- Injection molding
- Blow molding
- Micro- or nano-structuring
 - Honeycomb structures
- Modularization and assembled products
- Aggregated products
 - Microfiber alignment, self-densification or compaction, etc.
- Stitching
- Joining, welding, bonding or fusion
- Point-of-service manufacturing or assembly
- Electro-spinning

APPROACHES NOT OF INTEREST

The following approaches are not of interest unless the inventor can offer a step-change in the existing technology to dramatically change its cost or performance:

- Independent cooking or dehydration technologies that are NOT part of a multi-stage manufacturing process that results in a novel snack
- 3D printing technologies

PREFERRED COLLABORATION TYPES:

- Joint Development
- Contract Research
- Technology Acquisition
- Technology Licensing
- Supply Agreement
- To Be Negotiated

If you are interested, please respond to:

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