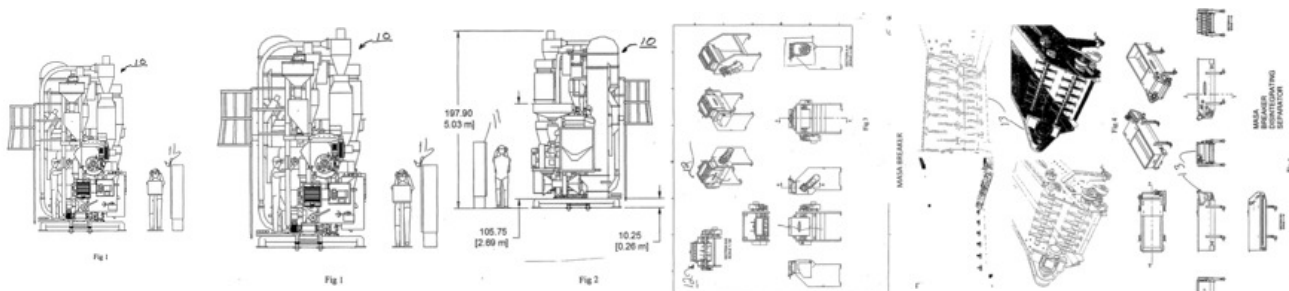
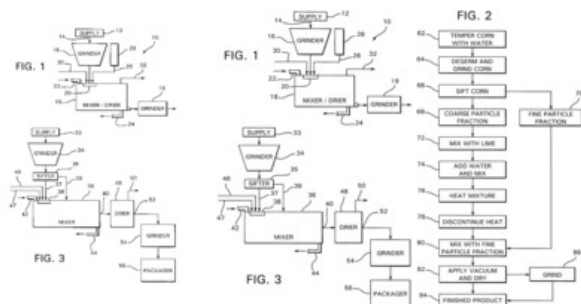


#			Title	Publication number	1st app. date	Applicant/Assignee	1st publ. date	Publ. date	
1.			System for quickly converting raw corn	CA2972241	2015-12-24	HEAT & CONTROL	2016-06-30	2016-06-30	

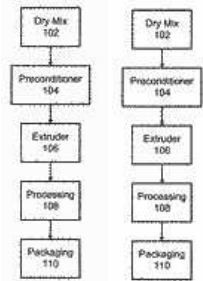
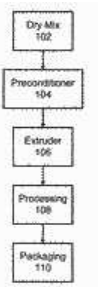
Fig. 1



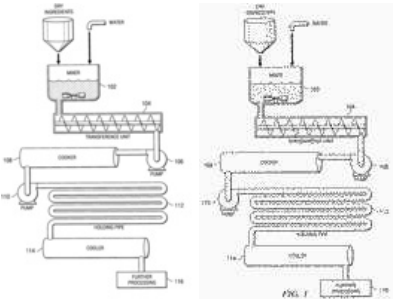
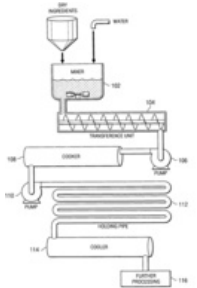
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A process for the production of fresh masa, nixtamalized flour and derived products. The invention is a new process for production of corn masa (dough) to be used in the production of tortillas, fried or baked tortilla chips, tostadas, or corn chips. The new process produces masa directly from raw materials without the traditional cooking and steeping steps. It utilizes a series of processing steps including dry blending, hydrating and working dough in an extruder having a unique screw configuration. The new process uses very little water and emits no waste water.



A process for the production of fresh masa, nixtamalized flour and derived products. The invention is a new process for production of corn masa (dough) to be used in the production of tortillas, fried or baked tortilla chips, tostadas, or corn chips. The new process produces masa directly from raw materials without the traditional cooking and steeping steps. It utilizes a series of processing steps including milling, blending, hydration, cooking and continuous cooling to stop gelatinization. The new process uses very little water and emits no waste water.



The present invention provides an additive composition made from milled cereal by-products. The additive is for enhancing the strength and/or stability of food products. The additive composition comprises a cooked cereal by-product which includes gelatinized edible starch. The starch is gelatinized to an extent, and is present in an amount, such that when the composition additive is added to masa or other cereal grain flour or dough at a level of at least about 0.5 weight percent the composition additive is effective for increasing the strength and/or the shelf life of food products made from the additive and flour.



Fig. 1

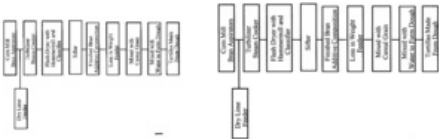


Fig. 1



Fig. 1

Instant fresh corn dough or masa may be prepared in short processing times, with low energy consumption and without liquid wastes by extruding a mixture of corn flour, lime and water in an extrusion or kneading chamber until a homogeneous dough is obtained, heating the homogeneous dough to cooking temperature while kneading is continued, expelling the cooked dough through a die from the extrusion chamber to a holding chamber, cooling the dough in said holding chamber and discharging the cooked and cooled dough through a discharge orifice, whereby the total processing time may be reduced to between 1.5 to a maximum of 7 minutes for the preparation of a fully nixtamalized corn dough or masa.

FIG. 1

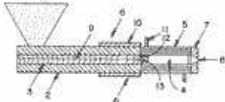


FIG. 1

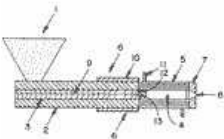
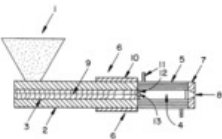
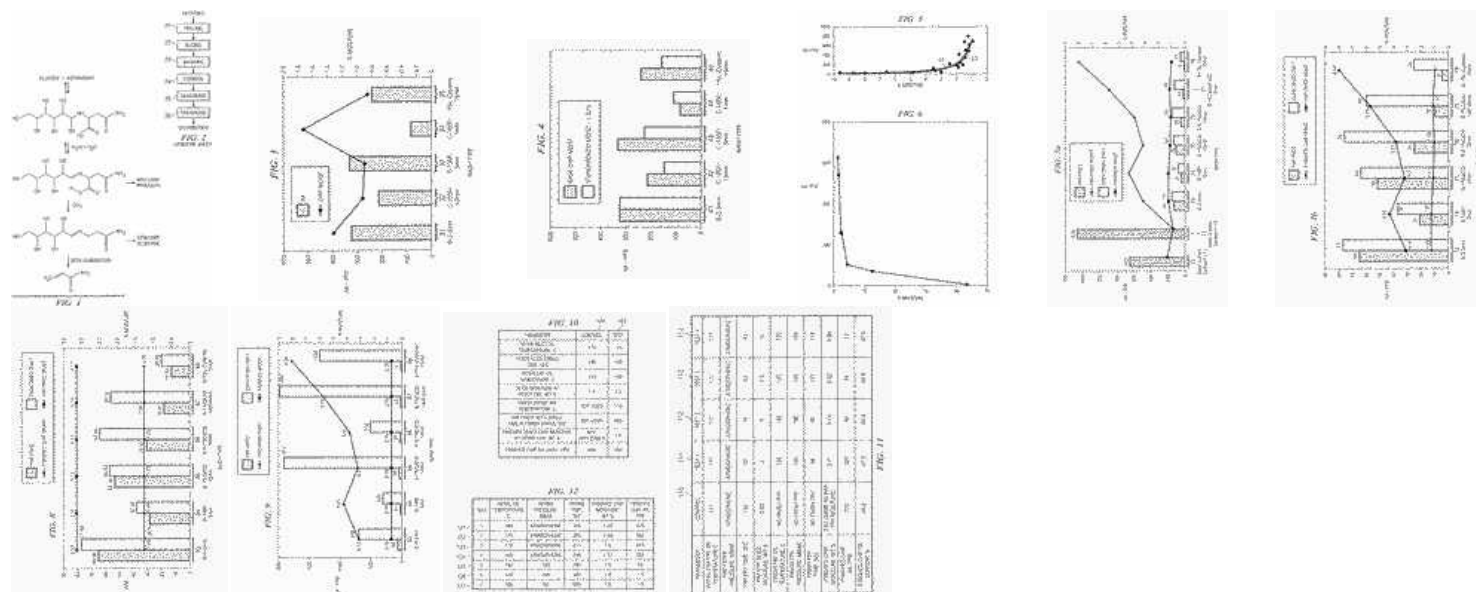


FIG. 1

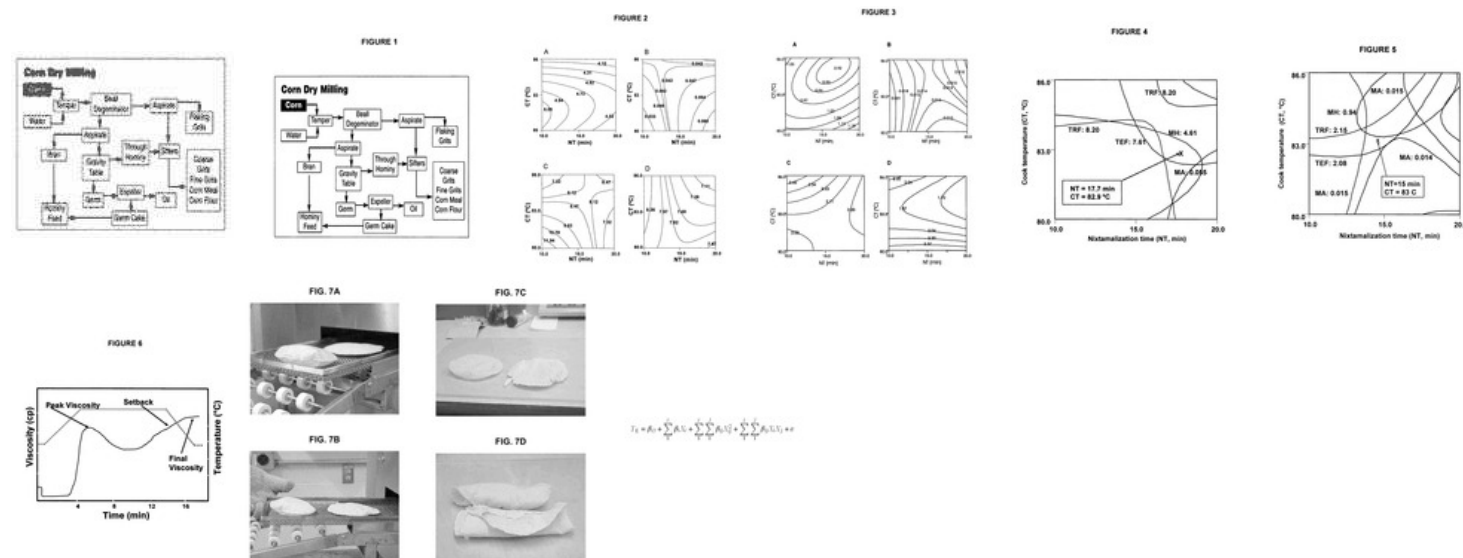


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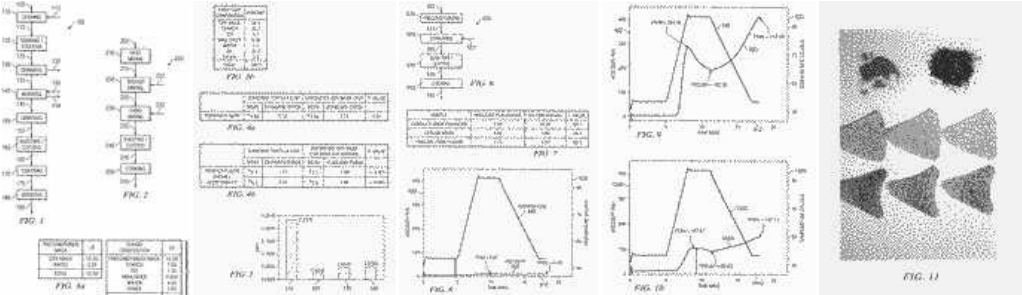
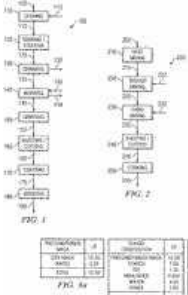
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graph TD
    Water[Water] --> Surge[Surge]
    Corn[Corn] --> Surge
    Surge --> Deg[Deol Degenerator]
    Deg --> Approx[Approx.]
    Approx --> Flaking[Flaking Rolls]
    Approx --> Thru[Through Rolling]
    Thru --> Germ[Germ]
    Thru --> Oil[Oil]
    Germ --> GermCake[Germ Cake]
    GermCake --> Apical[Apical Fluid]
    GermCake --> GermGrits[Germ Grits]
    GermGrits --> FineGrinds[Fine Grinds]
    GermGrits --> CornMeal[Corn Meal]
    GermGrits --> DensFlour[Dens Flour]

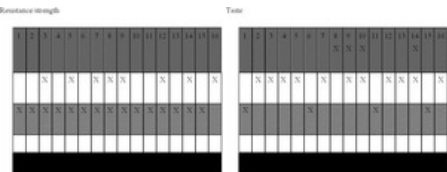
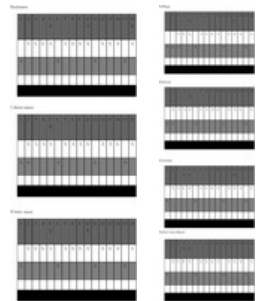
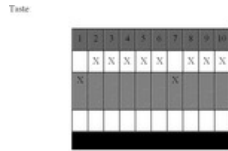
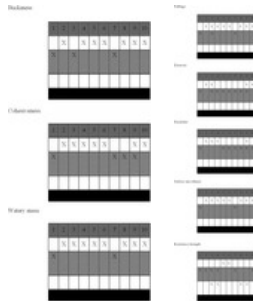
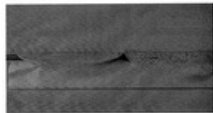
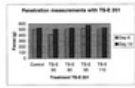
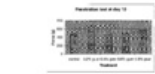
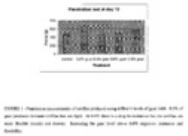
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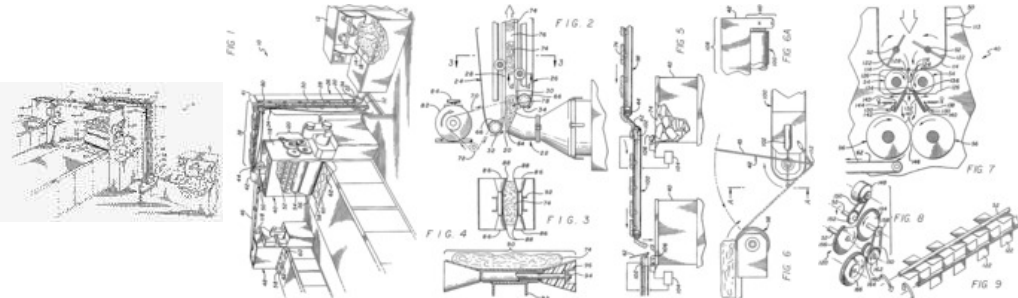
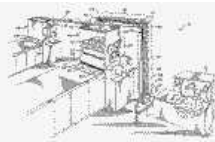
A novel toasted flavor additive for enhancing the toasted flavor and appearance of food products. In accordance with one embodiment of the present invention, toasted corn flavor additive ("TCF") is made by the steps of cooking whole corn kernels in a solution of lime and water; steeping the corn; draining and washing the corn; grinding, sheeting and cutting the corn into pieces; toasting the pieces until significant browning has occurred beyond the level normally associated with consumed masa products; and grinding the toasted pieces into a powder that can be administered as toasted corn flavor additive.



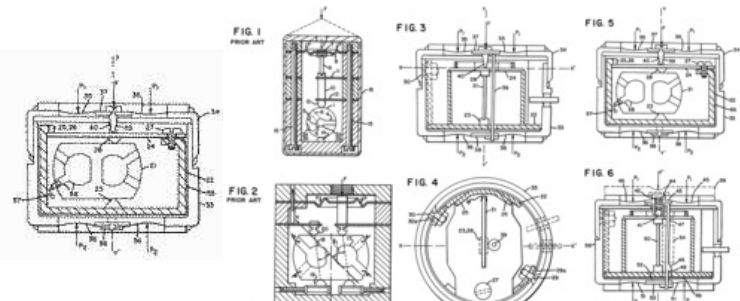
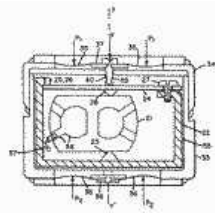
There is provided a process for the preparation of a modified masa foodstuff, the process comprising the steps of (i) preparing a masa by nixtamalisation of corn (ii) contacting an enzyme with (a) the masa, and/or (b) the corn prior to nixtamalisation; such that starch native to the corn is modified.



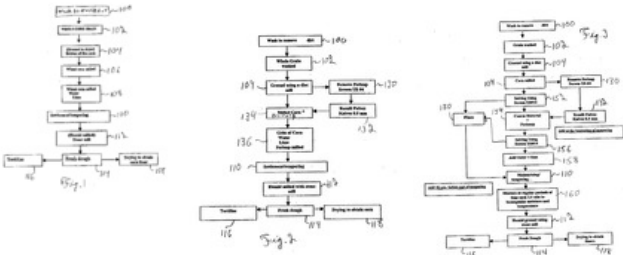
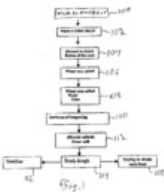
Mass handling methods for the continuous processing of masa type dough in conjunction with commonly available feed processing equipment, such as a masa extruder, an oven, or cooling apparatus. One masa handling method includes a masa separator having a pair of opposed, endless belt conveyors having facing surfaces spaced apart to receive a generally continuous masa stream output from a nozzle on the masa extruder. When the masa stream moves between the conveyors, it is gripped by their facing surfaces and moved away from the nozzle, causing the masa to be separated into individual pieces, or logs. The masa handling method can also include feeding the masa to masa hoppers fed by at least two endless belt conveyors arranged in upstream and downstream positions relative to each other. The masa is transported along the conveyors and is automatically diverted into one masa hopper by a diverter gate operated by a controller that receives a signal from a sensor sensing a masa level within an associated one of the hoppers. The hopper has one or more rotating shafts having projections to remove gas bubbles from the masa and force it toward the sheeter rollers. A pair of primary rollers with scrapers can be provided within the hopper to roll the masa to an intermediate thickness before it passes between the sheeter rollers.



A masa handling apparatus for the continuous processing of masa type dough in conjunction with commonly available feed processing equipment, such as a masa extruder, an oven, or cooling apparatus. The masa handling apparatus includes a masa separator having a pair of opposed, endless belt conveyors having facing surfaces spaced apart to receive a generally continuous masa steam output from a nozzle on the masa extruder. When the masa stream moves between the conveyors, it is gripped by their facing surfaces and moved away from the nozzle at a faster speed, causing the masa to be separated into individual pieces, or logs. The masa handling apparatus can also include at least two masa hoppers fed by at least two endless belt conveyors arranged in upstream and downstream positions relative to each other. The masa is transported along the conveyors and is automatically diverted into one masa hopper by a diverter gate. The diverter gate is operated by a controller that receives a signal from a sensor sensing a masa level within an associated hopper. The masa handling apparatus can also include a self-feeding masa hopper that has an opening for receiving masa from its associated feed conveyor. The hopper has one or more rotating shafts having projections to remove gas bubbles from the masa and force it toward a pair of sheeter rollers.



Improved methods for the formation of nixtamalized corn can result in the reduction or elimination of wastewater. In some embodiments, the method comprises hydrating a corn composition for a time of at least 5 minutes, and in further embodiments from about 5 minutes to about 5 hours. In some embodiments, the corn composition comprises cracked corn, water and no more than about 0.55 weight percent lime relative to cracked corn weight. In additional or alternative embodiments, the corn is combined with water at a temperature of at least about 70 DEG C at a pH from about 6 to about 7.5 pH units. In further embodiments, the cracked corn has a particle size of less than about 3.5 mm average size. The resulting corn dough can have a water content of about 45 to about 55 weight percent.



Exemplary embodiments provide methods of making a masa and exemplary corn-based snack food products made from the masa. The methods of making the masa include the steps of hydrating kernel corn; grinding the hydrated corn; and adding corn flour previously treated to deactivate enzymes therein to thereby make a masa comprised of hydrated ground corn and the added treated corn flour. Optionally, the treated corn flour may be corn flour that has been toasted to deactivate enzymes. The deactivation of the enzymes avoids an organoleptic property of a "raw" taste in the snack food product containing the corn flour.

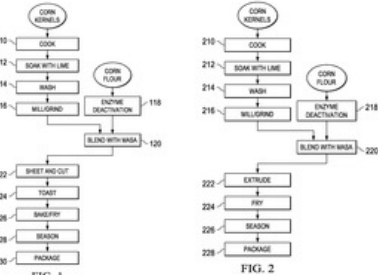
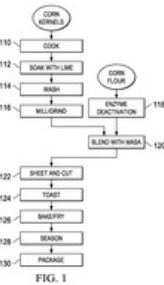
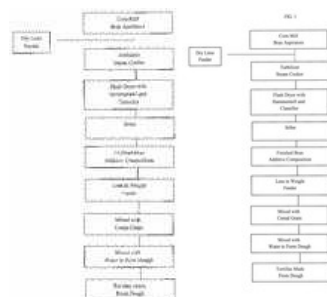
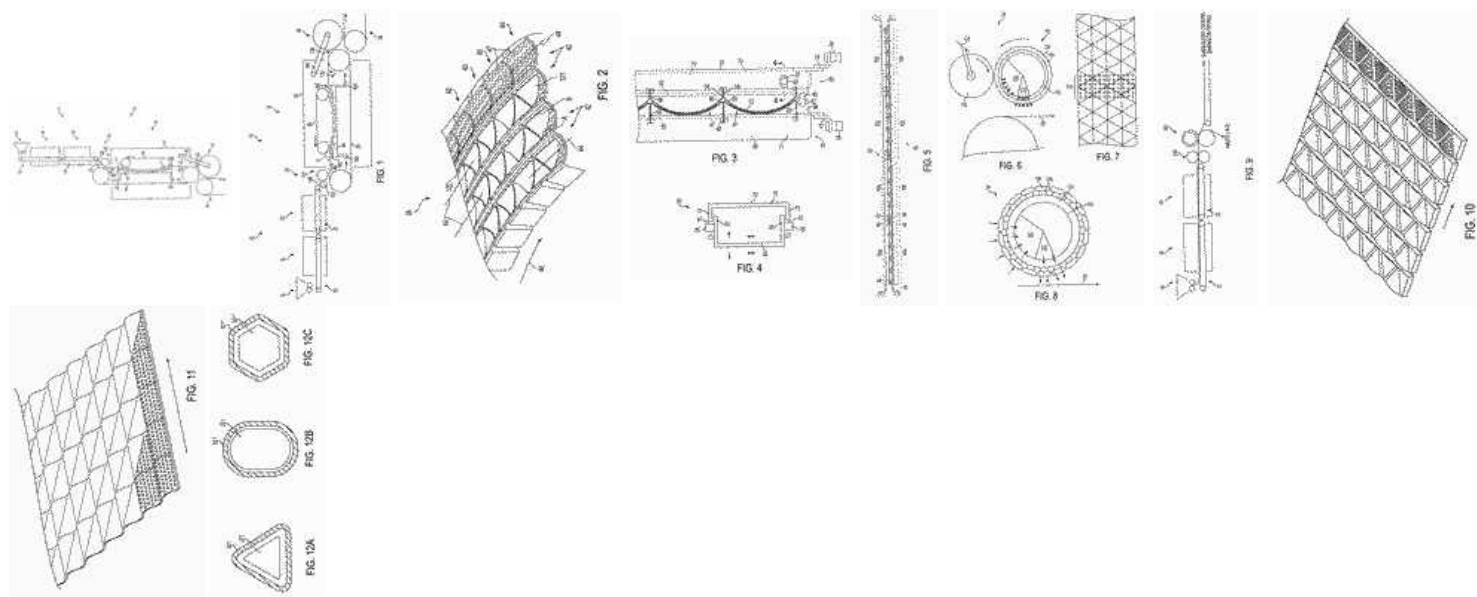


FIG. 1

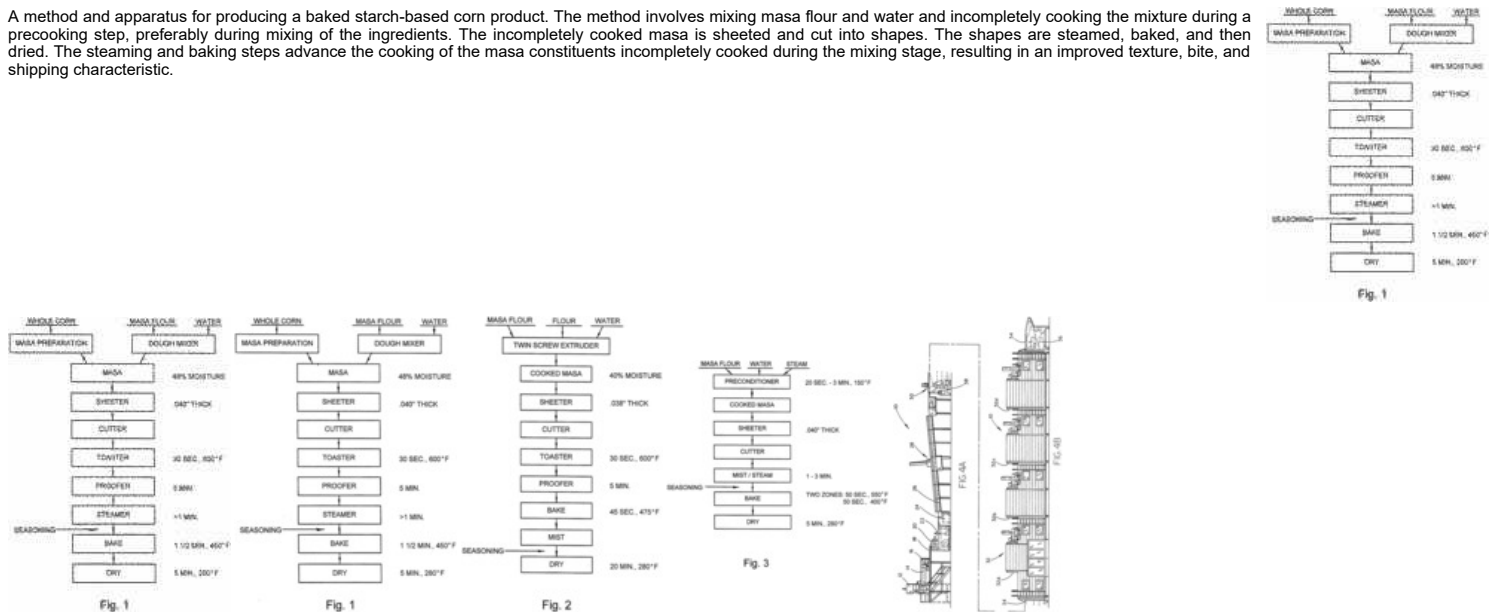
FIG. 2

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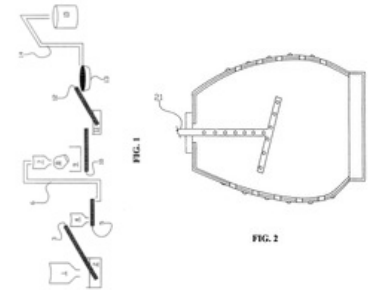
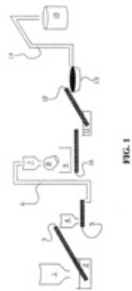
A schematic diagram of a machine for processing a workpiece. The machine consists of a main body with a horizontal axis. On the left side, there is a motor or drive unit connected to a series of gears and shafts. A workpiece is positioned horizontally across the center of the machine, supported by two vertical supports. Various components are labeled with numbers from 1 to 18, indicating different parts of the mechanism.



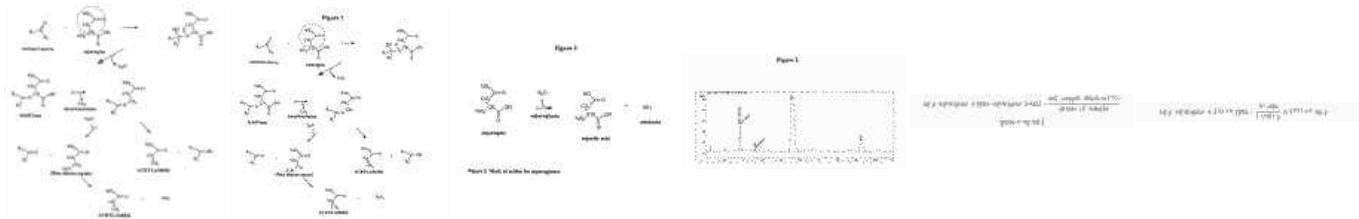
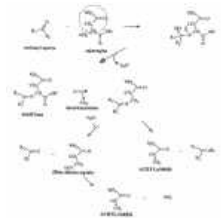
19. [Enzymatic process for nixtamalization of cereal grains](#) US6428828 2000-08-22 [UNIVERSITY OF NEBRASKA*](#) 2002-08-06 2002-08-06
- Disclosed are novel methods of producing food compositions by the use of an enzymatic digestion of the component parts of whole portions of cereal grains, and grain materials, to impart advantageous qualities to the resulting flour and dough related products produced therefrom. The present invention specifically relates to the fields of making flour and dough, used for totillas, corn chips, totilla chips, snacks, half-products and related products from the component parts and whole portions of cereal grains, and related materials.
20. [Baked corn-based product and process](#) US5505978 1994-05-16 [APV BAKER*](#) 1996-04-09 1996-04-09
- A method and apparatus for producing a baked starch-based corn product. The method involves mixing masa flour and water and incompletely cooking the mixture during a precooking step, preferably during mixing of the ingredients. The incompletely cooked masa is sheeted and cut into shapes. The shapes are steamed, baked, and then dried. The steaming and baking steps advance the cooking of the masa constituents incompletely cooked during the mixing stage, resulting in an improved texture, bite, and shipping characteristic.



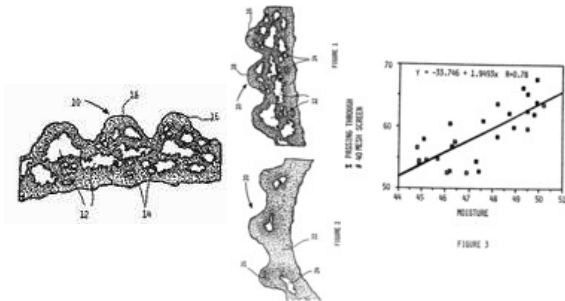
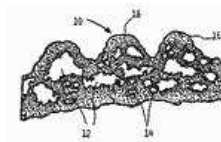
The invention relates to the dough and pancake industry, and all new industries wherein a product undergoes nixtamalization. The invention more particularly relates to a nixtamalization process involving a rotary reactor, having improved operation parameters that are defined for optimum operation. The conditions of the inventive system are advantageous over those of prior art systems in that the resulting rotary reactor parameter levels produce a good-quality product while reducing the amount of fuel consumed per amount of finished product. The aforementioned conditions are as follows: the speed of rotation of the reactor, which is between 25 and 30 seconds per revolution; the temperature of the heating jacket, which is between 130 and 300 °C; the supply of steam to the nixtamalization chamber is either continuous or intermittent with a break period of between 20 and 120 seconds and injection of steam for between 30 and 90 seconds; the start nixtamalization temperature which is maintained at least between 60 and 70 C and the end nixtamalization temperature which is maintained at between 85 and 90 C, while the post-nixtamalization conditioning water is maintained at a temperature between ambient temperature and 55 °C.



A method for the reduction of acrylamide in corn-based food products, corn-based food products having reduced levels of acrylamide, and an article of commerce. In one aspect, the method comprises reducing the level of asparagine in a corn-based food material before final heating (e.g., cooking). In another aspect, the method comprises adding to a corn-based food material an enzyme capable of hydrolyzing the amide group of free asparagine. In yet another aspect, an article of commerce communicates to the consumer that a corn-based food product has reduced or low levels of acrylamide or asparagine.

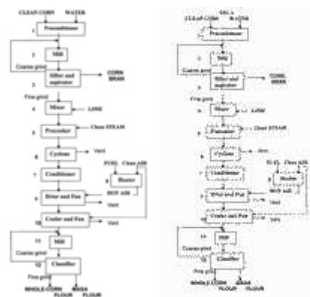
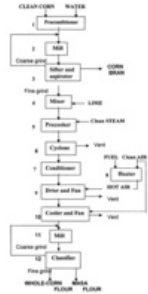


A process for producing expanded corn snack products. The products are preferably made in a fluted ring shape, and have an expanded, airy texture. The process for producing the products includes successive cutting steps wherein the corn is comminuted to a relatively narrow particle size distribution with most of the corn retained on a #40 or #60 mesh screen. The corn is comminuted by impelling whole cooked corn kernels against a blade and through a screen having a ratio of open area:screen material of from about 1:1 to about 3:1. A dough of the comminuted corn is extruded, cut into individual pieces and fried.



24.	Continuous production process of corn flour and whole-corn flour for corn-based foods, using a low-moisture precooling	US20070148318	2005-12-22	BARRERA ROBERTO GONZALEZ INVEST DE TECNOLOGIA AVANZAD INVEST DE TECNOLOGIA AVANZADA* INVESTIGACION DE TECNOLOGIA AVANZADA INVESTIGATION DE TECHNOLOGY AVANTADA ES A DESE UBE MEXICO	2007-06-28	2007-06-28
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A bioprocess and apparatus for the continuous production of novel masa and whole-corn flours as cereal-base and functional-food ingredients. The bioprocess includes providing a fine grind fraction of corn kernel; combining the fine grind fraction of corn kernel with at least one endoamylase to produce an enzyme-added fine grind; moist-heat precooling the enzyme-added fine grind to obtain a pre-cooked enzyme-added fine grind; low-moisture conditioning the precooked enzyme-added fine grind to partially hydrolyze starchy endosperm and swell starch and aleurone-bran granules to produce enzymatically conditioned corn kernel particles; and milling the conditioned corn kernel particles to obtain flour comprising a fine grind portion of the conditioned corn kernel particle.



25.	Fat free corn chips	WO9639865	1996-03-27	KELLOGG* PROCTER & GAMBLE	1996-12-19	1996-12-19
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The present invention relates to fat free corn chips comprising: corn flour or masa and fat free filler selected from the group consisting of starch, protein and nondigestible fiber, and mixtures thereof; nondigestible fat substitute; and other essentially fat free ingredients selected from the group consisting of salt, emulsifiers and fat free seasonings and combinations thereof. The corn chips comprise up to about 50 % corn and fat free filler; from about 1 % to about 35 % of nondigestible fat substitute; from 0 % to about 4 % moisture; and from 0 % to about 10 % of other essentially fat free ingredients and less than 0.5 gm digestible fat per 30 gm serving. Any residual or intrinsic digestible fat in the 30 gram serving is negligible.