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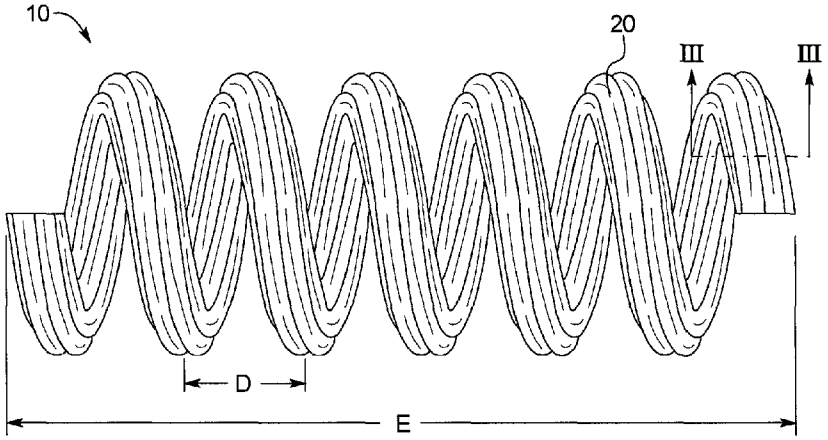
(54) **Title**: COMESTIBLE ANIMAL CHEW AND PLAY TOY

FIG. 1



(57) **Abstract**: The invention provides a comestible animal chew and play toy having a unique shape that engages an animal in play before and during consumption. In one aspect, the invention provides a comestible animal chew and play toy made from an edible composition having a helical shape. The edible composition of the comestible animal chew and play toy can be an extruded pet food composition. The edible composition can further include a filling that can be co-extruded with the edible composition and formed into a helical shape.

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COMESTIBLE ANIMAL CHEW AND PLAY TOY

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application Serial No. 61/626056 filed September 20, 2011, the disclosure of which is incorporated herein by this reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The invention relates generally to animal chews and animal toys and particularly to comestible animal chew and play toys having a unique shape that engages an animal in play before and during consumption.

Description of Related Art

[0003] Animal chew toys are designed to entertain the animal, combat animal boredom, prevent destructive animal chewing behavior, and provide an outlet for an animal's innate chewing instinct. Generally, animal chew toys are made from plastic or other material that cannot be eaten by the animal. Animals typically tire of non-edible animal chew toys after a short period and move on to other activities. At the same time, non-edible animal chew toys provide no nutritional value to the animal and are limited in providing a health benefit to the animal.

[0004] US5965182 discloses an animal chew and play toy that dispenses food while it is played with by the animal. The animal chew and play toy is in the form of an elastic or flexible spherical animal toy having an interior space and a slit or narrow opening of elongated shape through to the interior space. The animal chew and play toy can contain any type of food that is sized to fit inside the toy. The slit or narrow opening widens into a hole when pressure is applied to the ends of the slit or narrow opening, allowing a treat, such as animal food, treat or odor producing substance, inside the toy to fall out. An animal can typically open the slit and occasionally gain access to items placed inside the toy by biting or squeezing the toy. US5560319 discloses a play toy for an animal that can be gripped by the animal's mouth. The toy has any of a number of regular and irregular shapes, including rectangles and squares, having a plurality of tabs or other members intended to be grasped by and held in the animal's mouth. The toy's configuration is non-rigid and pliable and the structure contains a filling that forms a soft pillow or cushion like structure from which the tabs or members extend. A covering holds the filling and forms the outside surface of the toy. The filling material is of a non-toxic, non-

harmful nature, and will not injure the animal if ingested or inhaled. US7976884 discloses an edible animal chew made from hide. The edible animal chew is made of rehydrated hide folded about an inner fill via a positioning sheath. The edible animal chew primarily has the shape of an elongated shaft or a bone. These animal chew toys are adequate for their purpose. There is, however, a need for new animal chew toys having a unique shape that engages an animal in play before and during consumption.

SUMMARY OF THE INVENTION

[0005] It is, therefore, an object of the present invention to provide a comestible animal chew and play toy having a unique shape that engages an animal in play before and during consumption.

[0006] It is a further object of the invention to promote the health or wellness of an animal using a comestible animal chew and play toy.

[0007] It is yet another object of the present invention to improve the quality of life of an animal using a comestible animal chew and play toy.

[0008] It is still another object of the present invention to extend the prime years of an animal's life using a comestible animal chew and play toy.

[0009] It is a further object of the invention to provide containers and packages including one or more a comestible animal chew and play toy having a unique shape that engages an animal in play before and during consumption.

[0010] It is yet another object of the present invention to provide methods of manufacturing a comestible animal chew and play toy having a unique shape that engages an animal in play before and during consumption in a container or package.

[0011] One or more of these or other objects are achieved by providing a comestible animal chew and play toy made from an edible composition having a helical shape. The edible composition of the comestible animal chew and play toy can be an extruded pet food composition. The edible composition can further include a filling that can be co-extruded with the edible composition and formed into a helical shape.

[0012] Other and further objects, features, and advantages of the present invention will be readily apparent to those skilled in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 shows a side view of a comestible animal chew and play toy comprising an edible composition having a helical shape in an embodiment of the invention.

[0014] FIG. 2 shows a front view of a comestible animal chew and play toy comprising an edible composition having a helical shape in an embodiment of the invention.

[0015] FIG. 3 shows a cross-section view III-III of a comestible animal chew and play toy comprising an edible composition having a helical shape in an embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

Definitions

[0016] The term "animal" means any animal that could enjoy or benefit from a comestible animal chew and play toy, including dogs and cats.

[0017] The term "single package" means that the components of a kit are physically associated in or with one or more containers and considered a unit for manufacture, distribution, sale, or use. Containers include, but are not limited to, bags, boxes, cartons, bottles, packages of any type or design or material, over-wrap, shrink-wrap, affixed components (*e.g.*, stapled, adhered, or the like), or combinations thereof. A single package may be containers of individual components physically associated such that they are considered a unit for manufacture, distribution, sale, or use.

[0018] The term "virtual package" means that the components of a kit are associated by directions on one or more physical or virtual kit components instructing the user how to obtain the other components, *e.g.*, a bag or other container containing one component and directions instructing the user to go to a website, contact a recorded message or a fax-back service, view a visual message, or contact a caregiver or instructor to obtain instructions on how to use the kit or safety or technical information about one or more components of a kit.

[0019] The term "quality of life" means the ability to enjoy normal life activities.

[0020] The term "health and/or wellness of an animal" means the complete physical, mental, and social well being of the animal, not merely the absence of disease or infirmity.

[0021] The term "extending the prime" means extending the number of years an animal lives a healthy life and not just extending the number of years an animal lives, *e.g.*, an animal would be healthy in the prime of its life for a relatively longer time.

[0022] As used herein, ranges are used herein in shorthand, so as to avoid having to list and describe each and every value within the range. Any appropriate value within the range can be selected, where appropriate, as the upper value, lower value, or the terminus of the range.

[0023] As used herein, the singular form of a word includes the plural, and vice versa, unless the context clearly dictates otherwise. Thus, the references "a", "an", and "the" are generally inclusive of the plurals of the respective terms. For example, reference to "a compound" or "a method" includes a plurality of such "compounds" or "methods." Similarly, the words "comprise", "comprises", and "comprising" are to be interpreted inclusively rather than exclusively. Likewise the terms "include", "including" and "or" should all be construed to be inclusive, unless such a construction is clearly prohibited from the context.

[0024] The terms "comprising" or "including" are intended to include embodiments encompassed by the terms "consisting essentially of" and "consisting of". Similarly, the term "consisting essentially of" is intended to include embodiments encompassed by the term "consisting of".

[0025] All percentages expressed herein are by weight of the total weight of a composition unless expressed otherwise. For example, an ingredient in an amount of 25% by weight means that the ingredient is 25% of the total weight of a composition. Thus, if the total weight of the composition is 100 grams, the actual amount of the ingredient corresponding to 25% by weight would be 25 grams.

[0026] The methods and compositions and other advances disclosed here are not limited to particular methodology, protocols, and reagents described herein because, as the skilled artisan will appreciate, they may vary. Further, the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to, and does not, limit the scope of that which is disclosed or claimed.

[0027] Unless defined otherwise, all technical and scientific terms, terms of art, and acronyms used herein have the meanings commonly understood by one of ordinary skill in the art in the field(s) of the invention, or in the field(s) where the term is used. Although any compositions, methods, articles of manufacture, or other means or materials similar or equivalent to those described herein can be used in the practice of the present invention, the preferred compositions, methods, articles of manufacture, or other means or materials are described herein.

[0028] All patents, patent applications, publications, technical and/or scholarly articles, and other references cited or referred to herein are in their entirety incorporated herein by reference to the extent allowed by law. The discussion of those references is intended merely to summarize the assertions made therein. No admission is made that any such patents, patent applications, publications or references, or any portion thereof, are relevant, material, or prior art. The right to challenge the accuracy and pertinence of any assertion of such patents, patent applications, publications, and other references as relevant, material, or prior art is specifically reserved.

The Invention

[0029] In one aspect shown in FIGS. 1-3, the invention provides a comestible animal chew and play toy 10 for engaging an animal in play before and during consumption. Comestible animal chew and play toy 10 comprises an edible composition 20 having a helical shape (*e.g.*, coil shape). The invention is based upon the discovery that chews having a helical shape will induce an animal to play with the chew as well as consume the chew. While not bound by theory, it is believed that the spring-like action associated with the helical shape is playful and entertaining. Many other shapes do not induce such playful activity, even when the chew is made from the same ingredients.

[0030] The helical shape of comestible animal chew and play toy 10 has an internal diameter A and an external diameter B as shown in FIG. 2. Edible composition 20 of comestible animal chew and play toy 10 has a diameter C as shown in FIG. 3. A cross-sectional peripheral shape of comestible animal chew and play toy 10 can be in any form suitable for the toy, *e.g.*, in the form of circle, a hexagon, a polygon, star, triangle, or a flower. The helical shape of comestible animal chew and play toy 10 has a pitch D and an overall length E shown in FIG. 3. Preferred values and ranges for A-E are shown in Table 1.

Table 1

Parameters	Preferred Value	Acceptable Range
A:B	1:2.25	1:2 to 1:14
B:C	1:4	1:2.5 to 1:28
B:E	1:2.25	1:1 to 1:10
A:E	1:5.1	1:1.75 to 1:20
C:A	1:1.75	1:0.5 to 1:10
D (inches)	0.3	0.01 to 1

[0031] The helical shape of comestible animal chew and play toy 10 can have any suitable length. Preferably, the overall length of the helical shape ranges from about 1 to about 20 inches. More preferably, the overall length of the helical shape ranges from about 2 to about 15 inches. Even more preferably, the overall length of the helical shape ranges from about 3 to about 10 inches or from about 5 to about 6 inches. The length of the helical shape can depend on the type and size of the animal's mouth that a particular comestible animal chew and play toy is designed for.

[0032] In addition, the die that forms the cross sectional shape of the rope can be stationary or can rotate. The rotation of the die increases the visual impact of the product by giving it a more interesting definition, especially as it is formed into a helical shape.

[0033] Although the overall helical shape of edible composition 20 provides it with unique properties, edible composition 20 can have any suitable cross-sectional peripheral shape 22. As shown in FIG. 3, edible composition 20 can have a cross-sectional peripheral shape in the form of a flower. Other examples of suitable cross-sectional peripheral shapes can be in the form of a circle, a hexagon, a polygon, star, triangle, or a flower.

[0034] Edible composition 20 can be made from any suitable ingredients. For example, edible composition 20 can include one or more edible ingredients such as meats, grains, starches, meat meals, proteins, fibers, sugars, vitamins, minerals, aromas, colors, flavors, oils, humectants, preservatives, or a combination thereof. Preferred starch sources can include crisp rice, ground rice, corn flour and the like.

[0035] In a further aspect as shown in FIG. 3, comestible animal chew and play toy 10 includes a filling 30. Filling 30 can extend partially or entirely through comestible animal chew and play toy 10. Filling 30 can be made from any suitable ingredients. For example, filling 30 can include one or more edible ingredients such as meats, grains, starches, meat meals, proteins, fibers, sugars, vitamins, minerals, aromas, colors, flavors, oils, humectants, preservatives, or a combination thereof.

[0036] In some embodiments, the comestible animal chew is made such that is could contain a filling 30 but the filling is not included in the comestible animal chew. This results in a chew and play toy 10 having a hollow core.

[0037] In other embodiments, the comestible animal chew is made such that is could contain a filling 30 but the filling is included in only one or more sections of the comestible animal chew, *e.g.*, the filling is in the first one-half of the comestible animal chew. In one embodiment, the

filling alternates in sections of the comestible animal chew, *e.g.*, the filling fills one section, the next section has no filling, the next section has filling, the next section has no filling, and the like. The fillings can be regularly spaced or random. Having alternative sections of filling can increase the play associated with the toy since the animal searches for and anticipates the desirable filling.

[0038] The comestible animal chew can be made with or without a filling. Generally, the comestible animal chew has a filling that comprises from about 0 to about 50% filling, preferably from about 0 to about 40%, more preferably from about 0 to about 30%.

[0039] The comestible animal chew and play toy can be made from various ingredients using various methods known to skilled artisans. In a preferred embodiment, the comestible animal chew and play toy comprises a product comprising a coherent bio-plastics mass that includes a melted constituent, the melted constituent having included expanded material, as disclosed in US20060292288A1 and EP1440622A1. In another preferred embodiment, the comestible animal chew and play toy comprises an edible composition comprising at least one pre-activated, vegetable starch source and at least one bridger as disclosed in US20100034925A1 and EP1983841A1. In other embodiments, the comestible animal chew and play toy comprises a product made using the ingredients and methods disclosed in one of US20040086616A1, US20040197455A1, and US20050214349A1. Many such compositions are known to skilled artisans.

[0040] In another aspect, the invention provides methods for making a comestible animal chew and play toy suitable for engaging an animal in play before and during consumption. The methods comprise extruding an edible composition and forming the extruded edible composition into a helical shape. Any suitable device such as a coiling device can be used for shaping the extruded edible composition. The method can also comprise co-extruding a filling inside the edible composition and forming the co-extruded edible composition into a helical shape using a suitable shaping device.

[0041] In an alternative aspect, the invention provides methods for promoting the health or wellness of an animal. The methods comprise administering to an animal a health or wellness promoting amount of a comestible animal chew and play toy comprising an edible composition having a helical shape. Playing with, chewing, and consuming one or more of the comestible

animal chew and play toys can help promote the health or wellness of the animal by providing activity and nutrition to the animal.

[0042] In another aspect, the invention provides methods for improving the quality of life of an animal. The methods comprise administering to an animal a quality of life improving amount of a comestible animal chew and play toy comprising an edible composition having a helical shape. Playing with, chewing, and consuming one or more of the comestible animal chew and play toys can help improve the quality of life of the animal by providing activity and nutrition to the animal.

[0043] In another aspect, the invention provides method for extending the prime years of an animal's life. The methods comprise administering to an animal a comestible animal chew and play toy comprising an edible composition having a helical shape in an amount effective for extending the prime years of the animal. Playing with, chewing, and consuming one or more of the comestible animal chew and play toys can help extend the prime years of the animal by providing activity and nutrition to the animal.

[0044] In an alternative aspect, the invention provides kits comprising in a single package or in separate containers in a virtual package, as appropriate for a kit component, (A) a comestible animal chew and play toy comprising an edible composition having a helical shape, and (B) one or more of: (1) a description of the benefits of the comestible animal chew and play toy; (2) instructions for how to administer the comestible animal chew and play toy; (3) a second edible composition; (4) a serving tray for serving the comestible animal chew and play toy; (5) a serving utensil for serving the comestible animal chew and play toy; (6) instructions for how to extend the prime years of an animal's life using the comestible animal chew and play toy; or (7) a non-edible animal chew toy.

[0045] When the kits comprise a virtual package, the kits can be limited to instructions in a virtual environment in combination with one or more physical kit components. The kits may contain the kit components in any of various combinations and/or mixtures. For example, in one embodiment, the kit includes a comestible animal chew and play toy described herein and instructions for how to administer the comestible animal chew and play toy. In another embodiment, the kit includes a comestible animal chew and play toy described herein and a non-edible animal chew toy.

[0046] In another aspect, the invention provides a means for communicating information about or instructions for a comestible animal chew and play toy comprising an edible composition having a helical shape for one or more of: (1) administering the comestible animal chew and play toy; (2) describing the benefits of comestible animal chew and play toy; (3) promoting the health or wellness of an animal with the comestible animal chew and play toy; or (4) extending the prime years of an animal's life with the comestible animal chew and play toy.

[0047] The communication means can be a document, digital storage media, optical storage media, audio presentation, or visual display containing the information or instructions. More specifically, the means can be a displayed website, a visual display kiosk, a brochure, a product label, a package insert, an advertisement, a handout, a public announcement, an audiotape, a videotape, a DVD, a CD-ROM, a computer readable chip, a computer readable card, a computer readable disk, a USB device, a FireWire device, a computer memory, or any combination thereof.

[0048] In another aspect, the invention provides packages comprising indicia describing a comestible animal chew and play toy comprising an edible composition having a helical shape. The indicia can be in the form of words, symbols, pictures, photographs, figures, or combinations thereof to show details or examples of the comestible animal chew and play toy comprising an edible composition having a helical shape described herein. The packages can further contain a comestible animal chew and play toy comprising an edible composition having a helical shape.

[0049] In an alternative aspect, the invention provides methods for manufacturing a container including a comestible animal chew and play toy comprising providing an extrudable edible composition, extruding the edible composition, forming the extruded edible composition into a helical shape, cutting the edible composition having the helical shape into discrete pieces to form the comestible animal chew and play toy, and filling the container with the pieces of the comestible animal chew and play toy. The manufacturing methods can further comprise retorting the container.

[0050] Alternatively, the manufacturing methods can comprise co-extruding the edible composition with a filling, forming the co-extruded edible composition into a helical shape, cutting the co-extruded edible composition having the helical shape into discrete pieces to form the comestible animal chew and play toy, and filling the container with the comestible animal chew and play toy. The edible composition and filling can be made from any suitable ingredients and have any suitable textural properties for making a helical shape.

[0051] In a further aspect, the invention provides continuous production lines capable of manufacturing a container comprising a comestible animal chew and play toy comprising an edible composition having a helical shape. More specifically, the continuous production lines can include various devices for making a container having the comestible animal chew and play toy comprising an edible composition having a helical shape. For example, the continuous production line can include a mechanical mixer for combining the ingredients of the edible composition and/or filling. The continuous production line can include an extruder/co-extruder for co-extruding the edible composition and the filling and a coiling device for shaping the co-extruded edible composition into a helical shape. The helical shaped co-extruded edible composition can be cut into discrete pieces to form the comestible animal chew and play toy and filled in a container. The filled container can then be sealed or closed and taken to a steamer/retorting station. A conveyor belt can be used to transport the containers from one station to another station of the continuous production line. Continuous production lines, their components, and methods for constructing such lines are known to skilled artisans.

[0052] In an alternative aspect, the invention provides multi-pack packages comprising 1) a plurality of containers arranged in an array, each of the plurality of containers comprising a comestible animal chew and play toy comprising an edible composition having a helical shape, and 2) one or more devices for retaining the containers in the array. In various embodiments, the devices are boxes made from paper, plastic, polymers, or a combination thereof. In others, the devices are systems of connected plastic rings affixed to each of the containers. In still others, the devices are wrappings of plastic of similar materials, *e.g.*, twelve cans stacked in an array and wrapped in plastic. In some embodiments, the multi-pack packages have one or more handles affixed to the multi-pack packages to facilitate handling and transporting the multi-pack packages.

[0053] In other embodiments, the devices further comprise one or more windows that permit the package contents to be viewed without opening the multi-pack package. In some embodiments, the windows are a transparent portion of the devices. In others, the windows are missing portions of the devices that permit the containers to be viewed without opening the multi-pack package.

[0054] In preferred embodiments, the multi-pack packages further comprise one or more indicia describing the contents of the containers in the packages. The indicia can be in the form of

labels, printing on the packages, stickers, and the like and include words, symbols, pictures, photographs, figures, or combinations thereof to provide detail or examples of the comestible animal chew and play toy comprising an edible composition having a helical shape described herein. In a preferred embodiment, a label is affixed to the multi-pack packages containing a word or words, picture, design, acronym, slogan, phrase, or other device, or combination thereof, that indicates that the contents of the package contain a comestible animal chew and play toy comprising an edible composition having a helical shape.

EXAMPLES

[0055] The invention can be further illustrated by the following examples, although it will be understood that these examples are included merely for purposes of illustration and are not intended to limit the scope of the invention unless otherwise specifically indicated.

Play Testing Method

[0056] Helical shaped chews were tested with respect to consumption and play as follows. Dogs were fed their main meals in the mornings and then offered a treat (*i.e.*, helical shaped chew) in the afternoon. Each dog was offered one treat. During the test the dogs were observed for their interaction with the treat. For each dog, treat acceptance (whether they ate some, all, or none of the treat), the time it took to consume the treat, and play behavior were scored. Play was defined as any behavior towards the treat that did not include eating the treat or holding the treat to consume it. Examples of play behaviors observed included rolling the treat with either the front paws or nose, throwing the treat in the air and running around the kennel with the treat in mouth.

Example 1

[0057] The ingredients for the edible composition were used and processed as follows. The dry ingredients listed in Table 2 below were mixed together. This mix was then ground through a 4/64" hammer mill screen to reduce the particle size for better extrusion. The ground mix and liquids listed in Table 2 were metered into an extruder to cook the mix. A vacuum stuffer attached to the extruder barrel just prior to its exit was used to de-gas the extrudate. The vacuum ranged from 10 to 17 (inches Hg) to produce the desired compact texture. The extruder barrel temperature was maintained at 140 to 145°F (60 to 63°C). The exit product temperature ranged from 195 to 225 F° (91 to 107°C). The gear box pressure was maintained in the range of 80 to 110 bars.

Table 2

Edible Composition Formulation

	Ingredients	Weight (lbs)	Formula (%)
DRY	Crisp Rice	72.2701	68.6566
	Distilled Monoglyceride	1.1618	1.1037
	Caramel color	0.0022	0.0021
	BHA/BHT Powder	.0186	0.0177
	Yeast	2.3235	2.2073
	Corn Germ Meal	0.9294	0.8829
	Dye Yellow #5	0.0023	0.0022
	Sorbic Acid	0.2556	0.2428
	Titanium Dioxide	.4865	0.4622
LIQUIDS	Glycerin	12.5	11.875
	Liquid Smoke Flavor	0.05	0.0475
	Water	10.0	9.5
	Total	100.00	95.00

[0058] Instead of adding colors in the dry mix as shown in this example, color may be added via continuous color injection at the extruder to completely color the edible composition or by pulsed color injection for variation in color to the edible composition.

[0059] For the process described in this example, the range of conditions may be widened as follows: i) a vacuum stuffer can be used to de-gas the extrudate with 0 to 30 (inches Hg), with the more preferred vacuum range being 7 to 25 (inches Hg) and the most preferred vacuum range being from 10 to 17 (inches Hg) for most desirable texture; ii) the extruder barrel temperatures can be maintained at 120 to 160°F (49 to 71°C), with more preferred range being 130 to 150°F (54 to 66°C) and the most preferred temperature range being from 140 to 145°F (60 to 63°C) for optimal processing conditions; iii) the exit product temperature can range from 185 to 235°F (85 to 113°C), with the more preferred range being 195 to 225°F (91 to 107°C) and the most preferred temperature range being from 200 to 220°F (93 to 104°C); and iv) the gear box

pressure can range from 60 to 135 bars, with the more preferred range being from 70 to 125 bars and the most preferred range being from 80 to 110 bars.

[0060] In a separate operation, the filling was prepared by adding the dry and liquid ingredients per the filling formulation in Table 3 below to a batch mixer with mixing arms (paddles). While continuously agitating, the mixer was heated with steam to cook the filling to 185 to 195°F (85 to 91°C) and transformed it into a visco-elastic dough. This heated dough was placed in a hopper connected to a high pressure pump.

Table 3

Filling Formula

	Ingredients	Weight (lbs)	Formula (%)
DRY	Animal Digest	3.7542	0.1877
	Gelatin 250 bloom	1.609	0.0805
	Deoiled (dry) Soy Lecithin	0.1006	0.005
	Sugar	6.4694	0.3235
	Wheat Gluten	2.6146	0.1307
	Wheat Flour	38.9435	1.9472
	Poultry By-Product Meal	11.2627	0.5631
	Salt	1.8771	0.0939
	Sorbic Acid	0.4089	0.0204
	Color Blend	0.0081	0.0004
LIQUIDS	Beef Flavor	0.2757	0.0138
	Hydrogenated Starch Hydrolysates	9.5023	0.4751
	Phosphoric acid	2.0504	0.1025
	Glycerin	5.4016	0.2701
	Tallow	6.35	.3175
	Water	9.3719	0.4686
	Total	100	5.00

[0061] The extruder-cooked edible composition formulation was fed to a co-extrusion die to form a hollow cylindrical rope of 0.5 inch diameter. The filling formulation was metered and fed into the center of the edible composition at the co-extrusion die using a high pressure pump and hose connected to the co-extrusion die. The filling rate was 5% of the total product mass (Table 4).

Table 4

Finished Formula

Ingredients	Weight (lbs)	Formula (%)
Edible composition	95	95
Filling	5	5
Total	100	100

[0062] The co-extruded rope was cut into pieces of length of between 29 to 30 inches weighing about 100 to 110 grams. Each rope was transferred while still hot to a coiling device to form the helical shaped chews. The coiling device created a helical shaped chew that had a 1 inch internal diameter (I.D.) with coil spacing (*i.e.*, pitch) of 0.375 inch for an overall length of 4.7 inches. The portion of the coiling device that held the helical shaped chew was sent through a cooling conveyor to set the product before discharging the helical shaped chew product onto a conveyor for packaging. 9% shrinkage of the rope dimensions was observed after a week. No further shrinkage occurred after that.

[0063] The helical shaped chew pieces were tested for play using a panel of 20 small to medium dogs. The results are shown in Table 5. A discussion of Table 5 is provided by the examples that follow. Referring to the results, it is seen that 5 of the 20 dogs played with the chews while eating.

Table 5

Example	Rope Diameter (inch)	Helical Shaped Chew ID (inch)	Weight (Gms)	Helical Shaped Chew Length (inch)	Rope Profile or Shape	Dog Size	Number Dogs Playing	Time for Consumption (Minutes)
1	0.5	1	100	4.7	Round	Small to medium	5	10.8
2	0.5	1	200	7	Round	Large	6	9.6
2	0.5	2	200	3.5	Round	Large	2	10.2

3	0.375	0.75	100	5	Round	Small to medium	4	9.6
4	0.375	0.75	100	5	Round	Small to medium	1	7.2
4	0.375	0.75	100	5	Round	Large	1	3.7
4	0.5	1	100	4.7	Round	Small to medium	13	8.8
4	0.5	1	100	4.7	Round	Large	6	4.6
6	0.4375	1	100	5.25	Flower	Small to medium	4	6.09
6	0.4375	1	100	5.25	Flower	Large	3	3.49
6	0.5625	1	100	5.1	Flower	Small to medium	1	8.21
6	0.5625	1	100	5.1	Flower	Large	9	4.46
7	-	-	100	-	Ball	Small to medium	2	9.09
7	-	-	100	-	Ball	Large	0	5.49
8	-	-	100	-	Stick	Small to medium	0	9.3
8	-	-	100	-	Stick	Large	4	5.17
9	-	-	100	5.1	Bone	Small to medium	0	11.9
9	-	-	100	5.1	Bone	Large	1	5.4

Example 2

[0064] Helical shaped chews were made as in example 1 except for two larger piece size variations. Using 200 grams of co-extrudate (1) a set of helical shaped chews of length 7 inches were formed; and (2) a second set of helical shaped chews of internal diameter of 2 inches were made. These two sets of helical shaped chews were offered separately to panels of 20 large breed dogs and the results of play are shown in Table 5. It is seen that 6 dogs played with the helical shaped chews of 1 inch internal diameter before consuming.

Example 3

[0065] Helical shaped chews were made as in example 1 except the diameter of the die opening was reduced to produce ropes of 0.375 inch diameter and the internal diameter was reduced to 0.75 inch. The helical shaped chew length was now 5 inches. These were offered to panels of 20 small to medium or 20 large breed dogs per the method above. The results for play are shown in Table 5. Referring to the data, it is seen that when the pieces were consumed faster, there was less play.

Example 4

[0066] Helical shaped chews were made as in example 1 except that there was no co-extruded filling but a solid rope with the edible composition formulation. Two sizes of helical shaped chews were made. One set with rope diameter 0.5 inch and internal diameter 1 inch as in example 1. A second set as in example 3 with ropes of 0.375 inch diameter and the internal diameter of 0.75 inch. Each set was offered to separately to panels of 20 large or 20 small to medium dogs. The results are shown in Table 5. It is seen that there was significant play by both large (6 of 20) and small to medium (13 of 20) dogs with the larger 0.5 inch diameter helical shaped chews.

Example 5

[0067] Chews were made as in example 1 except that the round cross-section profile of the rope was changed to a star, a flower, or a triangle with longest cross-sectional measure being 0.5 inch. Helical shaped chews with each of these profiles were presented to a consumer focus group. The flower was chosen as the most appealing and was used for play testing.

Example 6

[0068] Two sets of center-filled helical shaped chews with a flower shape were made as in examples 1 and 5. One set had rope cross-section of 0.4375 inch and the second set has a rope cross-section of 0.5625 inch. For these, prior to coiling, the rope was rotated in the die to form a twisted rope. Then the twisted ropes for both sets were helical shaped to an internal diameter of 1 inch. Each set of helical shaped chews were offered to panels of 20 large and 20 small to medium dogs. The results are shown in Table 5. It is seen that there was significant play (9 of 20) with the helical shaped chews of 0.5625 in by the larger dogs. The small to medium dogs played more with the 0.4375 inch helical shaped chews.

Example 7

[0069] The 0.5625 inch diameter ropes of example 6 were cut into 30 inch long pieces and while still hot were rolled into ball (spherical) shapes. These were offered to panels of 20 large or 20 small

to medium dogs as per the play testing method. The results are shown in Table 5. As can be seen there was no play by the large dogs and 2 small to medium dogs played with the ball.

Example 8

[0070] The 0.5625 inch diameter ropes of example 6 were cut into 30 inch long pieces and while still hot were formed into stick shapes by folding the rope back on itself in 5 inch increments. Due to the folding, there was some springiness. These were offered to panels of 20 large or 20 small to medium dogs as per the play testing method. The results are shown in Table 5. As can be seen there was play by 4 of the large dogs and but no small to medium dog played.

Example 9

[0071] A commercial chew treat, Purina Busy Bone® with composition and filling similar to the helical shaped treats was also tested for play using to panels of 20 large or 20 small to medium dogs. The results are shown in Table 5. As can be seen no small to medium dog played with the treat and only 1 large dog played.

[0072] In the specification, there have been disclosed typical preferred embodiments of the invention. Although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation. The scope of the invention is set forth in the claims. Obviously many modifications and variations of the invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

CLAIMS

What is Claimed is:

1. A comestible animal chew and play toy suitable for engaging an animal in play before and during consumption comprising an edible composition having a helical shape.
2. The comestible animal chew and play toy of claim 1 wherein a ratio of an internal diameter of the helical shape to an external diameter of the helical shape ranges from 1:2 to 1:14.
3. The comestible animal chew and play toy of claim 1 wherein a ratio of an external diameter of the helical shape to a diameter of the edible composition ranges from 1:2.5 to 1:28.
4. The comestible animal chew and play toy of claim 1 wherein a ratio of an external diameter of the helical shape to a pitch of the helical shape ranges from 1:1 to 1:10.
5. The comestible animal chew and play toy of claim 1 wherein a ratio of an internal diameter of the helical shape to a pitch of the helical shape ranges from 1:1.75 to 1:20.
6. The comestible animal chew and play toy of claim 1 wherein a ratio of a diameter of the edible composition to an internal diameter of the helical shape ranges from 1:0.5 to 1:10.
7. The comestible animal chew and play toy of claim 1 wherein the helical shape has a pitch ranging from about 0.01 to about 1 inch.
8. The comestible animal chew and play toy of claim 1 wherein the helical shape has an overall length ranging from about 1 to about 20 inches.
9. The comestible animal chew and play toy of claim 1 wherein the edible composition comprises a cross-sectional peripheral shape in the form of a circle, a hexagon, a polygon, star, triangle, or a flower.
10. The comestible animal chew and play toy of claim 1 wherein the edible composition includes one or more edible ingredients selected from the group consisting of meats, grains, starches, meat meals, proteins, fibers, sugars, vitamins, minerals, aromas, colors, flavors, oils, humectants, preservatives, and combinations thereof.
11. The comestible animal chew and play toy of claim 1 wherein the edible composition comprises a filling.
12. The comestible animal chew and play toy of claim 11 wherein the filling includes one or more edible ingredients selected from the group consisting of meats, grains, starches, meat meals, proteins, fibers, sugars, vitamins, minerals, aromas, colors, flavors, oils, humectants, preservatives, and combinations thereof.

13. The comestible animal chew and play toy of claim 1 wherein the edible composition is an extruded pet food composition.
14. A method for making a comestible animal chew and play toy suitable for engaging an animal in play before and during consumption comprising:
co-extruding an edible composition; and
forming the edible composition into a helical shape.
15. The method of claim 14 wherein a ratio of an internal diameter of the helical shape to an external diameter of the helical shape ranges from 1:2 to 1:14.
16. The method of claim 14 wherein a ratio of an external diameter of the helical shape to a diameter of the edible composition ranges from 1:2.5 to 1:28.
17. The method of claim 14 wherein a ratio of an external diameter of the helical shape to a pitch of the helical shape ranges from 1:1 to 1:10.
18. The method of claim 14 wherein a ratio of an internal diameter of the helical shape to a pitch of the helical shape ranges from 1:1.75 to 1:20.
19. The method of claim 14 wherein a ratio of a diameter of the edible composition to an internal diameter of the helical shape ranges from 1:0.5 to 1:10.
20. The method of claim 14 wherein the helical shape has a pitch ranging from about 0.01 to about 1 inch.
21. The method of claim 14 wherein the helical shape has an overall length ranging from about 1 to about 20 inches.
22. The method of claim 14 comprising co-extruding a filling inside the edible composition.
23. A method for promoting the health or wellness of an animal comprising administering to an animal a health or wellness promoting amount of a comestible animal chew and play toy comprising an edible composition having a helical shape.
24. A method for improving the quality of life of an animal comprising administering to an animal a quality of life improving amount of a comestible animal chew and play toy comprising an edible composition having a helical shape.
25. A method for extending the prime years of an animal's life comprising administering to an animal a comestible animal chew and play toy comprising an edible composition having a helical shape in an amount effective for extending the prime years of the animal.

26. A kit comprising in a single package or in separate containers in a virtual package, as appropriate for a kit component, (A) a comestible animal chew and play toy comprising an edible composition having a helical shape, and (B) one or more of: (1) a description of the benefits of the comestible animal chew and play toy; (2) instructions for how to administer the comestible animal chew and play toy; (3) a second edible composition; (4) a serving tray for serving the comestible animal chew and play toy; (5) a serving utensil for serving the comestible animal chew and play toy; (6) instructions for how to extend the prime years of an animal's life using the comestible animal chew and play toy; or (7) a non-edible animal chew toy.
27. A means for communicating information about or instructions for a comestible animal chew and play toy comprising an edible composition having a helical shape for one or more of: (1) administering the comestible animal chew and play toy; (2) describing the benefits of comestible animal chew and play toy; (3) promoting the health or wellness of an animal with the comestible animal chew and play toy; or (4) extending the prime years of an animal's life with the comestible animal chew and play toy, the means comprising a document, digital storage media, optical storage media, audio presentation, or visual display containing the information or instructions.
28. The means of claim 27 wherein the means is selected from the group consisting of a displayed website, a visual display kiosk, a brochure, a product label, a package insert, an advertisement, a handout, a public announcement, an audiotape, a videotape, a DVD, a CD-ROM, a computer readable chip, a computer readable card, a computer readable disk, a USB device, a FireWire device, a computer memory, and combinations thereof.
29. A package comprising indicia describing a comestible animal chew and play toy comprising an edible composition having a helical shape.
30. The package of claim 29 wherein the package contains a comestible animal chew and play toy comprising an edible composition having a helical shape.
31. A method for manufacturing a container including a comestible animal chew and play toy comprising providing an extrudable edible composition, extruding the edible composition, forming the extruded edible composition into a helical shape, cutting the edible composition having the helical shape into discrete pieces to form the comestible animal chew

and play toy, and filling the container with the pieces of the comestible animal chew and play toy.

32. The method of claim 31 comprising retorting the container.

33. The method of claim 31 comprising co-extruding the edible composition with a filling, forming the co-extruded edible composition into a helical shape, cutting the edible composition having the helical shape into discrete pieces to form the comestible animal chew and play toy, and filling the container with the comestible animal chew and play toy.

34. A multi-pack package comprising:

a plurality of containers arranged in an array, each of the plurality of containers comprising a comestible animal chew and play toy comprising an edible composition having a helical shape; and

one or more devices for retaining the containers in the array.

35. The multi-pack package of claim 34 further comprising one or more handles suitable for handling and transporting the package.

36. The multi-pack package of claim 34 further comprising one or more indicia describing the contents of the containers in the package.

37. The multi-pack package of claim 34 wherein the device comprises one or more windows.

38. The multi-pack package of claim 34 further comprising a label affixed to the package containing a word or words, picture, design, acronym, slogan, phrase, or combination thereof, that indicates that the content of the package contains a comestible animal chew and play toy comprising an edible composition having a helical shape.

FIG. 1

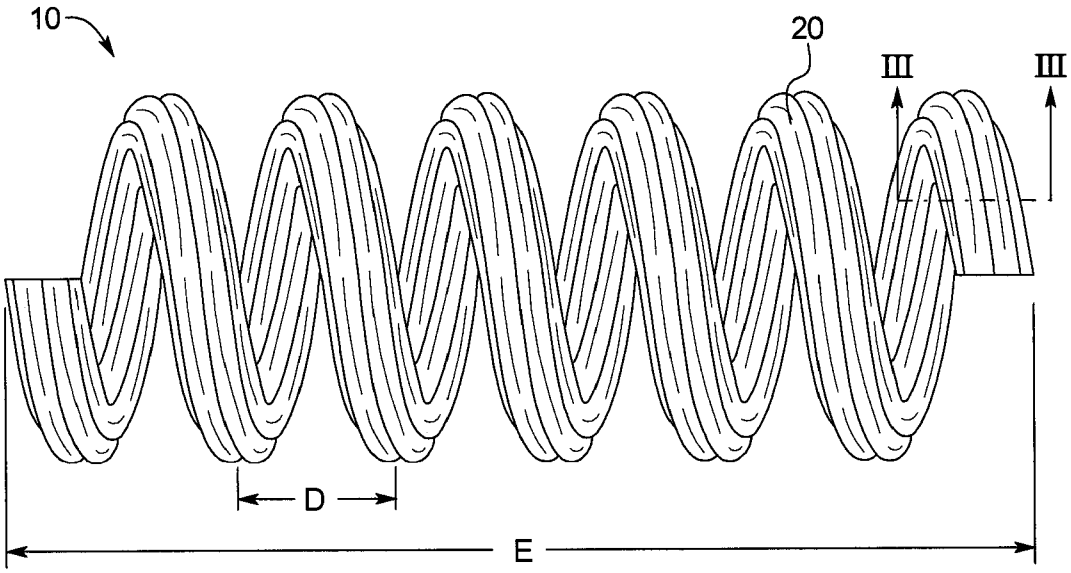


FIG. 2

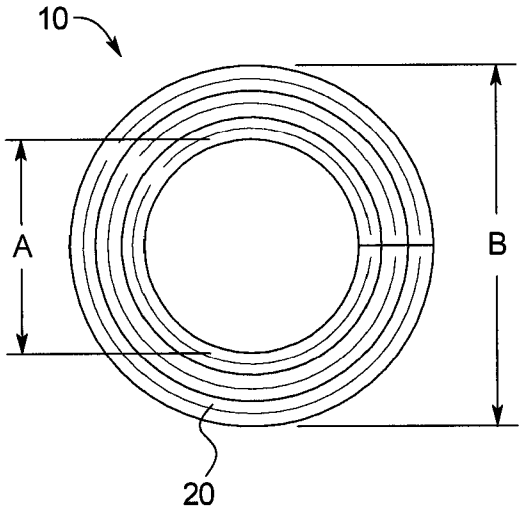
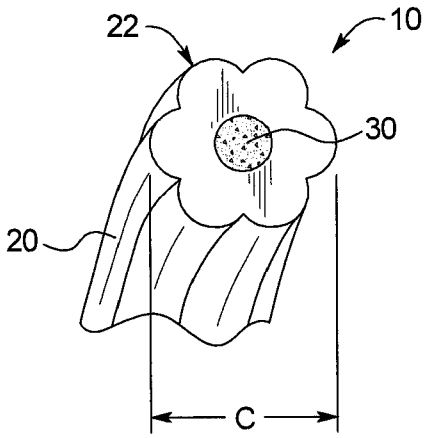


FIG. 3



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/053731

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A23K 1/10 (2013.01)
USPC - 424/442

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - A01K 29/00; A23K 1/10, 1/16, 1/18; A23L 1/00, 1/22 (2013.01)
USPC - 119/710; 424/442; 426/104, 250

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC - A01K 15/00, 15/02, 15/025, 15/026; A23K 1/00, 1/10, 1/16, 1/18, 1/003, 1/103, 1/106, 1/164, 1/0001, 1/1603, 1/1606, 1/1631, 1/1637, 1/1643, 1/1846

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase, Google Patents, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/0003270 A1 (GARCIA MARTINEZ) 03 January 2008 (03.01.2008) entire document	1, 9, 10
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Y		2-8, 11-22
Y	US 2009/0260704 A1 (SENET) 22 October 2009 (22.10.2009) entire document	2, 3, 6, 15, 16, 19
Y	WO 2009/144458 A2 (MCGENITY et al) 03 December 2009 (03.12.2009) entire docuemnt	4, 5, 7, 8, 13-22
Y	US 2006/0107906 A1 (WEINBERG) 25 May 2006 (25.05.2006) entire document	11, 12, 22

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
02 January 2013	06 FEB 2013
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/053731

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Extra Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-22

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/053731

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-22, are drawn to a animal chew and play toy.

Group II,claim 23, are drawn to a method for promoting health and wellness.

Group III, claim 24, are drawn to a method for promoting quality of life.

Group IV,claim 25, are drawn to a method for extending the prime years of an animal's life.

Group V, claim 26, are drawn to a kit.

Group VI, claims 27-28, are drawn to a means for communicating information.

Group VII, claims 29-30, are drawn to a package.

Group VIII, claims 31-33, are drawn to a method of manufacturing a container.

Group IX, claims 34-38, are drawn to a multi-pack package.

The inventions listed as Groups I - IX do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The special technical features of Group I, a play toy suitable for engaging an animal in play before and during consumption, are not present in Groups II-IX; the special technical features of the Group II, administering to an animal a health or wellness promoting amount, are not present in Groups I, III-IX; and, the special technical features of Group III, administering to an animal a quality of life improving amount, are not present in the invention of Groups I, II, IV-IX; the special technical features of Group IV, method for extending the prime years of an animal's life with the animal chew and play toy, are not present in the invention of Groups I-III or V-IX; the special technical features of Group V, description, instructions, second edible composition, a serving tray, a serving utensil, non-edible animal chew toy, are not present in the invention of Groups I-IV, VI-IX; the special technical features of Group VI, a means for communicating information by document, digital storage media, optical storage media, audio presentation, or visual display, are not present in the invention of Groups I-V, VII-IX; the special technical features of Group VII, a package with indicia, are not present in the invention of Groups I-VI or VIII-IX; the special technical features of Group VIII, cutting the edible composition having the helical shape into discrete pieces to form the comestible animal chew; and filling the container with the pieces, are not present in the invention of Groups I-VII, IX; the special technical features of Group IX, a plurality of containers arranged in an array; one or more devices for retaining the containers in the array, are not present in the invention of Groups I-VIII.

Groups I through IX share the technical feature of an animal chew and play toy. However, these shared technical features do not represent a contribution over the prior art. Specifically, US 3,198,173 to Fisher disclose an animal chew and play toy with a helical shape (rawhide 1, Fig. 1).

Since none of the special technical features of the Groups I - IX inventions are found in more than one of the inventions, unity of invention is lacking.