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(54) Title: PHARMACEUTICAL COMPOSITIONS

(57) Abstract: By individually metering and dispensing specific volumes and/or weights of each component of a dosage, an amount of the components for each dose is secured with very high accuracy. A method for dosing a pharmaceutical product in a sealed container, such as, for example, a packet, sachet, blister pack, or other unit dose form. The dosage may include a first component that is a thickening agent and a second component that is an active ingredient. The thickening agent serves as a carrier that allows the active ingredient to dissolve in the mouth and be swallowed without the administration of water. The method includes providing the first component by measuring the volume or weighing the mass of the first component and measuring the volume or weighing the mass of the second component. Subsequent components may also be individually measured or weighed before being added to a package.

## PHARMACEUTICAL COMPOSITIONS

### CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application No. 62/190,650, filed July 9, 2015, which is incorporated  
5 herein by reference in its entirety as if fully set forth herein.

### FIELD OF THE INVENTION

[0002] The present invention relates to a solid/semi-solid dosage form packaging for pharmaceutical and dietary supplement compositions.

### BACKGROUND OF THE INVENTION

10 [0003] Pharmaceutical and dietary supplement compositions may be produced in a variety of dosage forms, depending upon the desired route of administration of the active ingredient. Oral dosage forms, for example, include such solid/semi-solid compositions as tablets, granules, powders, beads, minitables, and pellets. The particular dosage form utilized will depend on such factors as the solubility and chemical reactivity of the active ingredient.  
15 Further, the dosage form may be selected so as to optimize delivery of the active ingredient and/or consumer acceptability of the composition.

[0004] Additionally, accuracy of the doses is of importance. Pharmaceutical compositions often contain active drug components that are harmful if the given dose is too high. On the other hand, the desired effect of the medicament is not achieved if the dose is  
20 too low.

[0005] When two or more ingredients are contained in a dosage form, uniform mixing of the ingredients prior to packaging is important in maintaining consistency and accuracy of the doses. It is, however, difficult to uniformly mix two or more solid ingredients having different physical characteristics, such as particle size, density, and flowability, as the  
25 ingredients tend to separate.

[0006] Therefore, a need remains for providing consistent and accurate pharmaceutical dosages, especially for rapid melt dosages. Such compositions are ideal for uses in the fields of pediatric and geriatric care, that is, for use with people or mammals who

have severe health issues, who cannot swallow the tablet or capsule, and people who do not have any teeth. Such compositions can also be used in the cancer patients. Such compositions can be administered without water.

### SUMMARY OF THE INVENTION

5 [0007] By individually metering and dispensing specific volumes and/or weights of each component of a dosage, an amount of the components for each dose is secured with very high accuracy. Thus, one of the advantages with the present invention is that the accuracy and precision of the amount of the components can be monitored and metered, and the result used to secure the quality of the pharmaceutical product.

10 [0008] The present invention relates to a new method for dosing a pharmaceutical or dietary supplement product in a sealed container, such as, for example, a packet, sachet, or blister pack, comprising a first component and a second component. In some embodiments, the first component is a thickening agent and the second component is an active ingredient. The thickening agent serves as a carrier that allows the active ingredient to dissolve in the  
15 mouth and be swallowed without the administration of water. When in use, the user merely opens the container and empties its contents into the mouth. The same principle can be used to make pharmaceutical and dietary supplement products containing more than two components.

[0009] The two component dosage form can be packaged in a sealed container, such  
20 as, for example, a packet, sachet, blister pack, or other unit dose form. The method comprises providing the first component by measuring the volume or weighing the mass of the first component. Thus, a defined dose of the first component is provided. Further, the method comprises introducing the first component into a package, measuring the volume or weighing the mass of the second component, introducing the second component into the package, and  
25 sealing the package. Subsequent components are also individually metered before being added to the package. When all the components are added to the container, it is sealed and ready for use.

### DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[00010] In describing and claiming the present invention, the following  
30 terminology will be used in accordance with the definitions set forth below. The singular

forms "a," "an," and, "the" include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to "a drug" includes reference to one or more of such drugs, and reference to "an excipient" includes reference to one or more of such excipients.

[00011] As used herein, the terms "formulation" and "composition" and  
5 "component" are used interchangeably and refer to a mixture of two or more compounds, elements, or molecules. In some aspects the terms "formulation" and "composition" may be used to refer to a mixture of one or more active agents with a carrier or other excipients.

[00012] As used herein, "active agent," "bioactive agent," "pharmaceutically active agent," "pharmaceutical," "active ingredient," "vitamin or mineral" or "functional  
10 agents" variations thereof may be used interchangeably to refer to an agent or substance that has measurable specified or selected physiologic activity when administered to a subject in a significant or effective amount. It is to be understood that the term "drug" is expressly encompassed by the present definition as many drugs and prodrugs are known to have specific physiologic activities. These terms of art are well- known in the pharmaceutical and  
15 medicinal arts.

[00013] As used herein, "subject" refers to a mammal that may benefit from the administration of a drug composition or method of this invention. Examples of subjects include humans, and may also include other animals such as horses, pigs, cattle, dogs, cats, rabbits, and aquatic mammals.

[00014] As used herein, "blood level" may be used interchangeably with terms  
20 such as blood plasma concentration, plasma level, plasma concentration, serum level, serum concentration, serum blood level and serum blood concentration. As used herein, "oral dosage form" and the like refers to a formulation that is ready for administration to a subject through the oral route of administration. Examples of known oral dosage forms, include  
25 without limitation, tablets, caplets, powders, pellets, granules, beads and mini tablets and combinations thereof etc. Such formulations also include multilayered tablets wherein a given layer may represent a different drug. In some aspects, granules, powders, pellets, minitables, or nanoparticles may be coated with a suitable polymer/fat/wax/emulsifier/carbohydrate or a conventional coating material to achieve, for example, greater stability in the oral cavity,  
30 gastrointestinal tract, to achieve the desired rate of release, or to improve taste. Tablets and caplets may be scored to facilitate division of dosing. Alternatively, the dosage forms of the

present invention may be unit dosage forms wherein the dosage form is intended to deliver one therapeutic dose per administration. Particular embodiments or groups of embodiments may be expressly limited to subsets of these dosage forms.

[00015] As used herein, "packet" or "stick pack" refers to a small, sealed packet  
5 containing a quantity of material, which is a single-use or unit dose quantity.

[00016] As used herein, an "effective amount" or a "therapeutically effective amount" of a drug or active ingredient refers to a sufficient amount of the drug, to achieve therapeutic results in treating a condition for which the drug is known to be effective. It is understood that various biological factors may affect the ability of a substance to perform its  
10 intended task. Therefore, an "effective amount" or a "therapeutically effective amount" may be dependent in some instances on such biological factors.

[00017] As used herein, "pharmaceutically acceptable carrier" and "carrier" may be used interchangeably, and refer to any inert and pharmaceutically acceptable material that has substantially no biological activity, and makes up a substantial part of the  
15 formulation. The term "admixed" means that the drug and/or other ingredients can be dissolved, dispersed, or suspended in the carrier. In some cases, the drug may be uniformly admixed in the carrier.

[00018] As used herein, the term "substantially" refers to the complete or nearly complete extent or degree of an action, characteristic, property, state, structure, item,  
20 or result. For example, an object that is "substantially" enclosed would mean that the object is either completely enclosed or nearly completely enclosed. The exact allowable degree of deviation from absolute completeness may in some cases depend on the specific context. However, generally speaking the nearness of completion will be so as to have the same overall result as if absolute and total completion were obtained. The use of "substantially" is  
25 equally applicable when used in a negative connotation to refer to the complete or near complete lack of an action, characteristic, property, state, structure, item, or result. For example, a composition that is "substantially free of" particles would either completely lack particles, or so nearly completely lack particles that the effect would be the same as if it completely lacked particles. In other words, a composition that is "substantially free of" an  
30 ingredient or element may still actually contain such item as long as there is no measurable effect thereof. As used herein, the term "about" is used to provide flexibility to a numerical

range endpoint by providing that a given value may be "a little above" or "a little below" the endpoint.

[00019] The dosage form of the present invention comprises at least a first and a second component that are provided in a sealed container. In some embodiments, the first  
5 component is a thickening agent and the second component is an active ingredient, preferably in a powder, granule, bead, minitab, pellet, nanoparticle, or a combination thereof. The thickening agent acts as a carrier for the active ingredient so that, when the dosage form is placed in the mouth, the active ingredient can be rapidly dissolved and ingested without additional administration of water. Although water is not required to dissolve the active  
10 ingredient, in certain embodiments, water may be used to assist in ingestion of the dosage form. Further, the method comprises introducing the first component into a package, metering a desired volume of the second component, introducing the second component into the same package, and sealing the package into which the components have been introduced. Subsequent components can similarly be added to the same package.

15 [00020] In some embodiments, the method comprises sealing the package after introducing the components.

[00021] In some embodiments, the present invention provides a solid or semi-solid product comprising at least a first and a second component in the same dosage form. The product can be contained, for example, in a package. Preferably, at least one of the  
20 components contains an active ingredient. It is also desirable to have at least one thickening agent. Preferably, the ratio of the active ingredient to a carbomer ranges from 0.001:0.05 to 0.05:0.1.

[00022] In some embodiments, the present invention provides a dosage form in a sealed container containing at least two components. The dosage form can be contained, for  
25 example, in a package. Preferably, at least one of the components contains an active ingredient and at least one of the other components contains a thickening agent.

[00023] The active ingredients can also be modified for taste masking, for a controlled release, or for a sustained release. Sustained and controlled release of the actives can be achieved using polymer coatings such as polyvinyl acetate, ethocel, and copolymers of  
30 ethyl acrylate and methyl methacrylate (e.g., Kollicoat® SR or Eudragit® RL/RS) as well as using Ion-Exchange resins to exchange ions in the resin with ions of the active drug (e.g.,

Dextromethorphan) and further coated with the same sustained release coatings as described above. The taste masking of the active ingredients can be achieved with polymers (methacrylate polymers, cellulose polymers, or combinations thereof), resins, fats, waxes, or carbohydrates. Processes for taste masking of the active ingredients include granulation, complexation, spray congealing, spray drying and fluid bed coating, which are known in the art.

[00024] The amount of active ingredient in the preparation is in the range of 0.1 mg to 5 g. Preferred prophylactic or therapeutic active ingredients contemplated for use in the present inventive subject matter are, without limitation, guaifenesin, mesalamine, diltiazem, metoprolol, balsalazide, aspirin, benzocaine, diphenhydramine, acetaminophen, ibuprofen and mixtures thereof. Preferred prophylactic or therapeutic active ingredients contemplated for use in the present inventive subject matter are antibiotic, which is selected from the group consisting of amoxicillin and clavulanate potassium, ciprofloxacin HCl, azithromycin, clarithromycin, sterile ceftriaxone sodium, cefuroxime axetil, imipenem cilastatin, levofloxacin, ceftazidime, ampicillin sodium and sulbactam sodium, cefaclor, amoxicillin, cefdinir, roxithromycin, sterile cefotaxime sodium, vancomycin, piperacillin sodium and tazobactam sodium, morniflumate, flomoxef sodium, cefotiam dihydrochloride, ofloxacin, mupirocin calcium, vancomycin HCl, teicoplanin, cefadroxil monohydrate, sulbactam cefoperazone, meropenem, ofloxacin, cephalexin, cefepime HCl, cefuroxime sodium, minocycline HCl, cefaclor, cefazolin, trimethoprim and sulfamethoxazole, norfloxacin, trovafloxacin, cefpodoxime proxetil, cefdinir, cefixime, panipenem, ceftibuten, levofloxacin, cefoxopran HCl, amikacin sulfate, aztreonam, minocycline HCl, ticarcillin disodium or mixtures thereof.

[00025] Many of the active ingredients listed above have unpalatable tastes. Taste-masking of compositions with those unpalatable active materials is well-known in the art. The active ingredient may be coated with a suitable polymer/fat/wax/emulsifier/carbohydrate. The use of flavors and sweeteners to mask the unpalatability of the active materials is also well-known. Thus, other materials which can be incorporated into composition include flavors, colors, and sweeteners. Importantly, it is possible to incorporate high levels of flavors, sweeteners and other taste-masking agents, making the compositions more palatable when undesirable tastes accompany the active materials. Taste masking may be chosen from natural and synthetic flavor liquids. Flavors

useful include, without limitation, volatile oils, synthetic flavor oils, flavoring aromatics, oils, liquids, oleoresins or extracts derived from plants, leaves, flowers, fruits, stems and combinations thereof. A non-limiting list of examples include citrus oils, such as, for example, lemon, orange, grape, lime and grapefruit and fruit essences including apple, pear,  
5 peach, grape, strawberry, raspberry, cherry, plum, pineapple, apricot or other fruit flavors.

[00026] Taste masking of the active ingredients can be done using the well-known processes in the art such as fluidization, spray drying, spray congealing, complex co-acervation, resin complexation, matrix granulation using carbohydrates, resins, polymers, waxes, and fats.

10 [00027] Taste enhancers may be chosen from natural and synthetic flavor liquids. Useful flavors include, without limitation, volatile oils, synthetic flavor oils, flavoring aromatics, oils, liquids, oleoresins or extracts derived from plants, leaves, flowers, fruits and fruit essences (e.g., apple, pear, peach, grape, strawberry, raspberry, cherry, plum, pineapple, apricot or other fruit flavors), stems, citrus oils (e.g., lemon, orange, grape, lime and  
15 grapefruit), fats, and combinations thereof.

[00028] Other useful flavorings include aldehydes and esters such as, for example, benzaldehyde (e.g., cherry, almond), citral (e.g., alphacitral - lemon, lime), neral (e.g., betal-citral - lemon, lime), decanal (e.g., orange, lemon), aldehyde C-8 (e.g., citrus fruits), aldehyde C-9 (e.g., citrus fruits), aldehyde C-12 (e.g., citrus fruits), tolyl aldehyde  
20 (e.g., cherry, almond), 2,6-dimethyloctanal (e.g., green fruit), and 2-dodecenal (e.g., citrus, mandarin), and mixtures thereof.

[00029] In some embodiments of the invention, the thickening agent serves as the taste masking agent.

[00030] The compositions are "storage stable", meaning that the compositions  
25 are stable in the absence of special handling procedures. The inventive compositions are stable both prior to packaging and after packaging. Importantly, the inventive compositions maintain their stability and integrity without refrigeration and without humidity controls being implemented during handling, packaging and storing of the products. Additionally, since the compositions exhibit increased integrity and stability, the compositions can be used  
30 in most of the current economical packages suitable for a global environment. Further, high temperatures are not needed when processing the packaging and sealing.

[00031] Embodiments of the invention are directed to a variety of High Viscosity Liquids (Gels) with OTC Cough & Cold Active Pharmaceutical Ingredients (API's) and/or vitamins and minerals. The products are administered using a single-use stick pack delivered directly into the mouth.

5 [00032] In an embodiment of the claimed invention, the thickening agents that are used in the inventive compositions are carbomer at a range of 0.6-1.2 w/w%. A specific carbomer that may be used is Carbomer 974P at 0.60 to 1.2% w/w. In another embodiment of the invention, the thickening agent is Maltitol and/or high fructose corn syrup at 10 to 40% w/w. In certain embodiments, a small amount of Edetate Disodium (EDTA) may be used as  
10 a chelate to keep the carbomer stable during storage to keep the viscosity from decreasing.

[00033] Embodiments of the invention use polyethylene glycol (PEG) as a solvent for dissolving Actives and Excipients that are not water soluble or slightly water soluble, e.g., APAP, Diphenhydramine, Brompheniramine Maleate, Melatonin, Methyl and Propyl Paraben. In specific embodiments, PEG 400 is used. Propylene Glycol may be used  
15 when the Phenylephrine HCL active is used, but in amounts less than 200 mg/kg/d.

[00034] An exemplary manufacturing process is described below:

1. Fill Mixing vessel with water.
2. Add Water soluble Actives and EDTA to step 1.
3. In a suitable container, Add PEG 400.
- 20 4. Add insoluble Actives to step 3 and dissolve (i.e., APAP, Melatoin, Brompheniramine maleate, Diphenhydramine HCl).
5. Add preservatives (methyl and Propyl paraben) to step 3 and dissolve.
6. Add Carbomer 974P to step 1 and disperse.
7. Add a taste masking amount of Maltitol and sucralose to step 1.
- 25 8. Add flavors to step 1.
9. Add colors to step 1, if applicable.

10. Partially neutralize pH with pH adjusting agent to a pH of 4.0 to 5.5 with sodium Hydroxide.
11. Package into Child resistant stick packs .

Key differences between the claimed invention and existing technology:

- 5 A. PEG 400 used in place of higher molecular weight PEG 600 to 1000 for products that do not contain Phenylephrine HCl.
- B. Higher concentration of Carbomer (0.60 to 1.2% w/w).
- C. No heat to produce the product.
- D. Lower pH of 4.0 to 5.5.
- 10 E. Our viscosity is higher (30,000 to 60,000 cps).
- F. No cellulose derivatives.
- G. Chelate such as EDTA used to improve the stability of the carbomer thickening agent.
- H. Combination of Maltitol, corn syrup, Sorbitol (also used as a thickening agent) and Sucralose for taste-masking bitter actives.

15 [00035] Properties of the claimed invention include:

1. A composition with a short flow rheology for extruding through a stick-pack orifice of 5 to 10 mm.
2. Using a combination of Maltitol and/or corn syrup/Sorbitol and Carbomer as a thickening agent: 0.60 to 1.2% w/w Carbomer; 10 to 40% Maltitol or corn syrup.
- 20 3. Comprising a chealate to stabilize the Carbomer.
4. Product is stable for approximately 6 months at 40°C/75RH, 12 months at 30C/65RH, and for 24 months at 25°C/60RH.
5. Product maintains a viscosity of approximately 30,000 to 60,000 cps after 3 months storage at 40°C/75RH.

6. Product contains between 0.60 to 1.2 % w/w Carbomer or 10 to 40% Maltitol, and/or corn syrup/Sorbitol.
7. Product does not contain a cellulose derivative.
8. Product may be administered using a stick-pack straight to the mouth or squeezed and  
5 sucked from a pack.
10. Product is stable for approximately 3 months at 40°C/75RH, 12 months at 30C/65RH, and for 24 months at 25°C/60RH

[00036] Without further description, it is believed that one of ordinary skill in the art can, using the preceding description and the following illustrative examples, make and  
10 use the present invention. The following examples are given to illustrate the present invention. It should be understood that the invention is not to be limited to the specific conditions or details described in the examples. The formulas for an exemplary list of products are shown in the tables below:

<i>Adult Sleep GEL - Melatonin 5 mg / serving</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	50-85
<b>Melatonin</b>	Active Ingredient	0.01-1.0
Polyethylene Glycol (PEG 400)	Solvent	2-10
Glycerin		5-15
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate disodium	Chealate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavor	Flavors	0.1-0.7
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Night-Time Cold &amp; Congestion - DPH 12.5 mg, PEH 5 mg / serving</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	40-60
<b>Diphenhydramine HCl</b>	Active Ingredient	0.15-1.0
<b>Phenylephrine HCl</b>	Active Ingredient	0.02-0.5
Propylene Glycol	Solvent	2-10
Glycerin		5-15
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate disodium	Chelate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavor	Flavor	0.1-0.5
FD&C Dye	Color	0.0001-0.005
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Cold &amp; Allergy GEL - BPM 2 mg: PEH 5 mg / serving</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	40-65
<b>Brompheniramine Maleate</b>	Active Ingredient	0.025-0.1
<b>Phenylephrine HCl</b>	Active Ingredient	0.02-0.5
Glycerin	Solvent	5-15
Propylene Glycol		2-10
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate Disodium	Chealate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavor	Flavor	0.1-0.5
FD&C Dye	Colors	0.0001-0.005
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Cough &amp; Cold GEL - DEX 5 mg: PEH 2.5 mg / serving</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	40-60
<b>Dextromethorphan HBr</b>	Active Ingredient	0.05-0.5
<b>Phenylephrine HCl</b>	Active Ingredient	0.02-0.5
Glycerin	Solvent	5-15
Propylene Glycol		2-10
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate disodium	Chealate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavor	Flavor	0.1-0.5
FD&C Dye	Color	0.0001-0.005
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Pain GEL - Acetaminophen 160 mg / serving</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	40-65
<b>Acetaminophen</b>	Active Ingredient	2-3
Polyethylene Glycol (PEG 400)	Solvent	10-25
Glycerin		5-15
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate Disodium	Chelate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavor	Flavor	0.1-0.5
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Pain GEL - Acetaminophen 240 mg / serving</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	40-60
<b>Acetaminophen</b>	Active Ingredient	3-5
Polyethylene Glycol (PEG 400)	Solvent	10-25
Glycerin		5-15
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate Disodium	Chealate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavor	Flavor	0.1-0.5
FD&C Dye	Color	0.0001-0.005
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Pain GEL - Acetaminophen 320 mg / serving</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	35-55
<b>Acetaminophen</b>	Active Ingredient	4-6
Polyethylene Glycol (PEG 400)	Solvent	10-25
Glycerin		5-15
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate Disodium	Chealate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavor	Flavor	0.1-0.5
FD&C Dye	Color	0.0001-0.005
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's MS Cough &amp; Cold GEL - BPM 2 mg: DEX 10 mg: PEH 5 mg / serving</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	40-60
<b>Brompheniramine Maleate</b>	Active Ingredient	0.025-0.1
<b>Dextromethorphan HBr</b>	Active Ingredient	0.05-0.5
<b>Phenylephrine HCl</b>	Active Ingredient	0.02-0.5
Glycerin	Solvent	5-15
Propylene Glycol		2-10
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate Disodium	Chealate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavor	Flavor	0.1-0.5
FD&C Dye	Color	0.0001-0.005
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Cough &amp; Chest Congestion GEL - GFN 100 mg: DEX 5 mg / serving</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	45-65
<b>Guaifenesin</b>	Active Ingredient	1.0-3.0
<b>Dextromethorphan HBr</b>	Active Ingredient	0.05-0.5
Polyethylene Glycol (PEG 400)	Solvent	5-15
Glycerin		5-15
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate disodium	Chealate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavors	Flavors	0.1-0.5
FD&C Dye	Colors	0.0001-0.005
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Expectorant GEL - GFN 100 mg / serving</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	45-65
<b>Guaifenesin</b>	Active Ingredient	1.0-3.0
Polyethylene Glycol (PEG 400)	Solvent	5-15
Glycerin		5-15
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate Disodium	Chealate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavors	Flavors	0.1-0.5
FD&C Dye	Colors	0.0001-0.005
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Cough &amp; Sore Throat</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	40-60
<b>Acetaminophen</b>	Active Ingredient	2-6
<b>Dextromethorphan HBr</b>	Active Ingredient	0.05-0.5
Polyethylene Glycol (PEG 400)	Solvent	5-15
Glycerin		5-15
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Edetate Disodium	Chealate to stabilize Carbomer	0.05-1.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavor	Flavor	0.1-0.5
FD&C Dye	Colors	0.0001-0.005
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Well Gel Allergy Relief</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	50-70
Edetate Disodium	Chealate to stabilize Carbomer	0.05-1.5
Polyethylene Glycol (PEG 400) and/or Propylene Glycol	Solvent	5-15
Glycerin		5-15
<b>Diphenhydramine HCL</b>	Active Ingredient	0.15-0.6
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Sucralose	Taste-Masking Sweeteners	0.05-1.0
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup		10-40
Flavors	Flavor	0.1-0.5
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
FD&C Dye	Color	0.0001-0.005
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

<i>Children's Well Gel Multi-Symptom Cold &amp; Flu</i>		
<b>Ingredients:</b>	<b>Use</b>	<b>(%) / servings</b>
Purified Water	Solvent	30-50
EDTA Disodium	Chealate to stabilize Carbomer	0.5-1.5
<b>Chlorpheniramine Malate</b>	Active Ingredient	0.01-0.1
<b>Acetaminophen</b>	Active Ingredient	2-8
<b>Dextromethorphan HBr</b>	Active Ingredient	0.06-0.1
<b>Phenylephrine HCL</b>	Active Ingredient	0.02-0.2
Propylene Glycol	Solvent	2-10
Glycerin		5-15
Propyl paraben	Preservatives	0.01-0.1
Methyl paraben		0.05-0.2
Carbomer 974 P	Viscosity increasing agent	0.6-1.2
HF Corn Syrup and/or Sorbitol and/or Maltitol Syrup	Taste-Masking Sweeteners	10-40
Sucralose		0.05-1.0
Flavor	Flavor	0.1-0.5
Sodium Hydroxide or Potassium Hydroxide (QS to pH 4.0 to 5.5)	pH adjustment	0.02-0.5

CLAIMS

What is claimed is:

1. A solid or semi-solid oral delivery dosage form comprising:
  - 5 a first component that comprises a thickening agent;
  - a second component that comprises an active ingredient; and
  - wherein the first component and the second component are contained in a sealed container.
2. The dosage form of claim 1, further comprising a solvent, wherein the solvent comprises at  
10 least one of purified water, propylene glycol, and polyethylene glycol 400.
4. The dosage form of claim 1, further comprising a preservative, wherein the preservative comprises at least one of propyl paraben and methyl paraben.
5. The dosage form of claim 1, further comprising a chelate.
6. The dosage form of claim 1, further comprising a viscosity increasing agent.
- 15 7. The dosage form of claim 1, further comprising a pH adjusting agent.
8. The dosage form of claim 1, wherein the active ingredient comprises beads, minitables, pellets, granules, crystals, powder, or combinations thereof.
9. The dosage form of claim 8, wherein the active ingredient is coated with at least one of a polymer, a fat, a wax, an emulsifier, and a carbohydrate.
- 20 10. The dosage form of claim 1, wherein the active ingredient comprises at least one of melatonin, n-acetyl-cystein, diphenhydramine HCl, phenylephrine HCl, brompheniramine maleate, phenylephrine HCl, dextromethorphan HBr, acetaminophen, guaifenesin, chlorpheniramine malate, pseudoephedrine HCl, hydrocodone bitartrate, codeine phosphate, pyrilamine maleate, vitamins, minerals, and herbs.
- 25 11. The dosage form of claim 1, wherein the sealed container is a packet, a sachet, a pouch, or a blister pack.

12. The dosage form of claim 1, further comprising a taste masking agent.
13. The dosage form of claim 1, wherein the first component is a carbomer
14. The dosage form of claim 1, wherein the first component is maltitol, corn syrup, or sorbitol.
- 5 15. The dosage form of claim 1, wherein a ratio of the first component to the second component ranges from about 0.001:0.05 to 0.5:0.1.
16. The dosage form of claim 1, further comprising a chelating agent.
17. The dosage form of claim 16, wherein the chelating agent is edetate disodium.
18. A method for making a solid or semi-solid dosage form comprising the steps of
- 10 (a) metering a volume or weight of a first component that comprises a thickening agent;
- (b) introduced the metered volume or weight of the first component into a container;
- (c) metering a volume or weight of a second component that comprises an active ingredient;
- (d) introducing the metered volume or weight of the second component into the container;
- and
- 15 (e) sealing the container.
19. The method of claim 18, wherein the active ingredient comprises beads, minitables, pellets, granules, crystals, powder, or combinations thereof.
20. The method of claim 18, wherein the active ingredient is coated with at least one of a polymer, fat, wax, emulsifier, and a carbohydrate.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2016/018832

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61K 9/14 (2016.01)

CPC - A61K 9/009 (2016.02)

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) - A61K 9/14, 9/16 (2016.01)

CPC - A61K 9/009, 9/141, 9/1605 (2016.02)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC - 424/489, 498; 514/970; IPC(8) - A61K 9/14, 9/16; CPC - A61K 9/009, 9/141, 9/1605 (keyword delimited)

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

Orbit, Google Scholar.

Search terms used: solid, oral, delivery, thickener, glycol, propylparaben, methylparaben, chelate, viscosifier, beads, minitablets, pellets, granules, polymer, fat, emulsifier, carbohydrate, coated, container, sealed, packet, blister pack, carbomer, maltitol, corn syrup, sorbitol.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/0063010 A1 (MEHTA et al) 11 March 2010 (11.03.2010) entire document	1, 2, 4, 5, 10, 12-17
Y		6-9, 11, 18-20
Y	US 4,818,517 A (KWEE et al) 04 April 1989 (04.04.1989) entire document	6, 7
Y	US 2011/0061345 A1 (CHERUKURI et al) 17 March 2011 (17.03.2011) entire document	8, 9, 11, 18-20
A	US 7,378,408 B2 (KIMBALL et al) 27 May 2008 (27.05.2008) entire document	1, 2, 4-20
A	US 5,881,926 A (ROSS) 16 March 1999 (16.03.1999) entire document	1, 2, 4-20
A	US 5,114,929 A (VARTAN) 19 May 1992 (19.05.1992) entire document	1, 2, 4-20

 Further documents are listed in the continuation of Box C. See patent family annex.

\* 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

04 April 2016

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