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(54) **Titre : SYSTEME D'ADMINISTRATION POUR COMPOSITION ACTIVE**

(54) **Title: ACTIVE COMPOSITION DELIVERY SYSTEM**

(57) **Abrégé/Abstract:**

An active composition delivery system having a water-soluble substrate, and an active composition disposed uniformly throughout the water soluble substrate. The water-soluble substrate is sized and shaped to form a sheet, and hold a premeasured amount of an active composition. The substrate dissolves when contacted with a sufficient amount of water, thereby releasing the active composition into the water. Methods of making and using the active composition delivery system are also disclosed.

ABSTRACT OF THE DISCLOSURE

An active composition delivery system having a water-soluble substrate, and an active composition disposed uniformly throughout the water soluble substrate. The water-soluble substrate is sized and shaped to form a sheet, and hold a premeasured amount of an active composition. The substrate dissolves when contacted with a sufficient amount of water, thereby releasing the active composition into the water. Methods of making and using the active composition delivery system are also disclosed.

Title: ACTIVE COMPOSITION DELIVERY SYSTEM

FIELD OF THE INVENTION

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The present invention relates to the fields of fabric care, hard surface cleaners, and personal cleaning products. More particularly, the present invention relates to systems and methods for delivering an active composition in the form of a premeasured unit dose sufficient for a single cleaning or treatment operation.

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BACKGROUND OF THE INVENTION

Cleaning agents, including detergents, are typically provided in liquid or powder forms. However, users find these forms inconvenient because their use requires an additional step of measuring out a correct dose of the detergent. Apart from the inconvenience of measuring out a correct dose is the material cost associated with the need to provide and store a utensil for measuring out the correct dose, and then load the correct dose, for example, into a dishwasher, a washing machine, or other like washing apparatus. Associated with this requirement for measuring a dose is the risk of getting the dose wrong, and either under-dosing (resulting in poor cleaning action), or over-dosing (resulting in wasted detergent, or damage to the item being cleaned). Other problems associated with liquid and powder forms of cleaning agents are that they are messy. They are also not easily transportable in small quantities, which may be desirable when travelling, for example.

In light of the above noted problems associated with liquid and powder forms of cleaning agents, many users prefer cleaning agents, such as for example, laundry detergents, that are provided in a form that is simpler to use and less messy than the liquid and powder forms.

Attempts have been disclosed in the prior art to overcome some of the above described problems associated with liquid and powder cleaning agents. Some of the attempts included providing a unit dose laundry detergent product, which removed the need to measure out a correct dose of laundry detergent, thereby
5 simplifying for the user the process of loading a washing machine with the correct dose of the laundry detergent.

For example, U.S. Pat. No. 4,356,099 to Davies disclosed fabric treatment products for use in washing machines consisting of a bag formed of water-
10 insoluble, water-impermeable synthetic plastics sheet material containing a fabric treatment composition comprising a liquid fabric treatment composition, such as an aqueous or non-aqueous liquid detergent composition. The bag has a weak seal that will be opened by the mechanical action of a washing machine, to release its liquid detergent contents. However, a problem with the
15 fabric treatment products disclosed by Davies is that they are prone to a failure of the weak seal not opening properly in modern day high efficiency (HE) washing machines. This is because opening of the weak seal in a Davies fabric treatment product relies on the mechanical action of the washing machine, and the more gentle mechanical action of HE washing machines may not be enough
20 to open the bag. Additionally, because the bag is made of a water-insoluble material, it remains in the washing machine during the entire wash cycle, and can affect the cleaning performance if it clings to certain areas of the clothing being washed. Furthermore, the format of the fabric treatment products taught by Davies does not allow for partial doses that may be better suited for laundry
25 loads which are smaller than full loads.

As another example, U.S. Patent No. 4,188,304 to Clarke discloses a detergent product which comprises a particulate detergent composition contained within a closed water-insoluble bag which has a water-sensitive seal, whereby the
30 contents of the bag are discharged on contact of the bag with water. Clarke's

detergent product shares many of the same problems noted above in connection to Davies. However, an additional problem with the Clarke detergent product is that it is difficult to ensure that all of the particulate detergent composition is emptied out of the bag and fully dissolved in the water, especially if the detergent product is used in the detergent dispensing trays on modern HE washing machines.

As yet another example, laundry detergent pods have become popular in recent years, in which a single premeasured unit dose of detergent is encapsulated in a water-soluble pouch, typically ranging from 20 to 40 grams in weight. However, a problem associated with such laundry detergent pods is that they do not dissolve readily because the water-soluble pouch covering the detergent powder must dissolve before the water can access the detergent. Furthermore, the detergent is provided as a large mass of partially-compressed powder, which presents a smaller overall surface area for the water to act on. For these reasons, such pods typically do not dissolve fully when used in the detergent dispensing trays on modern HE washing machines.

As yet another example, laundry detergent tablets exhibit similar problems as those described above with respect to laundry detergent pods, due to the large concentrated mass of highly-compressed detergent powder.

In general detergent dispensing trays on modern HE washing machines provide too short a time for dissolving the above noted laundry detergent pods and laundry detergent tables, and so they fail to yield optimal results when used in this way. For this reason, laundry detergent pods are better suited for being placed directly in the washing machine drum to be dissolved during the wash cycle.

Neither the laundry detergent pod, nor the laundry detergent tablet formats

allow for partial doses that may be better suited for laundry loads which are smaller than full loads.

5 As yet another example, U.S. Patent No. 4,853,142 to Win disclosed a high melting temperature meltblown web, such as a polyester meltblown web, which contains a sufficient amount of condensed liquid detergent to wash a load of laundry and does not exhibit an objectionable sticky feel. Similarly, U.S. Patent No. 4,938,888 to Kiefer disclosed a cleaning article formed from a detergent composition impregnated into a flexible substrate. The detergent composition
10 includes an alkyl polyglycoside and a detergency builder. The substrates employed are water-insoluble and are solid or substantially solid materials, such as foam, foil, sponge, paper, woven or non-woven cloth.

15 A problem shared by both Win and Kiefer is that they are made with non-dissolvable substrates, which remain in the washing machine drum after completion of the wash cycle. The non-dissolvable substrates also tend to cling to clothing being washed, making it more difficult for the embedded detergent to dissolve completely. Additionally, non-dissolvable substrates are not compatible with detergent dispensing trays on modern HE washing machines,
20 and both of Win's webs and Kiefer's cleaning articles, impregnated with detergent composition sufficient for a full load, would be too large to be used efficiently and reliably in the detergent dispensing trays on modern HE washing machines. Additionally, neither Win's web nor Kiefer's cleaning article allow for partial doses that may be better suited for laundry loads which are smaller than
25 full loads.

As yet another example, U.S. Patent No. 9,464,264 to Jalbert disclosed a method and apparatus for making dissolvable laundry detergent sheets, containing laundry detergent, for use in washing machines. The Jalbert laundry
30 detergent sheets dissolve completely in the drum of the washing machine

during the wash cycle, thereby releasing their laundry detergent contents to the wash water.

Other prior art attempts include those disclosed in: U.S. Patent Nos. 1,112,963;
5 2,665,528; 3,062,030; 3,694,364; 3,904,543; 3,950,277; 4,374,035; 4,806,261;
5,574,179; 5,780,418; 5,863,887; 6,699,826; 6,756,351; 6,831,051; 6,818,606;
6,864,196; 6,949,498; 6,995,126; 7,094,744; 7,544,409, and 8,669,219; and
U.S. Patent Application Publication Nos. 2002/0077265; 2004/0046272;
2005/0037942; 2008/0014393; 2008/00064618; 2008/0242579; 2009/0291282;
10 2010/0035789; 2010/0190677; 2011/0028374; 2011/0136719; 2012/0207699;
2014/0024574; and 2002/0169092.

Other prior art attempts include those disclosed in: CA 2,695,068; CN
101063066; CN 102492573; EP 2226379; KR 20130124261; WO 2004087857;
15 WO 2006134657; and WO 2007034471.

However, there remains a need for improvements in active composition
delivery systems.

20 **SUMMARY OF THE INVENTION**

What is desired is an improved system and method for delivering an active
composition, such as a cleaning or treatment composition, to where it is
needed, that overcomes at least some of the problems in the prior art. For
25 example, what may be desired is a system and method for delivering an active
composition in the form of a premeasured unit dose sufficient for a single
cleaning or treatment operation. As another example, what may be desired is
a system and method for delivering an active composition with a useful actives
content. As yet another example, what may be desired is a system and method
30 for delivering an active composition in the form of a sheet that is easy to handle

and store when dry, yet which dissolves completely when contacted by water, to deliver the active composition, without leaving behind any substrate or noticeable residue.

5 Therefore, in accordance with one aspect of the present invention, there is disclosed an active composition delivery system having a water-soluble substrate, and an active composition disposed uniformly throughout the water
10 soluble substrate. The water-soluble substrate is sized and shaped to form a sheet, and hold a premeasured amount of an active composition. The substrate dissolves when contacted with a sufficient amount of water, thereby releasing the active composition into the water. Methods of making and using the active composition delivery system are also disclosed. Preferably, the water-soluble substrate is made from polyvinyl alcohol (PVA). The active
15 composition may also be water-soluble, in which case the active composition delivery system will be completely dissolvable in water. However, according to other embodiments of the present invention, the active composition may be water insoluble, in which case, the active composition delivery system will not be completely dissolvable in water, although only the active composition will remain, for example as a fabric treatment of encapsulated fragrance coating
20 or impregnating portions of the treated fabric.

The active composition delivery system of the present invention comprehends many uses and applications, depending on the formulations of the active composition, and substrate containing the active composition, comprised by the
25 cleaning composition delivery system.

For example, embodiments of the present invention may include active composition delivery systems, wherein the active composition is a cleaning composition, configured for cleaning laundry, body parts (i.e. personal care
30 products), for cleaning dishes and utensils, and for cleaning hard surfaces.

As another example, embodiments of the present invention may include active composition delivery systems, wherein the active composition is a treatment composition, configured for treating fabric to provide, for example, scent properties (i.e. scent enhancement) to the fabric, soften the fabric, provide anti-
5 microbial properties to the fabric, provide anti-bacterial properties to the fabric, provide anti-fungal properties to the fabric, provide insect repellant properties to the fabric, and combinations thereof.

Therefore, the active composition delivery system may be a laundry detergent
10 sheet, wherein the active composition is a laundry detergent; hand soap sheet, wherein the active composition is a hand soap; a fabric softener sheet, wherein the active composition is a fabric softener; a fragrance enhancement sheet, wherein the active composition is a fragrance, including an encapsulated fragrance configured for slow or delayed release of the fragrance; a dish soap
15 sheet, wherein the active composition is a dish soap; a surface cleaner sheet, wherein the active composition is a surface cleaner; a shampoo and/or conditioner sheet, wherein the active composition is a shampoo and/or conditioner; a body wash sheet, wherein the active composition is a body wash; an anti-microbial sheet, wherein the active composition is an anti-microbial; an
20 anti-bacterial sheet, wherein the active composition is an anti-bacterial; an anti-fungal sheet, wherein the active composition is an anti-fungal; an insect repellant sheet, wherein the active composition is an insect repellant; and the like.

25 Furthermore, the active composition delivery system of the present invention is not limited to a particular manner of use or application, but comprehends many manners of uses and applications. For example, the active composition delivery system may be configured to enable the user to prepare a volume of a cleaning or treating solution for current use or for later use. For example, the
30 user may dissolve an active composition delivery system in a pail of water and

use the solution in the pail together with a mop to clean the floor. As another example, the user may dissolve an active composition delivery system in a kitchen sink filled with a volume of water and use the solution to wash dishes. As yet another example, the user may hold an active composition delivery system in his hands under running water to cleanse his hands, and/or other body parts. As yet another example, the user may hold an active composition delivery system in her hands or on her head in the shower to shampoo or condition her hair. As yet another example, the user may dissolve an active composition delivery system in a spray bottle filled with a volume of water and use the solution to clean hard surfaces. As yet another example, the user may dissolve an active composition delivery system in a disposable or reusable storage bottle filled with a volume of water and later dispense the solution, on an as needed basis, to use as a liquid fabric softener, a liquid dish detergent, a liquid laundry detergent, or the like.

Therefore, in accordance with one aspect of the present invention, there is disclosed an active composition delivery system.

According to another aspect of the present invention, there is disclosed a method of making an active composition delivery system.

According to yet another aspect of the present invention, there are disclosed methods of using the active composition delivery system for cleaning or treating people, animals, or things.

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BRIEF DESCRIPTION OF THE DRAWINGS

Reference will now be made to the preferred embodiments of the present invention with reference, by way of example only, to the following drawings in which:

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Figure 1 is a top view of an active composition delivery system in the form of a hand soap sheet, according to an embodiment of the present invention;

5 Figure 2 is a top view of an active composition delivery system in the form of a fabric softener sheet, according to another embodiment of the present invention;

Figure 3 is a top view of an active composition delivery system that is easily severable into smaller portions, according to another embodiment of the present invention; and

10 Figure 4 is a top view of another active composition delivery system that is easily severable into smaller portions, according to another embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

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The present invention is described in more detail with reference to exemplary embodiments thereof as shown in the appended drawings. While the present invention is described below including preferred embodiments, it should be understood that the present invention is not limited thereto. Those of ordinary skill in the art having access to the teachings herein will recognize additional implementations, modifications, and embodiments which are within the scope of the present invention as disclosed and claimed herein.

25 An active composition delivery system 10 according to an embodiment of the present invention is shown in Figure 1. Preferably, the active composition delivery system 10 has a water-soluble substrate 12, and an active composition 14 disposed uniformly throughout the water soluble substrate 12. The water-soluble substrate 12 is preferably sized and shaped to form a sheet, and hold a premeasured amount of the active composition 14. The water-soluble substrate 12 is configured to dissolve when contacted with a sufficient amount

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of water, thereby releasing the active composition 14 into the water. According to the example shown in Figure 1, the active composition delivery system 10 may be sized and shaped to form a square sheet, which is for example 1 inch long by 1 inch wide and which is for example 0.7 mm thick. It will of course be appreciated that other dimensions may be suitable depending on the application, or the amount of active composition 14 required or desired to be stored in and delivered by the active composition delivery system 10. Accordingly, it is contemplated that the active composition delivery system 10 may be shaped as a rectangle, or any other polygon, including triangle, trapezoid, diamond, rhombus, parallelogram, and the like, as well as arcuate shapes, such as circles, ovals and the like, and combinations thereof. Furthermore, the dimensions of the length and width may be larger or smaller than 1 inch, and the thickness may be larger or smaller than 0.7 mm. As another example, Figure 2 shows the active composition delivery system 10 in a larger rectangular form which is five inches long and two inches wide and 0.7 mm thick. Preferably, the length or width of the active composition delivery system 10 may be between 1 inch and 12 inches, and the thickness may be between 0.5 mm and 1 mm. All such embodiments are comprehended by the present invention.

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The active composition 14 may also be water-soluble, in which case the active composition delivery system 10 will be completely dissolvable in water. However, according to other embodiments of the present invention, the active composition 14 may be water insoluble, in which case, the active composition delivery system 10 will not be completely dissolvable in water, although only the active composition 14 will remain, for example as a fabric treatment of encapsulated fragrance coating or impregnating portions of the treated fabric.

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Referring now to Figures 3 and 4, the active composition delivery system 10 may preferably be configured to allow the user to easily select a combination

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of premeasured unit doses for a particular application. Most preferably, the active composition delivery system 10 may be provided with a frangible member, or line of weakness 16, to make it easier for the user to separate and remove one or more smaller portions 18 from the active composition delivery system 10, so they may be used. Preferably, the frangible member/line of weakness 16 may be in the form of a line of perforations, cuts, partial cuts, or thinner material.

By way of example, the active composition delivery system 10 shown in Figure 3 is in the shape of a strip containing five smaller portions 18, that may be separated along the lines of weakness 16 by a user. It will be appreciated that the active composition delivery system 10 may contain more or fewer such portions 18. Furthermore, it is contemplated that the active composition delivery system 10 may contain many such portions 18 rolled up to allow for easier dispensing. In this example, the portions 18 have the same dimensions. For example, the portions 18 may each be good for a partial application, such as for example applying a fabric softener treatment to a quarter load of laundry. Accordingly, a user would be able to sever between one and four portions 18 from the roll depending on whether the size of the load of laundry that needed treatment represented a quarter load, a half load, a three-quarter load, or a full load.

By way of example, the active composition delivery system 10 shown in Figure 4 is in the shape of a rectangle and contains eight portions 18, that may be separated along the lines of weakness 16 by a user. It will be appreciated that the active composition delivery system 10 may contain more or fewer such portions 18. The active composition delivery system 10 shown includes a small portion 20, and large portions 22, that may be used individually, or in combination. For example, two small portions 20 may be good for one application, such as for example applying a fabric softener treatment to a half

load of laundry. Similarly, one large portion 22 may be good for treating a half load of laundry. Similarly, two large portions 22, or four small portions 20, or two small portions 20 combined with one large portion 22 may be good for a treating a full load of laundry. And so on.

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Having described an embodiment of the active composition delivery system 10 of the present invention, method for making the same are described next in Examples 1 and 2.

10 Example 1 describes a method of making a water-soluble sheet for use as a hand soap, according to an embodiment of the present invention.

Preferably, the water-soluble hand soap sheet may contain the following compounds:

- 15 • about 22 weight % to about 30.5 weight%, of a biodegradable supporting matrix, such as PVA, preferably a combination of PVA B-05 and PVA B-17;
- about 0.1 weight % to about 0.11 weight%, of a food-grade preservative, such as potassium sorbate;
- 20 • about 12 weight % to about 13.5 weight%, of a food-grade surfactant, such as alpha olefin sulfonate (AOS);
- about 5.5 weight % to about 10 weight%, of an active composition, such as a cleaning composition (i.e. a soap mixture) comprising one or more of lauramine oxide, cocamidopropyl betaine / betaine monohydrate,
- 25 cetrimonium chloride / tetra alkyl ammonium chloride;
- about 14.5 weight % to about 15.5 weight%, of a texture improver, such as glycerin;
- optionally about 0.1 weight % to about 2.5 weight%, of a fragrance to provide scent enhancement;
- 30 • about 34 weight % to about 36.5 weight%, of a plant-derived

- biodegradability booster, such as starch; and
- about 0.5 weight % to about 0.65 weight%, of a texture improver, such as mineral oil; and
- about 7.8 weight % to about 8.2 weight%, of water to provide a water content of 8 percent.

Example 2 describes a method of making a water-soluble sheet for use as a fabric softener, according to another embodiment of the present invention.

- 10 Preferably, the water-soluble fabric softener sheet may contain the following compounds:
- about 21 weight % to about 22.5 weight%, of a biodegradable supporting matrix, such as PVA, preferably a combination of PVA B-05 and PVA B-17;
 - 15 • about 0.1 weight % to about 0.11 weight%, of a food-grade preservative, such as potassium sorbate;
 - about 11 weight % to about 12.5 weight%, of a food-grade surfactant, such as alpha olefin sulfonate (AOS);
 - about 6 weight % to about 6.5 weight%, of an active composition, such as a fabric treatment composition (i.e. a fabric softener mixture) comprising Stepantex® SP-90;
 - 20 • about 13 weight % to about 14 weight%, of a texture improver, such as glycerin;
 - optionally about 1.5 weight % to about 5.5 weight%, of a fragrance to provide scent enhancement;
 - 25 • about 32 weight % to about 36 weight%, of a plant-derived biodegradability booster, such as starch; and
 - about 0.6 weight % to about 0.65 weight%, of a texture improver, such as mineral oil; and
 - 30 • about 7 weight % to about 8 weight%, of water to provide a water

content of 7.41 percent.

Example 1 - Water-Soluble Sheet For Use As A Hand Soap

- 5 The following describes steps for making an active composition delivery system for delivering a cleaning active in the form of a water-soluble sheet that a user can use to wash her hands. Good results have been obtained with this method for making 1 inch by 1 inch square sheets, which could be placed on user's wet hands and rubbed to form a soapy lather, before being rinsed off the user's
- 10 hands under clean running water, and dried with a clean towel or a hand dryer.

A first concentrated stock solution containing polyvinyl alcohol (PVA) is made by mixing the following ingredients in the indicated amounts:

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Ingredients	Function	Weight (kg)	Wt%
polyvinyl alcohol PVA B-05	biodegradable supporting matrix	1.53	3.00
polyvinyl alcohol PVA B-17	biodegradable supporting matrix	5.10	10.00
20 potassium sorbate	food-grade preservative	0.02	0.04
alpha olefin sulfonate (AOS)	biodegradable surfactant	10.20	20.00
glycerin	improve texture of sheets	3.57	7.00
25 water		30.58	59.96

A second concentrated stock solution containing an active composition comprising a cleaning active is made by mixing the following ingredients in the indicated amounts:

	Ingredients	Function	Weight (kg)	Wt%
	lauramine oxide	foam builder	1.116	12.37
5	Cocamidopropyl betaine/ betaine monohydrate	moisturizing and conditioning agents	0.234	2.59
	cetrimonium chloride/ tetra alkyl ammonium chloride	conditioning Agent	0.522	5.78
10	glycerin	improve texture of sheets	0.333	3.70
	fragrance (optional)	scent enhancement	0.045	0.50
	water		6.772	75.06

15 A final mixture is made by mixing the following ingredients in the indicated amounts, which is enough to make five hundred 1 inch x 1 inch water-soluble hand soap sheets:

	Ingredients	Function	Weight (g)	Wt%
20	first concentrated stock solution		348.74	69.75
	starch powder	plant-derived biodegradability booster	82.05	16.41
	second concentrated stock solution		61.69	12.34
25	mineral oil	improve texture of sheets	1.37	0.27
	glycerin	improve texture of sheets	6.15	1.23

When preparing the final mixture, the first concentrated stock solution is preferably mixed first with the starch powder for 1 minute. Then the second

concentrated stock solution is added to the mixture, followed by the remaining ingredients. The mixture is mixed for 29 minutes. Preferably the final mixture will have a viscosity 75,500 cp at 20°C.

- 5 Next the final mixture may be applied to a surface, dried into a sheet, and cut to produce 1 inch x 1 inch square sheets, having an average thickness of 0.7 mm and an average weight of 0.245 grams, which represent one dose of hand soap. In this regard, an apparatus such as the apparatus for making a laundry detergent sheet disclosed in U.S. 9,464,264 may be used to dry the final
10 mixture in the form of a sheet, and cut it to size the desired dimensions.

Each 1 inch x 1 inch square water-soluble hand soap sheet produced according to this example ended up having the following substances, in substantially the following amounts:

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	Substance	Weight (g)
	polyvinyl alcohol PVA B-05	0.0128
	polyvinyl alcohol PVA B-17	0.0428
	potassium sorbate	0.0002
20	alpha olefin sulfonate (AOS)	0.0300
	lauramine oxide	0.0084
	cocamidopropyl betaine / betaine monohydrate	0.0018
25	cetrimonium chloride / tetra alkyl ammonium chloride	0.0039
	glycerin	0.0363
	fragrance	0.0003
	starch	0.0880
	mineral oil	0.0015
30	water	0.0194

Total Weight	0.2454
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Example 2 - Water-Soluble Sheet For Use As Fabric Softener

- 5 The following describes steps for making an active composition delivery system for delivering a treating active in the form of a water-soluble sheet that a user can use as a fabric softener. Good results have been obtained with this method for making 2 inch by 5 inch rectangular sheets, which could be placed in the fabric softener dispensing tray on modern HE washing machines, or directly in
10 the drum of an older model washing machine, during the rinse cycle.

A first concentrated stock solution containing polyvinyl alcohol (PVA) is made by mixing the following ingredients in the indicated amounts:

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Ingredients	Function	Weight (kg)	Wt%
polyvinyl alcohol PVA B-05	biodegradable supporting matrix	1.53	3.00
polyvinyl alcohol PVA B-17	biodegradable supporting matrix	5.10	10.00
20 potassium sorbate	food-grade preservative	0.02	0.04
alpha olefin sulfonate (AOS)	biodegradable surfactant	10.20	20.00
glycerin	improve texture of sheets	3.57	7.00
water		30.58	59.96

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A second concentrated stock solution containing an active composition comprising a fabric softener is made by mixing the following ingredients in the indicated amounts:

	Ingredients	Function	Weight (kg)	Wt%
5	Stepantex® SP-90 (Stepan Company, Northfield, Illinois, U.S.A.)	surfactant, fabric softener / biodegradable	2.228	24.765
	water		6.772	75.24

10 A final mixture is made by mixing the following ingredients in the indicated amounts, which is enough to make fifty 2 inch x 5 inch water-soluble fabric softener sheets:

	Ingredients	Function	Weight (g)	Wt%
15	first concentrated stock solution		336.87	67.77
	starch powder	plant-derived biodegradability booster	79.73	15.94
	second concentrated stock solution		59.80	11.96
20	mineral oil	improve texture of sheets	1.33	0.26
	glycerin	improve texture of sheets	7.97	1.59
	fragrance	scent enhancement	12.29	2.46

25 When preparing the final mixture, the first concentrated stock solution is preferably mixed first with the starch powder for 1 minute. Then the second concentrated stock solution is added to the mixture, followed by the remaining ingredients. The mixture is mixed for 34 minutes. Preferably the final mixture will have a viscosity 55,000 cp at 20°C.

30 Next the final mixture may be applied to a surface, dried into a sheet, and cut

to produce fifty 2 inch x 5 inch rectangular sheets, having an average thickness of 0.7 mm and an average weight of 2.45 grams, which represents one dose of fabric softener. In this regard, an apparatus such as the apparatus for making a laundry detergent sheet disclosed in U.S. 9,464,264 may be used to dry the
5 final mixture in the form of a sheet, and cut it to size.

Each 2 inch x 5 inch square water-soluble fabric softener sheet produced according to this example ended up having the following substances, in substantially the following amounts:

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Substance	Weight (g)
polyvinyl alcohol PVA B-05	0.12034
polyvinyl alcohol PVA B-17	0.40114
potassium sorbate	0.00157
alpha olefin sulfonate (AOS)	0.28158
Stepantex® SP-90	0.15770
glycerin	0.33845
fragrance	0.13096
starch	0.82587
mineral oil	0.01416
water	0.17823
Total Weight	2.450

Although embodiments of the active composition delivery system of the present
25 invention include water-soluble hand soap sheets, and water soluble fabric softener sheets, as mentioned above, the invention is not limited thereto, but comprehends other applications, depending on the formulations of the active composition, and the water-soluble substance comprised by the cleaning composition delivery system.

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For example, other embodiments of the present invention may include active composition delivery systems, wherein the active composition is a cleaning composition, configured for cleaning laundry, cleaning body parts (i.e. personal care products), for cleaning dishes and utensils, and for cleaning hard surfaces.

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As another example, other embodiments of the present invention may include active composition delivery systems, wherein the active composition is a treatment composition, configured for treating fabric to provide, for example, scent properties (i.e. scent enhancement), fabric softening, anti-microbial properties, anti-bacterial properties, anti-fungal properties, insect repellant properties, scent properties, and combinations thereof.

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Therefore, the active composition delivery system may be a laundry detergent sheet, wherein the active composition is a laundry detergent; hand soap sheet, wherein the active composition is a hand soap; a fabric softener sheet, wherein the active composition is a fabric softener; a fragrance enhancement sheet, wherein the active composition is a fragrance, including an encapsulated fragrance configured for slow or delayed release of the fragrance; a dish soap sheet, wherein the active composition is a dish soap; a stain remover sheet, wherein the active composition is a stain remover; a surface cleaner sheet, wherein the active composition is a surface cleaner; a shampoo and/or conditioner sheet, wherein the active composition is a shampoo and/or conditioner; a body wash sheet, wherein the active composition is a body wash; an anti-microbial sheet, wherein the active composition is an anti-microbial; a makeup remover sheet, wherein the active composition is a makeup remover; an anti-bacterial sheet, wherein the active composition is an anti-bacterial; an anti-fungal sheet, wherein the active composition is an anti-fungal; an insect repellant sheet, wherein the active composition is an insect repellant; and the like.

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Furthermore, the active composition delivery system 10 of the present invention is not limited to a particular manner of use or application, but comprehends many manners of uses and applications. For example, the active composition delivery system 10 may be configured to enable the user to prepare a volume of a cleaning or treating solution for current use or for later use. For example, the user may dissolve an active composition delivery system 10 in a pail of water and use the solution in the pail together with a mop to clean the floor. As another example, the user may dissolve an active composition delivery system 10 in a kitchen sink filled with a volume of water and use the solution to wash dishes. As yet another example, the user may hold an active composition delivery system 10 in his hands under running water to cleanse his hands, and/or other body parts, such as skin, arms, legs, face, head, hair, and the like. As yet another example, the user may hold an active composition delivery system 10 in her hands or on her head in the shower to shampoo or condition her hair. As yet another example, the user may dissolve an active composition delivery system 10 in a spray bottle filled with a volume of water and use solution to clean hard surfaces, such as mirrors, windows, counter tops, and the like. As yet another example, the user may dissolve an active composition delivery system 10 in a disposable or reusable storage bottle filled with a volume of water and later dispense the solution, on an as needed basis, to use as a liquid fabric softener, a liquid dish detergent, a liquid laundry detergent, or the like.

While reference has been made to various preferred embodiments of the invention other variations, implementations, modifications, alterations and embodiments are comprehended by the broad scope of the appended claims. Some of these have been discussed in detail in this specification and others will be apparent to those skilled in the art. Those of ordinary skill in the art having access to the teachings herein will recognize these additional variations, implementations, modifications, alterations and embodiments, all of which are

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within the scope of the present invention, which invention is limited only by the appended claims.

**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

1. An active composition delivery system substantially as disclosed herein.
2. The active composition delivery system as claimed in claim 1, in the form of a dissolvable sheet.
3. The active composition delivery system as claimed in claim 2, comprising PVA.
4. A method of making an active composition delivery system substantially as disclosed herein.
5. A method of using an active composition delivery system for cleaning or treating people, animals, or things, substantially as disclosed herein.
6. A use of an active composition delivery system to make a cleaning solution for cleaning laundry, for cleaning body parts, for cleaning dishes and utensils, and for cleaning hard surfaces.
7. A use of an active composition delivery system to make a treatment solution for treating fabric.
8. The use as claimed in claim 7, wherein said treatment provides scent properties to the fabric, softens the fabric, provides anti-microbial properties to the fabric, provides anti-bacterial properties to the fabric, provides anti-fungal properties to the fabric, provides insect repellent properties to the fabric, and combinations thereof.

9. A use of an active composition delivery system to make a volume of a cleaning or treating solution for current use or for later use.
10. The use as claimed in claim 9, wherein said cleaning solution is a liquid dish detergent, a liquid stain remover, or a liquid laundry detergent.
11. The use as claimed in claim 9, wherein said treating solution is a liquid fabric softener.
12. A method of making a volume of a cleaning or treating solution comprising the step of dissolving an active composition delivery system in a volume of water.
13. The method as claimed in claim 12, wherein the cleaning solution is a hard surface cleaner.
14. A method of cleaning comprising the step of dissolving an active composition delivery system in a volume of water to make a cleaning solution, and applying the cleaning solution to a surface to be cleaned.
15. The method as claimed in claim 14, wherein said surface is a hard surface.
16. The method as claimed in claim 15, wherein said hard surface is a mirror, a floor, a window, a counter top, a dish, a utensil.
17. The method as claimed in claim 14, wherein said surface is a body part.
18. The method as claimed in claim 17, wherein said body part is skin, hands, hair, a head, or a face.

19. The method as claimed in claim 14, wherein said cleaning solution is applied with a spray bottle.

5 20. A method of cleaning body parts comprising the step of holding an active composition delivery system under running water to form a cleaning solution and applying the cleaning solution to a body part to be cleaned.

21. The method as claimed in claim 20, wherein the body part is skin, hands, hair, a head, or a face.

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22. The method as claimed in claim 20, wherein the cleaning solution is shampoo, conditioner, soap, or makeup remover.

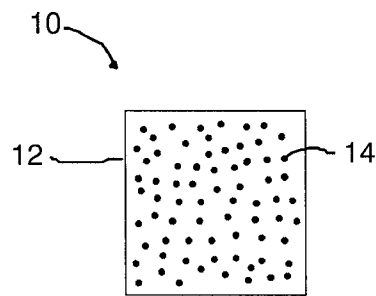


Figure 1

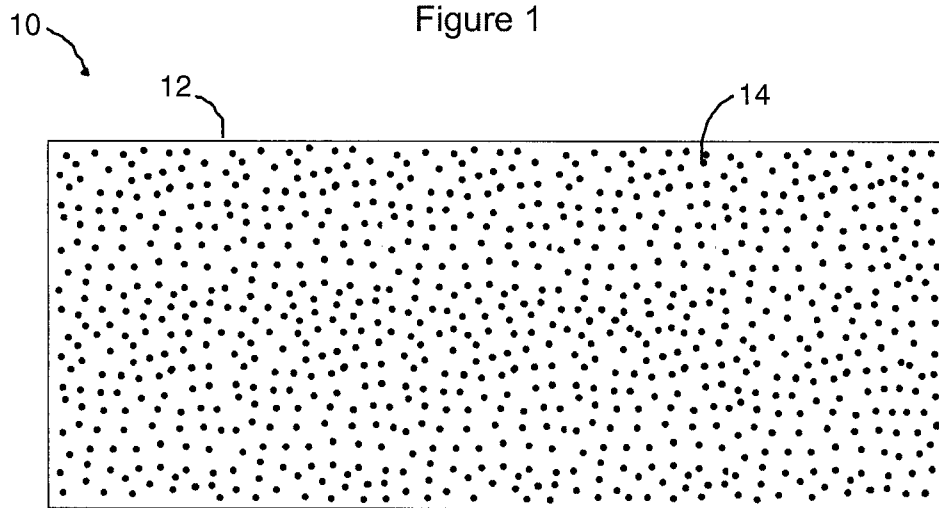


Figure 2

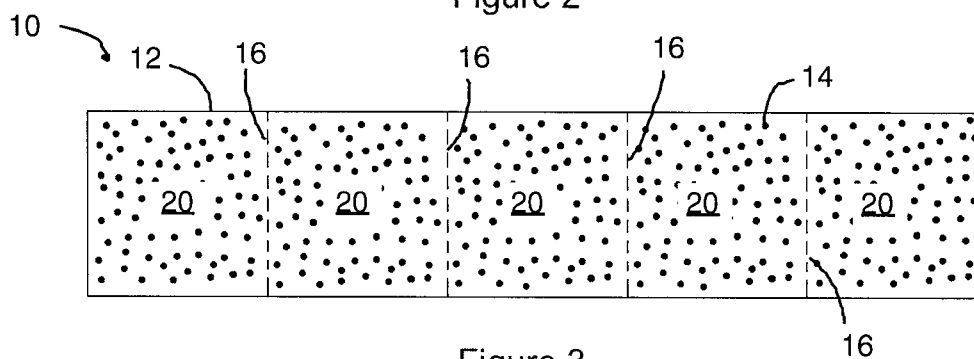


Figure 3

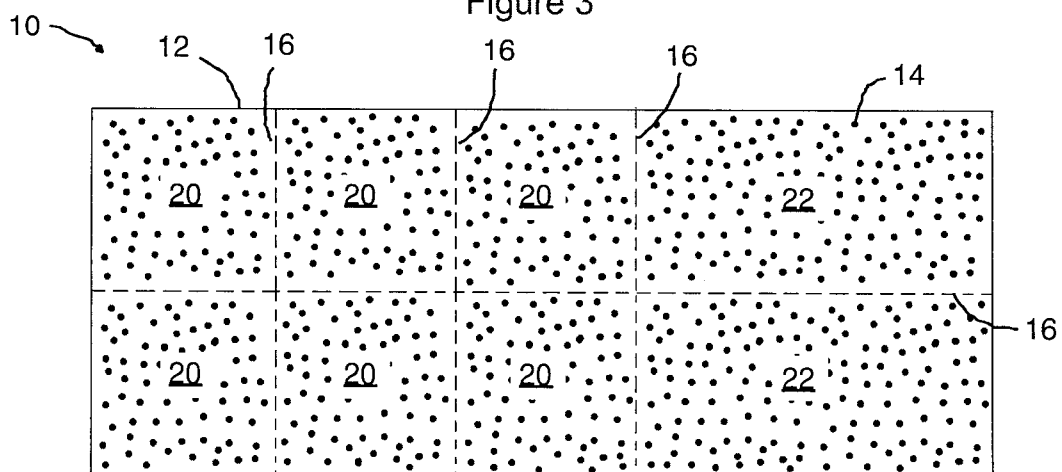


Figure 4