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CLEANSING TABLETS

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This invention relates to cleansing tablets, principally of the type of detergent tablets and bleach tablets, which are strong and resistant to physical breakage and abrasion and which disintegrate and dissolve rapidly in use.

The trend in cleansing compositions is toward providing them to the consumer in tablet form. Tablets are particularly useful because they make it possible for the housewife or other user to introduce precise amounts of a cleansing or bleaching composition into a washing machine, for example, and further because they are more readily handled, being free of dust and not susceptible to spillage.

However, this trend toward tablets has created several serious problems not associated with powdered cleansing compositions. In addition to being required to meet the usual requirements of powdered cleansing compositions, that is, of providing good cleansing and/or bleaching properties without being damaging to articles being treated, for example to objects such as paints, tiles, fabrics and the like, or to the skin of the user, the tablets must also meet the vital requirement that they be resistant to breaking and abrasion on storage and handling, and yet capable of rapid disintegration and dissolution upon being introduced into water for end use. The property of disintegration refers to the ability of the tablet to break into small pieces upon being put into water, while dissolution refers to dissolution of the tablet ingredients in water such that no visible particles remain.

Since tablets have been put to use in a variety of widely divergent applications, for example hard surface cleansers, clothes washing compositions, dry bleach compositions, and the like, these requirements have been difficult to satisfy. Even though compositions of these kinds often contain certain common ingredients, namely polyphosphates such as sodium tripolyphosphate, synthetic anionic and nonionic detergents, and the like, their end use requirements and the specific ingredients required therefor vary sufficiently so that no one means has been found to provide satisfactory properties in many of such tablets.

One useful approach to solving the problem of providing strong and readily soluble tablets has been through introduction into the tablet formulation of effervescing systems comprised of alkaline carbonates or bicarbonates together with weakly acidic materials, e.g. acid phosphates, organic acids of the type of citric acid, and the like which effervesce upon being wetted with water, thereby aiding in disintegration and dissolution of the tablet ingredients. This makes it possible to employ high pressures in tabletting, and therefore to produce dense, strong tablets, while the effervescing agent renders them capable of rapid disintegration and dissolution in water. However, this property of effervescence has in turn led to serious problems in storability of the tablets. Storage under humid conditions, or contact of the tablets with liquid water, leads to premature effervescing within the tablets, and a consequent loss of strength and of effectiveness in them. These problems are particularly aggravated in the case of dry bleach tablets, which comprise moisture-sensitive chlorine-containing compounds.

Other means of improving tablets have included modification of tabletting equipment, e.g. to provide rotating compressive forces as shown in Laskey Patent 3,081,267, issued Mar. 12, 1963, incorporation of adhesive agents to bond the ingredients and the like. While these various means have improved some tablets, no one means has been found to be helpful with a variety of kinds of tablets.

It therefore has been desired, and is an object of this invention, to provide cleansing tablets which are physically strong and resistant to abrasion, both initially and on storage, yet which disintegrate and dissolve readily upon being put to use in aqueous systems.

It is a further object to provide a readily available, inexpensive additive which is effective in imparting to a variety of kinds of cleansing tablets, both improved strength and the properties of ready disintegration and dissolution in water.

It has now been found, quite surprisingly, that cleansing composition tablets containing at least one of the following water-conditioning agents, (a) 5 to 98% of a polyphosphate, preferably sodium tripolyphosphate, (b) 0.5 to 20% of a nonionic or anionic synthetic detergent and (c) 0.5 to 98% of a chlorocyanuric compound, namely trichlorocyanuric acid, dichlorocyanuric acid or an alkali metal or alkaline earth metal salt of dichlorocyanuric acid, meet the above requirements provided they have present in them 2 to 95%, and preferably 5 to 60%, of particulate sodium chloride having a particle size of 10 to 325 mesh, and preferably particulate dendritic sodium chloride having a particle size of 30 to 200 mesh with approximately 85% being plus 100 mesh. All percentages given herein are percents of the weight of the total compositions. Such compositions containing dry bleaches of the kind named above, namely trichlorocyanuric acid, dichlorocyanuric acid, and the salts of dichlorocyanuric acid, are particularly benefited by the presence of the sodium chloride, being made stronger and more stable physically and also being more resistant to loss of chlorine thereby.

The sodium chloride employed in the herein tablets is a particulate material having a particle size of 10 to 325 mesh. The preferred sodium chloride is the dendritic material, having a particle size of 30 to 200 mesh, with about 85% being plus 100 mesh. The dendritic material is a form of sodium chloride having branched or starlike crystals as opposed to the cubical structure of regular vacuum salt or the crystal aggregates of flake type salt. It has the fine granulation of vacuum pan salt, typical dendritic salt having a density on the order of 56 pounds per cubic foot. It is produced by pretreating brine with 12 to 20 parts per million of yellow prussiate of soda (sodium ferrocyanide), and producing the salt crystals by a vacuum pan evaporation process. The additive causes growth to take place on the corners, rather than at the faces, of the crystals providing the characteristic dendritic crystal.

Use of sodium chloride having particle sizes substantially outside these ranges results in tablets not having the advantages of rapid dissolution and disintegration and strength provided by the use of sodium chloride in amounts, and having particle sizes, within these ranges.

A variety of kinds of cleansing tablets are prepared from compositions containing the herein sodium chloride additive and water conditioning agent or agents. The following table, headed Table I, presents a number of such tablet compositions, in terms of both useful and preferred ranges of the various additives. In some cases the ingredients are given in ranges which include 0; this means that the particular ingredient is not essential to the composition.

TABLE I.—COMPOSITIONS BY TABLET TYPE

Major Components	Dry Bleach		Laundry Detergent			
			Anionic		Nonionic	
	Useful	Preferred	Useful	Preferred	Useful	Preferred
Sodium Tripolyphosphate	0–95	20–50	25–75	50–65	25–75	50–65
Sodium Chloride	2–95	5–30	2–69	5–30	2–69	5–30
Chlorocyanuric Compound	0. 5–98	10–50				
Anionic Synthetic Detergent (beads pref.)	0–10	1–8	3–20	5–15		
Nonionic Synthetic Detergent	0–1	0–0. 5			3–20	5–15
Sodium Silicates:						
Dry $Na_2O:SiO_2$:			2–12	4–7		
1:2–1:3. 2					1–10	2–5
2:1–1:1						
Liquid $Na_2O:SiO_2$, 1:2–1:3. 2	0–50	0–25				
Sodium Sulfate						
Sodium Bisulfate	0–50	0–25				
Sodium Carbonate						

Major Components	Detergent-Bleach		Cleaners			
			Hard Surface		Chlorinated Industrial	
	Useful	Preferred	Useful	Preferred	Useful	Preferred
Sodium Tripolyphosphate	25–75	50–65	5–35	10–20	5–60	20–40
Sodium Chloride	2–74	5–30	2–94	30–75	2–93	30–50
Chlorocyanuric Compound	5–10	6–8			1–10	3–5
Anionic Synthetic Detergent (beads pref.)	3–20	5–15	1–20	3–10	1–20	3–10
Nonionic Synthetic Detergent	0–1	0–0. 5	0–5	1–3		
Sodium Silicates:						
Dry $Na_2O:SiO_2$:	2–12	4–7				
1:2–1:3. 2						
2:1–1:1						
Liquid $Na_2O:SiO_2$, 1:2–1:3. 2						
Sodium Sulfate						
Sodium Bisulfate						
Sodium Carbonate						

Major Components	Automatic Dishwashing		Sanitizer		Sanitizer-Cleaner		Toilet Bowl Cleaner	
	Useful	Preferred	Useful	Preferred	Useful	Preferred	Useful	Preferred
Sodium Tripolyphosphate	10–60	25–50	0–50	10–20	20–60	30–50		
Sodium Chloride	2–80	5–20	2–99	5–88	2–72	5–30	2–39	5–15
Chlorocyanuric Compound	0–8	2–6	1–100	2–25	1–30	2–15	0–5	1–3
Anionic Synthetic Detergent (beads pref.)			0–2	0–1	2–20	5–10	1–6	2–4
Nonionic Synthetic Detergent	0–5	1–3						
Sodium Silicates:								
Dry $Na_2O:SiO_2$:								
1:2–1:3. 2	10–70	15–30			5–30	10–20		
2:1–1:1								
Liquid $Na_2O:SiO_2$, 1:2–1:3. 2								
Sodium Sulfate							50–90	65–75
Sodium Bisulfate							10–25	15–20
Sodium Carbonate								

The above tableting compositions may contain also, as needed, other agents normally employed in providing the various tablets. These agents include bactericidal additives, fillers such as sodium carbonate and sodium sulfate, excipients such as sodium stearate and vegetable fats, optical brighteners, antiredeposition agents such as carboxymethylcellulose, dyes, pigments, dedusters such as mineral oil, foam stabilizers, tarnish inhibitors, ammonium chloride and phosphates such as trisodium phosphate, monosodium phosphate and the like.

Polyphosphates found useful in the compositions of this invention include the sodium tripolyphosphate, tetrasodium pyrophosphate and the so-called phosphate glasses (including sodium hexametaphosphate) with those having chain lengths of about 10 to 16 being preferred.

Dry, particulate chlorocyanuric compounds useful in the herein tablets together with sodium chloride include trichlorocyanuric acid, dichlorocyanuric acid and the alkali metal and alkaline earth metal salts of dichlorocyanuric acid. The preferred chlorocyanuric compound is sodium dichlorocyanurate, a fast-dissolving compound which is highly effective as a bleach and sanitizer, yet which does not damage fabrics and the like. The chlorocyanuric materials are normally highly stable in storage when compared with other active chlorine chemicals, however, they are decomposed with loss of active chlorine by contact with water in alkaline systems at elevated temperatures, and accordingly should be handled in a fashion to avoid exposure to this combination of conditions in formulation of tablets. The potassium magnesium and calcium dichlorocyanurates are also highly useful in the herein compositions, as are the other alkali and alkaline earth metal dichlorocyanurates.

Synthetic detergents useful in the above compositions are the anionic and nonionic non-soap synthetic detergents. The useful anionic non-soap synthetic detergents may be designated as water soluble salts of organic sulfuric reaction products having in their molecular structure an alkyl or acyl radical of carbon atom content within the range of about 8 to about 18 and a sulfonic acid or sulfuric acid ester radical.

Important examples of these anionic detergents are: sodium or potassium alkyl benzene sulfonate in which the alkyl group contains from about 9 to about 15 carbon atoms in either a straight chain or a branched chain which is derived from polymers of propylene; sodium and potassium alkyl glyceryl ether sulfonates, especially those ethers of higher fatty alcohols derived from the reduction of coconut oil; the reaction product of higher fatty acids with sodium or potassium isethionate, where, for example, the fatty acids are derived from coconut oil; sodium or potassium alkyl sulfonates and sulfates especial-

ly those alkyl sulfates derived by the sulfation of coconut or tallow fatty alcohols and mixtures of such alkyl sulfates, dialkyl esters of sodium or potassium salts of sulfosuccinic acid, for example, the dihexyl ester; sodium and potassium salts of sulfated or sulfonated monoglycerides derived for example, from coconut oil, sodium or potassium salts of the higher fatty alcohol esters of sulfocarboxylic acids, for example, the sodium salt of the lauryl alcohol ester of sulfoacetic acid; sodium or potassium salts of a higher fatty acid amide of methyl taurine in which the higher acyl radicals for example, are derived from coconut oil; and others known in the art, a number being specifically set forth in U.S. Patent 2,486,921, issued to Byerly on Nov. 1, 1949. Examples of other useful anionic non-soap synthetic detergents are acyl sarcosinates, e.g. sodium N-lauroyl sarcosinate. The sodium alkyl benzene sulfonates in which the alkyl group contains about 9 to about 15 carbon atoms are preferred in the practice of this invention.

Nonionic non-soap synthetic detergents useful in the herein tablets may be broadly classed as being constituted of a water solubilizing polyoxyethylene group in chemical combination with an organic hydrophobic compound such as polyoxypropylene, alkyl phenol, the reaction product of an excess of propylene oxide and ethylene diamine, and aliphatic alcohols. The nonionic synthetic detergents have a molecular weight in the range of from about 800 to about 11,000.

For example, a well-known class of nonionic detergents is made available on the market under the trade name of "Pluronic." These compounds are formed by condensing ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol. The molecular weight of the hydrophobic base is of the order of 1500 to 1800. The addition of polyoxyethylene radicals to this hydrophobic base increases the water solubility of the entire molecule. Liquid products are obtained up to the point where the polyoxyethylene content is about 50% of the total weight of the condensation product; higher proportions of polyoxyethylene renders the products solid in consistency. The molecular weights of Pluronic L61, L64 and F68, for example, are approximately 2000, 3000 and 8000 respectively.

Examples of other nonionic synthetic detergents useful in the present invention are: condensation products of 6 to 30 moles of ethylene oxide with one mole of an alkyl phenol containing 6 to 12 carbon atoms, either in a straight or branched chain, in the alkyl group (e.g. nonyl or octylphenol); condensation products of 6 to 30 moles of ethylene oxide with one mole of an aliphatic straight

chain or branched chain alcohol containing 8 to 18 carbon atoms (e.g. lauryl alcohol or tallow fatty alcohol); condensation products of ethylene oxide and the reaction product of propylene oxide and ethylene diamine wherein the reaction product has a molecular weight of 2500–3000 for example and the condensation product has a polyoxyethylene content of 40% to 80%. Care should be taken to select nonionic detergents which are not unduly reactive with chlorinated cyanuric compounds where the latter are employed. In this respect, condensation products of 6 to 30 moles of ethylene oxide with one mole of an alkyl phenol containing 6 to 12 carbon atoms, either in a straight or branched chain, in the alkyl group (e.g. nonyl or octylphenol) in which the terminal hydrogen of the ethylene oxide chain is replaced with a hydrophobic alkyl or aryl group are particularly useful with chlorocyanuric compounds, being resistant to attack by active chlorine.

Effervescing agents may be used in the herein tablets, and include such materials as particulate sodium bicarbonate or carbonate which are used together with an acid which acts in solution on the bicarbonate or carbonate to liberate carbon dioxide gas which aids in tablet disintegration.

Tableting of compositions of the herein kind is accomplished readily to provide strong, non-dusting tablets which disintegrate and dissolve rapidly in water. Whereas tableting of compositions not containing sodium chloride frequently results in picking of small pieces from the faces of the tablets as well as in capping, that is, breaking away of a cap from the tablet produced, these problems are minimized by inclusion of sodium chloride in the tableting formulation.

Tableting is accomplished by directly blending the components of the tablet formulation in any conventional mixer, and tableting it in a conventional manner, for example a conventional press mold. In the examples which follow, an ordinary Carver press was employed; however, any conventional molding press can be used. The pressure is varied to give tablets of varying densities, as is required for the different uses indicated for the tablets. It is an advantage of the herein tablets containing sodium chloride, that they can be tableted with very high pressures, to produce strong tablets, without unduly increasing tablet disintegration and dissolving times. In tablets not containing sodium chloride, substantial increases in tableting pressure are accompanied by marked increase in the times required to disintegrate and dissolve the tablets produced. In the following examples, which are presented by way of illustration of this invention only, all amounts are given in weight percent.

TABLE II.—TABLET TYPE—PERCENT COMPOSITION

Components	Dry Bleach Example			Laundry Detergent					
				Anionic Example			Nonionic Example		
	1	2	A*	3	4	B*	5	6	C*
Dendritic Sodium Chloride	25.8	5	0	20	5	0	23	5	0
Sodium Sulfate	0	20.8	25.8	0	15	20	0	18	23
Sodium Tripolyphosphate Dense Granular, Phase II	30	30	30	60	60	60			K
Sodium Tripolyphosphate Light Density							55	55	55
Trisodium Phosphate·12H₂O									
Trisodium Phosphate Anhydrous									
Sodium Tridecyl Benzene Sulfonate [1]									
Sodium Tridecyl Benzene Sulfonate (beads) [2]	4	4	4	12	12	12			
GD Silicate, Powder [3]									
Aqueous Sodium Silicate [4]				6	6	6			
Carboxymethyl Cellulose							11	11	11
Triton X 114 [5]				2	2	2	1	1	1
Granular Sodium Dichlorocyanurate	40	40	40				10	10	10
Granular Potassium Dichlorocyanurate									
Ultramarine Blue									
Tablet Properties:	0.2	0.2	0.2						
Diameter (inches)	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾
Thickness (millimeters)	23	23	23	16	16	16	16.5	16.5	16.5
Weight (grams)	50	50	50	30	30	30	28	28	28
Crushing Strength (lbs.) [6]	49	31	25	49	28	19	20	15	10
Disintegration Time	[7] 32	[7] 36	[7] 66	[7] 73	[7] 78	[7] 146	[7] 66	[7] 86	[7] 164
Portion Undissolved									

TABLE II—Continued

Components	Hard Surface Cleaner Example		Chlorinated Industrial Cleaner Example	
	7	D*	8	E*
Dendritic Sodium Chloride	59.5	0	35	0
Sodium Sulfate	0	59.5	30	30
Sodium Tripolyphosphate Dense Granular, Phase II	12	12		
Sodium Tripolyphosphate Light Density	25	25	25.5	60.5
Trisodium Phosphate·12H_2O				
Trisodium Phosphate Anhydrous	3.5	3.5	5.5	5.5
Sodium Tridecyl Benzene Sulfonate [1]				
Sodium Tridecyl Benzene Sulfonate (beads) [2]				
GD Silicate, Powder [3]				
Aqueous Sodium Silicate [4]				
Carboxymethyl Cellulose				
Triton X 114 [5]			3.5	3.5
Granular Potassium Dichlorocyanurate				
Granular Sodium Dichlorocyanurate				
Ultramarine Blue				
Tablet Properties:				
Diameter (inches)	1¾	1¾	1¾	1¾
Thickness (millimeters)	16	16	15	15
Weight (grams)	36	36	30	30
Crushing Strength (lbs.) [6]	32	27	19	2
Disintegration Time	[8] Yes	[8] No	[7] 50	[7] 110
Portion Undissolved	Trace	([7] [8])		

* Comparative Examples.

See footnotes at end of Table III.

TABLE III.—TYPES OF SODIUM CHLORIDE

Example	Concentrations			
	9	10	11	F *
Kind of NaCl	Dendritic −30+200 mesh	Cubic Crystal 200 mesh	Cubic Crystal −40+100 mesh	None
COMPONENTS				
Sodium Chloride	5	5	5	
Sodium Tripolyphosphate Phase II, Dense Granular	60	60	60	60
Sodium Tridecyl Benzene Sulfonate [1]	12	12	12	12
GD Silicate Powder [3]	6	6	6	6
Carboxymethyl Cellulose	1.8	1.8	1.8	1.8
Optical Brightener	0.2	0.2	0.2	0.2
Sodium Sulfate	15	15	15	20
TABLET PROPERTIES				
Tablet Diameter (inches)	1¾	1¾	1¾	1¾
Thickness (millimeters)	16	16	16	16
Weight (grams)	30	30	30	30
Crushing Strength (lbs.) [6]	28	23	20	19
Disintegration Time [7]	78	93	90	146
Dissolution Time [9]	98	127	112	202

[1] 85% active, 15% sodium sulfate.
[2] 40% active, 60% sodium sulfate—spray dried beads.
[3] $Na_2O:SiO_2$=1:2—81.5% solids, balance water. Sold by Philadelphia Quartz Co., Philadelphia, Pa.
[4] $Na_2O_2SiO_2$=1:2.5. 37% solids, balance water.
[5] Isooctyl phenyl polyethoxy ethanol. 7 to 8 moles of ethylene oxide per mole of isooctyl phenol. Sold by Rohm and Haas, Philadelphia, Pa.
[6] Minimum pressure in pounds required to fracture the tablet. Pressure is applied to the tablet edges by parallel platens.
[7] Time in seconds required for the tablet to escape completely from a one-half inch wire mesh cage suspended in a fixed position in an agitator-type clothes washing machine, containing 120° F. agitated tap water.
[8] Tests whether the tablet disintegrates when 1 gallon of 110° F. tap water is run at full force into a 4-liter beaker in which the tablet is placed.
[9] Until no tablet particles remain visible.
* Comparative Example.

Table II presents in summary form, formulations for typical dry bleach, anionic and nonionic laundry detergent, hard surface cleaner and chlorinated industrial cleaner tablets, and properties of tablets prepared from these formulations.

Examples 1 and 2, and comparative Example A, demonstrate the improved strength and the reduced disintegration time in dry bleach tablets containing dendritic sodium chloride when compared with similar tablets in which the sodium chloride is replaced with the common filler sodium sulfate. The same advantages are shown to be provided by incorporation of dendritic sodium chloride in the other tablets presented in Table II. Additionally, Examples 7 and D show that in a tablet made from a typical hard surface cleaner formulation, incorporation of the dendritic sodium chloride made an otherwise practically insoluble tablet readily disintegrating and soluble.

Examples 9 through 11, and comparative Example F, show that sodium chlorides other than the dendritic are useful in improving cleansing tablet properties, but also demonstrate the clear advantage of the dendritic variety. These examples also compare dissolution times, showing the marked reduction in the time required for dissolution,

as well as for disintegration of tablets when they contain sodium chloride.

Pursuant to the requirements of the patent statutes, the principle of this invention has been explained and exemplified in a manner so that it can be readily practiced by those skilled in the art, such exemplification including what is considered to represent the best embodiment of the invention. However, it should be clearly understood that, within the scope of the appended claims, the invention may be practiced by those skilled in the art, and having the benefit of this disclosure otherwise than as specifically described and exemplified herein.

What is claimed is:

1. A cleansing tablet essentially containing 2 to 95% of particulate sodium chloride having a particle size of 10 to 325 mesh, and a water conditioning agent from the group consisting of 5 to 98% of a polyphosphate, 0.5 to 20% of a water-soluble detergent from the group consisting of anionic synthetic detergents and nonionic synthetic detergents and 0.5 to 98% of a chlorocyanuric compound, said tablet being characterized by being physically strong and capable of fast disintegration and dissolution in water.

2. A tablet in accordance with claim **1**, which contains 5 to 60% of particulate sodium chloride.

3. A tablet in accordance with claim **1** which contains as a water conditioning agent, sodium tripolyphosphate.

4. A dry bleach tablet essentially containing 2 to 95% of particulate sodium chloride having a particle size of 10 to 325 mesh and 0.5 to 88% of a chlorocyanuric compound, said tablet being characterized by being physically strong and capable of fast disintegration and dissolution in water.

5. A tablet in accordance with claim **4** in which the chlorocyanuric compound is sodium dichlorocyanurate.

6. A detergent tablet essentially containing 2 to 95% of particulate sodium chloride having a particle size of 10 to 325 mesh and 0.5 to 20% of a water-soluble detergent from the group consisting of anionic synthetic detergents and nonionic synthetic detergents, said tablet being characterized by being physically strong and capable of fast disintegration and dissolution in water.

7. A cleansing tablet essentially containing 5 to 30% of particulate sodium chloride having a particle size of 10 to 325 mesh, 20 to 50% of sodium tripolyphosphate, 10 to 50% of a chlorocyanuric compound, and 1 to 8% of a water-soluble detergent from the group consisting of anionic synthetic detergents and nonionic synthetic detergents, said tablet being characterized by being physically strong and capable of fast disintegration and dissolution in water.

8. A tablet in accordance with claim **7** in which the

chlorocyanuric compound is sodium dichlorocyanurate.

9. A tablet in accordance with claim **7** in which a water-soluble anionic synthetic detergent is present and is in bead form.

10. A cleansing tablet essentially containing 2 to 95% of dendritic sodium chloride having a particle size of 30 to 200 mesh, and a water conditioning agent from the group consisting of 5 to 98% of a polyphosphate, 0.5 to 20% of a water-soluble detergent from the group consisting of anionic synthetic detergents and nonionic synthetic detergents and 0.5 to 98% of a chlorocyanuric compound, said tablet being characterized by being physically strong and capable of fast disintegration and dissolution in water.

11. A tablet in accordance with claim **10** in which the dendritic sodium chloride is present in the amount of 5 to 60%.

12. A tablet in accordance with claim **10** which contains as a water conditioning agent, sodium tripolyphosphate.

13. A dry bleach tablet essentially containing 2 to 95% of dendritic sodium chloride having a particle size of 30 to 200 mesh and 0.5 to 98% of a chlorocyanuric compound, said tablet being characterized by being physically strong and capable of fast disintegration and dissolution in water.

14. A detergent tablet essentially containing 2 to 95% of dendritic sodium chloride having a particle size of 30 to 200 mesh and 0.5 to 20% of a water-soluble detergent from the group consisting of anionic synthetic detergents and nonionic synthetic detergents, said tablet being characterized by being physically strong and capable of fast disintegration and dissolution in water.

15. A cleansing tablet essentially containing 5 to 30% of dendritic sodium chloride having a particle size of 30 to 200 mesh, 20 to 50% of sodium tripolyphosphate, 10 to 50% of a chlorocyanuric compound, and 1 to 8% of a water-soluble detergent from the group consisting of anionic synthetic detergents and nonionic synthetic detergents, said tablet being characterized by being physically strong and capable of fast disintegration and dissolution in water.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,338,836 August 29, 1967

Ewald H. Krusius et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Columns 5 and 6, TABLE II, tenth column, line 3 thereof, strike out "K"; columns 7 and 8, TABLE II, third column, line 21 thereof, for "(^{7} ^{8})" read -- 7/8 -- same columns 7 and 8, TABLE III, footnote 4 thereof, for "Na_2O2SiO_2" read -- $Na_2O:SiO_2$ --; column 9, line 30, for "88%" read -- 98% --.

Signed and sealed this 7th day of January 1969.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer .

EDWARD J. BRENNER
Commissioner of Patents