(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
28 December 2000 (28.12.2000)

PCT

(10) International Publication Number
WO 00/78153 A1

(51) International Patent Classification[7]: A23B 7/157, A23L 3/358, 3/3472, A01N 59/04 // (A01N 59/04, 59:00)

(21) International Application Number: PCT/IB00/00805

(22) International Filing Date: 16 June 2000 (16.06.2000)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
BS99A000061 18 June 1999 (18.06.1999) IT
RS99R19 6 August 1999 (06.08.1999) IT

(71) Applicant and
(72) Inventor: **SHPETIM, Tare, Shyti** [AL/IT]; Via Rua Sovera, 11, I-25100 Brescia (IT).

(74) Agent: **LECCE, Giovanni**; Dott. Giovanni Lecce & C. S.r.l., Via Gaetano Negri, 10, I-20123 Milan (IT).

(81) Designated States *(national)*: AE, AL, AU, BA, BB, BG, BR, CA, CN, CU, CZ, EE, GD, GE, HR, HU, ID, IL, IN, IS, JP, KP, KR, LC, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, US, UZ, VN, YU, ZA.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 00/78153 A1

(54) Title: AQUEOUS DISINFECTING SOLUTION

(57) Abstract: A surface active disinfecting, microbicidal and hygienizing aqueous solution containing active oxygen and a bicarbonate of an alkaline metal is employed for washing fruits and vegetables.

AQUEOUS DISINFECTING SOLUTION

DESCRIPTION

The present invention relates to a surface active disinfecting, microbicidal and hygienizing aqueous solution.

More particularly, the present invention refers to a surface active disinfecting, microbicidal and hygienizing solution, especially useful for washing and disinfecting foodstuff.

The aqueous solution of the present invention is particularly useful for use in washing and disinfecting vegetables and fruits.

As is known, the peel of fruits and raw vegetables, while having a high contents of vitamins and mineral salts, contains on the surface many microbes, bacteria and other polluting substances originating from the fertilizers employed in the production, as well as from various birds, animals and insects, atmospheric agents, etc.

In order to eliminate said microbes, bacteria and polluting substances, fruits and vegetables are submitted to intense water-washing in the presence of chemical products that improve water effectiveness and cleaning and disinfecting

action. One such product is sodium bicarbonate which, however, while being useful for washing, has no disinfectant and/or bactericidal action.

The known art also adds to washing water a product called "amuchina", which has, however, the drawback of leaving residues harmful for the human body that are not easily removable.

On the industrial plane, chlorine or chorine releasing compounds are employed during washing for disinfecting fruits and vegetables. However, the use of such compounds requires an accurate and intense washing to eliminate any traces of chlorine that, besides having a foul smell, is toxic. For this reason, chlorine-based products for the domestic washing of fruits and vegetables or other foodstuff are not available.

Object of this invention is to obviate the above drawbacks.

More particularly, object of this invention is to provide an aqueous washing solution that, besides markedly reducing the bacterial load and the polluting substances from fruits and vegetables, does not leave any traces of substances that are noxious or toxic for the body nor impart undesired smells or tastes to the washed product.

A further object of the present invention is to provide an aqueous washing solution devoid of any contraindication, innocuous for the human body and such as to allow at the same time to maintain unaltered the natural organoleptic, nutritive and fragrance of washed fruits and vegetables.

A further object of the present invention is to provide an aqueous washing solution for fruits and vegetables that is of easy and simple use.

According to the present invention, these and still other objects are obtained by means of a surface active, disinfectant, microbicidal and hygienizing solution containing active oxygen and an alkaline metal bicarbonate.

Any compounds able to generate active oxygen in aqueous solution may be employed. By way of example, we recall ozone, ozonides, peroxides in general, and in particular hydrogen peroxide at any concentration, e.g., 1, 10, 20, 30, 50.90% by weight, chlorides and perchlorides of alkaline metals, calcium or magnesium, etc.

Alternatively, active oxygen may be obtained by electrolysis.

The concentration of active oxygen in the aqueous washing solution is not critical for the purposes of the present invention. It may range between 1 and 99% by weight.

Alkaline or calcium or magnesium chlorates are preferred for the production of active oxygen in the aqueous washing solution. The concentration of said chlorides may range between 1 and 99% by weight, preferably between 5 and 30% by weight, based on the weight of the solution.

Among the alkaline metal bicarbonates, sodium and potassium bicarbonates are preferred for economic reasons. The concentration of bicarbonate may range between 1 and 8%, preferably between 3 and 5% by weight based on the weight of the solution.

Besides the aforesaid compounds, the aqueous solution of the present invention may contain natural extracts of alimentary plants that reinforce the bactericidal action of the solution. Examples of natural extracts that can be used comprise extracts of almond, laurel, sage, basil, mint, pine, lemon, etc.

The concentration of the extract in the solution is not critical and may vary between 0.001 and 10% by weight.

The disinfecting, microbicidal and hygienizing aqueous solution of the present invention is used such as is, by spraying it on the surface of fruits and vegetables.

The treatment process of fruits and vegetables with the solution of the present invention comprises the following steps: application of such solution on the product to be treated, leaving the solution in touch with the product for a period of time comprised between 1 and 5 minutes, and afterwards water-washing the product. The so washed product may be eaten.

The application of the solution of the present invention on the product to be treated my be performed by spraying, atomization or sprinkling. Measurements carried out by the applicant on the rinsing waters of the product treated with the solution of the present invention have determined that the bacterial load is lower by at least 5 times the one allowed for fourth range foodstuff, and by 100 to 1000 times the one present in the washing waters of the same untreated product.

From what has been expounded hereinabove, the advantages achieved by washes with the solution of the present invention are evident.

Such solution, in fact, besides being very effective to remove and reduce bacteria, microbes and polluting substances

harmful for the body, is not toxic and does not contains chemical products harmful or noxious for health, has no smell besides the one left by the natural extract of alimentary plants (if any), does not leave any traces of tastes or smells, is biodegradable without leaving harmful residues, keep the natural fragrance of the product treated unaltered and, mainly, may be applied in a simple manner by spray.

Because of such properties, the solution of the present invention is particularly suitable for washing fruits and vegetables intended for the ill, especially those affected by SIDA.

A further advantage of the solution of the present invention lies in that it allows to markedly reduce the amount necessary to perform a full bath of the product. So, for instance, 300 ml of disinfecting solution of the present invention proved sufficient to clean and disinfect the amount of fruits and vegetables eaten by a person in two months.

The solution of the present invention has been described above with reference to fruit and vegetable washing; however, the same solution may be applied for a different use and in general for all the applications of sanitization or disinfection of products.

CLAIMS

1. A surface active disinfecting, microbicidal and hygienizing aqueous solution containing active oxygen and a bicarbonate of an alkaline metal.

2. The aqueous solution according to claim 1, characterized in that the active oxygen is obtained from a compounds selected from ozone, ozonide, peroxides, hydrogen peroxide, chlorates and perchlorates of alkaline, calcium or magnesium metals, or by electrolysis.

3. The aqueous solution according to claim 1 or 2, characterized in that the concentration of active oxygen is comprised between 1 and 99% by weight.

4. The aqueous solution according to any of the preceding claims, characterized in that the active oxygen is obtained from a chlorate of alkaline, calcium or magnesium metal.

5. The aqueous solution according to claim 4, characterized in that chlorite concentration ranges between 1 and 99% by weight and preferably between 5 and 30% by weight based on the weight of the solution.

6. The aqueous solution according to any of the preceding claims, characterized in that bicarbonate concentration

ranges between 1 and 8% and preferably between 3 and 5% by weight.

7. The aqueous solution according to any of the preceding claims, characterized in that it further comprises natural extracts of alimentary plants.

8. The aqueous solution according to claim 7, characterized in that the concentration of the natural extract of alimentary plants ranges between 0,001 and 10% by weight.

9. A method for washing fruits and vegetable, characterized in that it comprises the following steps: application on fruits and vegetables of a solution comprising active oxygen and a bicarbonate of an alkaline metal according to any of the preceding claims; leaving the solution in touch with the product for a period of time comprised between 1 and 5 minutes, and afterwards water-washing the product.

10. The method according to claim 9, wherein the solution is spray-applied.

11. Use of the aqueous solution comprising an active oxygen and a bicarbonate of an alkaline metal according to any of the preceding claims for washing fruits and vegetables.

INTERNATIONAL SEARCH REPORT

Inter nal Application No
PCT/IB 00/00805

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A23B7/157 A23L3/358 A23L3/3472 A01N59/04 //(A01N59/04, 59:00)

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 7 A23B A23L A01N

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ, FSTA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 94 06294 A (SOLVAY INTEROX LTD ;WRIGHT CHRISTOPHER THOMAS (GB); DAVIES SANDRA) 31 March 1994 (1994-03-31) the whole document ---	1-11
X	US 5 330 964 A (ALESI JR CARL A) 19 July 1994 (1994-07-19) column 1, line 54 - line 59 ---	1,2,4
X	WO 93 22920 A (CHURCH & DWIGHT CO INC) 25 November 1993 (1993-11-25) page 7, line 8 - line 12; claims ---	1-8
X	US 1 534 289 A (TEPPET) 21 April 1925 (1925-04-21) the whole document ---	1-8

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in 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 document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 September 2000	06/10/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Boddaert, P

1

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Interr ial Application No
PCT/IB 00/00805

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 03624 A (HUTTON HOWARD DAVID ;OFOSU ASANTE KOFI (US); PROCTER & GAMBLE (US)) 29 January 1998 (1998-01-29) abstract page 3, line 4 -page 10; claims; examples	1-3,6,7
A	US 5 858 435 A (GALLO JOHN B) 12 January 1999 (1999-01-12) abstract; claims	1-11
A	US 5 480 788 A (DEVIC MICHEL) 2 January 1996 (1996-01-02) column 2, line 29 - line 57 column 3, line 61 -column 4, line 24	1-11
A	WO 96 21360 A (INNOVEST AG) 18 July 1996 (1996-07-18)	
A	YOST K. ; SUMNER S.: "Reduction of foodborne pathogens on beef carcass tissue using sodium bicarbonate and hydrogen peroxide" JOURNAL OF FOOD PROTECTION, vol. 58, 1995, page 34 XP000946440	

1

INTERNATIONAL SEARCH REPORT

..ormation on patent family members

Inter ..al Application No
PCT/IB 00/00805

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9406294 A	31-03-1994	AU 680831 B	14-08-1997
		AU 4970993 A	12-04-1994
		BR 9307056 A	29-06-1999
		CA 2144340 A	31-03-1994
		EP 0660666 A	05-07-1995
		FI 951197 A	15-03-1995
		JP 8502047 T	05-03-1996
US 5330964 A	19-07-1994	NONE	
WO 9322920 A	25-11-1993	AU 3815893 A	13-12-1993
US 1534289 A	21-04-1925	NONE	
WO 9803624 A	29-01-1998	AU 3727197 A	10-02-1998
		EP 0923634 A	23-06-1999
		JP 2000500808 T	25-01-2000
US 5858435 A	12-01-1999	NONE	
US 5480788 A	02-01-1996	FR 2673814 A	18-09-1992
		AT 123383 T	15-06-1995
		CA 2063022 A,C	16-09-1992
		DE 69202791 D	13-07-1995
		DE 69202791 T	16-11-1995
		DK 504056 T	16-10-1995
		EP 0504056 A	16-09-1992
		ES 2073879 T	16-08-1995
		GR 3017274 T	30-11-1995
		HU 211760 B	28-12-1995
		IE 67821 B	01-05-1996
		JP 2042053 C	09-04-1996
		JP 6014744 A	25-01-1994
		JP 7063331 B	12-07-1995
		NO 302451 B	09-03-1998
		TR 26060 A	15-12-1994
WO 9621360 A	18-07-1996	NONE	