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(54) Title: CONCENTRATED SOLUTION OF QUATERNARY AMMONIUM COMPOUNDS AND METHODS OF USE

(57) Abstract: A concentrated quaternary ammonium compound (QAC) solution comprising a QAC with a concentration from greater than about 10% by weight and at least one solubility enhancing agent, such as an alcohol, is disclosed. A diluted QAC solution is used to contact food products to prevent microbial growth on the food products from a broad spectrum of foodborne microbial contamination. A method of contacting the food products with the dilute QAC for an application time of at least 0.1 second is disclosed. The foods that can be treated by this method are meat and meat products, seafood, vegetables, fruit, dairy products, pet foods and snacks, and any other food that can be treated and still retain its appearance and texture. One of the treatment methods is spraying and misting the QAC solutions on the food products for an application time of at least 0.1 second to prevent broad spectrum foodborne microbial contamination.

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 A01N43/40 A01N33/12 A23L3/3526 A23B4/30 //(A01N43/40, 31:02,25:30,25:02),(A01N33/12,31:02,25:30,25:02)											
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 7 A01N A23L A23B											
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) WPI Data, PAJ, EPO-Internal, CHEM ABS Data											
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category *</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td> WO 97 38586 A (UNIV ARKANSAS) 23 October 1997 (1997-10-23) page 1, line 6 - line 30 page 7, line 21 - line 28 page 8, line 1 - line 14 page 9, line 28 -page 11, line 8 page 28, line 20 -page 30, line 2 </td> <td> 1-13,21, 25-27, 31,34-43 </td> </tr> <tr> <td>Y</td> <td> & US 5 855 940 A 5 January 1999 (1999-01-05) cited in the application --- -/--- </td> <td> 14-20, 22-24, 28-30, 32,33 </td> </tr> </tbody> </table>			Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	WO 97 38586 A (UNIV ARKANSAS) 23 October 1997 (1997-10-23) page 1, line 6 - line 30 page 7, line 21 - line 28 page 8, line 1 - line 14 page 9, line 28 -page 11, line 8 page 28, line 20 -page 30, line 2	1-13,21, 25-27, 31,34-43	Y	& US 5 855 940 A 5 January 1999 (1999-01-05) cited in the application --- -/---	14-20, 22-24, 28-30, 32,33
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X	WO 97 38586 A (UNIV ARKANSAS) 23 October 1997 (1997-10-23) page 1, line 6 - line 30 page 7, line 21 - line 28 page 8, line 1 - line 14 page 9, line 28 -page 11, line 8 page 28, line 20 -page 30, line 2	1-13,21, 25-27, 31,34-43									
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.											
* Special categories of cited documents : <table border="0"> <tr> <td> *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 </td> <td> *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 </td> </tr> </table>			*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							
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 6 July 2001		Date of mailing of the international search report 23/07/2001									
Name and mailing address of the ISA 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		Authorized officer Lamers, W									

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International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
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