Patents Act 1977	Opinion Number	16/25

OPINION UNDER SECTION 74A

Patent	EP 3076787 B1
Proprietor(s)	Buckman Laboratories International, Inc
Exclusive Licensee	
Requester	Ingrassia, Fisher and Lorenz UK Ltd
Observer(s)	Buckman Laboratories International, Inc
Date Opinion issued	10 March 2026

The request

1. The comptroller has been requested by Ingrassia, Fisher and Lorenz UK Ltd ("the requester") to issue an opinion as to whether EP 3076787 B1 ("the patent") is invalid on the grounds of a lack of novelty and/or inventive step. The request was filed on 12 December 2025 and was accompanied by a statement explaining the request.

2. The following supporting evidence was supplied by the requester:

   D1: Avis de l'Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail, no. 2012-SA-0232

   D2: Avis de l'Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail, no. 2013-SA-0091

3. Proof of online publication dates of D1 and D2, which are 6 May 2013 and 31 October 2013 respectively, and English language translations of the documents were also provided.

4. Patent document publication no. US 2009/0173697 A1 titled "Method and apparatus for the production and delivery of monochloramine into water streams" was provided as supporting evidence.

Observations and observations in reply

5. Observations were received from Buckman Laboratories International ("the observer") on 28 January 2026. Observations in reply were received on 6 February 2026.

The patent

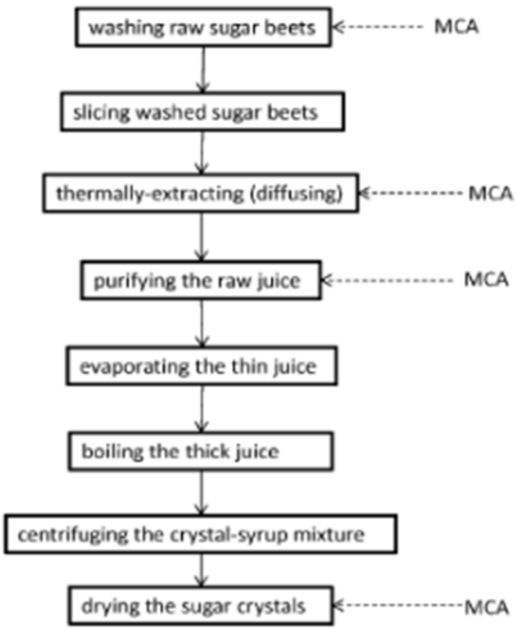
6. The patent was filed on 2 December 2014 and granted on 4 April 2018. It relates to methods for microbiological control during the production of sugar from sugar-containing plant materials.

7. The patent describes how sugar (sucralose) is obtained from vegetable raw materials, such as sugar beet and sugar cane, by mechanical disintegration of the raw material and extraction, or pressing out, of sugar-containing solutions. It is stated that sugar-containing plants are subject to microbiological decay through bacteria, yeasts and fungi within certain temperature ranges, pH values and concentration limits. Infestation by microorganisms during processing of sugar-containing plants can lead to degradation of sugars to acids and gases, resulting in the undesirable loss of sugar product.

8. The patent is particularly concerned with bacterial control in beet sugar processing. A method is proposed for using monochloramine as a low oxidative and potable water-approved technology to provide control of sugar loss due to bacterial sugar consumption, without adverse effects on the product.

9. Figure 2 (reproduced below) is a process flow chart showing stages in a beet sugar processing method and indicates stages in the process at which monochloramine (MCA) can be introduced.

FIG. 2



10. Claim 1 of the patent reads as follows:

> *A method for producing sugar from sugar-containing plant material with microbiological control, comprising treating a sugar-containing plant raw material, or a medium containing the plant raw material, with monochloramine, wherein the monochloramine is dosed in a system in which the method is performed at a dosage of from 1 g to 1000 g monochloramine*

per ton of sugar-containing plant raw material.

11. Claim 7 is a second independent claim, which reads as follows:

> *A method for processing beet sugar in sugar production with microbiological control, comprising treating beet sugar raw material or a medium containing the beet sugar raw material, with monochloramine, wherein the monochloramine is dosed in a system in which the method is performed at a dosage of from 1 g to 1000 g monochloramine per dry ton of beet sugar raw material.*

12. The patent also includes dependent claims 2 - 6 and 8 - 14, which read as follows:

> *2. The method of claim 1, wherein the sugar-containing plant raw material is sugar beet, sugar cane, maize, sorghum, sugar palm sap or juice, maple tree sap or juice, coconuts, nectarines, pineapples, mangoes, jackfruit, peaches, cantaloupe, apricots, bananas, grapes, apples, pears, cherries, oranges, or any combination thereof.*
>
> *3. The method of claim 1, wherein the monochloramine is added in an aqueous diluted form.*
>
> *4. The method of claim 1, wherein the monochloramine is added in an aqueous diluted form at a concentration of from 100 ppm to 15,000 ppm.*
>
> *5. The method of claim 1, wherein the monochloramine is sprayed in an aqueous form on the sugar-containing plant raw material.*
>
> *6. The method of claim 1, wherein the monochloramine is added in an aqueous form to process water that contacts or is brought into contact with the sugar-containing plant raw material or the medium containing the plant raw material.*
>
> *8. The method of claim 7, wherein the monochloramine is added in an aqueous diluted form.*
>
> *9. The method of claim 7, wherein the monochloramine is added in an aqueous diluted form at a concentration of from 100 ppm to 15,000 ppm.*
>
> *10. The method of claim 7, which comprises controlling microorganisms with the monochloramine, wherein the microorganisms are selected from Leuconostoc mesenteroides, Lactobacillus, and coccus species, or any combination thereof.*
>
> *11. The method of claim 7, which further comprises the steps of washing raw sugar beets, slicing the washed sugar beets, thermally extracting sugar-containing plant parts from the sliced sugar beets as raw juice, purifying the raw juice to produce thin juice, evaporating the thin juice to produce thick juice, boiling the thick juice to form a crystal-syrup mixture, centrifuging to separate the sugar crystals from syrup, and drying the sugar crystals, wherein the monochloramine is introduced in at least one of the steps.*

12. The method of claim 11, wherein the monochloramine is introduced in more than one of the steps.

13. The method of claim 7, wherein monochloramine treatment is performed on the beets before slicing, on diffuser pulp press water, on diffusion makeup water, at a sliced beet heat exchanger, at a depuration stage that is a purification stage, at a sugar dust catcher, in molasses by-product, on stillage that is vinasse, or any combination thereof.

14. The method of claim 7, wherein the monochloramine is prepared on-site where the method is performed by reacting ammonia or an ammonium salt with sodium hypochlorite.

Claim construction

13. Before considering novelty and inventive step, I need to construe the claims of the patent - that is to say, I must interpret them in the light of the description and drawings as instructed by Section 125(1) of the Patents Act 1977 ("the Act"):

> *For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.*

14. I consider that the claims are clear and do not present any difficulties of construction.

Prior art

15. D1 and D2 were issued by the French National Agency for Food, Environmental and Occupational Health and Safety in response to an application for authorisation to test monochloramine as a processing aid in sugar refineries for the decontamination of beet juices. D1 states that an aim of the processing aid is to reduce sugar losses due to microbiological contamination. It is apparent from the contents of D1 that it was issued in response to an initial application for authorisation. D1 raises a number of questions to be answered by the applicant to enable the required health risk assessment to be completed, before the agency can decide whether or not to allow industrial trials and the subsequent sale of resulting products. D2 was issued following receipt of the requested additional information and confirms authorisation of the proposed trials. D2 also specifies conditions that must be met during the trials.

16. D2 lists five separate stages in a sugar manufacturing process at which the processing aid (monochloramine) could be added, as indicated by the applicant. Trials will be performed in which the processing aid is added to the water used as spray on the raw plant material, during the diffusion phase (hot water extraction of juice), to press water, to the sludge tanks of the sewage treatment, and to the waters used for dust collection. D2 states that the doses tested could be between 30 and

1000 g/tonne of beets.

17. It is clear to me that D1 and D2 together provide disclosure of the contents of the application for authorisation to perform the proposed tests. As such, I consider that, as the original application for authorisation has not been provided by the requester (most probably due to not being publicly available), the combined contents of D1 and D2 (hereinafter referred to as D1/D2) can be treated as a single disclosure of the proposed tests.

18. It is, at this point, useful to consider the nature of documents D1 and D2. The requester points out in their observations in reply that, as a formal authorisation from a national safety authority, D2 serves as "*prima facie evidence of a reasonable expectation of success*". They further point out that "*the skilled person understands that [the authority] require[s] preliminary proof of efficacy - typically laboratory data - before granting approval*". I agree with this assertion and consider that D1/D2 is evidence that the process has already been developed and tested on a small scale. As such, D1/D2 forms an appropriate prior art disclosure for consideration of the novelty and inventiveness of the patent.

The law - novelty

19. Section 1(1) of the Act reads:

> *A patent may be granted only for an invention in respect of the following conditions are satisfied, that is to say –*
> *(a) the invention is new;*

20. Sections 2(1) and 2(2) of the Act read:

> *2(1) An invention shall be taken to be new if it does not form part of the state of the art.*
>
> *2(2) The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the priority date of that invention been made available to the public (whether in the United Kingdom or elsewhere) by written or oral description, by use or in any other way.*

Whether claims 1 and 7 are novel in light of D1/D2

21. The requester considers that D2 directly anticipates claim 1, as the document "*explicitly discloses the claimed method for producing sugar from sugar-containing plant material (beets) with microbiological control, by treating the raw material or a medium containing it with monochloramine at a dosage range of 30 to 1000 g/tonne*".

22. Claim 1 requires that the applied dosage of monochloramine is 1 g to 1000 g per ton (imperial) of sugar-containing raw plant material. A dosage of 30 - 1000 g per tonne (metric) is equivalent to approximately 29.5 - 984.2 g per ton. The range disclosed in D2 therefore falls within the required range of claim 1 of the patent. I consider that

D1/D2 anticipates claim 1.

23. Claim 7 is narrower in scope than claim 1, due to further specifying that the plant raw material is beet sugar raw material and that the dosage of monochloramine is per dry ton of raw material. Although D2 does not explicitly disclose that the raw beet material for treatment should be weighed as a dry product, I consider that the skilled person would interpret the disclosure as requiring this. I agree with the requester's assertion that claim 7 is anticipated by D1/D2.

Whether the dependent claims are novel in light of D1/D2

24. The sugar-containing plant raw material of D2 is sugar beet. Claim 2 is anticipated by D1/D2.

25. The requester refers to the statement in D2 that monochloramine will be produced in-situ and dosed directly into the applications, as "*indicating an aqueous diluted form given the nature of monochloramine production from aqueous precursors*". I note that D1 teaches that the monochloramine "*is expected to be produced in situ from a source of ammonium (ammonium sulphate/ammonium hydroxide) and sodium hypochlorite (bleach, bleach extract, sodium hypochlorite)*". The production of monochloramine from ammonium sulphate or ammonium hydroxide and bleach would result in an aqueous solution. Furthermore, D2 teaches treatment of the water used as spray on the raw materials with monochloramine and the addition of monochloramine to press water. I agree with the requester's assertion that claims 3 and 8 are not novel.

26. The requester considers that, as the monochloramine is being generated on-site, it would be applied at a dilution corresponding with the 'standard working range' of on-site monochloramine generators. They refer to patent publication no. US 2009/0173697 A1 as providing evidence of a typical concentration for on-site production of monochloramine, where it is stated that a "*day tank of up to 3,000 PPM of monochloramine could be safely produced with non-regulated components and reliably fed to a process water stream*". The requester considers that claims 4 and 9 are "*impliedly disclosed in D1/D2 by virtue of D2 providing on-site production of [monochloramine]*", which they consider would be provided at this typical concentration. The observer points out that a single patent document cannot be taken as evidence of common general knowledge.

27. In response, the requester provided a further three prior art patent documents (US 7651622 B2, US 5976386 A and WO 2008/091678 A1) in support of their argument. They assert that, together with document US 2009/0173697 A1, these documents provide evidence that monochloramine feedstock concentrations of 100 to 15,000 ppm were the standard operational parameters for on-site monochloramine generators before the priority date of the patent. They further point out that "*the apparatus disclosed in US 5,976,386 is consistent with the on-site production apparatus described in paragraph [0025] of EP 3 076 787 B1 because both systems employ precise, synchronous metering of diluted reactants to safely generate stable monochloramine on-site*."

28. The observer asserts that "*even if, for the sake of argument, D2 is considered to*

implicitly disclose a concentration range for on-site production of [monochloramine], this would not amount to a disclosure of a concentration range for addition in a method for producing sugar as claimed in EP(UK)3076787". In response, the requester points to the statement in D2 that the monochloramine is "*produced in situ and dosed directly…[with] no storage*", as confirming that the monochloramine flows unchanged from the generator to the application point.

29. I do not agree that there is a 'standard working range' for on-site monochloramine generation, nor do I agree that direct dosage without storage precludes the possibility of the monochloramine being diluted before application to the sugar beet material. I consider that claims 4 and 9 are novel in view of document D1/D2.

30. The requester notes that D2 discloses treatment with monochloramine of the water used as spray on the raw materials. It is my view that D1/D2 anticipates claims 5 and 6.

31. The requester considers that the teaching of D1/D2 "*inherently implies controlling common sugar-consuming microorganisms found in beet sugar processing, which would include Leuconostoc mesenteroides, Lactobacillus, and coccus species, as these are well-known contaminants in this industry (as acknowledged by the patent itself, citing common bacterial action)*".

32. In response, the observer points out that D2 does not actually disclose the specific microorganisms listed in claim 10 "*nor indeed any actual control of any microorganisms*". I disagree with this second point and consider that the statement in D1 that the objective of the treatment is "*to reduce losses due to microbiological contamination*" does amount to disclosure of the control of microorganisms.

33. In their observations in reply, the requester further states that either the microorganisms listed in claim 10 are inherent to beet sugar production, and so are controlled by the method of claim 7, or if the microorganisms are not inherent, "*the subject matter of claim 10 of [the patent] is insufficiently disclosed*", as the patent "*fails to specify the conditions under which the method of claim 10 would apply*".

34. It is my view that the method of claim 7 would result in the presence of the types of bacteria referred to in the patent as 'classic aerobic bacteria', namely Leuconostoc mesenteroides, Lactobacillus and/or coccus species, and that these bacteria will be controlled by the monochloramine. I consider that claim 10 is anticipated by D1/D2.

35. The requester states that D2 explicitly details multiple injection points for monochloramine within the sugar manufacturing process, including the washing stage, thermal extraction, post-extraction/pre-purification, purifying stage and drying stage. They consider that, as the sugar production process steps of claim 11 are standard in the art, D2 clearly discloses the introduction of monochloramine in at least one, or multiple, of these processing steps.

36. The method of claim 11, however, requires that all the listed processing steps, i.e. washing raw sugar beets, slicing the washed sugar beets, thermally extracting sugar-containing plant parts from the sliced sugar beets as raw juice, purifying the raw juice to produce thin juice, evaporating the thin juice to produce thick juice, boiling the thick juice to form a crystal-syrup mixture, centrifuging to separate the

sugar crystals from syrup, and drying the sugar crystals, are performed. I do not consider that D1/D2 discloses all these steps, either explicitly or implicitly. It is my view that claim 11 is novel. It follows that claim 12 is also novel by virtue of dependency.

37. The requester points out that D2 discloses injection of the monochloramine at most of the process steps listed in claim 13, including before slicing, at diffuser related stages, in the diffuser pulp press water, at a depuration/purification stage, and in a sugar dust catcher. I agree that D1/D2 discloses monochloramine treatment at one or more of the process stages listed in claim 13 and so consider that the claim lacks novelty.

38. D2 discloses production of the monochloramine in situ. The requester asserts that the "*production of monochloramine from ammonia/ammonium salts and hypochlorite is a standard, well-known chemical reaction*" and so "*in-situ production, combined with common knowledge of monochloramine synthesis, renders this claim lacking in novelty*". The observer does not agree, stating that, as other methods for generating monochloramine are known, "*a mere reference to in situ generation is not synonymous with a reference to reaction of ammonia or an ammonium salt with sodium hypochlorite*". However, as pointed out by the requester in their observations in reply, D1 does disclose preparing the monochloramine by reacting an ammonium salt with sodium hypochlorite. It is my view that claim 14 lacks novelty.

The law - inventive step

39. Section 1(1)(b) of the Act reads:

> *1(1) A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say –*
> *…*
> *(b) it involves an inventive step;*

40. The provisions in relation to inventive step are found in section 3 which states:

> *3. An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding section 2(3) above).*

41. The Court of Appeal in *Windsurfing*[1] formulated a four-step approach for assessing whether an invention is obvious to a person skilled in the art. This approach was restated and elaborated upon by the Court of Appeal in *Pozzoli*[2]. Here, Jacob LJ reformulated the Windsurfing approach as follows:

> *(1)(a) Identify the notional "person skilled in the art" ;*
> *(1)(b) Identify the relevant common general knowledge of that person;*
> *(2) Identify the inventive concept of the claim in question or if that cannot*

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[1] *Windsurfing International Inc. v Tabur Marine (Great Britain) Ltd*, [1985] RPC 59
[2] *Pozzoli SPA v BDMO SA* [2007] EWCA Civ 588

readily be done, construe it;
(3) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed;
(4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

Whether claims 4, 9, 11 and 12 are inventive in light of document D1/D2

42. Having determined that I consider claims 1 - 3, 5 - 8, 10, 13 and 14 to be anticipated by D1/D2, it is not necessary for me to consider the inventiveness of these claims. I will consider the inventiveness of claims 4, 9, 11 and 12.

<u>Identify the person skilled in the art</u>

43. Neither the requester nor the observer have provided a view on the identification of the person skilled in the art.

44. I consider the skilled person to be an individual or a team working in the field of microbiological control in food production/processing and also in the field of sugar production from sugar-containing plant materials.

<u>Identify the relevant common general knowledge of that person</u>

45. The skilled person or persons would be familiar with standard methods of sugar production and also standard methods of microbiological control applicable to sugar production processes.

Claims 4 and 9

<u>Identify the inventive concept of the claim</u>

46. I consider the inventive concept of claims 4 and 9 to be the selection of from between 100 ppm and 15,000 ppm as the amount of monochloramine in the aqueous solution for application to the sugar-containing plant raw material for microbiological control during sugar production.

<u>Identify what differences exist between the prior art and the inventive concept of the claim and whether those differences constitute steps which would have been obvious to the person skilled in the art</u>

47. When considering the novelty of claims 4 and 9, I already noted that the four patent documents referred to by the requester do not, in my view, form evidence of a 'standard' concentration for the production of monochloramine applicable to the method of D1/D2. The observer considers that the requester has not supplied any evidence that the concentration range of the monochloramine solution required by claims 4 and 9 would inevitably result from routine implementation by the skilled person. I am in agreement and consider that the skilled person would not consider it

to be obvious to use a monochloramine solution having a concentration of between 100 ppm and 15,000 ppm when implementing the method of D1/D2. It is my opinion that claims 4 and 9 are inventive.

Claims 11 and 12

Identify the inventive concept of the claim

48. I consider the inventive concept of claims 11 and 12 to be the production of sugar from sugar-containing plant material using a process that comprises all the steps of claim 11, wherein the process includes the introduction of monochloramine for microbiological control at one at least (claim 11) or more than one (claim 12) of the steps.

Identify what differences exist between the prior art and the inventive concept of the claim and whether those differences constitute steps which would have been obvious to the person skilled in the art

49. D1/D2 identifies specific points in a sugar-production process for the addition of monochloramine but does not recite all the steps required in the entire process. The skilled person would understand that the teaching D1/D2 intends for a standard sugar-production process to be performed in its entirety. It is my view that the processing steps listed in claim 11 are all standard processing steps for the production of sugar from sugar-containing plant material that the skilled person would consider including when performing the method of document D1/D2. It is my view that claims 11 and 12 lack an inventive step.

Further consideration of claim 14

50. The observer considers that part of claim 14 is inventive, pointing out that D1 states that "*monochloramine is expected to be produced in situ from a source of ammonium (ammonium sulphate/ammonium hydroxide) and sodium hypochlorite (bleach, bleach extract, sodium hypochlorite)*". They state that there "*is no disclosure in D1 of production by reacting ammonia with sodium hypochlorite, as referred to in claim 14 of [the patent]*". They consider that the option in claim 14 of preparing monochloramine on-site by reacting ammonia with sodium hypochlorite is novel and inventive over D1/D2. In response, the observer points out that ammonium hydroxide is hydrated ammonia. They consider that "*in an aqueous reaction environment (i.e., the reaction environment used to produce [monochloramine]) there would be no distinction*". I agree with the observer and consider that claim 14 does not include any novel or inventive subject matter.

Opinion

51. It is my opinion that claims 1 - 3, 5 - 8, 10, 13 and 14 lack novelty in view of the teaching of D1/D2, and that claims 11 and 12 lack an inventive step.

52. It is also my opinion, based on the argument and evidence provided in the request, that claims 4 and 9 are novel and inventive over the teaching of D1/D2.

Application for review

53. Under section 74B and rule 98, the proprietor may, within three months of the date of issue of this opinion, apply to the comptroller for a review of the opinion.

Karen Payne
Examiner

NOTE

This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.