COMMISSIONER'S DECISION

OBVIOUSNESS: Yeast Production

A process to produce a particular yeast by cultivation on a nutrient medium in the absence of added growth factors was held unpatentable over prior art.

FINAL ACTION: Affirmed

This decision deals with a request for review by the Commissioner of Patents of the Examiner's Final Action dated November 8, 1973, on application 056,232 (Class 195-54). The application was filed on July 4, 1969, in the name of Jozef T. DeLey et al, and is entitled "Process For Growing The Yeast,Candida Guilliermondii, On Petroleum Hydrocarbons." The Patent Appeal Board conducted a Hearing on May 7, 1975, at which Mr. R. Fuller represented the applicant.

The present claims relate to the production of a particular yeast, Candida guilliermondii, by cultivation on a hydrocarbon-containing nutrient medium in the absence of added growth factors. The recovered yeast is useful as a food supplement.

In the Final Action the examiner refused claims 1 to 10 on the grounds that they fail to show invention over the following references:

Chemical Abstracts Volume 66	113256u 1967	
Canadian Patents 670,301 788,976	 Sept. 10, 1963 July 2, 1968	 Cl. 195-35 Cl. 195-64.1
United States Patent 3,268,419	 Aug. 23, 1966	 Cl. 195-82

In that action the examiner stated (in part):

> The Chemical Abstracts reference discloses the cultivation of Candida guilliermondii on an aqueous medium containing hydrocarbons, a nitrogen source and inorganic salts to yield a cell product comprising 50% protein. The cited patents in turn show that such a medium can be used for the aerobic cultivation not only of Candida yeasts but also of other yeast genera and hydrocarbon-assimilating bacteria within the pH and temperature limits claimed by the applicant. Moreover the form of paraffinic hydrocarbon can vary over a wide range to include kerosines, gas oils, middle distillate fractions and wax.
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> Although his original claims did not specify this feature, applicant now contends, in his letter of March 27, 1973, that the proviso relating to the absence of added growth factors in the present claims is neither taught nor suggested in the cited reference and that on this account these claims are patentable. However it is stated in the disclosure of each of the applied patents that: "the growth of the yeasts (or microorganism) used is favoured by the addition to the culture medium of a very small proportion of extract of yeast or more generally of vitamins of group B and/or biotin". The implication of this statement is not that the presence of growth factors is an absolutely vital requirement but that these substances may improve the rate of growth of the microorganism according to the conditions chosen. It is therefore clear that the exclusion of the said growth factors does not in itself represent a patentable improvement over the prior art nor, as shown above, are the claims patentably distinguishable in other respects from the teachings of the cited references.

In the response dated Feb. 7, 1974, to the Final Action the applicant stated (in part):

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> Applicants wish to point out that in rejecting claims 1 to 10 the Examiner appears to be relying on a combination of two or more references. It is believed that such a combination of references is only permissible under Canadian practice under very special circumstances when an obviousness rejection is being made. Thus when making such an obviousness rejection the references can only be combined if they relate to the same problem and it can be said that at least one of them represents what is common general knowledge in the art. It is not considered that these requirements are met in the present case. The Examiner also alleges that the method for culturing Candida guilliermondii on paraffinic hydrocarbons and an aqueous nutrient medium in the absence of added growth factor does not represent a patentable improvement over the prior art. Applicants do not agree with such a statement as they have previously argued....
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> ...
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> Although the three Champagnat et al patents are directed to the metabolism of yeast on a petroleum substrate and provide more detailed teachings than in the Chemical Abstracts citation, none of these three patents are directed to the growth of Candida

guilliermondii on paraffinic hydrocarbons as is the process being claimed herein. These patents are directed principally to Candida lipolytica although other species of Candida yeasts and other hydrocarbon-utilizing microorganisms are disclosed. However the species of Candida being claimed herein is nowhere disclosed nor demonstrated in the three patents.

Not all species of Candida yeasts will grow on hydrocarbons as is clearly shown in the Klug et al reference cited in the U.S. prosecution of this application. Klug et al, a copy of which is attached hereto, presents the growth response of over 30 species of Candida and demonstrates that many of these species are incapable of assimilating paraffinic hydrocarbons. Further, the present application demonstrates in Example I (pages 6-8) that only 6 of 26 Candida species grew well on a petroleum substrate.

Since Klug et al and applicant's application show that not all Candida species have the ability to metabolize paraffinic hydrocarbons and the Champagnat et al patents are directed to Candida species other than C. guilliermondii, one skilled in the art could not predict the applicability of the Champagnat et al disclosures to C. guilliermondii short of actual laboratory testing. The predicability of applicant's process from these references is uncertain.

Further, the Champagnat et al references are deficient for another reason. In the process being claimed herein, a utilizable source of carbon, a utilizable source of nitrogen (usually ammoniacal nitrogen) and certain inorganic salts are disclosed as being necessary to promote the growth of Candida guilliermondii. Although the Champagnat et al patents disclose the necessity for a source of carbon and inorganic nutrition sources, there is no disclosure that a utilizable source of nitrogen is necessary. While the nutrient medium employed by Champagnat et al in the examples of these patents did in fact contain nitrogen-containing salts, Champagnat et al failed to recognize that this nitrogen source was essential since none of the claims of these patents are directed to this feature. Applicant's claims require a source of nitrogen in the nutrient medium.

The text of the chemical abstract reads:

Isolation and growth characteristics of C. guilliermondii on aliphatic hydrocarbons was investigated. The yeast was cultivated on the following medium: Nepasin (A kerosine fraction) 10 ml, NH_4Cl 2, KH_2PO_4 4.5, $MgSO_4$ 0.2 and NaCl 0.2 g in 1 l. H_2O. Two hundred ml of this medium in a 500 ml flask was inoculated and incubated in shaken culture at 30°: A dry yeast product (0.7g) contg. about 50% protein was obtained in 5 hrs. The optimal concn. a no. of sat. and unsatd. paraffins was studied including C_{12} to C_{22}. The respiratory coeff. and the riboflavine content of the product are given.

The Champagnat patents show the need to provide a supply of oxygen for the growth of Candida yeasts and other micro-organisms on hydra carbons, and to control the pH of the medium to between 3 to 6.

The application is concerned with the cultivation of a yeast, Candida Guilliermondii. Claim 1 reads:

> A process for the production of yeast which comprises aerobically culturing Candida guilliermondii on an aqueous nutrient medium containing a nitrogen source and inorganic nutrition sources in the presence of a feedstock containing a mixture of paraffinic petroleum hydrocarbons as a carbon source and in the absence of added growth factors wherein the pH is controlled between about four and six and the temperature is maintained between 15 and 30°C and recovering the yeast produced.

The question which the Board must consider is whether the applicant had made a patentable advance in the art.

It is noted that the detailed procedure for cultivating edible micro-organisms on hydrocarbons, with regard to other nutrients such as nitrogen sources, mineral salts, trace elements and pH and temperature conditions, is set forth in the cited patents. These are applicable not only to Candida and other yeasts but also to hydrocarbon - assimilating moulds and bacteria and are essentially the same as in the applicant's process. It is also clear from the above mentioned patents that Candida species require oxygen in order to metabolize hydrocarbons. We do not believe that there is anything unexpected in the finding the C. guilliermondii shows a similar oxygen requirement.

It is observed that the absence of added growth factors, a feature which the applicant now alleges is inventive, was not specified in the claims prior to his amendment of March 27, 1973. It is stated in the disclosure of each of the applied patents that: "...the growth of the yeasts (or microorganism) used is favoured by the addition to the culture medium of a very small proportion of extract of yeast or more generally of vitamins of group B and/or biotin." Surely the implication of this statement is not that the presence of growth factors is an absolutely vital requirement, but that these substances may improve the rate growth of the microorganism according to the conditions chosen.

The Chemical Abstracts reference specifically discloses a nutrient medium containing an ammonium salt. The cited patents similarly reveal the need for a nitrogen source and since the microorganism obviously requires nitrogen in order to synthesize protein, it is self-evident that this element must be supplied in the medium together with other conventional nutrients. In our view, the process which the applicant is claiming amounts to nothing more than the use of the conventional procedure for cultivating hydrocarbon - assimilating microorganisms in general for the production of a particular yeast which is known to possess this same ability to utilize hydrocarbons. Apart from the fact that the Chemical Abstracts reference makes no mention of the addition of growth factors, it is clear that, in the processes of the cited patents, the provision of these substances is optional rather than mandatory and their exclusion does not therefore represent a patentable advance in the art.

The applicant argues that his aerobically culturing is important. The chemical abstract is basically performing the same step "...inoculated and incubated in shaken culture at 30°...."

Upon reviewing all the evidence presented to us, we have concluded that the most that has been done by the applicant is mere verification. We cannot see that there has been any exercise of the inventive faculty. It is settled law that minor experimentation does not amount to invention. On this point we refer to British Thomson-Houston v. Charlesworth (1925) 42 R.P.C. 180, Sharp & Dohme v. Boots Pure Drug (1927) 44 R.P.C. 367 at 402 and (1928) 45 RPC 153 at 172 & ff, and quote from 44 RPC 402:

> If it be that, having regard to what the world knows in the art, the making of the body, if it be a body in a patent, is a matter of routine, is a matter which the ordinary tools of the chemist will enable him to obtain, or is a matter which will be obtained in fact, if you follow the anticipatory directions contained in the document, then there may be no subject-matter

in the patent, although the contents of it do not appear in the way of anticipation.

We recommend that the Application be refused.

J.F. Hughes,
Assistant Chairman,
Patent Appeal Board.

I concur with the findings of the Patent Appeal Board and refuse to grant a patent. The applicant has six months within which to appeal this decision under the provision of Section 44 of the Patent Act.

Decision accordingly,

A.M. Laidlaw,
Commissioner of Patents.

Dated at Hull, Quebec
this 24th.day of July,
1975.

Agent for Applicant

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