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D E C I S I O N
of 11 April 2002

Case Number: T 0942/00 - 3.2.1

Application Number: 89306067.3

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Language of the proceedings: EN

Title of invention:
Packaging for liquids

Patentee:
RHONE-POULENC AGRICULTURE LIMITED

Opponent:
Bayer AG

Headword:
-

Relevant legal provisions:
EPC Art. 56, 84

Keyword:
"Lack of clarity"
"Inventive step (no)"

Decisions cited:
-

Catchword:
-



Case Number: T 0942/00 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 11 April 2002

Appellant: RHONE-POULENC AGRICULTURE LIMITED
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Respondent: Bayer AG
(Opponent) Konzernbereich RP
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Representative: -

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 3 July 2000
revoking European patent No. 0 347 220 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: F. Gumbel
Members: S. Crane
G. Weiss

Summary of Facts and Submissions

I. European patent No. 0 347 220 was granted on 13 November 1996 on the basis of European patent application No 89 306 067.3.

II. The patent was opposed by the present respondents on the grounds that its subject-matter lacked novelty and/or inventive step (Article 100(a) EPC).

Of the prior art documents relied upon only the following have played any significant role on appeal:

(E1): GB-A-922 317

(E5): Kreinhöfer/Reip: "Polyvinylalkohol - eine neue wasserlösliche Verpackungsfolie" from "Fette-Seifen-Antstrichmittel", NR. 9/1961 (63 Jahrgang), pages 855 to 862.

III. With its decision posted on 3 July 2000 the Opposition Division revoked the patent on the ground that the subject-matter of independent claims 1 and 35 according to both requests then on file lacked novelty with respect to document E1.

IV. A notice of appeal against that decision was filed on 12 September 2000 and the fee for appeal paid at the same time. The statement of grounds of appeal was received on 13 November 2000, with new claims according to main and auxiliary requests.

V. The respondents filed a counterstatement on 11 May 2001 in which they requested dismissal of the appeal.

They argued that the subject-matter of claims 1 and 35 according to the main request filed with the statement of grounds lacked novelty with respect to both documents E1 and E5 and the subject-matter of claims 1 and 35 according to the auxiliary request lacked inventive step offended against Article 123(2) EPC and lacked inventive step with respect to the same prior art.

VI. With a letter dated and received on 3 April 2002 the appellants (proprietors of the patent) submitted sets of claims according to new main and (first) auxiliary requests.

Claims 1 and 35 of the main request read as follows:

"1. A package containing a liquid (5) comprising a phytosanitary chemical which package comprises an envelope (3) which comprises a water soluble material (4) and which envelope (3) has a thickness from 10 to 100 micrometres and comprises a flexible wall which is water soluble or water dispersible characterised in that the envelope (3) is sealed solely by means of one or more water soluble heat seals obtained by heat sealing the envelope material with a dwell time from 200 msec to 1.5 sec.

"35. A process for the preparation of a package which comprises an envelop (3) which comprises a water soluble material (4) and which envelope (3) has a thickness from 10 to 100 micrometres and comprises a flexible wall which is water soluble which package contain a liquid (5) comprising a phytosanitary chemical characterised in that the

process comprises heat sealing the envelope material (4) with a dwell time from 200 msec to 1.5 sec to obtain one or more water soluble heat seals which provide the sole means of sealing the package."

In claims 1 and 35 of the (first) auxiliary request it has been added that the heat sealing is performed with "a sealing pressure from 1 to 3.5 kg/cm²."

VII. Oral proceedings before the Board were held on 11 April 2002. The respondents were not present, having already indicated the intention not to attend with letter of 12 March 2002. In accordance with Rule 71(2) EPC the oral proceedings were continued without them.

At the oral proceedings the appellants added second and third auxiliary requests. Claim 1 (the only independent claim) according to the second auxiliary request corresponds to claim 35 of the main request and claim 1 of the third auxiliary request to claim 35 of the first auxiliary request.

With respect to the respective claim 1 of the main and first auxiliary requests the appellants argued that it would be an objectively determinable fact whether or not the heat seal of a liquid containing package had been formed under the conditions stated in these claims, so that there could be no objection to them under Article 84 EPC.

On the substance of the claimed subject-matter the appellants pointed in particular to the age of documents E1 and E5 and asserted that although the potential benefits of a package the envelope of which

dissolved in water to release its contents had been long known, the problems associated with non-soluble heat seals in the envelope had not been overcome until the present invention had been made. The invention had thus been responsible for releasing into practice the full potential of the concept taught in general terms in documents E1 and E5. Neither of these documents contained instructions to perform the heat sealing in the manner stated, in order to achieve a seal which was fully water soluble. Indeed, the information contained in document E1 in this respect was so sparse that it did not in any case constitute an enabling disclosure whereas document E5 specifically taught away from operating in the ranges of envelope thickness and heat sealing conditions now specified in the claims.

Reasons for the Decision

1. The appeal complies with the formal requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC. It is therefore admissible.

2. As set out in the introductory description of the patent specification there are a number of advantages associated with packaging a potentially harmful material, which for end use is to be dissolved in water, in an envelope which is resistant to the material but itself soluble in water. The end user can thus easily avoid any direct contact with the material involved.

As relevant state of the art the patent specification refers *inter alia* to document E1. This teaches the packaging of for example insecticides and fungicides in

liquid form in a container comprising polyvinyl alcohol (PVA). In column 2, lines 4 to 15, it is indicated that the thickness of the container material should be sufficient to give the required strength without taking an inconveniently long time to dissolve in water, for example between 0.04 and 0.1 mm (ie between 40 and 100 micrometres). The container preferably takes the form of a bag or sachet which is sealed after filling, for example by heat sealing or high frequency welding.

Document E1 was published in 1963, although the patent application from which it stems was filed considerably earlier. In between the two lies the publication date of document E5. This article, entitled (in English translation) "Polyvinylalcohol - a new water soluble packing foil" contains a general discussion of the production, properties and treatment of PVA foil, together with some more specific examples of using the foil to form packages having a water soluble envelope. In the introductory part the advantages associated with such packages are set out, in similar terms to those found in the present patent specification. Examples of materials which can be packaged include agricultural chemicals, insecticides and pesticides. On pages 857, right-hand column, second paragraph, it is indicated that exposure to temperature above 120°C for longer periods can lead to reduced water solubility of PVA. This solubility is further addressed in the paragraph bridging the left and right-hand columns of page 859. Here it is stated that the good solubility of both the foil and its welded seams in cold water is a prerequisite for the production of the envisaged packages. An example is given showing the temperature dependence of the time required for the disintegration and complete entry into solution of a 0.05 mm thick

foil. It is stated that heat-welded seams did not require a longer time to disintegrate and dissolve.

Under the sub-heading "welding" in the right-hand column of pages 859 there is a statement that thin PVA foils of thickness between 0.03 and 0.1 mm are welded exclusively by the "heat impulse" method. Thicker PVA foils over 0.1 mm in thickness can be welded by the "heat contact" method, as reference values for this method there are given 160°C for 2 seconds at a pressure of 3-5 kg/cm² for a 0.1 mm thick foil. It is stated that with the "heat impulse" method it is possible to form welded seams having a tear strength of 60 to 80% of that of the foil involved. When continuously forming a longitudinal welded seam the incremental advance of the foil should correspond to the length of the electrodes so as to avoid overlaps and unnecessary exposure of heat. It is indicated here that it is in any case preferred to form longitudinal seams by means of adhesive action, ie using water to make the foil tacky.

On pages 860 and 861 of document E5 there is a discussion of the methods that can be used to produce and fill bags made from PVA. The formation of both longitudinal and transverse seams by "heat impulse" welding on conventional machinery is specifically mentioned under the sub-heading "Automatic bag production, filling and closing", although it is again indicated here that adhesive joining of the longitudinal seam would be more rational. A potential system for liquid products operating in this way, based on convention form-and-fill machinery, is illustrated in Figure 10. With reference to this Figure it is stated that the PVA foil should be at least 0.1 mm

thick.

3. In the face of the state of the art found in documents E1 and more particularly E5 the appellants have introduced a number of restrictions into claim 1 as granted. In particular the upper limit for the thickness of the envelope has been reduced from 500 to 100 micrometres (ie to 0.1 mm), this feature being taken from claim 13 as granted (claim 12 as originally filed). In addition it has been stated that the envelope is sealed solely by means of heat seals "obtained by heat sealing the envelope with a dwell time form 200 msec to 1.5 sec" (main request) or "obtained by heat sealing the envelope with a dwell time form 200 msec to 1.5 sec and a sealing pressure from 1 to 3.5 kg/cm²" (first auxiliary request). These values relating to the heat sealing process have been taken from granted claims 40 and 41 (equivalent to claims 33 and 34 as originally filed), dependent on independent process claim 35.

It is a requirement of Article 84 EPC that the claims shall clearly define the matter for which protection is sought. In general, the inclusion in a claim to a product of features relating to how it was produced is in only permissible if this results in a more exact definition of the physical attributes of the product which cannot be achieved in another way. This is not the situation in the case at hand. The physical properties of a heat seal formed in an envelope of for example PVA foil will depend on a complex combination of various parameters (eg temperature, dwell time, jaw pressure, ambient conditions) and it will not subsequently be possible to separate the influences of these parameters from each other. It will thus not be

objectively determinable whether any particular heat seal has been obtained by sealing with a specific dwell time or specific sealing pressure of both.

The respective claim 1 of the main request and the first auxiliary request is therefore unallowable for lack of clarity (Article 84 EPC). The Board can also not see how notionally replacing the term "obtained" in the claims by "obtainable", as suggested by the appellants, can lead to any other conclusion.

4. In the claims according to the second and third auxiliary requests the independent product claims have been deleted, leaving only the independent method claims. More particularly, claim 1 of the second auxiliary request corresponds to claim 35 of the main request and claim 1 of the third auxiliary request to claim 35 of the first auxiliary request. In comparison with the granted independent process claim 35 the new independent process claims have been subject to the same amendments as discussed in point 3 above with respect to the independent product claims, namely restriction of the upper thickness limit to 100 micrometres, the requirement that all seals in the envelope are formed by heat sealing and the specification of particular parameters for the heat sealing (dwell time of 200 msec to 1.5 sec in the second auxiliary request, this dwell time and a sealing pressure of 1 to 3.5 kg/cm² in the third auxiliary request).

It is apparent from what has already been said in point 3 above that the amendments incorporated into the respective claim 1 of the second and third auxiliary requests are not objectable under Article 123(2) and

(3) EPC. Also, in contrast to the amended product claims considered and rejected above, the definition of the heat sealing parameters is plainly unobjectionable in the context of the process claims.

In the opinion of the appellants the features incorporated into the new process claims are effective in distancing the claimed subject-matter from the state of the art, in particular the disclosure of document E5, to such an extent that an objection of lack of inventive step can no longer be sustained. More specifically, they argue that in several respects what is required by the claims runs directly counter to what is taught by document E5 and cannot therefore have been obvious for the person skilled in the art.

Turning to these arguments in more detail, the appellants contend that document E5 recommends a lower limit of 100 micrometres (0.1 mm) for the thickness of PVA foil which is to be used for making packages containing liquids, whereas this thickness is the upper limit of the range specified in the claims under consideration. However, where this recommendation is to be found in document E5 it is specifically and exclusively directed to the particular packaging machinery illustrated in Figure 10. There is nothing in document E5 which could be taken as suggesting that when forming and filling bags in other ways a lower foil thickness could not be used, for example the 0.05 mm thick foil which is said to have proved reliable, see the left-hand column of page 861, paragraphs 1 and 3.

The appellants also argue that document E5 recommends forming a longitudinal seam by adhesive action rather

than heat sealing, whereas the claims require that heat sealing is the only sealing technique. However, this recommendation is only to provide a more rational manufacturing process and the document clearly and unambiguously discloses the formation of packages only having heat seals, see the left-hand column of page 861, paragraph 3. In any case, the independent claims under consideration are silent as to whether the envelopes comprise longitudinal seams within the meaning of document E5. As indicated in the last paragraph of column 4 of the patent specification it is possible for example to form the envelopes from a tubular extrusion, thus requiring only transverse seams to be made.

Another argument of the appellants is that through the indication of the dwell time of the heat sealing operation they have implicitly limited the claims to the use of "contact" heat sealing, whereas document E5 excludes the use of this techniques for PVA foils of thickness in the range claimed. However, the Board cannot see how this limitation arises, even implicitly. It is true that document E5 states that only "heat impulse" welding is usable for foils in the thickness range of 0.03 to 0.1 mm, whereas "contact" welding can be used for thicker foils, but both of these techniques are well-known heat sealing methods which differ only to the extent that with "heat impulse" welding the pressure jaws are heated momentarily for a fixed time period while closed, whereas with "contact" welding the pressure jaws are permanently heated. Both techniques operate with predetermined jaw closure, ie dwell times, whereby the "heat impulse" method allows more flexible and accurate control of the amount of heat transferred to the substrates which are to be joined.

Since the Board can find nothing of substance in these general arguments of the appellants, it is thus necessary to consider the specific heat sealing parameters added to the respective independent process claims. The first is the length of the dwell time, given as 200 msec to 1.5 sec. According to document E5 a reference value of 2 seconds is given for a foil of 0.1 mm thickness, albeit in the context of the "contact" method. It is axiomatic that thinner foils will require a shorter dwell time in order to provide an adequate seal, other conditions being constant, so that for the person skilled in the art to operate within the claimed dwell time range when sealing a foil of a thickness less than 0.1 mm is not something that can be seen as going beyond the result of routine experimentation to determine optimal conditions. As for the sealing pressure stated in claim 1 of the third auxiliary request, the Board notes that the stated range of 1 to 3.5 kg/cm² already overlaps at its upper end with the reference value of 3 to 5 kp/cm² given in documents E5 for a 0.1 mm thick PVA foil. Again, it is in any case apparent that thinner foils will generally require less sealing pressure, so that the stated range can add nothing of inventive significance to the claimed subject-matter.

It follows from the above that the process defined in the respective claim 1 of the second and third auxiliary requests lacks inventive steps (Article 56 EPC).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

S. Fabiani

F. Gumbel