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Datasheet for the decision of 13 November 2013

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Application Number: 00988840.5

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Language of the proceedings: EN

Title of invention:
INHALATION PARTICLES

Patent Proprietor:
Orion Corporation

Opponent:
GLAXO GROUP LIMITED

Headword:

Relevant legal provisions:
EPC Art. 54, 56, 84
RPBA Art. 13(1)

Keyword:
Novelty - main request (no)
Claims - clarity after amendment - first and third auxiliary requests (no)
Inventive step - second auxiliary request (no)
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G 0009/92

Catchword:
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Case Number: T 1392/09 - 3.3.07

D E C I S I O N
of Technical Board of Appeal 3.3.07
of 13 November 2013

Appellant: (Opponent)	GLAXO GROUP LIMITED Glaxo Wellcome House, Berkeley Avenue Greenford, Middlesex UB6 0NN (GB)
Representative:	Povey, Alexander W.G. GlaxoSmithKline Corporate Intellectual Property (CN9.25.1) 980 Great West Road Brentford, Middlesex TW8 9GS (GB)
Respondent: (Patent Proprietor)	Orion Corporation Orionintie 1 02200 Espoo (FI)
Representative:	Sexton, Jane Helen J A Kemp 14 South Square Gray's Inn London WC1R 5JJ (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 30 April 2009 concerning maintenance of the European Patent No. 1242048 in amended form.**

Composition of the Board:

Chairman: J. Riolo
Members: R. Hauss
M. Tardo-Dino

Summary of Facts and Submissions

I. European patent No. 1 242 048 was granted on the basis of 19 claims.

II. A notice of opposition was filed in which the revocation of the patent in its entirety was requested under Article 100(a) and (b) EPC, on the grounds that the claimed subject-matter lacked novelty and inventive step and was not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

III. The appeal lies from the decision of the opposition division, pronounced in oral proceedings on 31 March 2009 and posted on 30 April 2009, finding that the patent as amended in the form of the main request filed during the oral proceedings met the requirements of the EPC.

Said main request comprises eighteen claims, the independent claims reading as follows:

"1. A method for preparing particles suitable for pulmonary drug delivery, comprising the steps of:
providing a liquid feed stock comprising an active agent;
atomising the liquid feed stock to create droplets;
suspending said droplets in a carrier gas;
passing said carrier gas and droplets suspended therein through a heated tube flow reactor under predetermined residence time and temperature history; and
collecting the particles produced."

"9. Particles suitable for use in pulmonary drug delivery by inhalation, which particles are spherical and crystalline, have a rough surface and incorporate

an active agent, the particles being obtainable by a method according to any of claims 1 to 8."

"14. Inhalation composition comprising particles according to any of claims 9 - 13."

"18. An inhaler device comprising inhalation composition according to any of claims 14 to 17."

Claims 2 to 8 are dependent on claim 1, claims 10 to 13 are dependent on claim 9, and claims 15 to 17 are dependent on claim 14.

IV. The documents cited during the opposition and appeal proceedings included the following:

D2: EP 0 504 760 A1

D6: US 4 590 206

D10: Inhalation aerosols: physical and biological basis for therapy, ed. A. J. Hickey, New York 1996, 337-384

D16: Int. Journal of Pharmaceutics 18 (1984), 195-200

V. In the impugned decision, the opposition division came in particular to the following conclusions:

With the available information the skilled person was in a position to determine, without undue burden, the suitable process conditions for preparing spherical crystalline particles having a rough surface.

As far as novelty was concerned, the opposition division was *inter alia* of the opinion that the particles defined in claim 9, obtainable by a method according to claim 1, differed from the particles shown in figure 3 of document D2 by their narrower particle size distribution.

Document D2 describing spherical crystalline particles of ciclosporin for administration by inhalation was

regarded as the closest prior art as far as product claims 9 to 13 and 14 to 18 were concerned. The opposition division defined the technical problem to be solved as providing improved particles by increasing the effective separation distance between particles. The solution to that problem consisted in producing particles presenting a rough surface and a narrow particle size distribution. Document D2 appeared to suggest that smooth particles were desirable and did not disclose a narrow particle size distribution. The opposition division came to the conclusion that, even if the skilled person might have known that a rough surface would solve the technical problem, it could still not be derived from the available prior art that it was possible to manufacture such particles.

VI. The appellant (opponent) lodged an appeal against that decision.

In the statement setting out the grounds of appeal, the appellant argued that the particles defined in claim 9 of the main request lacked novelty over the disclosure of document D2 or at least did not involve an inventive step starting from documents D2 or D6 as the closest prior art. The appellant also submitted that the subject-matter of product claims 10 to 18 lacked novelty and inventive step, but did not raise any objections in that respect against claims 1 to 8 directed to a method for preparing particles. The appellant furthermore contended that the invention was insufficiently disclosed, without however identifying any particular claim to which that objection applied.

VII. In its reply to the statement setting out the grounds of appeal, the respondent (patent proprietor) requested that the appeal be dismissed and filed three sets of claims as first, second and third auxiliary requests.

Independent claim 9 of the first auxiliary request reads as follows:

"9. Particles suitable for use in pulmonary drug delivery by inhalation, which particles are spherical and crystalline **the relative degree of crystallinity being 90% or higher**, have a rough surface and incorporate an active agent, the particles being obtainable by a method according to any of claims 1 to 8."

Independent claims 1 and 9 of the second auxiliary request read as follows:

"1. A method for preparing particles suitable for pulmonary drug delivery, comprising the steps of:
providing a liquid feed stock comprising an active agent **selected from a group consisting of bronchodilators and steroidal anti-inflammatory drugs**;
atomising the liquid feed stock to create droplets;
suspending said droplets in a carrier gas;
passing said carrier gas and droplets suspended therein through a heated tube flow reactor under predetermined residence time and temperature history; and
collecting the particles produced."

"9. Particles suitable for use in pulmonary drug delivery by inhalation, which particles are spherical and crystalline, have a rough surface and incorporate an active agent **selected from a group consisting of bronchodilators and steroidal anti-inflammatory drugs**, the particles being obtainable by a method according to any of claims 1 to 8."

Independent claim 9 of the third auxiliary request reads as follows:

"9. Particles suitable for use in pulmonary drug delivery by inhalation, which particles are spherical and crystalline **the relative degree of crystallinity being 90% or higher**, have a rough surface and incorporate an active agent **selected from a group consisting of bronchodilators and steroidal anti-inflammatory drugs**, the particles being obtainable by a method according to any of claims 1 to 8."

To facilitate comparison, insertions into the wording of the corresponding claims of the main request are marked in bold.

VIII. With a further submission dated 11 October 2013 the respondent filed a fourth and a fifth auxiliary request.

The fourth auxiliary request corresponds to claims 1 to 8 of the main request directed to the method of preparation, all claims directed to products (former claims 9 to 18) having been deleted.

IX. In a communication issued in preparation of oral proceedings and advising the parties of the board's preliminary opinion, the board mentioned the following points:

- The appellant appeared to have substantiated the appeal only with regard to claims 9 to 18 directed to products (i.e. particles, inhalation composition and inhaler device).

- As far as the issue of novelty of the claimed particles over the disclosure of document D2 was concerned, doubt was expressed that surface roughness or a narrow particle size distribution could serve as distinguishing features.

- With regard to the parameter "relative degree of crystallinity" mentioned in claim 9 of the first and third auxiliary requests, the board referred to the requirement of clarity under Article 84 EPC and observed that the patent specification provided neither a definition of that parameter nor a full description of the methodology to be used for its determination.

- Ciclosporin used as the active substance in document D2 was neither a steroid nor was it known to be a bronchodilator. If the choice of the mandatory active agent was restricted to those two groups, as required in the second auxiliary request, it might be appropriate to consider a starting-point other than document D2 for the assessment of inventive step.

X. With the respondent's letter received by the EPO on 30 October 2013 it was announced that no-one would be attending oral proceedings on behalf of the respondent.

XI. Oral proceedings before the board took place on 13 November 2013 in the absence of the respondent.

XII. The appellant argued as follows:

Main request

Claim 9 lacked novelty in view of the disclosure of document D2, in particular examples 5 and 6.3 and figures 2 and 3 of said document. The definition of claim 9 did not contain any explicit or implicit limitation regarding the particle size distribution, which in consequence could not be a distinguishing feature over the prior art.

First and third auxiliary requests

The definition of claim 9 of both those requests lacked clarity in respect of the feature "the relative degree of crystallinity being 90% or higher".

Second auxiliary request

Document D6 related to finely divided spray-dried particles for inhalation and disclosed *inter alia* spherical particles of the bronchodilator terbutaline sulphate having a rough surface. The particles defined in claim 9 differed from the particles of document D6 only in that they were crystalline. That property had not been shown to result in any particular technical effect. Hence the objective technical problem consisted in providing further particles for inhalation. That problem was solved by crystalline particles as claimed.

In the field of pharmacy, crystallinity was generally a desirable property of active agents. As shown in document D2, crystalline particles for inhalation were also known, the particles of D2 being moreover spherical. It was furthermore known that crystallinity combined with a spherical particle shape could be achieved by spray-drying, as shown in document D16, or by supercritical fluid crystallisation as described in document D10. The skilled person was also aware that particle properties such as crystallinity could be controlled during manufacture by manipulation of the process conditions, such as temperature.

As a consequence, the skilled person attempting to solve the technical problem would have envisaged preparing crystalline particles and would have known how to obtain such particles without the exercise of inventive skill.

Fourth auxiliary request

The appellant declared at the start of the oral proceedings that it had no objection to the introduction of that request and did not wish to present any comment on its conformity with the

requirements of the EPC. At the end of the oral proceedings the appellant confirmed that its appeal was restricted to the product claims.

XIII. The respondent, in its written submissions, argued as follows:

Main request

The particles defined in claim 9 differed from those disclosed in document D2 in that they presented a rough surface and were characterised by a narrow particle size distribution. The particle size distribution was an implicit feature introduced by the requirement "the particles being obtainable by a method according to any of claims 1 to 8".

First and third auxiliary requests

The respondent did not submit any comment as to whether the meaning of the feature "the relative degree of crystallinity being 90% or higher" was clear.

Second auxiliary request

The requirement that the active agent be selected from bronchodilators and steroidal anti-inflammatory drugs was based on page 7, lines 11 to 16 of the application as filed.

In the respondent's opinion, publications disclosing the preparation of inhalation particles by solvent evaporation (spray-drying) methods, such as document D6, were more suitable as the closest prior art than document D2. As to the second auxiliary request, the skilled person intending to prepare crystalline spherical rough-surfaced particles of bronchodilators or steroidal anti-inflammatory drugs for inhalation would consider documents relating to

those groups of active agents as a suitable starting-point for research.

Irrespective of the choice of the closest prior art, at the first priority date of the patent in suit a skilled person would not have expected to be able to manufacture highly crystalline spherical inhalation drug particles having a rough surface, since such combination of properties was not obtainable for inhalation drug particles by the particle manufacture methods of the prior art. Conventional spray-drying usually yielded amorphous particles.

Fourth auxiliary request

The fourth auxiliary request, filed one month prior to oral proceedings, did not raise any new issues, since it was directed to the method claims of the first auxiliary request already present in the proceedings.

In fact, the claims of the fourth auxiliary request corresponded to claims 1 to 8 as upheld by the opposition division.

The appellant's objections were all directed against product claims, which however were absent from the fourth auxiliary request, with the result that that request served to resolve any potential issues with the product claims.

XIV. The appellant requested that the decision under appeal be set aside and that the main request and auxiliary requests 1, 2 and 3 be rejected.

XV. The respondent requested in its written submissions that the appeal be dismissed or, in the alternative, that the patent be maintained on the basis of one of the first to third auxiliary requests filed with the reply to the statement setting out the grounds of

appeal, or on the basis of one of the fourth or fifth auxiliary requests as filed with the letter dated 11 October 2013.

Reasons for the Decision

1. The appeal is admissible.

2. Main request - novelty

2.1 Claim 9 of the present main request, which is drafted as a "product-by-process" type claim, is directed to particles suitable for use in pulmonary drug delivery by inhalation, which particles incorporate an active agent, are spherical and crystalline, have a rough surface and can be obtained by a method of preparation according to claim 1.

The feature of suitability for use in pulmonary drug delivery by inhalation requires the presence of respirable particle sizes as well as physiological compatibility of the active agent when administered by inhalation.

2.2 Document D2 relates to crystalline particles of the active agent ciclosporin which are, in particular, intended for pulmonary administration (see D2: page 3, lines 56 to 58; page 5: line 14), i.e. the active agent is suitable for pulmonary delivery.

In example 5 of document D2 the preparation of spherical crystalline particles of ciclosporin with particle diameters in the range of 3 to 40 µm is described. Electron micrographs of the spherical particles are shown in figures 2 and 3 of D2. The material obtained contains particles of a size which is suitable for pulmonary delivery (generally,

particles under 10 µm; see D6: column 1, lines 17 to 22 and column 4, line 61 to column 5, line 1; D2: page 5, lines 16 to 18).

Thus, D2 discloses in the embodiment of example 5 spherical crystalline particles suitable for pulmonary drug delivery by inhalation, incorporating an active agent.

The particles were obtained by a process involving the autoclavation of suspensions of non-spherical crystalline particles of ciclosporin, followed by filtration and drying.

2.3 According to the respondent, the particles defined in claim 9 of the main request differ from those disclosed in document D2 in that they present a rough surface and a narrow particle size distribution. In that context, the respondent has argued that narrow particle size distribution was an implicit feature introduced by the requirement that the particles be obtainable by a method according to claim 1.

2.4 Surface roughness

2.4.1 Present claim 9 requires the claimed particles to have a "rough" surface, without further defining the term "rough". Said term must therefore be read in its broadest possible meaning.

According to the most general understanding of the term, any kind of unevenness or irregularity in the particle surface may classify as roughness.

Given that meaning, roughness cannot under normal circumstances serve as a distinguishing feature over the prior art, since any kind of particles may commonly be expected not to be perfectly smooth but to present, to some degree, an uneven and irregular surface.

2.4.2 In the respondent's view, claim 9 should be read in the light of the following statement found in paragraph [0036] of the patent specification: "Generally, the surface of the spherical particles is rough, i.e. the roughness is consistent over the entire surface of the particle, apparent when examined under the scanning electron microscope, and the ratio of the maximum and minimum diameter of the particle is between 1.001-1.5".

However, since the wording of claim 9 is clearly understandable in itself, there is no need for the reader to consult the description in order to read further limitations into the claim. If a specific meaning was intended, that should have been indicated in the claim and not only mentioned in the description. Thus the additional requirements which are mentioned only in the description cannot be taken into account.

That consideration applies independently of whether the criteria of paragraph [0036] could actually be put into practice in a meaningful way, seeing that neither a practicable method of determination of the minimum and maximum particle diameters nor any settings for the particles' examination under the scanning electron microscope are indicated, and that the lower limit of the ratio, 1.001, would moreover seem to describe nearly perfectly smooth particles.

2.4.3 According to the respondent's further argumentation, the electron micrographs of the ciclosporin particles of document D2 (figures 2 and 3) reveal a consistently smooth surface in comparison with consistently rough particles as shown in figures 4a to 4d of the patent in suit.

While the particles shown in the patent in suit look to some extent rougher, the board observes that the

magnification appears to be larger and that, in any case, those particles were obtained in the context of a specific embodiment described in example 1, involving the preparation of beclomethasone dipropionate particles at specified process conditions (see paragraph [0057] of the patent specification).

Novelty must however be established for the scope defined by the combination of features in claim 9, and not only for the specific particles of example 1. The degree of surface roughness observed in the particles of a specific embodiment, such as shown in figures 4a to 4d, is not a limiting technical feature of claim 9.

In fact, it is apparent from figures 2 and 3 of D2 that the particles shown therein do present some surface irregularity. Their surface may accordingly be classified as rough within the general meaning given above (see point 2.4.1 *supra*).

2.5 Particle size distribution

2.5.1 It remains to be established whether the prior-art particles of D2, which were actually obtained by a different method of preparation (see point 2.2 *supra*), are also obtainable by the method defined in claim 1 of the main request.

2.5.2 The method steps defined in claim 1 are not features of the particles of claim 9. They can only be relevant in terms of any technical features of the claimed particles which are the inevitable result of said method steps.

2.5.3 In this context, it has been alleged that the method of claim 1 must inevitably lead to a "narrow" particle size distribution distinguishing the particles of claim 9 from those disclosed in D2. Figures 3a and 3b and paragraph [0031] of the patent specification have

also been cited in support of that understanding of claim 9. Paragraphs [0031] and [0033] of the patent specification contain the following statements:

"... the temperature history and residence time of each droplet and product particle can be better controlled than in the conventional spray-drying method. Therefore, excellent uniformity of the resulted *[sic]* particles and narrow particle size distribution can be ensured."

"The aerosol flow reactor conditions are selected such that crystalline spherical particles of homogeneous constituents *[sic]* having a narrow particle size distribution and rough surfaces are formed."

2.5.4 Neither claim 9 nor claim 1 makes any explicit mention of the parameter "particle size distribution".

The particle size distribution shown in figures 3a and 3b of the patent specification was obtained in the specific context of the only preparation example described in the patent (example 1, see paragraph [0052] of the patent specification). It is however not present as a limiting feature in claim 9.

Nor can general statements in the patent specification (see paragraphs [0031] and [0033]) to the effect that a narrow particle size distribution can be obtained, *n.b.* by selecting the process conditions accordingly, impose any limitation upon the definition of claim 9.

2.5.5 Claim 9 is directed to particles described by their morphology, their suitability for pulmonary delivery by inhalation and by the fact that they incorporate an active agent. Those particles are moreover "obtainable by a method according to any of claims 1 to 8".

Such a wording does not necessarily mean that claim 9 is directed to a mixture of particles presenting as a mandatory feature a size range and/or particle size distribution directly resulting from the definition of the preparation steps in claim 1, in particular since the separate collection of different fractions of particles is not excluded. Size selective collection of particles is explicitly mentioned as an option in paragraph [0039] of the patent specification.

Moreover, claim 1 does not, in fact, define any concrete operating conditions (e.g. concerning the specific conditions of atomisation and of particle drying) which might conceivably result in limitations regarding the particle size distribution.

Hence the board comes to the conclusion that claim 9 does not contain any implicit requirement concerning the particle size distribution.

The only size requirement in claim 9 is the requirement that particles of a respirable size should be present, as implied by the feature "suitable for use in pulmonary drug delivery by inhalation"(see paragraph 2.1 *supra*).

2.6 In conclusion, neither surface roughness nor a specific "narrow" particle size distribution may be regarded as distinguishing features of claim 9 over the disclosure of document D2.

2.7 Hence the particles disclosed in example 5 and figures 2 and 3 of document D2 are deemed to be in conformity with the definition of claim 9 of the main request.

2.8 As a consequence, the subject-matter of claim 9 lacks novelty over the disclosure of document D2.

3. First auxiliary request - clarity

3.1 Claim 9 of the first auxiliary request contains the requirement that the relative degree of crystallinity of the particles must be 90% or higher.

That feature was not present in the claims as granted, but was taken from the description (see page 8, lines 32 to 33 of the application as filed, corresponding to paragraph [0034] of the patent specification).

When substantive amendments are made to a patent, both the opposition division and the board of appeal have the power, conferred by Article 101(3) EPC, to deal with issues arising from those amendments, including issues under Article 84 EPC.

3.2 A definition of the parameter "relative degree of crystallinity" is lacking both in claim 9 of the first auxiliary request and in the patent specification.

3.3 It is mentioned in paragraph [0034] of the patent specification that the relative degree of crystallinity can be determined based on the X-ray powder diffraction patterns, and that its value can be estimated by a known method of broadening of the diffraction maxima (FWHM-values). The method in question is however not further identified or described.

In the context of example 1 of the patent in suit, which describes the preparation of particles of beclomethasone dipropionate (see the patent specification, paragraphs [0053] to [0056]), it is correspondingly indicated that the relative degree of crystallinity of the resulting powder was determined based on the X-ray powder diffraction patterns, that the powder was compared to a reference sample which was "beclomethasone diproprionate powder supplied by Orion

Corporation, Finland", and that the estimation was based on the broadening of the diffraction maxima (FWHM-values) positioned at 11.3° and 18.4°. The relative degree of crystallinity of the powder sample prepared according to example 1 is indicated as 100% and that of the reference powder as 79% (see table 1 of the patent specification).

Neither the general description nor the specific preparation example provides any more detail about the determination of the parameter "relative degree of crystallinity". In particular, it is not mentioned how the relevant diffraction maxima are to be selected, in which way and according to what standards the estimation based on the broadening of the diffraction maxima is to be carried out, or how the reference sample is to be chosen.

In this context, it is pointed out that the active agent can be any kind of active agent or, according to claim 13 of the first auxiliary request, any of the group consisting of bronchodilators and steroidal anti-inflammatory drugs. It is to be expected that the relevant diffraction maxima in the case of other active agents would be different from those for beclomethasone dipropionate.

3.4 Furthermore, it would normally be assumed by the reader of amended claim 9 that the sample chosen as the reference should have a high degree of crystallinity and would be set at 100% relative degree of crystallinity for the purposes of the comparison. Since the value obtained for the test sample would vary according to how it compared to the reference, the choice of the reference sample, viz. its degree of crystallinity, would be expected to have a direct impact on the value of the parameter. The patent in

suit does not however indicate the criteria according to which the reference sample is to be selected.

If, on the other hand, the particles defined in claim 9 are supposed to be set at 100% relative degree of crystallinity, as indeed shown in table 1 of example 1, meaning that the value for the reference sample varies, then the criterion "more than 90%" recited in claim 9 is bound to be met and therefore is not a limiting feature.

The result of 79% for the reference sample obtained in example 1 of the patent in suit also suggests that the reference sample was not highly crystalline, which once more raises the question of the criteria to be used for selecting a reference sample. The quality of the sample which was used in example 1 is not indicated in the patent in suit.

3.5 In summary, the methodology for determining the parameter "relative degree of crystallinity" is not fully described in the patent in suit, a definition of the parameter is lacking, and the criteria for the choice of a crystalline reference sample of the "active agent" are not indicated. In view of the presentation in table 1 of the patent in suit, it is furthermore uncertain whether the reference sample or the test sample is supposed to be the 100% standard of relative crystallinity. Under these circumstances, the skilled person is not in a position to determine whether a given sample meets the requirement "the relative degree of crystallinity being 90% or higher".

3.6 As a consequence of the introduction of the feature "the relative degree of crystallinity being 90% or higher", the subject-matter defined in claim 9 of the

first auxiliary request lacks clarity and therefore fails to meet the requirements of Article 84 EPC.

4. Second auxiliary request - inventive step

Patent in suit

4.1 The patent in suit relates to spherical crystalline inhalation particles suitable for the pulmonary delivery of an active agent. According to claim 9 of the second auxiliary request, the mandatory active agent is selected from the group consisting of bronchodilators and steroidal anti-inflammatory drugs.

Closest prior art

4.2 Said types of active agents were known for pulmonary administration, usually in spray-dried or micronised form.

4.3 The appellant has suggested document D6 as the closest prior art. D6 was also contemplated by the respondent. The board sees no reason to select a different starting point.

4.4 Document D6 aims to provide finely divided, flowable drug particles for pulmonary administration by inhalation. The particles produced are of spherical, collapsed spherical or toroidal shape (see D6: column 2, lines 3 to 14, 24 to 30).

Suitable medicaments (active agents) identified in document D6 include bronchodilators and steroids such as beclomethasone dipropionate (see D6: column 4, lines 42 to 49).

A specific embodiment describes spherical particles of the bronchodilator terbutaline sulphate which have a rough surface, designated "orange peel spheres" (see

D6: figure 1 and column 2, line 40; table 1). The particles were produced by spray-drying.

Document D6 does not discuss crystallinity. It is therefore to be assumed in the respondent's favour that the particles disclosed in document D6 are not crystalline.

Technical problem and solution

4.5 Accordingly, the particles defined in claim 9 of the second auxiliary request differ from the spherical terbutaline sulphate particles disclosed in document D6 in that they are crystalline particles obtainable by a method according to claim 1.

The requirement that the particles be obtainable by a method according to claim 1 does not confer any characteristic properties upon the claimed particles. In this context the board observes that claim 1, which defines only general method steps, does not indicate any concrete operating conditions. All that can be inferred from the definition of claim 1 is that the envisaged method of preparation is a spray-drying method using a tubular drying chamber ("heated tube flow reactor"). There is no evidence of that feature as such having any specific impact on the properties of the resulting particles.

Consequently, the only distinguishing feature of the claimed particles over the particles disclosed in D6 is crystallinity.

4.6 It is mentioned in the patent in suit that spray-drying is commonly not conducive to achieving a good control of crystallinity. In conventional spray-drying methods, a liquid feed is atomised and contacted with a hot gaseous medium, which leads to rapid evaporation of the droplets, leaving dried solid particles. Such methods

usually yield amorphous particles which have stability problems and a high tendency to reabsorb moisture, which is undesirable for pharmaceutical agents (see paragraphs [0008] and [0019] of the patent specification).

The technical problem to be solved starting from the teaching of document D6 could accordingly be regarded as the provision of inhalation particles suitable for the pulmonary delivery of an active agent selected from bronchodilators and steroidal anti-inflammatory drugs, said particles presenting improved stability.

However, the patent in suit does not provide any data on stability or moisture reabsorption, so that it cannot be confirmed on the basis of the available information that such a technical problem could indeed be solved by the crystalline particles defined in claim 9, by credibly achieving improved stability across the claimed scope of active agents.

Moreover, the achievement of such a technical effect would not be regarded as surprising by the skilled person, since it was known that amorphous forms tend to absorb more moisture at a given relative humidity than crystalline forms, potentially causing stability problems (see D10: page 378, bottom paragraph).

4.7 The patent in suit does not provide any other data which might point to a surprising technical effect linked to the property of crystallinity.

4.8 Under these circumstances, the technical problem has to be formulated as the provision of further inhalation particles suitable for the pulmonary delivery of an active agent selected from bronchodilators and steroidal anti-inflammatory drugs.

4.9 The board is satisfied that that problem has been solved by the crystalline particles as defined in claim 9 of the second auxiliary request.

Obviousness of the solution

4.10 Document D6 proposes spherical spray-dried particles as having improved properties compared to known micronised crystalline inhalation particles which are irregular in shape, may display planar crystal faces and consequently tend to form aggregates and not to flow freely enough (see D6: column 1, lines 17 to 35; D10: page 374, paragraph 2).

4.11 The method of preparation of suitable particles as taught in document D6 involves atomising a solution of the active agent into air or another carrier gas, heat-drying the resulting droplets and collecting some or all of the particles produced. The product may be classified, e.g. sieved or air-classified, to remove over- and under-sized material (see D6: column 5, lines 52 to 58; column 7, lines 10 to 21, 58 to 59).

Document D6 teaches that all of the parameters of the spray-drying process (such as temperatures and flow rates) interrelate and can be adjusted to produce the desired product. It is suggested that the droplet drying time can be varied, increased residence time (i.e. slower drying) producing particles with improved performance (see D6: column 7, lines 13 to 15; column 10, lines 14 to 25).

4.12 The concept of crystalline spherical inhalation particles was known before the first priority date of the patent, e.g. from document D2 disclosing crystalline spherical ciclosporin. It was also known from document D16 that crystalline spherical particles could readily be obtained with a conventional spray-

drying method in the case of certain compounds, such as chlorothiazide, and that in the case of other materials post-crystallisation occurred in spray-dried amorphous particles (see D16, page 197: lines 3 to 15; figures 2 and 3).

4.13 The skilled person was aware that the frequently observed tendency to form amorphous solid particles was due to the short time-scales involved in spray-drying (see D10: page 353, lines 2 to 4, page 377, bottom paragraph and specification of the patent in suit, paragraph [0008]). It was known that the properties of the particles, such as final size, shape, density, crystallinity and solvent content, are all affected by the operating conditions of the drying process, *inter alia* temperature, gas flow rate and residence time (see D10: page 349, bottom paragraph).

4.14 Based on that prior knowledge, the skilled person would have envisaged preparing crystalline spherical particles as a possible variation in order to provide further inhalation particles of bronchodilators or steroidal anti-inflammatory drugs. The board has no reason to assume that such particles would not have been available using obvious routine measures, e.g. by manipulation of the operating conditions of a typical spray-drying process such as described in document D6 to achieve slower and more controlled drying allowing for crystallisation of the active agent.

Accordingly, it would be a matter of routine for the skilled person to select conditions of spray-drying which would lead to particles having all the features of claim 9. Nothing else is in any case suggested in the patent in suit, which teaches in principle the control of temperature and drying time such that suitable particles are obtained.

4.15 As a consequence, the subject-matter of claim 9 of the second auxiliary request does not involve an inventive step within the meaning of article 56 EPC.

5. Third auxiliary request - clarity

5.1 Since the feature "the relative degree of crystallinity being 90% or higher" is present in claim 9 of the third auxiliary request, the same objections apply, *mutatis mutandis*, as to the first auxiliary request (see point 3 *supra*).

5.2 As a consequence, the board finds that the definition of claim 9 of the third auxiliary request lacks clarity and consequently does not meet the requirements of Article 84 EPC.

6. Admission of the fourth auxiliary request

6.1 In its communication issued prior to the oral proceedings, the board drew the appellant's attention to the fact that its appeal was substantiated only in respect of the product claims. The appellant confirmed during the hearing that its appeal, contrary to what was stated in the notice of opposition, was in fact restricted to the product claims.

6.2 It follows from the above that since the fourth auxiliary request contains only method claims, that request falls outside the scope of the subject-matter under appeal.

6.3 It is a matter of fact that the fourth auxiliary request was filed at a late stage in the proceedings, and pursuant to Article 13(1) RPBA may be admitted at the board's discretion. Considering however that the claims in question had always been part of the

proceedings and were not under attack during the appeal proceedings, their filing is in line with the requirements set out in G9/92, OJ 1994, 875, namely that the patent proprietor, who has not filed an appeal and is therefore only a party to the proceedings under Article 107, second sentence, EPC, is primarily limited to defending the version maintained by the decision under appeal. Any amendments it proposes in the appeal proceedings must be appropriate or necessary, which is the case in the current appeal where the respondent has restricted its claims to the method claims considered patentable by the opposition division and not challenged by the appellant.

6.4 As a result of these considerations, the fourth auxiliary request is admitted into the proceedings.

7. Fourth auxiliary request

7.1 The claims of the fourth auxiliary request were among the claims deemed to be patentable in the impugned decision of the opposition division. As established above (see point 6 *supra*), since those claims are not directed to products but to a method of preparation they are outside the scope of the present appeal, and the board is precluded from examining their conformity with the EPC.

7.2 It follows that the fourth auxiliary request is to be allowed.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of the fourth auxiliary request as filed with the letter of 11 October 2013 and a description to be adapted thereto.

The Registrar: The Chairman:

D. Hampe J. Riolo

Decision electronically authenticated