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D E C I S I O N
of 4 April 2000

Case Number: T 1097/97 - 3.3.3

Application Number: 94400038.9

Publication Number: 0608157

IPC: C08J 11/10

Language of the proceedings: EN

Title of invention:
Fast process to reclaim cured or semi-cured rubber

Applicant:
OLIVEIRA DA CUNHA LIMA, Luiz Carlos

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56, 84

Keyword:
"Claims - clarity (yes) - support by description (yes)"
"Inventive step (yes) - non-obvious alternative"

Decisions cited:
-

Catchword:
-



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Boards of Appeal

Chambres de recours

Case Number: T 1097/97 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 4 April 2000

Appellant:

OLIVEIRA DA CUNHA LIMA, Luiz Carlos
Rue Pacheco Leao 606
Casa 107
Jardim Botânico
22460 Rio de Janeiro (BR)

Representative:

Bloch, Gérard
2, square de l'Avenue du Bois
F-75116 Paris (FR)

Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 9 June 1997
refusing European patent application
No. 94 400 038.9 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: C. Gérardin
Members: P. Kitzmantel
S. C. Perryman

Summary of Facts and Submissions

I. This appeal, which was filed on 31 July 1997, lies against the decision of the Examining Division dated 9 June 1997 refusing European patent application No. 94 400 038.9 filed on 6 January 1994 in the name of Luiz Carlos OLIVEIRA DA CUNHA LIMA, and published under No. 0 608 157. The appeal fee was paid together with the Notice of Appeal and the Statement of Grounds of Appeal was filed on 7 October 1997.

II. The decision under appeal was based on a set of five claims submitted by letter dated 3 March 1997, Claim 1 reading as follows:

"1. A process to reclaim cured or semi-cured rubber, which comprises forming a swollen mass of rubber by subjecting a mass of rubber to be reclaimed to a solvent effective to swell said rubber to be reclaimed, characterised [spelling corrected] in that it further comprises passing the swollen mass of rubber through restriction means with or in deleterious or devulcanizing substances."

The further claims 2 to 5 were dependent on Claim 1.

III. The decision under appeal held that Claim 1 lacked clarity with regard to the kind of processing equipment and of the solvent to be used. Furthermore, in the Examining Division's view, the subject-matter of Claim 1 did not involve an inventive step over the milling technique used according to WO-A-86/05192, because the use of an extruder, this being one of the possible processing equipments within the scope of Claim 1, was common in rubber reclaiming processes; nor did the provision of perforated plaques (screen packs) require an inventive effort, because such plaques were

an integral part of standard extruders. The alleged benefit, namely reducing the processing time, by having the screen pack integral with the extruder, rather than requiring a separate mill to degrade the swollen rubber mass as according to WO-A-86/05192, was not unexpected and the measures claimed were obvious.

IV. In its Statement of Grounds of Appeal the Appellant argued that the objections under Article 84 EPC were ill-founded, because choosing an appropriate device and an appropriate solvent for carrying out the claimed process was well within the knowledge of one skilled in the art. Furthermore, the claimed subject-matter did involve an inventive step, because the state of the art would suggest neither the simultaneous mechanical and chemical effects achieved by passing the rubber through restriction means nor the resulting reduction of the processing time as evidenced in the description of the application.

V. On 21 March 2000 the Appellant, following the suggestions in the Rapporteur's communication of 22 December 1999, filed an amended set of four claims and an adapted description, the latter being further amended on 22 March 2000.

VI. The amended Claims 1 to 4 reads as follows:

"1. A process to reclaim cured or semi-cured rubber, which comprises subjecting the rubber in the form of particles to a solvent effective to swell said rubber to be reclaimed, characterized in that it further comprises passing the swollen rubber particles with devulcanizing agents through perforated plaques, or screens, or sponges, or porous plaques."

"2. A process according to claim 1, applied to any type of cured or semi-cured rubber composition."

"3. A process according to claim 1, applied either in a cold or hot manner."

"4. A process according to claim 1, applied either at higher or lower pressure than the atmospheric pressure."

VII. The Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the following documents:

Claims 1 to 4 submitted on 21 March 2000,
description pages 1 and 2 submitted on 22 March 2000,
and
description pages 3 to 15 submitted on 21 March 2000.

Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*

Claim 1 is based on original Claims 1 and 2 and, with respect to the use of rubber particles, on page 1, fifth paragraph (especially line 3) and on page 11, point 4 "Relastomer B") of the application as filed.

Claims 2 to 4 are based on original Claims 3 to 5.

The requirement of Art. 123 (2) EPC is therefore complied with.

3. *Article 84 EPC*

The terms used in amended Claim 1 meet the requirement of clarity.

The "restrictions" (see original Claim 1) are now defined by concrete means, and the skilled person is aware of the meaning of the terms "solvent effective to swell rubber" and "devulcanizing agent". While the latter terms are defined by reference to a purpose, no undue investigation is necessary for one skilled in the art to reduce their meaning into practice (see e.g. W. Hofmann, *Kautschuk-Technologie*, Gentner Verlag Stuttgart (1980), pages 396 (Table 5.8), 551 to 558 (Section 6.8 "Regenerieren") and 646 (Section 9.2.2.10 "Quellverhalten und Permeation"))).

From the context of the description it is, moreover, clear that the term "plaque" used in Claim 1 is meant to designate a plate, i.e. a flat element comprising passage-ways for the swollen material.

The claims are also duly supported by the description.

4. *Novelty vis-à-vis WO-A-86/05192 (~ Brazilian Patent PI-8500981)*

This document relates to a process for the regeneration of vulcanised rubber by swelling of the rubber in an organic solvent and subsequent treatment of the swollen material in a mill in the presence of "deleterious" agents (metals, alloys and derivatives selected from copper, manganese, iron, nickel, chromium and cobalt) or devulcanising agents (Claims 1 and 2 in conjunction with Examples 2, 4 to 13 and 15).

From that disclosure the subject-matter of present Claim 1 is distinguished by the different mechanical treatment, i.e. the passing of the swollen rubber particles through perforated plaques, or screens, or sponges, or porous plaques.

The subject-matter of Claim 1 is therefore novel over WO-A-86/05192, which was the only document considered in the decision under appeal.

5. *Problem and solution*

5.1 WO-A-86/05192, which is correctly acknowledged in the introduction of the application in suit, represents an appropriate starting point for a discussion of the issue of inventive step.

5.2 The problem underlying the subject-matter of Claim 1 vis-à-vis this disclosure is the provision of an alternative rubber reclaiming process (cf. page 1, fifth paragraph of the original description; Brazilian Patent PI-8500981 ≈ WO-A-86/05192).

5.3 The solution of this problem resides in the passing of the swollen rubber particles through perforated plaques, or screens, or sponges, or porous plaques.

5.4 In view of the results obtained with the rubber formulations according to samples 1 to 9 of the present description, the Board is satisfied that this problem has effectively been solved by the claimed treatment.

5.5 The available evidence does not prove that the claimed process, all steps considered together, achieves a faster reclaiming of the rubber than according to the WO-A-86/05192, as stated on page 1, fifth paragraph of

the original description. However, in view of the conclusion of non-obviousness drawn below on the basis of the broader problem as defined in point 5.2 supra, there is no need for the achievement of this more ambitious goal.

6. *Obviousness*

WO-A-86/05192 does not contain any hint at a possible replacement of the treatment of the swollen rubber in a mill by a treatment involving the passing of the swollen rubber particles through perforated plaques, or screens, or sponges, or porous plaques.

Nor is there any disclosure on file relating to a rubber reclaiming process involving the passing of swollen rubber particles through an extruder (having or not having a "screen pack") as suggested in point 4 of the Reasons of the decision under appeal (see page 3, lines 2 to 6).

There was thus no basis for the conclusion of obviousness of the then claimed process as drawn in the decision under appeal, nor can similar reasoning be used to deny inventive step for the process now claimed. Thus, in the light of the available prior art, this process is not obvious.

The subject-matter of Claim 1 thus complies with the requirements of Article 56 EPC and by virtue of their appendance to Claim 1 the same conclusion applies to Claims 2 to 4.

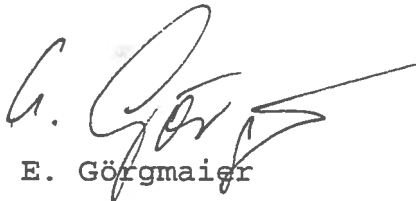
7. The claims and the amended description are thus in agreement with the requirements of the EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division with the order to grant a patent on the basis of the documents identified in point VII supra.

The Registrar:



E. Görgmaier

The Chairman:



C. Gérardin

C. Gérardin