BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen

D E C I S I O N
of 11 March 1998

Case Number: T 0539/97 - 3.2.3

Application Number: 93306104.6

Publication Number: 0581616

IPC: B08B 9/04

Language of the proceedings: EN

Title of invention:
Liquid removal process in pipelines, using a moving piston

Applicant:
Petroleo Brasileiro S.A.-Petrobras

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - additional effect"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0539/97 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 11 March 1998

Appellant: Petroleo Brasileiro S.A-Petrobras
Avenida Republica de Chile, 65
Rio de Janeiro (BR)

Representative: Barlow, Roy James
J.A. Kemp & Co.
14 South Square
Gray's Inn
London WC1R 5LX (GB)

Decision under appeal: **Decision of the Examining Division 2.3.09.113 of the European Patent Office dated 27 December 1996 refusing European patent application No. 93 306 104.6 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C. T. Wilson
Members: F. Brösamle
J.-P. Seitz

Summary of Facts and Submissions

I. With the decision of 27 December 1996 the examining division refused European patent application No. 93 306 104.6 in the light of

(D1) US-A-5 032 185 and
(D2) FR-A-2 343 979

for reasons of Article 56 EPC.

II. The appellant (applicant) lodged an appeal against the above decision on 26 February 1997 and paid the appeal fee on the same day. The statement of grounds of appeal was received on 23 April 1997. The appellant requested to set aside the impugned decision and to grant the patent with the claims 1 to 6 filed with the statement of grounds.

III. Following the board's communication pursuant to Article 11(2) RPBA dated 22 September 1997 oral proceedings were held on 11 March 1998 in which the appellant modified his request to grant a patent by submitting new documents, namely:

claims: 1 to 6

description: pages 2 to 6

drawings: two pages with Figures 1 to 5.

IV. Claim 1 thereof reads as follows:

"1. A process for removing liquid from a gas-conducting pipeline, comprising driving along the inner surface of the pipeline, by means of gas pressure, a piston introduced through an inlet opening and removed through an outlet opening, wherein said piston (1) is formed as a cylindrical body made of a flexible, polymeric foam material with a density no greater than 40 kg/m^3 without any kind of impervious resin coating and having a ratio of from 1.5:1 to 2:1 between its length and outer diameter."

V. Appellant's arguments to grant a patent on the above basis can essentially be summarised as follows:

- the feature "uncoated" of former claim 1 has been clarified in new claim 1 by the wording "without any kind of impervious resin coating";

- the requirements of Article 123(2) EPC are met since this wording can be found in the originally filed documents, see page 6, lines 31/32 or page 3, lines 23/24;

- the effect of this feature in combination with a gas-conducting pipeline is the possibility of gas passing through the pores of the polymeric foam material of the piston;

- the teaching of claim 1 cannot be seen from the prior art to be considered, namely (D1), (D2) and

(D3) SU-988 390 and its English Abstract

(D4) GB-A-1 270 378
(D5) US-A-3 148 689 and
(D6) US-A-2 906 650;

- from (D1) to (D6) only (D5) relates to a process for removing liquid from a gas-conducting pipeline whereas (D2) is restricted to a coated piston and to a drying gas and (D1) relates to a method for cleaning a pipeline which has an accumulated coating of paraffin in the line; above prior art documents (D2) to (D6) are, however, based on impermeable pistons allowing no gas to pass through the piston so that a skilled person is not directed to the method of claim 1 without the exercise of an inadmissible hindsight;

- summarising, a better pushing effect by allowing gas to pass through the piston is novel and inventive in combination with the remaining features of claim 1, namely the provision of a light weight polymeric foam as the piston material and the dimensional piston characteristics in combination with a process for removing liquid from a gas-conducting pipeline so that the patent should be granted on the basis of documents submitted in the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

2.1 Claim 1 comprises the features of originally filed claims 1, 9, 5, 7 and 4, namely inter alia the features relating to a **gas** - conducting pipeline, to a **gas pressure** as the means for driving the piston through the pipeline and to an **un**coated piston i.e. a piston **without any kind of impervious resin coating.**

2.2 The above wording for defining an **un**coated piston can be found literally on originally pages 6, lines 31/32, and 3, lines 23/24, so that "uncoated" can be replaced by the above wording "without any kind of..." without infringing the provisions of Article 123(2) EPC.

2.3 Present claims 2 to 6 correspond to originally filed claims 2 to 6 and are also in line with Article 123(2) EPC.

3. *Novelty*

Novelty was not disputed by the examining division in the impugned decision or by the board in its communication pursuant to Article 11(2) RPBA so that the clarified claim 1 is clearly based on a method which is novel within the meaning of Article 54 EPC.

4. *Inventive step*

Novelty not being disputed the crucial issue to be decided is inventive step. The following has to be observed in this respect:

4.1 Claim 1 is cast in a **one**-part form which appears to be appropriate in the present case, firstly since claim 1 is a **method** claim and secondly since (D2) seen as the closest prior art in the board's communication pursuant to Article 11(2) RPBA uses an additional **drying gas** which is not contemplated in the teaching of claim 1.

A delimitation of claim 1 over (D2) would therefore lead to an artificial independent claim giving rise to misunderstandings.

4.2 The prior art pistons whether consisting of a polymeric foam or using inflatable bodies cause problems with respect to the required elasticity or deformation capacity of the pistons ("pig") and with respect to their application in **gas**-conducting pipelines of **great lengths**, or in those with **significant changes in diameter**, see EP-A1-0 581 616, page 2, lines 22 to 43.

The problem to be solved by the invention is seen in eliminating the above problems in the prior art.

4.3 The object to be solved by the invention is solved with the features of claim 1, namely by the provision of a "lightweight" piston with a density no greater than 40 kg/m^3 without any kind of impervious resin coating ("uncoated piston").

4.5 The claimed piston is very cheap in its production compared with known pistons or inflatable bodies and allows moreover gas to pass through the piston since the piston is completely free from any impervious resin coating, see EP-A1-0 581 616, page 3, lines 43 to 45,

and page 4, lines 15 to 19.

Under these circumstances only a **small pressure difference** is needed to propel the piston along the internal surfaces of the pipeline, see EP-A1-0 581 616, page 4, lines 20 to 22, which effect is very important when the pistons have to be pumped **through risers** of the pipeline having a length of 1000 metres or so. The gas passing through the piston into the head of liquid in the riser reduces its resistance to the piston.

4.6 As pointed out by the appellant in the oral proceedings before the board the crucial features of claim 1 are the lightweight piston and its ability to allow gas to pass through the pores.

The prior art to be considered in this context points away from this teaching for the following reasons:

4.7 (D1) relates to a method of pipeline **cleaning**, namely removing **paraffin** from a pipeline in which **oil** is pumped so that (D1) has nothing to do with the process according to claim 1. What has, however, to be considered is the lightweight polymeric foam known from (D1).

In (D1) the low density polymeric foam overcomes the high friction and wear problems of higher density foams without, however, solving the removal efficiency, see EP-A1-0 581 619, page 2, lines 26 to 34; this means that the known lightweight pistons could only be used for the entrainment of solid residue (e.g. paraffin) in a liquid **over a short distance**.

Without the exercise of an **unallowable hindsight** a skilled person would therefore not rely upon the teaching of (D1) to solve the problems in a **gas**-conducting pipeline when removing **the liquid** contained in it.

4.8 From (D3), see second paragraph, a further cleaning mechanism is known which relies on a piston with a "**sealed** flexible casing" not allowing gas to flow through it. Barrier layers are used in the pistons of (D4), see column 2, lines 66 to 72, so that similar conditions are realized as in (D2), see reference sign "5" in its single figure, which seal the pistons against the possibility of fluid passing through the pistons and see also (D6) and its reference sign "2" in Figure 1 and the corresponding text of column 2, lines 45/46. The known pistons do therefore not fulfill the feature of claim 1 that the piston **is free** from any kind of impervious coating.

4.9 From (D5), see column 1, first paragraph, a method for removing liquid from a gas-conducting pipeline is known, however, "squeegees" are not found helpful in this context, see column 1, lines 46 to 71, and column 2, lines 50 to 54; the skilled person is taught that the above pistons are subject to wear, do not work and have to be adjusted in diameter according to varying and different diameters of the pipeline so that (D5) has to be seen as teaching against the application of foam-pistons.

4.10 Under these circumstances the prior art form of (D1) to

(D6) either is contradictory to the teaching of claim 1 by relying on **impervious** pistons, see (D2) to (D6), or is related to a **cleaning** method for removing a paraffin coating from an oil flowing pipeline, see (D1), and not as claimed for removing a **liquid** from a **gas**-conducting pipeline so that a skilled person not knowing the invention is not directed towards the teaching of claim 1 if the teaching against "squeegees" derivable from (D5) is duly considered.

4.11 Claim 1 is therefore based on novel and non-obvious subject-matter and is allowable, Articles 54 and 56 EPC.

4.12 Claims 2 to 6 are also allowable as dependent claims.

5. Summarizing, the impugned decision cannot be upheld.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant the patent with the following documents submitted during the oral proceedings:

claims: 1 to 6

description: pages 2 to 6

Figures: 1 to 5.

The Registrar: The Chairman:

N. Maslin C. T. Wilson