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D E C I S I O N
of 12 February 1996

Case Number: T 0713/93 - 3.2.2

Application Number: 85902197.4

Publication Number: 0179842

IPC: B30B 9/12

Language of the proceedings: EN

Title of invention:
A conveyor apparatus

Patentee:
SPIRAC ENGINEERING AB

Opponent:
(01) Hans Huber GmbH
(02) Köpcke Industrie B.V.

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (confirmed)"
"Combination invention"
"Problem statement new but not inventive"

Decisions cited:
T 0039/82, T 0109/82, T 0037/85

Catchword:
-



Case Number: T 0713/93 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 12 February 1996

Appellant: Köpcke Industries B.V.
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 27 May 1993
concerning maintenance of European patent
No. 0 179 842 in amended form.

Composition of the Board:

Chairman: H. J. Seidenschwarz
Members: M. G. Noël
M. K. S. Aúz Castro

Summary of Facts and Submissions

- I. European patent No. 0 179 842 was granted on 18 January 1989.

- II. In its Interlocutory decision of 27 May 1993, the Opposition Division maintained the European patent as amended during the oral proceedings, on the grounds that the subject-matter of claim 1 involved an inventive step with respect to the prior art.

Claim 1 reads as follows:

"An apparatus (1) for conveying and compacting compactable material containing liquid and solid components from refuse handling and waste water treatment wherein the apparatus includes an infeed portion (20) and a discharge portion (18) with a discharge opening (24), wherein a rotatable shaftless spiral (3) is disposed in a casing (2) which at least along a portion of its length is enclosing the spiral, wherein the spiral has a terminal free end (31, 32) and a free central passage extending longitudinally along the length of the spiral, wherein a drive means (4) for rotating the spiral is provided in conjunction with said infeed portion to cause the spiral to advance the material towards the discharge opening, wherein one or more infeed openings (14) for the material are disposed in said infeed portion and wherein an end portion (22, 23) of the casing (2) in conjunction with the discharge portion (18) has a substantial circular cross section to surround the spiral with slight play, wherein the end portion (22, 23) comprises a compacting zone (23) where the casing (2) is extending from and beyond said terminal free end whereby material conveyed into the compacting zone is opposed to advance, accumulated and

thereby compacted, that the end portion also comprises a precompacting zone (22) interacting with the compacting zone, said precompacting zone being placed in that region of the end portion which precedes the compacting zone and where the casing surrounds the spiral with slight play, whereby via the free central passage of the spiral compacted material interacts with the material in the precompacting zone (22) in order to gradually retard the advancement of the material and press it together, **characterised** in that a counterpressure member (8, 25, 26, 28, 35, 50) interacting with the casing (2) and movable with respect to the same is provided in connection with the compacting zone (23), and that the casing is provided with a plurality of draining openings traversing the casing wall in the region where compaction of the material takes place."

III. The prior art cited in support of the oppositions comprised in particular prior uses of various screw presses by the firm Maskinleveranser AB (ML) based on the following evidence:

- (1) A drawing dated 26 February 1981 from ML, captioned "RENSPRESS \emptyset 190", No. 8858,
- (2) A letter from Mr Leif Zetterlund (ML) to Mr den Hertog (Trijzelaar & Ruig) dated 21 September 1989, with enclosures:
 - a: Reference list ML-Screw Press 870401 (first page)
 - b: A drawing concerning delivery 8858
 - c: A drawing concerning delivery 8893
 - d: An invoice concerning delivery 8913
 - e: An invoice concerning delivery 8933
 - f: A drawing concerning delivery 8933
 - g: A drawing concerning delivery 9217
 - h: A replacement drawing concerning delivery 9217

- i: An invoice concerning delivery 9246
- j: An invoice concerning delivery 9248
- k: A brochure ML-SKRUVPRESS (in Swedish)
- l: A brochure SCREWPRESS (in English)

(2') Affidavit from Mr Leif Zetterlund to Mr den Hertog dated 21 March 1991 and supplementary to the letter of 21 September 1989

and the following documents:

(3) FR-A-1 494 284

(4) FR-A-2 522 585

IV. In the reasons for its decision, the Opposition Division held that the inventive step of the solution had to be seen in the overcoming of the prejudice against modifying the embodiment known from the closest prior art in the manner of the invention, bearing in mind the risks posed by such a modification. In the present case, a counterpressure member had to be provided at the end of the screwpress discharge hose in the Renspress apparatus according to the prior use, despite the risk of backflow of the material in the central passage of the shaftless spiral.

The Opposition Division also held that the technical problem solved by the invention was itself inventive, as there was no hint of any such problem in the prior art.

V. The Appellant (Opponent 02) filed an appeal against this decision on 29 July 1993, paid the appeal fee and submitted a Statement of Grounds within the prescribed time limits.

The Appellant argued that, having regard to the combination of either embodiment described in document (3) or (4) with the Renspress apparatus according to the prior use, the subject-matter of claim 1 did not involve an inventive step.

According to the Appellant, in the documents (3) and (4) had been posed the same problem as in the description of the contested patent, namely that of improving the compaction and dewatering of the material in the end portion of a screwpress, and disclosed similar solutions consisting of the combination of a movable counterpressure means with drainage openings in the casing.

The use of a shaftless spiral such as that in the Renspress apparatus instead of the full screw used in document (3) or (4) did not involve a prejudice which acted as a deterrent to the person skilled in the art, since it was unlikely that, given the stringy nature of the compressed material, it could flow back through the central passage of the screw, normally used as an outlet for the dewatering liquids. Whether a spiral with or without a central shaft was selected depended ultimately only on the nature of the material to be compressed.

Taking the Renspress apparatus as the starting point, the fact that the casing was slanting and the screw shorter than the casing in which it rotated was sufficient to cause the material to be compacted by gravity and by friction against the casing walls in the area beyond the screw. The fitting of an additional counterpressure member to the end of the casing was merely one equivalent means amongst many possibilities available to the skilled person by which to oppose the advance of the material in the casing and so produce sufficient compression.

VI. The Appellant requests that the contested decision be set aside and the patent revoked.

The Respondent (Proprietor of the patent) has not replied to the Appellant's Statement of Grounds and thus implicitly requests that the appeal be dismissed.

Reasons for the Decision

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

The invention as claimed relates to an apparatus for conveying and compacting solid material containing liquid, said apparatus comprising a tube-like casing 2 in which rotates a shaftless spiral 3. The spiral is shorter than the casing, so that the material is first conveyed by the spiral through the first transport zone 21 and then accumulates gradually in the intermediate precompaction zone 22 until it completely fills the end compaction zone 23 of the casing. This happens as a result of the presence of a counterpressure member which is movably attached to the end of the casing in conformity with the first feature of the characterising portion of claim 1. To enable the liquid produced by the compression process to be discharged, drainage openings 33 are provided in the casing in conjunction with the precompaction and compaction zones, in conformity with the second feature of the characterising portion of claim 1.

The counterpressure exerted by the counterpressure member makes it possible for the compaction zone at the end of the casing to be completely filled (cf. patent

specification: column 6, lines 2 to 12 and column 7, lines 4 to 9). Complete filling is a prerequisite for the achievement of the required degree of compaction (cf. amended patent, page 8, end of second paragraph), thus providing a simple and reliable technique for the batchwise discharge of the compacted material (cf. amended patent, page 3, end of second paragraph, and patent specification: column 7, lines 9 to 20).

3. *Prior art and novelty*

- 3.1 The Board has no reason to question the availability to the public of the prior use illustrated by the Renspress screwpress. This prior use has not been disputed by the parties either. There are also strong indications confirming its disclosure (the content of the letter and affidavit from Mr Leif Zetterlund, as well as drawings and order forms dated 1981 and 1982, cf. document 2a). The 1986 screwpress brochure (document 21) is dated after the priority date of the contested patent, but it can be used for explaining the design and operation of the apparatus shown, in particular, on drawings 8858, 8893 and 9217 (documents (2b), (2c) and (2g)).

The screwpress brochure describes an apparatus for conveying and compressing material containing liquids, primarily designed for continuous dewatering of screenings. Dewatering occurs mainly as a result of the friction of the material which is moved by the rotation of a shaftless spiral inside a tube-like casing which is inclined to the horizontal. The liquid is recovered after flowing through the central passage of the shaftless spiral in the opposite direction and by means of grooves provided in a peripheral lining for wear protection situated between the spiral and the casing.

The compressed, dewatered screenings are continuously discharged through the open end of the tube, i.e. extruded through the outlet.

This embodiment comprises neither a counterpressure member at the end of the casing nor drainage openings directly traversing the casing. Furthermore, in the absence of an adjustable counterpressure member exerting sufficient counterpressure, the material conveyed by the spiral cannot collect at the end of the tube and completely fill the free portion of the tube beyond the spiral. Contrary to the view expressed by the Appellant, the Board considers that the factors opposing the advance of the material, in particular the longitudinal friction against the tube and the inclination of the same to the horizontal, would alone be incapable of producing sufficient counterpressure on the material to completely fill the free end portion of the tube. Therefore, the apparatus according to the prior use does not enable the material to be compacted in the sense of the contested patent, i.e. for the purpose of batchwise discharging.

3.2 The subject-matter of claim 1 differs from the embodiments of the prior use by all the features in the pre-characterising portion directly or indirectly relating to the compaction of the material, namely: "an apparatus for compacting" (line 1), "a compacting zone" (line 20), "accumulated and thereby compacted" (line 23), "and press it (the material) together" (line 32), and by two features of the characterising portion, namely:

- "in that a counterpressure member interacting with the casing and movable with respect to the same is provided in connection with the compacting zone

- and that the casing is provided with a plurality of draining openings traversing the casing wall in the region where compaction of the material takes place".

3.3 Document (3) describes a wine press comprising a worm 2 rotating in a perforated pressure chamber 3 and a counterpressure gate 4 pivotally mounted at the end of the chamber. The problem to be solved is how to ensure uniform pressing irrespective of the quantity of material loaded into the chamber. The solution described in this document is based on the adjustment of the worm load moment (pressing load), by acting either on the counterpressure gate (Figures 1 to 2) or simultaneously on the counterpressure gate and the chamber volume (Figures 3 to 4). Concentrating on the embodiment in Figures 1 and 2, when material is introduced into the chamber the worm load moment increases and causes a back-gearred motor unit 5 to 10 to pivot around a shaft 6. A shank 11 then moves against the strength of a spring 11a to actuate electrical contacts 16, 17, which action causes the counterpressure gate to be opened or closed by a motor unit 19. The load moment is detected by the movement of the shank 11 and adjusted by the calibration of the spring 11a to ensure that the opening of the gate corresponds to a predetermined pressing load.

The embodiment in document (3) differs from the subject-matter of claim 1 even in terms of its structure, because the pressscrew has a central shaft and there are perforations along nearly the entire length of the chamber.

3.4 Document (4), which was filed by the same applicant as document (3), adds nothing further. Apart from the presence of a movable counterpressure gate 6, the

pressure chamber 3 comprises a first cylindrical section followed by a second divergent section (cf. claim 1 and Figure 3), the aim of which is to prevent the formation of an impermeable coating which adheres to the perforated grate, making it easier to remove the pressed grapes. However, this feature is not the subject-matter of claim 1 in suit.

3.5 As none of the documents considered during the proceedings discloses all the features of claim 1 in suit, its subject-matter is novel within the meaning of Article 54(1) EPC.

4. *Inventive step*

4.1 The differences set forth above (cf. point 3.2) with respect to the prior-use embodiments represent the solution to the technical problem underlying the present invention, namely the provision of a compaction apparatus enabling batchwise discharging of compacted material (cf. amended patent, page 3, end of second paragraph, and patent specification, column 7, lines 15 to 20).

The solution to this problem is to be seen essentially in the contribution of the counterpressure member which is movably attached to the end of the casing to ensure that the free end section of the casing, i.e. the compaction zone, is completely filled, (cf. point 2.).

4.2 Starting from the Renspress apparatus held by the Board as to be the prior art closest to the invention, the skilled person would not have thought of drawing on the inappropriate embodiments described in document (3) or (4), since these embodiments suggest the use of a press screw with a central shaft, which is precisely what the invention is endeavouring to avoid. Because of the

special nature of the material to be compacted, it is likely to wind around the central shaft and form plugs (cf. amended patent, page 2, first paragraph).

Even on the very unlikely assumption that the skilled person might take account of document (3) or (4) because they describe a movable counterpressure member at the end of the casing, it must again be pointed out that the object of these documents is not to compact material. The aim of document (3) is merely to achieve uniform pressing of the grapes and not to form batches of the residues. The spring adjustment which determines the pressing load is therefore such that the gate is opened when the load moment on the press screw reaches a predetermined value, which does not necessarily correspond to the end of the chamber being completely filled. Although a counterpressure member is present in document (3), this document does not therefore suggest the use of that member for compaction purposes. What it does suggest relates solely to the combination of a counterpressure member and a press screw having a central shaft.

- 4.3 As regards the Appellant's argument that, following the possible addition of a counterpressure member to the end of the Renspress screwpress, it is unlikely that the compressed material can flow back into the central passage of the screw, the board considers that, even if there is no substantiation for a risk of that kind, it is enough of a deterrent to act as a prejudice for the skilled person and to prevent him a priori from providing a counterpressure member which would only increase the risk.

In the case in point, the invention lies essentially in the new and inventive combination of a shaftless press screw and a counterpressure member for the purposes of compacting material and enabling it to be discharged in batches. Although all the components are known per se, in the invention they are combined in a new way that is not suggested by the prior art. The question to be asked is not therefore whether the skilled person could have produced the apparatus as claimed, but whether he would have done so in the light of the information available on the filing date (cf. T 37/85, OJ EPO 1988, 86). The answer is in the negative, given the prima facie prejudice against inserting a counterpressure member at the outlet from a hollow screw press.

- 4.4 Furthermore, in the case of a new application of known means (the counterpressure member), the assessment of an inventive step has to take account of the problems to be solved in the known embodiment and in the case in point (cf. T 39/82, OJ EPO 1982, 419, point 7.3). The possible difficulties due to backflow of the material are not an issue in document (3) owing to the presence of a central shaft. The fitting of a counterpressure member did not therefore involve any risk. Furthermore, as has already been stated, the compaction of material involving complete filling of the end of the pressure chamber was not sought in this document. The problem stated in the contested patent is, therefore, new. The invention does not lie in the statement of the problem, however, as held by the first instance, although the problem defined by it was posed in somewhat different terms from the Board's definition (cf. point 4.1); instead, the invention lies in the original combination of the means used (cf. likewise T 109/82, OJ EPO 1984, 473).

Whether or not a problem is new is of no importance when assessing the patentability of an invention. What finally counts is the novelty and inventiveness in the proposed solution to this problem. But if the problem is also new, this criterion naturally helps to substantiate the fact that the solution involves an inventive step, which is precisely the case when the invention relates to a new application of known means.

4.5 For the foregoing reasons and having regard to the state of the art, the subject-matter of claim 1 is not obvious to a person skilled in the art and thus involves an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:



S. Fabiani

The Chairman:



H. Seidenschwarz