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**Datasheet for the decision  
of 10 September 2024**

**Case Number:** T 0133/23 - 3.3.05

**Application Number:** 14821121.2

**Publication Number:** 3083022

**IPC:** B01F5/16, B01F7/16, B01F3/12,  
F04D29/22

**Language of the proceedings:** EN

**Title of invention:**  
A LIQUID PROCESSING MIXER

**Applicant:**  
Tetra Laval Holdings & Finance S.A.

**Headword:**  
Liquid Processing Mixer/Tetra Laval

**Relevant legal provisions:**  
EPC Art. 83  
RPBA 2020 Art. 11

**Keyword:**  
Sufficiency of disclosure - (yes)  
Remittal - (yes)

**Decisions cited:**  
T 2704/18

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

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Case Number: T 0133/23 - 3.3.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.05**  
**of 10 September 2024**

**Appellant:** Tetra Laval Holdings & Finance S.A.  
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**Representative:** Tetra Pak - Patent Attorneys SE  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 18 July 2022  
refusing European patent application No.  
14821121.2 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chair** J. Roider  
**Members:** S. Besselmann  
P. Guntz

## Summary of Facts and Submissions

I. The applicant's (appellant's) appeal is against the examining division's decision to refuse European patent application No. 14821121.2. The application concerns a liquid processing mixer.

II. Independent claims 1 and 13 of the amended set of claims of 4 November 2019 relate to a mixing unit and a method, respectively, and read as follows:

*"1. A mixing unit for mixing a flow of liquid product, comprising*

*a stator (220) forming a hollow sleeve, and*

*a rotor (210) having a circular displacement plate (240) with two opposite sides (242, 244), wherein at least one side (242, 244) has at least two chambers (214) formed by a plurality of vanes (252) extending in a direction being parallel with a longitudinal axis of the stator (220), wherein the rotor (210) is arranged within the stator (220) for rotating liquid product arranged in said chambers (214) relative the stator (220), wherein*

*the displacement plate (240) is tilted relative a longitudinal axis (Z) of the stator (220) such that a normal direction (Z') of the displacement plate 240 is angled relative the longitudinal axis (Z) so that said at least two chambers (214) have different volumes,*

*the displacement plate (240) being allowed to slide relative the vanes (252) along the direction of the longitudinal axis (Z) such that the volume of the chambers (214) may change upon rotation, and*

*a side wall (222) of the stator (220) has at least one exit area (260) comprising at least one through hole for allowing liquid product to exit the stator*

(220), wherein

the plurality of vanes (252) forms a vane assembly (250) such that each vane (252) extends radially outwards from a centre portion (212) of the displacement plate (240), such that the outer edges of the vane assembly (250) are arranged adjacent to an inner surface of the stator (220) for forming the chambers (214),

each one of said opposite sides (242, 244) of the displacement plate (240) has at least two chambers (214) formed by a plurality of vanes (252),

a single vane assembly (250) forms the chambers (214) on both sides of the displacement plate (240), and

the vanes (252) extend between an upper end (224) and a lower end (226) of the stator (220) and run through slits in the displacement plate (240)."

"13. A method for mixing a flow of liquid product, comprising the steps of:

introducing liquid product into at least two chambers (214) of a rotor (210), which rotor is allowed to rotate within a stator (220) and having a circular displacement plate (240) with two opposite sides (242, 244), which chamber (214) is formed by at least two vanes (252) extending in a direction being parallel with a longitudinal direction of the stator (220), wherein a normal direction ( $Z'$ ) of the displacement plate is tilted relative a longitudinal axis ( $Z$ ) of the stator, the displacement plate (240) being allowed to slide relative the vanes (252) along the direction of the longitudinal axis ( $Z$ ) such that the volume of the chambers (214) may change upon rotation, wherein the plurality of vanes (252) forms a vane assembly (250) such that each vane (252) extends radially outwards from a centre portion (212) of the displacement plate

*(240), such that the outer edges of the vane assembly (250) are arranged adjacent to an inner surface of the stator (220) for forming the chambers (214), each one of said opposite sides (242, 244) of the displacement plate (240) has at least two chambers (214) formed by a plurality of vanes (252), a single vane assembly (250) forms the chambers (214) on both sides of the displacement plate (240), and the vanes (252) extend between an upper end (224) and a lower end (226) of the stator (220) and run through slits in the displacement plate (240);*

*rotating (304) said rotor such that the volume of the at least one chamber is reduced, and*

*discharging (306) said liquid product by allowing the liquid product to exit said chamber through at least one hole being provided in a sidewall of said stator."*

Claims 2 to 12 and 14 depend, directly or indirectly, on claims 1 and 13, respectively.

- III. The examining division found that the invention was insufficiently disclosed (Article 83 EPC).
- IV. The appellant's main argument in support of sufficiency of disclosure was that the skilled person would understand, on the basis of geometric considerations, that the displacement plate had Z' as a fixed rotational axis.
- V. The appellant requested that the decision under appeal be set aside and that a patent be granted on the set of claims of 4 November 2019 underlying the impugned decision.

## Reasons for the Decision

1. Article 83 EPC
  - 1.1 The claimed invention is a mixing unit for mixing a flow of liquid product (claim 1) and a method for mixing a flow of liquid product (claim 13).
  - 1.2 It is an essential functional feature of the claimed invention that the volume of the chambers (formed by the plurality of vanes) changes upon rotation ("*such that the volume of the chambers (214) may change upon rotation*" in claims 1 and 13). This is explained in the paragraph bridging pages 7 and 8 and the subsequent two paragraphs in the application as originally filed. The change in volume is also essential for implementing the basic idea, namely that the mixing unit creates a suction pressure on the inlet side and a pressure on the outlet side and thus provides a high-shear mixer with a self-inducing positive displacement pump (page 2, lines 4 to 7).
  - 1.3 The structural features in claim 1 which are particularly relevant for implementing this functional feature, i.e. for causing the change of the volume of a chamber during rotation, are the following features of the rotor.
    - The displacement plate (240) is tilted relative to a longitudinal axis (Z) of the stator such that a normal direction (Z') of the displacement plate 240 is angled relative the longitudinal axis (Z) so that said at least two chambers (214) have different volumes.

- The displacement plate (240) is allowed to slide relative the vanes (252) along the direction of the longitudinal axis (Z).
- The vanes (252) extend between an upper end (224) and a lower end (226) of the stator (220) and run through slits in the displacement plate (240).

Claim 13 also specifies that:

- the normal direction of the displacement plate (240) is tilted relative to a longitudinal axis (Z) of the stator
- the displacement plate (240) is allowed to slide relative the vanes (252) along the direction of the longitudinal axis (Z)
- the vanes (252) extend between an upper end (224) and a lower end (226) of the stator (220) and run through slits in the displacement plate (240)

1.4 It was debated whether the skilled person would be able to implement these features (see point 1.3) in the claimed mixing unit and method in a manner that the intended function (point 1.2) was achieved based on the teaching of the application as originally filed and common general knowledge.

1.5 According to the impugned decision, the skilled person would understand from the description on page 6, line 25 to page 7, line 12 and Figure 3 that the displacement plate would rotate around the longitudinal axis Z of the stator. The skilled person would therefore be faced with a non-enabling embodiment. The examining division concluded that it would not have been obvious for the skilled person to modify the mixing unit to obtain the desired function.

- 1.6 It was common ground that the intended function indeed cannot be achieved if the rotational axis of the displacement plate is  $Z$ , i.e. if there is precession of  $Z'$  around  $Z$  (axes as shown in Figure 3).
- 1.7 However, neither the claims nor the description expressly specify what the rotational axis of the displacement plate is and do not require it to be  $Z$ . It is merely indicated that the rotor 210 is configured to rotate around the longitudinal axis  $Z$  of the stator and includes the displacement plate which is tilted relative to  $Z$  such that a normal direction  $Z'$  of the displacement plate is angled relative to  $Z$  (page 6, line 25 to page 7, line 12). Even if the skilled person understood from a first reading of this passage that the displacement plate itself also had  $Z$  as its rotational axis, they would immediately realise - by mere geometric considerations - that this would neither provide the required volume change upon rotation nor allow the displacement plate (240) to slide relative the vanes (252) along the direction of the longitudinal axis ( $Z$ ). The skilled person would thus conclude that a configuration in which the displacement plate has  $Z$  as its rotational axis is incompatible with the functional requirements in the claim and would not consider such a configuration.
- 1.8 The skilled person must be able to reproduce the invention on the basis of the application as originally filed without any inventive effort. The same level of skill has to be applied when inventive step and sufficiency of disclosure are being considered. The skilled person may use their common general knowledge to supplement the information contained in the application as originally filed and may even recognise and rectify errors in the description on the basis of

such knowledge (Case Law of the Boards of Appeal of the EPO, 10th edn., 2022, II.C.4.1; T 2704/18, Reasons 1.3.1).

- 1.9 In this case, the same geometric considerations which lead the skilled person to exclude Z as the rotational axis of the displacement plate would lead them to recognise that the requirements in the independent claims are met if the displacement plate has Z' as a fixed rotational axis, also taking the description into account. The paragraph bridging pages 7 and 8 discloses that during the rotation of the rotor, the volume of the chambers varies according to a periodic pattern, where one revolution [of the rotor] represents a cycle. Page 7, lines 3 to 12 disclose that by using two [synchronised] electrical motors driving the displacement plate and the vane assembly, respectively, or one motor connected to a transmission providing two synchronised rotations, a torque transfer between the vane assembly and the displacement plate can be avoided. It follows that with a single electrical motor providing a single rotation, driving the rotor involves torque transfer between the vane assembly and the displacement plate. Only if the rotational axis Z' of the displacement plate is fixed in space, the periodic pattern and the synchronised rotation of vane assembly and displacement plate can be achieved. These considerations are within what the skilled person would arrive at on the basis of common general knowledge and do not require inventive skill. This is even more so as Z and Z' are the only two axes mentioned in the application, thus limiting the number of possibilities to take into consideration. It is not apparent that there are other configurations of the mixing unit, in particular the displacement plate, within the

functional and structural limits of the independent claims.

1.10 The board is also convinced that the skilled person would be able to provide a structural implementation of the claimed invention on this basis, without the need to exercise inventive skill. It is within the normal design practice of the skilled person to provide the necessary motor(s) - disclosed in the application as originally filed (page 7, lines 3 to 12) - shafts, bearings, etc.

1.11 For these reasons, the requirements of Article 83 EPC are met.

2. Scope of examination in the appeal proceedings and remittal

2.1 The impugned decision exclusively dealt with Article 83 EPC. These appeal proceedings have therefore also been limited to Article 83 EPC.

2.2 In the board's communication pursuant to Article 15(1) RPBA (point 6), the question of essential features (Article 84 EPC) was provisionally addressed in so far as it was a direct consequence of the board's preliminary opinion that the invention was insufficiently disclosed. With the above finding on sufficiency of disclosure (point 1.), the board's preliminary view that independent claims 1 and 13 - not specifying the rotational axis of the displacement plate - might not contain all the features essential for achieving the required change in volume is not maintained. This, however, does not exclude that other

issues of clarity and conciseness (Article 84 EPC) may need to be addressed during further prosecution.

2.3 In this case, the EPO, acting as the International Searching Authority, found certain claims unsearchable because it considered that the application did not meet the requirements of sufficiency of disclosure of Article 5 PCT and thus issued an incomplete search report. In light of the board's finding that the invention is sufficiently disclosed, an additional search may be necessary during further prosecution (Guidelines for Examination in the EPO, March 2024, C-IV.7.3).

2.4 In light of the above, the circumstances of this case qualify as a special reason for remittal under Article 11 RPBA 2020.

## 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 for further prosecution.

The Registrar:

The Chair:



C. Vodz

J. Roider

Decision electronically authenticated