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**Datasheet for the decision  
of 14 March 2007**

**Case Number:** T 1185/04 - 3.2.01

**Application Number:** 00946545.1

**Publication Number:** 1200298

**IPC:** B62B 3/06

**Language of the proceedings:** EN

**Title of invention:**  
Lift truck with weighing system

**Applicant:**  
Ravas Europe B.V.

**Opponent:**  
-

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 54, 56

**Keyword:**  
"Novelty (yes)"  
"Inventive step (yes)"

**Decisions cited:**  
-

**Catchword:**  
-



Case Number: T 1185/04 - 3.2.01

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.01  
of 14 March 2007

**Appellant:** Ravas Europe B.V.  
Toepadweg 7  
NL-5301 KA Zaltbommel (NL)

**Representative:** Jilderda, Anne Ayolt  
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**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 23 April 2004  
refusing European application No. 00946545.1  
pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** S. Crane  
**Members:** P. L. P. Weber  
C. Heath

## Summary of Facts and Submissions

I. The appeal is against the decision of the Examining Division dated 23.04.04 to refuse application 00946545.1.

Notice of appeal was filed on 22.06.2004 and the fee paid on the same date.

The grounds of appeal have been filed on 01.09.2004.

II. The following documents are in the procedure:

D1 : FR-A-2752298

D2 : EP-A-0803717

D3 : WO-A-91/08977

D4 : WO-A-82/02024

III. Oral proceedings were held on 14.03.2007.

The appellant requested that the decision be set aside and the grant of a patent on the basis of Claims 1 to 10 and pages 1 to 10 of the description both as submitted at the oral proceedings, and the drawings as originally filed.

IV. Claim 1 reads as follows:

Mobile lifting device comprising a mobile frame (1) with lifting means (3,6,7) for receiving and lifting a cargo and comprising weighting means, which comprise a pressure or strain sensitive sensor (20) and a display panel (21) coupled to said sensor (20), for detecting and displaying at least an indication of a weight of said cargo, **characterized in that** said sensor of said weighing means is arranged on an exposed surface of a

part of said frame, said part being prone to mechanical deformation under the influence of said weight of said cargo, in order to detect said deformation and to generate this as an electronic signal.

V. The arguments of the appellant can be summarized as follows:

The invention avoids the drawbacks of the prior art by applying a weighing element over an existing, original part of the lifting device. This was now expressed more precisely by the wording of amended Claim 1 in comparison with the claim rejected by the Examining Division.

In D1 on the contrary the "capteur de force" replaces a part of the original frame so that it is not arranged on an exposed surface of a part of it.

D1 does not disclose that the sensor or strain gauge 26 arranged on the exposed surface of the "capteur de force" 13. In this respect the corresponding drawing in Fig. 3 giving the impression that the sensor 26 is and the electrical cables are arranged on the outside surface of the element 13 must be considered to be schematic. That Fig. 3 is schematic can be seen from the fact that the electric cables are shown with sharp corners, which would obviously not be the case.

For the skilled man reading D1 it is clear that the element 26 shown in the figure and designated as sensor or strain gauge in the description, cannot be the strain gauge or sensor itself but only the lid giving access to the strain gauge placed underneath in a

cavity together with the necessary electronic means the strain gauge is functioning with.

This construction can also be seen on the load cell shown during the oral proceedings and corresponding to state of the art load cells at the priority date. It can further be seen in the leaflets from load cell manufacturers presented during the oral proceedings which all show the cavities in which the sensor or strain gauge is fixed.

For the skilled man at the priority date there is thus no doubt that the strain gauge used in D1 is not mounted on an exposed surface of a part of the frame as required by present Claim 1 but inside the load cell.

D2 also discloses sensors interposed between bars 3 and 4, thus not arranged on an exposed surface of a part of the frame, but integrated.

In D4 as well, the sensor is not arranged on an exposed surface of the existing construction.

The present invention breaks with the existing prior art by merely measuring a deformation in an existing part of the original frame.

## **Reasons for the Decision**

1. The appeal complies with the requirements of Articles 106 to 108 and Rule 64 EPC. It is therefore admissible.
2. In the first part of Claim 1 it has been added that the sensor and display panel are for detecting and displaying at least an indication of the weight of the cargo. This is disclosed in original claims 6 to 9,

Fig. 3 and the corresponding part of the description as well as e.g. in the first paragraph of page 5 from which it is clear that the measurement and displaying accuracy is such that only an indication of the weight is given and not an accurate exact value.

The feature that "the sensor of said weighing means is arranged on an exposed surface of part of said frame" has been added to the characterising portion of the claim and is intended to express that the components are added to the frame e.g. the existing frame, and that the components once removed leave the frame essentially as it was. A basis for this amendment can be found at several places in the description as for example page 3, lines 28 to 31, where it is mentioned that the sensor can simply be arranged over an existing part of the construction. On page 4, lines 1 to 3, it is further indicated that the sensor is arranged on a part of the frame which mutually connects the lift forks which also implies that the sensor is arranged on the exposed surface of the part of the frame. Figure 1 also clearly is a basis for the amendment where the sensor 20 is shown fixed on the part 12 of the frame. On page 5, line 30 onwards, it is also mentioned that the sensor of the weighing device in the mobile lifting device ... is arranged not in but, instead, on the construction of the mobile lifting device. On page 6, lines 6 and 7, it is further indicated that the sensor is arranged outside the construction and not in the construction.

Thus, the board is satisfied that amended Claim 1 fulfils the requirements of Article 123(2) EPC.

3. None of the cited documents discloses the subject-matter of Claim 1.

3.1 In D1, in a pallet truck, the bridge structure allowing the transmission of the force from the hydraulic piston rod end to the forks is replaced by a weighing means in the form of a mechanical element 13 called a "capteur de force" and including a sensor 26, which element fulfil both functions of connecting the end of the piston rod to the frame and measuring the load. When looking at Fig. 3 of D1, it appears at first sight that the circular element designated with the reference numeral 26 is the strain gauge and that the electrical cables going from the strain gauge to the electronic means are disposed on the lateral exterior surface of element 13.

However on page 7 lines 27 to 31 of D1, it is explained that the "capteur de force" 13 bears strain gauges 26 and that the strain gauges 26 are disposed within cavities on each side of the "capteur de force" 13. This type of construction was also visible on the load cell shown by the appellant during the oral proceedings having the same shape as the one shown in Fig. 3 of D1 and having one cavity on each lateral side in which the strain gauge and the associated measuring bridge was disposed. This load cell was said to be of the type shown in Fig. 3 of D1.

On the basis of the explanations given and the leaflets of load cell manufacturers shown by the appellant during the oral proceedings, the board accepts that for the skilled man at the priority date, the strain gauge 26 appearing in Fig. 3 of D1 would not have been

understood by the skilled man as being on the outer and thus exposed surface of the "capteur de force" 13, since that interpretation would not be in line with this general knowledge at that time.

3.2 D2 discloses a lifting device with a fork and a built-in weighting system. This system includes strain sensitive sensors, placed between first and second connecting arms 3,4 of the forks, see col. 1, lines 7-9, col. 2, lines 22-24. The sensors give their signals to a controller for calculating the weight on the fork. An embodiment clearly showing a particular type of sensor and how they are mounted is not disclosed in the document. However, the skilled man could reasonably assume in the circumstances that they form the actual load transferring connection between the arms 3 and 4. There is accordingly no suggestion that the sensor of the weighing means is arranged on an exposed surface of a part of the frame to detect its mechanical deformation.

3.3 D3 and D4 both concern a lifting cart or pallet lifting device in which the weight is determined by placing a load cell between the upper end of the piston rod and the horizontal portion of the part connecting the two branches of the fork on which the piston rod end is acting. Both documents are additionally concerned with the way and the moment at which the weight should be measured. It is quite clear that no deformation of anything else than the sensor itself is measured.

Thus, the subject-matter of Claim 1 is novel.



4. *Inventive step*

4.1 The prior art mobile lifting device according to D1 is considered to be the closest prior art because it discloses all the features of the first part of claim 1 and from the four documents on file, this is the only one in which it is unambiguous that the sensor detects the deformation of part of the frame, namely the element 13.

4.2 The subject-matter of claim 1 differs from the prior art according to D1 in that the sensor of the weighing means is arranged on an exposed surface of a part of the frame, said part being prone to mechanical deformation under the influence of said weight of the cargo, in order to detect the deformation and to generate this as an electronic signal.

4.3 The effect of this distinguishing feature is that there is no need to replace an existing part of the frame by the sensor elements and that the weight on the fork can nevertheless be measured. In other words the existing frame can remain as it is and the weighing device is simply mounted to it. The electronic signal generated by the sensor and representative of the deformation of the part of the frame to which the sensor is connected can be analysed and allows a determination of the weight on the fork.

4.4 The objective problem to be solved can thus be considered to be to simplify the mounting of the weighing device while maintaining sufficient accuracy of the measuring system.

This problem is a general problem of the skilled man as it is one of his general concerns to simplify existing devices in order to save costs. It is also self evident that by simplifying such devices the skilled man does not wish to lose the basic functionality of the device.

This problem is solved by the invention since it provides a sensor which is fixed on an existing part of the existing frame of the mobile lifting device, which is far less cumbersome and less complicated to manufacture than the replacement of a part of the frame as in the device according to D1. By measuring the deformation of a part of the frame subject to deformation when there is weight on the fork, the invention provides a simple way of assessing the weight of the load on the fork. Since the deformation of the mechanical part of the frame on which the sensor is fixed is bound to be dependent on the weight of the cargo on the fork, after an adapted calibration the device will be able to give an indication of the weight on the fork.

- 4.5 This solution is not obvious in the light of the general knowledge of the skilled man nor is it suggested by any of the other cited documents.

In the board's opinion a skilled man wishing to simplify the construction of D1 would not separate the strain gauges 26 from the "capteur de force" 13 as these parts are adapted to each other so as have corresponding behaviours under load in order to give the best possible estimation of the weight. Thus it is not a natural step to take to separate these elements which are meant to function together.

D2 does not give any precise indication of the way the sensors are affixed to the arms, nor does it indicate what exactly is measured, in particular whether a deformation of a particular part of the frame is measured or something else. This document thus cannot suggest the characterising feature of claim 1.

D3 and D4 have the sensors placed between the end of the piston rod and the part of the frame on which the end of the rod acts. Thus the sensors in these documents do not measure any deformation of an existing part of a frame but rather are directly compressed by the force exerted by the piston rod end on the part of the frame directly opposite to this end. In other words, starting from D1, these documents would rather suggest using a normal frame and replacing the "capteur de force" (13,26) by a sensor directly placed on top of the piston rod.

Thus in the board's opinion the subject-matter of Claim 1 is novel and inventive.

**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 the first instance with the order to grant a patent in the following version:
  - Claims 1 to 10 and description pages 1 to 10 as submitted at the oral proceedings of 14.03.2007;
  - drawings as originally filed.

The Registrar:

The Chairman:

A. Vottner

S. Crane