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D E C I S I O N
of 29 March 2006

Case Number: T 0570/04 - 3.2.01

Application Number: 00830642.5

Publication Number: 1193164

IPC: B62D 33/06, B60J 5/06, E02F 9/16

Language of the proceedings: EN

Title of invention:
A cab for earth-moving machines

Applicant:
Komatsu Utility Europe S.p.A.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - no"

Decisions cited:
-

Catchword:
-

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Case Number: T 0570/04 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 29 March 2006

Appellant: Komatsu Utility Europe S.p.A.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 17 November 2003 refusing European application No. 00830642.5 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: S. Crane
Members: J. Osborne
C. Heath

Summary of Facts and Submissions

I. The appeal is directed against the decision posted 17 November 2003 to refuse European application No. 00 83 0642.5 (EP-A-1 193 164) due to lack of inventive step of the subject-matter of claim 1.

II. The following prior art played a role during the appeal proceedings:

D1: EP-A-1 001 094

D8: US-A-3 692 083.

III. During oral proceedings held 29 March 2006 the appellant requested that the decision under appeal be set aside and a patent granted on the basis of respective claims 1 to 5 according to a main and an auxiliary request filed with a letter of 28 February 2006.

IV. Claim 1 according to the appellant's main request reads:

"A mini-excavator comprising a frame (2) having a fixed part (4) and a movable part (5) provided with a junction element (6) for the coupling of an articulated arm, said movable part (5) being rotatable about a vertical axis of rotation (C), a cab (1) mounted on said movable part (5) and having an operating radius (R) corresponding to the maximum overall dimensions of the cab (1) during the rotation of the machine, said cab (1) comprising a closed structure (7) having at least an opening (8) and at least a door (9) hinged to said structure (7) in correspondence with said opening (8) and movable from a

closed position to an open position, said door (9) in said open position being external to said structure (7), said vertical axis of rotation (C) passing inside the cab (1), said junction element (6) being disposed in front of the cab (1), characterised in that said door (9) comprises at least a first (14) and a second wing (15) mutually connected in bellows-like fashion, said first wing (14) of said door (9) being hinged to said structure (7) according to a substantially vertical axis of rotation and said second wing (15) of said door (9) being hinged to said first wing (14) according to a substantially vertical axis of rotation, in that the cab (1) further comprises at least a guide (20) obtained in proximity to said opening (8), and at least a guide element (21) connected to said second wing (15) of said door (9) and slidingly engaged to said guide (20) to guide the movements of said door (9), in that, when the door is in the open position, the distance of all points of said door (9) from the centre of rotation (C) is lesser than the operating radius (R), and in that said wings (14), (15) of said door (9), in said open position, face each other and are adjacent to the structure (7)."

Claim 1 according to the appellant's auxiliary request differs in that the preamble contains the following additional feature:

"said cab having a width substantially corresponding to the width of the movable part".

V. The appellant's arguments may be summarised as follows:

As regards the main request, the features of the preamble of claim 1 represent a conventional small mini-excavator. The characterising features solve the problem of providing a door which when open does not extend outside the operating radius. The relevant state of the art does not disclose such a solution to this problem. D8 relates to a larger machine in which the lifting arm, not the cab, determines the operating radius. It relates to a problem which occurs when the door is closed and contains no teaching relevant to the present problem. Moreover, the double thickness of the open door in D8 would prejudice the person skilled in the art from using such a door with a mini-excavator. Even D1, which relates to an excavator somewhat larger than presently claimed, employs a recess in the wall of the cab to accommodate a single wing door when open. The smaller dimensions of the excavator according to the present application leave no possibility of a recess to accommodate the door according to D8.

The additional feature in claim 1 according to the auxiliary request is disclosed to the skilled person in the drawings and in paragraph [0060] of the description as published. In particular, figure 1 shows the anchorage for the excavator arm which is in the centre of the width of the cab and shows both the side wall and the front right hand corner of the cab as being flush with the movable part. The additional feature further defines the claimed subject-matter as relating to the type of excavator in which the space problem is greatest.

Reasons for the Decision

1. The application relates to a mini-excavator having the mounting bracket ("junction element") for an operating arm mounted in front of the operator's cab. The cab has an access door for the operator and is mounted on a platform ("movable part") which is mounted on and rotatable relative to, typically, a tracked base ("fixed part"). It may be convenient for the excavator to be operated whilst the door is open. As with larger excavators an important design criterion for a mini-excavator is the operating radius, namely the radius of the largest circumference described by a point of the cab when it rotates through 360° relative to the fixed part. For reasons of safety it is desirable that an open door does not extend outside of the operating radius.

Main request

2. The closest prior art in the present case is a mini-excavator as represented by the features in the preamble of present claim 1. In such machines the cab is of minimal dimensions. A doorway which is large enough for the operator therefore will occupy a large proportion of the length of the cab, typically two-thirds according to the appellant. A simple hinged door having the size of the opening therefore would reach beyond the extent of the cab when open. The characterising features of present claim 1 solve the problem of safely permitting the door to be kept open whilst the excavator is in operation.

2.1 D1 relates to a somewhat larger excavator having the mounting bracket of the excavator arm beside the cab, between it and the engine compartment. The cab is shaped to provide maximum interior width such that in plan the side of the cab containing the door approximates to two chords of the circle defined by the operating radius. The door closes the forward part of the side of the cab and folds back onto the rear part when open. This rear part comprises a recess into which the door enters to enable it to remain within the operating radius. The problem of accommodating an open door within the operating radius of an excavator therefore is not new. The dimensional limitations in a mini-excavator as defined in the preamble of present claim 1 render the problem with such a machine more acute than in the case of a machine according to D1. It follows that, although no state of the art according to Article 54(2) EPC on the file relates to the problem in the particular context of a mini-excavator as defined in the preamble of present claim 1, the realisation of the problem would be obvious for the person skilled in the art of excavators in general.

2.2 Folding doors *per se* are well known, as acknowledged by the appellant and confirmed by D8. In its review of the earlier state of the art D8 indicates that folding doors are commonly used in order to reduce the space requirement for an open door which is perpendicular to the opening and as an example mentions their use on cupboards in homes. It states that in the case where such doors open through a further 90 degrees a track extension may be provided to guide the door into this position. It then goes on to explain that bi-fold doors already had been used extensively in cabs for

agricultural and construction vehicles but that in such cases the track extension would unacceptably increase the width of the cab when the door was closed. The essential aim of the disclosure of D8 is to decrease the bulk of the track when the door is closed. In the preferred embodiment a bi-fold door is provided on the cab of a mobile crane and in its open position is stowed against the panel rearwards of the opening. The appellant does not dispute that D8 discloses all of the features of the characterising portion of present claim 1.

2.3 The concept of the bi-fold door having a smaller length when open than closed falls within the general knowledge of the skilled person. This is confirmed by the discussion in D8 of the earlier state of the art as exemplified by their use on cupboards in homes. Although it is stated there that the space saving is achievable in the direction perpendicular to the opening it is implicit for the skilled person that the same consideration applies within the plane of the opening when the door is further pivoted to lie parallel to it. The skilled person faced with the problem that the door on a mini-excavator when open extends beyond the cab out of the operating radius would readily appreciate from his general knowledge that the bi-fold door would provide a solution to the problem. However, he would need to search for a door suitable for being held open whilst the machine is in use. D8 provides in its preferred embodiment in a related technical field a bi-fold door which opens to lie against a panel approximately half the length of the opening, which may be retained in that position and which has all of the characterising features of present

claim 1. In the view of the board it would be an obvious measure for the skilled person to apply this teaching to a mini-excavator as defined in the preamble and thereby arrive at the subject-matter of present claim 1.

2.4 The appellant takes the view that the thickness of the folded door shown in D8 would act as a deterrent or "prejudice" against the use of such a door in a mini-excavator. The board disagrees. Even if the illustration of the space requirement for the open door in figure 4 of D8 were to be considered as tantamount to a teaching to the skilled person of inefficient use of the available width and therefore inappropriate for a mini-excavator, it is established jurisprudence of the boards that such a single disclosure would not be sufficient to establish a prejudice (see Case Law of the Boards of Appeal of the European Patent Office, 4th edition 2001, I.D.7.2). The cab according to D1, to which the appellant refers in support of its argument in favour of a prejudice, provides maximum interior width by taking full advantage of the space available within the operating radius but consequently has to provide the recess to accommodate the external open door. However, the recess merely results in a reduction once again in the interior dimension. By comparison, the present application illustrates in figure 3 a cab which has a somewhat flatter side wall. The teaching according to the present application requires no recess to accommodate the open door because it is generally less efficient than D1 in creating interior space in the cab. In other words, the possibility of providing a recess is not a function of the size of the machine but of the amount of the space available which is to be

contained within the cab. It follows that there is no support in the application for the appellant's argument that the dimensions of a mini-excavator as presently claimed leave no possibility of a recess. If the open door according to D8 does require more space in the transverse direction than a single wing door when open a choice to sacrifice interior space to accommodate it, in order to gain the advantage of the reduced extension in the longitudinal direction, would not require inventive activity on the part of the skilled person.

3. It follows from the foregoing that the subject-matter of claim 1 according to this request does not involve an inventive step (Article 56 EPC).

Auxiliary request

4. The subject-matter of claim 1 according to this request differs from that of the main request by the addition of the feature that the cab has a width substantially corresponding to the width of the movable part. This wording is not contained in the original application and the board has doubts as to whether it was, in fact, disclosed to the skilled person (Article 123(2) EPC). Nevertheless, the feature is contained in the preamble and merely serves to further define the type of mini-excavator to which the claimed subject-matter relates. The addition of this feature does not change the above assessment of inventive step. As a result, this request fails also. It is therefore not necessary to further consider the matter of original disclosure.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Vottner S. Crane