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**Datasheet for the decision
of 30 March 2017**

Case Number: T 0692/12 - 3.2.01

Application Number: 03763963.0

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Language of the proceedings: EN

Title of invention:

CONTROL SYSTEM FOR A LOAD HANDLING APPARATUS

Patent Proprietor:

J.C. BAMFORD EXCAVATORS LIMITED

Opponent:

MANITOU BF

Headword:

Relevant legal provisions:

EPC Art. 123(2), 83, 54, 56
RPBA Art. 13(1)

Keyword:

Added subject-matter (no)
Sufficiency of disclosure (yes)
Novelty (main request : no)
Inventive step (auxiliary request 4 : yes)
Admission of auxiliary request (yes)

Decisions cited:

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

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Case Number: T 0692/12 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 30 March 2017

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 23 January 2012
rejecting the opposition filed against European
patent No. 1532065 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman G. Pricolo
Members: C. Narcisi
S. Fernández de Córdoba

Summary of Facts and Submissions

- I. The Opposition against European patent No. 1 532 065 was rejected by the Opposition Division with its decision posted on 23 January 2012. Against this decision an appeal was lodged by the Opponent on 23 March 2012 and the appeal fee was paid on the same day. The statement of grounds of appeal was filed on 14 May 2012.
- II. Oral proceedings took place on 30 March 2017. The Appellant (Opponent) requested that the decision under appeal be set aside and that the patent be revoked. The Respondent (Patentee) requested that the appeal be dismissed and that the patent be maintained as granted (main request) or, in the alternative, that the patent be maintained in amended form according to auxiliary request 4, filed on 28 February 2017. The other auxiliary requests were withdrawn (in writing and during the oral proceedings).
- III. Granted claim 1 reads as follows:
- "A control system (40) for a machine (10) which includes a load handling apparatus (14), the load (L) being moveable relative to a body (12) of the machine (10) by the load handling apparatus (14), the load handling apparatus (14) being a lifting arm which is moveable about a generally horizontal axis (B) relative to the body (12) of the machine (10), the arm (14) thus being capable of raising and lowering the load (L) upon operation of a fluid operated actuator (24), the machine (10) including a pivot (C) about which a tipping moment is produced by the load (L), the load handling apparatus (14) being capable of lowering the load (L) to a position at which the tipping moment is

at a predetermined threshold value, the control system (40) including a sensor (30) to sense the tipping moment and to sense when the value of the tipping moment is approaching the threshold value and to provide an input to a controller (32) in response, characterized by the controller (32) being responsive to the input to operate a proportional fluid valve (42) to reduce the flow of fluid to the actuator (24) so that the speed of movement of the load (L) is progressively reduced as the lifting arm (14) is continued to be lowered."

Claim 1 of auxiliary request 4 differs from granted claim 1 in that the wording "is continued to be lowered" is replaced by the wording "is continued to be lowered, wherein the machine (10) includes a ground engaging structure by which the machine is supported on the ground, the ground engaging structure including pair of supports (19), the tipping moment being produced about a pivot axis (C) established by one of the supports, and the tipping moment being sensed by the sensor (30) sensing loading of the other (19) of the supports, and the machine (10) is a wheeled load handling machine (10) having a ground engaging structure including a pair of supports (19) provided by axles which each carry wheels (16, 17), and the tipping moment is produced about a rotational axis (C) of one of the pairs of wheels (16) and the sensor (30) senses the loading on the other pair of wheels (17)."

IV. The Appellant's submissions may be summarized as follows:

The subject-matter of claim 1 and the patent specification (hereinafter designated as EP-B) do not disclose the invention in a manner sufficiently clear

and complete for it to be carried out by a person skilled in the art. The feature "tipping moment" is not clearly defined, for neither the position of the pivot axis (C) nor the parameters determining the "tipping moment" (such as variable length of the telescopic arm, load etc.) are clearly stated in EP-B. Further, it is entirely unclear in which way the claimed sensor would be capable of directly "sensing" or measuring a "tipping moment", no such sensor having been invented according to the disclosure of EP-B. Also, contrary to the stated object of the invention (see EP-B, [0009]), stability of the machine during load movements is not obtained, since no control of tipping moment in a transverse direction is performed. All dependent claims are likewise not sufficiently clearly disclosed, since corresponding objections may be raised as above in relation to the "tipping moment" (see letter dated 17 February 2017; inter alia only the load (not the "tipping moment") on the rear axle is measured by the sensor).

The feature reading "sensor (30) to sense the tipping moment and to sense when the value of the tipping moment is approaching the threshold value and to provide an input to a controller (32) in response" is to be understood (according to a first interpretation) as implying an "intelligent sensor" capable of determining by itself whether said "threshold value" is being approached and communicating the result to the controller. According to a second interpretation, the same feature is understood as the sensor merely "sensing" the tipping moment and providing this information to the controller to decide whether a "threshold value" is approached. However, a sensor according to either interpretation has not been disclosed in EP-B in a clear and complete manner, thus

both embodiments covered by claim 1 could not be carried out by the skilled person.

Finally, the feature reading "the controller (32) being responsive to the input to operate a proportional fluid valve (42) to reduce the flow of fluid to the actuator (24) so that the speed of movement of the load (L) is progressively reduced as the lifting arm (14) is continued to be lowered" is not sufficiently clearly and completely disclosed, for EP-B does not describe in which way the electric signal is generated, as well as the timing of the signal's start and its duration when approaching said "threshold value" (this term being also unclearly defined in EP-B, [0011], [0040]): see "predetermined threshold value", "set threshold value", "permitted threshold value") of the tipping moment. In this respect the features included in the dependent claims are likewise insufficiently disclosed. Consequently, the operation of the "proportional fluid valve" is similarly not sufficiently clearly described in EP-B, for the specific signal to be applied such as to "progressively" reduce the speed of movement of the load is not detailed in EP-B (issues designated as "solenoid operated proportional valve" and "proportional fluid valve and progressive reduction").

The subject-matter of claim 1 extends beyond the content of the application as filed. First, the term "including an actuator" (as indicated in claim 1 as filed) was omitted in granted claim 1, the granted claim thus also encompassing an embodiment wherein the load is raised by operation of an external actuator. Second, the aforementioned feature reading "sensor (30) to sense the tipping moment and to sense when the value of the tipping moment is approaching the threshold value and to provide an input to a controller (32) in

response" (see above issue relating to "intelligent sensor") is not supported by the application as filed (see published patent application (hereinafter designated as WO-A), claim 1 and description, page 7, lines 17-21). Third, the feature reading the "controller being responsive to the input to operate a proportional fluid valve" was not disclosed in WO-A, for direct action of the controller on the proportional valve was not disclosed. Further, the description in EP-B (see [0004]) includes erroneous and inaccurate references to documents allegedly relating to "intelligent sensors", no such references being included in WO-A. Finally, granted dependent claim 7 encompasses features not included in WO-A, such as the sensor being disposed on the front wheel axle, which was not included in claims 9 to 11 as filed. Also, the term "proportional fluid valve" in claim 1 may be construed as comprising the main control valve (44), the claim thus encompassing subject-matter not originally disclosed.

The subject-matter of granted claim 1 lacks novelty over D1 (GB-A-1 403 046)/D2 (FR-A-2 184 108) (these documents disclosing the same technical object and belonging to the same patent family), for the characterizing features of claim 1 are known from D1/D2. In effect, the main line valves 15, 15' (providing hydraulic fluid to the hydraulic cylinders of the actuators) act as proportional fluid valves (see also submissions dated 17 February 2017) since they are responsive to a first (higher) pressure level in the control circuit, as set by limiting valves 29, 29', and to a second (lower) pressure level, as set by limiting valves 30, 30' (see figures 2, 2A). Therefore, the line valve 15 (or 15') has two intermediate open positions (corresponding to two possible fluid directions and to

said second control pressure), two fully open positions (corresponding to two possible fluid directions and to said first control pressure) and a neutral closed position. The fluid flow through line valves 15, 15' to the respective actuators (hydraulic cylinders) is therefore correspondingly progressively reduced, as the line valve 15 moves from a fully open to an intermediate position and further to the neutral position (closed). Thus, line valve 15 is to be regarded as being a proportional valve, for it performs the very functions of such a valve.

The subject-matter of claim 1 lacks novelty over D5 (EP 0 059 901). Indeed, the feature "a sensor to sense the tipping moment and to sense when the value of the tipping moment is approaching the threshold value and to provide an input to a controller in response" is known from D5, for D5 discloses sensors measuring the deployed length of the lifting arm and its lifting (elevation) angle (in the vertical plane) (D5, page 7, last two paragraphs; page 10, penultimate paragraph; page 2, lines 28-30); claim 1), thus determining the actual horizontal extension ("portée P") of the lifting arm (projection of the deployed length in the horizontal plane) and the maximum extension Pa for a known predetermined load (see figure 3; description, page 6). Thus, equivalently a tipping moment corresponding to extension P and a threshold value for the tipping moment corresponding to maximum extension Pa are indirectly determined. The same occurs according to EP-B, wherein the tipping moment and its threshold value are indirectly determined (by measuring the load on the rear axle). The characterizing portion of claim 1 is likewise known from D5, given that the speed of the lowering (or lifting) movement (and speed of deployment of the telescopic arm) are progressively

reduced (see claim 1; figures, 13, 14, 17, 18; pages 22,23) as the horizontal extension P of the lifting arm exceeds a calculated limit P_r and approaches the threshold value P_a . This speed reduction is achieved through reduction of fluid flow to the actuator by means of proportional valves 61 to 64 (figure 7, page 15; claim 1).

Auxiliary request 4 should not be admitted to the appeal proceedings since it was filed only one month before the date set for oral proceedings and since it was not filed in response to the arguments of the Appellant or to the communication of the Board.

The subject-matter of claim 1 of auxiliary request 4 is not inventive over D1/D2 or D5, in view of the skilled person's common general knowledge, or of further documents D6 (FR-A-2 750 972) and D21 (US-A-4 042 135). The skilled person (starting from D1/D2 or D5), aiming at providing an alternative way of disposing the load sensor, would locate this sensor in an obvious and conventional manner (see also EP-B, [0032]) on the rear axle of the load handling machine to get an indication of the tipping moment of the wheeled vehicle, this load value being communicated to the controller to determine whether a threshold value for the tipping moment is approached. The subject-matter of claim 1 would thus be obtained without exercising an inventive activity.

Alternatively, the skilled person would combine in an obvious manner D1/D2 (or D5) with D6, disclosing a load sensor 27 (D6, pages 15,16; figure 2) disposed on the rear axle 4 of a load handling apparatus or machine. This combination would be obvious since both D1/D2 or D5 (see e.g. D2, page 4, line 29; D5, page 1) as well as D6 (see figure 1) relate to wheeled vehicles and

deal with the same technical problem (D6, page 1; paragraph bridging pages 4-5), i.e. preventing and precluding tipping over of the vehicle with an adequate safety margin. The skilled person (aiming at providing an alternative position for the load sensor) would therefore arrange the load sensor on the rear axle of the vehicle, thus arriving at the claimed subject-matter in an obvious manner. Alternatively and similarly, the skilled person would combine D1/D2 or D5 with D21, which discloses a load lifting apparatus including a load sensor 27 on a rear axle (column 1, lines 50-59; column 3, lines 25) to warn the operator and to stop boom lower and boom extension rams when the tipping moment exceeds a predetermined value and an unstable condition is approached. Consequently, the skilled person would likewise obtain in an obvious way the subject-matter of claim 1.

The subject-matter of claim 1 of auxiliary request 4 lacks an inventive step over D6 in view of the skilled person's common general knowledge or in view of D1/D2 or D5. In effect, according to D6 corresponding devices could be employed to reduce power or fluid flow (D6, page 22, lines 25-27) when a threshold value (for given values measured by sensors) is reached or exceeded, thus suggesting the use of a proportional valve to progressively reduce the movement of the lifting arm. Such a valve forms part of the skilled person's common general knowledge and its use in the lifting machine of D6 would be obvious. The skilled person would thus arrive at the subject-matter of claim 1.

Alternatively, employing a proportional valve would be suggested by D1/D2 or D5, both documents disclosing the use of such a valve for reducing fluid flow when the sensed load (e.g. on the rear axle) exceeds a predetermined threshold. The skilled person would

obviously combine D6 with D1/D2 or D5 and would install a proportional valve in the lifting machine of D6 to reduce fluid flow to the hydraulic actuator when the sensed load approaches a threshold value.

The amended description does not comply with the requirements of Article 84 EPC, in particular with regard to paragraphs [0002], [0012], [0030] and [0047] of EP-B, which contemplate the use stabilisers (in contact with the ground). In this case the position of the pivot axis is not clearly defined, and the scope of protection conferred by claim 1 would be also not unambiguously defined (Article 69 EPC).

V. The Respondent's arguments may be summarized as follows:

The invention is disclosed in manner sufficiently clear and complete for it to be carried out by the skilled person. Concerning the issue relating to the "tipping moment" it is emphasized that EP-B clearly defines the pivot axis C in paragraph [0002] (see also paragraph [0030]) and that the skilled person would understand that the tipping (or rotation) axis is determined by an appropriate axis (e.g. the front axle) about which a rotational moment is produced by the load. Obviously, a "tipping moment" is not directly sensed according to EP-B and a load "indicative" (EP-B, [0033]) of the acting tipping moment is detected. Further, in EP-B evidently exclusively rotation about a transverse rotation axis (longitudinal stability) was considered, transverse stability being clearly no issue at all. In relation to the issue of an "intelligent sensor", it is considered that indeed EP-B discloses both types of sensors as mentioned by the Appellant, both being sufficiently clearly and completely disclosed.

Further, the skilled person would have no difficulty in implementing a proportional valve to produce a signal causing the speed of movement of the lifting to be "progressively reduced", for proportional valves and their use constitute part of the common general knowledge.

No subject-matter extending beyond the content of the application as filed was included in EP-B. In fact, the feature reading "including an actuator" was not omitted in claim 1, given that claim 1 recites "upon operation of a fluid operated actuator". Further, the feature reading "a sensor to sense the tipping moment and to sense when the value of the tipping moment is approaching the threshold value and to provide an input to a controller in response" is disclosed in claim 1 as filed. Further, the feature reading the "controller being responsive to the input to operate a proportional fluid valve" is disclosed in WO-A (page 9, second paragraph). Finally, concerning dependent claim 7 (based on claims 9 to 11 as filed), it is clear that "one of the supports" and "the other of the supports" are to be considered in this claim, since both alternatives are possible.

The subject matter of granted claim 1 is new over D1/D2. D1 in no way describes a proportional valve which is able to reduce the flow of fluid to the actuator progressively, as required by claim 1. When the solenoid operated valves 28, 28' adopt an open position (on account of their valve return springs) the pressure in the control circuit (i.e. the pressure acting on the control member of line valves 15, 15') is then determined by the pressure control valves 30, 30', which provide a lower operating pressure than the valves 29, 29'. Therefore the operating speed of the

actuators 4, 18 and 34 is reduced by a specific predetermined amount in the region between the load reaching the "anticipatory" load level and the disconnection level (D1, page 3, lines 99 to 130). Thus, the speed of operation is reduced from one discrete speed to another and is not progressively reduced. Smoothing out said transition by using throttle valves 31, 31' does not amount to progressively reducing speed. Hence the main line valve 15, 15' (dispensing working fluid to the actuator's hydraulic cylinder) appears to only incidentally assume an intermediate position, certainly not acting as a proportional valve.

The subject-matter of granted claim 1 is new over D5. Claim 1 is directed to a control system for a telescopic handler (telehandler or teleporter), having essentially only one horizontal (transverse) axis about which a tipping moment arises upon lowering or lifting the load (longitudinal instability), as reflected by the claim's wording. By contrast, D5 is related to a rescue ladder whose movement includes more degrees of freedom, e.g. a vertical axis in addition to the horizontal rotational axis of the ladder structure. This leads to a different control system and methodology being used, implying e.g. the concept of a "safe loading envelope". In addition, no "tipping moment" is sensed according to D5, for (contrary to claim 1) the load is not detected but merely the number of persons carried by the ladder's platform is used as predetermined manual input. Consequently, there is no means of directly and precisely determining when the tipping moment is about to reach a threshold value.

The subject-matter of claim 1 of auxiliary request 4 is inventive over D1/D2 or D5 in view of the skilled

person's common general knowledge or in view of further documents D6 or D21. Indeed, D1/D2 does apparently not disclose a wheeled load lifting vehicle but rather a fixed load lifting device. The skilled person would not consider adding wheels to this device, with a load sensor disposed on the rear axle. What is more, both lifting devices of D1/D2 and D5 have control systems adapted for a very broad range of movement and horizontal extension or reach of the load lifting arm, as well as a plurality of operating modes, thus being very different from the control systems disclosed in D6 or D21, these being adapted for teleporter or telehandler machines. Consequently, the skilled person would anyway not contemplate combining D1/D2 (or D5) with D6 or D21. Even if it would consider such a combination, it would anyway lack any incentive to dispose a load sensor on the vehicle's rear axle, no reason existing therefor.

The subject-matter of claim 1 of auxiliary request 4 is inventive over D6 in view of the skilled person's common general knowledge or D1/D2 and D5. The Appellant's stated objective problem (starting from D6) already implies that the skilled person would merely look for means apt to progressively reduce fluid flow to the actuator, thus presuming an essential part of the claimed solution to be known, contrary to the assumptions made. Therefore, this reasoning amounts to an ex post facto argument and is likewise a self-defeating argument. In addition, the skilled person would have no reason to consider and retain D1/D2 or D5, these documents relating to substantially different control systems adapted to a different kind of load lifting machines.

The subject-matter of claim 1 and its scope of protection is not rendered unclear by the paragraphs in the description cited by the Appellant. Including a ground engaging structure in the form of supports (as suggested in the corresponding paragraphs of the description in EP-B) would merely additionally limit the claimed subject-matter.

Reasons for the Decision

1. The appeal is admissible.

2. The invention is disclosed in a manner sufficiently clear and complete for it to be carried out by the skilled person (Article 83 EPC). The Appellant's objections are generally seen by the Board as being essentially and substantially based on language inaccuracies and imprecisions in the patent application and in the claims as filed, thus raising questions concerning clarity (Article 84 EPC) of the subject-matter disclosed. However, in the Board's view none of said objections, although not irrelevant in nature, can be considered as preventing the skilled person from putting the invention into effect. Indeed, as hereinafter discussed, the skilled person would understand in an appropriate and reasonable way the passages in EP-B relating to the specific objections raised.

Concerning the issue relating to the "tipping moment" the Board takes the view that the feature reading "the machine (10) including a pivot (C) about which a tipping moment is produced by the load (L)" (see claim 1) is sufficiently clearly and completely disclosed, in particular referring further to the description of EP-B (see [0002]), stating that "the lifting arm is moveable

by one or more actuators to move the load, the load producing a tipping moment, about either an axis of rotation of one of the pairs of wheels, or about another pivot where for example, stabilisers are used to stabilise the body relative to the ground during load handling operations" (see also EP-B, [0030]). The skilled person is given here a clear and sufficient indication of where the pivot axis may be located, bearing in mind that anyway the appropriate and convenient choice of the pivot (resulting in simplified equations of motion and computational simplification) is usually obvious from the nature of the physical system itself and that anyway the global motion of the physical system does not depend on the specific choice of the pivot.

In this respect it is also noted that the further objections of the Appellant related to EP-B completely neglecting transversal stability of the load handling apparatus are irrelevant, for it is entirely clear from EP-B (see e.g. [0002], [0005], [0006]) that the invention merely aims at improving longitudinal stability and no attempt at all is made to improve transversal stability.

As to the feature reading "a sensor to sense the tipping moment" (see claim 1) the Board concurs with the Appellant's view that no sensor for directly sensing the tipping moment is disclosed in EP-B and therefore this sensor has to be merely construed as providing measurement of a physical entity directly linked to the tipping moment (e.g. load, see EP-B paragraphs [0033], [0012], [0013]; sensor being a load cell or other transducer) to a controller, said physical entity allowing computation of the tipping moment on the basis of known physical parameters of the load lifting apparatus (e.g. location of the pivot

etc.). Hence, the skilled person would be able to implement said sensor in practice by adequate and reasonable interpretation of said feature (in agreement with the description of EP-B).

As to the issue relating to the "intelligent sensor", in accord with the above interpretation of a "sensor to sense the tipping moment", the Board considers that EP-B clearly discloses a sensor apt for measuring a load on the rear axle of the load handling apparatus (EP-B, [0012], [0032], [0033]) such as "by means of a load cell or other transducer". Further, EP-B clearly and unambiguously states that "from the input from the sensor 30, the controller determines that the value of the tipping moment about pivot C is approaching a predetermined threshold value" (EP-B, [0040]). Consequently, the feature reading "sensor (30) to sense the tipping moment and to sense when the value of the tipping moment is approaching the threshold value and to provide an input to a controller" (see claim 1) has to be construed as the sensor merely sensing a physical entity linked to the tipping moment (see above) for the controller to calculate the tipping moment (on the basis of this physical entity; see above) and for the controller to determine whether a threshold value is approached. The implementation of these features, particularly relating to the sensor, forms part of the skilled person's common general knowledge and, contrary to the view of the parties, no other type of sensor has been disclosed in EP-B. In this respect it is finally noted that (contrary to the Appellant's assertions) the skilled person would perfectly understand that the term "threshold value" (of the tipping moment) (in EP-B also occasionally designated as "set threshold value", "permitted threshold value", predetermined threshold value") actually represents a limit value of the

tipping moment delimiting the mechanical stability region of the load handling apparatus and its numerical value can be determined both experimentally and theoretically in each specific case.

Concerning the issue relating to the "proportional fluid valve" the Board notes that the Appellant's contentions appear to be unfounded since proportional fluid valves are generally known to the skilled person and are commonly used in the technical field of hydraulics since decades. This is demonstrated for instance by document D5 (see page, 15; figure 7) illustrating the use of electrically controlled proportional valves 61, 62, 63, 64 to progressively reduce fluid flow to the hydraulic actuators. Hence, there is no need for EP-B to disclose any specific details concerning the generation and form of the electric signal controlling the proportional fluid valves.

In respect of the objections raised against the dependent claims it is noted that these are again all substantially related to the inaccurate or erroneous mention a "tipping moment being sensed by the sensor" (see above), whereas actually only a load detecting sensor is disclosed in EP-B. However, as already set out above, the skilled person would be capable (through a sensible and reasonable construction of these features) of putting the claimed features into effect.

3. The Appellant's contentions with respect to non-compliance of the amendments with Article 123(2) EPC are unfounded. First, the feature reading "including an actuator" (in claim 1 as filed) is still present in claim 1 (see "the arm (14) thus being capable of

raising and lowering the load (L) upon operation of a fluid operated actuator (24)") and no omission occurred (in the context of claim 1 regarding said "fluid operated actuator" as being external to the load handling apparatus is tantamount to figuring a motor vehicle with an external motor: does it make any technical sense ?). Second, the feature reading "a sensor (30) to sense the tipping moment and to sense when the value of the tipping moment is approaching the threshold value and to provide an input to a controller (32) in response" is based on the corresponding feature included in claim 1 as filed (i.e. "the controller being responsive to the input to influence operation of the actuator so that in the event that the sensor senses that the value of the tipping moment is approaching the threshold value, the speed of movement of the load is progressively reduced"), wherein said feature is construed as merely implying a sensor detecting a physical entity linked to the tipping moment and permitting its calculation by the controller (see above, point 2). Third, the feature reading "controller being responsive to the input to operate a proportional fluid valve" does not extend beyond the content of WO-A (application as filed), which discloses different ways by which the controller may operate the proportional valve (see WO-A, page 9, second paragraph), thus making it obvious that this operation is not tied to any specific manner of operation. Fourth, the documents cited in EP-B (paragraph [0004]) solely disclose sensors detecting values of the load and not deciding themselves whether a threshold value of the tipping moment is approached. Additionally, proper and sensible construction of paragraph [0004] (in conjunction with the overall disclosure of EP-B) allows to conclude that the controller actually

determines whether said threshold value is approached (see EP-B, [0032], [0033], [0040]).

Concerning dependent claim 7 as granted it is obvious from claims 9 to 11 in WO-A (although the wording is inaccurate and by no means unambiguous) and physically self-evident that if the "sensor sensing loading" is arranged on "one of the supports" then the pivot must be located on the "other of the supports".

Finally, the term "proportional fluid valve" in claim 1 may not be construed as being implemented or constituted by the main control valve (44) and no extended subject-matter is thereby implied. There is no support and no suggestion in claim 1 (and likewise in the description of EP-B) that such an embodiment is at all considered or envisaged by the invention.

Therefore, the Appellant's interpretation of the above term lacks any support in the description and would be contrary to Article 84 EPC and Article 83 EPC.

Obviously, as should be evident to everyone and as the Appellant might understand, in principle no independent claim could possibly explicitly exclude all conceivable or imaginable potential embodiments not disclosed in the patent specification. Anyway, in cases of serious doubts on the clarity of the claim, the description might be used to determine the scope of the claimed subject-matter. Further, in all cases of practical (and not merely theoretical) interest (i.e. particularly infringement cases), as provided by Article 69 EPC the scope of protection would be determined in conjunction with the description of EP-B, which leaves no doubt as to the fact that the proportional fluid valve 42 and the main control valve 44 are quite distinct and separate objects (see EP-B, [0037], figure 3; WO-A, claim 15).

4. The subject-matter of claim 1 (main request) is not new over D1/D2 and over D5 (Article 54 EPC).

5. In relation to D1/D2, the Board considers that the Respondent's argument that claim 1 is directed to a control system for a teleporter or telehandler machine (having essentially only one horizontal (transverse) axis about which a tipping moment arises) is not convincing. Indeed, the subject-matter of claim 1 (i.e. "A control system (40) for a machine (10) which includes a load handling apparatus (14) ... the load handling apparatus (14) being a lifting arm which is moveable about a generally horizontal axis (B) relative to the body (12) of the machine...the machine (10) including a pivot (C) about which a tipping moment is produced by the load (L)") is much more general and broader, such as to clearly encompass the kind of machine disclosed in D1 (see D1, claim 1; description, page 1, column 8-19). Second, contrary to the Respondent's view, the main line valves 15, 15' constitute proportional fluid valves since they assume one open position (i.e. one for each flow direction) responding to nominal control pressure (as set by valves 29, 29'), one intermediate position (i.e. one for each flow direction) responding to reduced control pressure (on the valve control member; see D1, figures 2, 2A) as set by pressure limiting valves 30, 30', thus leading to reduced speed of the hydraulic actuators, and a closed neutral position responding to vanishing control pressure ("disconnection level" implying vanishing actuator speed) (see D1, column 3, line 99- page 4, line 8). Third and last, as just detailed the reduction of actuator (or load) speed occurs "progressively" since it is a stepwise (and continuous) reduction (smoothed out by throttle valves 31, 31') of the speed in response to progressive (stepwise)

reduction of control pressure. Hence, D1/D2 anticipates the subject-matter of claim 1.

6. Also, in relation to D5, the Board considers that the Respondent's argument that claim 1 is directed to a control system for a telescopic handler (telehandler or teleporter) (having essentially only one horizontal (transverse) axis about which a tipping moment arises upon lowering or lifting the load (longitudinal instability)) is not convincing. Indeed, the subject-matter of claim 1 (see passage cited above, point 5) is much more general and broader, such as to clearly encompass the kind of machine disclosed in D5 (D5, page 1, first paragraph; claim 1, lines 1 to 5); in particular, the motion of the lifting arm in granted claim 1 is not explicitly restricted to sole rotation about a pivot axis. Second, claim 1 does not explicitly include a load sensor but merely a "sensor to sense the tipping moment", which has to be construed in a more general way as detailed above (see point 2) (i.e. a sensor measuring a physical entity directly linked to the tipping moment and by which means the controller may calculate the tipping moment). Thus, such a sensor is disclosed in D5, for D5 discloses sensors measuring the deployed length of the lifting arm and its lifting angle (in the vertical plane), thus determining the actual horizontal extension ("portée P") of the lifting arm (projection of the deployed length in the horizontal plane) (see point IV, passages in D5 cited by Appellant), these quantities permitting evaluation of the tipping moment by the controller (the load being known by manual input; see points IV and V). Hence D5 anticipates the subject-matter of claim 1.

7. Auxiliary request 4 was admitted to the appeal proceedings according to the discretionary power of the

Board (Rule 13(1) RPBA (Rules of Procedure of the Boards of Appeal)) since the amendments of claim 1 are based on dependent claims 7 and 8 as granted and the inherent complexity of this new subject-matter would not lead to discussions incompatible with the need for procedural economy and with the state of the proceedings. In fact, the additional features concerning the pair of supports (provided by axles which carry wheels) were already subject of discussion in respect of the main request.

8. The subject-matter of claim 1 of auxiliary request 4 is based on dependent claims 7 and 8 as granted and it fulfils the requirements of Article 123(2) EPC (see above, point 3).

9. The subject-matter of claim 1 of auxiliary request 4 is inventive over D1/D2 or D5 in view of the skilled person's common general knowledge or in view of further documents D6 or D21 (Article 56 EPC). The Board shares the Respondent's view that the skilled person would have no incentive and no motivation starting from D1/D2 or D5 to introduce a sensor sensing the load on one pair of wheels distanced from the axle carrying the other pair of wheels and representing the pivot axis (as taught by D6 and D21). In effect, the load handling machines in D1/D2 or D5 comprise machines such as cranes (D1/D2, page 1, lines 19-25, lines 10-18) and rescue ladders (D5, page 1, first paragraph), both having a plurality of operating modes, including e.g. rotation about a vertical axis, and a broad operating range and horizontal extension of the load lifting arm. Therefore it would not be appropriate or convenient to place a load sensing sensor on the rear wheel axle of the machine, since the measured load would essentially merely be indicative of tipping moment about the front

axle, representing essentially only one operating mode. In addition, the skilled person would have to correspondingly modify and adapt the control systems of D1/D2 and D5, which would be a complex task, without obtaining as a result any advantage at all. For these reasons the subject-matter of claim 1 would not be obvious for the skilled person (Article 56 EPC).

10. The subject-matter of claim 1 of auxiliary request 4 is inventive over D6 in view of the skilled person's common general knowledge or D1/D2 and D5 (Article 56 EPC). In the Board's view there is no suggestion in D6 "to operate a proportional fluid valve (42) to reduce the flow of fluid to the actuator (24) so that the speed of movement of the load (L) is progressively reduced as the lifting arm (14) is continued to be lowered". The passage cited by the Appellant (see point IV; D6, page 22, penultimate paragraph) merely generally states that "devices could be employed to reduce power or fluid flow for reducing machine movement if a threshold is reached or is exceeded". This is nothing more than an obvious statement, which is part of common general knowledge, about reducing fluid flow or power in a hydraulic circuit in order to slow down machine motion. Therefore no specific suggestion or hint can be found here. Further, by simply reducing power (of the hydraulic motor or pump) the fluid flow is also automatically reduced, which would anyway render unnecessary using any further device or valve. Finally, D6 does not disclose any specific hydraulic circuit for operating the actuators (lifting arm) and solely deals with a machine operating method for avoiding instability. Consequently there is also no reason why the skilled person should retain documents D1/D2 and D5, which are directed to specific, different methods and correspondingly adapted hydraulic

circuits, which would not be suitable for implementing the methods disclosed in D6.

11. The disclosure of EP-B in paragraphs [0002], [0012], [0030] and [0047] of the description EP-B, which contemplate the use of stabilisers (in contact with the ground), does not render unclear the scope of claim 1 (Article 84 EPC). In effect, claim 1 clearly states that "the machine (10) is a wheeled load handling machine (10) having a ground engaging structure including a pair of supports (19) provided by axles which each carry wheels (16, 17), and the tipping moment is produced about a rotational axis (C) of one of the pairs of wheels (16) and the sensor (30) senses the loading on the other pair of wheels (17)" (corresponding to granted claim 8). Therefore according to claim 1 the supports undoubtedly consist of the pairs of wheels, and only this embodiment falls within the scope of the claimed subject-matter. The stabilisers merely represent a further, optional feature, in addition to the pairs of wheels. It is also noted that the Respondent voluntarily chose to incorporate into claim 1 both dependent claim 7 ("wherein the machine (10) includes a ground engaging structure by which the machine is supported on the ground, the ground engaging structure including pair of supports (19), the tipping moment being produced about a pivot axis (C) established by one of the supports, and the tipping moment being sensed by the sensor (30) sensing loading of the other (19) of the supports"), relating generally to pairs of supports, and claim 8 (depending on claim 7), specifying that said pairs of supports consist of pairs of wheels. No amendment of granted claim 1 based solely on claim 7 was filed.

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 first instance with the order to maintain the patent as amended in the following version:
 - claims 1 to 12 according to the fourth auxiliary request filed with letter of 28 February 2017;
 - description : columns 1 and 2 filed during oral proceedings; columns 3 to 8 of the patent specification;
 - figures 1 to 3 of the patent specification.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated