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Case No: CA-2022-002489

IN THE COURT OF APPEAL (CIVIL DIVISION)
ON APPEAL FROM THE HIGH COURT OF JUSTICE
BUSINESS AND PROPERTY COURTS OF ENGLAND AND WALES
INTELLECTUAL PROPERTY LIST (Ch.D)
PATENTS COURT, HP-2017-000027
His Honour Judge Hacon
[2022] EWHC 1724 (Pat)

Royal Courts of Justice
Strand, London, WC2A 2LL

Date: 22/03/2024

Before :

LORD JUSTICE NUGEE
LADY JUSTICE ELISABETH LAING
and
LORD JUSTICE BIRSS

- -

Between :

J.C. BAMFORD EXCAVATORS LIMITED	**Claimant/ Appellant**
- and -	
(1) MANITOU UK LIMITED	**Defendants/ Respondent**
(2) MANITOU BF S.A.	
- and -	
THE COMPTROLLER GENERAL for PATENTS, TRADE MARKS and DESIGNS	**Amicus**

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- -

Michael Silverleaf KC and Tim Austen (instructed by **Baker & McKenzie LLP**) for the **Appellant/Claimant**
Anna Edwards Stuart KC instructed by the **Comptroller General for Patents Trade Marks and Designs**
The Respondents/Defendants did not appear and were not represented

Hearing dates: 30 January 2024

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Approved Judgment

This judgment was handed down remotely at 10.30am on [date] by circulation to the parties or their representatives by e-mail and by release to the National Archives.

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Lord Justice Birss :

1. This appeal arises from the trial of a patent action between the appellant J.C. Bamford Excavators Ltd (JCB) and companies in the Manitou group. The action concerns machines called telehandlers. HHJ Hacon sitting as a judge of the Patents Court heard the trial in November 2021 and gave judgment seven months later on 4 July 2022, holding that three of the four JCB patents in issue were invalid but that one was valid and infringed by certain configurations of Manitou telehandlers. JCB appealed with leave of the trial judge. Before the appeal was heard JCB and Manitou settled the proceedings. The agreed terms allowed JCB to continue its appeal against the finding of invalidity of one of the patents, without Manitou's involvement. Following the procedure addressed in *Halliburton's Patent* [2006] EWCA Civ 185, the Comptroller attended the appeal pursuant to PD52D para 14.1(6)(b). I am extremely grateful for the assistance on this appeal provided by the Comptroller and by counsel representing the Comptroller, Ms Edwards Stuart (soon to be KC).

2. The patent in issue is EP (UK) 2 263 965 entitled "Method of Operating a Working Machine" ("EP 965"). The application was filed on 17 May 2010 claiming priority from a British filing on 19 June 2009. The patent was granted on 8 February 2012. The only relevant claim of EP 965 was claim 1. I will come back to the detail below but in summary claim 1 is a claim to a method performed by a safety control system in a telehandler machine.

3. The issue was whether claim 1 lacked inventive step in the light of Japanese patent application No. 2000-329073 published on 9 May 2002 and referred to as Aichi I. In this judgment I will call it simply Aichi.

4. Aichi describes a control system but the machine in Aichi in which the control system operates is not a telehandler, it is a mobile platform often called a cherrypicker. The difference is that in a cherrypicker, which is in effect a type of crane, the arm can rotate around a vertical axis as well as moving up and down (and extending/retracting) whereas in a telehandler the arm cannot rotate, it remains along the longitudinal axis of the machine at all times. There was no dispute that this meant that as described the cherrypicker machine of Aichi did not fall within claim 1 of EP 965 which was a method limited (in effect) to telehandlers. By the end of the trial any argument about lack of novelty had fallen away. However it was held to be obvious to a person skilled in the art to take whatever control system was described in Aichi and apply it unchanged to a telehandler, and that is not challenged on appeal. However the question then becomes, what is the result? The judge held that the way the resulting machine would work would be within claim 1 of EP 965. Therefore the claim was invalid. The unusual feature is that the obviousness of the step which moves from the prior art to the patent claim is not the focus of the debate. The issue is what exactly is the nature of the control system in Aichi. Whatever that control system is, the obvious step does not change it, the step simply locates it in a telehandler. Accordingly the debate is more like that in a novelty case.

5. The foundation of JCB's appeal is a submission that the control system of Aichi does not fall within the terms of claim 1. The answer in the end must depend on what is disclosed by Aichi and the correct interpretation of the claim.

6. The Comptroller's counsel observed that some of JCB's submissions were confusing. The way various similar but different descriptive labels were used was not always clear. One consequence was that it was not easy to understand how the judgment dealt with what became the major point JCB advanced on appeal. The resolution of this only emerged with clarity after the hearing of the appeal when, following a request from the bench, the appellant's legal team provided extracts from both sides' written closing submissions and part of the oral closing. It is now tolerably clear what has happened. The judgment proceeds on an unspoken assumption about the construction of claim 1 and how that relates to Aichi. I do not believe the fact this was unspoken was the judge's fault. It was not easy to disentangle until the closing materials were examined after hearing the appeal. The appeal turns on the correctness of that construction, but there is a lot of ground to cover before one gets there.

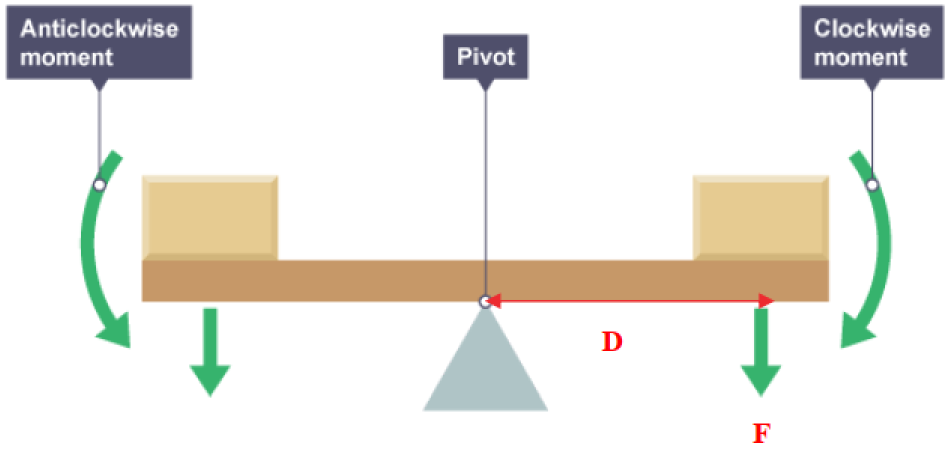
The facts

7. As the judge explained at [1] and [2] telehandlers emerged in the 1970s as modified forklift trucks. Telehandlers have a four-wheel chassis, a cab for the operator and an arm which can be raised or lowered and extended beyond the front of the chassis. The arm is used to lift and move loads. Telehandlers have become versatile workhorses in the agricultural and construction industries. The image below shows a telehandler with the telescopic arm extended longitudinally:

8. As the judge explained at [8] drivers of telehandlers know that in certain circumstances the vehicle will become unstable and tip forwards on the axis of the front wheels, raising the rear wheels off the ground. The load at the end of the arm creates a force tending to tip forwards (anticlockwise in the picture above). The mass of the vehicle provides a countervailing or restoring force. As long as the "tipping moment" is lower than the

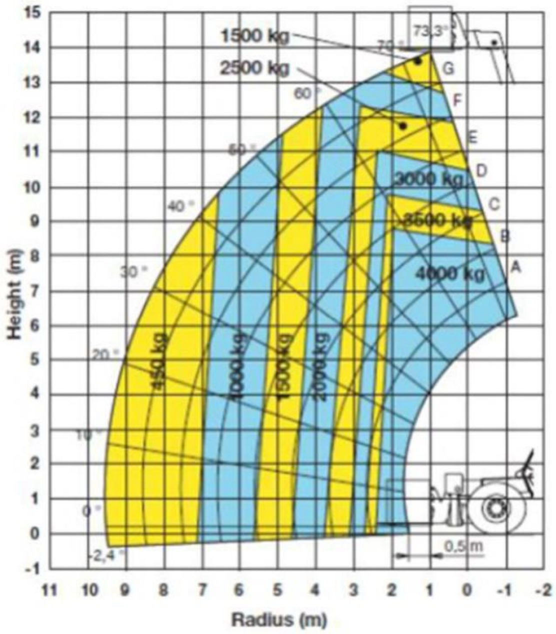
restoring moment the vehicle will not tip over. As the difference approaches zero the vehicle becomes unstable.

9. In mechanics the term "moment" refers to the capacity of a force to cause rotation of an object about an axis. The magnitude of a moment is calculated by multiplying the force (F) by the distance (D) from the axis at which it acts. This is explained in the technical primer (at [1.3]) which also provides a simple diagram (below). The point to note is that a moment involves a combination of a force (or load) and geometry (or position). The diagram is this:



10. Longitudinal load moment indicators ("LLMIs") had been fitted to telehandlers since the mid-1970s. These alert the operator when the machine is close to or has exceeded certain stability thresholds. Visual signals, typically using a traffic light sequence of green, amber and red, could be used. There could also be a sound alarm. When a telehandler was used on rough terrain, LLMIs tended to supply unnecessary warnings that were ignored by operators.

11. There had been a regulatory requirement for many years that each telehandler should have a load chart specific to the vehicle. A load chart indicates the safety limits of the vehicle, taking into account arm angle, arm extension and the load. This is an example of a load chart:



12. One can see that this load chart sets limits for the position of the arm in space for a given load being carried. In a sense this specifies a safe working envelope for the machine.

13. Before 2002 systems had been developed to prevent movements of the telehandler beyond thresholds which, if passed, would threaten stability. These were known as longitudinal load moment control systems ("LLMCs"). By 2009 the significant addition to the common general knowledge was the publication of a standard EN 15000 which provided that the incorporation of an LLMC would be mandatory for telehandlers from late 2010. The skilled person knew in 2009 that by the end of 2010 it would not be possible to sell a telehandler unless it had an LLMC compliant with EN 15000.

14. There was a fundamental dispute at trial about what exactly an LLMC was. One aspect of JCB's case below was that LLMCs worked in a different way from the envelope or load chart based safety control systems which were used in cranes and other similar systems (including cherrypickers). The difference between the two was as follows. LLMCs (which were specific to telehandlers) did not involve using the information in the load chart, rather they had a sensor measuring the load on the rear axle which directly sensed the tipping moment. That works in a purely longitudinal system because in that case, as the tipping moment increases it will tend to reduce the load on the rear wheels. Once the load drops below a certain predetermined level the LLMC would kick in and prevent the operator from moving the arm any further. While this direct approach does use a predetermined threshold, it does not involve a load chart or any envelope. The rear axle sensor based approach, of directly sensing the tipping moment, does not need to measure the position of the arm or the weight of the load. On the other hand an envelope control system such as would be used in a crane, involved using a set of sensors to measure things like the position of the arm and compare the measured data with the predetermined safety envelope. Such an envelope control system could also take into account the lateral effects if the arm was able to rotate around a vertical axis. This distinction was relevant to many of the patents in issue.

EP 965

15. As the judge explained (at [63]) the patent relates to a method of operating a vehicle with an arm controlled by an LLMC. The problem arises when the vehicle travels on uneven ground, particularly when used in agriculture. As the patent explains at paragraph [0005], when travelling in this way the uneven ground can cause transient forces to arise. It is not difficult to imagine how, in a system using a load sensor on the back axle, if in effect the machine bounces a little as it moves on uneven ground this could give a false indication of longitudinal instability. Thus if the LLMC remains active, the false indication is liable to cause the safety system to be triggered when it is not required.

16. The way the invention solves this problem is described in paragraph [0008]. The system senses the travelling speed of the vehicle. When the speed is above a threshold value the LLMC is disabled. The threshold speed could be zero, which would mean the LLMC was disabled whenever the machine was moving. As paragraphs [0036] and [0037] of the patent explain, the idea is that when the travelling speed of the machine is below the threshold, the LLMC remains fully operational to protect the machine when an unsafe longitudinal load moment is determined whereas when the speed is above the threshold, irrespective of what position the arm is in, the controller disables the LLMC, permitting the operator to move the arm at will.

17. Claim 1, divided into suitable integers, is as follows:

> (a) A method of operating a working machine which includes a main structure and a working arm,
>
> (b) the working arm being pivotably mounted on the main structure at one end of the arm, the working arm being raisable and lowerable relative to the main structure by a first actuator device, and being extendible relative to the main structure by a second actuator device and the arm carrying in use at its other end a working implement which in use carries a load,
>
> (c) the machine further including a ground engaging drive structure by which the machine is driveable on the ground,
>
> (d) and the machine having a longitudinal load moment control system
>
> (e) which is functional automatically to disable the operation of the first and/or second actuator device which would increase longitudinal instability
>
> (f) in the event that a predetermined machine longitudinal instability is sensed,
>
> characterised in that
>
> (g) the method includes sensing a parameter relating to the travelling speed of the machine on the ground, and where the machine is determined to be travelling at a speed above a

threshold speed, disabling the longitudinal load moment control system.

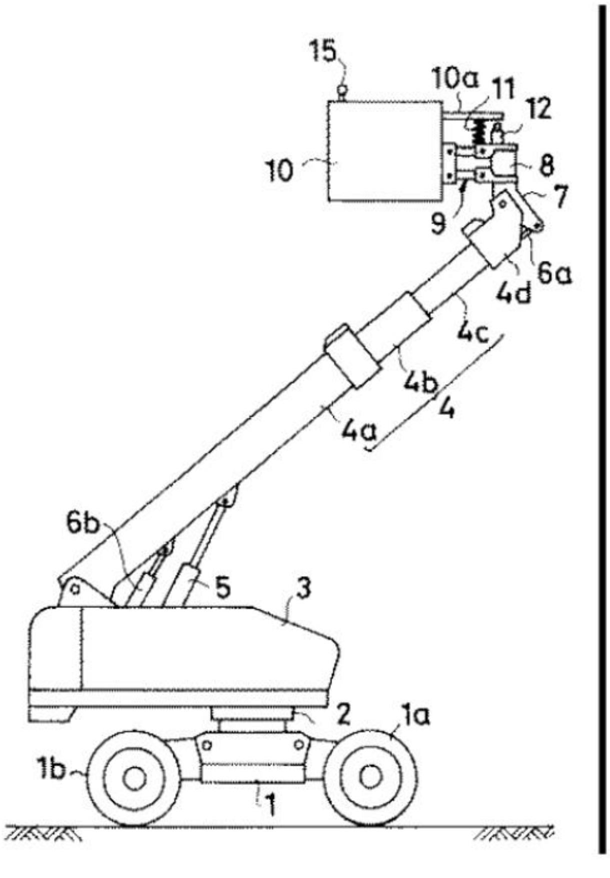
18. Thus the claim is to a method which involves operating a working machine with various components (b) to (d). Put broadly features (b) and (c) limit the claim to a telehandler and thereby distinguish the working machine operating from the machine in Aichi but the details of this do not matter on appeal.

19. Feature (d) requires the machine to have an LLMC. Feature (e) describes what the LLMC does (disable an operation which would increase instability) and feature (f) defines the criterion which triggers that act – it is triggered "in the event that a predetermined machine longitudinal instability is sensed".

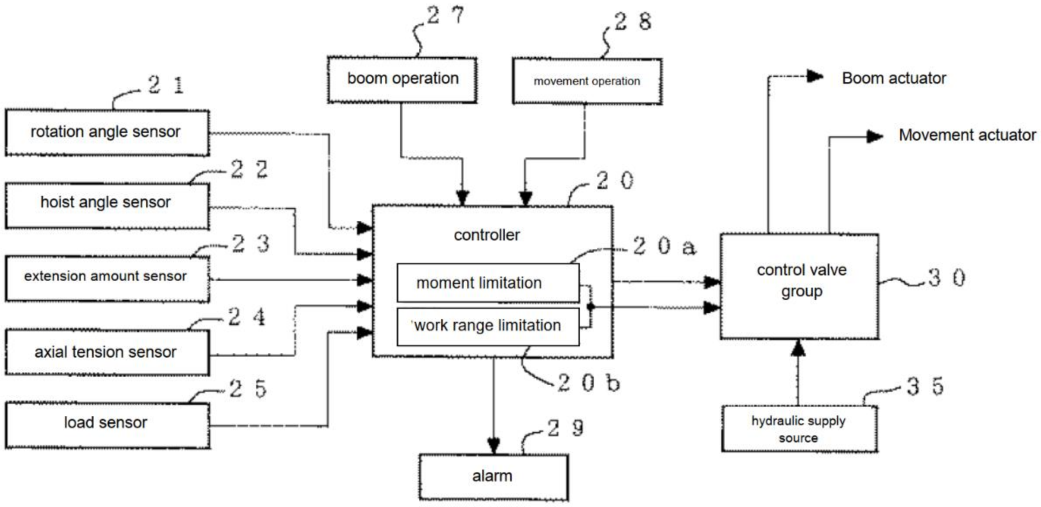
20. The characterising feature (g) provides that the travelling speed is sensed, and when the speed is above a threshold the LLMC is disabled.

Aichi

21. Turning to Aichi, the machine is shown in figure 2 of the application:



22. The control system of Aichi is depicted in figure 1 (with translations added) as follows:



23. Focussing on the controller 20, it has two elements 20a and 20b. Element 20a is referred to as a "moment limitation device" (MLD). Element 20b is called a "work range limitation device" (WRLD).

24. Paragraph (0025) described the MLD as follows:

> Moment limitation device 20a calculates the actual overturning moment Mr acting on the vehicle body from boom 4 and work platform 10 based on the hoist angle data from hoist angle sensor 22 and axial tension data from hoisting cylinder 5. It then detects rotational angle data from rotational angle sensor 21, reads out the permissible moment Ma set in advance according to the rotation angle and stored, and compares the actual overturning moment Mr with permissible moment Ma. It then outputs a signal to control valve group 30 which limits any operation of boom 4 for which the actual overturning moment Mr exceeds the permissible moment Ma. In this way the operation of control valve group 30 is limited, limiting any operation of the boom actuator tending to increase the overturning moment (for example, extension or lodging of boom 4) and forestalling the occurrence of a situation where stability is compromised due to the actual overturning moment Mr exceeding the permissible moment Ma.

25. It is clear that the MLD described here measures load and position data to calculate the actual overturning moment (defined as Mr) and compares it to a predetermined permissible moment Ma. Unsurprisingly since this system is not a telehandler, the MLD does not directly sense the actual overturning moment using a load sensor on rear axle, rather it uses information measured from other sensors to work out what the actual overturning moment is.

26. Paragraph (0026) describes the WRLD as follows:

> (0026) Work range limitation device 20b finds the position of work platform 10 based on the hoist angle data from hoist angle

> sensor 22 and extension amount data from extension amount sensor 23. The range over which movement of work platform 10 is possible (in other words the permissible working range) is set and stored in work range limitation device 20b with the overturning moment kept below the permissible moment when work platform 10 is carrying the rated load, a control signal being output to control valve group 30 to limit any movement of boom 4 for which the position of work platform 10 found as described would exceed the permissible working range set in this way. Thus any boom operation which would move work platform 10 beyond the permissible working range is limited, forestalling the occurrence of a situation where stability is compromised.

27. This WRLD works in a different way from the MLD. Instead of deriving the actual tipping moment experienced by the machine, the WRLD still senses the position of the arm but then uses a constant referred to here as the rated load to specify what the maximum working range would be for the arm assuming it is carrying that rated load. This is a cruder approach than the MLD which takes into account the actual load. It is, or at least seems very like, a system based on a load chart or envelope.

28. Aichi explains that the MLD is used when the machine is stationary and if movement of the machine along the ground is detected, then the WRLD is used instead of the MLD. The WRLD is used while the machine is moving. For example the last sentence of paragraph (0024) of Aichi provides:

> Controller 20 is thus provided with moment limitation device 20a as an overturning prevention device for use when the vehicle is stationary and with working range limitation device 20b as an overturning prevention device for use when the vehicle is in motion.

29. There is an alternative variant of the WRLD also described in Aichi in which, instead of using the rated load as a constant, the system uses the last actual load measurement in the calculation. Aichi describes this variant as preferable. Its relevance on appeal is in clearing up a misunderstanding about a passage of Mr Krayem's cross-examination (see below).

30. The reason Aichi switches from control by the MLD to control by the WRLD is to address the problem of inaccuracy arising as a result of vibrations caused when the vehicle is in motion. In other words the same problem as the patent. The solution proposed by Aichi involves adding a motion sensor and using the information it produces to switch between MLD and WRLD. The judge recognised this at [75] and [76].

31. The issue is this. It is a given for present purposes that it would be obvious for a skilled person to apply the Aichi method in a telehandler. This method would involve the MLD operating while the telehandler was stationary and the WRLD operating instead when the machine detects that the travelling speed of the machine on the ground is above a threshold speed of zero. The question is whether that method is within claim

1. If it is then the claim would be invalid. If not, then not. The judge held that that the claim was invalid at paragraphs [78] to [93].

The submissions below

32. Before going to the judgment I will refer briefly to some of the arguments below, making four points. First, there was a clear divide on the issue of "longitudinal". The arm in Aichi can rotate and so, argued JCB, the system cannot be a *longitudinal* load moment control system.

33. Second, it is clear that on a number of occasions (such as p553-554, and p562) counsel for JCB suggested that a machine with no axle load sensor would not be within the claims. Or conversely that since an envelope control system had no axle load sensor, if that system was installed in a telehandler, it would not be within the claims. It was a pithy way of explaining the difference as JCB saw it between an envelope control system and the systems claimed in the patents.

34. Third, Manitou's primary case that EP 965 lacked inventive step over Aichi, was that the Aichi control system applied to a telehandler, with both MLD when stationary and WRLD when moving, would be within claim 1 because the claim required disabling the LLMC which prevents movement of the arm on the basis of sensing machine instability (closing [194]). Manitou's case involved the submission that the MLD was an LLMC of the kind required by the claim because it measured or sensed the actual overturning moment, whereas the WRLD was not because it did not.

35. Manitou noted that the expert called by JCB, Professor Plummer, had in his evidence in chief expressed the view that switching between the MLD and WRLD was not disablement of the load moment control system but, asserted Manitou, Professor Plummer had not maintained that distinction in cross-examination. I think, although I do not believe it now matters, that the reference to the system as being a "load moment control" system as opposed to a longitudinal load moment control system (or LLMC) was because, consistent with JCB's case, Professor Plummer did not accept Aichi was a longitudinal system at all.

36. Fourth, JCB's response to Manitou's case (closing [177]-[178]) was that Manitou had misread the claim because it did not encompass an envelope control system whereas both systems in Aichi (MLD and WRLD) were envelope control systems. In other words both Aichi systems worked using the same method, which as JCB summarised in [181] as follows:

> "… Therefore, when stationary Aichi monitored the position of the load on the boom and compared with a look-up table containing mapped values. When it started moving, it switched to a system using the same methodology but with a map assuming the maximum loading of the platform. Alternatively to using the maximum loading, it could use the last measured value…

37. Mr Krayem was said to have accepted this in cross-examination. This paragraph [181] is important because in it JCB is asserting that in both Aichi systems, and in particular in the MLD, the system monitors position and compares that to a look-up table.

However that is not correct, as the judge observed and is addressed below. The MLD measures force (tension) as well as position, and derives the actual overturning moment.

38. Bearing this in mind I would summarise the issues which the court below had to grapple with, as follows:

i) "Longitudinal". A major issue was that JCB contended that Aichi is not a longitudinal system at all because it can rotate.

ii) The distinction between LLMCs and envelope control systems, irrespective of "longitudinal". This involves examining how the relevant control system works. Is an LLMC limited to a system which directly senses the tipping moment using a rear axle load sensor or does it cover a system which measures the actual tipping moment in other ways?

iii) The proper application of these conclusions to Aichi.

39. The unspoken assumption which I believe the judge made was that the WRLD was not an LLMC and was therefore outside the claim. I think this arose because for their own reasons, neither party was arguing that the WRLD of Aichi was an LLMC within the claim, but for different reasons. JCB said the WRLD was not within the claim for the same reason the MLD was not within the claim, they were both envelope control systems. Manitou said the WRLD was not within the claim because unlike the MLD, the WRLD did not measure or sense the actual overturning moment. The question which was not addressed in argument below but now arises on appeal was, if JCB's argument that the MLD was outside the claim because it was an envelope control system failed, what was the consequence for the WRLD?

The judgment

40. The judgment on EP 965 starts at [63] with a summary of the disclosure of EP 965 and sets out the claim. At [68] to [71] issues of construction are identified and addressed. That section identifies only two points of construction. The first is the "longitudinal" issue and the judgment resolves this in JCB's favour at [69], holding that the claim requires the control system to disable the arm in response to a longitudinal threshold. The second point is now irrelevant.

41. The next section at [72] to [76] summarises the disclosure of Aichi. This includes identifying that the MLD is in operation when the machine is stationary and the WRLD is in operation when it is in motion. The MLD detects the tipping moment acting on the vehicle caused by the arm and limits operation of the arm when the tipping moment exceeds a threshold, whereas the WRLD detects the position of the platform and this is mapped against pre-set working range conditions.

42. The next section at [77] to [80] addresses the parties' arguments. Manitou's case is referred to but not described in any detail in [77]. The rest of the section is as follows:

> "[78] JCB submitted that in Aichi the control system was the same regardless of whether the vehicle was stationary or in motion. In both cases the position of the platform was compared with a table of mapped values. The only difference was that

when the vehicle started moving, the mapped values assumed maximum loading or the last measured value. At this point there was no disabling of the load moment control system, just a change in input parameters.

[79] Further, Aichi I did not disclose a *longitudinal* load moment control system - it has a rotating arm so that the moment control is in all directions, not just longitudinal.

[80] Consequently, JCB submitted, the following elements of claim 1 are not disclosed in Aichi:

(i) a longitudinal load moment control system;

(ii) sensing a parameter relating to the travelling speed of the machine on the ground; and

(iii) disabling the longitudinal load moment control system."

43. Paragraph [78] is a fair reflection of paragraph [181] of JCB's closing (set out above). By referring to the "load moment control system" at the end of [78] the judge is isolating out the "longitudinal" point which comes in the next paragraph.

44. The final passage of the judgment on EP 965 is the discussion section [81] to [98].

45. First at [81] the judgment resolves the "longitudinal" point in Manitou's favour, holding that it was possible to lock the arm in Aichi into a longitudinal direction. There is no appeal from that conclusion.

46. Then, after a point not challenged on appeal at [82], at [83] the judgment addresses JCB's argument as summarised at [78]. The judge observed correctly that this way of putting JCB's case involves a misreading of Aichi. The MLD does not only measure the position of the arm, it in fact measures the actual moment experienced by the vehicle, calculated from input from two kinds of sensors, one kind based on position and the other related to load. In other words the judge is here recognising that the MLD senses load and position in real time and from those two elements calculates a moment, which is the actual overturning moment on the vehicle. Moreover the judge also recognised in this paragraph that in the MLD it is not the position (alone) which is compared to a table of mapped values, what happens is the measured actual moment is compared to a permissible moment.

47. The judgment then sets out the passages from Aichi which describe the MLD and WRLD and then reasons as follows at [86]:

"[86]. Thus, when the vehicle starts to move, the control over arm movement switches from moment limitation to working range limitation. I find it impossible to interpret this in any other way than that the moment limitation device is disabled when the vehicle starts to move. In his evidence in chief Professor Plummer said that it did not constitute disablement. But in cross-examination he accepted that when the Aichi I machine was in motion, the moment limitation device was switched off. I think

> that is plainly correct and that this amounts to disablement of the moment limitation device."

48. I agree with the first two sentences and I agree with the conclusion. This would be sufficient to resolve the issue if, as I have explained I believe the judge assumed, the WRLD was not an LLMC within the claim. However if that assumption cannot be made then this does not go far enough because while it is apparent that the MLD itself is disabled when there is switching from MLD to WRLD, the question is whether that switching amounts to disabling the LLMC.

49. As the paragraph recognises, Professor Plummer did agree in cross-examination that the MLD was switched off when motion is detected. On appeal JCB contended that the judge misunderstood the Professor's evidence in cross-examination. The particular piece of the evidence in chief of Professor Plummer which paragraph [86] refers to was [6.34] of his first report. In that paragraph the Professor refers to the "moment control system" and explains that in his view Aichi does not disclose disabling the "moment control system" because in his opinion the WRLD is just as much a moment control system as the MLD. In other words switching one off and the other one on does not disable the "moment control system". This is another example of the same unspoken assumption. If it is common ground before the court that the WRLD is not within the claim then the evidence in cross-examination is inconsistent with the position taken by the Professor in chief. However if that is not common ground then the cross-examination about the MLD does not change anything.

50. At [87] the judgment turns to the evidence of Mr Krayem and sets out a passage of cross-examination from the transcript. JCB had contended that Mr Krayem changed his mind in cross-examination and had accepted that the MLD and the WRLD were both systems which used the same kind of method, albeit the WRLD assumes a maximum loading when the machine is moving. The judge rejected that. He thought that Mr Krayem had not been accepting JCB's case but his evidence had been cut off. Mr Silverleaf showed us convincingly that in fact what the judge interpreted as Mr Krayem being cut off in the middle of a denial that the methodology was the same, was a different point altogether. Mr Krayem was cut off midstream, but it is tolerably clear that what Mr Krayem was trying to say related to a debate between him and counsel about an irrelevant preferable variant.

51. On the other hand, while I think counsel is right about the cutting off, this really does not matter because in the end it is clear what Aichi discloses.

52. At [89] the judge concludes by rejecting what he regarded as JCB's case that Mr Krayem had accepted that there was no difference of any kind between the way the control system operates when stationary and when moving, the judge rightly making the point that there are differences between these two methods. However again there is no attempt here to grapple with the question whether, bearing in mind the differences between two methods, are they both LLMCs or is the only LLMC the MLD.

53. The concluding passage of the judgment dealing with the evidence is [90] as follows:

> 90. In short, I found Professor Plummer's evidence in cross-examination on how Aichi I works clear and convincing, Mr Krayem's a little muddled and less convincing. I accept

> Professor Plummer's evidence. The moment limitation device is disabled as soon as the vehicle starts to move. In effect, the threshold speed for that disablement is zero.

54. The last two sentences of this paragraph are accurate but again they are only sufficient to resolve the issue if the only LLMC in Aichi is the MLD. In other words on the assumption that the WRLD is not an LLMC within the claim.

55. The remaining paragraphs of the judgment on this topic, which conclude at [93] holding that claim 1 is invalid over Aichi, deal with the point that it was obvious to apply Aichi to a telehandler and to incorporate the LLMC of Aichi into the telehandler, however they again appear to treat the MLD as the only LLMC.

56. That completes my review of the judgment.

This appeal

57. The question to be resolved on this appeal is whether Aichi discloses disablement of an LLMC within the claim when the vehicle moves.

58. On appeal JCB submitted that the conclusion reached in the judgment was wrong because the judge had no basis to hold that the "control system" in Aichi was disabled when the machine is moving. As counsel for the Comptroller pointed out, this was a confusing way of putting the case because the claim is not simply about a disabling any control system, it is about disabling the LLMC within the claim.

59. Then at [22] and [23] of JCB's appeal skeleton the submission is made which I believe JCB had never made below, at least not with such clarity. The submission is that in Aichi the "longitudinal load moment control system continues in operation rather than being disabled when the machine is moving". In other words both the MLD and WRLD are LLMCs of the claim. This is now the crucial issue on appeal.

60. JCB also submitted that the judgment misunderstood the evidence and cross-examination of both experts. To the extent it is relevant I have dealt with that above.

61. Counsel for the Comptroller, who had not had the benefit of seeing the closing submission from trial, effectively inferred what Manitou's case must have been and submitted that although it did not say so very clearly, the conclusion reached below was that the MLD of Aichi was an LLMC within the claim because the claimed required some kind of sensing of the actual tipping moment whereas the WRLD was not, and so switching between the two amounted to disabling the claimed LLMC.

62. The issue is whether the claim is limited in such a way so as to exclude the WRLD from being an LLMC. JCB submits that if the WRLD is an LLMC then it cannot be said that the disablement required by the claim takes place in Aichi. That may be right, but it depends on another issue, which is a submission from the Comptroller that the disablement requirement of the claim would be satisfied even if WRLD is an LLMC because Aichi still involves disabling the MLD (which is an LLMC) and the fact a different LLMC (the WRLD) then starts operating does not matter.

63. I start with the scope of the term LLMC. There is no basis for reading into the meaning of the term LLMC itself a necessary limitation that it must use a load sensor on the rear

axle. Although the judgment never identifies this point of construction, in the common general knowledge section ([15(2)] to [15(7)]) there are findings which would make such a conclusion difficult to sustain. This section includes holdings that as a matter of common general knowledge LLMCs routinely used strain gauges on the rear axle but sometimes use other methods instead (see [15(7)]).

64. The closest the claim language comes is feature (f) which requires that the trigger for disabling operation of the actuators is that a predetermined machine longitudinal instability is sensed. Counsel for JCB submitted that the WRLD does work this way, albeit more crudely that the MLD. I agree with JCB. What the words predetermined machine longitudinal instability mean is that there is a safety limit or threshold of some kind. It has been predetermined in order to set in advance a limit beyond which the risk of instability associated with the longitudinal load moment is too high. It could be a load on the rear axle below which the risk is too high, or it could be a position of the arm beyond which the arm is deemed not to be safely moveable. The term "sensed" requires that there must be some sensing or measurement by the control system. It does not require instability itself to be sensed, it requires the control system to sense when the predetermined safety limit beyond which the risk of instability associated with the longitudinal load moment is too high.

65. In the WRLD the system measures (i.e. senses) the position of the arm and compares it with a predetermined working range value, which is in turn determined taking into account the rated load or last measured load. The control system is sensing when the predetermined safety limit has been reached. That limit is a cruder measure of the risk of instability associated with the longitudinal load moment than is applied by the MLD, but it is in essence still controlling the same thing.

66. Therefore the two systems in Aichi are both LLMCs within claim 1 of EP 965.

67. The judge rightly rejected JCB's case that the two systems were not identical, however they are similar enough that the construction which brings the MLD within the claim, which is not challenged on appeal, also brings the WRLD within the ambit of the LLMC of the claim too.

68. The final issue therefore is the Comptroller's submission that turning off one LLMC is enough to satisfy the claim even if what is actually happening is switching to bring a different LLMC into operation. JCB had two answers to this. First that the act of switching between two LLMCs simply does not constitute "disabling the LLMC" as a matter of language. Those are the words of the claim in its final feature. Second, JCB points out that paragraph [0037] of the patent explains that the technical purpose of disabling the LLMC is to permit the operator to operate the actuator devices at will. Switching between two LLMCs does not achieve that purpose.

69. In my judgment, giving the claim a purposive construction having regard to the specification at paragraph [0037], a person skilled in the art would not understand the disablement feature in the claim to be satisfied by a method which involved switching from one LLMC to another. That is because switching would still leave an LLMC in operation thereby restricting the ability of the operator to operate the actuator devices at will.

70. I therefore conclude that claim 1 is not invalid over Aichi. I would allow the appeal and overturn the order for revocation of EP 965.

Lady Justice Elisabeth Laing:

71. I agree.

Lord Justice Nugee:

72. I also agree.