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**Datasheet for the decision
of 6 October 2015**

Case Number: T 0689/12 - 3.2.01

Application Number: 05113064.9

Publication Number: 1679251

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Language of the proceedings: EN

Title of invention:
Auxiliary drive and vehicle provided with an auxiliary drive

Patent Proprietor:
Reich KG

Opponents:
Carman Enterprise Co. Limited
AL-KO Kober SE

Headword:

Relevant legal provisions:
RPBA Art. 12(4)
EPC 1973 Art. 56, 54(1)

Keyword:
Admission of documents filed with grounds of appeal - (yes)
Inventive step - main request, auxiliary requests I to IV (no)
Novelty - auxiliary request V (no)

Decisions cited:
T 2020/09

Catchword:



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Case Number: T 0689/12 - 3.2.01

**D E C I S I O N
of Technical Board of Appeal 3.2.01
of 6 October 2015**

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
1 February 2012 concerning maintenance of the
European Patent No. 1679251 in amended form.**

Composition of the Board:

Chairman	G. Pricolo
Members:	W. Marx
	P. Guntz

Summary of Facts and Submissions

I. The appeals by the patent proprietor (appellant I) and by opponent 1 (appellant III) and by opponent 2 (appellant II) are directed against the decision of the opposition division posted on 1 February 2012 to maintain European patent No. 1 679 251 in amended form on the basis of auxiliary request III filed during the oral proceedings.

II. In its decision the opposition division had held, *inter alia*, that the subject-matter of claim 1 according to the main request and of auxiliary requests I and II, all filed with letter dated 11 November 2011, did not involve an inventive step. The subject-matter of claim 1 of auxiliary request III was considered inventive in view of the following documents:

D2: EP 1 225 090 A2;
D5: FR 2 786 456;
D7: EP 1 394 023 A1.

As regards procedural matters, the requests filed on 11 November 2011 were sent by the EPO to the opponents with letter dated 15 November 2011, i.e. were received by the opponents only less than four weeks before the date of oral proceedings scheduled for 13 December 2011. A request for postponement of oral proceedings filed by opponent 1 and received at the EPO on 1 December 2011, to have enough time for an additional search in response to the new requests filed, had not been conceded, and the requests had been admitted into the proceedings.

III. Together with its grounds of appeal dated 6 June 2012 the appellant II filed the following documents:

D12: DE 27 05 318 A1;

D13: EP 0 403 978 A2;
D14: DE 39 20 934 A1;
D15: US 4,596,300;
D16: Article "Und er bewegt sich doch" in
CARAVANING 6/98, pages 30, 31.

IV. In reply to the opponents' appeal, the patent proprietor filed with letter dated 21 December 2012 the following set of requests:

- main request corresponding to auxiliary request I underlying the decision under appeal;
- auxiliary request I directed to a tandem-axle vehicle provided with an auxiliary drive according to claim 1 of the main request;
- auxiliary requests II and V corresponding to auxiliary requests III and IV underlying the decision under appeal;
- new auxiliary requests III and IV.

V. Oral proceedings before the board took place on 6 October 2015.

The appellant I (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained in amended form according to the main request or, in the alternative, according to one of the auxiliary requests I, V, II, III or IV, all requests as submitted under cover of the letter dated 21 December 2012.

The appellants II and III (opponents 2 and 1) requested that the decision under appeal be set aside and that the European patent be revoked. All other requests have been withdrawn.

VI. Claim 1 according to the main request reads as follows (broken into a feature analysis adopted by the parties):

- 1.** Auxiliary drive (8, 9, 12) for driving and steering a non-towed towed vehicle (1) such as a caravan,
 - 1.a** comprising a drive (8, 9) to be fitted on the left and right of said vehicle,
 - 1.b** each drive comprising an electric motor (10) and a drive roller (11) driven by said motor,
 - 1.c** as well as a single controller (12) for said electric motors (10) and
 - 1.d** a control (14) that influences said controller and thus said electric motors,
 - 1.e** which control comprises control members (15) for moving said vehicle along a curved path (20), characterised in that
 - 1.f** said controller (12) is embodied such that on receiving a signal from said control (14) for moving along a curved path (20), this controller controls the electric motors (10) in such a way that both produce a movement (21, 22) of said vehicle in the same direction and
 - 1.g** that said curved path (20) is followed as a result of a difference in speed in said movement,
 - 1.h** on pushing a button that serves for the curved path (20) concerned on said control (14), driving of both electric motors (10) will be achieved via the controller (12),
 - 1.i** wherein said control and controller are embodied to move said vehicle in a straight line, wherein if the speed of the drive rollers when moving in a straight line is 100 %, the speed when executing a curve is such that one drive roller moves at the speed of 80 - 100 % and one drive roller moves at a speed of 10 - 30 %.

Claim 1 according to auxiliary request I is directed to a "Tandem-axle vehicle provided with an auxiliary drive for driving and steering a non-towed towed vehicle (1) such as a caravan" comprising features **1.a** to **1.i**.

In claim according to auxiliary request V, compared to claim 1 according to the main request, features **1.h** and **1.i** are replaced by feature **1.j**:

1.j wherein said control is so embodied that when it is not operated said electric motors have been/are switched off, wherein said switching off comprises gradually reducing the energy supplied to the electric motors.

In claim 1 according to auxiliary request II, compared to claim 1 according to the main request, features **1.h** and **1.i** are replaced by features **M10** to **M14** (according to the feature analysis provided by appellant II):

- M10** wherein the auxiliary drive comprises a safety feature, wherein the safety feature is one of
- M11** that the drive rollers (11) can be driven only after the drive rollers concerned have been pressed against the wheels concerned,
- M12** that movement of the drive rollers towards the wheels is impossible
- M13** and/or pressing of the drive rollers against the wheels is cancelled if the towed vehicle is coupled to a towing vehicle,
- M14** an alarm is given if the towed vehicle is coupled to a towing vehicle.

Claim 1 according to auxiliary request III respectively IV, compared to auxiliary request II, comprises only features **M12/M13** respectively **M11**, and in feature **M10** the term "one of" has been deleted.

VII. The appellant I (patent proprietor) argued as follows:

Additional prior art documents D12 to D16 should not be allowed into the appeal proceedings. To the extent that these documents relate to an auxiliary drive for a non-towed towed vehicle, they could have been filed in first-instance proceedings. To the extent that these documents relate to other subject-matter, they are otherwise irrelevant to the proceedings. In accordance with decision T 2020/09, documents submitted after the expiry of the nine month period were to be considered late-filed (Article 99(1) EPC in conjunction with Rule 76(2) EPC; Article 114(2) EPC). They were to be admitted in appeal proceedings only if they were *prima facie* highly relevant.

The subject-matter of claim 1 of the main request was new. Document D2 was, due to non-consistency of paragraph [0023], at least ambiguous with respect to feature **1.f**. Moreover, D2 did not show features **1.h** and **1.i**. D2 nowhere stated that functions F3, F4, F5 , F6 (initiating a curved path) could be activated by operating a single operating handle (a button), but seemed to comprise two operating handles to activate the curve, and D2 was silent about feature **1.i**. When taking the arrows in D2 as an indication of the shape of the curve, having a radius in the order of magnitude as 50% of the trailer's width, it would require wheel W3 not to be driven.

Starting from closest prior art document D2, the problem to be solved was to provide an auxiliary drive for easy and safe manoeuvring of a vehicle in a non-towed condition along a curved path avoiding damages to the auxiliary drive, see paragraphs [0009] and [0013] of the contested patent. As described in

paragraph [0012] of the patent, this was achieved by pushing a single button ("easy"), without having to consider the speed of the drive rollers or risking damaging the auxiliary drive due to improper operation ("safe"), also preventing swinging behaviour of the vehicle or torsion on the wheels.

The skilled person would not provide a single push button to which pre-set speed ranges were assigned for the different wheels based on D2, and he would not think of push buttons for initiating curves as they didn't provide the user with the option of controlling the radius of the curve. Buttons as control members were known. Paragraph [0012] of the patent application only stated ("push the button ... in the conventional manner") that a user would understand how to operate a push button. However, no moving along a curved path by pushing a single button was disclosed in any document of the known prior art, which was an indication for inventive step. Even if the skilled person would understand D2 as referring to a single operating handle for initiating a curved path, it was not obvious to select a push button for this purpose, as it was a contra-intuitive measure limiting the steering possibilities (control of sharpness of the curved path) of the vehicle and would only allow a user to make a curve with a predetermined ratio. According to D5 (pages 5 and 6), pushing of two buttons was required to move the trailer along a curved path, which did not solve the problem of providing easy manoeuvring. Moreover, D5 showed a trailer having a steered axle, so a turning manoeuvre was different. D16 showed buttons with arrows without presenting a detailed explanation thereof. In fact, D16 did not relate to manoeuvring a trailer along a curved path, but operating the buttons

for turning left or right caused a pivotal movement around a stationary inner wheel.

D2 only addressed the problem of tyres scrubbing and suggested a different solution by operating the drive units in steps interrupted by periods of braking (see paragraph [0008]). The drive unit of the slower wheel in D2 was operated in a pulsed mode (paragraph [0023], point 3), comprising periods of driving at normal speed, braking and no operation, which resulted in a speed of the drive rollers varying between 100% and 0%, so the effect described in D2 to jog the wheel was achieved (see paragraph [0009]; also paragraph [0013] mentioning wheel braking). Since a short driving period was used to accelerate the wheel followed by a braking period and periods "out of operation", the wheel - and also the drive roller - would come to a standstill. This led in another direction than the claimed invention, which had determined favourable speed ranges so that loads due to torsion or swinging could be prevented. D2 did not disclose any hint for the specific speed ranges claimed (the result of experiments done by the inventor, resulting in an advantageous curved path).

The control according to feature **1.d** was embodied for moving the vehicle along a curved path (feature **1.e**) and for switching off by gradually reducing the energy (feature **1.j**). D2 did not show such control that produced these two functions. D2 showed short-circuiting of the motor whilst rotating and generating a current to provide electro-magnetic braking, i.e. no gradual reduction of the energy or the current supplied to the electric motor. In the contested patent, operation as motor was continued, and power was gradually reduced (paragraph [0016]) in a controlled

manner (paragraph [0026]). The technical problem associated with this feature was "how to control the vehicle in a better way when the vehicle is stopped and reduce the stress on the auxiliary drive". This feature was not present or suggested in the prior art.

The associated objective technical problem with the safety features specified in claim 1 of auxiliary requests II to IV was to provide an auxiliary drive with an increased safety (the term "safety feature" implied the problem of unsafety). Since claim 1 showed at least three solutions to the problem, the skilled person was not guided directly to the first alternative (**M11**) mentioned in claim 1. D12 only mentioned briefly the use of *Reibradritzel* (page 5; not Figure 4) without providing safety features with respect to this embodiment. D13 did not relate to the technical field of auxiliary drives for non-towed towed vehicles, but to vehicles which are normally manually propelled, such as bicycles and wheel chairs, having completely different safety risks, in which steering was achieved by providing a steered wheel. The skilled person would not apply the safety features of D13 for towed trailers having a large mass as known from D2. D15 related to the remote technical field of aerial weapons, and no mention was made of any safety feature (page 4, lines 31 to 38 only described the appropriate order of operating the apparatus). D16 did not mention any safety feature either, but only an instruction for a user which did not represent a safety feature of the auxiliary drive. As regards features **M12** to **M14**, they were not mentioned in any of the cited prior art. As argued already previously, the drive rollers in D2 were always in driving contact with the wheels, i.e. there was no hint to implement features **M12** or **M13**.

VIII. The appellant II (opponent 2) essentially submitted the following:

The patent proprietor had filed a new main request and four new auxiliary requests comprising features taken from the description shortly (four weeks) before the oral proceedings before the opposition division. There had not been sufficient time for the opponents to search the new invention claimed. Requests for non-admitting the new requests or for postponement of the oral proceedings had not been granted by the opposition division. Non-admitting documents D12 to D16 - which lied within the board's discretion - would therefore amount to an unequal treatment of the parties.

D2 was considered to take away novelty of claim 1 of the main request and also of auxiliary request I. D2 disclosed clearly feature **1.f** in paragraph [0023], implicitly a push button (known in the prior art, see paragraph [0023] of the contested patent), and different speeds of the left and right drive unit when running on a curved path, including a range of variation as claimed. In particular, claim 1 did not specify any pre-set speed ratio or a single push button (or operating handle).

In any case, feature **1.h** ("on pushing a button") did not exclude that a further button had been pushed before (as in D5), i.e. claim 1 comprised embodiments where several buttons had to be pushed for moving a vehicle along a curved path, which was obvious in view of the knowledge of the skilled person. Such feature might contribute to a safe manoeuvrability of the vehicle, but did not relate to the avoidance of damages to the auxiliary drive, as included by the patent proprietor in its formulation of the problem to be

solved. Paragraph [0012] of the contested patent differed from the wording of claim 1 and did not provide a limited interpretation, and paragraph [0016] mentioned a "button for travel". Since D5 was cited to show how a control was designed (see Figures 11, 12), it was irrelevant that D5 related to a trailer having a steered axle. A remote control comprising push buttons was also known from D12.

The speed ratio specified by feature **1.i** resulted from the application area of the auxiliary drive and its intended use, i.e. manoeuvring a non-towed vehicle with small radii on e.g. a camping site. However, as can be taken from paragraph [0003] of D2, larger radii were achieved when the inner wheel was rotating. This was also the intended use in D2 and required a large ratio of wheel speeds on the left and right side, so one would automatically realise a speed ratio falling into the claimed ranges. D2 mentioned three periods of pulsed operation of the electric motor (driving, short-circuiting, no operation), which led - considering the integral - to a reduction in wheel speed and not to zero wheel speed. The drive roller continued to rotate in the second and third period as in the contested patent during the phase of soft-stopping.

The additional feature of claim 1 according to auxiliary request V, which did not relate to the control of a turning movement, constituted a mere aggregation and was known from D2 (see claim 10 or paragraphs [0027], [0028], describing the same approach as in in paragraph [0016] of the contested patent, which also stated that such approach was well-known in the prior art). Short-circuiting the motor provided the effect of "gradually reducing the energy supplied to the electric motors" as worded in claim 1. Claim 1 did

not require gradual reduction of the electric energy, i.e. comprised that energy provided by the vehicle was reduced during electric braking by short-circuiting.

The "safety features" **M10** to **M14** according to the auxiliary requests II to IV related to a situation prior to drive start, not influencing the subsequent turning manoeuvre according to features **1** to **1.g**. These alternatively claimed features related to problems different from features **1** to **1.g** and had to be assessed individually. The contested patent itself did not mention a safety risk, but only a "safety feature", corresponding solely to the mention of a problem.

Feature **M11** prevented an unpredictable movement of the caravan, an overload of the auxiliary drive and bouncing of the drive rollers, i.e. provided the technical effect of reducing damage and the risk of accidents. As argued by the patent proprietor, feature **M11** solved the problem of providing an auxiliary drive with improved safety. It was already within the knowledge of the skilled person to avoid bringing into contact a rotating driving element with a stationary part, in particular when trying to avoid accidents. D2 already contained a pointer to the solution by referring (see column 4, lines 11 to 17) to a "driving position" and an "out-off-use-position". Different driving states were important due to the fact that movement to the driving position was effected manually in D2. Moreover, D13 related in general to electrically driven auxiliary drives for vehicles and disclosed preventing operation of the electric motor when the wheel engagement elements (drive rollers) were not in operative driving engagement with the vehicle wheel (column 4, lines 24 to 44; claim 2; see also column 10, line 58 to column 11, line 6; column 11, lines 24 ff).

Claim 1 was directed to a non-towed vehicle, which corresponded to a manually propelled vehicle as known from D13. A similar teaching was to be found in D15 (column 3, lines 19 to 30; column 4, lines 31 to 38), and in D16 where the safety feature was realised through an operating instruction to the user ("Nach dem Anstellen der Motoren an die Räder die Stromzufuhr einschalten."). D12 disclosed, for a sprocket gear of an electric motor driving a toothed gear associated with the vehicle's wheel (Figure 4), that power was provided by the electric motor dependent on the engagement status, i.e. features **M10** and **M11** when assuming the toothed gear as part of the wheel and the sprocket gear to represent a drive roller. D12 also disclosed (Figure 3) an auxiliary drive comprising two motors and friction drive rollers pressed against the wheels. A mechanical clutch was provided (see page 5) for separating the auxiliary drive from the wheel during normal driving, e.g. realised by the engaging sprocket, which was also appropriate for the embodiment according to Figure 3.

Since operation of a remote control should not cause any uncontrolled movement of the caravan or damage to the auxiliary drive when coupled to a towing vehicle, feature **M12** was obvious for the skilled person. In particular, D2 pointed (see paragraphs [0001], [0003] and [0005]) to the requirement of decoupling the towed vehicle before manoeuvring.

Feature **M13** also resulted from safety considerations because drive rollers pressed against the wheels when moving off would damage the auxiliary drive and the trailer and also caused braking and thus presented an accident risk. As elaborated in the contested patent, a worm transmission already produced a braking effect.

D12 showed a drive wheel (e.g. a friction wheel, see page 5) engaging - via a clutch - and driving a vehicle wheel. The driving wheel was disengaged during normal driving.

IX. The appellant III (opponent 1) essentially submitted the following:

Filing of documents D12 to D16 with the statement of grounds of appeal was not considered as late-filed within the meaning of Article 114(2) EPC, since it was an immediate and appropriate reaction to the submission of a new request containing features derived from the description. As such, the issue of *prima facie* relevance was not to be considered. In particular, it had not been possible to perform an additional search for three alternative safety features derived from the description before the date of oral proceedings. Additional prior art could only be provided against claim 1 of former auxiliary request III (current auxiliary request V), based on granted claim 6, which had been searched.

Document D2 showed all the features according to the preamble of claim 1. Paragraph [0023] of D2 defined the rotating direction of both wheels for forward movement, which is referred to when describing a turning movement afterwards, so no ambiguous understanding of feature **1.f** was possible. It was clearly described that all wheels were driven (the inner wheel slower than the outer wheel) when turning. D2 also described a hand-held controller which normally had push buttons, as required by feature **1.h**, and feature **1.i** was implicitly disclosed in D2. Moreover, feature **1.h** only required one (of possibly several) push button to initiate a curved path. It was not originally disclosed that a

curve was executed by pressing one button only, and also claim 1 did not specify "a single button". D2 already disclosed a hand-held controller as required by claim 1, and it was obvious for the skilled person (see also D16) to provide a controller with push buttons in order to initiate the different functions as described in D2 in paragraph [0023]. D2 also showed a pulsed control of the electric motor to achieve that "wheel W3 therefore turns more slowly than the wheel W4" (see column 5). Wheel speed was significantly reduced by the timing mentioned in D2 (40 msec driving, 200 msec braking, 1 sec no operation), but the wheel and also the drive roller were always rotating due to the vehicle's inertia. Claim 1 did not specify how to realise a speed of 10 %, whether through pulsed activation of the motor - providing on average a reduced speed - or as a constant speed. The skilled person realising the teaching of D2 had to select the speed range for the inner and outer wheel, trying to reduce tyre wear for the inner wheel and at the same time maintaining a high degree of manoeuvrability. The speed ranges claimed resulted from obvious considerations.

As argued by appellant II, the additional feature of claim 1 according to auxiliary request V was known from D2. The characterising portion of claim 1 according to auxiliary request V specified a so-called soft-stop-function which provided reduced braking forces to the suspension and related to a problem during practical use of the device (jerky deceleration when switching off the drive). Neither this problem nor the solution to this problem contributed to an inventive step. When hard braking led to high forces, it was obvious to provide a soft-stop-function.

The problem underlying safety feature **M11** was to remove the risk associated with an auxiliary drive operated before pressing the drive rollers against the wheels, which caused uncontrolled (jerky) movement of the towed vehicle, increased wear of the tyres and damage to the vehicle. Such definition of the problem to be solved, aiming at eliminating safety deficiencies which became apparent latest during use of the device, could not contribute to an inventive step, even in the absence of any safety regulations presented by the opponent in this respect. It was a normal task of the skilled person to remove deficiencies resulting from the use of a device, i.e. resulting from the drive being operated before pressing the drive rollers against stationary wheels of the trailer. Such analysis was within the normal activities of the skilled person. Knowing the root cause of the problem, it was obvious to provide a safety feature **M11**, in particular if this solution was disclosed in D13 (see claims, not restricted to specific vehicles) and corresponding handling instructions were given in D15 or D16.

Reasons for the Decision

1. *Admitting documents D12 to D16 into appeal proceedings*

Pursuant to Article 12(4) of the Rules of Procedure of the Boards of Appeal (RPBA, OJ EPO 2007, 536), the board has the power to hold inadmissible facts, evidence or requests which could have been presented or were not admitted in the first-instance proceedings.

Documents D12 to D16 were filed by appellant II for the first time with its statement setting out the grounds of appeal. The appellants argued that there had not

been sufficient time to search the features taken from the description and included in the auxiliary requests filed only four weeks prior to the date of oral proceedings.

As can be seen from the course of the proceedings before the opposition division (points II and III *supra*), the amended claims as maintained in opposition proceedings were received by the opponents only less than four weeks before the date of oral proceedings. Moreover, requests for non-admitting the new requests or for postponement of first-instance oral proceedings had not been granted by the opposition division. The board agrees with the appellants that there was too little time left before the first-instance oral proceedings to search for additional prior art and present possibly new reasoned arguments.

However, it is crucial to establish whether the filing of documents D12 to D16 was a legitimate reaction to the submission of the amended claims or whether, with regard to the granted claims, these document could already have been filed with the notice of opposition. Claim 1 according to present auxiliary request II as upheld in opposition proceedings (which corresponds to former auxiliary request IV filed on 11 November 2011 and defined during oral proceedings as new auxiliary request III) was amended by including safety features **M10** to **M14** which are only disclosed in the description of the application as filed and also of the granted patent (paragraph [0022] of A- and B- publication). Therefore, the subject-matter of claim 1 was directed to a new aspect which did not form part of any of the granted claims. The board therefore finds that documents D12 to D16 were cited as a legitimate reaction to the filing of auxiliary requests containing

features taken from the description and could not have been presented in first-instance proceedings. Contrary to the assertion of appellant I, these documents have therefore been filed, although filed after expiry of the nine-month opposition period, on time.

Therefore, the board sees no reason to exercise its discretion under Article 12(4) RPBA to hold documents D12 to D16 inadmissible. As a consequence, documents D12 to D16 were taken into consideration, irrespective of their relevance.

2. *Inventive step - main request and auxiliary request I*

2.1 The subject-matter of claim 1 according to the main request and also according to auxiliary request I is new over document D2.

2.2 An auxiliary drive and also a tandem-axle vehicle according to the preamble of claim 1 of the main request and of auxiliary request I is known from D2, which was not contested.

According to appellant I, feature **1.f** was not unambiguously disclosed in D2. The board cannot share this view because paragraph [0023] of D2 clearly defines the rotating direction of both wheels for forward movement (arrow F1 in Figure 3) as being "anti-clockwise" for wheel W3 and "clockwise" for wheel W4 "viewed from the side of the caravan", which is referred to when describing a turning movement afterwards ("Forwards turning movement to the left as represented by arrow F3. In this case the two motors turn in opposite directions as in function F1 but the motor of drive unit 10 operates more slowly than the motor of drive unit 11."). The term "turn in opposite

directions" explicitly refers to the rotating direction as specified before for the forward movement ("as in function F1"), assuming a view from the side of the caravan, i.e. both motors produce a movement of the vehicle in the same direction as required by feature **1.f**. Moreover, feature **1.g** is also disclosed because both motors operate at different speeds, which was not contested.

- 2.3 The board agrees with appellant I that features **1.i** and **1.h** are not known from D2, so the subject-matter of claim 1 is new. In particular, D2 just mentions a hand-held controller (see paragraph [0022]) without further details on how to operate the controller, and D2 is silent about the speed ratio between the two wheels driven by motors at different speeds.

Feature **1.h** ("on pushing a button that serves for the curved path concerned on said control") further specifies the control members (15) of feature **1.e**, i.e. the means for actuating the control (14) which sends out a signal - received by the controller (12) for the electric motors - for moving along a curved path, as described in feature **1.f**.

Feature **1.i** specifies speed ranges for the drive rollers when executing a curve (80 - 100 %, 10 - 30 %) in comparison to a reference speed of 100 % when moving in a straight line.

In the board's judgement, distinguishing features **1.h** and **1.i** are neither structurally nor functionally interrelated. As argued by appellant I, feature **1.h** might contribute to an easy manoeuvring of a vehicle along a curved path, realised by pushing a button on the control. However, a safe operation avoiding damages to the auxiliary drive, as achieved by the speed ranges

according to feature **1.i** and confirmed by the embodiment described in the contested patent (see paragraph [0024]), is not necessarily linked to the way of operating or initiating the control by providing a push button. The aforementioned distinguishing features therefore solve independent partial technical problems and may therefore be considered separately for the purposes of assessing inventive step.

- 2.4 As regards distinguishing feature **1.h**, the board is not convinced that the expression "on pushing a button that serves for the curved path concerned" comprises a restriction to "pushing a single button" as argued by appellant I, which would only allow a user to make a curve with a predetermined ratio. The patent specification itself (see paragraph [0023], which mentions buttons for forward, backward, left, right movement) supports a broader interpretation comprising embodiments where different buttons are provided for determining heading direction (forward/rearward) and turning direction (left/right). Moreover, paragraph [0012] describes that "the user will have to push the button that serves for the curve concerned" and paragraph [0016] refers to a situation where "the operator releases the button for travel", which also suggests that different buttons might be used for starting travel and defining the turning direction.

When solving the problem of how to provide an easy way of operating the hand-held controller of D2, providing push buttons is one of the obvious alternatives the skilled person would think of. Since D2 describes at least a forward and rearward movement of a caravan and a turning movement to the left and to the right with both wheels rotating, it would be obvious to provide at least corresponding buttons for initiating said

movements separately. This would obviously lead to the claimed subject-matter according to claim 1 within the meaning as assumed by the board, i.e. not restricted to a single push button.

Moreover, such design of hand-held remote controllers is known in the prior art. D5 describes (Figures 11, 12 and pages 5 and 6) that two buttons are actuated for moving the vehicle along a curved path. The board cannot see why the fact that D5 relates to a trailer having a steered axle would prevent the skilled person from applying the design of its remote controller to the hand-held controller of D2. D16 also shows a remote controller (depicted on page 31) comprising push buttons for moving in a straight line and for turning. D16 might not disclose a turning movement along a curved path where both wheels produce a vehicle's movement in the same direction, since operating the buttons in D16 for turning left or right might cause a pivotal movement around a stationary inner wheel. However, such movement is already known from D2, and the skilled person would only need to apply the push buttons of D16 to the hand-held controller of D2, which is considered as not involving an inventive step. Whether the combination of D2 and D16 results in a design of the hand-held controller where only a single button (to which pre-set non-zero speed ranges are assigned for the left and right wheel) needs to be pushed or not, can be left open because the subject-matter of claim 1 is not considered to be limited in this sense, as argued above.

- 2.5 As acknowledged by appellant I, D2 already addresses (see paragraph [0005]) the problem of tyres scrubbing when turning a twin-axle trailer not coupled to a towing vehicle and the wheels at one side are

maintained stationary. This problem is related to the problem solved by feature **1.i** according to the contested patent, avoiding damages to the auxiliary drive, because scrubbing tyres will also produce torsion on the wheels and on the suspension.

Appellant I argues that D2 shows a different solution to this problem (see paragraph [0023]) in that the slower wheel is operated in a pulsed mode, comprising periods of driving at normal speed, braking and no operation, so that the wheel is jogged. However, this mode of actuation in D2 results in that the "wheel W3 therefore turns more slowly than the wheel W4" (see paragraph [0023]), i.e. D2 clearly discloses a slower rotating inner wheel, which makes technical sense due to the influence of the inertia of the trailer. After having been accelerated to a certain speed when driving the electric motor at normal speed, the trailer's wheel in D2 is braked by motor braking of the electric motor of the drive unit. It is left open in D2 whether the wheel is braked to a standstill or, due to the trailer's inertia, is still rolling at the end of the braking period and during the subsequent phase of no operation. At any rate, such pulsed operation will result in an average rotational speed of the trailer's inner wheel and also of the corresponding drive roller, which is in permanent contact with the trailer's wheel, as described in D2 ("turns more slowly").

Since claim 1 does not specify at all how the speed control of the electric motor driving the drive rollers is implemented, the board concludes that the pulsed operation mode known from D2 for moving along a curved path falls under the wording of claim 1. In fact, this is also supported by the description of the contested patent which explicitly mentions (see paragraph [0018])

a speed control where the rotation of the electric motors is influenced by pulsing, comprising in particular a speed control where "the duration of the pulse or the period between the pulses" is controlled.

It remains to be assessed whether the speed ranges claimed in feature **1.i** can contribute to an inventive step. Given that both D2 and the claimed invention relate to the same area of manoeuvring a trailer or caravan when uncoupled from a towing vehicle e.g. on a camping site, requiring a turning movement with small radii, and both address the problem associated in particular with tandem-axle trailers when maintaining the inner wheel stationary when turning, the board finds that the skilled person, starting from D2 and trying to define a suitable speed ratio between inner and outer wheels, would inevitably arrive at a speed ratio falling within the claimed ranges without the exercise of an inventive step.

2.6 As a consequence, the subject-matter of claims 1 according to the main request and according to auxiliary request I does not involve an inventive step starting from D2 as closest prior art (Article 56 EPC).

3. *Novelty and inventive step - auxiliary request V*

3.1 Feature **1.j** in claim 1 of auxiliary request V, replacing features **1.h** and **1.i** previously discussed, specifies a so-called soft-stop function, in particular how the control (which corresponds to the hand-held controller of D2) is embodied when not operated. In this case, the "electric motors have been/are switched off", and switching off "comprises gradually reducing the energy supplied to the electric motors". Considering that the hand-held controller in D2 is not

operated any more, i.e. when there is no input from the operator's side which would define a request for driving the electric motors, in particular in case of terminating a turning movement, the pulsed control of the slower wheel will have been terminated by motor braking as argued above (see point 2.5).

The wording of claim 1 ("reducing the energy supplied") leaves open whether the electric energy supplied to the electric motors should be gradually reduced, e.g. by reducing the operating voltage, or whether the mechanical energy (due the moving vehicle's inertia) is gradually reduced by braking the electric motor, which can be achieved e.g. by short-circuiting the electrical supply terminals. The latter variant is known from D2 (see claim 10, dependent upon claim 9), according to which braking of each drive unit is achieved "electromagnetically by short circuiting the drive motor or by placing a load resistor in circuit with the motor". Since the contested patent refers itself to an advantageous embodiment within this meaning (see paragraph [0016]: "if the operator releases the button for travel ... the various current circuits are shortcircuited, as a result of which a braking effect is produced"), feature **1.j** is known from D2 and the subject-matter of claim 1 according to auxiliary request V lacks novelty over D2 (Article 54(1) EPC).

- 3.2 Even assuming that feature **1.j** would mean a gradual reduction of electric energy or power supplied to the electric motors, such reduction is well-known to the skilled person when it comes to terminating the actuation of electric motors, as confirmed in the contested patent (paragraph [0016]: "in any manner known in the art"). Therefore, the board finds that the replacement feature **1.j** according to claim 1 of

auxiliary request V could also not help establishing an inventive step.

4. *Inventive step - auxiliary requests II to IV*

- 4.1 Claim 1 according to auxiliary request II specifies, as replacement for features **1.h** and **1.i** of the main request, a set **M10** to **M14** of alternative safety features, whereas claims 1 according to auxiliary requests III and IV are restricted to only a subset of safety features (**M12** and/or **M13**) or to a single safety feature (**M11**) with regard to the drive rollers.

Document D2 shows (Figures 2 and 3, paragraph [0019]) DC electric motors driving friction drive rollers 22 which can be moved into and out of contact with the tyres (see paragraph [0020], mentioning a toggle mechanism). In particular, D2 mentions in this context a "driving position", in which the friction roller is pressed against the adjacent tyre, and an "out-of-use position", in which the roller is out of contact with the tyre, i.e. the drive rollers are not in permanent driving contact with the wheel, as argued by appellant I. However, D2 does not go into further details as regards the conditions for driving the drive rollers or moving/pressing the drive rollers against the wheels.

- 4.2 The condition defined by feature **M11**, that the drive rollers can be driven only after the drive rollers have been pressed against the wheels, prevents any unpredictable movement of the caravan which might lead to accidents or damage to the vehicle.

The skilled person, when looking for a solution to prevent unpredictable or dangerous movement of the

caravan in D2, is well aware of the problems when bringing into contact a rotating driving element with a stationary part such as a wheel. Moreover, when consulting the prior art dealing with auxiliary drives for vehicles, in particular auxiliary drives comprising frictional drive rollers, he would have found document D13 which teaches to prevent operation of the electric motor when the wheel engagement elements are not in operative engagement with the vehicle wheel (column 4, lines 33 to 44; also column 10, line 58 to column 11, line 30). Therefore, without the exercise of an inventive step, the skilled person would arrive at the solution specified by feature **M11**, because the term "can be driven only" corresponds to the "prevent"-condition known from D13.

Appellant I argued that D13 did not relate to the technical field of auxiliary drives for non-towed towed vehicles having a large mass, but to steered and manually propelled vehicles such as bicycles and wheel chairs having different safety risks. However, the auxiliary drive in D2 serves for propelling a caravan when not coupled to towing vehicle, i.e. a manually propelled vehicle, and the teaching of D13 (see title; claim 1; column 1, lines 1 to 4) also comprises vehicles in general. Besides, according to the contested patent (see paragraph [0022]), the safety precautions are to be considered independent from the turning movement, i.e. unrelated to the steering function. Moreover, as demonstrated by document D15 relating to the precise positioning of large vehicles, in particular a trailer carrying aerial weapons, the same principle of operation also applies to vehicles having a large mass. According to D15 (see column 4, lines 31 to 38), first the drive rollers are engaged with the wheels of the trailer, and thereafter the

drive motors are actuated to effect rotation of the drive rollers. As indicated by the term "thereafter", the two steps of pressing the drive rollers against the wheels and driving the drive rollers are performed sequentially, as specified by feature **M11**. Moreover, a corresponding handling instruction is explicitly known from document D16 for a caravan.

Therefore, the board cannot see why the skilled person would not apply to the vehicle according to D2 the teaching of D13, D15 or D16, revealing a safety feature which is generally recognised, independent from the size or weight of a vehicle, for drive rollers driven by an electric motor and engaging a wheel.

- 4.3 Safety features **M12/M13** refer to a situation where the trailer is coupled to a towing vehicle. In this situation the trailer might be towed, and engagement of the drive rollers with the wheels should be avoided. Feature **M12** comprises a kind of inhibit function ("movement ... is impossible"), whereas the alternative feature **M13** simply states that "pressing of the drive rollers against the wheels is cancelled".

D2 already distinguishes between a "driving position" and an "out-of-use position" and describes a toggle mechanism for executing movement between both positions manually by means of a tool (paragraph [0020]). It is obvious for the skilled person that "out-of-use" refers to the situation where no auxiliary drive is needed, i.e. when the caravan is coupled to a towing vehicle (as mentioned in paragraph [0002] in the contested patent). Since the wording of claim 1 does not exclude a manual operation for bringing the drive rollers in contact with the wheels, features **M12** and **M13** also comprise handling instructions for the operator who has

to operate the toggle mechanism in D2. It is obvious for the skilled person, in view of D2, that the "out-of-use position" should be adopted when the caravan is coupled to a towing vehicle and no auxiliary drive is needed. Therefore, cancelling pressing of the drive rollers towards the wheels in this situation according to feature **M13** is an obvious measure the operator of the auxiliary drive would apply. Moreover, additionally securing the out-of-use position by appropriate means so that movement of the drive rollers towards the wheels is impossible, as specified by feature **M12**, is an obvious option for the skilled person when drive rollers are brought into contact with vehicle wheels by manual operation. The board finds that the safety features **M12** and **M13** as defined in claims 1 according to auxiliary requests II and III even comprise embodiments where an auxiliary drive is provided together with indications given for safety reasons e.g. in the operation manual or by a sticker associated e.g. with the manual toggle mechanism in D2, which is considered obvious as explained above.

- 4.4 It follows from the foregoing that any of safety features **M11** to **M13** is obvious to the skilled person when dealing with auxiliary drives for vehicles comprising drive rollers driven by an electric motor and engaging a wheel. As a consequence, the subject-matter of the claims 1 according to the auxiliary requests II to IV does not involve an inventive step (Article 56 EPC).
5. Since, for the reasons set out above, none of the requests submitted by appellant I (patent proprietor) are allowable, the patent has to be revoked. Accordingly, further issues with regard to non-

admittance of auxiliary requests for being late filed or divergent can be left open.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated