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**Datasheet for the decision  
of 14 November 2012**

**Case Number:** T 0173/10 - 3.2.01

**Application Number:** 98113692.2

**Publication Number:** 893315

**IPC:** B60R 25/00, B60R 25/04

**Language of the proceedings:** EN

**Title of invention:**  
Vehicle electronic key system

**Patentees:**  
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Kabushiki Kaisha Tokai Rika Denki Seisakusho

**Opponent:**  
Huf Hülsbeck & Fürst GmbH & Co. KG

**Headword:**  
-

**Relevant legal provisions:**  
-

**Relevant legal provisions (EPC 1973):**  
EPC Art. 56

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

**Decisions cited:**  
-

**Catchword:**  
-



Case Number: T 0173/10 - 3.2.01

**D E C I S I O N**  
**of the Technical Board of Appeal 3.2.01**  
**of 14 November 2012**

**Appellant:** Huf Hülsbeck & Fürst GmbH & Co. KG  
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**Representative:** TBK  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted 17 December 2009  
rejecting the opposition filed against European  
patent No. 893315 pursuant to Article 101(2)  
EPC.**

**Composition of the Board:**

**Chairman:** G. Pricolo  
**Members:** W. Marx  
D. T. Keeling

## Summary of Facts and Submissions

I. On 26 January 2010 the appellant (opponent) lodged an appeal against the decision of the opposition division posted 17 December 2009 rejecting the opposition against European patent No. 0 893 315. The appeal fee was paid on the same date. The statement setting out the grounds of appeal was received on 22 April 2010.

II. In its decision the opposition division held that none of the grounds mentioned in Article 100(a) EPC 1973, referring to objections under Article 56 EPC 1973, prejudiced the maintenance of the European patent, having regard inter alia to the following documents:

D3: JP 08 086 130 A;

D4: DE 36 15 890 A1;

D6: DE 43 29 697 C2.

With its statement setting out the grounds of appeal, the appellant filed the following translation of document D3, not being based on computer translation:

D3e: English translation of D3.

III. In the oral proceedings, held on 14 November 2012, the appellant requested that the decision under appeal be set aside and that the European patent be revoked. The appellant withdrew its objection of lack of novelty over document D3, raised for the first time in its statement setting out the grounds of appeal.

The respondents (patent proprietors), after having withdrawn its first to fourth auxiliary requests filed

with letter dated 12 October 2012, requested as sole request that the appeal be dismissed and the patent be maintained as granted.

IV. Claim 1 as granted according to the respondents' sole request reads as follows (the numbering of features corresponds to the one used in the contested decision):

**[a1]** "A vehicle electronic key system  
**[a2]** for performing code matching via communication with an electronic key (60) and  
**[a3]** controlling permission for and the prohibition of an engine start according to a result of the matching, comprising:  
**[a4]** an electronic key (60);  
**[a5]** a manually rotatable rotary switch (24) for an engine start;  
**[a6]** a keyhole (44) connected to the manually rotatable rotary switch (24), said electronic key (60) being insertable therein;  
characterised in that  
**[a7]** said manually rotatable rotary switch (24) includes an operating knob (40),  
**[a8]** said operating knob being manually rotatable by an operator to rotate said rotary switch (24);  
**[a9]** wherein code matching is performed via communication with the electronic key (60)  
**[a10]** when said electronic key is inserted into said keyhole (44)  
**[a11]** or when said electronic key is not inserted into said keyhole (44); and  
**[a13]** wherein depending on the result of the code matching, the operating knob (40) can be manually rotated by the operator to start the engine

**[a12]** irrespective of the insertion of the electronic key (60) into the keyhole (44)."

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

Starting from document D4 as closest prior art, the skilled person taking into account the teaching of D3 would arrive at the subject-matter of claim 1. D4 showed a vehicle electronic key system performing code matching via communication with an electronic key and controlling permission for and the prohibition of an engine start according to the result of the matching. The system of D4 comprised an electronic key ("anwenderseitiges Steuergerät 9") and a manually rotatable rotary switch including an operating knob ("Knopf 23"), manually rotatable by an operator to rotate said rotary switch to start the engine depending on the result of the code matching (column 7, lines 16 to 17: "wenn unter diesen Umständen die Lenkradschloßsperre 23 zum Starten des Motors manuell gedreht wird"). With D4 only showing a keyhole for inserting a mechanical key, code matching was performed in D4 without the electronic key being inserted into a keyhole. Therefore, part of feature **[a6]** as well as feature **[a10]** was not disclosed in D4.

By still relying on a mechanical key and its associated keyhole, the system known from D4 was vulnerable to lock-picking, protected against unauthorized use only by providing a limited time span to start the engine (column 7, lines 15 to 18) or a hidden switch 3 to be operated by the user of the vehicle (column 3, line 37 ff.). Based on this difference, the objective was to make the process shown in D4 safer and more comfortable.

The skilled person found several possibilities to solve the problem in document D3. The electronic key of D3 comprised a switch means to be manually operated in order to transmit the specific code signal (see claim 4 of D3e); the specific code signal to control startup of an engine was transmitted in response to a trigger signal from a vehicle side (claim 15 of D3e); the electronic key was integrally constructed with a mechanical key (claim 3 of D3e); D3 distinguished between a mechanical key and an electronic key (see page 23 and 29 of D3e) by providing separate reference signs 45 and 21. Admittedly, D3 did not show the mechanical key formed separately from but only integrally with the electronic key.

Therefore, D3 solved the above-mentioned problem by showing an electronic key that was insertable into a keyhole connected to the manually rotatable rotary switch (page 34, para. [0022] of D3e). Code matching was performed via communication with the electronic key either when the electronic key was inserted into the keyhole (see also claim 6 of D3e) or by manually operating a switch means 44, irrespective of the insertion of the electronic key (page 17, para. [0005] of D3e). Hence, by combining D4 and D3 the skilled person would arrive at the subject-matter of claim 1.

Moreover, the combination of document D6 with D3 also led the skilled person to the subject-matter of claim 1. D6 showed an electronic key system for vehicles for performing code matching via communication with an electronic key and controlling permission for and the prohibition of an engine start according to the result of the matching. The system comprised an electronic key

("Transponder 2") taking the form of a chip card or of a customary key, and a manually rotatable rotary switch to start the engine ("Motorstartknopf") including an operating knob ("Motorstartknopf"). Code matching was performed in D6 when the electronic key was not inserted into the keyhole, irrespective of the insertion of the electronic key into the keyhole. The sole features not known from D6 were features **[a6]**, **[a10]** and **[a13]**.

The objective of the subject-matter of the contested patent was the development of a key system for controlling engine start, using electronic keys of various shapes as already proposed in D6. The skilled person, knowing the teaching of D6 and faced with the problem mentioned in the contested patent, would consider the teaching of document D3 relating to the same technical field. D3 disclosed a keyhole connected to the manually rotatable rotary switch for inserting an electronic key (claim 6), and code matching was performed when the electronic key was inserted into the keyhole (claim 19). Depending on the result of the code matching (page 20, para. [0006] of D3e: "Based on this transmission ... whether or not to permit startup of the engine"), the operating knob was manually rotatable by the operator to start the engine (page 33, para. [0020]: "startup of the engine can be permitted by turning on the ignition through key operation while turning the switch 44 to the on position"; page 34, para. [0022]: "insertion of the key 21 into the key cylinder 31 may be detected using an on position of ACC (accessories) switched by rotation of the key"). Hence, the subject-matter of claim 1 was not inventive when starting from document D6 in view of the teaching of document D3.

In its statement setting out the grounds of appeal the appellant referred to its elaborations in the first instance proceedings with respect to all documents presented in opposition proceedings. However, at the request of the chairman during oral proceedings, the appellant declared that it was basing its objection of lack of inventive step only on documents D4 and D6 as closest prior art.

VI. The arguments of the respondents may be summarised as follows:

The question at issue was whether the skilled person would combine documents D4 and D3 without having hindsight knowledge of the claimed invention. D4 showed a card-type electronic key for performing code matching that was started either by actuation of a door handle switch 4 or, alternatively, a hidden switch 3 close to the steering lock device. Hence, a release step was required in D4 for performing code matching. But D4 was silent about what happened when the mechanical key was inserted or not. Moreover, D4 wanted to provide a possibility to start the engine occasionally without having to use the ignition key (see column 2, lines 32 to 33). D3, showing a mechanical key comprising an electronic key (see Figure 5: reference signs 21, 45), always required that the ignition key had to be inserted for starting the engine (see Figure 4, step #11; or Figure 7, step #31: further processing only if the key was inserted). The skilled person would not ignore said essential feature of D3 (as described on pages 17 and 30 of the translation document D3e). Therefore, combining the teaching of D3 with D4 led to an electronic key system where the key had to be inserted, contrary to



what was specified by features **[a12]** and **[a13]** ("irrespective of the insertion of the electronic key into the keyhole", "... the operating knob can be manually rotated by the operator to start the engine").

Considering document D6 as closest prior art, D6 at least did not show the features that the switch was manually rotatable with a knob, that a keyhole for the electronic key was provided in the switch, and that code matching was performed when the electronic key was inserted in the keyhole. In particular, D6 did not describe a manually rotatable rotary switch but simply a start knob. When trying to solve the problem that the identifier ("Transponder 2") of D6 did not make reliable communication with the receiver, D3 suggested a system where the starting switch was rotatable and the key or identifier was inserted therein to start the engine (last four lines of page 33 of D3e). D3 did not describe that switch 44 (described on page 24 of D3e as being the lock and unlock switch) was used to start the engine. Therefore, even when introducing the features of D3 in D6, the skilled person would not arrive at the feature that the starting of the engine could be performed irrespective of whether or not the electronic key was inserted into the keyhole.

## Reasons for the Decision

1. The appeal is admissible.
2. *Inventive step (Article 56 EPC 1973) - starting from D4*
  - 2.1 D4 discloses a vehicle electronic key system that performs code matching via communication with an electronic key (column 2, lines 41 to 42 and column 4, lines 60 to 66) controlling permission for and the prohibition of an engine start according to a result of the matching (column 7, lines 15 to 18) (features **[a1]** to **[a3]**), comprising an electronic key ("anwenderseitiges Steuergerät 9") (feature **[a4]**), a manually rotatable rotary switch for an engine start (column 7, lines 15 to 18: "die Lenkradschloßsperre 23 zum Starten des Motors manuell gedreht wird") (feature **[a5]**) and a keyhole (Figures 1 and 2: keyhole for receiving a mechanical key, as indicated in column 2, lines 28 to 33) connected to the manually rotatable switch (**first part** of feature **[a6]**). The manually rotatable rotary switch includes an operating knob (Figure 1 and column 7, line 6: "Knopf 23") that is manually rotatable by an operator to rotate said rotary switch (column 7, lines 15 to 18 and lines 38 to 40) (features **[a7]**, **[a8]**). Code matching is performed via communication with the electronic key (column 2, lines 60 to 66) when the electronic key is not inserted into the keyhole (see column 2, lines 28 to 33) (features **[a9]** and **[a11]**), and depending on the result of the code matching, the operating knob can be manually rotated by the operator to start the engine (column 7, lines 38 to 40) (feature **[a13]**), without having to insert the electronic key into the keyhole (feature **[a12]**).

However, as admitted by the appellant, the keyhole of D4 is not adapted to take the electronic key (**2nd part** of feature **[a6]** and feature **[a10]**), in particular since D4 shows a keyhole (see Figures 1 and 2) for inserting a conventional mechanical key. Therefore, the subject-matter of claim 1 of the main request is novel over D4, which was not contested.

2.2 As argued by the appellant, the vehicle key system of D4 was vulnerable to lock-picking and protected against unauthorized use only by providing a limited time span to start the engine after entering the vehicle; alternatively a hidden switch within the vehicle had to be operated to permit engine start.

However, the objective technical problem cannot be formulated merely on the basis of disadvantages of the known prior art. The problem to be solved has to be determined on the basis of those features which distinguish the claimed subject-matter from the prior art and the effect obtained by the distinguishing features. When providing a keyhole for inserting an electronic key connected to the manually rotatable rotary switch, the user of the vehicle might still start the engine by rotating the electronic key within the keyhole, as he was accustomed to when using a conventional mechanical key. Moreover, if code matching is performed when the electronic key is inserted into the keyhole, permission for the engine to start is triggered as is customary for conventional vehicle key systems, thus avoiding the unusual procedure disclosed in D4 when the engine has not been started within a predetermined time span.

Therefore, the objective technical problem underlying the invention is considered to be the provision of a means for starting the engine that is comfortable to operate and takes into account the customary practice of the vehicle's user when starting the engine.

- 2.3 When looking at document D3 (together with its English translation D3e), the skilled person will find an electronic key 21 incorporating an immobiliser function integrally constructed with a mechanical key 45 that is inserted into a keyhole of a key cylinder 31 and that might be rotated (see page 34, para. [0022] of D3e), permitting startup of the engine (page 33, para. [0020] of D3e). As indicated in Figures 4 or 7 of D3 (see description of said Figures in D3e), engine start is only permitted (Figure 4: step #17; Figure 7: step #36) after having successfully received the correct code (Figure 4: step #14; Figure 7: step #33). Hence, on the assumption that the skilled person would apply the teaching of document D3, he would be tempted to replace the card-type electronic key 9 of D4, controlling permission for, and the prohibition of, an engine start on the basis of code matching, by the key-type electronic key 21 of D3 and its corresponding key cylinder 31, providing the same functionality. Moreover, as with conventional ignition keys, engine start is possible by rotating the electronic key.

At the same time, there would no longer be the need to keep a mechanical key - together with the complex mechanical construction of the key cylinder - in addition to the electronic key, which is more comfortable for the user. By adopting the key cylinder

for inserting the electronic key known from D3, the skilled person would dispense with the operating knob 23 provided for the mechanical key cylinder of D4, simply because D3 already provides - by rotatable key cylinder 31 - a manually rotatable rotary switch that is switched by rotation of the electronic key 21. In D4 the operating knob was provided in order to occasionally permit an engine start without having to use the mechanical ignition key. Since D3 does not require a mechanical ignition key any more, but just insertion of the electronic key into the keyhole for performing code matching, which provides the additional benefit of having a defined place of storage for said key, the problem mentioned in D4 is also solved when adopting the key cylinder of D3 as mentioned above.

Therefore, when applying the teaching of D3, the skilled person would not arrive at the claimed subject-matter of granted claim 1 which requires a manually rotatable rotary switch including an operating knob (feature **[a7]**). This alone, in the Board's view, supports the presence of an inventive step.

Moreover, D3 teaches that engine start is only permitted (see Figure 4: step #17; or Figure 7: step #36) after it has been detected that the electronic key was inserted into the keyhole (see Figure 4: step #11; or Figure 7: step #31, representing a waiting loop realised by software). Therefore, there is no indication in D3 that the skilled person, when combining documents D4 and D3, would maintain the functionality to permit engine start irrespective of the insertion of the electronic key into the keyhole, as required by features **[a13]**, **[a12]**.

In summary, even assuming that the skilled person would consider D3 showing an electronic key to be inserted into a keyhole according to features **[a6]** and **[a10]**, there is no reason why he should keep the operating knob of D4 and why engine start should be possible without insertion of the electronic key when applying the teaching of D3, in particular since D3 teaches that engine start permission is only given when the insertion of the electronic key has been detected and that engine start is performed by rotating the electronic key. He would simply replace the whole key-keyhole assembly of D4 by the assembly known from D3 and its mode of operation, so features **[a7]** and **[a13]**, **[a12]** would be missing. It is noted that the wording of claim 1 makes clear that the operating knob and the electronic key are different means interacting with the manually rotatable rotary switch.

- 2.4 The appellant argued that D3 showed an electronic key, formed integrally with a mechanical key, and different means for transmitting a code signal, namely when manually operating a switch means on the electronic key or in response to a trigger signal from a vehicle side. Code matching was performed in D3 via communication with the electronic key either when the electronic key 21 was inserted into the keyhole or by manually operating a switch means 44, irrespective of the insertion of the electronic key.

In this respect, the clear and unambiguous teaching of D3 has to be considered. Indeed, the electronic key 21 of D3 shows a switch 44 (see Figure 2), triggering a process of code matching. However, said switch is described in D3e as a "lock and unlock switch to be

operated for activating the keyless entry system" (see page 24, para. [0009]), which relates to locking and unlocking a vehicle door and not to a function of permitting engine start. D3 does not describe that it is possible for the operator to start the engine via switch 44 when the electronic key is not inserted, i.e. irrespective of the insertion of the electronic key (features [a13], [a12]). D3 rather requires that the electronic key has to be inserted before permitting engine start (see Figures 4 and 7) as explained above. Therefore, the combination of documents D3 and D4 leads to an electronic key system requiring the electronic key to be inserted for permission of an engine start, contrary to what is specified in granted claim 1. The Board follows the respondents' view that the skilled person would not simply ignore that essential feature.

Besides, as argued above, the skilled person would dispense with the operating knob of D4 when applying the teaching of document D3. The operating knob according to the claimed invention makes it possible to start the engine irrespective of the insertion of the electronic key into the keyhole. However, the teaching of D3 requires the electronic key to be inserted into the keyhole in order to permit an engine start, so an operating knob makes no sense in the light of this teaching. And document D4 only shows an operating knob of a keyhole for inserting a conventional mechanical key, i.e. D4 does not provide any indication that a keyhole for inserting an electronic key may additionally include an operating knob.

3. *Inventive step (Article 56 EPC 1973) - starting from D6*

3.1 D6 basically relates to a vehicle electronic key system (column 1, lines 3 to 4) for performing code matching via communication with an electronic key (column 1, lines 62 to 65: "tragbarer Transponder"), where the electronic key could take the form of a smartcard or a conventional key (see column 7, lines 24 to 27). Permission for and prohibition of an engine start is performed according to the result of code matching performed via communication with the electronic key (column 7, lines 55 to 59) (features **[a1]** to **[a4]**), just based on the detection of the transponder within the vehicle interior (features **[a9]** and **[a11]**). Depending on the result of the code matching process - which begins when the motor start button ("Motorstartknopf") is pressed - the engine is started without further manual operation by the user of the vehicle (see column 7, lines 55 to 59). Even when following the argumentation of the appellant that D6 discloses a manually rotatable switch for engine start including an operating knob (via "Motorstartknopf"), D6 still fails to disclose features **[a6]**, **[a10]** and **[a13]**, as admitted by the appellant. D6 at least does not show a keyhole connected to a manually rotatable rotary switch for inserting the electronic key (features **[a6]**, **[a10]**), and D6 also fails to disclose that, depending on the result of the code matching, an operating knob can be operated to start the engine (feature **[a13]**). Therefore, the subject-matter of claim 1 is novel over D6, which was not contested.

3.2 As explained above (see para. 2.2) with respect to document D4, the objective technical problem to be solved based on distinguishing features **[a6]** and **[a10]**



is the provision of a means for starting the engine that is comfortable to operate and takes into account the customary practice of the vehicle's user when starting the engine. Further feature **[a13]** ("depending on the result of the code matching, the operating knob can be manually rotated by the operator to start the engine"), which is not known from D6, serves the same purpose and therefore does not change the problem to be formulated.

3.3 However, as explained above (see para. 2.3) with respect to document D4 as closest prior art, also when starting from D6 as closest prior art the teaching of D3 does not render the solution claimed in granted claim 1 obvious. The skilled person would provide the system known from D6 with an electronic key insertable in a keyhole connected to a manually rotatable switch, as disclosed in D3. There is no reason why he should keep an operating knob - assuming that an operating knob were disclosed in D6 - and why engine start should be possible without insertion of the electronic key when applying the teaching of D3, since in D3 engine start is only permitted when insertion of the electronic key has been detected and engine start is performed by rotating the electronic key. Hence, once again at least features **[a7]** and **[a13]**, **[a12]** would be missing.

4. Thus, the subject-matter of granted claim 1 according to the respondents' sole request involves an inventive step and the appeal is to be dismissed.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:

A. Vottner

G. Pricolo