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Datasheet for the decision of 6 September 2024

Case Number: T 2405/22 - 3.5.05

Application Number: 18162969.2

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Language of the proceedings: EN

Title of invention:
Automatic driving system for a vehicle

Applicant:
IVECO FRANCE S.A.S.

Headword:
Staggered posts for automatic driving/IVECO

Relevant legal provisions:
EPC Art. 56
RPBA 2020 Art. 13(1), 13(2)

Keyword:
Inventive step - main and 1st auxiliary request (no): obvious combination of known features
Admittance of claim amendments filed after notification of Art. 15(1) RPBA communication - 2nd auxiliary request (no): no "exceptional circumstances" + no *prima facie* allowability

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Case Number: T 2405/22 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 6 September 2024

Appellant: (Applicant)	IVECO FRANCE S.A.S. 1, rue des Combats du 24 Août 1944 Porte E 69200 Vénissieux (FR)
Representative:	Studio Torta S.p.A. Via Viotti, 9 10121 Torino (IT)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 27 June 2022 refusing European patent application No. 18162969.2 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair	K. Bengi-Akyürek
Members:	N. H. Uhlmann
	C. Heath

Summary of Facts and Submissions

I. The appellant appealed against the examining division's decision to refuse the present European patent application. The examining division held that a main request and an auxiliary request did not comply with Article 56 EPC.

II. The following prior-art documents are referred to in this decision:

D3: US 5 939 987 A

D9: KÖHLER et al.: "Autonomous Evasive Maneuvers Triggered by Infrastructure-Based Detection of Pedestrian Intentions", IEEE INTELLIGENT VEHICLES SYMPOSIUM (IV), pp. 519-526, 23 June 2013.

III. Oral proceedings before the board took place on 6 September 2024. At the end of them, the board's decision was announced.

The appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of a **main request** or **auxiliary request 1** both as filed with the statement setting out the grounds of appeal, or **auxiliary request 2** filed during the oral proceedings before the board.

IV. Claim 1 of the **main request** reads as follows:

"An automatic driving system (1) for a vehicle (2) on a road (3), said system (1) comprising a plurality of sensor means (4) positioned along said road (3) each

configured to observe an area (8) wherein to detect the presence of a moving object, and telecommunication means (9) configured to allow the communication of the data acquired by said sensor means (4), said area (8) comprising a first portion (8a) positioned on said road (3) and a second portion (8b) positioned in proximity to the lateral edges (3a) of said road (3), said second portion (8b) being of an outer part (5) of the lateral edges (3a) of said road (3), said system (1) being configured to recognise the presence of moving objects on the second portion (8b) and those which are approaching said road (3) to automatically regulate, as a consequence, the speed and/or the trajectory of said vehicle (2) on said road (3);

wherein said sensor means (4) are installed on respective posts (7) positioned on said lateral edges (3a) of said road (3);

wherein the posts (7) on one of the lateral edges (3a) are positioned in a staggered way with respect to the posts (7) on the other opposite edge of the lateral edges (3a);

wherein said first portions (8a) overlap one another to cover all of the road (3) and said second portions (8b) overlap one another to cover the respective side strips in proximity to the outer area of the lateral edges (3a) of the road (3)."

V. Claim 1 of **auxiliary request 1** differs from claim 1 of the main request in that the following clause has been added to claim 1:

"wherein each sensor mean (4) is configured to observe said area (8) around the respective post (7) within a radius (r) greater than half the width of the road (3)".

VI. Claim 1 of **auxiliary request 2** differs from claim 1 of the main request in that the wording

> "recognise the presence of moving objects on the the second portion (8b)"

has been replaced by the phrase

> "recognise the presence of moving objects on the first portion (8a) and on the second portion (8b)".

Reasons for the Decision

1. The present application pertains to an "automatic driving system" for a vehicle. Data from a "plurality of sensor means" positioned on posts on both sides of a road in a staggered way is communicated to a vehicle. When "moving objects" are detected next to the road, the speed and/or the trajectory of the vehicle are regulated automatically.

2. **Main request - claim 1**

The main request is identical to the main request underlying the contested decision. Claim 1 of the main request includes the following limiting features (board's labelling and emphasis):

(a) An automatic driving system for a vehicle on a road,
(b) said system comprising a plurality of sensor means positioned along said road each configured to observe an area wherein to detect the presence of a moving object, and

(c) telecommunication means configured to allow the communication of the data acquired by said sensor means,
(d) said area comprising a first portion positioned on said road and a second portion positioned in proximity to the lateral edges of said road,
(e) said second portion being of an outer part of the lateral edges of said road,
(f) said system being configured to recognise the presence of moving objects on the second portion and those which are approaching said road
(g) to automatically regulate, as a consequence, the speed and/or the trajectory of said vehicle on said road;
(h) wherein said sensor means are installed on respective posts positioned on said lateral edges of said road;
(i) wherein the posts on one of the lateral edges are positioned in a staggered way with respect to the posts on the other opposite edge of the lateral edges;
(j) wherein said first portions overlap one another to cover all of the road and said second portions overlap one another to cover the respective side strips in proximity to the outer area of the lateral edges of the road.

3. Main request - claim 1 - Article 56 EPC

3.1 Interpretation of claim 1

3.1.1 **Features (f) and (g)** specify that the "automatic" regulation of the "speed and/or the trajectory of the vehicle" is the "consequence" of the recognition of the "presence of moving objects on the second portion and those which are approaching said road". Thus, the

claimed "automatic driving" (cf. feature (a)) is the "consequence" of this recognition. Furthermore, according to feature (b), the "area" (which comprises the "first portion" and the "second portion") is observed "to detect the presence of a moving object". However, claim 1 leaves open the significance of the detection of any "moving object" in the "first portion". Consequently, according to claim 1, the detection of a "moving object" in the "first portion" does not necessarily have any impact on the claimed "automatic driving".

3.1.2 **Feature (f)** states that the claimed system is configured to recognise the presence of "moving objects" on the "second portion". According to feature (b), each "sensor means" detects the "presence of a moving object", i.e. one "sensor" detects one "moving object". Thus, the recognition of a plurality of "moving objects" is the result of the claimed "plurality of sensor means" and one "sensor means" does not necessarily detect more than one "moving object".

3.1.3 According to **feature (g)**, automatically regulating only the speed or only the trajectory of the vehicle is encompassed by the scope of claim 1. Furthermore, claim 1 does not set out specifically how the speed and/or the trajectory of the vehicle are actually regulated. Hence, regulating by reducing only the speed (i.e. breaking) and staying in the lane as well as regulating the trajectory and staying in the lane are both encompassed by the scope of claim 1.

3.2 Document **D9** discloses techniques for observing an area on a road and in its proximity and for automatically controlling a vehicle when pedestrians are detected next to the road. The examining division found that

document D9 did not disclose the following features of claim 1:

- a "plurality of sensor means" (cf. feature (b)) and

- features (h), (i) and (j).

The appellant essentially agreed with this finding. The board notes that, in document D9, the "stereovision camera" is installed on a post positioned at the lateral edges of the road (cf. Figure 1). Hence, D9 in fact discloses feature (h) except the plurality of "sensor means" and "posts".

Consequently, the features distinguishing the claimed subject-matter from the disclosure of D9 in fact are:

- **features (i) and (j)** and that

- a "plurality of sensor means" and a plurality of "posts" are foreseen (cf. **features (b) and (h)**).

3.3 Technical effect

3.3.1 According to the impugned decision, the technical effect of the distinguishing features was that the monitoring area of the system is enlarged. The board essentially endorses this finding.

3.3.2 The appellant referred first to a largely similar effect, namely "maximising the extension of the area observed by the sensor means in a cost-effective manner" (cf. the last paragraph before section 1.2.5 of

the statement of grounds of appeal). The following analysis will be based on this effect.

3.3.3 The appellant suggested another technical effect, too: namely "improved quality and safety of road circulation" (cf. section 1.2.5 of the statement of grounds of appeal).

However, the board finds that this effect is not the direct result of the distinguishing features. In particular, claim 1 leaves entirely open how the data from the "plurality of sensor means" is actually processed. Thus, the inventive-step analysis according to the problem-solution approach cannot be based on it. At the oral proceedings before the board, the appellant argued that additionally the number of the available manoeuvres was maximised by means of the distinguishing features. In particular, D9 was limited to "lane keeping" manoeuvres, while in the claimed system other kinds of manoeuvres could be performed due to the plurality of sensor means which also covered the road. The board, however, holds that this effect is not achieved over the whole scope of claim 1. In fact, the scope of claim 1 encompasses "regulating the speed" as a single manoeuvre (see point 3.1.3 above) and this manoeuvre corresponds to the "lane keeping" disclosed in D9.

3.4 The objective technical problem to be solved can thus be formulated as "how to adapt the system disclosed in D9 to maximise the extension of the area observed by the system in a relatively cost-effective manner".

3.5 When approaching this problem, the skilled person in the field of automatic driving would have indeed realised, based on their common general knowledge and common sense, that by simply using a plurality of cameras in the system of D9 the observed area would certainly be enlarged. Such considerations do not involve any *ex-post facto* analysis.

The appellant argued in this regard that such modification "can actually be functional" (cf. the last sentence of the first paragraph of page 9 of its statement of grounds of appeal). In the same paragraph, the appellant argued that such modifications of the teaching of D9 would not have been obvious because it would break the requirement provided in D9 that "line keeping manoeuvres" were mandatory.

However, claim 1 encompasses such "line keeping" manoeuvres (cf. point 3.1.3 above). Furthermore, the skilled person would indeed have considered prior-art documents disclosing the observation of larger areas, in particular areas on the outer side of a road. In particular, document **D3**, from a similar technical field, already discloses such an observation of the roadside of a road using a plurality of motion detectors (cf. the abstract). It discloses further that the "motion detectors" are installed at a plurality of posts on both sides of the road. Moreover, the posts are evidently positioned in a staggered way on both sides of the road according to Figure 1. The detection zones of the motion detectors on the outer side of the road may thus overlap each other (cf. D3, Figure 4). Hence, when modifying the system of D9 according to this disclosure of D3, the skilled person would have

indeed arrived at the subject-matter of claim 1, without any need of inventive activity.

3.6 The appellant further argued that D3 "does not disclose that the sensor means are configured to observe the claimed first portion of the area".

The board agrees with this argument. However, D9 discloses that the road, i.e. the "first portion", is observed, too (see Figures 1 and 4). Hence, by using a plurality of cameras, a plurality of first portions will naturally be observed. As an additional remark it is noted that, as already explained in point 3.1.1 above, the observation of the "first portion" does not have any impact on the automatic driving.

3.7 The appellant also submitted that the system of D9 was not designed to work and would in particular not efficiently work with a "plurality of sensor means".

This argument is not convincing, either. It is correct that the system disclosed in D9 was not designed to work with a "plurality of sensor means" and that adaptations therefore would have been needed. However, such adaptations amount to straightforward modifications which are well within the reach of the skilled person. Indeed, the application in suit does not disclose any details regarding the processing of the data from a "plurality of sensor means".

3.8 The appellant brought forward that the posts in D3 were not positioned "in a staggered way" in accordance with feature (i). No such feature was disclosed in the

description, and Figure 1 disclosed a staggered configuration only on its left-hand side.

The board disagrees. The posts used in the system of D3 (i.e. items 18 in Figure 1) are in fact positioned "in a staggered way" within the meaning of feature (i), albeit to a smaller degree on the right-hand side. However, claim 1 does not define any degree of the staggered positioning of the posts, either.

3.9 Finally, the appellant's argument that the skilled person would not have combined the teachings of D9 and D3, because the former related to an automatic control and the latter merely disclosed that a visual warning was given to the driver, fails to convince.

When dealing with the objective technical problem set out above, the skilled person would have maintained the automatic control already disclosed in D9. As explained in point 3.5 above, the skilled person would then have looked for techniques disclosing observation of larger areas, not for any control aspects. Document D3 includes such disclosure. Furthermore, even if the skilled person had added visual indications to the system of D9, this would not contradict claim 1.

3.10 For these reasons, the subject-matter of claim 1 does not involve an inventive step under Article 56 EPC. Thus, the main request is not allowable.

4. Auxiliary request 1 - claim 1 - Article 56 EPC

4.1 Auxiliary request 1 is identical to the auxiliary request underlying the contested decision. The following feature has been added to claim 1:

(k) each sensor means is configured to observe said area around the respective post within a radius (r) greater than half the width of the road.

4.2 It is common ground that document D9 does not disclose **feature (k)**.

4.3 The appellant argued that this feature ensured an optimal overlap of a detection area between neighbouring sensor means and thus ensured the maximisation of the detection area while requiring the minimum amount of sensor means.

The board holds that this effect is not achieved over the claimed scope. In particular, the amount of overlap depends on the radius and the distance between the posts. Feature (k) however defines only a lower limit for the radius while the distance is not defined. Hence, both *large* and *small* overlaps are within the scope of claim 1. In fact, the claimed lower limit for the radius follows plainly from feature (j). Instead, the board considers that feature (k) provides a specific implementation of the sensor means which enables the maximisation of the detection area. This effect corresponds to the effect mentioned in point 3.3 above.

4.4 Hence, the objective technical problem to be solved is the same as set out in point 3.4 above.

The objective technical problem suggested by the appellant, namely "how to design a driving system granting an optimal monitoring of the road, in particular outside the road", is not really addressed by feature (k). The claimed relationship between the

radius and the width of the road does not have any impact on the monitoring outside of the road.

4.5 When addressing this problem, the skilled person would have considered the properties of available sensor means at the application's priority date. Sensor means with a circular detection area were well-known at that time. Having in mind that it is important for the reliability of the system to avoid areas which cannot be observed, the skilled person would, based on basic rules relating to Euclidean geometry, have realised that the radius must be greater than half of the width of the road. Hence, the skilled person would have arrived at the subject-matter of claim 1, without any need of inventive activity.

4.6 Hence, the subject-matter of claim 1 does not involve an inventive step. Thus, auxiliary request 1 is not allowable under Article 56 EPC, either.

5. Auxiliary request 2 - admittance

5.1 Auxiliary request 2 was filed for the first time during the oral proceedings before the board. Feature (f) of claim 1 has been modified as follows:

(f2) said system being configured to recognise the presence of moving objects on the first portion and on the second portion and those which are approaching said road.

5.2 Auxiliary request 2 was filed not only after the board's communication under Article 15(1) RPBA was issued, but also at the latest possible point in time during the oral proceedings, i.e. after the board

presented its conclusion on the main request and auxiliary request 1.

5.3 Such amendments to appellant's appeal case shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the appellant (Article 13(2) RPBA).

5.4 As to the issue of "exceptional circumstances", the appellant argued at the oral proceedings that the board introduced, in its communication pursuant to Article 15(1) RPBA, new arguments regarding the (lack of) interrelation between the claimed "first portion" (feature (d)) and the "recognition" in feature (f) and the step "automatically regulate" mentioned in feature (g).

The board holds that in the case at hand there are no "exceptional circumstances". First, the examining division stated in the decision under appeal that D9 already disclosed feature (d). Second, the interpretation of the features (f) and (g) of claim 1 adopted in point 3.1.1 above does not introduce any unexpected aspects but merely emphasises the technical meaning of the claim's language. Furthermore, the board notes that the appellant filed auxiliary request 2 at the latest possible point in time, although it was well aware of the board's preliminary opinion for a number of months.

5.5 The lack of exceptional circumstances notwithstanding, auxiliary request 2 is not to be admitted under Article 13(1) RPBA, either.

In particular, claim 1 as amended does not overcome the inventive-step objection set out above with regard to the main request. In fact, document D9 discloses that the presence of walking pedestrians on the road (which corresponds to the "first portion") is detected (see Figure 4).

5.6 For these reasons, auxiliary request 2 was not admitted into the appeal proceedings (Article 13(1) and (2) RPBA).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

B. Brückner K. Bengi-Akyürek

Decision electronically authenticated