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Datasheet for the decision of 10 October 2023

Case Number: T 0567/21 - 3.5.03

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Title of invention:
Method to prevent interference and detect collision between mechanical members

Patent Proprietor:
I.M.A. Industria Macchine Automatiche S.p.A.

Opponent:
Focke & Co. (GmbH & Co. KG)

Headword:
Collision prevention and detection/IMA

Relevant legal provisions:
EPC Art. 100(c), 123(2), 123(3)

Keyword:
Added subject-matter - main request and auxiliary request 6 (yes)
Extension of scope - auxiliary requests 1, 1bis, 2, 2bis, 3, 4 and 5 (yes)

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Case Number: T 0567/21 - 3.5.03

D E C I S I O N
of Technical Board of Appeal 3.5.03
of 10 October 2023

Appellant: (Patent Proprietor)	I.M.A. Industria Macchine Automatiche S.p.A. Via Emilia 428-442 40064 Ozzano Dell Emilia (Bologna) (IT)
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Representative:	Aulich, Martin Meissner Bolte Patentanwälte Rechtsanwälte Partnerschaft mbB Hollerallee 73 28209 Bremen (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 3 March 2021 revoking European patent No. 2766780 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chair	K. Bengi-Akyürek
Members:	K. Schenkel
	C. Almberg

Summary of Facts and Submissions

I. The appeal by the patent proprietor lies from the decision of the opposition division revoking the present European patent for added subject-matter and extension of scope of protection.

II. Oral proceedings were held before the board on 10 October 2023.

The parties' final requests were as follows:

- The appellant/proprietor requested that the appealed decision be set aside and that the patent be maintained as granted (**main request**) or, in the alternative, as amended based on the claims of one of **auxiliary requests 6, 1, 1bis, 2, 2bis, 3, 4, and 5,** in this order.

- The respondent/opponent requested that the appeal be dismissed.

At the end of the oral proceedings, the board's decision was announced.

III. Claim 1 of the **main request** includes the following limiting features (numbering and underlining of the relevant text by the board):

(a) "Method to prevent interferences and to control collisions between mechanical members (17, 23) of at least two operating units (11, 111) for executing an operating cycle, each of the at least two operating units (11, 111) being associated with a position detector or with a position simulator,

and being equipped with at least one electric motor (15, 21) supplied with a corresponding current for driving a mechanical member (17, 23), said method being managed by a management and control unit (13) and being characterised by two phases:

(b) a first phase of preventing interferences between the mechanical members (17, 23) following trajectories that interfere with each other, in which, at a determinate instant of time, the actual position of each of the mechanical members (17, 23) is detected, as a function of current dynamics and braking or acceleration times and spaces, and the actual position of each of the mechanical members (17, 23) is compared in relation to a future position of possible interference of the mechanical members (17, 23) and if the comparison of the actual position of each of the mechanical members (17, 23) and the future position of possible interference of the mechanical members (17, 23) indicates the possibility of interference, the electric motor (15, 21) of each of the mechanical members (17, 23) is blocked in order to decelerate or stop the respective mechanical member (17, 23);

(c) a second phase of detecting collisions in which, at said determinate instant of time, the actual intensity of current supplied to the at least one electric motor (15, 21) of each of the at least two operating units (11, 111) is verified, dividing said operating cycle into "n" sub-phases, in relation to every sub-phase "n" each actual intensity of current being compared with a reference current in order to identify a current

intensity error in absolute terms, for each sub-phase "n" each actual intensity of current at the determinate instant of time for the sub-phase "n" being compared with a window of acceptability made from two thresholds applied to the reference current value, of which one is bigger and one is smaller than the reference current value, wherein if, at the determinate instant of time for the sub-phase "n", at least one of the currents supplied to the electric motors (15, 21) is outside the window of acceptability made from said two thresholds, defined at the determinate instant of time for the sub-phase "n", a collision is detected and the management and control unit (13) controls the intensity of current supplied to each electric motor (15, 21) in order to decelerate or stop the respective mechanical member (17, 23)."

IV. Claim 1 of **auxiliary request 6** differs from claim 1 of the main request *inter alia* in that feature (b) now reads as follows (added text indicated by the board):

(b6) "a first phase of preventing interferences between the mechanical members (17, 23) following trajectories that interfere with each other, in which, at a determinate instant of time, the actual position of each of the mechanical members (17, 23) is detected, as a function of current dynamics and braking or acceleration times and spaces, and the actual position of each of the mechanical members (17, 23) is compared<u>, as a function of current dynamics and breaking or acceleration times and spaces,</u> in relation to a future position of possible interference of the mechanical members (17, 23) and if the comparison of the actual position of each of the mechanical

members (17, 23) and the future position of possible interference of the mechanical members (17, 23) indicates the possibility of interference, the electric motor (15, 21) of each of the mechanical members (17, 23) is blocked in order to decelerate or stop the respective mechanical member (17, 23);"

V. Claim 1 of **auxiliary requests 1 and 1bis** differs from claim 1 of the main request *inter alia* in that feature (b) now reads as follows (amendments indicated by the board):

(b1) "a first phase of preventing interferences between the mechanical members (17, 23) following trajectories that interfere with each other, in which, at a determinate instant of time, the actual position of each of the mechanical members (17, 23) is ~~detected~~ verified, as a function of current dynamics and braking or acceleration times and spaces, ~~and~~ wherein verifying comprises comparing the actual position of each of the mechanical members (17, 23) ~~is compared~~ in relation to a future position of possible interference of the mechanical members (17, 23) and if the comparison of the actual position of each of the mechanical members (17, 23) and the future position of possible interference of the mechanical members (17, 23) indicates the possibility of interference, the electric motor (15, 21) of each of the mechanical members (17, 23) is braked or accelerated by supplying to the corresponding motor a current, for braking and clamping the mechanical member (17, 23) by means of the electric motor (15, 21) ~~is blocked~~ in order to decelerate or stop the respective mechanical member (17, 23);"

VI. Feature (b) of claim 1 of **auxiliary requests 2 and 2bis** differs from claim 1 of the main request *inter alia* in that it now reads as follows (added text underlined by the board):

(b2) "a first phase of preventing interferences between the mechanical members (17, 23) following trajectories that interfere with each other, in which, at a determinate instant of time, the actual position of each of the mechanical members (17, 23) is detected, verified as a function of current dynamics and braking or acceleration times and spaces, and the actual position of each of the mechanical members (17, 23) is compared in relation to a future position of possible interference of the mechanical members (17, 23) and if the comparison of the actual position of each of the mechanical members (17, 23) and the future position of possible interference of the mechanical members (17, 23) indicates the possibility of interference, the electric motor (15, 21) of each of the mechanical members (17, 23) is blocked in order to decelerate or stop the respective mechanical member (17, 23), by braking or accelerating supplying to the corresponding motor a current, for braking and clamping the mechanical member (17, 23) by means of the electric motor (15, 21);"

VII. Feature (b) of claim 1 of **auxiliary requests 3 to 5** differs from claim 1 of the main request *inter alia* in that it now reads as follows (amendments indicated by the board):

(b3) "a first phase of preventing interferences between

the mechanical members (17, 23) following trajectories that interfere with each other, in which, at a determinate instant of time, the actual position of each of the mechanical members (17, 23) is ~~detected~~ verified, ~~as a function of current dynamics and braking or acceleration times and spaces,~~ and the actual position of each of the mechanical members (17, 23) is compared, by considering the dynamics with which the members (17, 23) are proceeding and the dynamics with which the members (17, 23) are able to stop, using the maximum allowed torque, in relation to a future position of possible interference of the mechanical members (17, 23) and if the comparison of the actual position of each of the mechanical members (17, 23) and the future position of possible interference of the mechanical members (17, 23) indicates the possibility of interference, the electric motor (15, 21) of each of the mechanical members is blocked in order to decelerate or stop the respective mechanical member (17, 23);"

Reasons for the Decision

1. Main request (patent as granted) - added subject-matter (Articles 100(c) and 123(2) EPC)

1.1 Claim 1 as originally filed specifies the "first phase", i.e. **feature (b)**, as follows (underlining of the relevant text by the board):

- a first phase of preventing interferences in which at a determinate instant of time the actual position of the mechanical member (17, 23) is

verified as a function of the current dynamics and the braking or acceleration times and spaces.

1.2 This process of verifying the actual position, as also found by the opposition division in Reasons 3.3.1 of the appealed decision, has been replaced in granted claim 1 by two processes, namely the processes of

- detecting the actual position, and of

- comparing it in relation to a future position of possible interference of the mechanical members.

This raises the question to which of the two processes the wording "as a function of the current dynamics and the braking or acceleration times and spaces" of originally filed claim 1 is to be attributed.

1.3 The originally filed description includes the following disclosures of the above two processes which are carried out in the "first phase", i.e. the verification of the position:

"For a case of two operating units it is stated in the section "SUMMARY OF THE INVENTION" that the position of at least one motor shaft is detected and compared with the position of possible interference (page 2, lines 30 and 31). In more detail, "the position of at least one shaft of the motor" is detected "considering the braking time and space of the specific operating unit" (page 2, lines 25, 26, 28 and 29). The comparison is done "considering the dynamics with which the members are proceeding and the dynamics with which the

members are able to stop, using the maximum allowed torque" (page 3, line 32 to page 4, line 1).

Further, an embodiment with a plurality of operating units including operating units 11 and 111 and its mechanical members 17 and 23 is disclosed (page 6, lines 9 to 11 and 20 to 22). In this embodiment, a management and control unit calculates if there will be any interference between the two mechanical members, "taking into account the braking times and spaces" (page 8, lines 20 to 23). The management and control unit also foresees if any interference of these two mechanical members will occur, "depending on their dynamics and taking into account the stopping times and spaces" (page 9, lines 1 to 3).

1.4 There is, as found by the opposition division in Reasons 3.3.3 of the appealed decision, only one disclosure for **detecting a position** considering some sort of dynamic behaviour, namely detecting "the position of at least one shaft of the motor ... considering the braking time and space of the specific operating unit" (page 2, lines 25 to 29). In granted claim 1, however, it reads "the actual position of each of the mechanical members is detected, as a function of current dynamics and braking or acceleration times and spaces".

The board does not regard these differences as only "linguistic discrepancies" like the opposition division. The wording "mechanical member" is actually much broader than "motor shaft". Further, the wording of the description does not mention the acceleration time and space. For these reasons alone, the wording on page 2 of the original description does not provide a proper basis for the disputed feature.

1.5 All the other disclosures related to a "dynamic behaviour" refer to its use for calculating possible future interferences (page 3, line 28 to page 4, line 1; page 8, lines 20 to 26 and page 9, lines 1 to 3). The board therefore agrees with the opposition division in that the disclosure at page 3, line 28 to page 4, line 3 does not provide a basis for the disputed feature (appealed decision, Reasons 3.3.1).

1.6 The proprietor argued that the disclosures on page 2 should be considered as a whole independent from the number of operating units and that lines 28 and 29 overlapped largely with the feature in lines 30 and 31 and provided a basis for the disputed feature. Further, the term "dynamics" used in line 30 of page 2 was broad and conveyed the concept of "acceleration".

1.7 The board is not convinced because the term "mechanical member" used in claim 1 is clearly broader than the phrase "shaft of motor" used on page 2. Further, not all elements in "current dynamics and braking or acceleration times and spaces" according to claim 1 find support in the wording "considering the braking time and space" on page 2. The board agrees with the opponent in that the term "dynamics" could also be directed to uniform movements without acceleration (or deceleration). But even if it was to be understood as encompassing "acceleration", the broad term "dynamics" does not provide a basis for picking up the specific parameter "acceleration".

1.8 The proprietor also argued in point 2.2.b) of its statement of grounds of appeal that the detection *per se* could not occur as a function of "current dynamics and the braking and acceleration times and spaces". The feature of "considering the current dynamics and the

breaking or acceleration times and spaces" in association with the action of "detecting" clearly referred to the action of "verifying" the position, because this feature could have a meaning only in association with the processing of the position information, i.e. the process of "comparing". Rather, the disputed feature was, only because of its position, linked improperly to the action of "detection" and, in this position, did not provide any technical contributions to the subject-matter and thus should not be treated as added subject-matter according to the exception formulated in G 1/93.

1.9 The board is not convinced by the above proprietor's arguments for the following reasons:

The wording of feature (b) of granted claim 1 leaves no doubt that the adverbial clause "as a function of current dynamics and braking or acceleration times and spaces" refers to the position detection and not to the calculation of possible interference. Even assuming, for the sake of argument, that determining a position based on the dynamics is unusual, it would not be ruled out *a priori* by a skilled person and is therefore encompassed by claim 1. The original description discloses detecting a position "considering the braking time and space of the specific operating unit", i.e. dynamic properties (page 2, lines 28 to 29). Hence, the patent itself corroborates that the disputed feature can indeed refer to the detection of the position and not only to the calculation of possible interference.

1.10 The opponent argued that there was no basis for replacing the originally disclosed step of "verifying the position" by the two steps of "detecting and comparing the position". In view of the above

conclusion that the originally filed application does not disclose detecting the position of each of the mechanical members as a function of current dynamics and braking or acceleration times and spaces, it can be left open whether this argument is persuasive.

1.11 The board therefore concludes that Article 100(c) EPC, in conjunction with Article 123(2) EPC, prejudices the maintenance of the patent.

2. Auxiliary request 6 - added subject-matter (Article 123(2) EPC)

2.1 The amendment made in **feature (b6)** adds "as a function of current dynamics and breaking or acceleration times and spaces" as an adverbial to the step of comparing the detected position of the mechanical members.

2.2 This amendment, however, does not remove the feature that "the actual position of each of the mechanical members is detected, as a function of current dynamics and braking or acceleration times and spaces" which was found to be not disclosed in the application as filed and therefore fails to remedy the objection raised against claim 1 of the main request (see point 1 above).

2.3 The proprietor argued that there was no reason that in the disclosure only one of the two steps, i.e. the steps of "detecting and comparing the position", was linked to the adverbial of considering the "acceleration and braking times". Following the view that the step of "verifying the position" had been split into the steps of "detecting and comparing the position", "as a function of the current dynamics and

the braking or acceleration times and spaces" was therefore to be linked to both steps.

2.4 The board disagrees. Even if the step of "verifying the position" in claim 1 as originally filed encompassed the two steps of "detecting and comparing the position", it does not follow necessarily that the aforementioned addendum refers to both steps. It would be rather required that, for each of the two steps, the link to said addendum was disclosed separately which, as set out in point 1 above, is not the case for the step of "detecting the position".

2.5 In consequence, the objection raised against claim 1 of the main request also applies to claim 1 of auxiliary request 6. Hence, regardless of the matter of its admissibility, auxiliary request 6 is not allowable under Article 123(2) EPC either.

3. Auxiliary requests 1 and 1bis - extension of scope (Article 123(3) EPC)

3.1 The first amendment in **feature (b1)** re-establishes the wording of the originally filed claim 1 as to the verification of the position of each mechanical member. This, however, removes the strong link between the clause "as a function of current dynamics and braking or acceleration times and spaces" and the detection of the actual position of each of the mechanical members in claim 1 of the main request. Without this limitation, the scope of the claim as granted is now extended as correctly concluded by the opposition division in Reasons 4.2.1 of the appealed decision.

3.2 The proprietor argued that, from the overall patent, it was clear that the "verification of the position"

included "detecting the actual position". The skilled person would therefore derive that the "verification" implied necessarily the step of "detection".

3.3 The board has a different view. Even if the step of "verifying" the position was understood as inherently including the steps of "detecting" the position and "comparing", the limitation in claim 1 as granted as to how the position is detected, i.e. "as a function of current dynamics and braking or acceleration times and spaces", has been removed since the new wording in feature (b1) does not necessarily link "as a function of current dynamics and braking or acceleration times and spaces" to the included step of "detecting the position". Hence, the specific detection of the position "as a function of current dynamics and braking or acceleration times and spaces" does no longer constitute a technical limitation and the protection claim 1 confers has been extended.

3.4 Auxiliary requests 1 and 1bis are therefore not allowable under Article 123(3) EPC.

4. Auxiliary requests 2 and 2bis - extension of scope (Article 123(3) EPC)

4.1 The insertion of the word "verified" in **feature (b2)** disconnects semantically the word "detected" from the clause "as a function of current dynamics and braking or acceleration times and spaces", which now is linked to the word "verified". The new wording thus has a different meaning, contrary to the conclusion of the opposition division set out in Reasons 5.2 of the appealed decision, and includes the steps of

- detecting the position of each of the mechanical members (without any limitation),
- verifying the detected position as a function of current dynamics and braking or acceleration times and spaces and
- comparing it in relation to a future position of possible interference of the mechanical members.

Removing the limitation from the step of "detecting the position" likewise results in an extension of the scope of the patent as granted.

4.2 The proprietor argued that the amendment was not a mere stylistic reformulation, as found by the opposition division, and that the new formulation was adherent to the patent and had a basis on pages 3 and 5 of the original description. Auxiliary requests 2 and 2bis therefore did comply with the requirements of Article 123(2) and 123(3) EPC, since the scope of protection had not been enlarged.

4.3 The board is not convinced by that. As in the case of auxiliary requests 1 and 1bis, the detection of the position of each of the mechanical members is no longer limited by the wording "as a function of current dynamics and braking or acceleration times and spaces". This results in an extension of the scope.

4.4 Auxiliary requests 2 and 2bis are therefore not allowable under Article 123(3) EPC either.

5. Auxiliary requests 3 to 5 - extension of scope (Article 123(3) EPC)

5.1 As to the new wording of **feature (b3)**, even conceding that the "position detection" is inherently included in

the respective "verification step", its limitation "as a function of current dynamics and braking or acceleration times and spaces" has been removed. Hence, the scope of protection has been extended in this respect.

5.2 Auxiliary requests 3 to 5 are therefore not allowable under Article 123(3) EPC, too.

6. In the absence of any allowable claim request, the present appeal has to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

B. Brückner K. Bengi-Akyürek

Decision electronically authenticated