

Commissioner's Decision #1248  
Décision du commissaire #1248

TOPIC: 0  
SUJET: 0

Application No: 2,027,413 Class: H02K-1/14  
Demande No: 2,027,413 Class: H02K-1/14

COMMISSIONER'S DECISION SUMMARY

C.D. 1248 ....Application No. 2,027,413 (0)

The examiner rejected this application for being obvious in view of a UK patent application. The Board found that the applicant had made an improvement which could not be considered obvious over the cited reference.

The application was returned to the examiner by the Commissioner of Patents

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2,027,413 having been rejected under Subsection 30(3) of the Patent Rules, the Applicant asked that the Final Action of the Examiner be reviewed. The rejection has been considered by the Patent Appeal Board and by the Commissioner of Patents. The findings of the Board and the decision of the Commissioner are as follows:

Agent for the Applicant

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This decision deals with a request that the Commissioner of Patents review the Examiner's Final Action on patent application number 2,027,413 which was filed on 11 October, 1990. The Applicant is A. O. Smith Corporation, assignee of inventor Richard E. Peters and the invention is entitled "ELECTRICAL MOTOR STATOR ASSEMBLY WITH SQUARE EDGED STATOR PLATES". The Examiner in charge issued a Final Action on 10 April, 1997 refusing claims 1 to 10 of the application in view of United Kingdom patent application number 2,194,104, Parshall et al. This UK application was filed on 21 July 1987 and was published on 24 February 1988.

Prior to making its substantive response to the Final Action the Applicant wrote a letter posing a number of questions of the Examiner who replied with a further explanatory letter dated 22 September, 1997. The Applicant then replied to the Final Action on 10 October, 1997 requesting that the refusal be reviewed by the Commissioner of Patents and that an oral hearing before the Patent Appeal Board be held.

The invention relates to electric motors in which the stator is formed from a laminated assembly of generally circular plates and, more particularly, to such an assembly in which the plate edges are partially truncated or squared and randomly oriented in a circumferential direction during assembly such that the effective outer surface of the plate stack is maintained cylindrical. In accordance with the invention, a laminated stator assembly for an electric motor includes a series of stator plates which are disposed in face-to-face relation to provide a laminated stator stack. Each of the stator plates is identically formed with generally circular peripheral edge sectors which are separated by square-trimmed edge segments. In assembling the stack, the plates are disposed in a random circumferential orientation such that the circular peripheral edge sectors provide a stack having a generally cylindrical outer surface. The generally cylindrical outer surface of the plate stack allows the use of thinner and less expensive outer housings and the random orientation of the plates requires less sophisticated equipment and assembly techniques. Figures 1, 2, 4 and 5 shown below are illustrative of Applicant's disclosed invention.

Stator plate 10 is formed from a thin ferrous metal sheet. The stator assembly is formed from a stack 12 of plates 10. Each plate is generally circular, with circular peripheral edge sectors 13 which are separated by square-trimmed edge segments 14.

Independent claims 1 and 8 which are representative of the claims in the application are as follows:

1. A laminated stator assembly for an electric motor comprising:
  - a series of stator plates disposed in stacked face-to-face relation;
  - each of said plates formed with generally circular peripheral edge sectors separated by square trimmed edge segments;
  - each plate further including a circular interior opening defined by circumferentially spaced inwardly extending radial stator legs;
  - said stacked plates having complete circumferential register and axial alignment of the stator legs; and
  - the circular peripheral edge sectors of said plates disposed in random circumferential orientation to provide a laminated stack having a generally cylindrical outer surface.
  
8. In a laminated stator assembly for an electric motor wherein a stack of stator plates are disposed in face-to-face relation, each of said plates having circular peripheral edge sectors separated by square-trimmed edge segments, the method of assembling the plate stack comprising the steps of:
  - (1) aligning said plates on the common axis of the circle defined by said peripheral edge sectors; and
  - (2) orienting said plates randomly in a circumferential direction on said axis to provide a stack having a generally cylindrical outer surface.

In his Final Action the Examiner refused both the claims of the application and the application itself in view of United Kingdom application number 2,194,104 to Parshall stating, in part, that:

Parshall describes a laminated stator core for a dynamo-electric machine comprising a plurality of like laminations, each having a substantially square configuration with four rounded corners and a central circular opening with inwardly extending radial stator legs. Each plate is circumferentially offset from adjacent plates to form the stator core. The plates include openings and slots which cooperate to form vent holes when the adjacent plates are rotated.

Parshall does not mention orienting plates randomly but rather rotates each plate by a fixed amount relative to adjacent plates. However the present application does not indicate that orienting the plates randomly will give any new and unexpected result over orienting them according to a fixed pattern.

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In the correspondence dated February 4, 1997, the argument is made that claim 1 differs from the Parshall reference in that the stator plates in the present invention are disposed in Arandom circumferential orientation to provide a laminated stack having a generally cylindrical outer surface. Parshall describes a laminated stator core, Athe laminations being angularly displaced in relation to one another to off-set the corners and define a circular outer surface@ (page 2, lines 1 to 4) and Aeach lamination is angularly displaced relative to the adjacent laminations to define a continuous circular outer surface@ (page 2, lines 45 to 48). Thus, in the broadest description of his invention, Parshall does not describe any specific means of offsetting the adjacent stator plates. Only in a preferred embodiment does he suggest rotating adjacent plates by 120°.

It is also argued in the above mentioned correspondence that notches in the Parshall stator plates produce a series of continuous grooves which prevents the stator from having a Agenerally cylindrical outer surface@. In the Parshall invention, these notches provide means for fastening the stator plates together and fastening the stator to the motor housing. Such means are not provided in the instant application. These notches line up to form discontinuous grooves, and would do so whether the plates had been oriented uniformly or randomly. Even with these notches, which occur in every fourth stator plate for each groove, the plates of the Parshall invention form a substantially fully circular stator core.

It is further argued that Arandom orientation of the plates requires less sophisticated equipment and assembly techniques@ and thus Asimplifies assembly@. However, no elaboration is provided to show why this should be so.

In the absence of any concrete information to the contrary, it would seem that random orientation of the stator plates may have some distinct disadvantages. If the orientations were truly random, there would always be a finite probability the some, or even all, of the plates would end up with the same orientation. To prevent this, some means of ensuring a reasonably smooth distribution of orientations would be required.

In its reply of 10 October 1997, the applicant stated, in part:

In order to interpret claim 1, it is necessary that the meaning of the words in claim 1 be understood. The word Arandom@ has several different connotations depending on the context in which it appears. A copy of page 1106 of the Collins Concise English Dictionary, Third Edition, published 1992, Harper Collins Publishers, which shows a definition of the word Arandom@, is submitted herewith. The word Arandom@ can have two possible connotations, namely:

- (i) lacking any definite plan or pre-arranged order; haphazard: *a random selection*; and
- (ii) chosen without regard to any characteristic of the individual members of the population so that each has an equal chance of being selected: *random sampling*.

For convenience, these two connotations of the word Arandom@ will be referred to as the (i) product connotation, and the (ii) method connotation.

In the first product connotation, the word Arandom@ refers to a state or characteristic of an object or product, such as Aa random selection@. In the second method connotation, the word Arandom@ refers to an event, such as in the expression Arandom sampling@. In this second method connotation, the word Arandom@ has the meaning Achosen without regard to any of characteristic of the individual members of the population so that each has an equal chance of being selected@, such as in the expression Aa lottery is a random event because each number has an equal chance of being selected@.

Claim 1 recites Aa laminated stator assembly@ with the generally cylindrical peripheral edge of the plates disposed in a random circumferential orientation. In this context, claim 1 uses the word Arandom@ in the product connotation to describe a characteristic of the assembled laminated stator. The word Arandom@ is not used in claim 1 in the method connotation at least because there is no Aevent@ recited in claim 1. Claim 1 is not a product by process claim in that claim 1 does not recite that the plates are produced by randomly (method connotation) orienting the stack of plates. In other words, claim 1 does not recite an assembly method, but rather recites an assembled laminated assembly.

It is noted from the Examiner's Response to Question 7 of the Request for Clarification dated August 21, 1997 that the Examiner has referred to one connotation of the word "Random", namely "with equal chances for each item". It is accepted that this is one definition of the word "Random". However, it is respectfully submitted that this connotation corresponds to the method connotation discussed above, and this is not the connotation which should be used in claim 1.....

The Examiner has set out three separate grounds for rejecting the instant application. These grounds are :

1. The claimed invention lacks novelty over the cited reference;
2. If there are differences between the subject matter of the cited reference and the subject matter of the instant application, these differences would be obvious to a skilled worker; and
3. There is a lack of utility in the claimed stator because the differences over the cited reference could be disadvantages.

The questions before the Board are therefore, whether or not the invention claimed in the application is new in view of the cited prior art, if it is new, is it unobvious and is it useful?

In construing the claims, the Examiner has concluded that there is a finite probability that some or all of the stator plates of the instant application could have the same orientation if the orientation is completely random.

Presumably, the Examiner also rejected the claims for lack of novelty because of the belief that there is a finite possibility that the "Randomly" oriented plates could be in the same orientation as the plates of the Parshall stator assembly.

However, the applicant has, in its 14 November, 1997 response, made it clear that these configurations are specifically excluded from the scope of the claims when the proper meaning of the word "Random" is used i.e. that the overlap lacks a definite plan or prearranged order. Thus a haphazard arrangement would not yield an arrangement of plates at 120° as per the Parshall reference nor an arrangement where all plates are symmetrically lined up. The Board accepts this explanation.

With respect to the issue of obviousness, the Board has reviewed what is disclosed in the Parshall patent application. Parshall forms a stator assembly in a uniform manner, i.e. each plate is rotated a uniform amount with respect to the preceding plate. In the embodiment which is set out as an example, the plates are rotated through 120°. However, even in other embodiments where there is no mention of a specific amount of rotation, it is evident that the rotation must be uniform because the construction requires that notches in successive plates align to form passageways for cooling air and grooves for the insertion of frame bars.

Would it be obvious to modify the Parshall stator assembly to substitute random orientation for the orderly orientation? With the instant application in hand, the difference between it and the prior art appears small. However, it is a long accepted principle in patent law that an ex post facto analysis of the invention is insufficient to establish obviousness; in other words the issue of obviousness must not be approached by working backwards as, in the words used in the court decision in Van der Lely (C.) N.V. v. Bamfords Ltd. [1960] R.P.C. 169 at 193,

.....With the hindsight afforded by the Patentee's disclosure, the individual stages in the

conversion of one device to the other can each be made to appear of a non-inventive character, although certain practical difficulties were acknowledged by Mr. *North* in his evidence. But this is not a fair test of inventive merit. It is the whole gap to be jumped that must be considered, and not the case of passage across stepping stones either not present or hidden from view at the time the crossing was made.

As a result, the Board is not satisfied that the invention set out in this application is obvious in view of the Parshall patent application.

As for the question of utility, the Applicant has set out a number of advantages in the disclosure, as well as in replies to Office Actions. The Board accepts that the invention which is disclosed and claimed satisfies the utility requirements set out in the Patent Act.

The Board therefore recommends that the Examiner's rejection of the application be reversed and that the application be returned to the Examiner for further prosecution consistent with the recommendation.

P.J. Davies  
Chairman

M. Wilson  
Member

I concur with the recommendation of the Board that the Examiner's rejection of the application be reversed and return the application to the Examiner for further prosecution consistent with the Board's recommendation.

David Tobin  
Commissioner of Patents

Dated at Hull, Quebec,  
this 14th day of September 2000