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**Datasheet for the decision
of 11 September 2007**

Case Number: T 0591/04 - 3.2.04

Application Number: 97308247.2

Publication Number: 0841000

IPC: A01D 69/02

Language of the proceedings: EN

Title of invention:
Battery powered vegetation trimmer

Patentee:
Black & Decker Inc.

Opponent:
GARDENA Manufacturing GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 52(1), 56

Keyword:
"Inventive step (all requests) - no"

Decisions cited:
T 0967/97

Catchword:
-



Case Number: T 0591/04 - 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 11 September 2007

Appellant:
(Opponent)

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(Patent Proprietor)

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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted 12 March 2004
rejecting the opposition filed against European
Patent No. 0841000 pursuant to Article 102(2)
EPC.**

Composition of the Board:

Chairman: M. Ceyte
Members: A. de Vries
T. Bokor

Summary of Facts and Submissions

- I. The Appellant (Opponent) lodged an appeal, received 30 April 2004, against the decision of the Opposition Division posted 12 March 2004 to reject the opposition, and simultaneously paid the appeal fee. The statement setting out the grounds was received 8 July 2004.
- II. Opposition was filed against the patent as a whole and based on Article 100(a) together with Articles 52(1) and 56, for lack inventive step.

The Opposition Division held that the grounds for opposition mentioned in Article 100 EPC did not prejudice the maintenance of the granted patent having regard to the following documents in particular cited by the parties:

D2: WO-A-92 151 93
D3: DE-U-8 634 082
D7: DE-U-9 013 294

- III. Oral proceedings were duly held before this Board on 11 September 2007.
- IV. The Appellant (Opponent) requested that the decision under appeal be set aside and the patent be revoked in its entirety.

The Respondent (Proprietor) requested as main request that the appeal be dismissed or, alternatively, that the patent be maintained on the basis of claims 1 to 18 filed as first auxiliary request, or, on the basis of

claims 1 to 16 filed as second auxiliary request, both submitted with letter dated 20 November 2004.

V. The wording of claim 1 of the requests is as follows :

Main Request

1." A hand held battery powered vegetation trimmer which is substantially supported in use by a user above the ground in a cutting position, the trimmer comprising;

a battery pack (4) which powers an electric motor (12) to generate a rotary output (22), and a cutting line (30) which is adapted to be rotatably driven by a line support structure (28)

characterised in that;

the rotary output drives the line support structure (28) via a reduction gear stage (22, 24)."

First Auxiliary Request

Claim 1 is as in the main request with the addition after the final feature of "and wherein the speed of rotation of the line support structure (28) when there is no cutting load on the trimmer is between 5,000 and 9,000 rpm".

Second Auxiliary Request

Claim 1 is as in the first auxiliary request with the addition after the final feature of "and the speed of rotation of the motor when there is no cutting load in the trimmer is between 13,000 and 28,000 rpm".

VI. The Appellant argued as follows :

D7 can be considered closest prior art as it has all the essential features of a handheld trimmer to which the patent relates. Starting from D7 the sole difference of replacing mains supply by a battery to improve range and electrical safety is a well-known solution, see D3.

The only difference with respect to D3 is the reduction gear. The objective technical problem must be formulated on the basis of this feature alone and not on the other features which must underlie the runtime problem identified in the patent itself but which are not present in the claim. The corresponding problem is thus that of reduction of line speed and increase of torque, which is already solved in the handheld trimmer of D7.

Any bonus effect is not merely the result of using a reduction gear, which naturally leads to reduced power consumption. Cutting performance is the result of a complex of various factors not mentioned in either claims or description. The rpm ranges of claim 1 according to the auxiliary requests also do not suffice. In any case they are derivable from D7.

VII. The Respondent argued as follows :

The invention is specific to handheld battery operated trimmers which are significantly different from mains powered trimmers. Replacing the mains power in the latter by a battery involves all sorts of design issues

which would discourage the skilled person from considering such a trimmer in the first place. Motors of mains powered trimmers have much higher power ratings for example. In D7 this is necessary to rotate the additional cutting disk.

D3 is thus the closest prior art. In that context - a battery powered trimmer - the use of a reduction gear has the surprising effect of maintaining cutting performance even though line speed is reduced. A further unexpected effect is the level of energy savings, as the introduction of gears into the drive train is expected to entail frictional losses. Gear reduction represents an optimization of known battery operated trimmers, which, moreover, arises from purely technical rather than marketing considerations.

The line speeds indicated in the auxiliary requests are clearly lower than conventional speeds as e.g. mentioned in D7, and will result in an acceptable cutting performance over a wide range of line lengths.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is therefore admissible.
2. Background of the Invention

The invention concerns a hand held vegetation trimmer in which a line rotating at high speed is used to cut vegetation. The trimmer is battery powered and includes a reduction gear stage in the drive train between

electric motor rotary output and the line support structure. The reduction gear reduces (rotating) line speed to thereby reduce battery power consumption and increase its runtime.

3. The prior art

The parties are agreed that the most pertinent prior art is disclosed in documents D2, D3 and D7.

3.1 D2, see e.g. claim 1 and the figures, and D3, see figures 1a, 2 and 3 in conjunction with the description, pages 4 and 5, both disclose battery powered rotating line trimmers. D2 does not provide any detail of the drive train between its electromotor 22 and cutting head 20, whereas in figure 2 of D3 an angular gear 36 between motor output shaft 32 and line cutter 30 is shown but no indication of gear ratio is given.

D7, see figures and description pages 4 and 5, on the other hand relates to a line trimmer which is mains rather than battery powered (from the mains power cord or "Stromzuführungskabel" on page 4) with reduction gearing 2 provided between output shaft 16 of motor 1 and a (modularly designed) line trimmer head (page 5, first paragraph).

3.2 With respect to the above prior art the trimmer of claim 1 (all requests) differs at least in either the feature of a reduction gear (vis-à-vis D2 or D3) or the use of a battery (vis-à-vis D7). Consequently, the subject-matter of claim is novel. Novelty is in fact not at issue.

4. Inventive Step

4.1 The assessment of inventive step under Article 56 EPC must consider the state of the art, which, under Article 54(2) EPC, includes *everything* made available to the public before the date of filing of the European patent application. Rather than consider obviousness with respect to each and every item of prior art, the Boards of the EPO have adopted, as a more practical methodology, the widely recognized problem and solution approach, see e.g. the Case Law of the Boards of Appeal, fifth edition, December 2006, section I.D.2. This approach departs from a nominal "closest prior art" to formulate an objective technical problem solved by the claimed invention's distinctive features. As denying inventive step requires only one obvious path from a point in the prior art to the claimed invention, a judicious choice of that starting point as the best vantage point will usually result in clear savings in time and effort.

It should however not be lost from view that the prior art for the purpose of assessing inventive step by definition encompasses a multiplicity of potential starting points, some of which will be more, but the majority less promising for deciding obviousness. In how far a starting point is more or less promising depends on how closely it is related to the claimed invention, e.g. in terms of purpose or effect or of an underlying problem. In any case, more than one promising starting point may exist. To deny the existence of inventive step it is then necessary to demonstrate that one of these starting points leads in

obvious manner to the claimed invention, see e.g. T 0967/97, reasons 3.2.

- 4.2 From the above it follows that for the purpose of assessing inventive step D2, D3 and D7 can be regarded as equally legitimate starting points. They are also more or less equally promising, as each relates to hand held vegetation trimmers of the rotating line type, the field of present invention, but also shares the same number of (albeit different) features with the claimed invention. That they are mains or battery powered is of little importance: these features are subordinate to the main characteristics that set such hand-held vegetation line trimmers apart from others in terms of purpose (vegetation trimming) and principle design (handheld, rotating line).
- 4.3 Starting from D7 as closest prior art, the sole difference of claim 1 of the **main request** with respect to D7 is found to lie in the use of a battery rather than the mains to power the trimmer.
- 4.3.1 The use of batteries addresses the problems of limited range and electrical safety risks associated with the use of an electrical power supply cord providing power from a mains supply. These problems are however manifestly known where hand-held electrical tools are concerned, as is their solution in the form of a battery, which specifically serves the purpose of providing independence of a mains power supply. They are available in all sizes, weights and power ratings, and are in fact already known in the context of hand held rotating line vegetation trimmers as illustrated by either of D2 or D3.

4.3.2 The skilled person who is concerned with the problems of range and safety associated with mains power supply will as a matter of course and using his common general knowledge of batteries and their purpose replace the mains power supply and cord of D7 by a battery. In so doing he will also, as a matter of obviousness, select a battery of appropriate size and power. In as far as the use of a battery might necessitate the use of a suitable battery operable electromotor, the Board is of the firm conviction that such a further modification also lies within the skilled person's common skills and general knowledge. The particular battery and motor selected will thus be determined by his particular needs. That this selection might result in a trimmer that is too costly in manufacture and too heavy for an average consumer is irrelevant. This argument confuses the issues of marketability and inventive step. Only the latter is a requirement of the EPC, and is assessed in a purely technical consideration of the inventive process.

4.3.3 In summary, in order to solve the known problems of mains power supply in the D7 trimmer the skilled person will as a matter of course use his common general knowledge of batteries to replace the mains power by a battery and arrive at a trimmer falling within the terms of claim 1 of the main request. The trimmer of claim 1 (main request) thus lacks inventive step.

4.4 At least one obvious route leading from the prior art to the claimed invention has been shown above to exist, and this is sufficient for negating inventiveness. However, the Board notes for completeness' sake that

the same conclusion is arrived at if the skilled person sets out from the patent proprietor's preferred starting point, namely **D2** or **D3**. In respect of this prior art the claimed trimmer differs only in the feature of a reduction gear between electromotor rotary output and the line support.

4.4.1 The reduction gear serves in first place to reduce line speed, see page 2, lines 32 to 34, while increasing the torque at the line support, see page 3, lines 19 and 20. As explained in further lines 20 to 25, increased torque in turn allows the trimmer to cope in difficult cutting conditions, so that it does not slow down so much when cutting tough or heavy vegetation. The associated technical problem to be solved can thus be formulated as improving the known trimmer so as to cope in difficult cutting conditions when cutting tough or heavy vegetation.

4.4.2 The above problem differs from the problem of increasing battery run-time identified in the originally filed description on page 2, lines 15 to 18, and, as argued by the patent proprietor, not addressed in the prior art. This problem is associated with the effect of reduced power consumption which the Board regards as incidental to the primary effect of the use of a reduction gear mentioned in the preceding paragraph. As secondary to this main effect it constitutes an extra or bonus effect inevitably resulting from the use of a reduction gear in the present context. A proper formulation of the objective technical problem must however also consider the underlying, primary causes and effects as apparent to the skilled person from his common general knowledge

when considering the claimed invention in relation to the prior art.

4.4.3 Any other effects such as maintained cutting performance and "surprising" energy savings ("surprising" in as far as over and above the inevitable savings resulting from a reduction gear per se) are associated with specific conditions and factors not included in the claim (e.g. output and line speeds, gear ratio, line length, diameter, cross-section and mass) rather than that they are a direct consequence of the use of a reduction gear. As they are absent from the claim (nor in fact fully disclosed) the Board need not consider them in its assessment of inventive step.

4.4.4 The use of gears to modify input (driving) speed and torque is commonly known. Reduction gears in particular are used to reduce output speed and increase torque, as is common general knowledge in mechanical engineering.

To realize a trimmer with a desired speed the skilled person - a mechanical engineer involved in development and design of handheld garden appliances - will preferably use an electromotor operable at the desired speed. Where, however, his choice may be limited, he will as a matter of course consider the use of a motor with a suitably geared drive train. In the case of a small motor rotating at high speeds as commonly used in lightweight handheld appliances, which provides sufficient power for such an application, but not enough torque, such a gear will then take the form of a reduction gear designed so as to bring the speed down to the desired value while raising torque to the requisite level.

4.4.5 The use of a reduction gear to reduce output speed and increase torque in a handheld trimmer is also explicitly taught by D7. In combination with a high speed motor it allows the trimmer to be operated with a modular line head at sufficient speed to keep the line taut, while also allowing operation with a cutting disk at the necessary increased torque. The skilled person thus learns from D7 that requisite line speed can also be accomplished by a high speed motor with reduction gear. In realizing a battery operated trimmer according to D2 or D3 with the necessary line speed, he will consider as a matter of course the use of a high speed motor and gear as taught by D7, and thus arrive at a trimmer falling within the terms of claim 1 (main request).

4.4.6 In conclusion, the subject-matter of claim 1 also lacks inventive step starting from D2 or D3 and in view of the skilled person's common general knowledge or having regard to D7.

4.5 Auxiliary Requests

4.5.1 Claim 1 of the auxiliary requests specifies the particular ranges of line support speed (first auxiliary request) and, additionally, motor speed (2nd auxiliary request) at no load. These ranges - 5000 to 9000 rpm for line speed; 13000 to 28000 rpm for motor speed, both at no load - are those in which the Respondent argues, energy consumption is generally reduced while cutting performance is maintained.

4.5.2 D7 at page 3, 2nd paragraph, already discloses motor speeds from 15000 to 50000 rpm, i.e. overlapping with the range of the 2nd auxiliary request. However, the Board accepts that D7 does not directly and unambiguously disclose values within the claimed line speed range, when its relevant passages are read in context. Though combining the lower and upper end values of the ranges for motor speed and gear ratio respectively mentioned on page 3, 2nd paragraph produces line speeds in the claimed range, such a reading is contrary to the range of speeds of 10000 to 12000 rpm taught in the immediately preceding paragraph on page 3 as necessary for maintaining the line sufficiently taut.

4.5.3 Apart from the fact that this undisclosed range of line speeds will be specific to other unclaimed factors and conditions not present in the claim (and will thus not generally result in maintained cutting performance and energy savings irrespective of e.g. length, diameter, cross-section or mass of the line) the Board considers these values to be none other than the result of routine optimization of cutting performance. Implementing a trimmer with such routinely optimized values and using a reduction gear in accordance with common knowledge or as taught by D7 does not involve an inventive step.

4.5.4 The Board thus concludes that the subject-matter of claim 1 of the first and 2nd auxiliary request also lacks inventive step.

5. In conclusion the Board finds that the subject-matter of claim 1 according to the main, first and second

auxiliary request does not meet the requirement of Article 52(1) together with Article 56 EPC. The ground mentioned under Article 100(a) EPC therefore prejudices the maintenance of the patent according to any of these requests.

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

G. Magouliotis

M. Ceyte