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Case Number: T 0752/06 - 3.2.07

Application Number: 99914330.8

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Title of invention:
Ratchet wrench

Applicant:
Joda Enterprises, Inc.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56, 123(2)

Keyword:
"Unallowable amendments: main, first to third auxiliary requests (no)"
"Inventive step: main, first and second auxiliary requests (no); third auxiliary request (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0752/06 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 2 July 2007

Appellant: Joda Enterprises, Inc.
2440 Lakeview Avenue
Chicago
IL 60614 (US)

Representative: Grünecker, Kinkeldey
Stockmair & Schwanhäusser
Anwaltssozietät
Maximilianstraße 58
D-80538 München (DE)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 14 November 2005 refusing European application No. 99914330.8 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: H. Meinders
Members: K. Poalas
I. Beckedorf

Summary of Facts and Submissions

I. The appellant (applicant) lodged an appeal against the decision of the Examining Division refusing European patent application 99 914 330.8.

II. In its decision, the Examining Division held that the subject-matter of claim 1 according to the appellant's main request was obvious to the skilled person in view of document D2 (US 5 000 066 A) and his general technical knowledge. The appellant did not agree to the grant of a patent on the basis of its allowable auxiliary request.

III. Oral proceedings before the Board took place on 2 July 2007.

The appellant requested that the decision under appeal be set aside and that a patent be granted in the following version:

(1) claims 1 to 25 as filed as main request during the oral proceedings, or
(2) claims 1 to 24 as filed as first auxiliary request during the oral proceedings, or
(3) claims 1 to 24 as filed as second auxiliary request during the oral proceedings, or
(4) claim 1 as filed as third auxiliary request during the oral proceedings.

IV. Amended claim 1 according to the main request reads as follows (amendments when compared to the relevant independent claim 3 of the application as originally

filed (D0: WO 99/52681 A) are depicted in bold, deletions are struck through):

"A ratchet wrench **(1)** comprising:
a handle **(7)** comprising a head **(22)**;
a load-bearing element **(21)** ~~rotatably~~ mounted to the head **(22) to rotate about an axis (A)**;
a drive stud **(9)** coupled to rotate with the load-bearing element **(21)**; **and**
a ratchet mechanism **(20)** coupled with the load-bearing element **(21)**;
characterised in that
said load-bearing element **(21) comprises** a first face **(23)** on a side of the load-bearing element **(21)** opposite the drive stud **(9)**, said first face **(23)** comprising a recess **(24)** extending around the axis **(A)**; **and**
said head **(22) comprises** a centering element **(30)** received in the recess **(24), said centering element (30) is integral with the head (22)** and **is** positioned to resist movement of the load-bearing element **(21)** in at least one direction away from the axis **(A)"**.

Amended claim 1 according to the first auxiliary request reads as follows (amendments when compared to the relevant independent claim 3 of D0 are depicted in bold, deletions are struck through):

"A ratchet wrench **(1)** comprising:
a handle **(7)** comprising a head **(22)**;
a load-bearing element **(21)** ~~rotatably~~ mounted to the head **(22) to rotate about an axis (A)**;
a drive stud **(9)** coupled to rotate with the load-bearing element **(21)**;

a quick-release mechanism (21) disposed in the drive stud (9),
an actuator (40) mounted in the handle (7) and coupled to the quick-release mechanism (21) to allow user control thereof, and
a ratchet mechanism **(20)** coupled with the load-bearing element **(21)**;
characterised in that
said load-bearing element **(21) comprises** a first face **(23)** on a side of the load-bearing element **(21)** opposite the drive stud **(9)**, said first face **(23)** comprising a recess **(24)** extending around the axis **(A)**; **and**
said head **(22) comprises** a centering element **(30)** received in the recess **(24), said centering element (30) is integral with the head (22)** and **is** positioned to resist movement of the load-bearing element **(21)** in at least one direction away from the axis **(A),**
wherein the head (22) comprises a guide (44) that guides the actuator (40) in sliding movement in a plane substantially transverse to the axis (A)".

Amended claim 1 according to the second auxiliary request reads as follows (amendments when compared to the relevant independent claim 3 of D0 are depicted in bold, deletions are struck through):

"A ratchet wrench **(1)** comprising:
a handle **(7)** comprising a head **(22)**;
a load-bearing element **(21)** ~~rotatably~~ mounted to the head **(22) to rotate about an axis (A)**;
a drive stud **(9)** coupled to rotate with the load-bearing element **(21)**;

a quick-release mechanism (21) disposed in the drive stud (9),
an actuator (40) mounted in the handle (7) and coupled to the quick-release mechanism (21) to allow user control thereof, and
a ratchet mechanism **(20)** coupled with the load-bearing element **(21)**;
characterised in that
said load-bearing element **(21) comprises** a first face **(23)** on a side of the load-bearing element **(21)** opposite the drive stud **(9)**, said first face **(23)** comprising a recess **(24)** extending around the axis **(A)**; **and**
said head **(22) comprises** a centering element **(30)** received in the recess **(24), said centering element (30) is integral with the head (22)** and **is** positioned to resist movement of the load-bearing element **(21)** in at least one direction away from the axis **(A),**
wherein the head (22) comprises a guide that guides the actuator (40) in sliding movement in a plane substantially transverse to the axis (A), the guide including a slot (44) in the head (22) and/or first and second portions (31, 32) of the centering element (30)".

Amended claim 1 according to the third auxiliary request reads as follows (amendments when compared to the relevant independent claim 3 of D0 are depicted in bold, deletions are struck through):

"A ratchet wrench **(1)** comprising:
a handle **(7)** comprising a head **(22)**;
a load-bearing element **(21)** ~~rotatably~~ mounted to the head **(22) to rotate about an axis (A)**;

a drive stud **(9)** coupled to rotate with the load-bearing element **(21)**; **and**
a ratchet mechanism **(20)** coupled with the load-bearing element **(21)**;
wherein the load-bearing element (21) comprises a ratchet wheel, wherein the ratchet mechanism (20) comprises a pawl (25) that engages the ratchet wheel; and a quick-release mechanism disposed in the drive stud (9), said quick-release mechanism comprising a pin (2) slideable in the drive stud (9) along the axis (A); characterised in that
said load-bearing element **(21) comprises** a first face **(23)** on a side of the load-bearing element **(21)** opposite the drive stud **(9)**, said first face **(23)** comprising a recess **(24)** extending around the axis **(A)**; **and**
said head **(22) comprises** a centering element **(30) integral with the head and** received in the recess **(24),** and positioned to resist movement of the load-bearing element **(21)** in at least one direction away from the axis **(A);**
an actuator (40) is mounted in the head (22) to move in a plane substantially transverse to the axis (A), said actuator (40) is coupled with the pin (2) such that sliding movement of the actuator (40) in a guide in the head (22) causes said sliding movement of the pin (2) in the drive stud (9), wherein the actuator (40) is configured never to intersect a line oriented parallel to the axis (A) and passing through an interface between the pawl (25) and the ratchet wheel".

V. The appellant argued as follows:

(a) *Amendments - Article 123(2) EPC*

(i) *Claim 1 according to the main request*

Claim 3, page 4, lines 16 to 21 and figures 2, 3 and 4 of D0 are the basis for the features of the subject-matter of claim 1 according to the main request.

(ii) *Claim 1 according to the first auxiliary request*

The additional features of the subject-matter of claim 1 according to the first auxiliary request over the subject-matter of claim 1 according to the main request correspond to the additional features of the originally filed claims 1 and 5 of D0.

(iii) *Claim 1 according to the second auxiliary request*

The additional features of the subject-matter of claim 1 according to the second auxiliary request of the subject-matter of claim in 1 of the first auxiliary request are mentioned on page 5, lines 17 to 19 and they are shown in figures 1 and 2 of D0.

(iv) *Claim 1 according to the third auxiliary request*

The additional features of the subject-matter of claim 1 according to the third auxiliary request of the subject-matter of claim in 1 according to the first auxiliary request correspond to the additional features of the originally filed claims 4 and 10 of D0.

(b) *Inventive step - Article 56 EPC*

(i) *Claim 1 according to the main request*

The characterising part of claim 1 is not known from the documents in the file.

In accordance with the present invention, the head of the handle can be formed with a significantly increased wall thickness for increasing the overall strength and for mounting respective elements, like actuators, quick release mechanisms and so on.

A review of the prior art shows that the design of the centering element as a rotating boss extending from the load-bearing element into a recess formed in the head of the handle is the common and usual course of design to be followed. Neither D2 nor any one of the further publications of the art contains sufficient information to enable a person of ordinary skill in the art to realise that this well established design could be changed with a beneficial effect, particularly such that the boss of the

centering element is now arranged on the head of the handle and extends into a recess formed in the load-bearing element.

(ii) *Claim 1 according to the first auxiliary request*

The user of the ratchet wrench known from the D2 has to press the actuator from above in order to cause sliding movement of the latter along the axis of rotation. The actuator according to claim 1 being slidingly movable in a plane substantially transverse to the axis of rotation of the load-bearing element can be operated by the thumb of the user, allowing him thereby to use only one hand for holding the ratchet wrench as well as for shifting the actuator by using his thumb.

The above mentioned advantages are achieved in that the head comprises a guide that guides the actuator in sliding movement in a plane substantially transverse to the axis. There exists no hint in the state of the art for such a solution.

(iii) *Claim 1 according to the second auxiliary request*

There exists no hint in the state of the art for reconstructing a ratchet wrench as known from D2 so that it involves a reversed centering mechanism as well as an actuator

as described now in claim 1. Even if a similar actuator is known from D4 (US 4 218 940 A) the skilled person would not incorporate it into a ratchet wrench having a centering element which is integral with the head and which is received in a recess of the load-bearing element.

(iv) *Claim 1 according to the third auxiliary request*

There exists no hint in the state of the art for reconstructing a ratchet wrench as known from D2 so that it involves a reversed centering mechanism as well as an actuator as described now in claim 1. Even if a similar actuator is known from D4 the skilled person would be dissuaded to incorporate it into a ratchet wrench having a centering element which is integral with the head and which is received in a recess of the load-bearing element.

Reasons for the decision

1. *Amendments - Article 123(2) EPC*

1.1 Claim 1 according to the main request

Apart from the introduction of the reference signs and the rephrasing of the expression "rotatably mounted to the head" into "mounted to the head to rotate about an axis", claim 1 according to the main request differs

from the relevant independent claim 3 as originally filed in that the centering element 30 is integral with the head 22.

In page 4, lines 16 to 21 it is defined that "the head 22 of the wrench 1 defines a centering element 30" and that the centering element 30 comprises first and second portions 31 and 32 which are interconnected by additional portions 33, 34. Figures 2, 3 and 4 of D0 clearly show, especially by way of the type of hatching used, that the centering element is integral with the head.

Therefore, claim 1 according to the main request fulfils the requirements of Article 123(2) EPC.

1.2 Claim 1 according to the first auxiliary request

Claim 1 according to the first auxiliary request differs from claim 1 according to the main request in that:
a quick-release mechanism is disposed in the drive stud,
an actuator is mounted in the handle and coupled to the quick-release mechanism to allow user control thereof, and the head comprises a guide that guides the actuator in sliding movement in a plane substantially transverse to the axis.

Said features correspond to features of claims 1 and 5 of D0, which can be added to present claim 1 without infringing Article 123(2) EPC.

Therefore, claim 1 according to the first auxiliary request fulfils the requirements of Article 123(2) EPC.

1.3 Claim 1 according to the second auxiliary request

Claim 1 according to the second auxiliary request differs from claim 1 according to the first auxiliary request in that the guide includes a slot in the head and/or first and second portions of the centering element.

Said additional features are disclosed on page 5, lines 17 to 19 and they are depicted in figures 1 and 2 of D0, and can be added to present claim 1 without infringing Article 123(2) EPC.

Therefore, claim 1 according to the second auxiliary request fulfils the requirements of Article 123(2) EPC.

1.4 Claim 1 according to the third auxiliary request

Claim 1 according to the third auxiliary request differs from claim 1 according to the main request in that:
the load-bearing element comprises a ratchet wheel, wherein the ratchet mechanism comprises a pawl that engages the ratchet wheel;
a quick-release mechanism is disposed in the drive stud, said quick-release mechanism comprising a pin slideable in the drive stud along the axis;
an actuator is mounted in the head to move in a plane substantially transverse to the axis;
said actuator is coupled with the pin such that sliding movement of the actuator in a guide in the head causes

said sliding movement of the pin in the drive stud, wherein the actuator is configured never to intersect a line oriented parallel to the axis and passing through an interface between the pawl and the ratchet wheel.

Said features correspond to features of claims 4 and 10 of D0, which can be added to present claim 1 without infringing Article 123(2) EPC.

Therefore, claim 1 according to the third auxiliary request fulfils the requirements of Article 123(2) EPC.

1.5 Inventive step, Article 56 EPC

1.5.1 Claim 1 according to the main request

The ratchet wrench shown in figures 5, 6 and 7 of D2 comprises (following the wording of claim 1):
a handle 4 comprising a head 61;
a load-bearing element 59 mounted to the head to rotate about an axis;
a drive stud 66 coupled to rotate with the load-bearing element;
a ratchet mechanism 7, 11 coupled with the load-bearing element;
said load-bearing element 59 comprising a first face on a side of the load-bearing element opposite the drive stud, said first face comprising a boss 12 extending around the axis;
said head comprising a centering element (gear boss cavity 22) receiving the boss 12, said centering element being integral with the head and positioned to resist movement of the load-bearing element in at least one direction away from the axis.

1.5.2 The subject-matter of claim 1 differs from this known ratchet wrench in that the boss is located in the head and the corresponding recess is located in the load-bearing element. The effect of this boss is that the load-bearing element is centered on both sides of the ratchet mechanism, thus better transferring the forces acting on the load-bearing element to the head. This effect is also obtained by a centering mechanism of D2, with the boss on the load-bearing element, the boss being located in a recess in the head.

Therefore, the problem to be solved by the above mentioned differentiating feature needs to be redefined, ie. the provision of an alternative centering mechanism.

The centering mechanism known from D2, said mechanism consisting of a recess in the head cooperating with a corresponding boss located on the load-bearing element, and the centering mechanism as claimed in claim 1, consisting of a recess in the load-bearing element cooperating with a corresponding boss located on the head, represent for the person skilled in the art two kinematically equivalent mechanisms which have the same centering effect as far as the load-bearing element is concerned. Therefore, replacing the centering mechanism known from D2 by the mechanism claimed in claim 1 does not necessitate an inventive activity.

1.5.3 The Appellant argued that providing the recess in the load-bearing element and not in the head is a measure which appears simple and not inventive only with hindsight. This measure has however particular

advantages, like avoiding the wall thickness of the head of the handle of being weakened by a recess, or like making the space on top of the head available for constructional purposes. Consequently, the provision of the recess in the load-bearing element requires from the skilled person an inventive activity in order to recognise these advantages and to decide to deviate from the solution proposed in D2.

The Board cannot follow these arguments for the following reasons:

Firstly, the argument concerning the advantage of not having the wall thickness of the head reduced by the space necessary for the centering means is ex-post-facto produced, without any support in the originally filed application. Not only is there no mention of any advantage or any other technical reason for providing the centering element in the head apart from the centering function, on the contrary, the originally filed application treats a centering mechanism having the centering element positioned in the load-bearing element and received in a recess of the head, ie. the one known from D2, as entirely equivalent to the centering mechanism of present claim 1, see page 7, lines 14 to 30 and figures 6 and 7 of D0.

Secondly, present claim 1 itself does not specify any thickness of the wall of the head nor the actuator of the quick release mechanism. By absence in claim 1 of any limitation concerning the thickness of the wall of the head or concerning the constructional arrangements in the head this cannot be invoked in support of inventive step.

Therefore, the subject-matter of claim 1 according to the main request does not involve an inventive step.

1.5.4 Claim 1 according to the first auxiliary request

Claim 1 according to the first auxiliary request differs from claim 1 according to the main request in that a quick-release mechanism is disposed in the drive stud, in that an actuator is mounted in the handle and coupled to the quick-release mechanism to allow user control thereof, and in that the head comprises a guide that guides the actuator in sliding movement in a plane substantially transverse to the axis.

The ratchet wrench according to figures 5 to 7 of D2 comprises a quick-release mechanism 60, 65, 67, 67 which is disposed within the drive stud 59 mounted in the handle 4. The pushbutton actuator 60 is mounted in the drive stud 59 and consequently, it is also "mounted in the handle" 4. Said pushbutton actuator is part of the quick-release mechanism and allows the user to operate said quick-release mechanism.

Accordingly, the further differentiating feature of the ratchet wrench according to claim 1 of the first auxiliary request over the ratchet wrench according to figures 5 to 7 of D2 is the feature that the head comprises a guide that guides the actuator in sliding movement in a plane substantially transverse to the axis.

1.5.5 As concluded under point 1.5.2 above, the person skilled in the art considers the centering mechanism of claim 1 as being a mechanical equivalent of the one known from D2. That mechanism consists of a recess in the head cooperating with a boss 12 on the load-bearing element 59 which comprises a dual bore 67, 68 which guides the pushbutton actuator 60. Thus when having the boss located on the head and received in a recess on the load-bearing element the head must, by necessity, also comprise such a bore which guides the pushbutton actuator, otherwise the pushbutton actuator cannot work.

The remaining difference would then be that the actuator is movable in a plane substantially transverse to the axis of rotation and not along said axis. In this respect the Board considers that the selection of the orientation of the plane in which the actuator is movable is a normal workshop modification which falls within the normal practice of the person skilled in the art. Such actuator mechanisms are well known in the field of ratchet wrenches, see for example D4, column 4, lines 1 to 51.

For these reasons, the subject-matter of claim 1 of the first auxiliary request does not involve an inventive step.

1.5.6 Claim 1 according to the second auxiliary request

Claim 1 according to the second auxiliary request differs from claim 1 according to the first auxiliary request in that the guide includes a slot in the head and/or first and second portions of the centering element.

As stated in point 1.5.5 above the skilled person replacing the centering mechanism of D2 by the equivalent one according to claim 1, will provide the head comprising the boss with a bore for guiding the actuator, and if the requirements were such, provide that the actuator is movable in a plane substantially transverse to the axis of rotation. In that case arranging the bore to be a slot in the head is a necessity as the user should be able to operate the actuator from the outside of the head.

Therefore, the subject-matter of claim 1 of the second auxiliary request does not involve an inventive step.

1.5.7 *Claim 1 according to the third auxiliary request*

The ratchet wrench of claim 1 according to the third auxiliary request differs from the ratchet wrench according to figures 5 to 7 of D2 in that:

(a) the centering element is integral with the head and received in the corresponding recess located on a side of the load-bearing element which is opposite to the drive stud;

(b) an actuator is mounted in the head to move in a plane substantially transverse to the axis;

(c) said actuator is coupled with the pin such that sliding movement of the actuator in a guide in the head causes said sliding movement of the pin in the drive stud,

(d) wherein the actuator is configured never to intersect a line oriented parallel to the axis and passing through an interface between the pawl and the ratchet wheel (of the ratchet mechanism).

As it was concluded by the Board under points 1.5.3, 1.5.5 and 1.5.6 above, the replacement of the centering mechanism known from D2 by its kinematically reversed equivalent in the form of the claimed centering mechanism with the above mentioned features (a), (b) and (c) was not considered to involve inventive step.

1.5.8 It has therefore to be examined whether it would be obvious to the person skilled in the art, after having reconstructed the ratchet wrench of D2 in such a manner, to arrange the actuator such that it never intersects a line oriented parallel to the axis and passing through the interface between the pawl and the ratchet wheel.

In the present case the question is whether the skilled person would consider applying the actual specific technical teaching of D4 to such a "reconstructed wrench".

D4 describes a ratchet wrench 10 comprising:
a handle 34 comprising a head 12;
a load-bearing element 20, 18 mounted to the head 12 to rotate about an axis;
a drive stud 18 coupled to rotate with the load-bearing element 20, 18; and
a ratchet mechanism 20, 26 coupled with the load-bearing element 20, 18;
wherein the load-bearing element 20, 18 comprises a ratchet wheel 20, wherein the ratchet mechanism 20, 26

comprises a pawl 26 that engages the ratchet wheel; and a quick-release mechanism disposed in the drive stud 18, said quick-release mechanism comprising a pin 58 slideable in the drive stud along the axis; whereby said load-bearing element 20, 18 comprises a first face on a side of the load-bearing element opposite the drive stud 18, said first face comprising a recess 24 extending around the axis;
an actuator 42, 44 is mounted in the head 12 to move in a plane substantially transverse to the axis, said actuator is coupled with the pin 58 such that sliding movement of the actuator in a guide 46 in the head 12 causes said sliding movement of the pin in the drive stud, wherein the actuator is configured never to intersect a line oriented parallel to the axis and passing through an interface between the pawl and the ratchet wheel.

1.5.9 From the above it is evident that the ratchet wrench known from D4 comprises an actuator as claimed in claim 1.

However, in the ratchet wrench according to D4 a free space within the head 12 and above of the load-bearing element 20, 18, is needed for accommodating the sliding movement of the actuator 44, 42 in order to allow the actuator to interact with the pin 58 in the load-bearing element. This is in direct conflict with the head having an integral centering element, received in a recess in the load-bearing element, resulting from the "reconstructed wrench" as discussed above.

The person skilled in the art would therefore be dissuaded from integrating an actuator as known from D4

into the "reconstructed ratchet wrench" having a load-bearing element with a recess and a centering element integral with the head received in said recess.

For the above-mentioned reasons, the subject-matter of claim 1 is considered to involve inventive step and thus fulfils the requirements of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent on the basis of claim 1 of the third auxiliary request filed during the oral proceedings and a description and the dependent claims to be adapted.

The Registrar: The Chairman:

G. Nachtigall H. Meinders