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**Datasheet for the decision
of 23 June 2026**

Case Number: T 0624/24 - 3.2.04

Application Number: 19719354.3

Publication Number: 3781267

IPC: A62B9/04, A62B25/00

Language of the proceedings: EN

Title of invention:
ADJUSTABLE HARNESS

Applicant:
Draeger Safety UK Limited

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - main request (yes)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0624/24 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 23 June 2026

Appellant: Draeger Safety UK Limited
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Representative: Haseltine Lake Kempner LLP
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted/electronically
transmitted on 19 December 2023 refusing
European patent application No. 19719354.3
pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman A. Pieracci
Members: J. Wright
K. Kerber-Zubrzycka

Summary of Facts and Submissions

- I. The appeal was filed by the appellant (applicant) against the decision of the examining division to refuse the patent application in suit.
- II. The examining division decided that although the subject matter of the present main request (then auxiliary request 3) was new with respect to D2 it lacked inventive step starting from D2.
- III. The Board issued a summons to attend oral proceedings. In a communication it set out its preliminary opinion on the relevant issues. In a telephone conversation on 21 May 2026 the rapporteur informed the applicant that the description according to the then main request was deficient. With a letter dated 22 May 2026 the appellant-applicant refiled its main request with an amended description. The Board cancelled the oral proceedings and has decided the case in writing.
- IV. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of a main request filed on 22 May 2026.
- V. Claim 1 of the main request reads as follows:

"A breathing apparatus harness (100) comprising: a length-adjustable back plate (102) comprising a breathing gas delivery system, the length-adjustable back plate (102) comprising an upper back plate (102) element for attachment to at least one shoulder support, and a lower back plate (102) element for attachment to a waist support, wherein the upper and lower back plate (102) elements are moveable relative

to each other in a longitudinal direction between a contracted position and an extended position to thereby adjust the length of the length-adjustable back plate (102); and characterised by a ratchet mechanism (150) permitting relative movement of the upper and lower back plate (102) elements towards the contracted position, while preventing relative movement of the upper and lower back plate (102) elements towards the extended position, wherein the ratchet mechanism (150) is releasable so as to selectively permit relative movement of the upper and lower back plate (102) elements towards the extended position".

VI. In the present decision, reference is made to the following documents:

D1: US 6401715 B1
D2: WO 2014/140519 A1
D3: US 2004/0045991 A1
D4: US 2015/0144675 A1
D5: WO 2017/020088 A1
D6: GB 2501739 A

VII. The arguments of the appellant relevant to the decision are set out in the reasons for the decision presented below.

Reasons for the Decision

1. The appeal is admissible.
2. For the reasons explained below, the Board is of the opinion that claim 1 of the present main request meets the requirements of the EPC.

3. Main request, claim 1, interpretation of the word "ratchet"
- 3.1 Before looking in detail at the claims, the Board finds it useful to comment on the meaning of the term "ratchet", which plays an important role in the claims.
- 3.2 The appellant (see appeal grounds, middle of page 4 with its Wikipedia reference) interprets a "ratchet" as a mechanical device that allows continuous linear or rotary motion in only one direction while preventing motion in the opposite direction. However, according to the Oxford English Dictionary online (see entry 2a), a ratchet is: *A series of angular teeth on the edge of a bar, the rim of a wheel, etc., into which a cog, tooth, pawl or similar part may engage, typically in order to prevent reversed motion in a mechanism. Also: a bar, wheel, etc., provided with such teeth.*
- 3.3 Therefore, although a ratchet is *typically* a device that allows movement in one direction while preventing it in the opposite direction (unidirectional), at its most general it has a broader meaning, for example a bar with angular teeth on its edge. That said, the claimed *ratchet mechanism* allows relative movement of the upper and lower back plates in only one direction (towards their contracted position). Therefore, the claimed ratchet mechanism is of the typical unidirectional kind.
4. Main request, claim 1, added subject matter (references in this section to the original filing are to the published application, WO 2019/202315)

4.1 Claim 1

The Board understands the examining division's comment (decision, reasons 30.1), that the amendment was unambiguously derivable from the single enabling embodiment to mean that its subject matter did not extend beyond the application as filed. The Board agrees with this finding. In the Board's view, claim 1 also finds a basis in original claims 1, 3, 7 and 8 read with the description. In particular the description and drawings disclose a harness with a breathing apparatus and this amounts to a breathing apparatus harness (see for example page 5, line 26 to page 6, line 6). In this context, the skilled person would also understand that the back plate comprises a gas delivery system rather than merely being suitable for accommodating it (see for example sentence bridging pages 5 and 6, and figure 1: air supply hoses 118, 120). In the context of length adjustment of a back plate so as to accommodate users with a different distance between the shoulders and waist, the Board considers it is implicit that the ratchet mechanism defined in original claim 1 permits/prevents the relative longitudinal movement between the upper and lower back plate elements defined in original claims 7 and 8. For these reasons, the Board considers that the subject matter of claim 1 is directly and unambiguously derivable from the application as filed. Therefore, claim 1 meets the requirements of Article 123(2) EPC.

4.2 Claims 2 to 14

4.3 The Board considers that these claims have a basis in the original claims according to the following scheme:

<i>Dependent claim of present main request</i>	<i>Basis in original claim:</i>
2	2
3	4
4	5
5	6
6	9
7	10
8	11
9	12
10	13, 14
11	15
12	17
13	18
14	20

5. Main request, claim 1, novelty with respect to D2

The Board considers that the subject matter of claim 1 is new with respect to D2, as did the examining division.

5.1 D2 (see abstract and figures 10 and 16) discloses a load carriage frame (for wearing by a person) that includes a shoulder yoke and a belt, separated from the yoke by a connecting brace. The connecting brace can be altered in length, as best illustrated in figure 14. Thus D2 discloses a harness with length adjustable back plate (brace), upper back plate (yoke for shoulder support) and lower back plate for attaching to a waist support.

5.2 In its examination of the present main request (auxiliary request 3 in examination proceedings), the examining division seems to have considered that D2 disclosed a breathing apparatus harness with a back

plate comprising a breathing gas delivery system (cf. its decision, reasons, section 19.2.1 and 19.2.2 regarding the then main request). There, the division seems to have argued that a harness used by infantrymen in hostile military operations (cf. D2, page 1, first paragraph) would carry a load that included a gas mask which can be considered to be a "breathing apparatus " respectively a "breathing gas delivery system".

- 5.2.1 Leaving aside the question as to whether it is implicit that infantry personnel would carry gas-masks, the Board considers that the feature "breathing apparatus harness "defines more than a harness able to support, for example a rucksack, in which a mask is placed. Rather, the feature defines a harness specially adapted to support a breathing apparatus. In D2, the only harnesses disclosed are those for a rucksack, body armour or generic load (page 2, lines 5 to 8). Moreover, merely carrying a gas mask in for example a rucksack mounted on a harness would imply nothing about the harness' back plate, let alone that it comprised a breathing gas delivery system.
- 5.2.2 Therefore, the Board agrees with the appellant-applicant that D2 does not disclose a breathing apparatus harness. Moreover, D2 does not disclose a breathing gas delivery system comprised in a length adjustable [harness] back plate.
- 5.3 For at least these reasons, the Board considers that the subject matter of claim 1 is new with respect to D2.
- 6. Main request, claim 1, novelty with respect to D1, D3, D4, D5 and D6

6.1 Regarding D1

The Board agrees with the appellant that D1 discloses a carrying device 1 for a breathing apparatus. The device is clearly to be worn (see abstract and figure), so it is a breathing apparatus harness. It has a middle part 7 which is provided with a longitudinal adjustment means 15 for adjustment to different body heights and shown schematically in Figure 2 (see also column 2, lines 13 to 14 and column 3, lines 51 to 54). The Board agrees with the appellant that, in the absence of any details of this longitudinal adjustment arrangement, it is not directly and unambiguously disclosed that it is a ratchet mechanism, let alone one as claimed. Therefore, the subject matter of claim 1 is new with respect to D1.

6.2 Regarding D3

D3 discloses a wearable supporting frame for a respiratory air container, thus a breathing apparatus harness (see abstract and figures 1 and 2). As explained in paragraph [0011] (top of page 2) and best seen in figure 2, a back support extension plate 14 is length-adjustable in that locking grip ends 22 can be held in one of four locking grooves 17 to 20 in a guiding channel 13 so that the plate 14 can be locked in any one of four discrete positions to adapt to different torso lengths. The Board agrees with the appellant-applicant that this arrangement is not a [unidirectional] ratchet mechanism in the sense of claim 1. Rather, in a locked state upward movement (towards the contracted position) and downward movement (towards the extended position) is prevented and in the unlocked state, movement both up and down is permitted (see paragraph [0012]).

6.3 Regarding D4

D4 (see abstract, paragraph [0008] and figures 3A, 3B, 4, 5A, 7 and 8) discloses a longitudinally adjustable lumbar support for a breathing apparatus, thus a breathing apparatus harness. To adapt the length of the harness to fit different users, a locking slider 145 can be locked into discrete slots 170A, 171A or 172A (figures 5A, 7 and 8) in a similar manner to D3's breathing apparatus harness.

As the appellant has pointed out (appeal grounds, page 3, first complete paragraph) D4 thus does not disclose a ratchet mechanism in the sense of claim 1. Rather, as with D3 it discloses a mechanism that is either locked (movement prevented) or which allows movement up and down when disengaged (see paragraphs [0031] to [0033] with figures 7 and 8). Therefore, the subject matter of claim 1 is new with respect to D4.

6.4 Regarding D5

As the appellant-applicant has explained (appeal grounds, page 3, second complete paragraph), D5 does not disclose a breathing apparatus harness. Rather, as with D2, D5 discloses a length-adjustable backpack or back frame harness (see page 1, lines 5 to 10 and lines 25 to the last line). Furthermore, D5 also does not disclose a [unidirectional] ratchet mechanism as claimed. The harness' length can be adjusted up and down when a lock is disengaged (see page 7, lines 14 to 25 with figure 3A). When a lock is engaged (see page 7, line 26 to page 8, last line with figures 3B and 3C) L-shaped locking projections 24 and 28 and corresponding apertures 30, 26 interlock to engage a

locking latch. In this locked state, movement up and down is prevented. Therefore, this mechanism is not a [unidirectional] ratchet mechanism as claimed but a locking mechanism which is functionally similar to D3's lock for example.

6.5 Regarding D6

D6 discloses a breathing apparatus harness (see for example abstract and page 3, line 31 to page 4, line 3, page 5, lines 14 to 18). As explained on page 7, lines 4 to 8 and seen in figures 4 and 5, the harness has a longitudinally extendable back plate, thus a length adjustable backplate. However, as the appellant-applicant has pointed out (see appeal grounds, page 3, third complete paragraph), the adjustment does not result in an adjustment of the distance between the shoulder and waist support as claimed. The distance between these is fixed. Rather, the length adjustment merely allows for movement of a lower part of the back plate between a loading and retaining position for the gas cylinders. Nor does D6 disclose a [unidirectional] ratchet mechanism as claimed. Rather, the longitudinal movement of the back-plate between an extended and retracted position is achieved by means of telescopic struts when a locking latch is disengaged. Once the latch is engaged, longitudinal movement is prevented (see page 8, lines 14 to 33). Therefore, the subject matter of claim 1 is new with respect to D6.

6.6 From the above, the Board concludes that the subject matter of claim 1 of the main request is new over the available prior art, D1 to D6, and thus meets the requirements of Article 54(1) EPC.

7. Main request , claim 1, inventive step starting from D2 figures 21 to 22 in combination with D2, figures 17-20
- 7.1 The examining division considered that this combination took away inventive step of the subject matter of claim 1. The Board however agrees with the appellant-applicant (cf. appeal grounds, section 3.2.1.1) that the contrary is true. In particular, however obvious it might be to combine certain embodiments of D2, the combination would at most lead to a wearable harness for a rucksack, armoured vest or some generic load (cf. D2, page 1, lines 4 to 8) but not to a breathing apparatus harness, let alone a breathing apparatus harness having a back plate comprising a breathing gas delivery system. This is because, as the Board noted above in its consideration of novelty, D2 does not disclose a breathing apparatus harness. Therefore, D2 on its own does not take away inventive step of the subject matter of claim 1.
8. Main request, claim 1, inventive step, other choices of the closest prior art
- 8.1 The Board agrees with the appellant-applicant, that each of D1, D3 and D4 discloses a breathing apparatus harness. Moreover, each is length adjustable in such a way that the extension of a back plate between the user's shoulders and hips is adjustable. Therefore, they appear to be suitable starting points from which to consider inventive step.
- 8.2 As already explained in relation to novelty, like D2, D5 does not disclose a breathing apparatus harness and D6 discloses a breathing apparatus with a back plate which is not length adjustable between a user's shoulders and hips. Therefore, these are less promising

starting points from which to arrive at the subject matter of claim 1.

8.3 Development of the objective technical problem starting from D3

Whichever of D1, D3 and D4 is chosen as closest prior art, the differing feature appears to be at least the ratchet mechanism permitting relative movement of the upper and lower back plates towards the contracted position while preventing their relative movement towards the extended position. By way of example the Board will consider D3 as the starting document.

8.4 As explained in the published application (see page 11, last three paragraphs and the first paragraph on page 12) and highlighted by the appellant-applicant in its appeal grounds, section 3.2.2, the technical effect of the ratchet mechanism is to allow back plate height adjustment of the breathing apparatus harness to the user's torso size whilst being worn, making the adjustment quick and easy.

8.5 In this regard, the claimed direction in which the ratchet allows adjustment seems to play an important role in the invention (see application, page 11, penultimate paragraph): Users large and small can don the breathing apparatus harness in its fully extended state but "for all but the tallest users, the user will find that the back plate 102 is too long for his or her body size in its fully extended position. However, the user can reach around the harness 100 and, using the knobs 146 or the strap 148, apply a force to urge the upper yoke 122 towards the back plate frame 124, thereby contracting the back plate 102".

- 8.6 The appellant-applicant (appeal grounds, top of page 6) has argued that, starting from D3 and based on the differing feature (specific unidirectional ratchet) the objective technical problem can be formulated as:
"[H]ow to adapt the harness of D3 to enable quick and easy donning of a breathing apparatus harness for users of different sizes." The Board finds this plausible. Rather than requiring a user specific adjustment prior to donning which may be inaccurate and thus require iterative adjustment (see published application, page 12, first paragraph), all users can don the harness regardless of their size and then the act of adjustment is simply one of pulling the harness towards the fully contracted position until the appropriate length is reached. Correct adjustment is ensured because it is carried out whilst on the user's back, thus not iteratively. Therefore, the whole process of donning and adjusting the harness to the user's size is quicker and easier for the breathing apparatus harness of the invention compared to that of D3.
9. Main request, claim 1, inventive step starting from D3 with any of D1, D4, D5 or D6
- 9.1 As the appellant has explained (appeal grounds, page 6, third paragraph) and as is also derivable from the Board's novelty analysis above, like D3, none of D1, D4, D5 or D6 discloses a [unidirectional] ratchet as claimed. Therefore, the combination of D3 with any of documents D1, D4, D5 or D6 would not lead the skilled person to the subject matter of claim 1 as a matter of obviousness.
10. Main request, claim 1, inventive step starting from D3 with D2

Considering the objective technical problem associated with D3 (quick and easy donning), the Board agrees with the examining division's assessment made in the context of inventive step over D2 (decision, reasons 32.2.3.1, first sentence) that D2's harness can be adjusted whilst the user is wearing it: As explained with regard to an arrangement described on pages 15 to 17 and shown in figures 14 to 20, the wearer of D2's harness can quickly and conveniently set the correct height of the harness by suitably hunching their shoulders with a locking pin of a ratchet disengaged, before re-engaging it at the adjusted height (first paragraph on page 17).

Therefore, D2 appears to disclose a solution to the objective technical problem. D2 also explicitly discloses a ratchet in the description of the examples of figures 14 to 22, see for example page 15, first paragraph. However, bearing in mind how the Board interprets the word "ratchet", the word alone does not imply that D2 discloses a unidirectional mechanism.

- 10.1 In its analysis of D2 (see the impugned decision, reasons 31.1.1, 31.4.1.3 and 32.4.2.1) the examining division considered that D2's examples of figures 17 to 20 (which are also shown in figures 14 to 16) disclosed a harness with an arrangement which "could be configured such that any of the two possible free adjustment directions of the harness were envisageable" (reasons 32.4.1.3). It considered that a second group of examples (figures 21 to 22) disclosed an alternative ratchet arrangement that was unidirectional, permitting relative movement of upper and lower back plates towards the extended position while preventing their relative movement towards the contracted position (the opposite to what is claimed).

- 10.2 In the Board's view, neither the example ratchet arrangements of figures 14 to 20 nor those of figures 21 to 22 permit relative movement in one direction while preventing it in the opposite direction.
- 10.2.1 With regards to the first example (figures 14 to 17 shown in more detail in figures 18 to 20) a telescopic, user-adjustable back brace 11 is disclosed. As best seen in figure 20 and explained on page 16, lines 5 to 6 and 16 to 23, this arrangement comprises a row of discrete lock-pin through holes 312 in a back-brace and a locking-pin which is urged by a spring into one of the holes to lock the back brace to a support belt 120 at a particular height. The locking-pin can be manually released from the through-hole by overcoming the spring force to allow movement in both the up and down directions before being locked into a new lock-pin through hole.

In this way the effective length of the back brace can be freely adjusted (see also page 15, last paragraph with figures 18 to 20). According to this example, when the locking pin is engaged, the ratchet is completely locked (allowing no movement). When the locking pin is disengaged, movement is permitted in both directions (towards the fully extended or retracted positions), even though it may be biased by another spring (base spring) to adopt the fully extended or fully retracted position by default when the locking pin is released (page 15, lines 28 to last line). Thus, the ratchet of figures 14 to 20 is not of the unidirectional kind that permits movement in one direction whilst blocking it in the opposite direction. Rather, it is a locking arrangement that is functionally similar to D3's locking arrangement.

- 10.2.2 Turning now to the example arrangements of figures 21 and 22, contrary to the examining division's assessment (impugned decision, reasons 32.4.1.3) the Board considers that these also do not disclose a unidirectional ratchet mechanism.
- 10.2.3 As explained on page 17, lines 15 to 25 with reference to figure 21: "height setting is realized by engagement of pivoted and biased clamping pincer arms 400, 402 within splines 410 formed on an external surface of a ratchet member 420". The next sentence explains that "The clamping pincer arms 400, 402 may therefore be functionally equated to the locking pin of FIG. 18."
- 10.2.4 The Board holds that the wording "height setting" by engagement of pincer arms in the first sentence can but mean that the height is set at a certain level, so that it cannot be freely changed. In other words it is locked. By functionally equating the role of the pincer arms to the locking pin of the first example, the second sentence confirms that the engagement of the pincer arms locks the ratchet arrangement at a certain height. In other words movement is prevented in any direction rather than permitted in only one direction.
- 10.2.5 The locking nature of the ratchet arrangement is also supported by the next sentence: "Also, rather than a perpendicular pull on a release cord (or webbing strap) 206, a pincer biasing spring 440 allows for a downward movement to disengage the clamping pincers 400, 402 from the splines". Element 440 is thus a spring which holds the pincer arms in engagement with the toothed ratchet 410, thus locking it (right hand part of figure 21). Only on manually disengaging the pincer arms (left side of figure 21) is an up and down movement possible. Therefore, although at first glance figure 21 might

appear to show a ratchet mechanism which could allow free movement downwards whilst preventing movement upwards, it is in fact a locking arrangement which is functionally the same as the examples of D2's figures 14 to 20 and which boils down to a releasable locking mechanism. This is thus functionally much the same as D3's arrangement.

- 10.2.6 Whilst D2 discloses little information about how the alternative arrangement of figure 22 works (cf. page 17, lines 27 to 29), the Board has no reason to consider that it might have a different functionality to the embodiment of figure 21. In other words, the Board considers that it also discloses a ratchet mechanism that is lockable to prevent vertical movement in either direction when engaged and which may be manually disengaged to permit movement in both up and down directions.
- 10.2.7 Turning now to the combination of the teachings of D3 and D2, as explained above, D2 offers a solution to the objective technical problem. Therefore, it would be obvious for the skilled person to combine the teachings of D3 and D2.

However, the result of this combination would at most be a breathing apparatus harness having an adjustable height back plate which replaced D3's height adjustment arrangement, with a ratchet height adjusting arrangement known from D2. That is, one having the same functionality as D3 (locked to prevent longitudinal movement or unlocked and free to move longitudinally in either direction). Thus, the combination would not result in a breathing apparatus harness with a unidirectional ratchet mechanism, let alone one that permitted movement of upper and lower back plate

elements towards the contracted position while preventing their relative movement towards the extended position when engaged as claimed. Therefore, the subject matter of claim 1 is not rendered obvious by the combination of D3 with D2.

- 10.2.8 In reaching this conclusion, the Board notes that because neither D3 nor D2 discloses a unidirectional ratchet, the question as to whether the particular blocking direction of a unidirectional ratchet is one of just two straightforward possibilities from which the skilled person might be able to select need not be considered (cf. impugned decision, reasons, 32.4.1).

11. Main request, claim 1, inventive step starting from D1 or D4 with any of the other cited documents

In the Board's view, since none of the cited documents discloses a releasable unidirectional ratchet arrangement, let alone one that prevents movement of upper and lower back plate elements towards the extended position, the skilled person would not arrive at the claimed subject matter as a matter of obviousness when starting from D1 or D4. The arguments are effectively the same as when starting from D3.

12. From the above, the Board is satisfied that the claimed subject matter involves an inventive step over the available prior art and that therefore the requirements of Article 56 EPC are met.

13. Main request, sufficiency of disclosure

In the Board's view, the whole application discloses the invention in a manner which is sufficiently clear and complete for the skilled person to be able to carry it out. Therefore, the application meets the requirements of Article 83 EPC.

14. Main request, Article 84 EPC

14.1 In the Board's view, the claims are clear. Moreover, they are concise. Claims 2 to 13 are directed to a breathing apparatus harness and depend on claim 1. Although claim 14 is directed to a breathing apparatus, it comprises a breathing apparatus harness according to any preceding claim and so includes all the features of previous claims. Thus, to all intents and purposes it is also a dependent claim, cf. Rule 43(4) EPC.

14.2 Taking into account the amendments made to the description in appeal, the claims are supported by the description.

15. It follows from the above that the main request is allowable. Therefore, the impugned decision must be set aside and the case remitted to the examining division so that a patent can be granted according to the main request.

Order

For these reasons it is decided that:

The decision under appeal is set aside and the case is remitted to the examining division with the order to grant a patent in the following version:

Description:

Pages 1, 1a and 2 to 12 filed with letter of 22 May 2026.

Claims:

1 to 14 of the main request filed with letter of 22 May 2026.

Drawings:

Sheets 1/7 to 7/7 as published in the international application.

The Registrar:

The Chairman:



G. Magouliotis

A. Pieracci

Decision electronically authenticated