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KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG,  
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- (54) **Title:** WEARING POINT DEVICE WITH A QUICK COUPLING

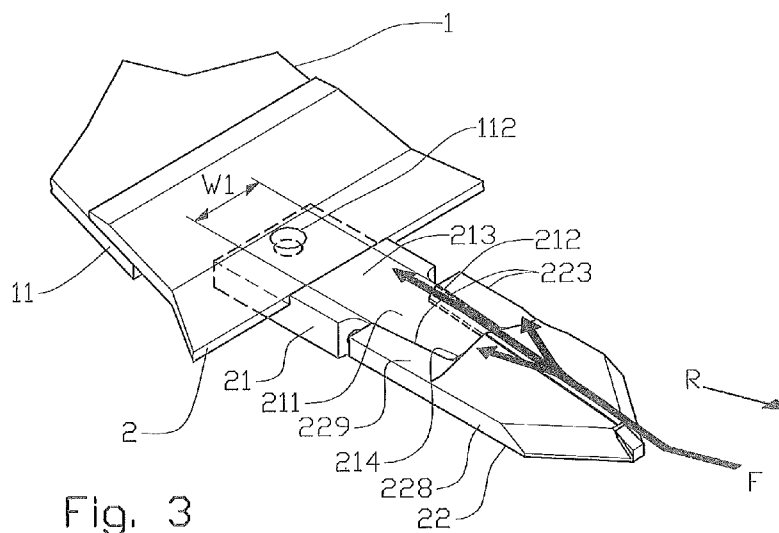


Fig. 3

- (57) **Abstract:** A wearing-point device (22) with a quick-coupling formed from a coupling portion (211) of a wearing-part holder (21) and corresponding attachment portions (223) of the wearing point (22), in which a longitudinal elevation (224) extends with a desired height from a front portion (221) towards the attachment portion (223), sliding surfaces (222, 222') extending in a downward-sloping manner from the longitudinal centre plane of the wearing point (22) in the directions of opposite side edges (228) of the wearing point (22) and forming a downward-sloping rear edge (227) that forms an interface towards the attachment portions (223).



## WEARING POINT DEVICE WITH A QUICK COUPLING

The invention relates to a wearing-point device with a quick coupling formed from a coupling portion of a wearing-part holder and a corresponding attachment portion of the wearing point.

- 5 On soil-working implements, for example ploughs and cultivators, it is known to use wearing points with quick couplings, see for example the applicant's own Norwegian patent NO 332031. A problem with such wearing-point arrangements is that the quick coupling partially wears in step with the wearing point itself. The transverse eminence according to NO 332031 tries to remedy this, but it has turned out that as said emi-  
10 nence wears down, the wearing point is weakened and tends to break.

The invention has for its object to remedy or reduce at least one of the drawbacks of the prior art or at least provide a useful alternative to the prior art.

The object is achieved through features, which are specified in the description below and in the claims that follow.

- 15 Surprisingly, it has turned out that by forming a wearing point with a longitudinal elevation with an increasing height from a front portion of the wearing point to the transition to a quick-coupling attachment, a favourable effect is achieved both on the durability of the quick-coupling attachment and on the durability of a possible transverse elevation of the kind that is described in NO 332031. The longitudinal, rising elevation  
20 results in the upward-facing wearing surfaces of the wearing point exhibiting transverse downward slopes outwards from the longitudinal centre line of the wearing point. These inclined wearing surfaces have the effect of the adjacent unconsolidated mass that is sliding along the wearing surfaces partly being guided sideways away from the centre portion of the wearing point and thereby away from the quick-  
25 coupling details as well. Besides, the longitudinal, rising elevation results in the ability to provide the possible transverse eminence with a more favourable geometry, which

results in both a lower risk of cracks growth while the wearing point is being formed and a larger material thickness in the front portion of the transverse eminence by hot shaping (forging), which is a common, rational production method for components of this kind.

5 The maximum height of the longitudinal elevation is typically in the range of 8-12 mm.

The invention relates more specifically to a wearing-point device with a quick-coupling formed from a coupling portion of a wearing-part holder and a corresponding attachment portion of the wearing point, characterized by a longitudinal elevation extending with an increasing height from a front portion towards the attachment portion, sliding  
10 surfaces extending in a downward-sloping manner from the longitudinal centre plane of the wearing point in the directions of opposite side edges of the wearing point and forming a downward-sloping rear edge which forms an interface towards the attachment portion.

The downward-sloping rear edge may be formed of a transverse eminence.

15 The downward-sloping rear edge may be formed of a transverse eminence with a height that is 2-5 mm larger than the maximum height of the longitudinal elevation.

The maximum height of the longitudinal elevation lies in the range of 10-15 mm.

The ratio of the maximum height of the longitudinal elevation to the width of a coupling mount may be in the range of 0.15-0.30.

20 In what follows, examples of preferred embodiments are described, which is visualized in the accompanying drawings, in which:

Figure 1 shows a first embodiment of a wearing point according to the invention in perspective;

25 Figure 2 shows a second embodiment of a wearing point according to the invention in perspective;

Figure 3 shows a perspective view on a smaller scale of an assembled implement with a first embodiment of the wearing point according to the invention;

Figure 4 shows a longitudinal section through the wearing point as is indicated by IV-IV in figure 1; and

Figure 5 shows a longitudinal section through the wearing point as is indicated by V-V in figure 2.

In what follows, reference being made to the drawings, preferred exemplary embodiments of a replaceable wearing point according to the invention, adapted for mounting on an implement with one or more working front edges or fronts that are arranged to work in a specific material and that are subjected to wear over time, will be described.

Even though the term "wearing point" is used, the invention is not limited to wearing parts with pointed fronts, but also covers wearing parts with front portions of other shapes.

The preferred exemplary embodiments that are described are connected with soil-working implements for use in agricultural operations, but it will be understood that the invention has a further application, as it can be used on replaceable working shares of a kind known *per se*, and for other types and combinations of tools requiring the fitting of replaceable wearing parts held fixed by a wearing-part holder whose life should desirably be extended.

The operative direction of motion of an implement 1 is indicated by an arrow R.

On the implement 1, an attachment portion 11 (see figure 3) has been formed for a replaceable leading edge element 2. The edge element 2 may be formed as a share of a plough or as a levelling share, a jaw of an excavator bucket, an end portion of a cultivator tine and so on. On the edge element 2, a wearing-part holder 21 has been integrated, shown here as attached to the implement 1 by means of a fixing bolt 112 that has been passed through a portion of the wearing-part holder 21 and the edge element 2. The wearing-part holder 21 is provided with a mount 211 including profiled abutment surfaces 212 which are arranged to engage with a corresponding attachment portion 223 of a replaceable wearing point 22 (see figures 1 and 2). The wearing-part holder 21 is provided with a sliding surface 213 which is defined towards the wearing point 22 by a forward sliding-surface edge 214 and lies on roughly the same level as corresponding sliding surfaces 229 on the attachment portions 223.

The replaceable wearing point 22 is provided with a front portion 221, which, in the exemplary embodiment shown, is formed to easily penetrate into a mass in which the implement 1 is going to be moved. The wearing point 22 is provided with a longitudinal elevation 224 forming two sliding surfaces 222, 222' sloping evenly outwards towards the side edges 228 of the wearing point 22 from the vertical centre plane of the wearing point 22. The longitudinal elevation forms a downward-sloping rear edge 227

facing the attachment portions 223 of the wearing point and forming an interface towards the attachment portions 223.

In a second embodiment (see figure 4), the longitudinal elevation 224 ends in a transverse eminence 224' that forms a boundary portion between the longitudinal elevation and the attachment portions 223. See NO 332031 for more details concerning the design of the transverse eminence 224'.

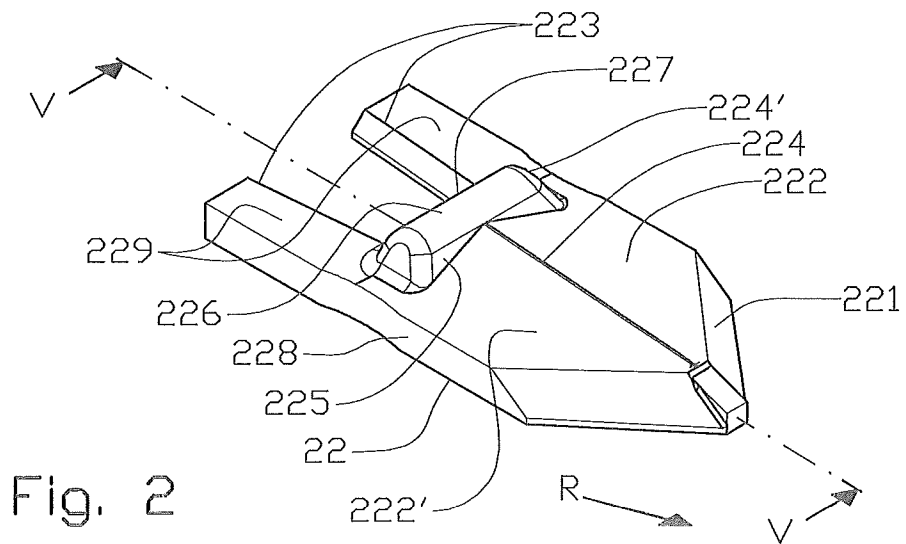
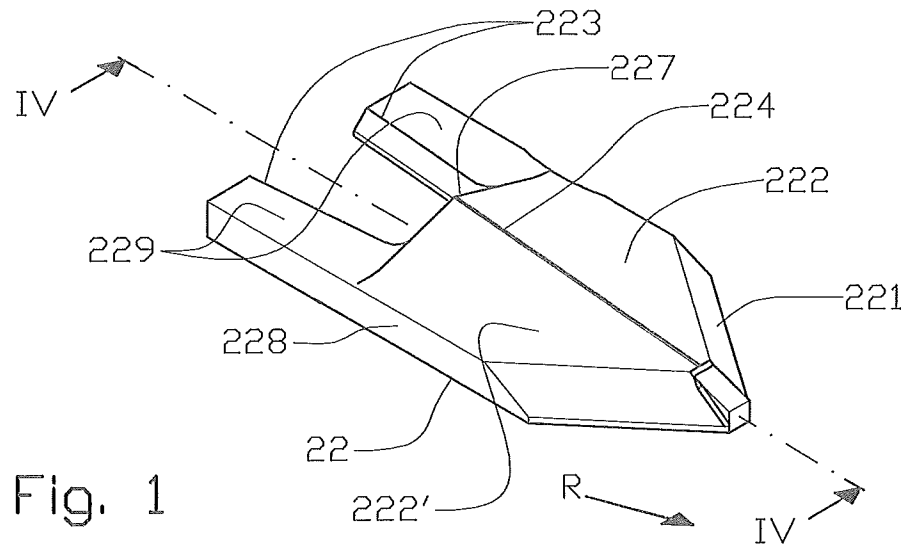
A material flow across the sliding surfaces 213, 222, 222' of the wearing part 22 and the wearing-part holder 21 is indicated by the arrow F. The effect of the longitudinal elevation 224 is shown by the change of direction of the arrow F, as the downward-sloping sliding surfaces 222, 222' guide parts of the material flow F out towards the side edges 228 of the wearing point 22 and the rear edge 227 of the longitudinal elevation lifts the material flow F clear of the wearing-part holder 21.

The maximum height h of the longitudinal elevation 224 above the sliding surfaces 229 of the attachment portions 223 lies in the range of 10-15 mm for a wearing point 22 with a wearing-point holder 21 with a mount width W1 in the range of 45-55 mm. The ratio of the maximum height h of the longitudinal elevation to the width W1 of the mount lies more generally in the range of 0.15-0.30. The height of the transverse eminence 224' is indicated by the reference h'. In combination with the transverse eminence 224', the maximum height h of the longitudinal elevation 224 is somewhat smaller than the height h' of the transverse eminence 224', typically 2-5 mm smaller.

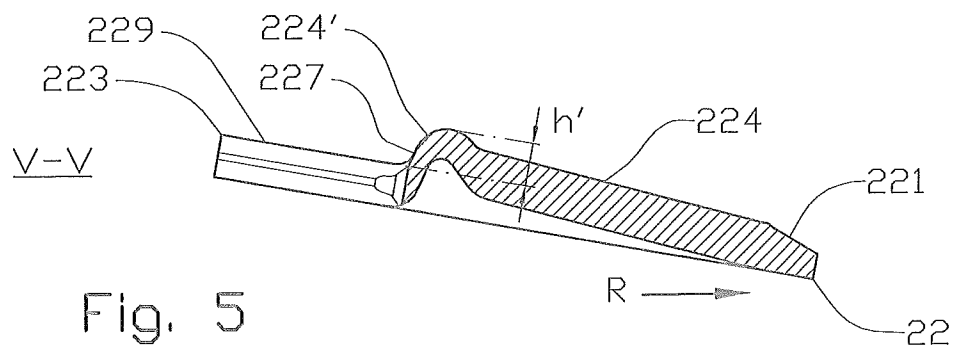
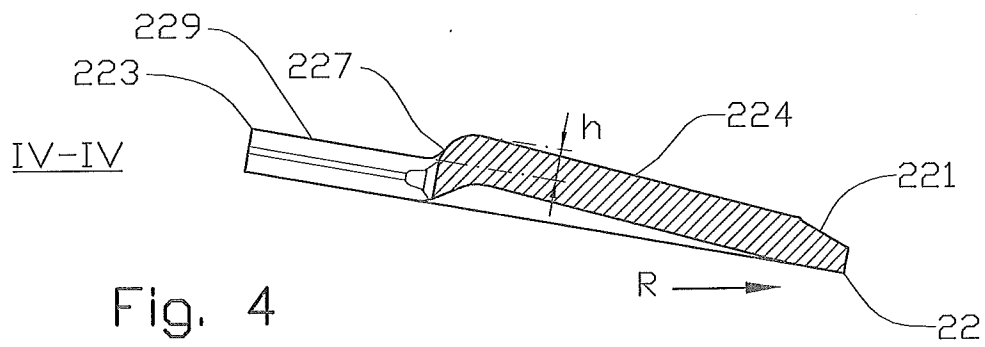
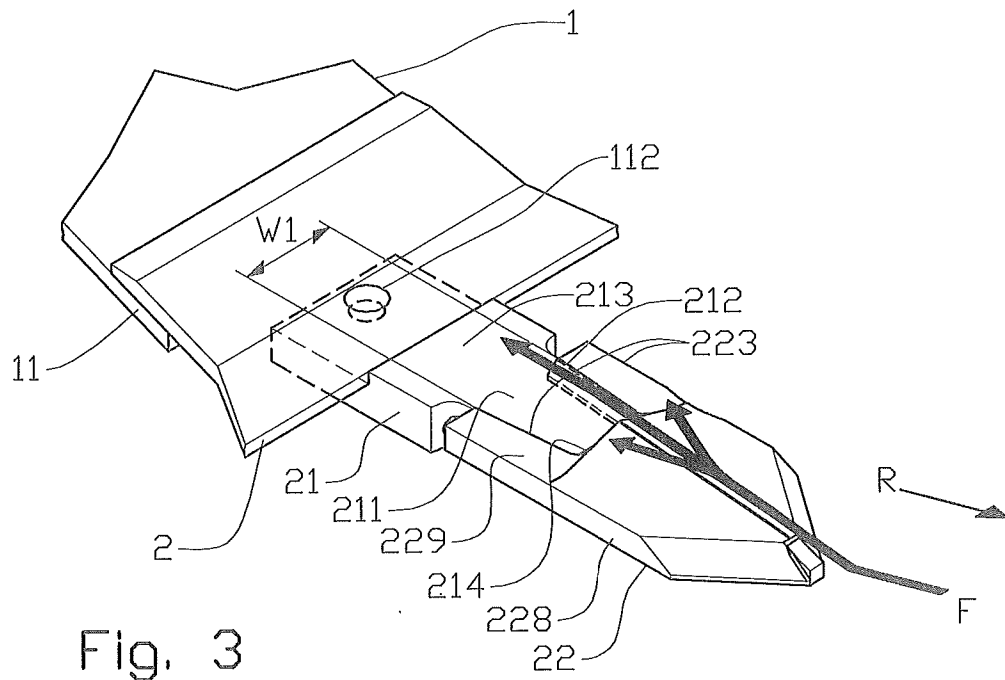
## C l a i m s

1. A wearing-point device (22) with a quick-coupling formed from a coupling portion (211) of a wearing-part holder (21) and corresponding attachment portions (223) of the wearing point (22), c h a r a c t e r i z e d  
5 i n that a longitudinal elevation (224) extends with an increasing height from a front portion (221) towards the attachment portion (223), sliding surfaces (222, 222') extending in a downward-sloping manner from the longitudinal centre plane of the wearing point (22) in the directions of opposite side edges (228) of the wearing point (22) and forming a downward-sloping rear edge (227) that forms an interface towards the attachment portions (223).  
10
2. The device according to claim 1, wherein the downward-sloping rear edge (227) is formed of a transverse eminence (224').
3. The device according to claim 1, wherein the downward-sloping rear edge (227) is formed of a transverse eminence (224') with a height (h') which is  
15 2-5 mm larger than the maximum height (h) of the longitudinal elevation (224).
4. The device according to claim 1, wherein the maximum height (h) of the elevation (224) lies in the range of 10-15 mm.
5. The device according to claim 1, wherein the ratio (h/W1) of the maximum  
20 height (h) of the longitudinal elevation (224) to the width (W1) of a coupling mount (211) lies in the range of 0.15-0.30.

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/NO2014/050189

## A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A01B, E02F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2058440 A1 (METALOGINIA S A -(A4) METALOGENIA SA [ES]), 13 May 2009 (2009-05-13); abstract; paragraphs [0012], [0028], [0032], [0049]; figures 8-11 --	1-5
X	US 3136077 A (TROEPPL WILLIAM M), 9 June 1964 (1964-06-09); column 3, line 8 - line 31; figures 1-7; claim 1	1, 4, 5
Y	--	2, 3
Y	US 20120279096 A1 (SKJAEVELAND MAGNE), 8 November 2012 (2012-11-08); paragraphs [0003], [0007]-[0009], [0025]; figures 2-5 --	2, 3



Further documents are listed in the continuation of Box C.



See patent family annex.

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“X”

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y”

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&amp;”

document member of the same patent family

Date of the actual completion of the international search

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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X	US 4269274 A (ROBERTSON FORREST E ET AL), 26 May 1981 (1981-05-26); figures 1,2,4	1, 4, 5
A	--	2, 3
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A	--	2, 3
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A	--	2, 3
X	US 20050050775 A1 (CLENDENNING CHARLES ET AL), 10 March 2005 (2005-03-10); figures 1,2,4	1, 4, 5
A	-- -----	2, 3

**Continuation of:** second sheet

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

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