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- 5 **[0001]** The invention relates to a mouldboard for ploughs configured as a solid body or as a slatted body, with a mouldboard rear part, which has a mouldboard upper edge, a mouldboard lower edge and a mouldboard front edge, and with a recess which merges into the mouldboard lower edge and into the mouldboard front edge and into which a mouldboard front part which is of substantially congruent design, is insertable as a replacement part which, in the mounted state, continues the mouldboard front edge and the mouldboard lower edge of the mouldboard rear part.
- 10 **[0002]** A mouldboard of the type mentioned above is known from the LEGERER catalogue 2010 "Spare parts for soil cultivators" from the Legerer GmbH, A-2294 Marchegg. In this a mouldboard to be provided with a tailpiece and a fertilizer guide plate is provided with an essentially slightly convex-shaped recess into which a correspondingly essentially concave-shaped mouldboard front part of congruent design is to be inserted. The mouldboard rear part and the mouldboard front part together form a mouldboard lower edge and a mouldboard upper edge wherein the mouldboard front part merges spatially relatively close to the mouldboard upper edge into the mouldboard front edge of the mouldboard. The mouldboard front part can be changed when worn without having to replace the entire
- 15 mouldboard. However with higher ploughing speeds the stresses on the mouldboard are considerably increased, i.e. increased wear occurs. The known mouldboard with its mouldboard front part can no longer cope satisfactorily with such increased wear.
- 20 **[0003]** The object of the present invention is therefore to make with the lowest possible additional material and construction costs a mouldboard of the type mentioned at the beginning which is less susceptible to wear at higher ploughing speeds.
- 25 **[0004]** In order to achieve this object the mouldboard of the type mentioned at the beginning is characterised in that the length of the maximum orthogonal distance between the apex, which faces away from the mouldboard front edge, of the mouldboard front part, which is inserted into the recess, to the connecting line between the transition of the recess into the mouldboard lower edge and the
- 30 transition of the recess into the mouldboard front edge is 40% to 100% of the length of the connecting line, in that the angle between a straight line placed in the front half of the upper region, which runs obliquely forwards and rectilinearly downwards, of the blade plate front part in the region of the separating line be-
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tween the recess in the mouldboard rear part and mouldboard front part, and a straight line placed in the lower half of the rear region, which runs obliquely forwards and rectilinearly downwards of the blade plate front part in the region of the separating line between the recess in the mouldboard rear part and mouldboard front part, is smaller than 90° , but greater than 60° .

[0005] A mouldboard for ploughs, configured as a solid body or as a slatted body, is thus provided having a substantially improved wear region so that even increased stresses can be withstood at higher ploughing speeds. The mouldboard has as a whole a wear region which is considerably enlarged compared with the previously known prior art and which as regards its geometrical extension in the mouldboard front part is considered as a replaceable part. The replaceable mouldboard front part is substantially integrated into the rear region of the mouldboard in an expanded manner by its curved region with its apex compared with the previously known prior art so that the regions which suffer the most stress during soil cultivation are formed by the mouldboard front part. The preferably substantially convex recess and the correspondingly preferably substantially convex-shaped mouldboard front part of congruent design are therefore preferably formed substantially semi-elliptical in some regions. It is preferably proposed that the separating line between the substantially convex-shaped recess in the mouldboard rear part and the substantially concave-shaped mouldboard front part of congruent design runs from the transition of the separating line into the mouldboard lower edge in the direction of movement of the soil flowing over the mouldboard obliquely downwards into a direction facing away from the mouldboard front edge and aligned towards the mouldboard upper edge, then merges into a curved path tracking the apex path of an ellipse, and then obliquely towards the mouldboard front edge and to the mouldboard lower edge towards the mouldboard front edge and merges into the latter. Through the configuration of the mouldboard front part which is spread out in the front region, as indicated by the angle details of the upper edge and rear edge of the mouldboard front part which are arranged relative to one another, an optimized configuration of the mouldboard front part, formed as an insertable replaceable part, is achieved in terms of the wear which occurs.

[0006] With a profile of this kind it happens that the mouldboard rear part engages round the mouldboard front part in regions like clamps, whereby the mouldboard front part is locally strengthened by the mouldboard rear part.

[0007] A particularly good configuration both as regards the wear which occurs and the sufficient rigidity of the parts of the mouldboard is thereby guaranteed if the angle lies within a range of between 75° and 65°.

5 **[0008]** Further advantageous configurations of the invention are apparent from further dependent claims, the following description and the drawings. In the drawings:

Figure 1 shows an exemplary embodiment of a mouldboard configured as a solid
10 body, in a view of the mouldboard front edge, the share tip and the share blade;

Figure 2 shows a side view of the exemplary embodiment of the mouldboard according to Figure 1 with the contact bearing rail, and

15 Figure 3 shows a plan view of the exemplary embodiment according to Figure 2.

[0009] 1 marks in general the mouldboard for ploughs which in the exemplary embodiments according to Figures 1 to 3 is configured as a solid body with a mouldboard rear part 2 and a mouldboard front part 3. A mouldboard upper edge
20 4, a mouldboard front edge 5 and a mouldboard lower edge 6 are formed on the mouldboard 1. The mouldboard lower edge 6 is adjoined by a share blade 7 and a share tip 8.

[0010] The mouldboard rear part 2 has a substantially convex recess 9, configured as a cut-out, with a separating line 9.1 which merges at 10 into the mouldboard lower edge 6 and at 11 into the mouldboard front edge 5. The mouldboard front part 3 is configured concave substantially congruent with the recess 9 so that the separating line 9.1 in the assembled state of the mouldboard rear part runs between the mouldboard rear part 2 and the mouldboard front part 3. The
30 mouldboard front part 3 is inserted into the recess 9 and is held as a replaceable wear part, by way of example via the body or base frame 12 which together with the contact bearing rail 13 is to be seen from Figure 2. A rectilinear connecting line 14 runs between the transition 10 of the separating line 9.1 into the mouldboard lower edge 6 and the transition 11 of the separating line 9.1 into the
35 mouldboard front edge 5.

[0011] The orthogonal distance B between the apex S of the separating line 9.1 of the recess 9 between the mouldboard front part 2 and the mouldboard front

part 3 is matched to the length of the connecting line 14, looking at the wear regions of the mouldboard 1, and is to amount to at least 40% of the length of the connecting line 14 between the transition points 10 and 11 and to a maximum of 100% of the length. The mouldboard front part 3 is thus formed to run substantially into the mouldboard rear part 2 and also takes into account as a whole the heavily stressed regions of the mouldboard 1 at higher ploughing speeds.

[0012] The separating line 9.1 has a profile approximately the shape of a semi-ellipse, particularly in the region of the mouldboard front part 3 which adjoining the apex S is placed deeper in the mouldboard rear part 2. The separating line 9.1 then has a profile which starting from the point 10 of the transition of the separating line 9.1 into the mouldboard lower edge 6 runs obliquely backwards into a direction facing away from the mouldboard front edge 5, and obliquely upwards towards the mouldboard upper edge, then merges in the approximately semi-elliptical curved region whilst including the apex S, and then again in turn runs obliquely to the mouldboard front edge 5 and towards the mouldboard lower edge 6, and then merges at the point 11 into the mouldboard front edge 5. It is thus ensured that the mouldboard rear part 2 engages round the mouldboard front part 3 in some regions in the manner of a clamp.

[0013] In order to provide a sufficient amount of engagement by the mouldboard rear part, the distance A of the point 10 of the transition of the recess 9 or separating line 9.1 into the mouldboard lower edge 6 to the mouldboard front edge 5 corresponds to a maximum of 85% of the overall length of the mouldboard lower edge 6. The distance C of the point 11 of the transition of the recess 9 or separating line 9.1 into the mouldboard front edge 5 from the mouldboard rear edge 6 corresponds to a maximum of 85% of the overall length of the mouldboard front edge 5. Also the upper distance of the point of the transition of the mouldboard upper edge 4 into the mouldboard front edge 5 is matched accordingly. Therefore the length of the connecting line 14 between the points 10 and 11 should be dimensioned to lie between 60 and 75 % of the length of the mouldboard lower edge 6.

[0014] Furthermore the mouldboard front part 3 projects with its apex point S beyond the rectilinear connecting line D between the intersection of the rear end of the share blade 7 with the mouldboard lower edge 6 of the mouldboard rear part 2 and the intersection of the mouldboard front edge 5 with the mouldboard upper edge 4 at least in the middle region of the connecting line. The term inter-

section is not to be understood in its idealised form but also relates to rounded corner regions so that an imaginary intersection point is to be understood here.

5 [0015] By the middle region of the connecting line is meant at least the middle third of the length of the connecting line. This middle region can amount to up to 70% of the length of the connecting line. The distance of the apex point S from the connecting line amounts to at least 5%, preferably more than 10%, of the length of the rectilinear connecting line between the apex point S and the intersection point between the lower edge of the mouldboard front part 3 and the front
10 edge of the mouldboard front part 3.

[0016] The straight line 16 is placed in the front half 14 of the upper region 15, running obliquely forwards and downwards, of the mouldboard front part 3 in the region of the separating line 9.1 between the recess 9 in the mouldboard rear
15 part 2 and the mouldboard front part 3. Furthermore the straight line and/or tangent 19 is placed in the lower half 17 of the rear region 18, running obliquely forwards and downwards, of the mouldboard front part 3 in the region of the separating line 9.1 between the recess 9 in the mouldboard rear part 2 and the mouldboard front part 3. These two regions 15 and 18 thus run at a specific angle
20 E to one another.

[0017] This angle E between the straight line 16 placed in the front half 14 of the upper region 15, running obliquely forwards and downwards, of the mouldboard front part 3 in the region of the separating line 9.1 between the recess 9 in
25 the mouldboard rear part 2 and the mouldboard front part 3, and a straight line 19 and/or tangent, placed in the lower half 17 of the rear region 18, running obliquely forwards and downwards, of the mouldboard part 3 in the region of the separating line 9.1 between the recess 9 in the mouldboard rear part 2 and the mouldboard front part 3, is smaller than 90° , but greater than 60° . The angle E
30 preferably lies within a range of between 75° and 65° .

[0018] The mouldboard front part 3 is configured expanded in its front region, as indicated by the aforementioned angle details E of the upper edge 15 and rear edge 18, arranged relative to one another, of the mouldboard front part 3. An
35 optimized configuration of the mouldboard front part 3, designed as a replaceable insert part, is hereby reached in terms of the wear which occurs,.

[0019] Figures 2 and 3 show the exemplary embodiment of Figure 1 in even more detail. Here the body 12 is shown which is connected via a holder to a supporting frame of the plough body. The contact bearing rail 13 is to be placed against the furrow wall of the soil being cultivated. The mouldboard rear part 2 and the mouldboard front part 3 are furthermore visible, as is the share tip 8.

Patentkrav

1. Muldplade (1) til plove og udformet som et massivt legeme eller som et opspaltet legeme, med en muldpladeoverkant (4), en muldpladeunderkant (6) og et
5 muldpladebagparti (2), der har en muldpladeforkant (5) og et udtag (9), der går over i muldpladeunderkanten (6) og ind i muldpladeforkanten (5), og ind i hvilket et muldpladeforparti (3), som er i det væsentlige kongruent udformet, kan indføres som en udskiftningsdel, som i monteret tilstand fortsætter muldpladeforkanten (5) og muldpladeunderkanten (6) af muldpladebagpartiet (2), **kendetegnet**
10 **ved, at** længden af den maksimale vinkelrette afstand (B) mellem muldpladeforpartiets (3) spids (S), der vender væk fra muldpladeforkanten (5) og er indført i udtaget (9), til forbindelseslinien (14) mellem udtagets (9) overgang (10) i muldpladeunderkanten (6) og udtagets (9) overgang (11) i muldpladeforkanten (5) er 40% til 100% af længden af forbindelseslinien (14), idet vinklen (E) mellem en
15 lige linie (16) placeret i den forreste halvdel (14) af det øvre område (15), som forløber skråt fremad og retlinet nedad, af skærpladeforpartiet (3) i området af skillelinien (9.1) mellem udtaget (9) i muldpladebagpartiet (2) og muldpladeforpartiet (3), og en lige linie (19) placeret i nedre halvdel (17) af det bageste område (18), som forløber skråt fremad og retlinet nedad af skærpladeforpartiet (3) i
20 området af skillelinien (9.1) mellem udtaget (9) i muldpladebagpartiet (2) og muldpladeforpartiet (3), er mindre end 90° , men større end 60° .

2. Muldplade ifølge krav 1, **kendetegnet ved, at** vinklen (E) ligger i området mellem 75° og 65° .

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