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Description

This invention relates to a tooth system for earth-working tools such as excavators, loaders, mechanical shovels, rotary dredging cutters, etc. Because the teeth of earth-working tools are exposed to very severe wear it is customary for them to be divided into an adapter more or less permanently secured to the tool and a readily replaceable tooth tip detachably fitted in the adapter. The tooth tip is the part which is exposed to the major share of the wear and which therefore has to be replaced relatively frequently. It is therefore usually so designed that it also protects the adapter against wear to the greatest possible extent. In large wear part systems there are also different types of intermediate parts between the tooth tip and the adapter. In these designs it can readily be envisaged that the tooth tip is divided into a front and a rear part. The interconnection between the adapter and the tooth tip is very often achieved by means of male and female members adapted to each other, formed in the tooth tip and/or adapter respectively. In the interconnection the male member is thus entered into the female member, whereupon their relative movement are blocked with the locking element disposed crosswise to the direction of interconnection of the parts. If the male member is a part of the adapter or of the tip is conceptually of no real interest. To ensure the least possible play between the male and female members the male member is usually made slightly wedge-shaped and the insides of the female member are adapted to the same wedge shape. It is further normal for the main direction of the male member to coincide with the interconnection direction of the parts, which, in turn, coincides with the main working direction of the tool. The male and female members will thus be pressed towards each other in order to give a play-free fit between them as soon as the tool is engaged in working the soil. This arrangement, however, has the disadvantage that the previously mentioned locking element has to absorb all the extraction forces acting upon the tip when the tool is withdrawn back through the working soil. The extraction forces may be of considerable magnitude and are also of an extremely frequently recurring load type. There has therefore been a tendency to introduce increasingly stout locking elements at the same time as modified wear part systems have been introduced on the market.

A tooth system of the aforementioned kind, which has the features set out in the preamble part of claim 1, has been known from FR—A—2.175.120.

It is an object of the invention to improve the tooth system of the aforementioned kind for obtaining a new wear part system in which a portion of the extraction forces acting upon the interconnection between the parts of the system is transferred directly between the male and female members of the parts without acting on the locking element inserted between the parts.

According to the invention this object is solved by the two-part system as described in claim 1.

As can be seen from the claim, the invention is characterized by a special geometry obtained by the manner in which the various contact surfaces between the tooth tip and the adapter are located relative to each other and how they are angled relative to each other and to the anticipated main working direction of the tool.

The contact surfaces formed in the adapter which thus interact with corresponding contact surfaces in the tooth fit when this is fitted give through their angular setting relative to the main working direction of the tool and their mutual location along the adapter a virtually entirely playfree clamping of the tool tip, at the same time as the angular setting of the contact surfaces ensures that the working forces acting upon the tooth tip force the parts together to even better contact with each other, while the extraction forces acting on the tooth tip, thanks to the angular setting of the same contact surfaces, are distributed to the opposing sides of the adapter partly along one side thereof where portions of the extraction forces are transmitted in a conventional manner with the locking element as an intermediate part and partly along the other side of the holder where portions of the extraction forces are transmitted directly from the tooth tip to the adapter via the contact surface of the adapter towards the tooth tip, since the said contact surface, along this side of the adapter, is inclined relative to the main working direction of the tool but faces away from this direction.

The mutual positions of the contact surfaces relative to each other also give the tooth tip a powerful overhand rearwards behind the locking element. This overhang enables the tooth tip to cope with very large breaking forces.

In more detail, the tooth system according to the invention may be said to comprise an adapter, the truncated, wedge-shaped male member of which displays a first broad side which is inclined relative to the main working direction of the tool but facing in this direction, whereas the male organ is limited in the opposite direction by a second broad side which is also inclined relative to the main working direction of the tool but faces away from the said direction. The female member in its turn displays opposing first and second broad sides adapted to the broad sides of the male member. The respective broad sides of the male and female member are united towards the side by edge sides adapted to each other. The male member further displays a third contact surface facing towards the tooth tip which is parallel with its own second broad side but which is located on the same side of the male member as the first broad side and faces in the same direction as the first broad side, i.e. obliquely forward in the main working direction of the tool. The female member naturally displays a third contact surface adapted to this third contact surface which thus faces in the opposite direction. The part of the locking seat which is formed in the

male member is located between the broad side of the male member and the third contact surface. The second part of the locking seat is formed in the female member. In the male member, the locking seat forms a step between its third broad side and its third contact surface which lies at a slightly lower level so that the step forms a locking surface or locking edge facing away from the main working direction of the tool. In the male member there is also a fourth contact surface towards the female member. This fourth contact surface is formed in the adapter at the same height as the base of the male member where it forms a pointed angle to the third contact surface extending in the main working direction of the tool. These third and fourth contact surfaces are appropriately disposed opposite each other.

The tooth system according to the invention is naturally also further characterized in that the tooth tip, in addition to its own said first and second broad sides and edge sides respectively adapted to the male organ of the adapter and a third contact surface, also displays a fourth contact surface adapted to the fourth contact surface of the adapter. The third and fourth contact surfaces of the tooth tip are formed in an overhang formed partly behind the female member in the main working direction of the tool where the tooth tip portion of the locking seat adapted for the locking member forms a step or locking surface running across the tooth tip between the first broad side of the female member and its third contact surface located at a lower level and wherein the fourth contact surface of the tooth tip is located on the opposing side of the overhang, i.e. its top side.

On many occasions it may be appropriate to divide the said third and fourth contact surfaces into two parts by means of a cam disposed in either part, tooth tip or adapter, and a recess provided in the corresponding part. The overhang of the tooth tip can also be fitted to advantage with a stop edge against the holder at the same time as it is appropriate to permit the side edges of the tooth tip to extend to the rear end of the overhang and to provide apertures for the locking element in its side edges on a level with the previously mentioned locking edges.

The entire length of the male member and the length of the second broad side of the female member shall now be so adapted that the following method can be exploited for interconnection of the two associated parts.

Initially, the parts are angled more relative to each other than is indicated by what corresponds to the difference between the main working direction and the interconnection direction of the parts. The interconnection direction of the parts is defined as the direction along which the male and female members are pushed together to close contact between the parts. The interconnection direction for tooth systems with the geometry according to the present invention coincides with the angular setting of the second broad sides and third contact surfaces of the tooth tip and adapter

respectively relative to the anticipated main working direction of the tool. In the aforesaid first angled position the parts (tooth tip and adapter) are pushed together so far that the locking edge of the female member or tooth tip reaches the locking edge in the male member. The angle between the parts is then reduced in that the third contact surface of the tooth tip is angled down to rest against the third contact surface of the male member. In order for the procedure to be possible the male member may not be too long and the second broad side of the female member, which thus lies opposite the third contact surface of the tooth tip, may not extend farther rearwards in the interconnection direction than to roughly the same height as the locking surface of the male member. When the parts have now been angled in towards each other they can be pushed together in the interconnection direction to close contact between the male and female members, whereafter the locking element is inserted between the parts and locks their relative movements.

The tooth system according to the invention is defined in the accompanying claims and will now be described in greater detail and with reference to a preferred embodiment illustrated in the accompanying drawings, wherein Fig. 1 shows a side projection of the tooth system according to the invention, Fig. 2 shows a plan view of the parts of the tooth system in the non-connected condition, Fig. 3—5 shows, with figures partly sectioned along line III—III in Fig. 2, how the interconnection between the tooth and the adapter according to Fig. 1 and Fig. 2 is accomplished and Fig. 6 shows an inclined projection of the locking element.

Similar parts are identified by the same reference numerals in the different figures.

The tooth system according to the invention thus consists of two parts in the form of a tooth tip 1 and an adapter 2. The design of the rear part of the adapter depends upon the appearance of the tool to which it is intended to be welded. This design is in full agreement with known technique and has therefore not been included in the figures.

The main working direction for the tool in which the tooth system according to the figures is intended to be included is indicated by the arrow A.

The adapter 2 displays a wedge-shaped male member 3, truncated towards its outer end and protruding forwards in the main working direction A.

The male member 3 is limited by a first broad side 4 facing upwards in the figures and a second broad side 5 facing downwards from this, as well as opposing edge sides 6 and 7 uniting these broad sides, which edge can also run together to form a truncated wedge-shaped towards the outer end of the male member. The male member is terminated in the main working direction A by a leading edge surface 8.

The tooth tip 1 displays in its turn a female

member 9 adapted to the male organ and expanding away from the main working direction a first upper broad side 10, and opposing second broad side 11 and two edge sides 12 and 13 opposite to each other. The female member 9 is appropriately terminated in the main working direction with a soft recess 14 which is sufficiently large to prevent the edge surface 8 of the male member from bottoming in the female member.

A contact between the male and female members takes place in addition along the previously mentioned edge sides of the adapter and the tooth tip.

Included now in the invention is that one broad side of the male member, in this case the first broad side 4, is angled relative to the main working direction A and faces in this direction whereas the second broad side 5 is also angled relative to the main working direction but faces away from this direction. Since the corresponding broad sides of the female member rest against the male member along the said first and second broad sides, parts of the extraction forces acting upon the tooth tip will be transmitted directly between the second broad side 11 of the female member facing obliquely in the main working direction A and the broad side 5 of the male member facing obliquely away from the main working direction. In the example shown in the figures the angle between the main working direction A and the first broad side of the male and female member respectively is 158° and the angle between the main working direction and the second broad side of the male and female member respectively 170° . The wedge-shape of the male and female members respectively is thus 12° .

Portions of the extraction forces acting on the tooth tip are thus transmitted to the adapter 2 directly between the second broad sides 11 and 5. The remainder of the extraction forces is transmitted in a conventional manner with a locking element 15 as intermediate piece between opposing locking surfaces formed in the male and female member respectively which extend across the lengthwise direction of the parts. The locking surface 16 of the tooth tip is then turned forwards in the main working direction while the locking surface 17 of the adapter is turned away from the said direction.

Also included in the tooth system according to the invention is that the male member, apart from the previously mentioned contact surfaces adapted to the female member, also displays a third contact surface which may be divided into two contact surfaces 18, 19 disposed adjacent to each other, which is parallel with the second broad side but turned in the same direction as its first broad side 4 and wherein a portion formed in the male member for the locking seat required for the locking element 15 forms with its locking surface 17 facing away from the main working direction A a step between the first broad side of the male member and the said third contact surface 18, 19, located at a lower level corre-

sponding to the height of the locking surface 17. In the adapter there is also a fourth contact surface which can also be divided into two partial surfaces 20, 21, and which is opposite to the third contact surface and forms an acute angle extending forwards in the main working direction with the said third contact surface 18, 19. The third and fourth contact surfaces are appropriately located opposite each other in the adapter on a level with the base of the male member. Also included in the invention is that the tooth tip in addition to the previously mentioned contact surfaces, also displays its own third and fourth contact surfaces 22, 23 (22 not shown) and 24, 25 (24 not shown) respectively which are adapted to the third and fourth contact surfaces of the adapter. These third and fourth contact surfaces of the tooth tip are elaborated in an overhang formed behind the female member in the said main working direction A so that the tooth tip portion of the locking seat adapted to the locking element forms with its locking surface 16 a step between the first broad side 10 of the female member and the third contact surface 22, 23 of the tooth tip located at a lower level.

The fourth contact surface 24, 25 of the tooth tip 1 is located on the top side of the overhang. Above the said fourth contact surface are stop edges 27, 28, interacting with each other in the tooth tip and adapter.

The division of the third and fourth contact surfaces into two parts is accomplished with a cam 29 formed in the adapter and a corresponding recess 30 in the tooth tip. As shown by Fig. 2, the overhang actually forms two lugs on which the third and fourth contact surfaces of the tooth tip are formed.

In order to make the tooth tip self-sharpening the tip is provided with a front recess 31.

The side edges 12, 13 of the tooth tip are formed into walls 32, 33 which, in a gentle curve, extend from the rear edge of the second broad side of the tooth tip to the rear edge of the overhang. Openings 34, 35 for the locking element 15 are provided in these walls so that the locking element can be introduced between the locking edges 16 and 17. The locking element 15 consists of steel wedge but it can be held in place with a separate blocking member of one or other per se known type.

The interconnection between tooth tip and adapter is evident from figures 3 to 5. Initially, the tooth tip is inclined so much that the third contact surface 22, 23 of the overhang runs clear of the first broad side 4 (Fig. 3) of the male member. The parts are then brought together with this direction until the locking surfaces 16 and 17 have passed each other (Fig. 4), whereupon the tooth tip is dropped down to the position shown in Fig. 5, whereafter the parts are pushed together along the direction defined by the second broad sides of the male and female members respectively by the third contact surfaces of the holder and tooth tip. This direction could be referred to as the interconnection direction of the parts.

When the parts are pushed together a wedge effect is obtained partly between the broad and edge sides of the male and female members and partly between the third and fourth contact surfaces of the overhang and the adapter. When the parts have been pushed completely together their position relative to each other is locked in that the locking member is inserted in position.

Claims

1. A tooth system for soil-working tools such as excavator and loader buckets, rotary dredging cutters, etc., the system comprising two mutually interconnectable parts (1, 2), one of which is an adapter (2) attached to the tool and displaying a truncated wedge-shaped male member (3) protruding towards its outer end in the main working direction (A) of the tool, and the other part is a replaceable tooth tip (1) detachably attached to the adapter and displaying a female member (9) for receiving the adapter and making contact therewith along mutually engaging contact faces, and a locking element (15) insertable in a locking seat between opposing locking surfaces (16, 17) formed partly in the adapter (2) and partly in the tooth tip (1) for blocking the tooth tip against disengagement from the adapter, said male member (3) being delimited by first and second broad sides (4, 5) wedge-like converging towards the outer end of the male member, the first broad side (4) being inclined to the main working direction (A) of the tool and facing in this direction, lateral edge sides (6, 7) uniting said broad sides (4, 5), and a front edge surface (8) facing towards in the main working direction (A) of the tool, and said female member (9) comprising opposing broad sides (10, 11) and lateral edge sides (12, 13) adapted and counter-directed for contact with the respective sides of the male member (3), characterized in that said second broad side (5) of the male member (3) is so inclined to the main working direction (A) that it faces away from this direction, that the adapter further comprises a third contact surface (18, 19) parallel to said second broad side (5) but facing in the same direction as said first broad side (4) and being on a lower level, so that the locking surface (17) which runs across the adapter (2) and faces away from the main working direction (A) forms a step between said first broad side (4) and third contact surface (18, 19), and a fourth contact surface (20, 21) facing towards the third contact surface (18, 19) and being adjacent the base of the male member (3), and that said tooth tip (1) further comprises third (22, 23) and fourth (24, 25) contact surfaces which are adapted for contact with those of the adapter and formed at an overhang of the tooth tip behind the female member (9) with respect to the main working direction (A) of the tool, with the contact surface (18) which runs across the tooth tip (1) forming a step between said third contact surface (22, 23) and the first broad side (10) of the female member, and the fourth contact surface (25, 26) being formed on the opposite side of the overhang.

2. A tooth system as claimed in Claim 1, characterized in that the third and fourth contact surfaces of the adapter (2) and tooth tip (1) are each divided into two contact surfaces by a cam (29) rubbing along the centre plane of the adapter — tooth system in one part and a thereto adapted recess (30) in the other part.

3. A tooth system as claimed in Claim 1 or Claim 2 characterized in that the second broad side (11) of the female member (9) facing in the main working direction (A) of the tool with the parts in interconnected condition rest against the second broad side (5) of the male member from the front part of the male member rearwards in the main working direction (A) of the tool to level with the locking surface (17) of the male member whilst the respective side edges of the female member extend from this position in the form of a wall in a gentle curve up to the rear edge of the overhang in the main working direction of the tool and in which the said walls, level with the locking seat, display openings adapted to the locking element (15).

4. A tooth system as claimed in any of Claims 1—3, characterized in that the tooth tip (1) and adapter (2) in interconnected condition display mutually interacting stop edges (27, 28) arranged in direct conjunction with the said fourth contact surfaces.

5. A tooth system as claimed in any of Claims 1—4, characterized in that the said first broad side (4) of the male member forms an angle of 158° with the main working direction (A) of the tool whereas its third contact surface (18, 19) forms an angle of 170° with the said direction while its fourth contact surface is parallel with the said direction.

Patentansprüche

1. Zahnsystem für Erdbearbeitungswerkzeuge, wie Greifbagger und Pflugbagger Schaufelradbagger, etc., mit zwei wechselseitig miteinander verbindbaren Teilen (1, 2), von denen eines ein an dem Werkzeug befestigtes Anpaßstück (2) ist und ein abgestutztes keilförmiges Einsteckteil (3) offenbart, das in der Hauptarbeitsrichtung (A) des Werkzeugs gegen sein äußeres Ende vorsteht, und das andere Teil ist eine austauschbare Zahnspitze (1), die abnehmbar an dem Anpaßstück befestigt ist und ein Aufnahmeteil (9) zum Aufnehmen des Anpaßstückes offenbart und mit diesem entlang sich wechselseitig berührender Kontaktflächen in Berührung kommt, und mit einem Schließelement (15), das in einen Schließsitz zwischen sich gegenüberliegenden Schließflächen (16, 17) einführbar ist, die teilweise in dem Anpaßstück (2) und teilweise in der Zahnspitze (1) ausgebildet sind zum Blockieren der Zahnspitze gegen eine Loslösung vom Anpaßstück, wobei das Einsteckteil (3) durch erste und zweite Breitseiten (4, 5), die keilförmig zum äußeren Ende des Einsteckteiles hin konvergieren, abgegrenzt ist, wobei die erste Breitseite (4) in der Hauptarbeitsrichtung (A) des Werkzeugs geneigt ist und in diese Richtung gerichtet ist, seitliche Randseiten (6, 7) die Breitseiten (4, 5) verbinden, eine Vorderkantenfläche (8)

auf die Hauptarbeitsrichtung (A) des Werkzeugs gerichtet ist, und wobei das Aufnahmeteil (9) sich gegenüberliegende Breitseiten (10, 11) und seitliche Randseiten (12, 13) umfaßt, die zur Berührung mit den jeweiligen Seiten des Einsteckteils (3) angepaßt und entgegengerichtet sind, dadurch gekennzeichnet, daß die zweite Breitseite (5) des Einsteckteils (3) so in die Hauptarbeitsrichtung (A) geneigt ist, daß sie von dieser Richtung weggerichtet ist, daß das Anpaßstück ferner eine dritte Berührungsfläche (18, 19) umfaßt, parallel zu der zweiten Breitseite (5) aber in die gleiche Richtung wie die erste Breitseite (4) gerichtet und auf einem tieferen Niveau, so daß die Schließfläche (17), die quer über das Anpaßstück (2) verläuft und von der Hauptarbeitsrichtung (A) weggerichtet ist, eine Stufe zwischen der ersten Breitseite (4) und der dritten Berührungsfläche (18, 19) bildet, und eine vierte Berührungsfläche (20, 21), die auf die dritte Berührungsfläche (18, 19) hin gerichtet und der Basis des Einsteckteils (3) benachbart ist, und daß die Zahnschmelze (1) ferner umfaßt, dritte (22, 23) und vierte (24, 25) Berührungsflächen, die zur Berührung mit denen des Anpaßstückes ausgebildet sind und an einem Überhang der Zahnschmelze hinter dem Aufnahmeteil (9) in Bezug zu der Hauptarbeitsrichtung (A) des Werkzeugs ausgebildet sind, wobei die Berührungsfläche (18), die quer zu der Zahnschmelze (1) verläuft, eine Stufe zwischen der dritten Berührungsfläche (22, 23) und der ersten Breitseite (10) des Aufnahmeteils bildet, und wobei die vierte Berührungsfläche (25, 26) an der gegenüberliegenden Seite des Überhangs ausgebildet ist.

2. Zahnsystem nach Anspruch 1, dadurch gekennzeichnet, daß die dritten und vierten Berührungsflächen des Anpaßstückes (2) und der Zahnschmelze (1) beide in zwei Berührungsflächen unterteilt werden, durch eine entlang der Mittelebene des Anpaßstück-Zahnsystems verlaufenden Nocke (29) in einem Teil und durch eine an diese angepaßte Aussparung (30) in dem anderen Teil.

3. Zahnsystem nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die zweite Breitseite (11) des Einsteckteils (9) in die Hauptarbeitsrichtung (A) des Werkzeugs gerichtet ist, mit den Teilen in verbundenem Haltezustand gegen die zweite Breitseite (5) des Einsteckteils von dem Vorderteil des Einsteckteils aus nach hinten in der Hauptarbeitsrichtung (A) des Werkzeugs, um mit der Schließkante (17) des Einsteckteils abgeglichen zu sein, während die jeweiligen Seitenkanten des Aufnahmeteils sich von dieser Position aus in Form einer Wand, in einer leichten Biegung nach oben zu der Hinterkante des Überhangs hin, in der Hauptarbeitsrichtung des Werkzeugs erstrecken und in der die Wände mit dem Schließsitz abgeglichen sind und Öffnungen offenbaren, die an das Schließelement (15) angepaßt sind.

4. Zahnsystem nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß die Zahnschmelze (1) und das Anpaßstück (2) in verbundenem Zustand wechselseitig zusammenwirkende Stoppkanten (27, 28) offenbaren, die in direkter Verbindung mit dem vierten Berührungsflächen angeordnet sind.

5. Zahnsystem nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß die erste Breitseite (4) des Einsteckteils einen Winkel von 158° mit der Hauptarbeitsrichtung (A) des Werkzeugs bildet, wogegen seine dritte Berührungsfläche (18, 19) einen Winkel von 170° mit der Richtung bildet, während seine vierte Berührungsfläche parallel zu dieser Richtung ist.

Revendications

1. Système de dent pour outils de travail du sol tels que, des godets chargeurs et excavateurs, des couteaux rotatifs pour dragage, etc. . . , le système comprenant deux parties (1, 2) s'interconnectant mutuellement, l'une d'elles étant un adaptateur (2) fixé à l'outil et présentant un élément mâle (3) en forme de coin tronqué en saillie vers son extrémité la plus externe dans la direction principale de travail (A) de l'outil, et l'autre partie étant une plaque pour dent (1) remplaçable fixée de manière amovible à l'adaptateur et présentant un élément femelle (9) pour recevoir l'adaptateur et faisant contact avec celui-ci le long de faces de contact à engagement mutuel, et un élément de blocage (15) insérable dans un réceptacle de blocage entre des surfaces de blocage opposées (16, 17) formées en partie dans l'adaptateur (2) et en partie dans la plaque pour dent (1) pour bloquer la plaque pour dent afin d'empêcher le désengagement de l'adaptateur, ledit élément mâle (3) étant délimité par un premier et un second côté large de coin convergent en direction de l'extrémité la plus extérieure de l'élément mâle, le premier côté large (4) étant incliné par rapport à la direction principale de travail (A) de l'outil et faisant face dans cette direction des faces de côté latéral (6, 7) reliant lesdits côtés plats (4, 5), et une surface de côté frontal (8) faisant face vers l'avant dans la direction principale de travail (A) de l'outil, et ledit élément femelle (9) comprenant des côtés plats opposés (10, 11) et des côtés latéraux (12, 13) adaptés et symétriques pour un contact avec les faces respectives de l'élément mâle (3), caractérisé en ce que ledit second côté large (5) de l'élément mâle (3) est incliné par rapport à la direction principale de travail (A) de telle manière qu'il ne fait pas face à cette direction, en ce que l'adaptateur comprend en outre une troisième surface de contact (18, 19) parallèle audit second côté large (5) mais face à la même direction que ledit premier côté (4) et étant positionné à un niveau plus bas, de sorte que la surface de blocage (17) qui s'étend en travers de l'adaptateur (2) dans une direction différente de la direction principale de travail (A) forme une marche entre ledit premier côté large (4) et la troisième surface de contact (18, 19), et une quatrième surface de contact (20, 21) faisant face à la troisième surface de contact (18, 19) et adjacente à la base de l'élément mâle (3), et en ce que ladite plaque pour dent (1) comprend en outre des troisième (22, 23) et quatrième (24, 25) surfaces de contact qui sont adaptées pour entrer en contact avec celles de l'adaptateur et sont formées à l'endroit d'un surplomb de la plaque pour dent

derrière l'élément femelle (9) par rapport à la direction principale de travail (A) de l'outil, la surface de contact (18) qui est transversale à la plaque pour dent (1) formant une marche entre ladite troisième surface de contact (22, 23) et le premier côté latéral (10) de l'élément femelle, et la quatrième surface de contact (25, 26) étant formée sur le côté opposé du surplomb.

2. Système de dent selon la revendication 1, caractérisé en ce que les troisième et quatrième surfaces de contact de l'adaptateur (2) et la plaque pour dent (1) sont divisées chacune en deux surfaces de contact par une came (29) s'étendant le long du plan central de l'adaptateur — système de dent d'une part et une gorge (30) adaptée pour celui-ci d'autre part.

3. Système de dent selon la revendication 1 ou 2, caractérisé en ce que le second côté latéral (11) de l'élément femelle (9) face à la direction principale de travail (A) de l'outil avec les parties se trouvant dans une condition d'interconnexion reposent contre le second côté latéral (5) de l'élément mâle depuis la partie frontale de l'élément mâle vers l'arrière dans la direction principale de travail (A) de l'outil pour mettre à niveau

le bord de blocage (17) de l'élément mâle tandis que les bords latéraux de l'élément femelle s'étendent depuis cette position selon la forme d'une paroi faiblement incurvée en montant vers le bord arrière du surplomb dans la direction principale de travail de l'outil et dans lequel lesdites parois, au niveau du réceptacle de blocage, présentent des ouvertures adaptées à l'élément de blocage (15).

4. Système de dent selon l'une quelconque des revendications 1 à 3, caractérisé en ce que la plaque pour dent (1) et l'adaptateur (2) dans une condition d'interconnexion présentent mutuellement des arrêtes d'arrêt (27, 28) d'interaction disposées en conjonction directe avec lesdites quatrième surfaces de contact.

5. Système de dent selon l'une quelconque des revendications 1 à 4, caractérisé en ce que ledit premier côté latéral (4) de l'élément mâle forme un angle de 158° avec la direction principale de travail (A) de l'outil, tandis que sa troisième surface de contact (18, 19) forme un angle de 170° avec ladite direction tandis que sa quatrième surface de contact est parallèle avec ladite direction.

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