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(54) **Speed wrench**

Schraubenschlüssel für Schnellmontage

Clé d'utilisation rapide

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## Description

This invention relates in general to wrenches of the type commonly known as "speed wrenches" which provide a ratcheting-type action.

### Description of the Prior Art

The prior art includes a number of different designs of wrenches which provide a ratchet-type action without the use of any ratchet wheel or dog or other additional moving parts to provide the ratcheting action. Such wrenches are commonly referred to as "speed wrenches" and are typically characterized by jaws respectively having long and short driving surfaces for respectively engaging opposite sides or flats of an associated fastener, such as a hexagonal fastener. Both open-end wrench and adjustable wrench versions of such ratcheting-type speed wrenches have been provided. In operation, when the wrench is rotated in a forward torque applying direction, the driving surfaces will firmly grip the fastener for applying torque to it, while when the wrench is rotated in the reverse direction the driving surfaces will slip or "ratchet" over the fastener surfaces to facilitate movement of the wrench to engagement with a different set of fastener flats without having to lift the wrench from the fastener.

A common prior art speed wrench configuration is designated by the numeral 10 in FIGS. 1 and 2 and includes long and short driving surfaces 11 and 12 interconnected by a generally V-shaped throat which includes flat throat surfaces 13 interconnected by an arcuate corner recess 14. Such recesses 14 may also be provided at the junctions between the throat surfaces 13 and the driving surfaces 11 and 12. The wrench 10 is illustrated as used with a hexagonal fastener 15 having six flats or side surfaces 16 interconnected at six equal-angle corners 17. The wrench 10 is designed so that when an appropriately-sized fastener 15 is disposed between the jaws, the corner recesses 14 will provide clearance for the fastener corners 17. Ideally, if both the wrench 10 and the fastener 15 are accurately sized, the fastener 15 will fit snugly between the wrench jaws and the fastener corners 17 will remain in the corner recesses 14 during a torque applying operation.

Such prior speed wrenches work satisfactorily when the wrench is properly sized for the fastener with which it is being used. However, in practice, fasteners are manufactured to relatively wide tolerances, resulting in considerable variation in the dimensions of fasteners which are nominally of the same size. To a lesser extent, there are also tolerance variations in the spacing between driving surfaces of open-end wrenches of the same nominal size. As a result, there may be considerable clearance or play between the fastener and a wrench which is nominally of the proper size for that fastener. It is not uncommon for this play to be such that it is necessary to rotate the wrench through an angle of as great as 10° before bringing the driving surfaces into

firm torque applying engagement with the fastener flats.

When, because of tolerance variations in the parts, the wrench 10 must be rotated through several degrees in order to bring the driving surfaces 11 and 12 into firm torque applying engagement with opposed fastener flats 16, the corner 17 disposed in the wrench throat will ride up out of the corner recess 14 in the throat and onto the adjacent throat surface 13, as can be seen in FIG. 2. This creates a camming action between the throat surface 13 and the fastener corner 16 which tends to urge the fastener 15 outwardly away from the throat. Thus, the short driving surface 12 is slid down closer to the adjacent corner of the fastener and, if this relative rotation between the wrench 10 and the fastener 15 continues far enough, the short driving surface 12 will slip off the fastener. Even if firm gripping action with the fastener is achieved, the short driving surface 12 will be gripping the adjacent fastener flat 16 closer to the corner and will tend to wear or deform the corner more readily, as indicated at 18 in FIG. 2, further exacerbating the tendency to slip during a torque applying operation. The net result is that the ultimate torque which can be applied to the fastener 15 is greatly reduced.

U.S. patent no. 3,921,476 to Evans, corresponding to the preamble of claim 1, discloses a speed wrench wherein the throat includes a short flat surface portion inclined at an angle of 120° to the short driving surface and positioned and sized so that, during a torque-applying rotation, it does not engage a corner of the fastener.

US-A-1,954,141 discloses a wrench comprising a short and a long driving surface and a throat therebetween, including a straight surface portion bearing full length against the across-side dimension of a hexagonal fastener. In another embodiment the straight face is substituted by a projection inwardly curved towards the side of the fastener thus clearing the corners of the fastener. The reference lacks to disclose the particular length of said face and the angle of inclination between the short driving surface and said face being different from 120°. Accordingly, there is no initial contact between said face and the fastener which includes only one corner thereof.

### Summary of the Invention

It is a general object of the invention to provide an improved speed wrench which avoids the disadvantages of prior speed wrenches while affording additional structural and operating advantages.

An important feature of the invention is a speed wrench which significantly increases the ultimate torque which can be applied by the wrench.

In connection with the foregoing feature, another feature of the invention is the provision of a speed wrench which maintains consistent fastener engagement and torque application despite tolerance variations in fastener size.

Still another feature of the invention is the provision of a speed wrench of the type set forth which inhibits

slippage of the wrench from an associated fastener during a torque applying operation.

Yet another feature of the invention is the provision of a speed wrench of the type set forth which minimizes damage to the corners of an associated fastener.

Still another feature of the invention is the provision of an open-end speed wrench of the type set forth.

Yet another feature of the invention is the provision of an adjustable speed wrench of the type set forth.

These and other features of the invention are attained by providing an open-end speed wrench (20) for use in torque applying forward rotation and ratcheting reverse rotation with a fastener (15) having a plurality of substantially flat sides (16) each having the same side dimension (S) and intersecting at a plurality of corners (17), the fastener having an across sides dimension (X), the wrench including a wrenching head (22) including two jaws (23,24) and a throat (30) interconnecting said jaws, said jaws respectively including short and long driving surfaces (25,26), respectively defining first and second driving planes spaced apart a distance (W) slightly greater than the across sides dimension (X) and respectively disposed for driving engagement with opposed sides of the fastener, said throat including a generally flat first surface portion (31) adjacent to said short driving surface (25) and inclined with respect thereto at a predetermined angle (Z) and having a length (L) substantially less than the side dimension (S), said throat (30) including a recessed second surface portion (35) interconnecting said first surface portion (31) and said long driving surface (26) and shaped and dimensioned so as to remain spaced from an associated fastener (15) when engaged with said driving surfaces, characterized by said first surface portion (31) extending from a first end (32) between said driving planes to a second end spaced from said short driving surface (25) and disposed on the opposite side of said first driving plane from said long driving surface (26), said predetermined angle (Z) being between 120° and 140° and said length (L) of said first surface portion being such that said first surface portion initially contacts a portion of the fastener which includes only the corner (A) thereof during a torque applying forward rotation and supports that corner during a ratcheting reverse rotation through a sufficient angle to prevent lock up of said wrench on the fastener.

The invention consists of certain novel features and a combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the details may be made without departing from the scope of the present invention as defined in the appended claims.

#### Brief Description of the Drawings

For the purpose of facilitating an understanding of the invention, there are illustrated in the accompanying drawings preferred embodiments thereof, from an

inspection of which, when considered in connection with the following description, the invention, its construction and operation, and many of its advantages should be readily understood and appreciated.

FIG. 1 is a fragmentary plan view of a prior art open-end speed wrench, shown with an associated fastener at the beginning of a torque applying operation;

FIG. 2 is a view similar to FIG. 1, illustrating rotation of the wrench relative to the fastener during a torque applying operation as a result of size variations in the fastener;

FIG. 3 is an enlarged view similar to FIG. 1 of an open-end speed wrench in accordance with the present invention;

FIG. 4 is a reduced view similar to FIG. 3, illustrating a wrench with an associated fastener at the beginning of the torque applying operation;

FIG. 5 is a view similar to FIG. 4, illustrating the parts during a high torque application;

FIG. 6 is a view similar to FIG. 5, illustrating reverse or ratcheting rotation of the wrench; and

FIG. 7 is an enlarged fragmentary view of a portion of a driving surface.

#### Description of the Preferred Embodiments

Referring to FIGS. 3-6, there is illustrated an open-end speed wrench, generally designated by the numeral 20, constructed in accordance with a first embodiment of the present invention. The wrench 20 includes a handle or shank 21 provided with a wrenching head 22 at the end thereof. It will be appreciated that another wrenching head could be provided at the other end of the handle (not shown). The wrenching head 22 has a short jaw 23 and a long jaw 24, respectively having substantially flat planar driving surfaces 25 and 26 thereon and respectively terminating at the outer or distal ends thereof in truncated angled ends 27 and 28. The driving surface 25 is substantially shorter than the driving surface 26 and, at the inner end thereof, intersects a short arcuate recess 29. The driving surfaces 25 and 26 are spaced apart a distance W slightly greater than the nominal across-sides dimension X of an associated hexagonal fastener 15 of the size for which the wrench 20 is intended to be used. The driving surfaces 25 and 26 are generally parallel, but they may slightly converge outwardly at a small angle of approximately 3° to improve the flat engaging contact with the opposite sides of an associated fastener 15 despite tolerance size variations in the fastener. The length of the short driving surface 25 is long enough to ensure adequate gripping of the fastener 15 during forward rotation and short enough to ensure ratcheting slippage during reverse rotation, and is typically approximately one-tenth the across sides dimension X of the fastener 15.

The wrench head 22 has a throat 30 which interconnects the jaws 23 and 24. The throat 30 includes a

generally flat support surface portion 31 which extends from the arcuate recess 29 downwardly away from the driving surface 25. More specifically, the support surface portion 31 is inclined with respect to the driving surface 25 at an angle Z in the range of from about 120° to about 140° and, preferably, approximately 123°. While the support surface portion 31 may be a flat planar surface, in the preferred embodiment it is very slightly convex for ease of manufacturing, having a large radius R which is more than twice the distance W between the driving surfaces 25 and 26. The support surface portion 31 terminates at an inner end 32 and has a length L which is substantially less than the nominal side dimension S of the associated fastener 15. In particular, the length L may be in the range of from about 1/3 to about 2/3 the fastener side dimension S and is preferably approximately 1/2 S.

The throat 30 also includes an arcuate portion 35 which extends from the inner end 32 of the support surface portion 31 to the inner end of the driving surface 26. While the arcuate portion 35 may have any desired shape, in the preferred embodiment, it is a compound surface including a relatively small radius portion 36 and a relatively large radius portion 37, so that the arcuate portion 35 slopes more steeply away from the support surface 31. The essential aspect of the arcuate portion 35 is that it be so dimensioned and shaped that it will not contact the associated fastener 15 in use, as will be explained in greater detail below.

In operation, when it is desired to torque a fastener 15, the wrench 20 is applied to the fastener 15 in the manner illustrated in FIG. 4 in which, to facilitate the description, the corners of the fastener 15 have been respectively designated A through F, lettered clockwise. The fastener 15 is received between the wrench jaws 23 and 24 until a corner A of the fastener 15 engages the support surface portion 31 of the throat 30 at point 38, with the driving surface 25 disposed in engagement with the adjacent one of the fastener flats 16. The opposite one of the fastener flats 16 will be disposed for engagement with the driving surface 26 at a location adjacent to the outer or distal end thereof, which location may be spaced a slight distance therefrom, depending upon tolerance variations in the fastener size. In the latter case, it will be necessary to rotate the wrench 20 a few degrees clockwise to bring the driving surface 26 into driving engagement with the adjacent flat of the fastener 15. It will be appreciated that, because the angle Z is preferably greater than the 120° angle between adjacent flats of the fastener 15, the fastener 15 will initially normally make only point contact with the support surface portion 31 at point 38.

It is a significant aspect of the invention that when the fastener 15 is thus disposed in point contact with the support surface portion 31, with the driving surfaces 25 and 26 respectively disposed in driving engagement with opposite flats 16 of the fastener 15, the arcuate portion 35 of the throat 30 will be out of contact with the fastener 15 and, more specifically will be spaced from

the corners B and C of the fastener 15. Even in the case of an undersized fastener, where the rotation of the wrench 20 needed to bring the driving surface 26 into engagement with the adjacent fastener flat 16 is sufficient to move the support surface portion 31 into engagement with the flat between corners A and B, the depth and shape of the arcuate portion 35 is such that it will still be spaced from the corners B and C, as can be seen in FIG. 5.

In applying torque to the fastener 15, the wrench 20 is rotated further in a clockwise direction. In low torque applications, this will not result in any deformation of the fastener 15. After the fastener 15 has been rotated the desired amount, the wrench 20 is then rotated in a counterclockwise direction, as illustrated in FIG. 6, so that it will slip with respect to the fastener 15 in a ratcheting manner to reposition the wrench 20 at a new wrenching location, in a known manner. It is a significant aspect of the invention that the support surface portion 31 supports the corner A of the fastener 15 during the initial part of the rotation of the wrench 20 to a new wrenching location. When the corner A reaches the end of the support surface portion 31, the fastener 15 will be supported on the driving surfaces 25 and 26. Throughout the rotation of the wrench 20 to a new wrenching location, the arcuate portion 35 of the throat 30 remains out of contact with the fastener 15.

Thus, it will be appreciated that the length L of the support surface portion 31 must be great enough to provide support for the fastener corner A during reverse rotation through a sufficient angle to prevent lockup of the wrench 20 on the fastener 15. Yet the length L must be short enough so that the surface portion 31 will not come in contact with the corner B of the fastener or cause the arcuate portion 35 of the throat 30 to contact the corner B, during the torque application.

Also, the angle Z must be large enough, preferably at least 120°, so that it will not engage the flat of the fastener 15 between corners A and B too soon, and thereby start to push it out of the wrench before wrenching engagement of the driving surfaces 25 and 26 with the fastener 15 has been achieved. On the other hand, it is desirable that, during high torque applications, when the driving surfaces 25 and 26 distort the fastener 15 near the corners A and D, that the support surface portion 31 engage the fastener 15, as at 39 (FIG. 5), to provide an additional driving location. Thus, the angle Z should be small enough to permit this to happen. However, even in this event it will be appreciated that the arcuate portion 35 of the throat 30 remains spaced from the fastener corners B and C. In this regard, it will be appreciated that the corner recess 29 permits a clearance space for fastener material to flow as a result of deformation by the driving surface 25, as illustrated in FIG. 5.

In summary, the length L and the angle Z are compromises between adequate support for one fastener corner during reverse rotation, while ensuring clearance of the arcuate portion 35 of the throat from the fastener

and good engagement of the jaws with the fastener flats during forward rotation.

It has been found that the above-described design of the wrenching head 22 results in dramatic improvement of the ultimate torque which can be applied by the wrench 20. More specifically, with fasteners of nominal size, the wrench 20 has achieved ultimate torques approximately twice those achieved with the prior art wrench 10 of FIGS. 1 and 2 and, with fasteners about 97% of nominal size, the wrench 20 has achieved ultimate torques approximately four times those achieved with the prior wrench 10 of FIGS. 1 and 2. It is a significant aspect of the invention that the fastener 15 will make single-point initial contact with the support surface 31 at point 38, despite tolerance variations in the size of the fastener 15.

Referring to FIG. 7, there is illustrated a portion of a serrated wrench driving surface which comprises a series of recesses or grooves 75 spaced apart by coplanar lands 73. Each of the recesses 75 has a 60° flat 76 and a 30° flat 77 disposed substantially perpendicular to each other and interconnected by an arcuate root 78. The recesses 75 are oriented so that the 30° flats 77 are disposed at the lower or inner end of the recess, but they could be oriented so that the 30° flats 77 are disposed at the upper end of the recess.

The serrations reduce slippage between the jaws and the fastener 15 and, thereby, further increase the ultimate torque which can be achieved with the wrench. In the case of a speed wrench the serrations would be formed only on the long driving surface.

From the foregoing, it can be seen that there has been provided an improved wrench which has a uniquely-shaped throat which provides initial contact with only a single corner of a fastener during torque application, this configuration providing dramatically increased ultimate torque when the wrench is used in a high torque application, and at the same time providing support for the fastener when the wrench is ratcheted in a reverse rotation direction for speed wrench applications.

### Claims

1. An open-end speed wrench (20) for use in torque applying forward rotation and ratcheting reverse rotation with a fastener (15) having a plurality of substantially flat sides (16) each having the same side dimension (S) and intersecting at a plurality of corners (17), the fastener having an across sides dimension (X), the wrench including a wrenching head (22) including two jaws (23,24) and a throat (30) interconnecting said jaws, said jaws respectively including short and long driving surfaces (25,26), respectively defining first and second driving planes spaced apart a distance (W) slightly greater than the across sides dimension (X) and respectively disposed for driving engagement with opposed sides of the fastener, said throat including

a generally flat first surface portion (31) adjacent to said short driving surface (25) and inclined with respect thereto at a predetermined angle (Z) and having a length (L) substantially less than the side dimension (S), said throat (30) including a recessed second surface portion (35) interconnecting said first surface portion (31) and said long driving surface (26) and shaped and dimensioned so as to remain spaced from an associated fastener (15) when engaged with said driving surfaces, characterized by said first surface portion (31) extending from a first end (32) between said driving planes to a second end spaced from said short driving surface (25) and disposed on the opposite side of said first driving plane from said long driving surface (26), said predetermined angle (Z) being between 120° and 140° and said length (L) of said first surface portion being such that said first surface portion initially contacts a portion of the fastener which includes only the corner (A) thereof during a torque applying forward rotation and supports that corner during a ratcheting reverse rotation through a sufficient angle to prevent lock up of said wrench on the fastener.

2. The wrench of claim 1, wherein each of said driving surfaces is a substantially flat planar surface.
3. The wrench of claim 1, wherein said driving surfaces converge in a direction away from said throat at an angle of approximately 3°.
4. The wrench of claim 1, wherein said predetermined angle is approximately 123°.
5. The wrench of claim 1, wherein said first surface portion is very slightly convex.
6. The wrench of claim 5, wherein said first surface portion has a radius greater than twice said across sides dimension.
7. The wrench of claim 1, wherein said wrenching head is of unitary one-piece construction.
8. The wrench of claim 1, and further comprising a short arcuate recess (29) formed in one of said jaws between said short driving surface and said first surface portion.
9. The wrench of claim 1, wherein said first surface portion has a length approximately one-half the side dimension.
10. The end wrench of claim 1, wherein said second surface portion is arcuate in shape.
11. The wrench of claim 1, and further comprising means (45,46) accommodating relative movement

of said jaws for varying the distance between said driving surfaces to accommodate different size fasteners.

12. The wrench of claim 11, wherein at least said long driving surface has a plurality of serrations (73-78) formed therein. 5
13. The wrench of claim 12, wherein each of said serrations includes an asymmetrical recess (75) formed in said driving surface, said recess including two substantially planar portions (76, 77) disposed substantially perpendicular to each other and respectively disposed at angles of approximately 30° and 60° with respect to said driving surface. 10 15
14. The wrench of claim 12, wherein said predetermined angle is approximately 133°.
15. The wrench of claim 1, wherein the length (L) of the first surface portion is substantially 0.29 times the distance (W) between the first and second driving planes. 20

#### Patentansprüche

1. Schraubenschlüssel (20) mit offenem Maul für Schnellmontage zum Aufbringen von Drehmoment in Vorwärtsdrehrichtung und mit Ratschenwirkung in Rückwärtsdrehrichtung mit einem Befestigungselement (15) mit mehreren, im wesentlichen flachen Seiten (16) von jeweils der gleichen Seitenabmessung (S), die sich in mehreren Ecken (17) schneiden, wobei das Befestigungselement einen Seitenabstand (X) aufweist, der Schraubenschlüssel einen Kopf (22) mit zwei Backen (23, 24) und einem die Backen verbindenden Maul (30) aufweist, die Backen jeweils kurze und lange Ansetzflächen (25, 26) aufweisen, die jeweils erste und zweite Ansetzebenen bilden, die einen Abstand (W) voneinander aufweisen, der etwas größer ist als der Seitenabstand (X) und die jeweils zum Ansetzen an entgegengesetzten Seiten des Befestigungselementes angeordnet sind, wobei das Maul neben der kurzen Ansetzfläche (25) einen allgemein flachen ersten Seitenabschnitt (31) aufweist, der zur kurzen Ansetzfläche in einem bestimmten Winkel (Z) schräg verläuft und dessen Länge (L) im wesentlichen geringer ist als die Seitenlänge (S), wobei das Maul (30) einen zurückgesetzten zweiten Seitenabschnitt (35) aufweist, der den ersten Seitenabschnitt (31) und die lange Ansetzfläche (26) verbindet und so geformt und dimensioniert ist, daß er von dem an den Ansetzflächen erfaßten Befestigungselement (15) im Abstand bleibt, 40 45 50 55
- gekennzeichnet dadurch, daß der erste Seitenabschnitt (31) von einem ersten Ende (32) zwischen den Ansetzebenen zu einem zweiten Ende verläuft,

das von der kurzen Ansetzfläche (25) beabstandet ist und auf der gegenüberliegenden Seite der ersten Ansetzebene von der langen Ansetzfläche (26) angeordnet ist, wobei der vorbestimmte Winkel (Z) zwischen 120° und 140° beträgt, und die Länge (L) des ersten Seitenabschnitts derart ist, daß der erste Seitenabschnitt anfänglich einen Teil des Befestigungselementes kontaktiert, in dem nur dessen Ecke (A) liegt, wenn Drehmoment in Vorwärtsdrehrichtung aufgebracht wird, und diese Ecke in Rückwärtsdrehrichtung beim Ratschen über einen ausreichenden Winkel hinweg abstützt, um ein Verklemmen des Schraubenschlüssels an dem Befestigungselement zu verhindern.

2. Schraubenschlüssel nach Anspruch 1, bei dem jede Ansetzfläche im wesentlichen eine flache ebene Fläche ist.
3. Schraubenschlüssel nach Anspruch 1, bei dem die Ansetzflächen in Richtung vom Maul weg mit einem Winkel von etwa 3° konvergieren.
4. Schraubenschlüssel nach Anspruch 1, bei dem der vorbestimmte Winkel annähernd 123° ist. 25
5. Schraubenschlüssel nach Anspruch 1, bei dem der erste Seitenabschnitt ganz leicht konvex ist.
6. Schraubenschlüssel nach Anspruch 5, bei dem der erste Seitenabschnitt einen Radius besitzt, der größer ist als das zweifache des Seitenabstandes.
7. Schraubenschlüssel nach Anspruch 1, bei dem der Kopf einstückig ausgeformt ist.
8. Schraubenschlüssel nach Anspruch 1, ferner mit einem kurzen bogenförmigen Ausschnitt (29), der in einer der Backen zwischen der kurzen Ansetzfläche und dem ersten Seitenabschnitt ausgeformt ist.
9. Schraubenschlüssel nach Anspruch 1, bei dem der erste Seitenabschnitt eine Länge aufweist, die etwa die Hälfte des Seitenabstandes beträgt.
10. Schraubenschlüssel nach Anspruch 1, bei dem der zweite Seitenabschnitt bogenförmig ist.
11. Schraubenschlüssel nach Anspruch 1, ferner mit Mitteln (45, 46) für eine Relativbewegung der Backen zum Ändern des Abstandes zwischen den Ansetzflächen, zur Anpassung an verschiedene Größen der Befestigungselemente.
12. Schraubenschlüssel nach Anspruch 11, bei dem mindestens die lange Ansetzfläche eine Riffelung (73 - 78) aufweist.
13. Schraubenschlüssel nach Anspruch 12, bei dem

die Zähne der Riffelung einen asymmetrischen Ausschnitt (75) in der Ansetzfläche aufweisen, der Ausschnitt zwei im wesentlichen ebene Abschnitte (76, 77) besitzt, die im wesentlichen rechtwinklig zueinander und unter Winkeln von etwa 30° bis 60° bezüglich der Ansetzfläche angeordnet sind.

14. Schraubenschlüssel nach Anspruch 12, bei dem der vorbestimmte Winkel etwa 133° beträgt.
15. Schraubenschlüssel nach Anspruch 1, bei dem die Länge (L) des ersten Seitenabschnittes im wesentlichen gleich 0,25 mal dem Abstand (W) zwischen den ersten und zweiten Ansetzebenen beträgt.

### Revendications

1. Clé rapide à extrémité ouverte (20) permettant l'application d'un couple par rotation vers l'avant et le décrochement par rotation inverse sur un organe de fixation (15) comportant une pluralité de faces sensiblement plates (16), chacune présentant la même dimension de face (S) et se coupant sur une pluralité d'arêtes (17), l'organe de fixation présentant une dimension entre faces (X), la clé comportant une tête de serrage (22) comprenant deux mâchoires (23, 24) et une gorge (30) reliant lesdites mâchoires, lesdites mâchoires comprenant respectivement des surfaces d'entraînement courte et longue (25, 26), définissant respectivement des premier et second plans d'entraînement espacés l'un de l'autre d'une distance (W) sensiblement supérieure à la dimension entre faces (X) et disposés respectivement en contact d'entraînement avec des faces opposées de l'organe de fixation, ladite gorge comprenant une première partie de surface globalement plane (31) adjacente à ladite surface d'entraînement courte (25) et inclinée par rapport à celle-ci d'un angle prédéterminé (Z) et présentant une longueur (L) sensiblement inférieure à la dimension de face (S), ladite gorge (30) comprenant une seconde partie de surface (35) en creux reliant ladite première partie de surface (31) et ladite surface d'entraînement longue (26) et étant formée et dimensionnée de manière à rester espacée par rapport à un organe de fixation associé (15) lorsqu'il est engagé sur lesdites surfaces d'entraînement, caractérisée en ce que ladite première partie de surface (31) s'étend à partir d'une première extrémité (32) entre lesdits plans d'entraînement vers une seconde extrémité espacée de ladite surface d'entraînement courte (25) et disposée sur la face opposée dudit premier plan d'entraînement de ladite surface d'entraînement longue (26), ledit angle prédéterminé (Z) étant compris entre 120° et 140° et ladite longueur (L) de ladite première partie de surface étant telle que ladite première partie de surface attaque, initialement une partie de l'organe

de fixation qui comprend seulement son arête (A) lors d'une rotation vers l'avant pour application de couple et supporte cette arête lors d'une rotation inverse de décrochement sur un angle suffisant pour empêcher le blocage de ladite clé sur l'organe de fixation.

2. Clé selon la revendication 1, dans laquelle chacune desdites surfaces d'entraînement est une surface plane sensiblement plate.
3. Clé selon la revendication 1, dans laquelle lesdites surfaces d'entraînement convergent dans un sens opposé à ladite gorge avec un angle de 3° approximativement.
4. Clé selon la revendication 1, dans laquelle ledit angle prédéterminé est de 123° approximativement.
5. Clé selon la revendication 1, dans laquelle ladite première partie de surface est très légèrement convexe.
6. Clé selon la revendication 5, dans laquelle ladite première partie de surface présente un rayon supérieur au double de ladite dimension entre faces.
7. Clé selon la revendication 1, dans laquelle ladite tête de serrage est formée d'une pièce.
8. Clé selon la revendication 1, et comprenant, en outre, une petite cavité courbe (29) formée dans l'une desdites mâchoires entre ladite surface d'entraînement courte et ladite première partie de surface.
9. Clé selon la revendication 1, dans laquelle ladite première partie de surface présente une longueur sensiblement égale à la moitié de la dimension de face.
10. Clé en bout selon la revendication 1, dans laquelle ladite seconde partie de surface est de forme courbe.
11. Clé selon la revendication 1, et comprenant, en outre, des moyens (45, 46) adaptés à un mouvement relatif desdites mâchoires afin de modifier la distance entre lesdites surfaces d'entraînement pour s'adapter à différentes tailles d'organes de fixation.
12. Clé selon la revendication 11, dans laquelle une pluralité de dents (73 à 78) est formée au moins sur ladite surface d'entraînement longue.
13. Clé selon la revendication 12, dans laquelle chacune desdites dents comporte une cavité asymétri-

que (75) formée sur ladite surface d'entraînement, ladite cavité comportant deux parties sensiblement planes (76, 77) disposées sensiblement perpendiculairement l'une par rapport à l'autre et disposées respectivement avec des angles de 30° et 60° approximativement par rapport à ladite surface d'entraînement. 5

14. Clé selon la revendication 12, dans laquelle ledit angle prédéterminé est de 133° approximativement. 10

15. Clé selon la revendication 1, dans laquelle la longueur (L) de la première partie de surface est sensiblement égale à 0,29 fois la distance (W) entre les premier et second plans d'entraînement. 15

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