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Description

Background

[0001] For removal of old paint or rust from surfaces by scraping, it is since long known to use scrapers with replaceable cutting inserts, which are provided with holes for fastening with a screw, as in, for instance, US Patent 1,940,107 and 4,768,254 or with a threaded pin and a nut.

[0002] The cutting inserts are most often rectangular or triangular, as in, for instance, US Patent 4,768,254, but it is also known to make scrapers with a circular cutting insert for scraping of concave mouldings, or with two adjacent cutting inserts for scraping and deburring of edges. Cutting inserts with different profiles or radii of curvature are disclosed in US Patent 1,940,107, and SE Patent 94 04 143-1.

[0003] The majority of scrapers have a cutting insert mounting which gives too high bending loads on the cutting inserts, which entails that brittle cutting insert materials, e.g. cemented carbide, may break easily, unless they are made with an extra large thickness, which makes the product considerably more expensive, or that cutting inserts of the type standard indexable cutting inserts are used as in the patent US 5,027,512, the geometry of the cutting insert rarely being adapted for the work operation of scraping.

[0004] The present invention relates to a type of cutting insert mounting which may be used for paint scrapers with replaceable, relatively thin especially formed cemented carbide cutting inserts and a paint scraper adapted thereto.

Objects and Features of the Invention

[0005] A primary object of the present invention is to define a scraper, the cutting insert mounting of which permits usage of thin cemented carbide cutting inserts with minimised risk of cracks and damage on the cemented carbide cutting insert.

[0006] Another object is to define a scraper with the possibility of locking the cutting insert in different positions. An additional object is to define a scraper that permits mounting of cemented carbide cutting inserts having different shape and profile. Still another object is to define a scraper, the cutting edge of which is turnable for operation in different working directions. According to the invention, the above-mentioned objects are attained by the features that are defined in the characterizing clause of claim 1. Preferred embodiments of the invention are furthermore defined in the dependent claims.

List of Figures

[0007]

Figure 1 shows a paint scraper in side view, while figure 2 shows the paint scraper in perspective pro-

vided with an attached triangular cemented carbide cutting insert, while figure 3 shows said cutting insert fastened in an alternative position.

Figure 2a represents the front of the scraper without a mounted cutting insert, and shows the position of the screw hole and the insert position.

Figure 4 is a longitudinal cross-section according to the cutting insert line IV - IV in figure 3.

Detailed Description of Preferred Embodiment of the Invention

[0008] A paint scraper according to the invention as it is shown in figures 1 and 2 has four different main parts, a front portion or a supporting part 11 with an insert position 22, an edge-provided plane cemented carbide cutting insert 13, a hand grip 12 and a screw 14. The front surface of the supporting part is at an-angle α exceeding 90 degrees in relation to the centre line, CL, of the scraper and the handle.

[0009] The front surface is formed by two parallel plane surfaces 21, 22 spaced apart by a step 20. The lower situated surface 22 is provided with a threaded hole in order to fasten, with a screw 14, a cemented carbide cutting insert 13 provided with a hole 15. The cemented carbide cutting insert may either be in the shape of a polygon e.g. a triangle or a rectangle or have different profiles with radii in both convex and concave shapes. It may also have shapes that are combinations of straight lines, angles and radii. Drop-shape, elliptical or cylindrical shapes are also feasible embodiments of the cutting insert.

[0010] The step 20 consists of two plane surfaces spaced apart by a V-shaped recess 23. The step gives the cutting insert support and absorbs pressure forces so that the screw joint is not unnecessarily overloaded and gives at the same time a good stability to the cutting insert. The shape of the step enables a triangular equilateral cutting insert to be locked in six different positions. Furthermore, the step blocks rotation of cutting insert shapes having projecting corners.

[0011] The cutting insert is fastened to the insert position of the supporting part with a screw, the head 16 of which in cross-section has a concavely shaped underside. The result of this is that the contact surface 17 between screw head and cutting insert becomes ring-shaped and located at a distance from the centre line of the screw which exceeds the radius of the hole 15 and which preferably should be at least 50 % larger than said radius. With concave shape of the underside of the screw head, all types of geometries are included which give the above, described ring-shaped contact surface or give contact at at least three points at a distance from the centre of the screw exceeding the radius of the hole with at least 50 %. The screw head may, for instance, be made with an annular recess. It may also be provided with a loose, ring-shaped spacing washer, centered by the screw in a suitable way, which washer gives the corre-

sponding effect.

[0012] In this way, the cutting insert gets a much better support than if it would be mounted with a usual screw joint, which may imply a risk that the cemented carbide cutting insert would break close to the hole. By this method, the thickness of the cutting insert may be reduced, which gives economical advantages at the same time as the cutting insert requires less force to penetrate into the work surface and thereby cuts more efficiently without unnecessarily exhausting hands and arms.

[0013] The elongate and thin shape of the scraper in combination with an insert position that permits fastening of relatively small cutting inserts in different positions make it especially adapted for precision work, also in narrow spaces.

[0014] The shank 18 of the screw may suitably be made with a thread, which has been provided with a friction-increasing thread profile, for instance non-cylindrical or asymmetrical. This is done to make sure that the cutting insert should not run the risk of coming loose and be exposed to vibrations, which may cause damage on the cutting insert. The ratio between the size of the hole and the thickness of the cutting insert should be such that the cutting insert has a thickness which is not larger than the radius R1 of the hole or at least is less than 60 % of the diameter of said hole. Furthermore, if the thickness of the cutting insert is such that it is less than the size of the step 20, the cutting insert may advantageously be turned and mounted reversedly in the insert position. Normally, the scraper is pulled towards the user at scraping, but thanks to this reverse mounting of the cutting insert, the scraper may also be pushed away from the user, which may be an advantage in narrow passages such as at interior corners on mouldings.

[0015] The supporting part is formed with a shoulder or a finger grip where it is possible to rest the thumb or another suitable finger in order to increase the stability of the scraper and at the same time give additional pressure against the cutting insert so that the cutting edge more easily penetrates into the work surface.

[0016] The cone-shaped and ergonomic shape of the handle enables a very good grip to pull the scraper towards you. In the thicker end of the grip, there is a projecting shoulder-shaped part 23, which gives a good support against the hand. This, together with the soft elastic material, which the hand grip is covered with, in combination with the ribbed design on the underside, gives an improved grip.

[0017] By the fact that the cutting edge is very close to the centre line CL of the tool, the torque that normally has to be carried by the wrist at scraping work, especially at work near an edge or a wall, is reduced.

[0018] The cone-shaped contact surface 19 of the hand grip in combination with the projecting shoulder of the supporting part as well as the fact that the location of the cutting insert is close to the centre line CL of the tool gives a possibility to store the tool in a holder with a cone-shaped inner surface, which constitutes an exten-

sion of the tangent surface 19, and which then grips the cone-shaped handle of the tool at the same time as the shoulder of the supporting part gives support and ensures that the cutting insert lies clear inside the holder.

The position of the scraper at storage in the holder is outlined in figure 1 where the inner contour of the holder is shown in the form of two dashed lines symmetrically converging around the centre line CL of the scraper. Such a holster may easily be worn, for instance, in the belt and allows that the scraper is easy to reach without injuring the user on the cutting insert, at the same time as the tool is protected. The holster is suitably made with a hole at the bottom so that it easily may be cleaned from paint residues etc.

[0019] The handgrip part of the scraper is, in the thicker free end, provided with a hole for hanging up the tool.

Claims

1. Scraper for removal of paint, coating or rust, including a supporting part (11) with a hand grip (12) and a replaceable plane cemented carbide cutting insert (13) provided with a hole (15), which insert is fastened to an insert position on the supporting part (11) with a screw (14) the shank (18) of which penetrates through the hole (15) in the cutting insert (13), the cutting insert (13) and the screw (14) co-operating via a contact surface (17), **characterized in that** the screw (14) is made with a head (16) of such a shape that the contact surface (17) is separated from the shank (18) of the screw and arranged at a radial distance from the centre of the hole with a radius (R2) exceeding the radius (R1) of the hole (15).
2. Scraper according to claim 1, **characterized in that** the head (16) of the screw has a underside, the contour of which, seen in cross-section, is of a concave shape so that the contact surface (17) against the cutting insert becomes ring-shaped.
3. Scraper according to claim 1 or claim 2, **characterized in that** the contact surface (17) is on a radius (R2) which is at least 50 % larger than the radius (R1) of the hole.
4. Scraper according to claim 1, **characterized in that** the cutting insert has a thickness of less than 60 % of the diameter of the hole.
5. Scraper according to claim 1, **characterized in that** the shank (18) of the screw is provided with a friction-increasing thread profile.
6. Scraper according to claim 1, **characterized in that** the hand grip (12) comprises a cone-shaped contact surface (19) for clamping in a holder, and that the insert position is so close to the centre line of the

hand grip (12) that the entire cutting insert (13) is positioned inside a cone-shaped surface which constitutes an extension of the contact surface.

7. Scraper according to claim 1, **characterized in that** the insert position is surrounded by a step (20), the shape of which blocks rotation of such cutting inserts having projecting corners.
8. Scraper according to claim 1, **characterized in that** the step (20) with a recess (23) permits mounting of a triangular cutting insert in six positions.

Patentansprüche

1. Kratzer zum Entfernen von Farbe, Beschichtung oder Rost, einschließlich eines Stützteils (11) mit einem Handgriff (12) und einem ersetzbaren ebenen Hartmetallschneideinsatz (13), der ein Loch (15) aufweist, wobei der Einsatz an einer Einsatzzposition auf dem Stützteil (11) mit einer Schraube (14) befestigt ist, wobei der Schaft (18) der Schraube das Loch (15) im Schneideinsatz (13) durchdringt und der Schneideinsatz (13) und die Schraube (14) über eine Kontaktfläche (17) miteinander wechselwirken, **dadurch gekennzeichnet, daß** die Schraube (14) mit einem Kopf (16) mit solch einer Form hergestellt ist, daß die Kontaktfläche (17) von dem Schaft (18) der Schraube getrennt ist und mit einem radialen Abstand vom Zentrum des Loches mit einem Radius (R2), der den Radius (R1) des Loches (15) übersteigt, beabstandet ist
2. Kratzer nach Anspruch 1, **dadurch gekennzeichnet, daß** der Kopf (16) der Schraube eine Unterseite hat, deren Kontur im Querschnitt eine konkave Form hat, so daß die Kontaktfläche (17) über dem Schneideinsatz ringförmig wird.
3. Kratzer nach Anspruch 1 oder Anspruch 2, **dadurch gekennzeichnet, daß**, die Kontaktfläche (17) auf einem Radius (R2) liegt, der zumindest um 50 % größer als der Radius (R1) des Loches ist.
4. Kratzer nach Anspruch 1, **dadurch gekennzeichnet, daß** der Schneideinsatz eine Dicke von weniger als 60 % des Lochdurchmessers hat.
5. Kratzer nach Anspruch 1, **dadurch gekennzeichnet, daß** der Schaft (18) der Schraube mit einem Reibung erhöhenden Gewindeprofil ausgestattet ist.
6. Kratzer nach Anspruch 1, **dadurch gekennzeichnet, daß** der Handgriff (12) eine konusförmige Kontaktfläche (19) aufweist für das Klemmen in einem Halter und daß die Einsatzzposition so nahe an der Mittellinie des Handgriffes (12) ist, daß der gesamt

Schneideinsatz (13) innerhalb einer konusförmigen Fläche positioniert ist, die eine Erweiterung der Kontaktfläche bildet

7. Kratzer nach Anspruch 1, **dadurch gekennzeichnet, daß** die Einsatzzposition von einer Stufe (20) umgeben ist, wobei die Form der Stufe die Drehung der Schneideinsätze mit vorstehenden Ecken blockiert.
8. Kratzer nach Anspruch 1, **dadurch gekennzeichnet, daß** die Stufe (20) mit einer Ausnehmung (23) die Montage eines dreieckigen Schneideinsatzes in sechs Positionen erlaubt.

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Revendications

1. Grattoir destiné au retrait d'une peinture, d'un revêtement ou de rouille, comprenant une partie de support (11) ayant un manche (12) et une plaquette de coupe en carbure cémenté plane pouvant être remplacée (13) comportant un trou (15), laquelle plaquette de coupe est fixée à une position de plaquette de coupe sur la partie de support (11) à l'aide d'une vis (14) dont la tige (18) pénètre à travers le trou (15) dans la plaquette de coupe (13), la plaquette de coupe (13) et la vis (14) coopérant par le biais d'une surface de contact (17), **caractérise en ce que** la vis (14) comporte une tête (16) d'une forme telle que la surface de contact (17) est séparée de la tige (18) de la vis et disposée à une distance radiale par rapport au centre du trou avec un rayon (R2) dépassant le rayon (R1) du trou (15).
2. Grattoir selon la revendication 1, **caractérisé en ce que** la tête (16) de la vis comporte un côté inférieur, dont le contour, observe en coupe est de forme concave de sorte que la surface de contact (17) contre la plaquette de coupe adopte une forme annulaire.
3. Grattoir selon la revendication 1 ou la revendication 2, **caractérise en ce que** la surface de contact (17) se situe sur un rayon (R2) qui est au moins 50% plus grand que le rayon (R1) du trou.
4. Grattoir selon la revendication 1, **caractérisé en ce que** la plaquette de coupe présente une épaisseur inférieure à 60 % du diamètre du trou.
5. Grattoir selon la revendication 1, **caractérise en ce que** la tige (18) de la vis est dotée d'un profil de filet augmentant la friction.
6. Grattoir selon la revendication 1, **caractérisé en ce que** le manche (12) comprend une surface de contact de forme conique (19) destinée à être serrée dans un élément de support, et **en ce que** la position de la plaquette de coupe est si proche de la médiane

du manche (12) que la plaquette de coupe entière (13) est positionnée à l'intérieur d'une surface de forme conique qui constitue une extension de la surface de contact.

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7. Grattoir selon la revendication 1, **caractérisé en ce que** la position de la plaquette de coupe est entourée par un élément étagé (20) dont la forme bloque la rotation de telles plaquettes de coupe présentant des coins protubérants.

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8. Grattoir selon la revendication 1, **caractérisé en ce que** l'élément étagé (20) présentant un évidement (23) permet le montage d'une plaquette de coupe triangulaire dans six positions.

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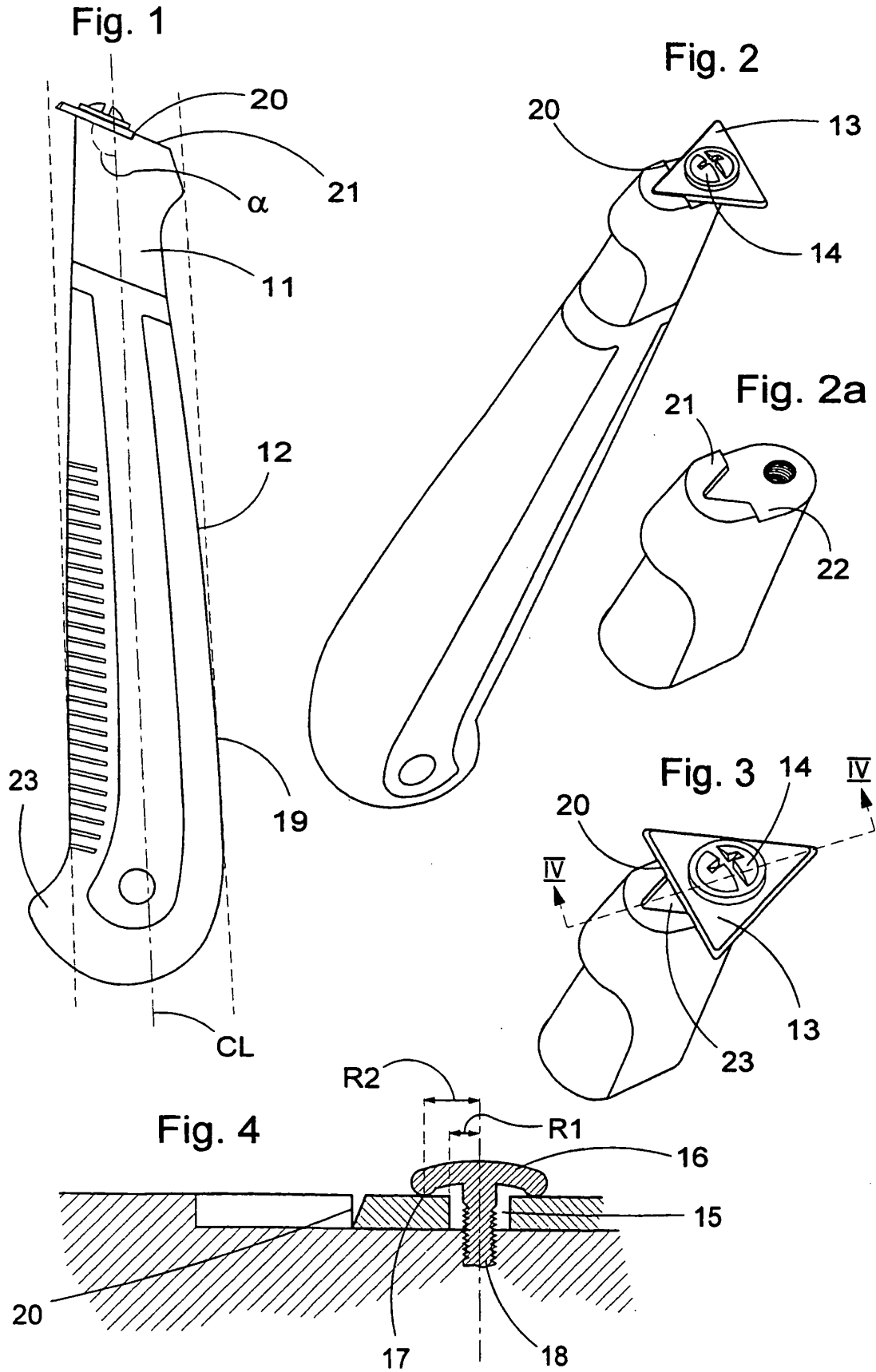
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REFERENCES CITED IN THE DESCRIPTION

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