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European Patent Office
Office européen des brevets

⑪ Publication number:

0 128 883
B1

⑫

EUROPEAN PATENT SPECIFICATION

④⑤ Date of publication of patent specification: **12.07.89**

⑤① Int. Cl.⁴: **B 25 B 19/00**

②① Application number: **84850120.1**

②② Date of filing: **12.04.84**

⑤④ Impact-driven key arrangement.

③⑥ Priority: **13.04.83 SE 8302037**

④③ Date of publication of application:
19.12.84 Bulletin 84/51

④⑤ Publication of the grant of the patent:
12.07.89 Bulletin 89/28

④④ Designated Contracting States:
AT BE CH DE FR GB IT LI NL SE

⑤⑥ References cited:
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DE-C- 861 379
DE-U-1 810 293
GB-A- 837 892
US-A-2 795 158
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Courier Press, Leamington Spa, England.

Description

Technical field

The present invention relates to a key arrangement and in particular to a key arrangement of a kind which is intended to turn a component forming part of a screwed joint as stated in the preamble of claim 1.

Description of the prior art

In GB—A—837892 is previously disclosed a key arrangement designed to turn a component forming part of a screwed joint, designated as an impact key, said key arrangement being intended to be capable of releasing and to a certain extent also of tightening the screwed joint, for which purpose it exhibits a main shaft, the end of which is provided with a screw-driven blade actuated by a so-called striking arm. Its function derives from the striking arm being caused to move in the desired direction of force, when its kinetic energy will be absorbed by end stops, so that the torque will be transmitted in the form of short but intensive torque pulses which is used to release or to tighten one part of the screwed joint.

This prior art exhibits the features stated in the preamble of claim 1.

Description of the present invention

Technical problem

With reference to previously disclosed designs, it is clear that a major technical problem is encountered in conjunction with the design of a key arrangement of the aforementioned fundamental nature in which the component parts of the key arrangement are so dimensioned and executed that the key arrangement is easily operated, but in which the execution of said component parts is such that they may easily be brought into interaction with each other for the purpose of influencing the part of the screwed joint, in addition to which the component parts shall be capable, when not in use, of being combined together as a single unit for storage.

Certain problems have also been encountered in conjunction with the dimensioning of the component parts of the key arrangement in such a way that the handle and the rod-shaped organ shall be capable of being connected to each other by the simple expedient of one of them exhibiting a pin and the other exhibiting a recess corresponding to the pin, and also by the part situated between the handle and the organ being so arranged as to serve as a bearing area for the impact arm during its turning motion.

Certain problems have also been encountered in conjunction with the incorporation of measures in a key arrangement of the aforementioned nature such that the support may be executed in the form of legs formed on a 'U'-shaped component, said component being attached with advantage to the rod-shaped organ so that it is not free to rotate.

Previously disclosed designs have to an overwhelming extent been executed with fixed hand-

les, and a major requirement exists, therefore, in the case of key arrangements of the aforementioned nature to create conditions such that the handle may be so arranged as to be capable of rotating in relation to the rod-shaped organ, said rod-shaped organ being executed for this purpose with a part about which the handle is so arranged as to be free to rotate.

Solution

The present invention relates to a key arrangement of the kind mentioned above and shall exhibit the features stated in the characterizing part of claim 1.

Advantages

The advantages which may principally be regarded as being characteristic of a key arrangement in accordance with the present invention designed to turn a component forming part of a screwed joint are that the key arrangement consists of a small number of component parts which are able easily to interact with each other so that they may be caused to interact with each other in order to influence the component parts of the screwed joint, but where said components are capable, when not in use, of being combined together into a compact unit for storage.

Description of the drawings

Two preferred embodiments exhibiting the significant characteristic features of the present invention are described below in greater detail with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of a first embodiment of a key arrangement in which the constituent parts of the key arrangement are shown in exploded form; and

Figure 2 shows a section through a second embodiment.

Description of the preferred embodiments

Figure 1 thus shows a perspective view of a key arrangement 1 designed to turn a component forming part of a screwed joint. The component part of the screwed joint is not shown in Figure 1, although said component part is intended to interact with a sleeve 2, a pin or a similar organ. The key arrangement also exhibits a rod-shaped organ 3 capable of interacting with the sleeve 2, a striking arm 4 capable of rotating in conjunction with the organ 3 and a handle 5 designed for a hand holding the key arrangement 1. The striking arm 4 consists of a main part 4a together with mass concentrations 4b executed at one end, or preferably at both ends in accordance with the embodiment shown in Figure 1. The main part 4a is attached by means of a hole 4c to the rod-shaped organ 3 in such a way as to be free to rotate so that the striking arm 4 can be turned between a number of stop positions so that, by coming to a halt in a particular stop position, it is able to transfer kinetic energy associated with the turning motion as shock torque to the rod-shaped

organ 3 and to the component 2. At least one stop position is executed as a support 6 arranged adjacent to the striking arm, securely connected to the rod-shaped organ 3 and able to absorb impact forces from the striking arm 4. The centre line 3a of the rod-shaped organ 3 must also be arranged on or adjacent to a centre line 5a of the handle.

In accordance with the present invention it is proposed that the handle 5 and the rod-shaped organ 3 be connected together by the expedient of one of them exhibiting a pin 5b and the other exhibiting a recess 3b corresponding to the pin. A part 6a formed between the handle 5 and the organ 3 shall also be so arranged as to serve as a bearing area for the striking arm 4 during its turning motion.

The present invention proposes that the support 6 be executed from legs 6' formed on a 'U'-shaped component 6. The component 6 is attached to the rod-shaped organ 3 in such a way as to be free to rotate via a welded joint not shown in the Figure.

Figure 1 shows the handle 5 to have been executed with a pin 5b, whereas the rod-shaped organ 3 is shown to have been executed with a recess 3b, whereby the handle 5 and the rod-shaped organ can be brought into interaction with each other and whereby the pin 5b serves as a bearing surface for the arm 4. It may be appropriate to provide a locking arrangement not shown in the Figure in order to lock the handle 5 in its engaged position with the rod-shaped organ 3.

Figure 2 illustrates the manner in which a handle 5 has been formed with an internal recess 5c and in which the rod-shaped organ 3 has been formed with a pin 3b', said pin being intended to interact with the recess 5c. In this case, too, it may be appropriate to provide a locking arrangement not shown in detail in the Figure between the pin 3b' and the recess 5c. Figure 2 also shows the manner in which the arm 4 is supported on the pin 3b' so as to be free to rotate and the manner in which the organ 6 has been executed with two legs 6'.

It is also proposed in respect of all the preferred embodiments that the handle 5 be so arranged that it is free to rotate in relation to the rod-shaped organ 3 and the striking arm 4, thereby enabling the striking arm 4 and the organ 3 to rotate without corresponding rotation of the handle 5.

The rod-shaped organ 3 may also be executed with a part 3' to which or about which the handle 5 is so arranged that it is free to rotate. Figure 1 shows the rod-shaped organ 3 to have been executed with a tubular part 3' into which a bar 5b which is securely attached to the handle 5 may be introduced.

The sleeve 2 or, in the event of the sleeve 2 having been replaced by a pin or similar, the latter may be attached in a previously disclosed manner to the rod-shaped organ in such a way that it is capable of being removed.

It should, perhaps, be pointed out in conjunction with Figure 1 that the legs 6' have been

executed at some distance from the recess 3b so as to produce a practically acceptable design. Figure 2 shows more usual dimensioning of the support 6 in relation to the width of the arm 4, from which it will be appreciated that the distance between the legs 6' should exceed the width of the arm 4 by a factor of between 1.5 and 4.0, although the most practical value is of the order of 3.0.

In order to enable the components, when not in use, to be combined together as a single unit for storage, the present invention proposes that the length of the rod-shaped unit 3 together with the sleeve 2 and the support 6 be so dimensioned as to be less than the distance between the opposing surfaces of the mass concentrations 4b, and that the handle 5 and any bar 5b which may be attached to it be similarly dimensioned so as to be capable of being stored directly adjacent to the striking arm 4 between opposing end parts of the mass concentrations 4b. This will produce the advantage that the support 6 will lie next to one of the mass concentrations 4b whilst the sleeve 2 will lie next to the other mass concentration 4b.

The present invention is not, of course, restricted to the embodiment described above by way of example, but may be modified within the context of the following Patent Claims.

Claims

1. An impact-driven key arrangement for turning, such as tightening or loosening, a component, such as a nut, a screw or the like, forming a part of a screwed joint, said arrangement comprising:

— a first part, in the form of a rod-shaped organ (3), a sleeve, pin or similar organ (2), intended for engagement with said component, and a support (6),

— a second part, in the form of a striking arm (4), consisting of a main part (4a), having a hole (4c) and mass concentrations (4b) executed at both ends and

— a third part in the form of a handle (5), whereby said arrangement, when said three parts are assembled together and interacting with each other in such a way that said rod-shaped organ (3) and said handle (5) are connected together, with said striking arm (4) therebetween, allows a free rotation of the striking arm (4) relative said rod-shaped organ (3) through a given angular distance, before said striking arm (4) is brought into engagement with said support (6) and thereby transfers an impact force to said sleeve, pin or similar organ (2) via said rod shaped organ (3), characterized in that

a. said support (6) is in the form of a flat bar serving as a cross-member (6a) with two upstanding shoulders or legs (6') arranged on each side of the hole (4c) in said striking arm (4),

b. said striking arm (4) is free to rotate relative to said cross-member (6a) by the use of a journal means in the form of a single journal pin (5b) serving as a bearing surface for the striking arm

when said pin (5b) is introduced into said hole (4c) in said striking arm (4) and insertable into a recess (3b) corresponding to said pin (5b) and

c. said handle (5) is further free to rotate in relation to the rod-shaped organ (3) and said striking arm (4).

2. An impact driven key arrangement according to claim 1, characterized in that the handle (5) has a pin (5b) and the rod-shaped organ has a recess (3b).

3. An impact driven key arrangement according to claim 1, characterized in that the handle (5) has a recess and the rod-shaped organ has a pin.

4. An impact driven key arrangement according to claim 1, characterized in that a locking arrangement locks the handle in its engaged position with said rod-shaped organ.

5. An impact driven key arrangement according to claim 1, characterized in that the distance between the legs (6') exceed the width of the striking arm (4) by a factor 1,5 to 4,0, especially in the order of 3,0.

6. An impact driven key arrangement according to claim 1 or 2, characterized in that the length of the rod-shaped organ (3) together with said sleeve (2) and the support (6) is so dimensioned as to be less than the distance between opposing surfaces of the mass concentrations, that the handle (5) and its pin (5b) are similarly dimensioned so as to be storable directly adjacent to the striking arm (4) between opposing end parts of the mass concentrations and that so dismantled said support will lie next to one mass concentration whilst the sleeve will lie next to the other mass concentration.

Patentansprüche

1. Schlagbetätigte Schlüsselanordnung zum Drehen, z.B. Anziehen oder Lösen, eines Bauteils, z.B. einer Mutter, Schraube oder dergleichen, das Teil einer Schraubverbindung ausmacht, wobei diese Anordnung

— einen ersten Teil in Form eines stabförmigen Glieds (3), eine Hülse, einen Stift oder ein ähnliches Glied (2) zum Eingriff mit diesem Bauteil und einen Träger (6);

— einen zweiten Teil in Form eines aus einem Hauptteil (4a) mit einem Loch (4c) und an beiden Enden ausgeführten Massenkonzentrationen (4b) bestehenden Schlagarms (4), und

— einen dritten Teil in Form eines Handgriffs (5) umfasst, wodurch diese Anordnung bei Zusammenbau dieser drei Teile und Zusammenwirken miteinander, so dass jenes stabförmige Glied (3) und jener Handgriff (5) miteinander verbunden sind, mit dazwischenliegendem Schlagarm (4) freie Drehung des Schlagarms (4) in Bezug auf jenes stabförmige Glied (3) über einen gegebenen Winkelabstand gestattet, bevor jener Schlagarm (4) mit jenem Träger (6) in Eingriff gebracht wird und damit eine Schlagkraft auf diese Hülse, Stift oder ähnliches Glied (2) über jenes stabförmige Glied (3) überträgt, dadurch gekennzeichnet, dass

a. jener Träger (6) in Form einer flachen, als

Kreuzstück (6a) mit zwei aufrechten Schultern oder Schenkeln (6') auf jeder Seite des Lochs (4c) in jenem Schlagarm (4) dienenden Stange vorliegt,

b. jener Schlagarm (4) relativ zu jenem Kreuzstück (6a) durch Verwendung eines Zapfenmittels in Form eines einzigen Lagerzapfens (5b), der als Auflagefläche für den Schlagarm bei Einführung jenes Zapfens (5b) in jenes Loch (4c) in jenem Schlagarm (4) dient und in einer jenem Zapfen (5b) entsprechenden Ausnehmung (3b) einführbar ist frei drehbar ist, und

c. jener Handgriff (5) ferner in Bezug auf das stabförmige Glied (3) und jenen Schlagarm (4) frei drehbar ist.

2. Schlagbetätigte Schlüsselanordnung gemäß Anspruch 1, dadurch gekennzeichnet, dass der Handgriff (5) einen Stift (5b) und das stabförmige Glied eine Ausnehmung (3b) aufweisen.

3. Schlagbetätigte Schlüsselanordnung gemäß Anspruch 1, dadurch gekennzeichnet, dass der Handgriff (5) eine Ausnehmung und das stabförmige Glied einen Stift aufweist.

4. Schlagbetätigte Schlüsselanordnung gemäß Anspruch 1, dadurch gekennzeichnet, dass eine Arretieranordnung den Handgriff in seiner Eingriffsstellung mit jenem stabförmigen Glied arretiert.

5. Schlagbetätigte Schlüsselanordnung gemäß Anspruch 1, dadurch gekennzeichnet, dass der Abstand zwischen den Schenkeln (6') die Breite des Schlagarms (4) um einen Faktor von 1,5 bis 4,0, insbesondere in der Größenordnung von 3,0, übersteigt.

6. Schlagbetätigte Schlüsselanordnung gemäß Anspruch 1 oder 2, dadurch gekennzeichnet, dass die Länge des stabförmigen Glieds (3) zusammen mit jener Hülse (2) und dem Träger (6) so dimensioniert ist, dass sie weniger als der Abstand zwischen gegenüberliegenden Flächen der Massenkonzentrationen beträgt, dass der Handgriff (5) und sein Zapfen (5b) ähnliche Abmessungen aufweisen, um direkt neben dem Schlagarm (4) zwischen gegenüberliegenden Endteilen der Massenkonzentrationen gelagert werden zu können und dass in diesem auseinandergenommenen Zustand jener Träger neben einer Massekonzentration liegen wird, während die Hülse neben der anderen Massekonzentration liegen wird.

Revendications

1. Dispositif de clé opérant par choc pour tourner, par exemple serrer ou desserrer, un élément, tel qu'un écrou, une vis, ou analogue, faisant partie d'un raccord à vis, ledit dispositif comportant:

— une première partie, se présentant sous la forme d'un élément en forme de tige (3), un manchon, un axe, ou élément analogue (2), destiné à venir en prise avec ledit élément, et un support (6),

— une seconde partie, se présentant sous la forme d'un bras de percussion (4), comportant une partie principale (4a), ayant un trou (4c) et des

protubérances (4b) formées aux deux extrémités et,

— une troisième partie ne présentant sous la forme d'une poignée (5),

grâce à quoi ledit dispositif, lorsque lesdites trois parties sont assemblées et agissent entre elles, de manière que ledit élément en forme de tige (3) et ladite poignée (5) soient reliés ensemble, avec ledit bras de percussion (4) entre eux, permette une libre rotation du bras de percussion (4) par rapport audit élément en forme de tige (3) d'une distance angulaire donnée, avant que ledit bras de percussion (4) soit amené en prise avec ledit support (6) et transfère ainsi une force d'impact audit manchon, axe ou élément analogue (2) par l'intermédiaire dudit élément en forme de tige (3).

caractérisé en ce que:

a) ledit support (6) se présente sous la forme d'une barre plate servant d'élément transversal (6) avec deux épaulements verticaux ou jambages (6') disposés de part et d'autre du trou (4c) dans ledit bras de percussion (4),

b) ledit bras de percussion (4) est libre de tourner par rapport audit élément transversal (6a) à l'aide de moyens de pivotement sous forme d'un axe de pivotement unique (5b) servant de surface de support au bras de percussion lorsque ledit axe (5b) est introduit à l'intérieur dudit trou (4c) dans ledit bras de percussion (4) et pouvant être inséré à l'intérieur d'un évidement (3b) correspondant audit axe (5b) et

c) ladite poignée (5) est en outre libre de

tourner par rapport à l'élément en forme de tige (3) et ledit bras de percussion (4).

2. Dispositif de clé opérant par choc selon la revendication 1, caractérisé en ce que la poignée (5) présente un axe (5b) et l'élément en forme de tige présente un évidement (3b).

3. Dispositif de clé opérant par choc selon la revendication 1, caractérisé en ce que la poignée (5) présente un évidement et l'élément en forme de tige présente un axe.

4. Dispositif de clé opérant par choc selon la revendication 1, caractérisé en ce que un dispositif de verrouillage verrouille la poignée dans sa position engagée avec ledit élément en forme de tige.

5. Dispositif de clé opérant par choc selon la revendication 1, caractérisé en ce que la distance entre les jambages (6') dépasse la largeur du bras de percussion (4) par un facteur de 1,5 à 4,0, en particulier de l'ordre de 3,0.

6. Dispositif de clé opérant par choc selon la revendication 1 ou 2, caractérisé en ce que la longueur de l'élément en forme de tige (3), ensemble avec ledit manchon (2) et le support (6), est dimensionnée de manière à être inférieure à la distance entre les surfaces opposées des protubérances, de telle sorte que la poignée (5) et son axe (5b) soient dimensionnés de la même façon, de manière à pouvoir se loger directement près du bras de percussion (4) entre les parties d'extrémité opposées des protubérances, alors que démontés, ledit support s'étendra près de l'une des protubérances alors que le manchon s'étendra près de l'autre protubérance.

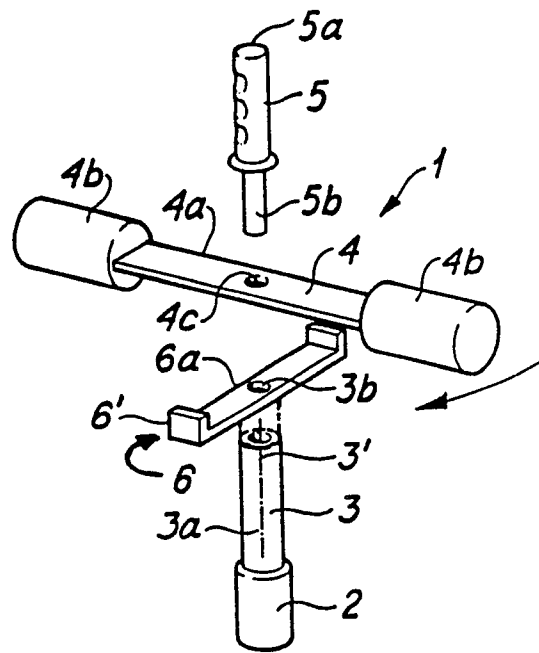


Fig. 1

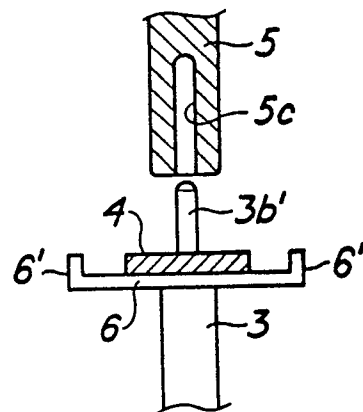


Fig. 2