



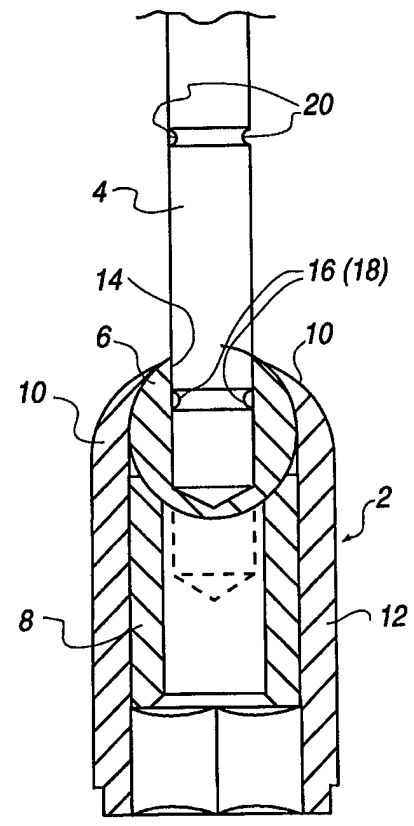
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<p>(21) International Application Number: PCT/GB98/00752 (22) International Filing Date: 12 March 1998 (12.03.98) (30) Priority Data: 9705369.8 14 March 1997 (14.03.97) GB (71)(72) Applicant and Inventor: MAITLAND-APPS, Christopher, George [GB/GB]; 40 Leslie Park, Burnham on Crouch, Essex CM0 8SZ (GB). (74) Agent: HITCHCOCK, Esmond, Antony; Lloyd Wise, Tregear & Co., Commonwealth House, 1-19 New Oxford Street, London WC1A 1LW (GB).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p>	

(54) Title: SOCKET SPANNER ASSEMBLY

(57) Abstract

A socket spanner comprises a box section (2) for fitting over a nut, and a handle (4) attached to the box section by means of a universal joint (6). The universal joint provides a pivotal mounting for the handle (4) which can be moved between a number of angularly oriented operative positions relative to the turning axis of the box section (2).



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SOCKET SPANNER ASSEMBLY

This invention relates to socket spanners, and particularly to a socket spanner assembly especially suitable for use in connection with scaffolding. However, spanners according to the invention can be of use in many situations in which nuts must be tightened and loosened.

Scaffolding spanners are known tools which combine a box spanner with a movable handle. The handle is attached to the box by means of a fixed pin so that the handle can subtend to the axis of the box spanner at a right angle in two diametrically opposed directions. Generally, such a spanner allows a nut to be turned by a succession of 180° rotations between which the handle is pivoted between the diametrically opposed directions in which it can subtend relative to the axis of the box spanner.

The present invention is a development from the scaffolding spanner design referred to above. A socket spanner according to the invention has a box section for fitting over a nut, and a handle attached to the box section but movable between operative positions relative to the box section, and particularly relevant to the turning axis of the box section. According to the invention, the handle is coupled to the box section by means of a universal joint, and pivotally movable to engage the box section in at least three angularly oriented operative positions relative to its turning axis.

The universal joint in spanners according to the invention will typically comprise a ball and socket. The socket can conveniently be formed within the box section, and in preferred embodiments the box section comprises an outer sleeve for fitting over a nut, and an inner sleeve forming at one end a stop for abutting against the nut and at the other end, a seat for the

ball of the joint. The joint may be completed by sections of the outer sleeve extending from the inner sleeve around and partly over the ball to hold it in place.

5 The use of a ball and socket to form the universal joint in spanners according to the invention provides an additional facility which can be exploited. The handle coupled to the ball can be slidingly received in a ball which extends centrally through the ball. With this
10 facility, with the handle aligned with the turning axis of the box section and the cross-section of the handle being no greater than that of the box section, the box section can be slid onto the handle shaft. In this orientation, the spanner is easy to handle and more
15 particularly transport between locations. This can be particularly beneficial where the tool is being handled on site, and carried between elevated workstations. Provision can of course be made for retaining the handle within the ball at at least one axial position relative
20 thereto and, as will be explained below, this can be useful not only in the transportation orientation of the spanner, but also when the handle is in one of its operative positions.

 The invention will now be described by way of
25 example, and with reference to the accompanying schematic drawings wherein:

 Figure 1 shows a cross-sectional view through a socket spanner according to the invention, with the handle and box section being in axial alignment;

30 Figure 2 is a bottom plan view of the spanner as shown in Figure 1, in direction A;

 Figure 3 is a side view of the box section of the spanner shown in Figure 1; and

35 Figure 4 is a top plan view of the spanner as shown in Figure 1 with the handle in one of its operative positions.

The spanner shown in Figure 1 comprises a box section 2 and a handle 4, coupled by means of a universal joint in the form of a ball 6 rotatably received in the seat formed within the box section 2.

5 The seat is defined by a concave spherical surface formed at one end of an inner sleeve 8 of the box section, and the distal ends 10 of the segments of an outer sleeve 12 of the box section which extend beyond the end of the inner sleeve 8. The other end of the

10 inner sleeve 8 forms a stop defining the depth of a recess defined by the outer sleeve 12, and shaped to match the hexagonal or other shape of a nut to which the spanner is to be applied.

The end of the handle 4 in the spanner shown in Figure 1 is fixedly fitted in a recess 14 in the ball 6.

15 However, in some embodiments the recess may be extended to form a handle extending through the ball 6, as indicated in dotted outline, whereby the handle can be slidably received in the ball and moved to various axial

20 positions relative thereto. As can be seen, the cross-section of the handle 4 is less than the inner cross-section of the inner sleeve 8. Balls 16 resiliently mounted in the bore (socket 14) can be received in matching recesses 18, 20 formed in the handle 4 to

25 axially locate the handle relative to the ball 6. A similar system can be used to hold the handle 4 in the socket 14 of the ball 6 in the illustrated embodiment. However, when the handle is capable of passage through the ball 6, registration of the balls 16 with the

30 recesses 20 will serve to locate the box section 2 on the handle, facilitating transportation thereof.

Figure 2 provides an indication of the overall cross-section of a spanner according to the invention, and the coaxial arrangement of the respective components

35 of the box section. Figures 3 and 4 assist in explaining how the handle can be manipulated relative to the box section in the spanner of Figure 1 into its

respective operative positions.

As noted above, the ball 6 in the spanner of Figure 1 is held in place by extended segments 10 from the outer sleeve 12 of the box section 2. These segments
5 are closed towards each other, forming claws which hold the ball 6 in place. Between the extended segments 10 are defined four slots 22 for receiving the handle 4 in each of four available operative positions. At the
10 entrance to each slot 22 is a pair of leaf springs 24 which serve to provide some resilient grip on the handle received in the slot 22.

Figure 4 shows three of four slots 22 in the outer sleeve of the box section 2, the fourth being obscured by the presence of the handle 4 in a respective
15 operative position. As shown, the spanner can be used in a conventional manner by locating the box section 2 on a nut, and rotating about the turning axis 26. Turning force is applied to the box section 2 by
20 creating a moment of forces acting through the ball and effectively at the turning axis in one direction, and through the handle acting on a section 10 of the box section in the other. It will thus be recognised that
25 if the handle can pass entirely through the ball 6 it can be received in the diametrically opposite slot 22, and thereby transmit a further turning force against the respective segment tip 10.

CLAIMS :

1. A socket spanner comprising a box section (2) having a turning axis (26), for fitting over a nut and a handle (4) attached to the box section (2), the handle (4) being movable between operative positions relative to the box section (2), characterised in that the handle (4) is coupled to the box section (2) by means of a universal joint (6), and pivotally movable to engage the box section (2) in at least three angularly oriented operative positions relative to its turning axis (26).

2. A spanner according to Claim 1, wherein the universal joint (6) comprises a ball and socket.

3. A spanner according to Claim 2, wherein the box section (2) comprises an outer sleeve (12) for fitting over a said nut and an inner sleeve (8) forming at one end a stop for abutting against a said nut and at the other end a seat for the ball (6) of the joint.

4. A spanner according to Claim 3, wherein the handle (4) is selectively slidable through a hole (14) in the ball (6) and receivable in the sleeves (8, 12) for transportation.

5. A spanner according to Claim 4, including means (16, 18, 20) for retaining the handle within the ball in at least one axial position relative thereto.

6. A spanner according to any preceding claim, wherein each operative position of the handle (4) defines a right-angle with the turning axis (26) of the box section (2).

7. A spanner according to Claim 4 and Claim 6, wherein the handle (4) is slidable through the ball (6) in its operative positions to engage the box section (2) on diametrically opposite sides thereof.

5

8. A spanner according to any preceding claim, wherein the box section (2) is formed with slots (22) for receiving the handle (4) in its operative positions.

10

9. A spanner according to any preceding claim, including means (24) for resiliently retaining the handle (4) in each of its operative positions.

15

10. A spanner according to any preceding claim, wherein the handle (4) has four operative positions angularly spaced at right-angles around the turning axis (26) of the box section.

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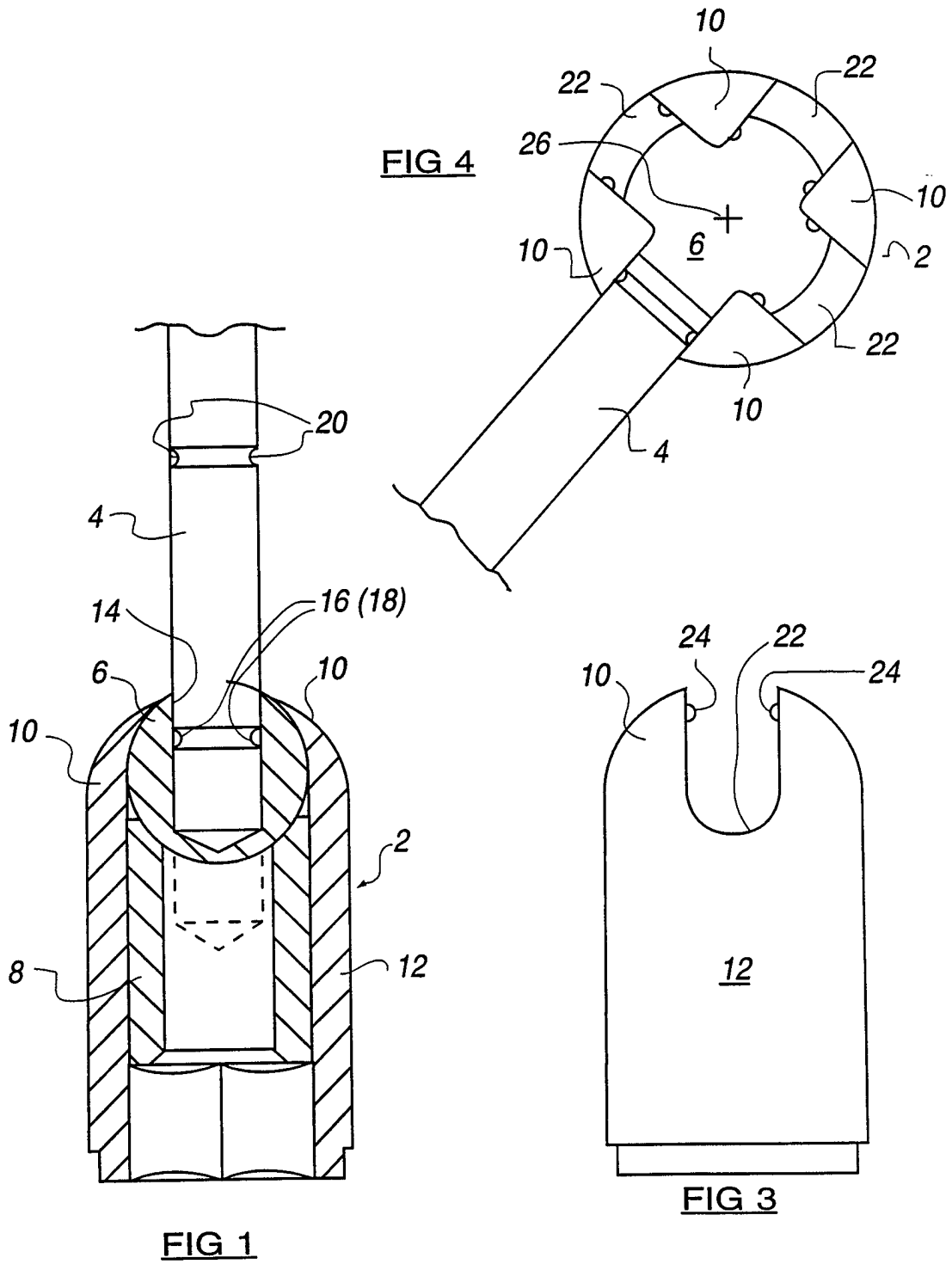


FIG 1

FIG 3

FIG 2

INTERNATIONAL SEARCH REPORT

In tional Application No

PCT/GB 98/00752

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B25B13/06

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B25B F16D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 450 273 C (W.STAIGER) 3 October 1927	1,2,6-8, 10
A	see the whole document ---	4,5
X	FR 40 599 E (J.PIAT) 27 July 1932	1,2,6-8, 10
A	see the whole document ---	4,5,9
X	BE 461 869 A (M.BONNIER ET AL.) 31 January 1946	1,2,6,8, 10
A	see claims 1-4; figures ---	3-5
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 947 436 A (G.TSERETELLI) 1 July 1949	1,2,6,8, 10
A	see claim; figures 1,2 -----	3-5
A	FR 840 074 A (C.LAUREAU ET AL.) 18 April 1939 see page 2, line 53 - line 80; figures 1,2 -----	9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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BE 457361	A	NONE	
FR 947436	A	06-07-1949	NONE
FR 840074	A	18-04-1939	NONE