

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
3 March 2005 (03.03.2005)

PCT

(10) International Publication Number
WO 2005/019716 A1

(51) International Patent Classification⁷: **F16L 19/065**,
19/08, 19/14

(21) International Application Number:
PCT/US2004/026094

(22) International Filing Date: 12 August 2004 (12.08.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/642,430 15 August 2003 (15.08.2003) US

(71) Applicant (for all designated States except US):
SWAGELOK COMPANY [—/US]; 29500 Solon
Road, Solon, Ohio 44139 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **WILLIAMS, Peter,**
C. [—/US]; 3495 Edison Road, Cleveland Heights, Ohio
44139 (US).

(74) Agent: **MCKNIGHT, Douglas, B.**; 800 Superior Avenue,
Suite 1400, Cleveland, OH 44114 (US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

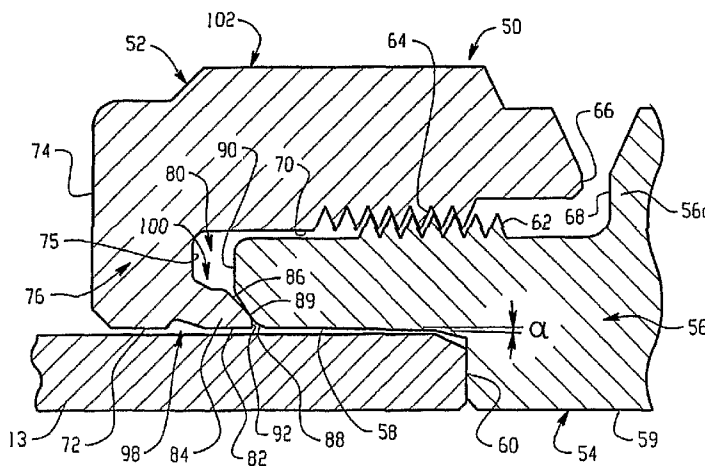
— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report

[Continued on next page]

(54) Title: FITTING FOR METAL PIPE AND TUBING



(57) Abstract: A tube fitting (50) that uses only two components, namely a fitting body (54) and a fitting nut (52). The nut (52) and body (54) are adapted to be threadably coupled together by relative rotation therebetween. The nut (52) includes an integral tube gripping ring (80) that cooperates with a camming surface (88) on the body (54) when the fitting is made-up. The camming surface (88) preferably has a steep camming angle. The ring (80) is radially compressed against the tube (13) outer wall to form a seal and a tight tube grip. The ring (80) also forms a line contact-type seal against the camming surface. The ring (80) is designed to have a hinging action and to plastically deform during pull-up to embed into the tubing for excellent tube grip, and an axially adjacent swage or collet zone that isolates any stress riser resulting from the embedding action from vibration effects. The fitting components, and particularly the ring (80), may be case hardened. The fitting (50) may include a self-gauging feature to indicate sufficient pull-up and to prevent excessive pull-up. Also provided is a single ferrule tube fitting that uses a steep camming surface and has a hardness ratio that is at least about 3.3 times the hardness of the stainless steel tube end on the Vickers scale.

WO 2005/019716 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.