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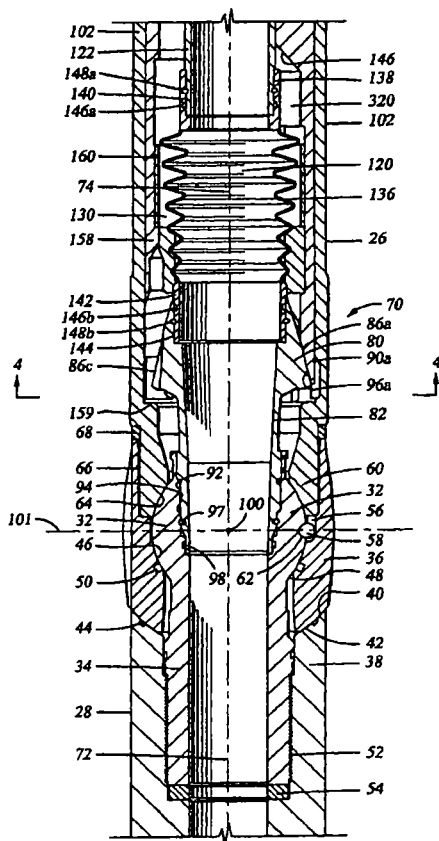
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09/467,588 20 December 1999 (20.12.1999) **US**(71) Applicant: **HALLIBURTON ENERGY SERVICES, INC.** [US/US]; 4100 Clinton Drive, Building 01, 6th Floor, Houston, TX 77020-6299 (US).(72) Inventors: **EPPINK, Jay, M.**; 25310 Hollybush, Spring, TX 77373 (US). **ODELL, Albert, C., II**; 2115 WildernessPoint Drive, Kingwood, TX 77339 (US). **ESTEP, James, W.**; 14202 Lake Scene Trail, Houston, TX 77059 (US). **TERRY, James, B.**; 403 Godsey Court, Houston, TX 77024 (US). **WILSON, Thomas, P.**; 1614 Fall valley, Houston, TX 77077 (US). **TRAINOR, William, F.**; 15519 Rio Plaza, Houston, TX 77083 (US).(74) Agents: **ROSE, David, A. et al.**; Conley, Rose & Tayon, P. C., P. O. Box 3267, Houston, TX 77253-3267 (US).(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, 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, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

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(54) Title: **THREE DIMENSIONAL STEERABLE SYSTEM**

(57) Abstract: A steering assembly (20) includes upper (26) and lower (28) tubular housings connected by a universal joint (30). An angle cam (80) is disposed on the end of the lower housing and projects into the housing. A plurality of wedge members (90) extend axially from the upper housing and into engagement with the angle cam. Drive trains (150) are connected to the wedge members to move the wedge members toward and away from the angle cam to change the angle and azimuth of the lower housing with respect to the upper housing by the universal joint. The lower housing is connected to a bearing pack (16) supporting a drill bit (12) so as to change the direction of the drill bit. The steering assembly is connected to composite tubing (520) having conductors (584, 586) in the wall and a processor (514) is at the surface. Data on the position of the bit is transmitted to the processor to change the bend angle and direction of the drilling of the bit.



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