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[Continued on next page]

(54) Title: MINING PIN RETENTION SYSTEM

(57) Abstract: An improved drive pin retention system for mining chains is disclosed, including several embodiments. The drive pin retention system further decreases the chance that the chain can break due to sheared dowel pins.

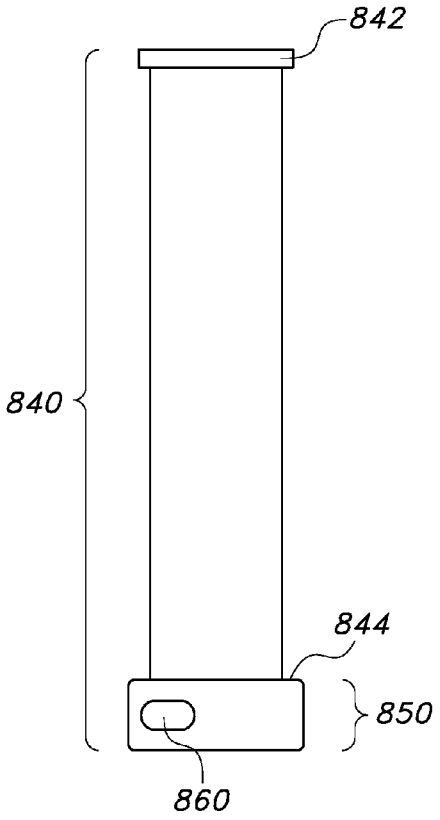

FIG. 5

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SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - E21C 25/36; F16B 21/12; F16G 13/06; F16H 7/06 (2016.01)
CPC - E21C 25/36; F16B 21/12; F16G 13/06; F16H 7/06
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(8) Classifications: E21C 25/34, 25/36; F16B 21/12; F16G 13/06; F16H 7/06 (2016.01)
CPC Classifications: E21C 25/34, 25/36; F16B 21/12; F16G 13/06; F16H 7/06

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 practicable, search terms used)
PatSeer (US, EP, WO, JP, DE, GB, CN, FR, KR, ES, AU, IN, CA, INPADOC Data); pin, pintle, rod, shaft, bolt, thread, screw, nut, nyloc, nylon, polymer, elastic, lock, retain, chain, cutting, link, mining, cotter pin, Hendrix pin, rubber sandwich, steel spring, castle nut, bore, hole, channel, aperture, opening, passage, transverse, side

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2,129,420 A (GUY F. M.) September 06, 1938; figure 1; column 2, lines 40-50	1, 2
X	CN 202176672 U (GAO Y.) March 28, 2012; figure 2; paragraph [0012]	1, 3
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Y		4
X	US 1,011,398 A (ANDREGG J. G.) December 12, 1911; figure 1; page 1, lines 55-80	1, 4
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Y		5-7
Y	JP 60125783 A (AKIRA H. et al.) July 05, 1985; abstract; figures 2, 3	4
Y	'Nuts (hardware)' (WIKIPEDIA) May 26, 2015. Retrieved from the Internet on August 9, 2016. URL: <https://web.archive.org/web/20150526221608/https://en.wikipedia.org/wiki/Nut_(hardware)>	5-7
P, X	US 2016/0032722 A1 (ITR AMERICA LLC) February 04, 2016; figures 8-18D; paragraphs [0042]-[0049]	1-7
X	US 3,888,133 A (KREKELER C. B.) June 10, 1975; figures 22-24	1
X	US 3,679,265 A (KREKELER C. B.) July 25, 1972; figure 7	1
X	US 2,162,811 A (GUY F. M.) June 20, 1939; figure 1	1
X	GB 302,094 A (THORNTON A. A.) December 13, 1928; figures 1-3	1

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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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.
A	US 2,846,248 A (KLIWER A. G.) August 05, 1958; entire document	1-7
A	US 20070107412 A1 (HUMCKE M. W. et al.) May 17, 2007; entire document	1-7
A	GB 760,941 A (HOROVITZ M.) October 19, 1954; entire document	1-7
A	US 2006/0231820 A1 (BILBY M.) October 19, 2006; figure 2; entire document	1-7