

Search history

Search pn = EP2163347 (Results 1)
1:

Search FT = ((cylinder W2 lin?er) NEAR (extract# OR remove#)) AND engine (Results 6)
2:

Search FT = ((cylinder W2 lin%er) NEAR (extract# OR remove#)) AND engine (Results 281)
3:

Search CPC = B23P19/0* (Results 16482)
4:

Search 3 AND 4 (Results 9)
5:

Search CPC = B23P11/05 OR B23P19/042 (Results 0)
6:

Search CPC = B23P11/05* OR B23P19/042* (Results 0)
7:

Search CPC = B23P19/042* (Results 377)
8:

Search CPC = B23P11/05* (Results 0)
9:

Search 8 AND (FT = disassembl* OR extract* OR remov*) (Results 189)
10:

Search 10 AND (FT = (cylinder W2 lin%er)) (Results 31)
11:

Search fn=(21973015 or 22379836 or 22014781 or 22481568 or 22819179 or 1146984 or 36968266 or 19745054 or 19427798 or 20973685 or 21284633 or 26677565 or 26669247) (Results 13)
12:

Search fn=(13291606 or 48910146 or 22234758 or 22481504 or 22135953 or 22287369 or 21973015 or 22512772 or 21687627 or 21623915 or 22248508 or 22306406 or 22409398 or 22282151 or 22553895 or 2869957 or 2869957 or 30181331 or 59338003 or 56826539 or 56826539) (Results 19)
13:

Search fn=(23966899 or 64016364 or 22282151 or 1022370 or 6629805 or 2869957 or 2869957 or 11336500 or 66270251 or 19189492 or 19745054 or 19586857) (Results 11)
14:

Search fn=(52323290 or 54030625 or 54030625 or 52323290 or 29994390 or 23484283 or 43176976 or 48165703 or 52323290 or 4400247 or 4504317 or 2152353 or 5215749 or 30816826 or 2869957 or 2869957 or 3339433 or 4207708 or 8828106 or 8926032 or 13027991 or 11784662 or 28331953 or 29994390 or 23484283 or 52323290 or 48165703 or 24819232 or 18681018 or 21506857 or 22234758 or 22287369 or 889859) (Results 25)
15:

Search fn=(55252616 or 29994390 or 32809547 or 67828217 or 29994390 or 66270251 or 18993194 or 22296302 or 22287369 or 22166863 or 22212161 or 27335397) (Results 11)
16:

Search CPC = (B23P19/042* OR Y10T29/53*) (Results 34444)
17:

Search 17 AND (PD <20170704) (Results 34429)
18:

Search 17 AND (PD < 20170704) (Results 34429)
19:

Search 19 AND (FT = (sleeve OR bushing) W2 puller) (Results 99)
20:

Search 20 AND (CC = CO) (Results 0)
21:

Search 19 AND (CC = CO) (Results 20)
22:

Search 20 AND (FT = engine OR motor) (Results 39)
23:

Title: METHOD AND APPARATUS FOR REMOVING CYLINDER LINERS OF AUTOMOTIVE VEHICLE DIESEL **ENGINES**

Abstract: Cylinder liners are removed or extracted from diesel **engines** of automotive vehicles, with the diesel **engine** remaining mounted on the vehicle, by removing only the pistons, piston rods and the bolts holding the main bearing caps and rotating the crank shaft so that the cranks extend horizontally. The main bearing cap bolts are utilized to secure, to the undersurfaces of the main bearing caps in depending relation therefrom, a pair of substantially identical angle brackets having aligned apertures at their lower ends. A cross bar is inserted through these apertures, and a pressing tool is placed in the lower end of the cylinder liner and secured by a threaded bolt and nut to a centering device seated in the upper end of the liner. An ordinary shop jack is then positioned on the cross bar in engagement with the pressing tool, and is extended to push the cylinder liner upwardly out of the cylinder.

Classifications:

International (IPC 8-9): B25B27/00 F02F7/00 (Advanced/Invention);
F02B3/06 (Advanced/Non-invention);
B25B27/00 F02F7/00 (Core/Invention);
F02B3/00 (Core/Non-invention)

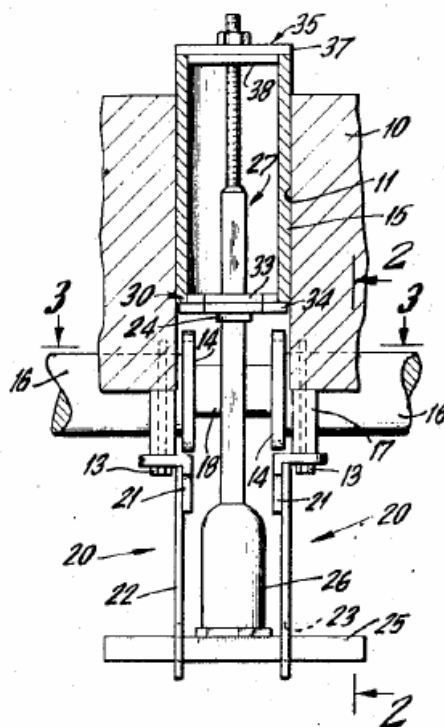
International (IPC 1-7): B23P19/00 B23P19/04 B23Q3/18
B25D17/28

CPC: F02F7/00 B25B27/00 F02B3/06 Y10T29/49233 Y10T29/49822
Y10T29/53843 Y10T29/53952

European: B25B27/00 F02F7/00 R02B3/06

US: 269/1 269/52 29/255 29/280 29/426.5 29/427 29/888.011

PatBase - US3685132_A



Family:

Publication number	Publication date	Application number	Application date
US3685132 A	19720822	US19700054149	19700713

Priority:

US19700054149 19700713

Probable Assignee:

JAMES G HODGE

Assignee(s): (std):

JAMES G HODGE

Inventor(s): (std):

HODGE JAMES G

Inventor(s):

JAMES G HODGE

Legal status (INPADOC)

[View legal status timeline](#)

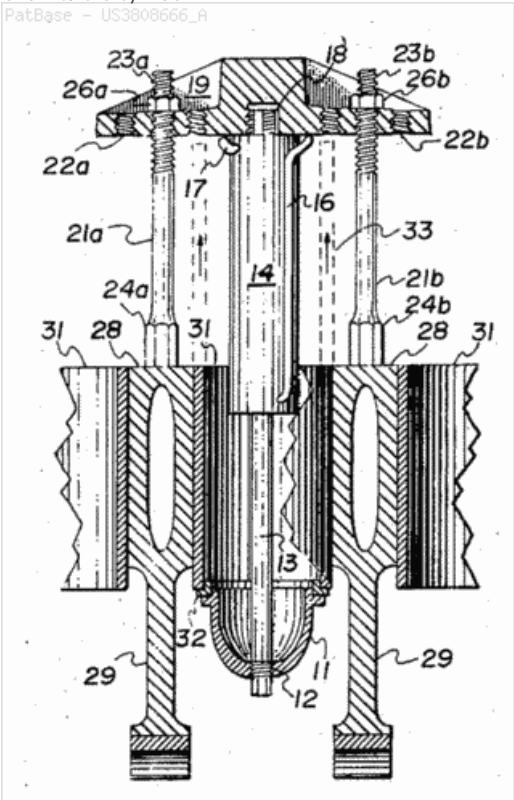
Patent	Date recorded	Event group	Code	Event	Details
US3685132 A	19720822	LSGT	+	granted / extensions (spc, cpc, pte)	

Title: CYLINDER **SLEEVE PULLER** AND INSERTER

Abstract: A cylinder **sleeve puller** and inserter in which a reversible dome fitting is coupled through a quick disconnect means to a hydraulic piston rod and placed in communication through an adaptor with one end of a cylinder sleeve, the piston rod being concentrically received by the cylinder; a structural bridging plate communicating through spacer legs to the top of an **engine** block in which the cylinder is located for coupling to the hydraulic cylinder receiving the hydraulic piston rod for exerting a force on the reversible dome fitting and forcing the cylinder sleeve out of the cylinder and surrounding the hydraulic cylinder. When inserting a cylinder, the reversible dome fitting is reversed attached to the hydraulic piston rod and the end of a cylinder sleeve which hydraulically forces the cylinder sleeve into the cylinder.

Classifications:

International (IPC 8-9): B25B27/06 (Advanced/Invention);
B25B27/02 (Core/Invention)
International (IPC 1-7): B23P19/02
CPC: B25B27/064 Y10T29/5383 Y10T29/53987
European: B25B27/06C
US: 29/25.2 29/252 29/282



Family:

Publication number	Publication date	Application number	Application date
US3808666 A	19740507	US19720239271	19720329

Priority:

US19720239271 19720329

Probable Assignee:

BALES R

Assignee(s): (std):

BALES R

Assignee(s):

BALES R US

Inventor(s): (std):

BALES R

Inventor(s):

BALES R US

Legal status (INPADOC)

[View legal status timeline](#)

Patent	Date recorded	Event group	Code	Event	Details
US3808666 A	19740507	LSGT	+	granted / extensions (spc, cpc, pte)	

Title: **ENGINE** CYLINDER **SLEEVE PULLER** AND METHOD

Abstract: A puller supported atop the cylinder block has lugs or jaws engaging the underside of the cylinder wall ridge resulting from deposits of carbon and wear by piston rings, whereby screw force applied to the jaws through the puller is effective to pull the cylinder sleeve from the cylinder block. The piston is removed subsequently.

Classifications:

International (IPC 8-9): B25B27/02 (Advanced/Invention);

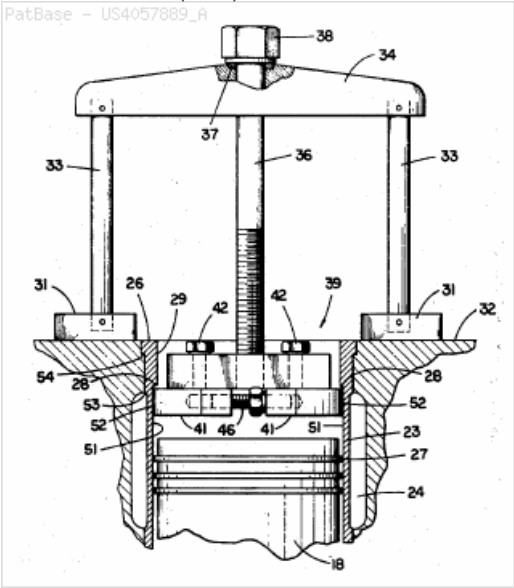
B25B27/02 (Core/Invention)

International (IPC 1-7): B23P19/02

CPC: B25B27/023 Y10T29/49822 Y10T29/53891 Y10T29/53952

European: B25B27/02B

US: 29/266 29/280 29/426.5 29/427



Family:

Publication number	Publication date	Application number	Application date
US4057889 A	19771115	US19760668727	19760319

Priority:

US19760668727 19760319

Probable Assignee: FERGUSON MARVIN D

Assignee(s): (std): FERGUSON MARVIN D

Inventor(s): (std): FERGUSON MARVIN D

Legal status (INPADOC)

[View legal status timeline](#)

Patent	Date recorded	Event group	Code	Event	Details
US4057889 A	19771115	LSGT	+	granted / extensions (spc, cpc, pte)	

Title: **SLEEVE** BEARING **PULLER**

Abstract: A **sleeve** bearing **puller** for removing **sleeve** bearings such as camshaft bushings from **engine** cylinder blocks including a pair of expandable and contractable half cylinder shaped extractors having an outer end pulling flange and internal longitudinally spaced cam surfaces, guide pins between the extractors for guiding them in parallel relation between expanded and contracted positions, and expander mandrel between the extractors having longitudinally spaced cam surfaces for expanding the extractors in parallel relation in response to a pull on the mandrel, and a garter spring encircling the extractors holding the extractors on the expander mandrel.

Classifications:

International (IPC 8-9): B23P19/04 B25B27/06

B25B27/073 (Advanced/Invention);

B25B27/02 (Core/Invention)

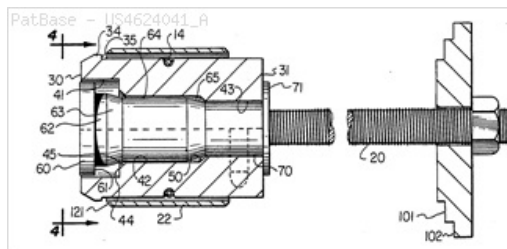
International (IPC 1-7): B23P19/02 B23P19/04 B25B27/06

B25B27/28

CPC: Y10T29/53878 B25B27/062

European: B25B27/06B

US: 29/263



Family:

Publication number	Publication date	Application number	Application date
CA1268927 A1	19900515	CA19860512392	19860625
GB2181383 A1	19870423	GB19860015622	19860626
GB2181383 B2	19890802	GB19860015622	19860626
GB8615622 A0	19860730	GB19860015622	19860626
JP62094277 A2	19870430	JP19860192622	19860818
US4624041 A	19861125	US19850789620	19851021

Priority:

US19850789620 19851021 CA19860512392 19860625

Probable Assignee: GATHRIGHT PULLER INC

Assignee(s): (std): GATHRIGHT PULLER INC ; GATHRIGHT PULLER INC ; GIYASURAITO PURAA INC

Assignee(s): GATHRIGHT PULLER INC A CORP OF ARKANSAS ; GATHRIGHT GRADY CORDELL ; GATHRIGHT JOHN BUCK

Inventor(s): (std): GATHRIGHT GRADY C ; GATHRIGHT GRADY CORDELL ; GATHRIGHT JOHN B ; GATHRIGHT JOHN BUCK ; GURADEII KOODERU GIYASURAITO ; JIYON BATSUKU GIYASURAITO

Inventor(s): JOHN BUCK GATHRIGHT ; GRADY CORDELL GATHRIGHT

Agent(s): RICHES MCKENZIE AND HERBERT LLP

Legal status (INPADOC)

[View legal status timeline](#)

Patent	Date recorded	Event group	Code	Event	Details
GB2181383 A1	19870423	LSPB	+	published / reissued	
GB2181383 B2	19890802	LSGT	+	granted / extensions (spc, cpc, pte)	
GB2181383 B2	19980218	LSLE	-PCNP	PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE	EFFECTIVE DATE : 19970626
GB2181383 B2	20060626	PEXP		Calculated Patent Term Expiry	
JP62094277 A2	19870430	LSPB	+	published / reissued	
US4624041 A	19861125	LSGT	+	granted / extensions (spc, cpc, pte)	
US4624041 A	19860718	LSAS	AS	ASSIGNMENT	PARTYTYPE : OWNER OWNER : GATHRIGHT PULLER INC., 622 WEST SEVENTH STREET, SM OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNORS:GATHRIGHT, JOHN B.; GATHRIGHT, GRADY C.; REEL/FRAME:004577/0973 EFFECTIVE DATE : 19860422
US4624041 A	19860923	LSGT	PAT1	Patented Case	
US4624041 A	19900503	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US4624041 A	19940519	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US4624041 A	19981122	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY	

				MAINTENANCE FEES	
US4624041 A	19990202	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 19981125
US4624041 A	20180131	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	

Title: CYLINDER LINER **SLEEVE PULLER**

Abstract: A cylinder liner **sleeve puller** has four legs having flanged feet at their bottom and being connected by four pivotably mounted pivot arms. The arms are pivotably connected to a central hub, which arrangement forces the lower ends of the legs outward when the hub is manually moved downward. In operation, the legs are inserted into the cylinder so that their bottom extremities are below the lower end of the liner sleeve. The hub is then pressed downward, forcing the lower ends of the legs outward until the flanged feet are directly below the liner sleeve. A jack support plate having spaced holes for the legs is then passed over the legs and rests on the **engine** block. A hydraulic jack is placed on the support plate, and a top plate is fastened to the top of the legs. When the jack is activated, the plunger pushes the top plate upward, causing a corresponding upward movement of the legs, thereby removing the liner sleeve. In one embodiment, an elastic band encircles the legs at a level below the pivot arms, providing added stability in operation.

Classifications:

International (IPC 8-9): B25B27/02 B25B27/06 (Advanced/Invention); B25B27/02 (Core/Invention)

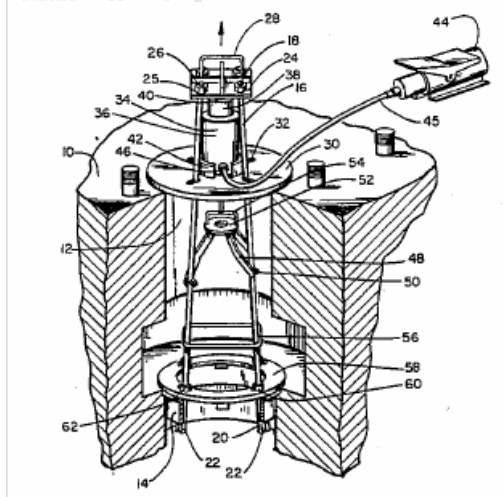
International (IPC 1-7): B23P19/04

CPC: B25B27/026 B25B27/02 B25B27/06 Y10T29/53796 Y10T29/5383 Y10T29/53843 Y10T29/53987 Y10T29/53991

European: B25B27/02 B25B27/02C B25B27/06

US: 29/244 29/252 29/255 29/282 29/283 81/454 81/461

PatBase - US4707900_A

**Family:**

Publication number	Publication date	Application number	Application date
US4707900 A	19871124	US19860916830	19861009

Priority:

US19860916830 19861009

Probable Assignee: BURLINGTON NORTHERN RAILROAD

Assignee(s): (std): BURLINGTON NORTHERN RAILROAD ; BURLINGTON NORTHERN RAILROAD C

Assignee(s): BURLINGTON NORTHERN RAILROAD CO ; BURLINGTON NORTHERN RAILROAD CO A CORP OF DE

Inventor(s): (std): RAWLE ROGER D ; TWOGOOD RODNEY L ; WRIGHT RAYMOND L

Legal status (INPADOC)

[View legal status timeline](#)

Patent	Date recorded	Event group	Code	Event	Details
US4707900 A	19871124	LSGT	+	granted / extensions (spc, cpc, pte)	
US4707900 A	19861009	LSAS	AS	ASSIGNMENT	PARTYTYPE : OWNER OWNER : BURLINGTON NORTHERN RAILROAD COMPANY, 3800 CONTINE OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNORS:TWOGOOD, RODNEY L.; WRIGHT, RAYMOND L.; RAWLE, ROGER D.; REEL/FRAME:004616/0194 EFFECTIVE DATE : 19861007
US4707900 A	19870922	LSGT	PAT1	Patented Case	
US4707900 A	19911124	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US4707900 A	19920204	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 19911124
US4707900 A	20180130	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	

Title: **SLEEVE** BEARING **PULLER** AND INSTALLER

Abstract: Apparatus and methods for the removal and installation of sleeve bearings in a camshaft bore of an **engine**, such as a diesel **engine**. The device includes an operator rod, a bearing puller in accordance with U.S. Pat. No. 4,624,041, for engaging and pulling and/or pushing a sleeve bearing in the camshaft bore, apparatus for coupling the bearing puller along a rear end portion of the rod and at selected positions along the length of the rod for engaging sleeve bearings along the camshaft bore to both pull the bearings out of operating position and to reinstall bearings in operating positions, and apparatus for coupling the rod with a front face of the **engine** during the pulling and pushing of sleeve bearings for removal and installation of the bearings. In some embodiments of the apparatus the rod is operated by a wrench driven nut to pull and/or push the rod. In other embodiments the rod is operated by a hydraulic jack having an open hole piston fitting on the rod. Methods are described for operating the apparatus to remove and install the sleeve bearings along the camshaft bore and at an end location with the **engine** either in or out of a frame.

Classifications:

International (IPC 8-9): B25B27/06 (Advanced/Invention);

F02B3/06 (Advanced/Non-invention);

B25B27/02 (Core/Invention);

F02B3/00 (Core/Non-invention)

International (IPC 1-7): B23P

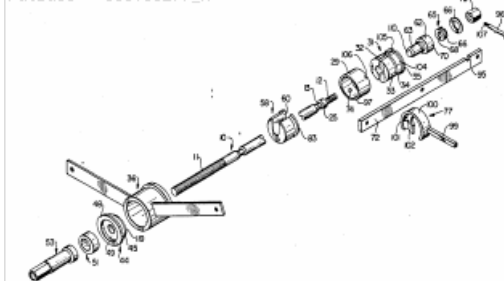
CPC: B25B27/062 F02B3/06 Y10T29/49638 Y10T29/49824

Y10T29/53883 Y10T29/53952

European: B25B27/06B R02B3/06

US: 29/264 29/280 29/426.6 29/898.01

PatBase - US5033177_R



Family:

Publication number	Publication date	Application number	Application date
US5033177 A	19910723	US19890404960	19890908

Priority:

US19890404960 19890908

Probable Assignee: INNOVATIVE TOOLS AND EQUIPMENT C

Assignee(s): (std): INNOVATIVE TOOLS AND EQUIPMENT C

Assignee(s): INNOVATIVE TOOLS AND EQUIPMENT CORP

Inventor(s): (std): CALLOWAY JAMES J ; GATHRIGHT GRADY C ; GATHRIGHT JOHN B ; RUTLEDGE N T

Legal status (INPADOC)

[View legal status timeline](#)

Patent	Date recorded	Event group	Code	Event	Details
US5033177 A	19910723	LSGT	+	granted / extensions (spc, cpc, pte)	
US5033177 A	19890908	LSAS	AS	ASSIGNMENT	PARTYTYPE : OWNER OWNER : INNOVATIVE TOOLS AND EQUIPMENT CORPORATION, ARKANS OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNORS:GATHRIGHT, JOHN B.; GATHRIGHT, GRADY C.; CALLOWAY, JAMES J.; AND OTHERS; REEL/FRAME:005131/0835; SIGNING DATES FROM 19890901 TO 19890902
US5033177 A	19910522	LSGT	PAT1	Patented Case	
US5033177 A	19941230	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5033177 A	19990725	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5033177 A	19991005	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 19990723
US5033177 A	20180128	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5033177 A	20090908	PEXP		Calculated Patent Term Expiry	

Title: HYDRAULIC CAM BUSHING INSTALLATION AND REMOVAL TOOL

Abstract: A simple, hydraulically powered tool for removing and installing the camshaft bushings of an internal combustion **engine** including an elongated shaft adapted to extend through the camshaft bearing journals to a hydraulic unit which is adapted to be reversibly mounted at one end of the **engine** to apply either a pushing or pulling force to the shaft. The elongated shaft includes a plurality of axially spaced annular grooves which are adapted to receive a first slotted collar at one end for interconnecting the shaft to the piston of the hydraulic unit and a second slotted collar at the other end to interconnect the shaft to a slotted bushing support mandrel which is adapted to be slid onto the shaft for engagement with a bushing to be installed or removed. A spacer is provided for mounting the hydraulic cylinder unit on the **engine** when the cylinder unit is operated to impart a pulling force to the shaft and a cradle is provided for mounting the hydraulic cylinder unit when a pushing force is to be imparted to the shaft.

Classifications:

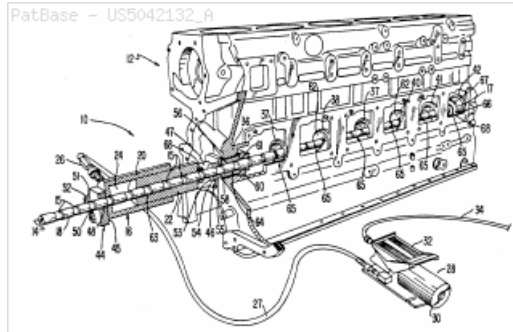
International (IPC 8-9): B25B27/06 (Advanced/Invention);
B25B27/02 (Core/Invention)

International (IPC 1-7): B23P19/04

CPC: B25B27/064 Y10T29/5383

European: B25B27/06C

US: 29/252

**Family:**

Publication number	Publication date	Application number	Application date
US5042132 A	19910827	US19900463341	19900110

Priority:

US19900463341 19900110

Probable Assignee: CUMMINS ENGINE IP INC

Assignee(s): (std): CUMMINS ENGINE CO INC

Assignee(s): CUMMINS ENGINE COMPANY INC ; CUMMINS ENGINE IP INC ; CUMMINS ENGINE CO

Inventor(s): (std): HARDIN RICHARD A

Legal status (INPADOC)

[View legal status timeline](#)

Patent	Date recorded	Event group	Code	Event	Details
US5042132 A	19910827	LSGT	+	granted / extensions (spc, cpc, pte)	
US5042132 A	19900110	LSAS	AS	ASSIGNMENT	PARTYTYPE : OWNER OWNER : CUMMINS ENGINE COMPANY, INDIANA OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNOR:HARDIN, RICHARD A.; REEL/FRAME:005215/0899 EFFECTIVE DATE : 19900102
US5042132 A	19910626	LSGT	PAT1	Patented Case	
US5042132 A	19950203	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5042132 A	19990226	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US5042132 A	20011011	LSAS	AS	ASSIGNMENT	PARTYTYPE : OWNER OWNER : CUMMINS ENGINE IP, INC., MINNESOTA OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:CUMMINGS ENGINE COMPANY, INC.; REEL/FRAME:013868/0374 EFFECTIVE DATE : 20001001
US5042132 A	20030226	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12
US5042132 A	20100110	PEXP		Calculated Patent Term Expiry	

Title: CAM SHAFT **BUSHING PULLER**

Abstract: An improved camshaft **bushing puller** comprising a split collar comprising two hemi-annular sections which can be flexibly compressed to a smaller diameter for insertion into a camshaft bushing. The outer ends of each hemi-annular section have integral outer peripheral lips adapted to engage the outer end of the bushing. Complementary threaded grooves receive the end of a conventional pulling handle which urges the **bushing puller** into uniform solid contact with the camshaft bushing for effective uniform pulling action.

Classifications:

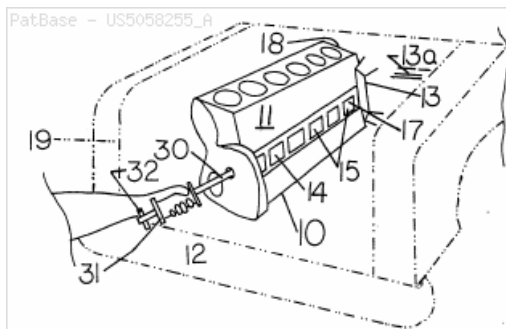
International (IPC 8-9): B25B27/06 F01L1/46 (Advanced/Invention);
F02B3/06 (Advanced/Non-invention);
B25B27/02 F01L1/00 (Core/Invention);
F02B3/00 (Core/Non-invention)

International (IPC 1-7): B23P19/04

CPC: F01L1/46 B25B27/06 F02B3/06 Y10T29/53843 Y10T29/53987

European: B25B27/06 F01L1/46 R02B3/06

US: 29/255 29/282 292/550



Family:

Publication number	Publication date	Application number	Application date
US5058255 A	19911022	US19900569408	19900817

Priority:

US19900569408 19900817

Probable Assignee: QUALKENBUSH JACK D

Assignee(s): (std): QUALKENBUSH JACK D

Inventor(s): (std): QUALKENBUSH JACK D

Legal status (INPADOC)

[View legal status timeline](#)

Patent	Date recorded	Event group	Code	Event	Details
US5058255 A	19911022	LSGT	+	granted / extensions (spc, cpc, pte)	
US5058255 A	19910821	LSGT	PAT1	Patented Case	
US5058255 A	19950731	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5058255 A	19991024	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5058255 A	20000104	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 19991022
US5058255 A	20180127	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5058255 A	20100817	PEXP		Calculated Patent Term Expiry	

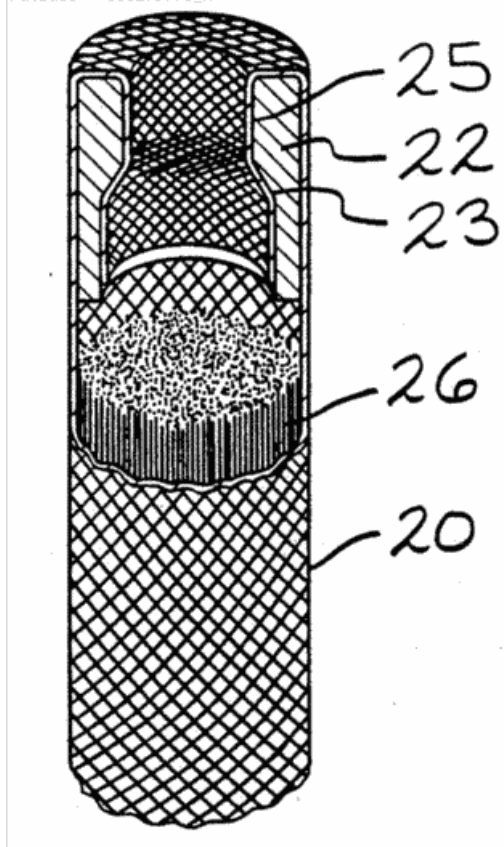
Title: METHOD AND MEANS FOR PRODUCING DISKS OF TIGHTLY PACKED ON-END ALIGNED FIBERS

Abstract: A method and means for producing disks of tightly packed on-end aligned fibers wherein side-by-side filament tows are surrounded and pulled by a Chinese-finger type gripper sleeve which tightens about the tows and compacts the filaments as it is pulled. The gripper sleeve and filament assembly is further compacted by being pulled through a draw-down die and into a tube surrounded by a backup casing. The highly compacted mass of filaments with the surrounding portion of the sleeve within the tube are cut free from the external portion of the portion of the **puller sleeve** and the loaded tube is removed from the casing. A plurality of disks of predetermined thickness containing the desired highly compacted on-end aligned fibers are then formed by cross-sectionally cutting the filament loaded tube segment by segment.

Classifications:

International (IPC 8-9): B01D39/20 B01D46/30 B21C1/28 B21C23/24 (Advanced/Invention); B01D39/20 B01D46/30 B21C1/16 B21C23/22 (Core/Invention)
International (IPC 1-7): B23P23/04 H01R43/20
CPC: F42B12/70 B01D39/2017 B01D39/2055 B01D39/2065 B01D46/30 B01D2239/0241 B01D2239/086 B01D2239/1233 B21C1/28 B21C23/24 Y10T29/49119 Y10T29/49208 Y10T29/49801 Y10T29/49929 Y10T29/49934 Y10T29/5187 Y10T29/53126 Y10T29/532
European: B01D39/20B4 B01D39/20F B01D39/20F4 B01D46/30 B21C1/28 B21C23/24 F42B12/70 L01D239/02F L01D239/08D L01D239/12H
US: 29/33F 29/419.1 29/517 29/520 29/728 29/745 29/826 29/876 298/760

PatBase - US5179778_A



Family:

Publication number	Publication date	Application number	Application date
US5179778 A	19930119	US19920842029	19920225

Priority:

US19920842029 19920225

Probable Assignee: COMPOSIX CO
Assignee(s): (std): BLAKE DONALD L ; DICKSON LAWRENCE J
Assignee(s): COMPOSIX CO
Inventor(s): (std): DICKSON LAWRENCE J ; BLAKE DONALD L

Legal status (INPADOC)

[View legal status timeline](#)

Patent	Date recorded	Event group	Code	Event	Details
US5179778 A	19930119	LSGT	+	granted / extensions (spc, cpc, pte)	
US5179778 A	19960124	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5179778 A	20000929	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US5179778 A	20050119	LSRE	+REIN	REINSTATEMENT AFTER MAINTENANCE FEE PAYMENT CONFIRMED	
US5179778 A	20050315	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20050119
US5179778 A	20060509	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12

US5179778 A	20060828	LSRE	+PRDP	PATENT REINSTATED DUE TO THE ACCEPTANCE OF A LATE MAINTENANCE FEE	EFFECTIVE DATE : 20060901
US5179778 A	20060901	LSGT	PAT1	Patented Case	
US5179778 A	20080109	LSAS	AS	ASSIGNMENT	PARTYTYPE : OWNER OWNER : COMPOSIX CO., OHIO OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:DICKSON, LAWRENCE J.; BLAKE, DONALD L.; REEL/FRAME:020339/0094 EFFECTIVE DATE : 20060330
US5179778 A	20120225	PEXP		Calculated Patent Term Expiry	

Title: CYLINDER **SLEEVE PULLER**

Abstract: A cylinder **sleeve puller** for use in combination with a cylinder positioned in an **engine** block and having a removable sleeve liner therein comprising a rigid support frame having a horizontal member supported by a pair of depending vertical ends, said vertical ends being adapted to be disposed on each side of the cylinder to be worked upon in engagement with the surface of the **engine** block adjacent such cylinder; a threaded rod extending through the center of said horizontal member and adapted to be threaded up and down therethrough within said cylinder and its associated removable sleeve liner; a horizontally extendible lifting member pivotally connected to the base of said threaded rod and adapted to pivot to a downward angle to permit insertion into said cylinder; and sleeve-engaging lift surfaces at each end of said lifting member to engage with the base of said sleeve and to exert upward extracting forces thereon when said lifting plate is pulled upward by action of the attached threaded rod. This construction allows automatic centering of the lifting force. Modifications include an oiler for providing lubricating oil to the threaded rod and its associated bearings.

Classifications:

International (IPC 8-9): B25B27/06 (Advanced/Invention); B25B27/02 (Core/Invention)

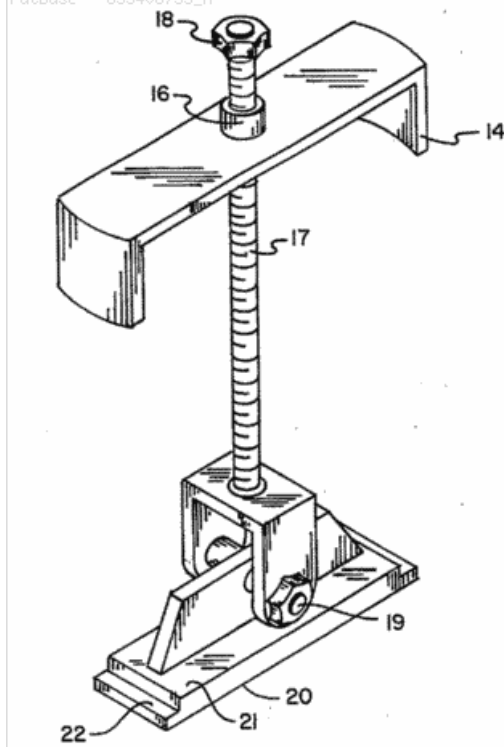
International (IPC 1-7): B23P19/04

CPC: B25B27/062 Y10T29/53874 Y10T29/53891

European: B25B27/06B

US: 29/262 29/266 29/2620

PatBase - US5408733_A

**Family:**

Publication number	Publication date	Application number	Application date
US5408733 A	19950425	US19930143652	19931101

Priority:

US19930143652 19931101

Probable Assignee:

BLANKENSHIP JIM D

Assignee(s): (std):

BLANKENSHIP JIM D

Inventor(s): (std):

BLANKENSHIP JIM D

Legal status (INPADOC)

[View legal status timeline](#)

Patent	Date recorded	Event group	Code	Event	Details
US5408733 A	19950425	LSGT	+	granted / extensions (spc, cpc, pte)	
US5408733 A	19990329	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5408733 A	20030425	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5408733 A	20030528	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5408733 A	20030624	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20030425
US5408733 A	20131101	PEXP		Calculated Patent Term Expiry	