



## AU GRES OPERATIONS PATENTS

<b>DATE ISSUED</b>	<b>TITLE &amp; INVENTOR</b>	<b>PATENT NUMBER</b>
1. 11/21/72	<b>Foundry Stopper Having Parallelogram Rigging</b> <i>William W. Seaton</i>	3,703,248
2. 10/02/73	<b>Control Device For Stopper of a Casting Container</b> <i>William W. Seaton</i>	3,762,605
3. 07/05/77	<b>Synchronizing Velocity and Position Control</b> <i>William W. Seaton, George C. Miller</i>	4,033,403
4. 08/30/77	<b>Ladle with Axis Of Rotation Through Discharge Spout</b> <i>William W. Seaton</i>	4,044,927
5. 05/22/79	<b>Stopper Valve for a Pouring Ladle</b> <i>William W. Seaton</i>	4,155,492
6. 04/08/80	<b>Stopper Throttling System</b> <i>William W. Seaton</i>	4,196,829
7. 01/09/81	<b>Flex Rod Assembly for a Stopper Valve in a Bottom Pour Ladle</b> <i>William W. Seaton</i>	4,271,994
8. 11/04/86	<b>Green Sand Mold Filling System</b> <i>Raymond H. Witt</i>	4,620,584
9. 02/03/87	<b>Machine for Cleaning Castings</b> <i>Kenneth D. McKibben, Thomas E. Wuepper, Alan P. Gould, Craig J. Groh</i>	4,639,968
10. 02/17/87	<b>Machine for Impact Cleaning Casting</b> <i>Kenneth D. McKibben, Thomas E. Wuepper, Alan P. Gould, Craig J. Groh</i>	4,643,243
11. 06/23/87	<b>Method for Sand Castings Varying Thickness Articles</b> <i>Raymond H. Witt</i>	4,674,553

12.	12/20/88	<b>Process of Flaskless Sand Castings</b> <i>Thomas E. Wuepper, Terry L. Franklyn</i>	4,791,975
13.	06/06/089	<b>Method and Apparatus for Registering Flaskless Sand Cope and Drag Molds</b> <i>Thomas E. Wuepper, Terry L. Franklyn</i>	4,836,266
14.	10/24/89	<b>Method and Apparatus for Reclaiming Used Hydraulic Fluid</b> <i>Kenneth D. McKibben</i>	4,876,015
15.	02/13/90	<b>Apparatus for Flaskless Sand Casting</b> <i>Thomas E. Wuepper, Terry L. Franklyn</i>	4,899,806
16.	11/27/90	<b>Method for Resurfacing Flask Walls</b> <i>James L. Sylvester, Alan P. Gould</i>	4,972,567
17.	12/11/90	<b>Method of an Apparatus for Forming Sand Molds</b> <i>Thomas E. Wuepper, Orren R. Tate, Alfred D. Philo, Keith R. Grauherr</i>	4,976,303
18.	05/28/91	<b>Sand Muller Bowl Liner</b> <i>Kenneth D. McKibben, Thomas E. Wuepper</i>	5,019,196
19.	10/08/91	<b>Apparatus for Cleaning Passageways in Metal Castings</b> <i>Kenneth D. McKibben, Thomas E. Wuepper</i>	5,054,155
20.	10/15/91	<b>Method of an Apparatus for Pouring Molds on a Continuously Moving Conveyor</b> <i>William W. Seaton</i>	5,056,584
21.	12/10/91	<b>Method and Apparatus for Cleaning Passageways in Metal Castings</b> <i>Kenneth D. McKibben, Thomas E. Wuepper</i>	5,071,487
22.	04/14/92	<b>Resurface Worn Flask Walls</b> <i>James L. Sylvester, Alan P. Gould</i>	5,103,891
23.	04/14/92	<b>Sand Muller Bowl Liner</b> <i>Kenneth D. McKibben, Thomas E. Wuepper</i>	5,104,049
24.	11/17/92	<b>Method of an Apparatus For Forming Sand Molds</b> <i>Thomas E. Wuepper, Keith R. Grauherr, Orren R. Tate, Alfred D. Philo</i>	5,163,497

25.	11/24/92	<b>Metal Chip Washing System</b> <i>Kenneth D. McKibben</i>	5,165,432
26.	10/26/93	<b>Multi-Surface Flame Hardening Machine and Process</b> <i>Robert L. Macheske</i>	5,256,217
27.	02/01/94	<b>Induction Heated Metal Pouring Apparatus</b> <i>William J. Duca, William W. Seaton, Thomas E. Wuepper, Kenneth D. McKibben</i>	5,282,608
28.	5/17/94	<b>Apparatus and Method for Controlling a Stopper Rod of a Bottom Pouring Vessel</b> <i>William W. Seaton, Richard A. Gillett, Mark T. Salgat</i>	5,312,090
29.	06/07/94	<b>Removable Plate Assembly for Core Machine Head</b> <i>Kenneth D. McKibben, Thomas E. Wuepper, Al Gould</i>	5,318,096
30.	09/30/97	<b>Low Pressure Assembly</b> <i>Daniel L. Merrill</i>	5,598,882
31.	02/11/97	<b>Mold Loading in Low-Pressure Casting</b> <i>Daniel L. Merrill</i>	5,601,135
32.	09/30/97	<b>Low-Pressure Casting Machine Hold Down System</b> <i>Daniel L. Merrill</i>	5,671,799
33.	10/07/97	<b>Disc with Coolant Passages for an Abrasive Machine Assembly</b> <i>Daniel L. Merrill, John R. Synder, Chuck O. Eckholm, Jr., Steve M. Sunday, John L. Seaver</i>	5,674,116
34.	12/30/97	<b>Automated Spin-Casting System</b> <i>Kenneth D. McKibben, Alan P. Gould, Thomas E. Wuepper, Daniel D. Minor, Mark T. Salgat, David D. Marthaler, David Good, Richard A. Gillette, Phillip L. Bond, Donald C. Coyle, Darrell Rentfrow, Thomas O. Stiens, Larry M. Stevens</i>	5,701,945

35.	11/10/98	<b>Bracket Mounting Arrangement for Machine Frames</b> <i>Kenneth D. McKibben</i>	5,833,384
36.	04/03/01	<b>Bracket Mounting Arrangement for Machine Frames</b> <i>Kenneth D. McKibben</i>	6,209,775 HLI
37.	7/30/02	<b>Module Casting System with Shared Controls</b> <i>Kenneth D. McKibben, Daniel D. Minor, Robert L. Macheske, Rick VanHorn</i>	6,425,435
38.	10/8/02	<b>Apparatus and Method for Producing Cast Products</b> <i>Thomas E. Wuepper, Jim Boes, Ron Klinger, Mark Salgat, Tom Rozich</i>	6,460,600
39.	01/07/03	<b>Brake Systems on Rotary Table</b> <i>William W. Seaton, Robert L. Macheske, Kenneth D. McKibben, Alan P. Gould, Daniel D. Minor</i>	6,502,672
40.	01/14/03	<b>Method for Producing a Sand Core</b> <i>Alan P. Gould, Daniel D. Minor, Kenneth D. McKibben, Mark T. Salgat</i>	6,505,671
41.	6/24/03	<b>Controlling Fill of Mold Cavity</b> <i>Dave Good, Tom Rozich, Robert Macheske, Daniel D. Minor, Kenneth D. McKibben, Brandon Schnettler, Mark T. Salgat</i>	6,581,673B1
42.	9/30/03	<b>"Stopper Module Device for a Casting Machine Furnace Apparatus"</b> <i>Kenneth D. McKibben, Daniel D. Minor, Karl Voss, William Seaton, Diane Zekind, Khushal Wardak</i>	6,627,146B1
43.	10/28/03	<b>Rotary Casting System for Low Pressure Casting</b> <i>Daniel D. Minor, Robert Macheske, Alan Gould, Tom Rozich, Kenneth D. McKibben</i>	6,637,496
44.	10/28/03	<b>Modularized Permanent Molding Machine with Multiple Mold (VRS&amp;H)</b> <i>Robert Macheske, Alan Gould, Tom Rozich, Daniel D. Minor, Kenneth D. McKibben</i>	6,637,498

45.	11/11/03	<b>Quick Connect Fixture</b> <i>Daniel D. Minor, Jeff Grimshaw, Aaron Russick, Steven Sunday, Larry Erdman</i>	6,644,640
46.	11/18/03	<b>Module Casting System with Shared Controls (VRS&amp;H)</b> <i>Robert Macheske, Kenneth D. McKibben, Daniel D. Minor, Rick Van Horn</i>	6,648,058
47.	12/30/03	<b>Determining Separation Distance of Two Surfaces in a Hostile Environment</b> <i>Dave Good, Tom Rozich, William Seaton, Daniel D. Minor, Kenneth D. McKibben</i>	6,668,903
48.	7/20/04	<b>Proportional Mold Temperature Control for Casting System</b> <i>Dan Minor, Bob Macheske, Dave Good, Tom Rozich, Ken McKibben, Alan Gould, Diane Zekind, Karl Voss, Dave Gillette.</i>	6,763,879
49.	8/24/04	<b>"Method for Filling a Mold"</b> <i>Dave Good, Tom Rozich, Dan Minor, Kenneth McKibben, Robert Macheske, Mark Salgat, Brandon Schnettler.</i>	6,779,588
50.	5/17/05	<b>Trajectory Compensation for Tilttable Stopper-Poured Molten Metal Casting Vessel</b> <i>Dan Minor, Ken McKibben, Mark Salgat, Bill Seaton, Dave Good.</i>	6,892,791
51.	5/24/05	<b>Stopped-Poured Molten Metal Casting Vessel With Constant Head Height</b> <i>Dan Minor, Mark Salgat, William Seaton, Dave Good, Ken McKibben.</i>	6,896,032
52.	9/6/05	<b>Safety Block Device for Use in a Press Device</b> <i>Ken McKibben, Dan Minor, Mark Salgat, Robert Macheske, Michael Coffman, Aleksander Filipov.</i>	6,938,673

53. 2/7/06 **Process, Method, and Apparatus for Reducing Gas Bubbles in Lines Pressure Furnaces** 6,994,148  
*Dean VanderJagt, Dan Minor, Al Gould, Bob Macheske, Ken McKibben, Rick Van Horn, Roger Mucce, John Starks, Khushai Wardak*
54. 3/14/06 **Mold Rollover Apparatus** 7,011,138  
*Kenneth McKibben, Dan Minor, Mark Salgat, Alex Filipov, Brooks Lucas, Michael A. Thompson*
55. 11/28/06 **In-Gate/Runner Removal from an Aluminum Engine Block** 7,140,414  
*Kenneth McKibben, Dan Minor, Bob Macheske, Alan Gould*