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Wirtgen EX1002
U.S. Patent No. 9,975,538

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I am the Applicant:

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- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor
- ☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

Signature	<i>Dorothy J. Casey</i>	Date	2-14-15
Name	Dorothy J. Casey	Telephone	703-463-3002
Title and Company	Secretary, Caterpillar Paving Products Inc.		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms for more than one signature, see below *.

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Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	Milling Machine Fuel Efficiency Control System			
First Named Inventor/Applicant Name:	James A. Aardema			
Filer:	Robin Seunghyun O/Yazmin Nunez			
Attorney Docket Number:	50100/15-0379			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1600

Electronic Acknowledgement Receipt

EFS ID:	22379262
Application Number:	14715204
International Application Number:	
Confirmation Number:	2012
Title of Invention:	Milling Machine Fuel Efficiency Control System
First Named Inventor/Applicant Name:	James A. Aardema
Customer Number:	89881
Filer:	Robin Seunghyun O/Yazmin Nunez
Filer Authorized By:	Robin Seunghyun O
Attorney Docket Number:	50100/15-0379
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RAM confirmation Number	5332
Deposit Account	
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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Patent_Application_15-0379.pdf	184217 a75235d70aa3e8dc310a758af92a95589ddba765	yes	16
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	11	
	Claims		12	15	
	Abstract		16	16	
Warnings:					
Information:					
2	Application Data Sheet	ADS_15-0379.pdf	1561237 43981c50b042ba2c38b64edfbc23c07892d861ad	no	7
Warnings:					
Information:					
3	Drawings-only black and white line drawings	Formal_Drawings_15-0379.pdf	232678 1f08bd324bce221009166c31d2665e870973be	no	4
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	IDS_15-0379.pdf	612497 eae15a9a886126c9cf4eccc4ca0c7edec47f5d41	no	4
Warnings:					
Information:					
5	Power of Attorney	POA_15-0379.pdf	196373 8f5e45b488132c9d7c189200247d1b97d21d1b9d00	no	1
Warnings:					
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6	Fee Worksheet (SB06)	fee-info.pdf	34992 286f409901dcd12ec9231244e30a4c01c1bd3	no	2

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Milling Machine Fuel Efficiency Control System

Technical Field

[0001] The present disclosure generally relates to milling machines, and more particularly, to methods and systems for controlling the rotor speeds of cold planers and rotary mixers with optimized performance and fuel efficiency.

Background

[0002] Industrial machines, such as cold planers, pavement profilers, road milling machines, roadway planers, rotary mixers, and the like, are machines designed for scarifying, removing, mixing or reclaiming material from the surface of bituminous or concrete roadways and similar surfaces. These machines typically have a plurality of tracks or wheels which adjustably support and horizontally transport the machine along the surface of the road to be planed. Such milling machines also have a rotatable cutter or planing rotor that may be mechanically and/or hydraulically driven. Vertical adjustment of a milling machine with respect to the road surface may be provided by hydraulically adjustable rods that support the machine above its tracks or wheels.

[0003] The rotational speed of the cutter or rotor, or the rotor speed, of a conventional milling machine may be manually or automatically varied and adjusted by the operator. Typically, it may be desirable to maintain substantially constant rotor speed at the speed specified by the operator for at least the duration of a given milling task and/or until the operator chooses otherwise. However, changes in engine speed and engine load throughout the operation can cause unwanted variations in the rotor speed. Some milling machines, such as in U.S. Pat. No. 8,645,105 ("Parker"), provide variable transmissions

which allow for variations in the engine speed without affecting rotor speed. However, these conventional systems do not further address fuel efficiency, which is another concern that can be adversely affected by variations in engine speed and engine load.

[0004] Accordingly, there is a need for improved solutions for controlling and maintaining a desired rotor speed of a milling machine, which also takes fuel consumption or efficiency into consideration. The present disclosure is directed at addressing one or more of this need. However, it should be appreciated that the solution of any particular problem is not a limitation on the scope of this disclosure or of the attached claims except to the extent express noted.

Summary of the Disclosure

[0005] In one aspect of the present disclosure, a controller-implemented method of controlling a machine having a rotor coupled to an engine through a variable transmission is provided. The controller-implemented method may include receiving a desired rotor speed, determining an engine load of the engine, adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points, and adjusting a gear ratio of the variable transmission based on the engine speed and the desired rotor speed.

[0006] In another aspect of the present disclosure, a control system for controlling a machine having a rotor coupled to an engine through a variable transmission is provided. The control system may include a memory configured to retrievably store one or more algorithms, and a controller in communication with the memory. Based on the one or more algorithms, the controller may be configured to at least receive a desired rotor speed, determine an engine load of the engine, adjust an engine speed of the engine based on the

engine load and one or more predefined efficiency points, and adjust a gear ratio of the variable transmission based on the engine speed and the desired rotor speed.

[0007] In yet another aspect of the present disclosure, a machine having an engine, a variable transmission, a rotor and a controller is provided. Furthermore, the variable transmission may be operatively coupled to an output of the engine, the rotor may be operatively coupled to an output of the variable transmission, and the controller may be in electrical communication with one or more of the engine, variable transmission, and the rotor. The controller may be configured to determine an engine load, adjust an engine speed based on the engine load and one or more predefined efficiency points, and adjust a gear ratio of the variable transmission based on the engine speed to maintain a desired rotor speed.

Brief Description of the Drawings

[0008] Fig. 1 is a side view of one exemplary milling machine in accordance with the present disclosure;

[0009] Fig. 2 is a diagrammatic view of one exemplary control system of the present disclosure;

[0010] Fig. 3 is a graphical illustration of the relationships between the carrier speed, the ring gear speed and the sun gear speed of a planetary gear set that may be referenced by the present disclosure;

[0011] Fig. 4 is a tabular illustration of fuel consumption rates and the associated efficiency points that may be referenced by the present disclosure; and

[0012] Fig. 5 is a flow diagram of one exemplary method for controlling a milling machine of the present disclosure.

Detailed Description

[0013] Referring now to Fig. 1, one exemplary embodiment of a milling machine 100 is provided. Although shown as a cold planer, it will be understood that the milling machine 100 can alternatively include pavement profilers, road milling machines, roadway planers, rotary mixers, or any other suitable machine having a cutter or planing rotor and adapted to scarify, remove, mix or reclaim material from the surface of bituminous or concrete roadways and similar surfaces. As shown, the milling machine 100 may include a frame 102 that is carried along a road surface 104 by an arrangement of track assemblies 106. The frame 102 may be supported on the track assemblies 106 by hydraulically actuated adjustable struts 108 that extend between the track assemblies 106 and the frame 102. Hydraulic cylinders 110 may also be provided and used to raise and lower the milling machine 100. The milling machine 100 may also include a pickup conveyor belt 112 which delivers debris to a discharge conveyor belt 114 that is movably supported by a telescoping arm 116.

[0014] The milling machine 100 in Fig. 1 may further include a rotor 118 that is rotatably mounted to the frame 102, and a housing 120 that is disposed about the body of the rotor 118 but exposed to the road surface 104. The depth of the cut made by the rotor 118 may be controlled by the appropriate extension or retraction of the adjustable struts 108 and cylinders 110. The milling machine 100 may also include an engine 122 as a power source that may drive the rotor 118 via a hydrostatic, mechanical, or hydromechanical drive arrangement, such as a continuously variable transmission (CVT) 124, or the like. The engine 122 may be a combustion engine, such as a diesel engine, a gasoline engine, a natural gas engine, or the like. Furthermore, drive arrangements or configurations other than that shown in Fig. 1 can be employed. The milling machine

100 may further include an operator interface 126 which provides input and output devices enabling operator control of one or more of the engine 122, the CVT 124, the rotor 118, and the like.

[0015] Turning to Fig. 2, one exemplary embodiment of a control system 128 is provided which may be integrated into the milling machine 100 and used to control at least the rotor 118 in response to input received via the operator interface 126. As shown, the control system 128 may include a controller 130 that is in electrical communication with at least a memory 132, the operator interface 126, and one or more of the rotor 118, the engine 122, and the CVT 124. The controller 130 may further communicate with one or more sensors 134, such as encoders, Hall-effect sensors, variable reluctance sensors, anisotropic magnetoresistance sensors, or any other means for determining at least engine speed via an engine output 136 and rotor speed via a CVT output 138. The controller 130 may be implemented using one or more of a processor, a microprocessor, a microcontroller, an electronic control module (ECM), an electronic control unit (ECU), and any other suitable means for receiving input from the operator interface 126 and directly or indirectly providing control of the milling machine 100. Furthermore, the controller 130 may be configured to operate according to predetermined algorithms or sets of instructions retrievably stored within the associated memory 132.

[0016] As also shown in Fig. 2, the CVT 124 may further include a clutch 140, a mechanical arrangement 142, a hydrostatic arrangement 144, as well as a planetary gear set 146 having a sun gear 148, planetary gears 150, a carrier 152 and a ring gear 154. In the embodiment shown, the clutch 140 may selectively couple the engine output 136 to one or more of the mechanical arrangement 142 and the hydrostatic arrangement 144. The mechanical arrangement 142 may include any suitable arrangement of pulleys, belts,

roller chains, output shafts, and the like, configured to mechanically couple the engine output 136 to the sun gear 148. The hydrostatic arrangement 144 may include, for example, a hydraulic pump 156, a hydraulic motor 158, and corresponding fluid lines 160 collectively configured to hydromechanically couple the engine output 136 to the ring gear 154. More specifically, the engine output 136 may mechanically drive the hydraulic pump 156 to pressurize fluid within the fluid lines 160, and thereby cause the hydraulic motor 158 to mechanically drive the ring gear 154. The corresponding rotations of the carrier 152 may be directly communicated to the rotor 118 via the CVT output 138.

[0017] With further reference to Fig. 3, the CVT 124 and the planetary gear set 146 of Fig. 2 may be operated to continuously adjust the gear ratio, for instance, between the engine output 136 and the CVT output 138, in a manner which substantially maintains the rotor speed at the desired rotor speed specified by the operator irrespective of changes in the engine speed. As illustrated in Fig. 3, for example, any suitable rotor speed can be achieved and maintained at the carrier 152 by manipulation of the speed of the sun gear 148 and/or the speed of the ring gear 154, where the sun gear 148 is driven by the engine 122 and the ring gear 154 is driven by the hydraulic motor 158. Although shown in graphical form, relationships between the sun gear 148, carrier 152 and the ring gear 154 may be predetermined and preprogrammed within the memory 132 associated with the controller 130, such as in the form of lookup tables, maps, mathematical formulations, or any other suitable format that enables the controller 130 to automatically adjust one or more of the engine 122 and the hydraulic motor 158 to output a desired rotor speed.

[0018] In addition to providing a desired rotor speed, the gear ratio between the engine output 136 and the CVT output 138 may further be continuously adjusted in a manner that provides optimum fuel efficiency, or constrained according to predetermined fuel

consumption rates shown in Fig. 4. More specifically, the estimated fuel consumption rates for a given milling machine 100 and an associated engine 122 may be predetermined for different combinations of engine speed and engine load, where the engine load may include loads due to the rotor 118, the hydrostatic arrangement 144, and other parasitic loads. As graphically represented in Fig. 4, the relative fuel consumption rates may be used to predefine efficiency points 162, or combinations of engine speed and engine load expected to provide relatively better fuel economy. Information pertaining to these relationships between fuel consumption rate, engine speed and engine load, or at least the efficiency points 162 associated therewith, may be preprogrammed within the memory 132 and available to the controller 130, such as in the form of lookup tables, maps, mathematical formulations, or the like. Moreover, using the efficiency points 162 as reference, the controller 130 may be able to control the engine 122 to output an engine speed that is not only appropriate for the determined engine load, but also the fuel efficient.

[0019] Using a combination of such techniques, the controller 130 of the control system 128 of Fig. 2 may be capable of achieving and maintaining a desired rotor speed while optimizing fuel efficiency. Specifically, the controller 130 communicates with the engine 122 to adjust engine speed based on changes in the engine load and predefined efficiency points 162 for better fuel economy. The controller 130 further communicates with the CVT 124 to adjust the gear ratio based on changes in the engine speed for more consistent rotor speeds. Moreover, the controller 130 of Fig. 2 may be configured to control rotor speeds and optimize fuel efficiency based on algorithms or sets of instructions programmed therein and/or retrievably stored within the memory 132. While other variations and modifications will be apparent to those of ordinary skill in the art,

one exemplary algorithm or method by which the controller 130 may be operated is discussed in more detail below.

Industrial Applicability

[0020] In general, the present disclosure finds utility in various industrial applications involving the use of machines, such as cold planers, pavement profilers, road milling machines, roadway planers, rotary mixers, or other machines designed for scarifying, removing, mixing or reclaiming material from the surface of bituminous or concrete roadways and similar surfaces. In particular, by providing a milling machine with a cutter or rotor that is driven via a variable transmission with continuously adjustable gear ratios, the present disclosure is able to dynamically control the rotor and more reliably maintain desired rotor speeds specified by the operator. Furthermore, by constraining adjustments to the gear ratios based on predetermined fuel consumption rates and predefined efficiency points, the present disclosure is also able to dynamically control the engine to operate with better fuel economy.

[0021] Turning to Fig. 5, one exemplary algorithm or controller-implemented method 164 of controlling a milling machine 100 having a rotor 118 coupled to an engine 122 through a CVT 124 is diagrammatically provided. As shown in block 164-1, the controller 130 may initially receive a desired rotor speed from the operator, such as via the operator interface 126 of the milling machine 100. In block 164-2, the controller 130 may additionally monitor or determine the current engine speed and current engine load of the milling machine 100, such as via a sensor 134 located at the engine output 136. Additionally, in block 164-3, the controller 130 may retrieve, recall and/or refer to predefined fuel efficiency points 162, or any other predetermined information pertaining to the fuel consumption characteristics of the milling machine 100 stored in memory 132,

to determine an optimum engine speed for the given engine load. Once the optimum engine speed, or the engine speed expected to provide the optimum fuel efficiency, has been determined for the given engine load, the controller 130 in block 164-4 may compare the actual engine speed to the optimum engine speed.

[0022] If the actual engine speed is not at the optimum engine speed as derived from the predefined fuel efficiency points 162 in block 164-4 of Fig. 5, the controller 130 may increase or decrease the engine speed in block 164-5 until the optimum engine speed is substantially achieved. Once the engine speed has been determined to be at the optimum engine speed, the controller 130 may proceed to block 164-6 to determine the actual speed of the rotor 118, such as via a sensor located at the CVT output 138. If, however, the controller 130 in block 164-4 determines the actual engine speed to be already at the optimum engine speed, the controller 130 may proceed to block 164-6 as shown without adjusting engine speed. Furthermore, once the actual rotor speed has been determined in block 164-6, the controller 130 in block 164-7 may compare the actual rotor speed to the desired rotor speed specified by the operator to determine if any adjustments need to be made in the gear ratio of the CVT 124.

[0023] If the actual rotor speed is not in substantial agreement with the desired rotor speed in block 164-7, the controller 130 may proceed to block 164-8 to adjust the gear ratio of the CVT 124 accordingly. For example, the controller 130 may derive the current speed of the sun gear 148 of the CVT 124 based on the optimum engine speed determined in blocks 164-4 and 164-5, and further, derive the target speed of the carrier 152 based on the desired rotor speed received in block 164-1. The controller 130 may then apply the sun gear speed and the carrier speed to predetermined relationships of the planetary gear set 146 of the CVT 124, as graphically illustrated in Fig. 3 for example, to derive the

target speed of the ring gear 154. The controller 130 may further control the speed of the ring gear 154 via the hydraulic motor 158 of the CVT 124 until the target ring gear speed, and thereby the corresponding target carrier speed and desired rotor speed, is achieved.

If, however, the actual rotor speed is determined to be already at the desired rotor speed in block 164-7, the controller 130 may proceed to block 164-9 to monitor for any changes necessitating further gear ratio adjustments.

[0024] Once the desired rotor speed has been achieved for a given iteration of the method 164, the controller 130 may proceed to block 164-9 of Fig. 5 to continue making any necessary adjustments to the gear ratio of the CVT 124. Adjustments to the gear ratio may be intended to not only substantially maintain the rotor 118 at the desired rotor speed, but also to maintain the optimum engine speed for the given engine load. For example, the controller 130 may continue monitoring for significant changes in one or more of the actual rotor speed, the desired rotor speed, the engine speed and the engine load, and if substantial changes are detected, repeat any one or more of the functions or blocks of Fig. 5 as necessary. Iterations of the method 164 of Fig. 5 may be repeated in such manner as needed, or for example, for as long as the rotor 118 is in use and for as long as a desired rotor speed has been received by the operator interface 126. Furthermore, it will be understood that any two or more functions or blocks of the method 164 of Fig. 5 may be performed simultaneously or in sequences other than as shown to provide comparable results.

[0025] From the foregoing, it will be appreciated that while only certain embodiments have been set forth for the purposes of illustration, alternatives and modifications will be apparent from the above description to those skilled in the art. These and other

alternatives are considered equivalents and within the spirit and scope of this disclosure and the appended claims.

Claims

What is claimed is:

1. A controller-implemented method of controlling a machine having a rotor coupled to an engine through a variable transmission, comprising:
receiving a desired rotor speed;
determining an engine load of the engine;
adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points; and
adjusting a gear ratio of the variable transmission based on the engine speed and the desired rotor speed.
2. The controller-implemented method of claim 1, wherein the desired rotor speed is received through an operator interface of the machine.
3. The controller-implemented method of claim 1, wherein the engine load includes loads due to at least the rotor and a hydrostatic arrangement.
4. The controller-implemented method of claim 1, wherein the engine speed is automatically adjusted based on detected changes in the engine load according to one or more predetermined relationships providing a plurality of the predefined efficiency points, the predefined efficiency points being at least partially based on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads.
5. The controller-implemented method of claim 1, wherein the gear ratio of the variable transmission is automatically adjusted to maintain a rotor speed of the rotor at the desired rotor speed irrespective of changes in the engine speed.

6. A control system for controlling a machine having a rotor coupled to an engine through a variable transmission, comprising:

a memory configured to retrievably store one or more algorithms; and
a controller in communication with the memory and, based on the one or more algorithms, configured to at least receive a desired rotor speed, determine an engine load of the engine, adjust an engine speed of the engine based on the engine load and one or more predefined efficiency points, and adjust a gear ratio of the variable transmission based on the engine speed and the desired rotor speed.

7. The control system of claim 6, wherein the controller is configured to receive the desired rotor speed through an operator interface of the machine.

8. The control system of claim 6, wherein the controller is configured to determine the engine load as a sum of loads due to at least the rotor and a hydrostatic arrangement.

9. The control system of claim 6, wherein the controller is configured to automatically adjust the engine speed based on changes in the engine load according to one or more predetermined relationships providing a plurality of the predefined efficiency points, the predetermined relationships being stored within the memory, the predefined efficiency points providing optimum engine speeds for different engine loads and being based at least partially on predetermined fuel consumption rates.

10. The control system of claim 6, wherein the controller is configured to automatically adjust the gear ratio to maintain a rotor speed of the rotor at the desired rotor speed irrespective of changes in the engine speed.

11. The control system of claim 6, wherein the controller is configured to adjust the gear ratio through control of a hydraulic motor of the variable transmission.

12. The control system of claim 6, wherein the controller is configured to selectively disengage the rotor from the engine through control of a clutch disposed between the rotor and the engine.

13. A machine, comprising:
an engine;
a variable transmission operatively coupled to an output of the engine;
a rotor operatively coupled to an output of the variable transmission; and
a controller in electrical communication with one or more of the engine, variable transmission, and the rotor, the controller being configured to determine an engine load, adjust an engine speed based on the engine load and one or more predefined efficiency points, and adjust a gear ratio of the variable transmission based on the engine speed to maintain a desired rotor speed.

14. The machine of claim 13, wherein the variable transmission includes a gear set and a hydraulic motor configured to adjust a rotor speed of the rotor.

15. The machine of claim 14, wherein the gear set is a planetary gear set having a sun gear coupled to the engine, a carrier coupled to the rotor, and a ring gear coupled to the hydraulic motor.

16. The machine of claim 14, wherein the controller is configured to adjust the gear ratio through control of the hydraulic motor.

17. The machine of claim 13, wherein the controller is configured to determine the engine load as a sum of loads due to at least the rotor and a hydrostatic arrangement.

18. The machine of claim 13, wherein the controller is configured to automatically adjust the engine speed based on changes in the engine load according to

one or more predetermined relationships providing a plurality of the predefined efficiency points, the predefined efficiency points providing optimum engine speeds for different engine loads and being based at least partially on predetermined fuel consumption rates.

19. The machine of claim 13, further comprising an operator interface configured to at least receive the desired rotor speed from an operator of the machine, the controller being configured to receive the desired rotor speed from the operator interface.

20. The machine of claim 13, further comprising a clutch disposed between the engine and the rotor, the controller being configured to selectively disengage the rotor from the engine through control of the clutch.

Abstract of the Disclosure

Milling Machine Fuel Efficiency Control System

A controller-implemented method of controlling a machine having a rotor coupled to an engine through a variable transmission is provided. The controller-implemented method may include receiving a desired rotor speed, determining an engine load of the engine, adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points, and adjusting a gear ratio of the variable transmission based on the engine speed and the desired rotor speed.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50100/15-0379
		Application Number	
Title of Invention	Milling Machine Fuel Efficiency Control System		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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Inventor Information:

Inventor 1					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	James	A.	Aardema			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	Plymouth	State/Province	MN	Country of Residence i	US	
Mailing Address of Inventor:						
Address 1		15495 58th Place North				
Address 2						
City	Plymouth	State/Province	MN			
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All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add						

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<input type="checkbox"/> An Address is being provided for the correspondence Information of this application.			
Customer Number	89881		
Email Address	tmiller@millermatthiashull.com	Add Email	Remove Email
Email Address	ro@millermatthiashull.com	Add Email	Remove Email

Application Information:

Title of the Invention	Milling Machine Fuel Efficiency Control System		
Attorney Docket Number	50100/15-0379	Small Entity Status Claimed	<input type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	Suggested Figure for Publication (if any)	1

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50100/15-0379
		Application Number	
Title of Invention	Milling Machine Fuel Efficiency Control System		

Filing By Reference :

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

Request Not to Publish. I hereby request that the attached application not be published under

☐ 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	89881		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50100/15-0379
		Application Number	
Title of Invention	Milling Machine Fuel Efficiency Control System		

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove			
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ^j (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

<input type="checkbox"/> This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

<input checked="" type="checkbox"/> Authorization to Permit Access to the Instant Application by the Participating Offices
--

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50100/15-0379
		Application Number	
Title of Invention	Milling Machine Fuel Efficiency Control System		

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant 1			Remove
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
Clear			
<input checked="" type="radio"/> Assignee	<input type="radio"/> Legal Representative under 35 U.S.C. 117	<input type="radio"/> Joint Inventor	
<input type="radio"/> Person to whom the inventor is obligated to assign.		<input type="radio"/> Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor : <input type="text"/>			
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>			
Organization Name	CATERPILLAR PAVING PRODUCTS INC.		
Mailing Address Information:			
Address 1	9401 85TH AVENUE NORTH		
Address 2			
City	BROOKLYN PARK	State/Province	MN
Country ⁱ	US	Postal Code	55445-2199
Phone Number		Fax Number	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50100/15-0379
		Application Number	
Title of Invention	Milling Machine Fuel Efficiency Control System		
Email Address	us_docket_clerk@cat.com		
Additional Applicant Data may be generated within this form by selecting the Add button.			<input type="button" value="Add"/>

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.			
			<input type="button" value="Remove"/>
If the Assignee or Non-Applicant Assignee is an Organization check here.			<input checked="" type="checkbox"/>
Organization Name	CATERPILLAR PAVING PRODUCTS INC.		
Mailing Address Information For Assignee including Non-Applicant Assignee:			
Address 1	9401 85TH AVENUE NORTH		
Address 2			
City	BROOKLYN PARK	State/Province	MN
Country i	US	Postal Code	55445-2199
Phone Number		Fax Number	
Email Address	us_docket_clerk@cat.com		
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.			<input type="button" value="Add"/>

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications					
Signature	/Robin S. O/			Date (YYYY-MM-DD)	2015-05-18
First Name	Robin	Last Name	O	Registration Number	60043
Additional Signature may be generated within this form by selecting the Add button.					<input type="button" value="Add"/>

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50100/15-0379
		Application Number	
Title of Invention	Milling Machine Fuel Efficiency Control System		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

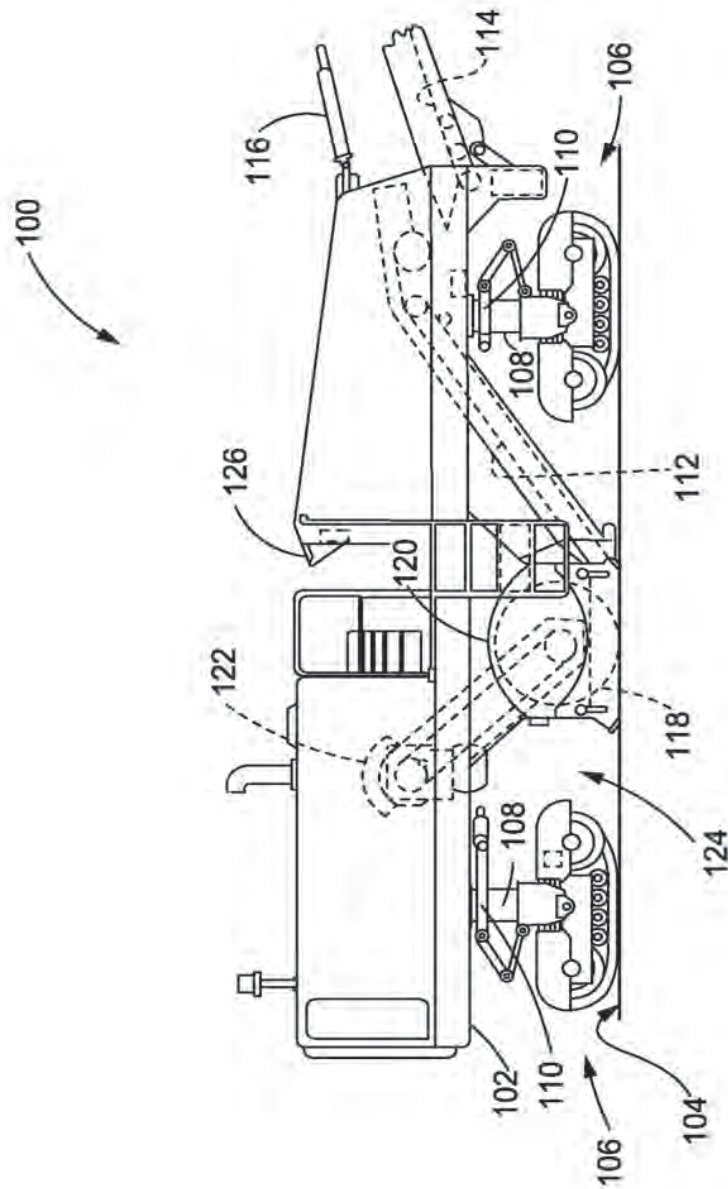


FIG. 1

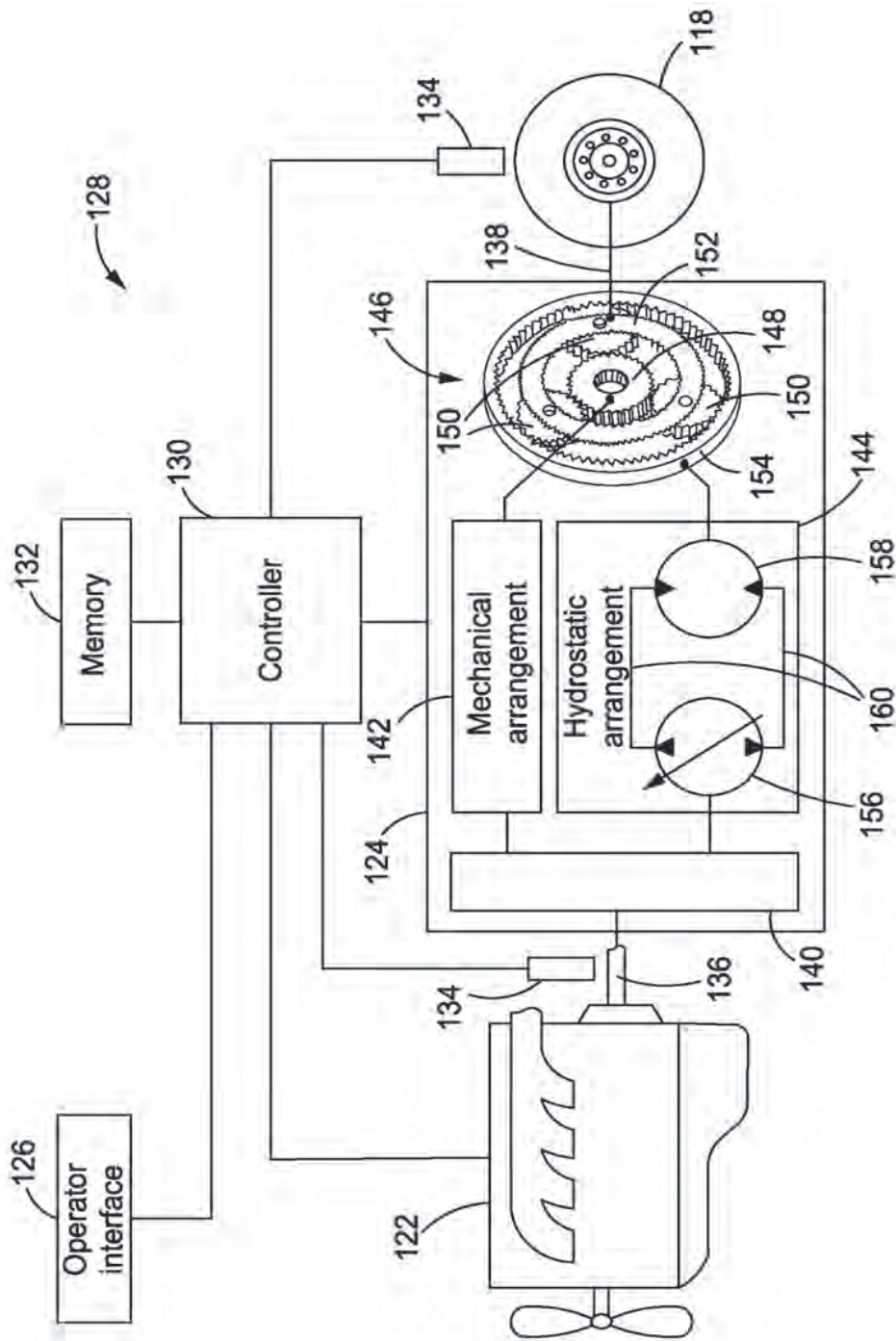


FIG.2

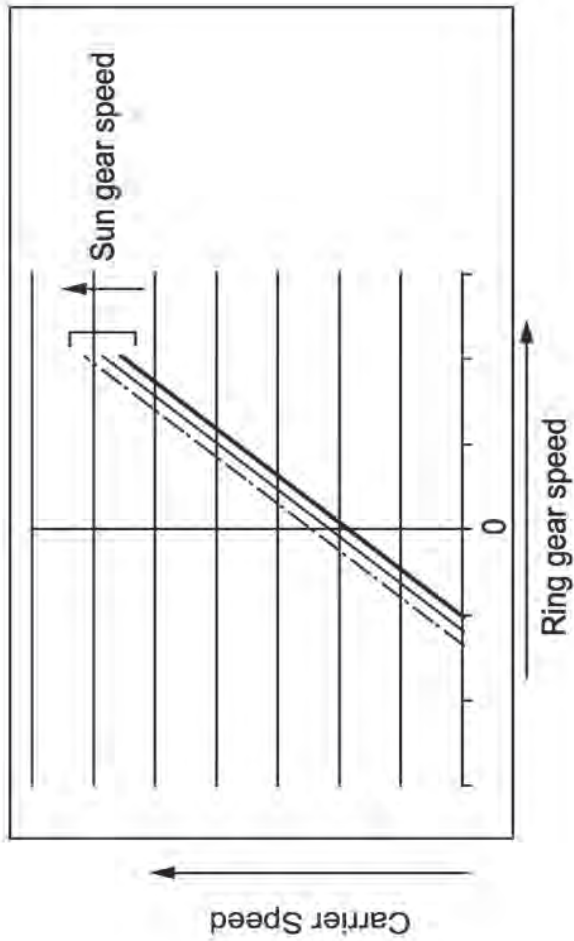


FIG.3

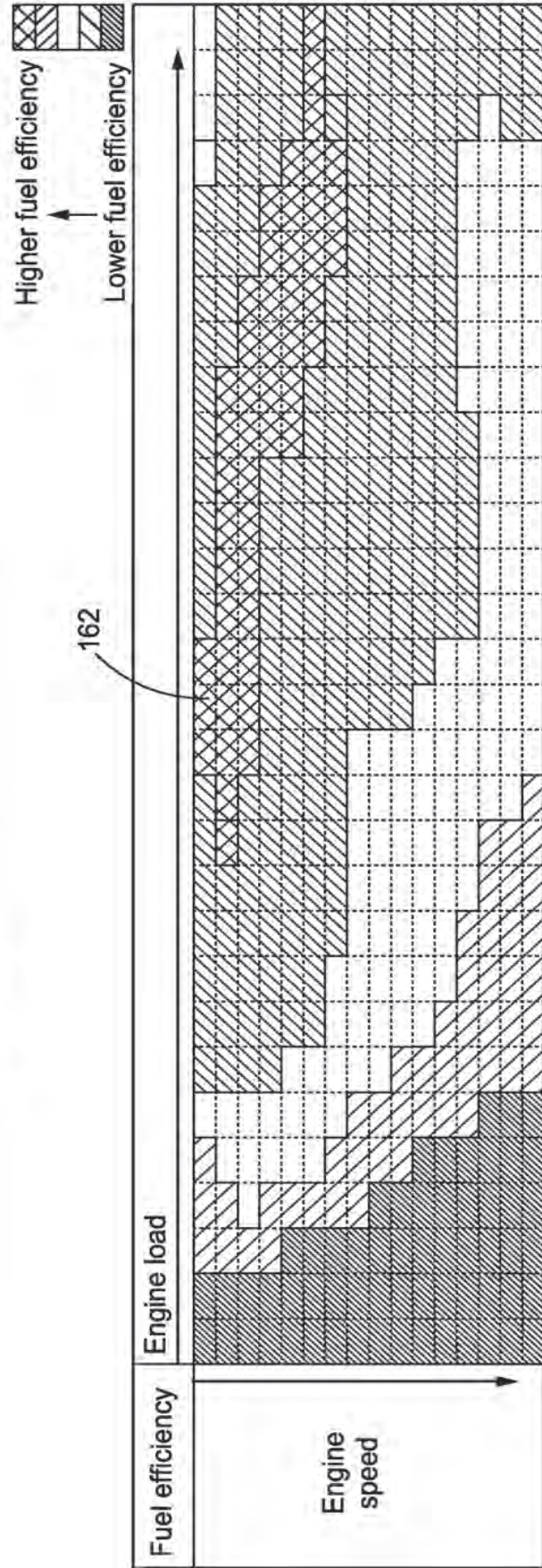


FIG.4

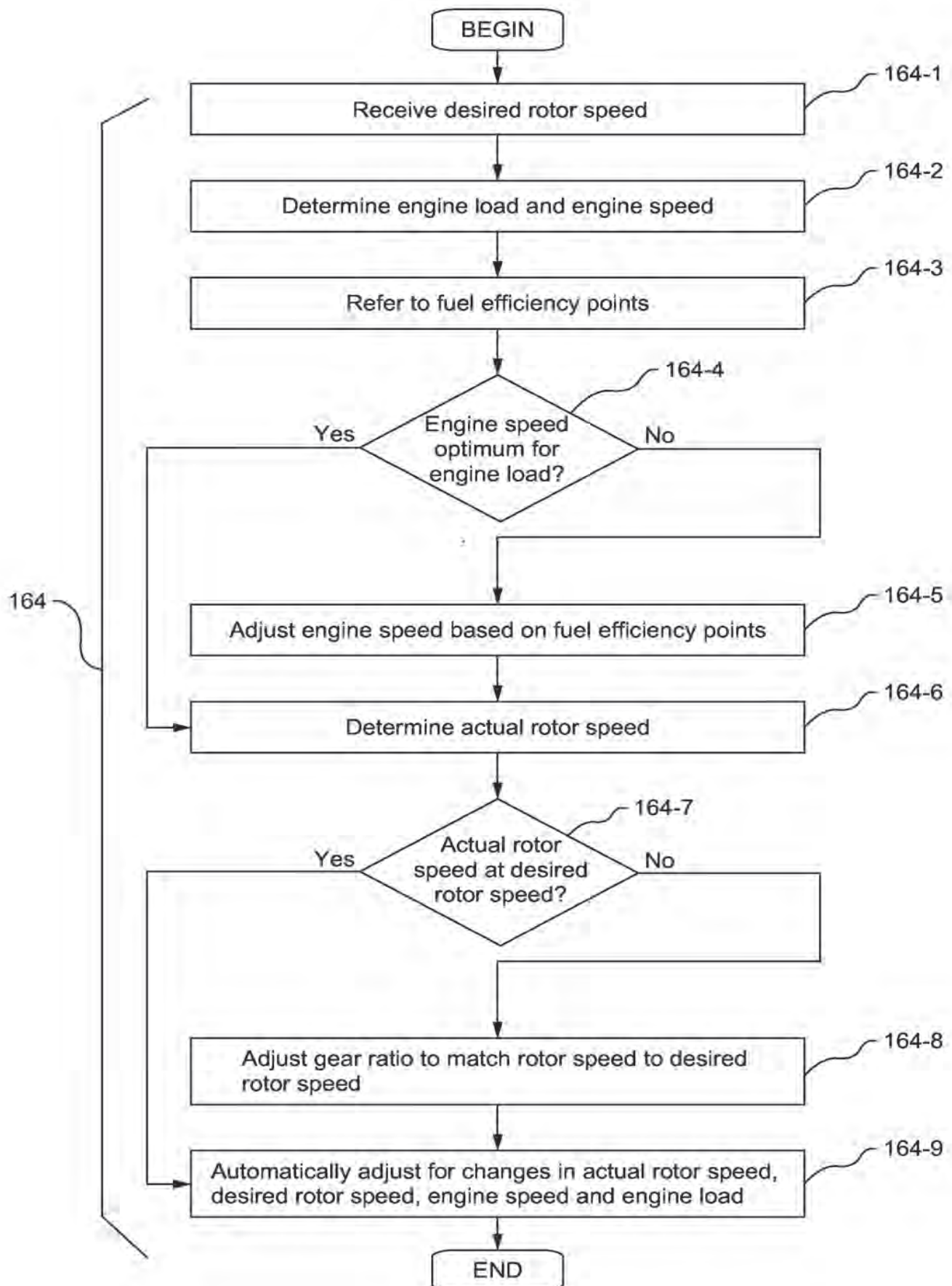


FIG.5

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date			
	First Named Inventor	James A. Aardema		
	Art Unit			
	Examiner Name			
	Attorney Docket Number	50100/15-0379		

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8622871	B2	2014-01-07	Brian D. Hoff	
	2	8465105	B2	2013-06-18	Carl D. Parker	
	3	8408838	B2	2013-04-02	Paul E. Willis	

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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20130079999	A1	2013-03-28	Daniel H. Killion, et al.	
	2	20070150166	A1	2007-06-28	Hisaho Mino, et al.	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		
First Named Inventor	James A. Aardema	
Art Unit		
Examiner Name		
Attorney Docket Number	50100/15-0379	

	1							<input type="checkbox"/>
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1		<input type="checkbox"/>

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	James A. Aardema
Art Unit	
Examiner Name	
Attorney Docket Number	50100/15-0379

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robin S. O/	Date (YYYY-MM-DD)	2015-05-18
Name/Print	Robin S. O	Registration Number	60043

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/715,204	05/18/2015	2831	1600	50100/15-0379	20	3

CONFIRMATION NO. 2012

FILING RECEIPT



CC00000075402753

89881

Caterpillar/ Miller, Matthias & Hull LLP
One North Franklin Street
Suite 2350
Chicago, IL 60606

Date Mailed: 05/29/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

James A. Aardema, Plymouth, MN;

Applicant(s)

CATERPILLAR PAVING PRODUCTS INC., Brooklyn Park, MN;

Assignment For Published Patent Application

CATERPILLAR PAVING PRODUCTS INC., Brooklyn Park, MN

Power of Attorney: The patent practitioners associated with Customer Number 89881**Domestic Applications for which benefit is claimed - None.**

A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 05/27/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/715,204**

Projected Publication Date: 11/24/2016**Non-Publication Request:** No

Early Publication Request: No
Title

Milling Machine Fuel Efficiency Control System

Preliminary Class

290

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/715,204	05/18/2015	James A. Aardema	50100/15-0379

CONFIRMATION NO. 2012

FORMALITIES LETTER



OC000000075402754

89881

Caterpillar/ Miller, Matthias & Hull LLP
One North Franklin Street
Suite 2350
Chicago, IL 60606

Date Mailed: 05/29/2015

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing.

Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
The surcharge is due for any one of:
 - late submission of the basic filing fee, search fee, or examination fee,
 - late submission of inventor's oath or declaration,
 - filing an application that does not contain at least one claim on filing, or
 - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. No entity status discount is in effect. If applicant is qualified for small entity status, a written assertion of small entity status must be submitted to establish small entity status. (See 37 CFR 1.27). If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- \$ **140** surcharge.
- \$(**0**) previous unapplied payment amount.
- \$ **140** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
James A. Aardema

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".
<https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at
(571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/bcao/

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
14/715,204

APPLICATION AS FILED - PART I

(Column 1)		(Column 2)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)			RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A				N/A	280
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A				N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A				N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	20	minus 20 = *				OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3	minus 3 = *					x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).							0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))								0.00
			TOTAL				TOTAL	1600

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)		
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=		
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=		
	Application Size Fee (37 CFR 1.16(s))							OR				
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR				
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE			

		(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)		
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=		
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=		
	Application Size Fee (37 CFR 1.16(s))							OR				
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR				
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE			

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

Attorney Docket No.: 50100/15-0379
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

James A. Aardema

Application No.: 14/715,204

Confirmation No.: 2012

Filed: May 18, 2015

Art Unit: 2831

For: Milling Machine Fuel Efficiency Control
System

Examiner: To be assigned

RESPONSE TO NOTICE OF MISSING PARTS

MS Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Notice to File Missing Parts mailed on May 29, 2015, applicants respectfully enclose an inventor declaration and electronic payment of \$140.00 to cover the surcharge for submission of a late declaration.

Dated: July 29, 2015

Respectfully submitted,

By /Robin S. O/
Robin S. O
Registration No.: 60,043
MILLER, MATTHIAS & HULL LLP
One North Franklin Street
Suite 2350
Chicago, Illinois 60606
(312) 977-9902
Agent for Applicants

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of
Invention

MILLING MACHINE FUEL EFFICIENCY CONTROL SYSTEM

As the below named inventor, I hereby declare that:

This declaration
is directed to:

☐

The attached application, or

☒

United States application or PCT international application number 14/715,204

filed on May 18, 2015

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: James A. Aardema

Date (Optional): 7/28/2015

Signature: [Handwritten Signature]

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 7 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

(If you need assistance in completing this form, call 1-800-PTO-7199 and select option 2)

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	14715204			
Filing Date:	18-May-2015			
Title of Invention:	Milling Machine Fuel Efficiency Control System			
First Named Inventor/Applicant Name:	James A. Aardema			
Filer:	Robin Seunghyun O/Meg Boinski			
Attorney Docket Number:	50100/15-0379			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Late Filing Fee for Oath or Declaration	1051	1	140	140
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				140

Electronic Acknowledgement Receipt

EFS ID:	23058517
Application Number:	14715204
International Application Number:	
Confirmation Number:	2012
Title of Invention:	Milling Machine Fuel Efficiency Control System
First Named Inventor/Applicant Name:	James A. Aardema
Customer Number:	89881
Filer:	Robin Seunghyun O/Meg Boinski
Filer Authorized By:	Robin Seunghyun O
Attorney Docket Number:	50100/15-0379
Receipt Date:	29-JUL-2015
Filing Date:	18-MAY-2015
Time Stamp:	14:54:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 140
RAM confirmation Number	1128
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	15-0379-US_RESP_NOMP_7-29-15.pdf	16457 20526661789dca16d1678211835250f194977890	no	1

Warnings:**Information:**

2	Oath or Declaration filed	15-0379-US_Executed_Declaration.pdf	521514 4cb91022b6a603ff6a3106048d142e2a9e349367	no	2
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Warnings:

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

Information:

3	Fee Worksheet (SB06)	fee-info.pdf	30151 acad03aa1a37646981b5a5b59b2f4130c72f4421	no	2
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Warnings:**Information:**

Total Files Size (in bytes):	568122
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
14/715,204

APPLICATION AS FILED - PART I

(Column 1)		(Column 2)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)			RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A				N/A	280
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A				N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A				N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	20	minus 20 = *				OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3	minus 3 = *					x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).							0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))								0.00
			TOTAL				TOTAL	1600

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)				RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=		
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=		
	Application Size Fee (37 CFR 1.16(s))											
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
							TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		

		(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)				RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=		
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=		
	Application Size Fee (37 CFR 1.16(s))											
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
							TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/715,204	05/18/2015	2831	1740	50100/15-0379	20	3

**CONFIRMATION NO. 2012
UPDATED FILING RECEIPT**



CC00000078879647

89881

Caterpillar/ Miller, Matthias & Hull LLP
One North Franklin Street
Suite 2350
Chicago, IL 60606

Date Mailed: 08/05/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

James A. Aardema, Plymouth, MN;

Applicant(s)

CATERPILLAR PAVING PRODUCTS INC., Brooklyn Park, MN;

Assignment For Published Patent Application

CATERPILLAR PAVING PRODUCTS INC., Brooklyn Park, MN

Power of Attorney: The patent practitioners associated with Customer Number 89881**Domestic Applications for which benefit is claimed - None.**

A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 05/27/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/715,204**

Projected Publication Date: 11/24/2016**Non-Publication Request:** No

Early Publication Request: No
Title

Milling Machine Fuel Efficiency Control System

Preliminary Class

290

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/715,204	05/18/2015	James A. Aardema	50100/15-0379

CONFIRMATION NO. 2012

PUBLICATION NOTICE



OC000000087446586

89881

Caterpillar/ Miller, Matthias & Hull LLP
One North Franklin Street
Suite 2350
Chicago, IL 60606

Title: Milling Machine Fuel Efficiency Control System

Publication No. US-2016-0339917-A1

Publication Date: 11/24/2016

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/715,204	05/18/2015	James A. Aardema	50100/15-0379	2012

89881 7590 03/24/2017
Caterpillar/ Miller, Matthias & Hull LLP
One North Franklin Street
Suite 2350
Chicago, IL 60606

EXAMINER

HLAVKA, DAVID J

ART UNIT	PAPER NUMBER
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3659

NOTIFICATION DATE	DELIVERY MODE
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03/24/2017

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

tmiller@millermatthiashull.com
mlroye@millermatthiashull.com
us_docket_clerk@cat.com

Office Action Summary

Application No.
14/715,204

Applicant(s)
AARDEMA, JAMES A.

Examiner
DAVID J. HLAVKA

Art Unit
3659

AIA (First Inventor to File)
Status
Yes

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2015.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 1-20 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☐ Claim(s) ____ is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date ____
- 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 4) ☐ Other: ____

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

DETAILED ACTION

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-5 and 13-20, drawn to a machine and method of controlling said machine, classified in B60W30/188.

- II. Claims 6-12, drawn to a control system, classified in G06F17/00.

The inventions are distinct, each from the other because of the following reasons:

3. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the subcombination requires memory configured to retrievably store on or more algorithms that a controller communicates with. There is no such requirement in the combination, as it merely reads and determines parameters and then acts based on said parameters. The subcombination has separate utility such as a control system that has more than one control algorithm.

The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

4. Restriction for examination purposes as indicated is proper because all the inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and/or examination burden if restriction were not required because one or more of the following reasons apply:

- *the inventions or groupings of patentably indistinct inventions require a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search strategies or search queries).*

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected invention.**

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election

shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID J. HLAVKA whose telephone number is (571)270-3218. The examiner can normally be reached on Monday-Thursday EST, 8:00 AM-4:00 PM Alternate Friday.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ramya Burgess can be reached on (571) 272-6011. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DAVID J HLAVKA/
Primary Examiner, Art Unit 3659



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BIB DATA SHEET

CONFIRMATION NO. 2012

SERIAL NUMBER 14/715,204	FILING or 371(c) DATE 05/18/2015 RULE	CLASS 477	GROUP ART UNIT 3659	ATTORNEY DOCKET NO. 50100/15-0379		
APPLICANTS CATERPILLAR PAVING PRODUCTS INC., Brooklyn Park, MN; INVENTORS James A. Aardema, Plymouth, MN; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 05/27/2015						
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and Acknowledged <u>/ David J Hlavka /</u> Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	STATE OR COUNTRY MN	SHEETS DRAWINGS 4	TOTAL CLAIMS 20	INDEPENDENT CLAIMS 3
ADDRESS Caterpillar/ Miller, Matthias & Hull LLP One North Franklin Street Suite 2350 Chicago, IL 60606 UNITED STATES						
TITLE Milling Machine Fuel Efficiency Control System						
FILING FEE RECEIVED 1740	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit			

<i>Index of Claims</i> 	Application/Control No. 14715204	Applicant(s)/Patent Under Reexamination AARDEMA, JAMES A.
	Examiner DAVID J HLAVKA	Art Unit 3659

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant			<input type="checkbox"/> CPA			<input type="checkbox"/> T.D.			<input type="checkbox"/> R.1.47		
CLAIM		DATE									
Final	Original	03/18/2017									
	1	+									
	2	+									
	3	+									
	4	+									
	5	+									
	6	+									
	7	+									
	8	+									
	9	+									
	10	+									
	11	+									
	12	+									
	13	+									
	14	+									
	15	+									
	16	+									
	17	+									
	18	+									
	19	+									
	20	+									

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of)	
)	
James A. Aardema)	Art Unit: 3659
)	
Application No.: 14/715,204)	
)	Examiner: David J. Hlavka
)	
Filed: May 18, 2015)	
)	Confirmation No: 2012
)	
For: MILLING MACHINE FUEL)	
EFFICIENCY CONTROL SYSTEM)	
)	
Attorney Docket No.: 50100/15-0379)	
_____)	

Mail Stop Amendment

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Via EFS-Web

RESPONSE TO RESTRICTION REQUIREMENT

This paper is filed in response to the Restriction Requirement dated March 24, 2017.

Restriction has been required under 35 U.S.C. § 121 between:

Group I: Claims 1-5 and 13-20, drawn to a machine and method of controlling said machine, classified in B60W30/188; and

Group II: Claims 6-12, drawn to a control system, classified in G06F17/00.

Applicant elects the invention of Group I corresponding to claims 1-5 and 13-20, without traverse. Applicants reserve the right to file one or more divisional applications corresponding to the non-elected subject matter.

If there are any remaining issues, the Examiner is requested to call the undersigned.

Please grant any extensions of time required to enter this response and charge and additional fees to our Deposit Account No. 03-1129.

Respectfully submitted,

/Derek J. Somogy/

Derek J. Somogy, Reg. No. 66,833
Caterpillar Inc.

June 27, 2017

Telephone: (309) 494-4483

Facsimile: (309) 675-1236

Electronic Patent Application Fee Transmittal

Application Number:	14715204			
Filing Date:	18-May-2015			
Title of Invention:	Milling Machine Fuel Efficiency Control System			
First Named Inventor/Applicant Name:	James A. Aardema			
Filer:	Derek James Somogyi			
Attorney Docket Number:	50100/15-0379			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 2 months with \$0 paid	1252	1	600	600
Miscellaneous:				
Total in USD (\$)				600

Electronic Acknowledgement Receipt

EFS ID:	29623494
Application Number:	14715204
International Application Number:	
Confirmation Number:	2012
Title of Invention:	Milling Machine Fuel Efficiency Control System
First Named Inventor/Applicant Name:	James A. Aardema
Customer Number:	89881
Filer:	Derek James Somogy
Filer Authorized By:	
Attorney Docket Number:	50100/15-0379
Receipt Date:	27-JUN-2017
Filing Date:	18-MAY-2015
Time Stamp:	16:09:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$600
RAM confirmation Number	062817INTEFSW00003159031129
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response to Election / Restriction Filed	15-0379_response_to_RR_date_d_03-24-2017.pdf	64570 5415f43d624ce050d0a13e27067415d92b571eq57	no	2

Warnings:**Information:**

2	Fee Worksheet (SB06)	fee-info.pdf	30366 b420dba54bdf60ba2731a5591602ce848d4811d1	no	2
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Warnings:**Information:**

Total Files Size (in bytes):	94936
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/715,204	05/18/2015	James A. Aardema	50100/15-0379	2012

89881 7590 09/29/2017
Caterpillar/ Miller, Matthias & Hull LLP
One North Franklin Street
Suite 2350
Chicago, IL 60606

EXAMINER

HLAVKA, DAVID J

ART UNIT	PAPER NUMBER
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3659

NOTIFICATION DATE	DELIVERY MODE
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09/29/2017

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

tmiller@millermatthiashull.com
us_docket_clerk@cat.com
ynunez@millermatthiashull.com

Office Action Summary

Application No.
14/715,204

Applicant(s)
AARDEMA, JAMES A.

Examiner
DAVID J. HLAVKA

Art Unit
3659

AIA (First Inventor to File)
Status
Yes

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2015.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 1-20 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-3, 5, 13, 14, 16, 17, 19 and 20 is/are rejected.
- 8) ☒ Claim(s) 4, 15 and 18 is/are objected to.
- 9) ☒ Claim(s) 6-12 are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 18 May 2015 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date 5/18/2015
- 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date, ____
- 4) ☐ Other: ____

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA. This is the first Office Action on merits for application no. 14/715,104 filed 18 May 2015. Claims 1-20 pending. Claims 6-12 withdrawn from consideration.

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 18 May 2015 in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Election/Restrictions

3. Claims 6-12 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on.

Claim Rejections - 35 USC § 102

4. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

6. Claims 1-3, 5, 13, 14, 16, 17, 19 and 20 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by U.S. Patent Publication No. 2008/0173740 to Parker et al. (hereinafter referred to as Parker).

7. Regarding claims 1-3, 5, 13, 14, 16, 17, 19 and 20, Parker discloses:

Claim 1:

- A controller-implemented method of controlling a machine having a rotor (i.e., 30) coupled to an engine (i.e., 16) through a variable transmission (i.e., 20), comprising: receiving a desired rotor speed (i.e., 116; [0032]); determining an engine load of the engine; adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points; and adjusting a gear ratio of the variable transmission based on the engine speed and the desired rotor speed (i.e., [0039] discloses maintaining consistent drum rotation).

Claim 2:

- Wherein the desired rotor speed is received through an operator interface of the machine (i.e., 116; [0031]).

Claim 3:

- Wherein the engine load includes loads due to at least the rotor and a hydrostatic arrangement (i.e., [0039]; [0044] discloses hydrostatic system).

Claim 5:

- Wherein the gear ratio of the variable transmission is automatically adjusted to maintain a rotor speed of the rotor at the desired rotor speed irrespective of changes in the engine speed (i.e., [0039]).

Claim 13:

- A machine, comprising: an engine (i.e., 16); a variable transmission operatively coupled to an output of the engine (i.e., 20); a rotor operatively coupled to an output of the variable transmission (i.e., 30); and a controller in electrical communication with one or more of the engine, variable transmission, and the rotor (i.e., 42), the controller being configured to determine an engine load, adjust an engine speed based on the engine load and one or more predefined efficiency points, and adjust a gear ratio of the variable transmission based on the engine speed to maintain a desired rotor speed (i.e., [0039]).

Claim 14:

- Wherein the variable transmission includes a gear set (i.e., 38 and planetary Fig. 2) and a hydraulic motor (i.e., [0044] hydrostatic motor) configured to adjust a rotor speed of the rotor.

Claim 16:

- Wherein the controller is configured to adjust the gear ratio through control of the hydraulic motor (i.e., [0039] uses motors and pumps through transmission to control; [0044]).

Claim 17:

- Wherein the controller is configured to determine the engine load as a sum of loads due to at least the rotor and a hydrostatic arrangement (i.e., [0039]).

Claim 19:

- Further comprising an operator interface configured to at least receive the desired rotor speed from an operator of the machine, the controller being configured to receive the desired rotor speed from the operator interface (i.e., 116; [0031]).

Claim 20:

- Further comprising a clutch disposed between the engine and the rotor, the controller being configured to selectively disengage the rotor from the engine through control of the clutch (i.e., [0029] discloses clutching device associated with drum).

Allowable Subject Matter

8. Claims 4, 15 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art as set forth in the attached "Notice of References Cited" disclose various systems that utilize features set forth in the limitations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID J. HLAVKA whose telephone number is (571)270-3218. The examiner can normally be reached on Monday-Thursday EST, 8:00 AM-4:00 PM Alternate Friday.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ramya Burgess can be reached on (571) 272-6011. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DAVID J HLAVKA/
Primary Examiner, Art Unit 3659

Notice of References Cited

Application/Control No.

14/715,204

Applicant(s)/Patent Under
Reexamination
AARDEMA, JAMES A.

Examiner

DAVID J. HLAVKA

Art Unit

3659

Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2008/0173740 A1	07-2008	Parker; Carl D.	E01C23/088	241/33
*	B	US-8,408,838 B2	04-2013	Willis; Paul E.	E01C23/088	299/1.5
*	C	US-6,921,230 B2	07-2005	Silay; Louis E.	E01C23/088	299/1.5
*	D	US-7,434,889 B2	10-2008	Moller; Karl H.	B23D59/001	299/1.5
*	E	US-9,267,446 B2	02-2016	Killion; Daniel	F02D29/00	1/1
*	F	US-2007/0026910 A1	02-2007	Brome; John G.	A01D41/127	460/6
*	G	US-2014/0155212 A1	06-2014	Kato; Yuji	F16H47/04	475/59
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				


FOREIGN PATENT DOCUMENTS

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	N					
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	R					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
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	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes 	Application/Control No. 14715204	Applicant(s)/Patent Under Reexamination AARDEMA, JAMES A.
	Examiner DAVID J HLAVKA	Art Unit 3659

CPC- SEARCHED		
Symbol	Date	Examiner
B60W 10/103, 30/188, 10/115, 10/06, 2510/0638, 2710/1038, 2710/1005, 2710/0644, 10/02	9/25/2017	DJH
F16H 2037/088, 47/04	9/25/2017	DJH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
East Text Search	9/25/2017	DJH
Inventor Search	9/25/2017	DJH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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BIB DATA SHEET

CONFIRMATION NO. 2012

SERIAL NUMBER 14/715,204	FILING or 371(c) DATE 05/18/2015 RULE	CLASS 477	GROUP ART UNIT 3659	ATTORNEY DOCKET NO. 50100/15-0379		
APPLICANTS CATERPILLAR PAVING PRODUCTS INC., Brooklyn Park, MN; INVENTORS James A. Aardema, Plymouth, MN; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 05/27/2015						
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and Acknowledged <u>/ David J Hlavka /</u> Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	STATE OR COUNTRY MN	SHEETS DRAWINGS 4	TOTAL CLAIMS 20	INDEPENDENT CLAIMS 3
ADDRESS Caterpillar/ Miller, Matthias & Hull LLP One North Franklin Street Suite 2350 Chicago, IL 60606 UNITED STATES						
TITLE Milling Machine Fuel Efficiency Control System						
FILING FEE RECEIVED 1740	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit		

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	73	aardema\$3-james\$.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/09/25 10:42
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S3	0	("2013/0079999").URPN.	USPAT	OR	OFF	2017/03/17 13:30
S4	9	("20060129280" "20090311045" "3888542" "4929121" "6113310" "6755482" "6921230").PN. OR ("8408838").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/17 13:34
S5	18	("20020192025" "3606742" "4588231" "4614305" "5362176" "5415495" "5607205" "5752783" "6152648" "6186248" "6230552" "6558072" "6752567").PN. OR ("6921230").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/17 13:35
S6	3367	B60W30/188.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:37
S7	106	S6 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:38
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S23	609	S22 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:46
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S37	274	S36 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2017/09/24 10:28

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S41	0	("2013/0079999").URPN.	USPAT	OR	OFF	2017/09/24 10:50

EAST Search History (Interference)

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9/ 25/ 2017 10:43:00 AM**C:\ Users\ dhlavka\ Documents\ EAST\ Workspaces\ 14715204.wsp**

Doc code: IDS

PTO/SB/08a (01-10)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 07/31/2012. OMB 0651-0031

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date			
	First Named Inventor	James A. Aardema		
	Art Unit			
	Examiner Name			
	Attorney Docket Number	50100/15-0379		

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8622871	B2	2014-01-07	Brian D. Hoff	
	2	8465105	B2	2013-06-18	Carl D. Parker	
	3	8408838	B2	2013-04-02	Paul E. Willis	

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	1	20130079999	A1	2013-03-28	Daniel H. Killion, et al.	
	2	20070150166	A1	2007-06-28	Hisaho Mino, et al.	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		
First Named Inventor	James A. Aardema	
Art Unit		
Examiner Name		
Attorney Docket Number	50100/15-0379	

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EXAMINER SIGNATURE

Examiner Signature	/DAVID J HLAVKA/	Date Considered	03/17/2017
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		
First Named Inventor	James A. Aardema	
Art Unit		
Examiner Name		
Attorney Docket Number	50100/15-0379	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robin S. O/	Date (YYYY-MM-DD)	2015-05-18
Name/Print	Robin S. O	Registration Number	60043

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

/DAVID J HLAVKA/

03/17/2017

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8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
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/DAVID J HLAVKA/

03/17/2017

<i>Index of Claims</i> 	Application/Control No. 14715204	Applicant(s)/Patent Under Reexamination AARDEMA, JAMES A.
	Examiner DAVID J HLAVKA	Art Unit 3659

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant				<input type="checkbox"/> CPA		<input type="checkbox"/> T.D.		<input type="checkbox"/> R.1.47	
CLAIM		DATE							
Final	Original	03/18/2017	09/25/2017						
	1	=	✓						
	2	=	✓						
	3	=	✓						
	4	=	O						
	5	=	✓						
	6	=	N						
	7	=	N						
	8	=	N						
	9	=	N						
	10	=	N						
	11	=	N						
	12	=	N						
	13	=	✓						
	14	=	✓						
	15	=	O						
	16	=	✓						
	17	=	✓						
	18	=	O						
	19	=	✓						
	20	=	✓						

**IN THE UNITED STATES PATENT
AND TRADEMARK OFFICE**

Appl. No.: 14/715,204)	Confirmation No.: 2012
)	
First Named Inventor: James A. Aardema)	Art Unit: 3659
)	
Filed: May 18, 2015)	Examiner: David J. Hlavka
)	
Title: Milling Machine Fuel Efficiency Control System)	
)	
)	
)	

RESPONSE TO OFFICE ACTION DATED SEPTEMBER 29, 2017

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

This paper is submitted in response to the Office action dated September 29, 2017. The Applicant respectfully requests reconsideration of the application in view of the following amendments and remarks:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Amendments to the Claims:

1. (Currently Amended) A controller-implemented method of controlling a machine having a rotor coupled to an engine through a variable transmission, comprising:
receiving a desired rotor speed;
determining an engine load of the engine;
adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points at least partially based on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads; and
adjusting a gear ratio of the variable transmission based on the engine speed and the desired rotor speed.
2. (Original) The controller-implemented method of claim 1, wherein the desired rotor speed is received through an operator interface of the machine.
3. (Original) The controller-implemented method of claim 1, wherein the engine load includes loads due to at least the rotor and a hydrostatic arrangement.
4. (Currently Amended) The controller-implemented method of claim 1, wherein the engine speed is automatically adjusted based on detected changes in the engine load according to one or more predetermined relationships providing a plurality of the predefined efficiency points, ~~the predefined efficiency points being at least partially based on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads.~~
5. (Original) The controller-implemented method of claim 1, wherein the gear ratio of the variable transmission is automatically adjusted to maintain a rotor speed of the rotor at the desired rotor speed irrespective of changes in the engine speed.
6. (Withdrawn-Currently Amended) A control system for controlling a machine having a rotor coupled to an engine through a variable transmission, comprising:
a memory configured to retrievably store one or more algorithms; and

a controller in communication with the memory and, based on the one or more algorithms, configured to at least receive a desired rotor speed, determine an engine load of the engine, adjust an engine speed of the engine based on the engine load and one or more predefined efficiency points providing optimum engine speeds for different engine loads and the predefined efficiency points being based at least partially on predetermined fuel consumption rates, and adjust a gear ratio of the variable transmission based on the engine speed and the desired rotor speed.

7. (Withdrawn) The control system of claim 6, wherein the controller is configured to receive the desired rotor speed through an operator interface of the machine.

8. (Withdrawn) The control system of claim 6, wherein the controller is configured to determine the engine load as a sum of loads due to at least the rotor and a hydrostatic arrangement.

9. (Withdrawn – Currently Amended) The control system of claim 6, wherein the controller is configured to automatically adjust the engine speed based on changes in the engine load according to one or more predetermined relationships providing a plurality of the predefined efficiency points, the predetermined relationships being stored within the memory; ~~the predefined efficiency points providing optimum engine speeds for different engine loads and being based at least partially on predetermined fuel consumption rates.~~

10. (Withdrawn) The control system of claim 6, wherein the controller is configured to automatically adjust the gear ratio to maintain a rotor speed of the rotor at the desired rotor speed irrespective of changes in the engine speed.

11. (Withdrawn) The control system of claim 6, wherein the controller is configured to adjust the gear ratio through control of a hydraulic motor of the variable transmission.

12. (Withdrawn) The control system of claim 6, wherein the controller is configured to selectively disengage the rotor from the engine through control of a clutch disposed between the rotor and the engine.

13. (Currently Amended) A machine, comprising:
an engine;
a variable transmission operatively coupled to an output of the engine;
a rotor operatively coupled to an output of the variable transmission; and
a controller in electrical communication with one or more of the engine, variable transmission, and the rotor, the controller being configured to determine an engine load, adjust an engine speed based on the engine load and one or more predefined efficiency points being based at least partially on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads, and adjust a gear ratio of the variable transmission based on the engine speed to maintain a desired rotor speed.

14. (Original) The machine of claim 13, wherein the variable transmission includes a gear set and a hydraulic motor configured to adjust a rotor speed of the rotor.

15. (Original) The machine of claim 14, wherein the gear set is a planetary gear set having a sun gear coupled to the engine, a carrier coupled to the rotor, and a ring gear coupled to the hydraulic motor.

16. (Original) The machine of claim 14, wherein the controller is configured to adjust the gear ratio through control of the hydraulic motor.

17. (Original) The machine of claim 13, wherein the controller is configured to determine the engine load as a sum of loads due to at least the rotor and a hydrostatic arrangement.

18. (Currently Amended) The machine of claim 13, wherein the controller is configured to automatically adjust the engine speed based on changes in the engine load according to one or more predetermined relationships providing a plurality of the predefined efficiency points, ~~the predefined efficiency points providing optimum engine speeds for different engine loads and being based at least partially on predetermined fuel consumption rates.~~

19. (Original) The machine of claim 13, further comprising an operator interface configured to at least receive the desired rotor speed from an operator of the machine, the controller being configured to receive the desired rotor speed from the operator interface.

20. (Original) The machine of claim 13, further comprising a clutch disposed between the engine and the rotor, the controller being configured to selectively disengage the rotor from the engine through control of the clutch.

Remarks

The above referenced application was filed on May 18, 2015. In response to a Restriction Requirement received March 24, 2017, claims 1-5 and 13-20 were elected without traverse. In a non-final Office action dated September 29, 2017, claims 1-3, 5, 13, 14, 16, 17, 19 and 20 were rejected as being anticipated over the cited art. Claims 4, 15 and 18 were objected to but indicated to be allowable if rewritten in independent form. Applicant thanks the Examiner for the allowance of this subject matter. By way of this amendment, claims 1, 4, 13 and 18 are currently amended. No new matter is introduced. Accordingly, claims 1-20 are pending and claims 1-5 and 13-20 are at issue. In view of the foregoing amendments and following remarks, Applicant respectfully requests reconsideration and allowance of all pending claims.

In addition, Applicant further requests rejoinder of withdrawn claims 6-12 as withdrawn independent claim 6 has been amended to include all of the limitations of independent claim 1. Therefore, rejoinder is proper under MPEP §821.04.

Amendments to the Claims

It is respectfully submitted that the claims as amended above do not contain new matter and are supported by the application as originally filed in the Patent Office on May 18, 2015. It is well settled that the specification need not reproduce the exact language of the claims to satisfy the written description requirement of 35 U.S.C. § 112, first paragraph. *In re Wright*, 9 U.S.P.Q.2d 1649, 1651 (Fed. Cir. 1989) (“the claimed subject matter need not be described in haec verba in the specification in order for that specification to satisfy the written description requirement”). The written description requirement of §112 can even be satisfied based **solely** on the drawings of a patent application. *Vas-Cath inc. v. Mahurkar*, 19 U.S.P.Q.2d 1111, 1118 (Fed. Cir. 1991) (“These cases support our holding that, under proper circumstances, drawings alone may provide ‘written description’ of an invention as required by §112”). Accordingly, the amended claim language finds adequate support in the specification and drawings as originally filed, as discussed in greater detail below.

Independent claim 1 is amended to specify, among other things, “adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points at least partially based on predetermined fuel consumption rates and providing optimum engine

speeds for different engine loads.” Support for these amendments is provided at, for example, claim 4, paragraphs [0018], [0019] and FIG. 4 of the application as filed.

Similarly, independent claim 13 is amended to now recite, “the controller being configured to determine an engine load, adjust an engine speed based on the engine load and one or more predefined efficiency points being based at least partially on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads, and adjust a gear ratio of the variable transmission based on the engine speed to maintain a desired rotor speed.” Support for these amendments may also be found throughout the specification as filed, for example, claim 18, paragraphs [0018], [0019] and FIG. 4.

Dependent claims 4 and 18 are amended to reflect amendments made adding allowable subject matter of claims 4 and 18 into independent claims 1 and 13, respectively. No new matter is added as a result of the amendments.

In view of this, the Applicant respectfully submits that the amendments to claims 1, 4, 13 and 18 do not present new matter and do not raise new issues. Applicant respectfully requests entry of the present amendments and consideration of the claims as amended and the following remarks in response to the bases for the rejections in the present non-final Office action.

Anticipation Rejections – 35 U.S.C. §102

Parker

Claims 1-3, 5, 13, 14, 16, 17 19 and 20 were rejected under 35 U.S.C 102(a)(1) as being anticipated by U.S. Patent Publication No. 2008/0173740 to Parker et al. (hereinafter “*Parker*”). To anticipate a claim, MPEP §2131 requires that a single prior art reference must disclose each and every limitation of the claim. The Applicant respectfully submits the *Moore* reference does not disclose each and every limitation of amended claim 1.

As stated above, independent claims 1 and 13 are currently amended to incorporate indicated allowable subject matter of claim 4 and 18, respectively. As a result, claims 1 and 13 now recite, among other things, “adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points at least partially based on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads.” These limitations are supported at, for example, paragraphs claims 4 and 14, paragraphs [0018] and [0019] and FIG. 4 of the disclosure.

As one non-limiting example, FIG. 4 (shown below) graphically illustrates predetermined fuel consumption rates. More specifically, the estimated fuel consumption rates for a given milling machine and associated engine may be predetermined for different combinations of engine speed and engine load. In some cases, the estimated fuel consumption rates may factor in engine loads which include load due to the rotor of the machine, hydrostatic arrangement and other such parasitic loads. Furthermore, FIG. 4 illustrates the relative fuel consumption rates which may be used to predefine efficiency points 162, or other such combination of engine speed and engine load expected to provide an improved fuel economy.

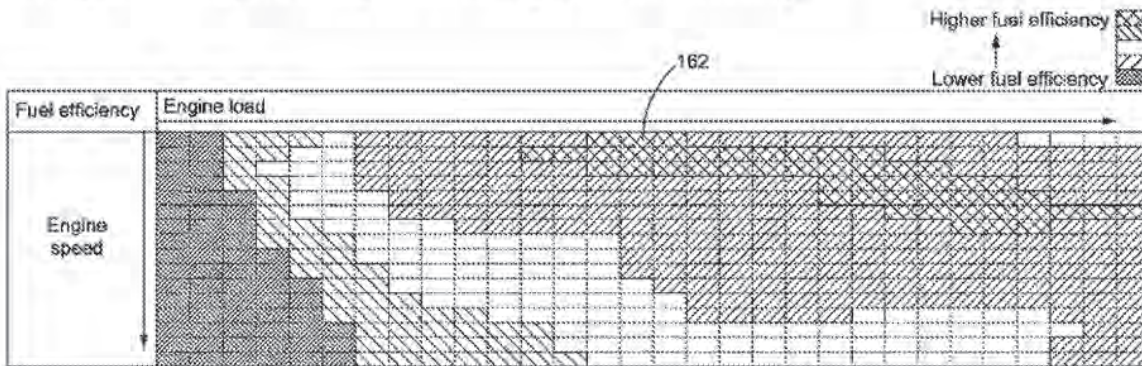


FIG.4

Parker discloses a cold planer machine including an engine coupled to an infinitely variable transmission via a power take off shaft. Furthermore, the transmission is connected to a drive mechanism which is associated with a cutter drum mounted on the underside of the machine and the rotational speed of the cutter drum is dictated by the output of the infinitely variable transmission. (See paragraphs [0023] and [0024] of *Parker*). Additionally, the machine of *Parker* may include a controller that coordinates the control of the infinitely variable transmission to bring the cutter drum speed up to a preset speed. However, the control system of *Parker* is concerned with providing control of the cutter drum speed in relation to the overall travel or ground speed of the machine. (See *Parker*, paragraph [0006]).

On page 3, the Office action states that *Parker* allegedly discloses a controller-implemented method of controlling a machine comprising: receiving a desired rotor speed, determining an engine load of the engine, adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points and adjusting a gear ratio of the variable transmission based on the engine speed and the desired rotor speed. FIG. 6 (shown below) of *Parker* provides a flow-chart illustration of a setup and operational procedure for the

machine. During setup, the operator is instructed to enter the engine speed/cutter drum speed or the cutter drum speed/ground speed ratio. *Parker* further discloses that the drum speed/ground speed ratio permits the operator to control the pattern that is cut into the road surface. This may be accomplished by the controller adjusting the cutter drum speed to maintain the cutter drum speed/ground speed ratio that the operator entered into the controller during setup. (See paragraph [0032] of *Parker*).

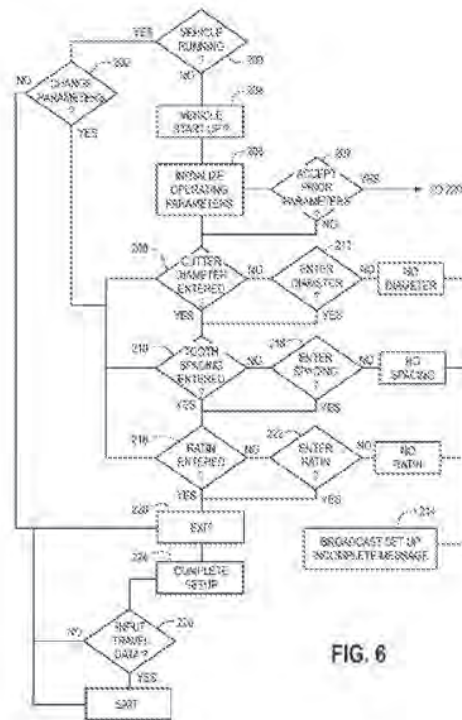


FIG. 6

However, while the drum speed/ground speed ratio may assist in maintaining the cutter drum speed of the machine, *Parker* is silent as to adjusting the engine speed based on engine load and one or more predefined efficiency points that may be at least partially based on predetermined fuel consumption rates. Furthermore, the drum speed/ground speed ratio of *Parker* is focused on maintaining a desired pattern cut into the road. As such, *Parker* is silent as to the drum speed/ground speed ratio being concerned with maintaining a desired rotor speed while also optimizing fuel efficiency. Accordingly, *Parker* fails to disclose “adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points at least partially based on predetermined fuel consumption rates and providing optimum engine”

speeds for different engine loads,” as now required by amended independent claims 1 and 13 of the present application.

Since *Parker* fails to disclose every element of independent claims 1 and 13, the anticipation rejection cannot be sustained. Claims 2, 3, and 5 depend from claim 1, claims 14, 16, 17, 19 and 20 depend from claim 13, and are allowable for at least the same reasons. Claims Therefore, Applicant respectfully requests that the rejection of claims 1-3, 5, 13, 14, 16, 17, 19 and 20 be withdrawn and be placed in condition for allowance.

CONCLUSION

It is submitted that the present application is in good and proper form for allowance. A favorable action on the part of the Examiner is respectfully solicited. If, in the opinion of the Examiner, a telephone conference would expedite prosecution of the subject application, the Examiner is invited to call the undersigned.

Dated: December 12, 2017

Respectfully submitted,

By: Michael W. Lubeley
Michael W. Lubeley
Registration No.: 73,817
MILLER, MATTHIAS & HULL LLP
One North Franklin Street
Suite 2350
Chicago, Illinois 60606
(312) 676-7598
Attorney for Applicant

Electronic Acknowledgement Receipt

EFS ID:	31200242
Application Number:	14715204
International Application Number:	
Confirmation Number:	2012
Title of Invention:	Milling Machine Fuel Efficiency Control System
First Named Inventor/Applicant Name:	James A. Aardema
Customer Number:	89881
Filer:	Michael William Lubeley/Cynthia Ramirez
Filer Authorized By:	Michael William Lubeley
Attorney Docket Number:	50100/15-0379
Receipt Date:	12-DEC-2017
Filing Date:	18-MAY-2015
Time Stamp:	13:45:53
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	2017_12_12_Response_to_NF OA_dated_09_29_17_for_15-0379.pdf	226983 a583683d1c27dae99ac72125822d15b35185f92647	no	10

Warnings:

Information:	
Total Files Size (in bytes):	226983
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/715,204	Filing Date 05/18/2015	<input type="checkbox"/> To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		x \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		x \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	12/12/2017	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	= 20	Minus	** 20	= 0	x \$80 =	0
	Independent (37 CFR 1.16(h))	= 3	Minus	*** 3	= 0	x \$420 =	0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	Minus	**	=	x \$ =	
	Independent (37 CFR 1.16(h))	Minus	***	=	x \$ =	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
						TOTAL ADD'L FEE

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

TOTAL ADD'L FEE

SLIE
SHARON M. WEST

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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NOTICE OF ALLOWANCE AND FEE(S) DUE

89881 7590 01/23/2018
Caterpillar/ Miller, Matthias & Hull LLP
One North Franklin Street
Suite 2350
Chicago, ILLINOIS 60606

EXAMINER	
HLAVKA, DAVID J	
ART UNIT	PAPER NUMBER
3659	

DATE MAILED: 01/23/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/715,204	05/18/2015	James A. Aardema	50100/15-0379	2012

TITLE OF INVENTION: Milling Machine Fuel Efficiency Control System

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
REGULAR	UNDISCOUNTED	\$1000	\$0.00	\$0.00	\$1000	04/23/2018

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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89881 7590 01/23/2018
Caterpillar/ Miller, Matthias & Hull LLP
One North Franklin Street
Suite 2350
Chicago, ILLINOIS 60606

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/715,204	05/18/2015	James A. Aardema	50100/15-0379	2012

TITLE OF INVENTION: Milling Machine Fuel Efficiency Control System

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
REGULAR	UNDISCOUNTED	\$1000	\$0.00	\$0.00	\$1000	04/23/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
HLAVKA, DAVID J	3659	477-115000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1	
2	
3	

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/715,204	05/18/2015	James A. Aardema	50100/15-0379	2012

89881 7590 01/23/2018

Caterpillar/ Miller, Matthias & Hull LLP
One North Franklin Street
Suite 2350
Chicago, ILLINOIS 60606

EXAMINER

HLAVKA, DAVID J

ART UNIT	PAPER NUMBER
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3659

DATE MAILED: 01/23/2018

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b) (2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/715,204	Applicant(s) Aardema, James A.	
	Examiner DAVID J HLAVKA	Art Unit 3659	AIA Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 12 December 2017 .
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____ .

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-5 and 13-20 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some *c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____ 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material _____ 4. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date. _____	5. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 7. <input type="checkbox"/> Other _____
---	--

/DAVID J HLAVKA/
Primary Examiner, Art Unit 3659

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA. This is the first Office Action on merits for application no. 14/715,204 filed 18 May 2015. Claims 1-7 pending. Claims 8-20 canceled.

Election/Restrictions

2. This application is in condition for allowance except for the presence of claims 6-12 directed to an invention non-elected without traverse. Accordingly, claims 6-12 have been cancelled.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Claims 6-12 canceled

Allowable Subject Matter

4. Claims 1-5 and 13-20 allowed.

5. The following is an examiner's statement of reasons for allowance: the prior art of record fails to show or render obvious:

Claim 1:

- A controller-implemented method of controlling a machine having a rotor coupled to an engine through a variable transmission, comprising: receiving a desired rotor speed; determining an engine load of the engine; adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points at least partially based on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads; and adjusting a gear ratio of the variable transmission based on the engine speed and the desired rotor speed.

Claim 13:

- A machine, comprising: an engine; a variable transmission operatively coupled to an output of the engine; a rotor operatively coupled to an output of the variable transmission; and a controller in electrical communication with one or more of the engine, variable transmission, and the rotor, the controller being configured to determine an engine load, adjust an engine speed based on the engine load and one or more predefined efficiency points being based at least partially on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads, and adjust a gear ratio of the variable transmission based on the engine speed to maintain a desired rotor speed.

6. Regarding claims 1 and 13, the prior art of record fails to teach or render obvious all the limitations set forth. In particular, the imported limitations of previously objected dependent claims in combination with the remaining limitations are not taught or rendered obvious by the prior art of record.

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID J HLAVKA whose telephone number is (571)270-3218. The examiner can normally be reached on Monday-Friday 8:00am-5:00pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ramya Burgess can be reached on 5712726011. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DAVID J HLAVKA/
Primary Examiner, Art Unit 3659




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BIB DATA SHEET

CONFIRMATION NO. 2012

SERIAL NUMBER 14/715,204	FILING or 371(c) DATE 05/18/2015 RULE	CLASS 477	GROUP ART UNIT 3659	ATTORNEY DOCKET NO. 50100/15-0379		
APPLICANTS CATERPILLAR PAVING PRODUCTS INC., Brooklyn Park, MN; INVENTORS James A. Aardema, Plymouth, MN; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 05/27/2015						
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and / David J Hlavka / Acknowledged Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	STATE OR COUNTRY MN	SHEETS DRAWINGS 4	TOTAL CLAIMS 13 20	INDEPENDENT CLAIMS 2 3
ADDRESS Caterpillar/ Miller, Matthias & Hull LLP One North Franklin Street Suite 2350 Chicago, IL 60606 UNITED STATES						
TITLE Milling Machine Fuel Efficiency Control System						
FILING FEE RECEIVED 1740	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit			

Search Notes 	Application/Control No. 14/715,204	Applicant(s)/Patent Under Reexamination Aardema, James A.
	Examiner DAVID J HLAVKA	Art Unit 3659

CPC - Searched*		
Symbol	Date	Examiner
B60W 10/103, 30/188, 10/115, 10/06, 2510/0638, 2710/1038, 2710/1005, 2710/0644, 10/02	9/25/2017	DJH
F16H 2037/088, 47/04	9/25/2017	DJH

CPC Combination Sets - Searched*		
Symbol	Date	Examiner


US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
East Text Search	9/25/2017	DJH
Inventor Search	9/25/2017	DJH
Updated East Text Search	01/06/2018	DJH

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
East	Searched All Classes	01/06/2018	DJH


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Issue Classification 	Application/Control No. 14/715,204	Applicant(s)/Patent Under Reexamination Aardema, James A.
	Examiner DAVID J HLAVKA	Art Unit 3659

CPC						
Symbol					Type	Version
B60W	/	10	/	103	F	2013-01-01
B60W	/	10	/	06	I	2013-01-01
B60W	/	10	/	115	I	2013-01-01
B60W	/	30	/	1882	I	2013-01-01
B60W	/	2710	/	0644	A	2013-01-01
B60W	/	2710	/	1005	A	2013-01-01
B60W	/	2710	/	1038	A	2013-01-01
F16H	/	47	/	04	A	2013-01-01
F16H	/	2037	/	088	A	2013-01-01
Y02T	/	10	/	56	A	2013-01-01
Y02T	/	10	/	84	A	2013-01-01

CPC Combination Sets					
Symbol				Type	Set
	/		/		

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	13	
/DAVID J HLAVKA/ Primary Examiner, Art Unit 3659	06 January 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1


Issue Classification 	Application/Control No. 14/715,204	Applicant(s)/Patent Under Reexamination Aardema, James A.
	Examiner DAVID J HLAVKA	Art Unit 3659

INTERNATIONAL CLASSIFICATION			
CLAIMED			
B60W	/	10	/ 103
NON-CLAIMED			
	/		/

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	13	
/DAVID J HLAVKA/ Primary Examiner, Art Unit 3659	06 January 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification 	Application/Control No. 14/715,204	Applicant(s)/Patent Under Reexamination Aardema, James A.
	Examiner DAVID J HLAVKA	Art Unit 3659

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1		10	12	19										
2	2		11	13	20										
3	3		12												
4	4	6	13												
5	5	7	14												
	6	8	15												
	7	9	16												
	8	10	17												
	9	11	18												

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 13	
/DAVID J HLAVKA/ Primary Examiner, Art Unit 3659 (Primary Examiner) _____ (Date) 06 January 2018		O.G. Print Claim(s) 1	O.G. Print Figure 1

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	3892	B60W30/188.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:42
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L3	2219	B60W10/103.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:42
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L6	4414	L5 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:42
L7	868	L6 and variabl\$3 near1 transmission\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:42
L8	666	L7 and engin\$3 near1 speed\$3	US-PGPUB;	OR	OFF	2018/01/06

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			09:42
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L12	337	L11 and variabl\$3 near1 transmission\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:42
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L15	13035	B60W2510/0638.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:42
L16	705	L15 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2018/01/06 09:42

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L21	6455	B60W10/115.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:43
L22	863	L21 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:43
L23	220	L22 and variabl\$3 near1 transmission\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:43
L24	3912	F16H2037/088.cpc..cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:43
L25	276	L24 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	OFF	2018/01/06 09:43

			JPO; DERWENT; IBM_TDB			
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L27	304	L26 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:43
L28	4022298	engin\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/01/06 09:47
S1	5	("8622871" "8465105" "8408838" "20130079999" "20070150166").PN.	US-PGPUB; USPAT	OR	OFF	2017/03/17 13:27
S2	0	("2013/0079999").URPN.	USPAT	OR	OFF	2017/03/17 13:30
S3	0	("2013/0079999").URPN.	USPAT	OR	OFF	2017/03/17 13:30
S4	9	("20060129280" "20090311045" "3888542" "4929121" "6113310" "6755482" "6921230").PN. OR ("8408838").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/17 13:34
S5	18	("20020192025" "3606742" "4588231" "4614305" "5362176" "5415495" "5607205" "5752783" "6152648" "6186248" "6230552" "6558072" "6752567").PN. OR ("6921230").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/17 13:35
S6	3367	B60W30/188.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:37
S7	106	S6 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:38
S8	0	B60W10/03.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2017/03/17 13:40

			IBM_TDB			
S9	2052	B60W10/103.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:40
S10	38	S9 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:40
S11	59408	B60W10/06.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:41
S12	3997	S11 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:41
S13	799	S12 and variabl\$3 near1 transmission\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:41
S14	225647	engin\$3 near1 speed\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:41
S15	619	S13 and engin\$3 near1 speed\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:41
S16	28691	B60W10/02.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:44
S17	2011	S16 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	OFF	2017/03/17 13:45

			JPO; DERWENT; IBM_TDB			
S18	1097	S17 and engin\$3 near1 speed\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:45
S19	306	S18 and variabl\$3 near1 transmission\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:45
S20	495	B60W2710/1038.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:46
S21	65	S20 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:46
S22	11749	B60W2510/0638.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:46
S23	609	S22 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:46
S24	3979	B60W2710/1005.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:48
S25	165	S24 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:48
S26	8031	B60W2710/0644.cpc.	US-PGPUB; USPAT;	OR	OFF	2017/03/17 13:50

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S27	573	S26 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/03/17 13:50
S28	0	("2013/0079999").URPN.	USPAT	OR	OFF	2017/03/17 13:52
S29	4	("2007/0150166").URPN.	USPAT	OR	OFF	2017/03/17 13:54
S30	12	("20070150166" "20100024412" "20100070146" "20110178684" "20120004816" "20120191307" "20130030667" "20140200795" "20150006010" "20150225927" "20150308078" "6202411").PN. OR ("9347204").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/17 13:54
S31	21	("20030079720" "20030109977" "20060276304" "20070150166" "20080173740" "20090320461" "20100014917" "20100144489" "20100192907" "5479908" "5527156" "5528500" "5999872" "6092504" "6233511" "7353105" "7422391" "7702450" "7774117" "7905682" "8424630").PN. OR ("9267446").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/03/17 13:57
S32	4	("2007/0150166").URPN.	USPAT	OR	OFF	2017/03/17 13:59
S33	6308	B60W10/115.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/09/24 10:24
S34	842	S33 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/09/24 10:25
S35	218	S34 and variabl\$3 near1 transmission\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/09/24 10:26
S36	3872	F16H2037/088.cpc..cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	OFF	2017/09/24 10:28

			JPO; DERWENT; IBM_TDB			
S37	274	S36 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/09/24 10:28
S38	5769	F16H47/04.cpc..cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/09/24 10:30
S39	301	S38 and rotor\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/09/24 10:30
S40	0	("2013/0079999").URPN.	USPAT	OR	OFF	2017/09/24 10:50
S41	0	("2013/0079999").URPN.	USPAT	OR	OFF	2017/09/24 10:50
S42	73	aardema\$3-james\$.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/09/25 10:42

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L29	1373913	engin\$3	US-PGPUB; USPAT	OR	OFF	2018/01/06 09:47
L30	112272	29 and rotor\$3	US-PGPUB; USPAT	OR	OFF	2018/01/06 09:47
L31	3837	30 and variabl\$3 near1 transmission\$3	US-PGPUB; USPAT	OR	OFF	2018/01/06 09:48
L32	117070	engin\$3 near1 speed\$3	US-PGPUB; USPAT	OR	OFF	2018/01/06 09:48
L33	18891	32 and rotor\$3	US-PGPUB; USPAT	OR	OFF	2018/01/06 09:48
L34	2035	33 and variabl\$3 near1 transmission\$3	US-PGPUB; USPAT	OR	OFF	2018/01/06 09:48
L35	1719	34 and (fuel\$3)	US-PGPUB; USPAT	OR	OFF	2018/01/06 09:48
L36	1023	35 and consumption\$3	US-PGPUB; USPAT	OR	OFF	2018/01/06 09:49
L37	829	36 and load\$3	US-PGPUB; USPAT	OR	OFF	2018/01/06 09:49

1/6/2018 9:53:39 AM
C:\Users\dhlavka\Documents\EAST\Workspaces\14715204.wsp

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

CHANGE OF CORRESPONDENCE ADDRESS *Application*

Address to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	14/715,204
Filing Date	05/18/2015
First Named Inventor	James A. Aardema
Art Unit	3659
Examiner Name	Hlavka, David J
Attorney Docket Number	15-0379-54173

Please change the Correspondence Address for the above-identified patent application to:

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☐

Applicant

☒
Attorney or agent of record. Registration Number 58,605
☐

Registered practitioner named in the application transmittal papers who acts in a representative capacity under 37 CFR 1.34. See 37 CFR 1.33(a)(1). Registration Number _____

Signature /Timothy A. Parker/

Typed or Printed
Name Timothy A. Parker

Date 04/05/2018

Telephone 309-675-8091

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications.
Submit multiple forms if more than one signature is required, see below.

☐ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	14715204			
Filing Date:	18-May-2015			
Title of Invention:	Milling Machine Fuel Efficiency Control System			
First Named Inventor/Applicant Name:	James A. Aardema			
Filer:	Kelsey L. Milman/Lindsey Naffziger			
Attorney Docket Number:	50100/15-0379			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1000

Electronic Acknowledgement Receipt

EFS ID:	32373312
Application Number:	14715204
International Application Number:	
Confirmation Number:	2012
Title of Invention:	Milling Machine Fuel Efficiency Control System
First Named Inventor/Applicant Name:	James A. Aardema
Customer Number:	89881
Filer:	Kelsey L. Milman/Lindsey Naffziger
Filer Authorized By:	Kelsey L. Milman
Attorney Docket Number:	50100/15-0379
Receipt Date:	18-APR-2018
Filing Date:	18-MAY-2015
Time Stamp:	14:08:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$1000
RAM confirmation Number	041918INTEFSW00000378031129
Deposit Account	031129
Authorized User	Lindsey Naffziger
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)
 37 CFR 1.20 (Post Issuance fees)
 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		15-0379_Issue_Fee_COCA.pdf	4118103 66ccb9eac14320041c3d878fcb9998b93463d165	yes	3

Multipart Description/PDF files in .zip description

Document Description	Start	End
Issue Fee Payment (PTO-85B)	1	1
Change of Address	2	3

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	29985 31d8ee0c2027174fca90c1e6022c37ab113275e7	no	2
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Warnings:

Information:

Total Files Size (in bytes): 4148088

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
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or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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89881 7590 01/23/2018
Caterpillar/ Miller, Matthias & Hull LLP
One North Franklin Street
Suite 2350
Chicago, ILLINOIS 60606

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/715,204	05/18/2015	James A. Aardema	50100/15-0379	2012

TITLE OF INVENTION: Milling Machine Fuel Efficiency Control System

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
REGULAR	UNDISCOUNTED	\$1000	\$0.00	\$0.00	\$1000	04/23/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
HLAVKA, DAVID J	3659	477-115000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). <input checked="" type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. <input type="checkbox"/> "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.	2. For printing on the patent front page, list (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.	1 Miller, Matthias & Hull 2 3
--	---	-------------------------------------

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Caterpillar Paving Products Inc.
 (B) RESIDENCE (CITY and STATE OR COUNTRY): Brooklyn Park, Minnesota

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 031129 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
☐ Applicant asserting small entity status. See 37 CFR 1.27
☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
 NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
 NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature: /Timothy A. Parker/ Date: 04/05/2018
 Typed or printed name: Timothy A. Parker Registration No. 58,606



UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/715,204	05/22/2018	9975538	15-0379-54173	2012

719 7590 05/02/2018
Caterpillar Inc.
Intellectual Property Dept.
100 N.E. Adams Street
AH 9510
PEORIA, IL 61629-9510

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 252 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

James A. Aardema, Plymouth, MN;
CATERPILLAR PAVING PRODUCTS INC., Brooklyn Park, MN;

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AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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 filed in the U.S. District Court _____ for the District of Delaware _____ on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 17-770 (RGA)	DATE FILED 6/16/2017	U.S. DISTRICT COURT for the District of Delaware
PLAINTIFF Wirtgen America, Inc.		DEFENDANT Caterpillar Inc.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED 10/14/2021	INCLUDED BY <input type="checkbox"/> Amendment <input checked="" type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 7,523,995	4/28/2009	Caterpillar Inc.
2 9,975,538	5/22/2018	Caterpillar Inc.
3 9,371,618	6/21/2016	Caterpillar Inc.
4		
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

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