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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,906	11/07/2005	Andrew Miller Cameron	M02B129	6895

20411 7590 01/12/2012

The BOC Group, Inc.
575 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974-2082

EXAMINER	
YANG, JIE	

ART UNIT	PAPER NUMBER
1733	

MAIL DATE	DELIVERY MODE
01/12/2012	PAPER

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.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ANDREW MILLER CAMERON and
CHRISTIAN JUAN FELDERMANN

Appeal 2010-009820
Application 10/517,906
Technology Center 1700

Before BRADLEY R. GARRIS, CHUNG K. PAK, and
TERRY J. OWENS, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 1-21. We have jurisdiction under 35 U.S.C. § 6.

We AFFIRM-IN-PART.

Appellants claim a method of refining a ferroalloy comprising blowing a gas which contains molecular oxygen into a melt of the ferroalloy, introducing a metallurgically acceptable particulate material (e.g., an oxide of chromium) which is "capable of providing a cooling effect" from above into the melt in a first supersonic gas jet which travels to the melt shrouded by a second supersonic gas jet (claim 1). The claimed method includes an embodiment wherein the metallurgically acceptable particulate material is an oxide of manganese (claim 8). The claimed method also includes an embodiment wherein the second supersonic gas jet is formed of burning gases (claim 14).

Representative claims 1, 8, and 14 read as follows:

> 1. A method of refining a ferroalloy, comprising blowing a gas selected from molecular oxygen and a gas mixture including molecular oxygen into a melt of the ferroalloy and exothermically reacting the molecular oxygen with carbon in the melt; introducing a metallurgically acceptable particulate material, capable of providing a cooling effect, from above into the melt in a first supersonic gas jet which travels to the melt shrouded by a second supersonic gas jet; and forming velocities of the first and the second supersonic gas jets for controlling migration of said particulate material between said first and second supersonic gas jets, the velocity of the second supersonic gas jet being from 10% less to 10% greater than the velocity of the first supersonic gas jet.

8. A method according to claim 1, wherein the ferroalloy is ferromanganese and the metallurgically acceptable particulate material is an oxide of manganese.

14. A method according to claim 1, wherein the second supersonic gas jet is formed of burning gases.

The references listed below are relied upon by the Examiner as evidence of obviousness:

Schlichting	5,366,537	Nov. 22, 1994
Anderson et al.	6,241,510 B1	June 5, 2001
Edlinger	6,409,793 B1	June 25, 2002
Fritz	6,558,614 B1	May 6, 2003

The Examiner rejects claims 1-7, 9-14, and 19-21 under 35 U.S.C. § 103(a) as unpatentable over Schlichting in view of Edlinger and correspondingly rejects claims 15-18 as unpatentable over these references and further in view of Fritz. In the Answer, the Examiner newly rejects claim 8 under 35 U.S.C. § 103(a) as unpatentable over Schlichting in view of Edlinger and further in view of Anderson.

The Rejection based on Schlichting and Edlinger

Concerning independent claim 1, we share the Examiner's conclusion that it would have been obvious to provide the coal-containing supersonic gas jet of Schlichting's method with chromium oxide-containing dust in order to obtain a high-grade ferrochromium alloy as taught by Edlinger (Ans. para. bridging 4-5). Further, we agree with the Examiner's determination that the chromium oxide in the so-modified method of

Schlichting would be inherently "capable of providing a cooling effect" as recited in claim 1 (*id.*).

Appellants argue that the above combination would not have been obvious because the non-combustible chromium-containing dust of Edlinger would inhibit the combustion desired by Schlichting and would render Schlichting's method unsatisfactory for its intended purpose (App. Br. 11).

This argument is unpersuasive because it is unsupported by evidence. Appellants have offered no evidence at all that adding chromium oxide-containing dust to Schlichting's coal-containing gas jet would inhibit combustion and render the method of Schlichting unsatisfactory. Furthermore, Appellants' argument is undermined by Edlinger's express teaching that it is advantageous to add coal to the chromium-containing jet in order to maintain the necessary slag treatment temperature (col. 4, ll. 39-40). That is, this teaching of Edlinger evinces that the combination of coal and chromium oxide in a gas jet would not inhibit combustion and render Schlichting's method unsatisfactory.

Appellants also argue that the Examiner's inherency position is improper because no factual basis exists for believing that chromium oxide would necessarily be capable of providing a cooling effect or for believing that a person of ordinary skill in the art would recognize this capability (App. Br. 12).

As correctly pointed out by the Examiner, the basis for considering Edlinger's chromium oxide as inherently "capable of providing a cooling effect" (claim 1) is the undisputed fact that Appellants disclose and claim chromium oxide as possessing this capability (Ans. para. bridging 4-5; *see also* Spec. 4-5 and claim 4). As for Appellants' argument relating to

recognition of this inherent capability by a person of ordinary skill in the art, such recognition is not required. *See Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003).

Appellants argue that the Examiner has failed to establish a prima facie case of obviousness for claims 9 and 10 which require that the metallurgically acceptable particulate material is in fine particulate form (claim 9) having a mean particle size of 1 mm or less (claim 10) (App. Br. 14).

This argument lacks convincing merit. The Examiner finds that the chromium oxide-containing dust of Edlinger is disclosed as having "particle sizes of below 4mm, preferably 0.5-2mm, which overlaps the particle size of 1 mm or less as recited in the instant claim [i.e., claim 10 which depends from claim 9]" (Ans. 6; *see also* Edlinger col. 2, ll. 18-21). This finding has not been disputed by Appellants in the record before us. Based on the Examiner's undisputed finding, a prima facie case of obviousness has been established for claims 9 and 10.

Finally, Appellants argue that the Examiner has failed to identify any teaching or suggestion in the applied references of the claim 14 limitation "wherein the second supersonic gas jet is formed of burning gases" (App. Br. 15; Reply Br. 5-6).

For the reasons detailed by Appellants in the above referenced pages of the Appeal Brief and the Reply Brief, this argument is persuasive. The Schlichting disclosures cited by the Examiner for establishing the unpatentability of claim 14 (Ans. 6, 12) contain no teaching or suggestion of the limitation under consideration.

The remaining claims in this rejection have not been separately argued by Appellants (App. Br. 9-15).

In light of the foregoing, the § 103 rejection based on Schlichting and Edlinger is affirmed as to claims 1-7, 9-13, and 19-21 but is reversed as to claim 14.

The New Rejection based on Schlichting, Edlinger, and Anderson

The Examiner relies on Anderson to establish a prima facie case of obviousness for claim 8 (Ans. para. bridging 7-8).

In response to this new rejection, Appellants filed a Reply Brief in which they argue that the Examiner fails to identify any teaching or suggestion in Anderson of the claim 8 limitation "wherein . . . the metallurgically acceptable particulate material is an oxide of manganese" (Reply Br. 6-7).

Appellants' argument is correct. The Anderson disclosures cited by the Examiner (Ans. para. bridging 7-8) contain no such teaching or suggestion. Moreover, this argument against the new rejection of claim 8 has not been rebutted by the Examiner (i.e., no Supplemental Answer has been filed).

These circumstances compel us to reverse the Examiner's § 103 rejection of claim 8.

The Rejection based on Schlichting, Edlinger, and Fritz

Appellants have directed no additional, separate arguments against this rejection (App. Br. 15-16). As a consequence, we affirm this § 103 rejection of dependent claims 15-18 for the reasons given in affirming the rejection of parent independent claim 1.

Conclusion

In summary, we affirm the rejections of claims 1-7, 9-13, and 15-21 but reverse the rejections of claims 8 and 14.

The decision of the Examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED-IN-PART

bar

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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,906	11/07/2005	Andrew Miller Cameron	M02B129	6895

20411 7590 07/15/2010

The BOC Group, Inc.
575 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974-2082

EXAMINER	
YANG, JIE	

ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
07/15/2010	PAPER

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.

United States Patent and Trademark Office

Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

THE BOC GROUP, INC.
575 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974-2082

Appeal No: 2010-009820
Application: 10/517,906
Appellant: Andrew Miller Cameron et al.

Board of Patent Appeals and Interferences
Docketing Notice

Application 10/517,906 was received from the Technology Center at the Board on July 12, 2010 and has been assigned Appeal No: 2010-009820.

In all future communications regarding this appeal, please include both the application number and the appeal number.

The mailing address for the Board is:

BOARD OF PATENT APPEALS AND INTERFERENCES
UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VIRGINIA 22313-1450

The facsimile number of the Board is 571-273-0052. Because of the heightened security in the Washington D.C. area, facsimile communications are recommended. Telephone inquiries can be made by calling 571-272-9797 and referencing the appeal number listed above.

By order of the Board of Patent Appeals and Interferences.

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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,906	11/07/2005	Andrew Miller Cameron	M02B129	6895

20411 7590 07/12/2010

The BOC Group, Inc.
575 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974-2082

EXAMINER	
YANG, JIE	
ART UNIT	PAPER NUMBER
1793	
MAIL DATE	DELIVERY MODE
07/12/2010	PAPER

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.

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
10517906	11/7/2005	CAMERON ET AL.	M02B129

The BOC Group, Inc.
575 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974-2082

EXAMINER	
JIE YANG	
ART UNIT	**PAPER**
1793	20100707

DATE MAILED:

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

Commissioner for Patents

The reply brief filed 5/25/2010 has been entered and considered. The application has been forwarded to the Board of Patent Appeals and Interferences for decision on the appeal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-2701884. The examiner can normally be reached on IFP.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-2721244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/ Roy King/
Supervisory Patent Examiner, Art Unit 1793

/JieYang/

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Andrew Miller CAMERON, et al.	Docket No.	M02B129
Serial No.	10/517,906	Examiner:	Jie YANG
Filed:	November 7, 2005	Group Art Unit:	1793
Title:	REFINING FERROALLOYS	Conf. No.:	6895

MAIL STOP APPEAL BRIEF-PATENTS
COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

Certificate of Electronic Transmission

I hereby certify that this correspondence is being transmitted to the United States Patent and Trademark Office via the Office Electronic Filing System in accordance with 37 C.F.R. §1.6(a)(4).

Vincent A. Cortese		May 25, 2010
(type or print name of person transmitting paper)	(signature of person transmitting paper)	(date)

APPELLANTS' REPLY BRIEF UNDER 37 C.F.R. § 41.41

Dear Sir:

This a Reply Brief submitted in response to the Examiner's Answer mailed March 29, 2010, which was in response to Appellants' Brief under 37 C.F.R. § 41.37 appealing to the Board of Patent Appeals and Interferences (the "Board") from the final rejection set forth in the Office Action mailed October 2, 2009. The Notice of Appeal was submitted electronically via EFS-Web by Appellants on November 25, 2009. The present appeal is of claims 1-21 of the present application.

Status of Claims

The present application was given a 35 U.S.C. § 371 date of November 7, 2005 after being initially submitted to the Office on December 10, 2004 with original claims 1-21. A Final Office Action for this application was mailed by the Office on September 5, 2008. A Request for Continued Examination for this application was filed with the Office on January 9, 2009. A Final Office Action for this application, subsequent to Appellants' Request for Continued Examination, was mailed by the Office on October 2, 2009.

Claims 1-21 are currently under final rejection and constitute the claims on appeal.

Grounds of Rejection to be Reviewed on Appeal

A. The 35 U.S.C. § 103(a) rejection of claims 17, 9-14 and 19-21 as unpatentable over U.S. Patent No. 5,366,537 to Schlichting in view of U.S. Patent No. 6,409,793 B1 to Edlinger. Claim 8 has been removed from this ground of rejection, based on the new ground of rejection presented in the Examiner's Answer.

B. The 35 U.S.C. § 103(a) rejection of claims 15-18 as unpatentable over U.S. Patent No. 5,366,537 to Schlichting in view of U.S. Patent No. 6,409,793 B1 to Edlinger, further in view of U.S. Patent No. 6,558,614 B1 to Fritz.

C. NEW GROUND OF REJECTION: Claim 8 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,366,537 to Schlichting ("Schlichting") in view of U.S. Patent No. 6,409,793 B1 to Edlinger ("Edlinger"), further in view of U.S. Patent No. 6,241,510 B1 to Anderson, et al ("Anderson").

Argument

A. Claims 1-14 and 19-21

Preliminarily, the Office again alleges, at page 12, last paragraph, of the Examiner's Answer, that "the appellant's arguments are against the references individually, [and] one cannot show nonobviousness by attacking references individually where the rejections are based on a combination of references." Appellants have addressed this issue at page 9, second paragraph of Appellants' Brief, but Appellants' wish to reiterate the argument: Since it is necessary to argue the appropriateness of the combination of references with regard to arguing that the Office has not established a prima facie case of obviousness, Appellants respectfully submit that it is necessary to discuss the references individually in order to show their differences as well as their incompatibility for the combination alleged by the Office.

The Office Has Not Established a Prima Facie Case of Obviousness

At page 11 of the Examiner's Answer, the Office addresses Appellants' arguments regarding the Office's failure to state a prima facie case of obviousness. Appellants' arguments at pages 9-11 of Appellants' Brief are extensive, and do not need repeating. However, Appellants' wish to note that the Office has merely restated its arguments from the previous Office Actions, and has not addressed arguments in Appellants' Brief with any specifics. Appellants therefore maintain that the Office has failed to state a prima facie case of obviousness.

The Office's Burden of Proving Inherency Has Not Been Met

At pages 11-12 of the Examiner's Answer, the Office addresses Appellants' arguments regarding the Office's failure to meet its burden of proving inherency. Appellants arguments at pages 12-13 of Appellants Brief are extensive, citing specific language from the MPEP which discusses the requirements for proving inherency. The Office's response to these arguments does not address the specific requirements of proving inherency discussed in Appellants' Brief.

namely: The Office must establish that the alleged inherency must necessarily be present and it must be recognized as necessarily present by a person of ordinary skill in the art. Therefore, Appellants maintain that the Office has failed to meet its burden of proving inherency.

Dependent Claims 9 and 10

At page 12 of the Examiner's Answer, the Office addresses Appellants' arguments regarding the rejection of dependent claims 9 and 10. At page 14 of Appellants' Brief, Appellants expressed confusion regarding the rejection of claim 9, stating that the citations provided by the Office in the rejection of claim 9 do not teach or suggest the features of claim 9, namely that the "particulate material is introduced into the melt in fine particulate form." In the Examiner's Answer, the Office newly alleges that "particulate coal" (Schlichting at col. 6, lns. 63-64) reads on the particulate material in fine particulate form as recited in claims 9 and 10 (claim 10 depending from claim 9).

Appellants' respectfully submit that this new allegation by the Office is technically incorrect. The metallurgically acceptable particulate material of claim 9 is "capable of providing a cooling effect", as recited in claim 1. As recognized by the presently applied prior art, particulate coal is used to increase the heat of combustion, not to provide a cooling effect. Therefore, a disclosure of introducing particulate coal does not read on introducing the particulate material in fine particulate form capable of providing a cooling effect, as recited in claim 9 as depending from claim 1. Appellants respectfully maintain that the Office has failed to state a prima facie case of obviousness with regard to claims 9 and 10.

Dependent Claim 14

At page 12 of the Examiner's Answer, the Office addresses Appellants' arguments regarding the rejection of dependent claim 14. At page 15 of Appellants' Brief, Appellants once again expressed confusion, this time regarding the rejection of claim 14, stating that the citations provided by the Office in the rejection of claim 14 do not teach or suggest the features of claim 14, namely that "the second supersonic gas jet is formed of burning gases." In the Examiner's

Answer, the Office newly cites the Abstract of Schlichting as teaching "a process for melting iron ore and /or [sic] refining molten oxygen and a carbonaceous fuel . . ., which allege the 'burning gases' of the instant claim."

However, the Abstract of Schlichting states that "[t]he interposition of the inert gas stream between the coal and oxygen streams prevents the volatile matter in the coal from combusting before it reaches the slag layer." Therefore, the Abstract of Schlichting teaches against a gas jet formed of burning gases, the opposite of that which is recited in claim 14. Appellants respectfully maintain that the Office has failed to state a prima facie case of obviousness with regard to claim 14.

B. Claims 15-18

Appellants respectfully submit that the Office has failed to respond in substance to Appellants' arguments regarding the rejection of dependent claims 15-18. Specifically, responses to Appellants' argument found in the Examiner's Answer do not discuss Fritz at all. Appellants therefore respectfully submit that the Office has failed to establish a prima facie case of obviousness with regard to claims 15-18.

C. Claim 8

Claim 8 has been newly rejected under 35 U.S.C. § 103(a) as being unpatentable over Schlichting, in view of Edlinger, and further in view of Anderson. Specifically, the Office has alleged, at pages 7-8 of the Examiner's Answer, that Anderson "teaches the technique is applied to ferromanganese refine [sic] furnace."

Claim 8, which depends from claim 1, recites that "the ferroalloy is ferromanganese and the metallurgically acceptable particulate material is an oxide of manganese." The Office has merely alleged that Anderson teaches a ferromanganese refining furnace, and has failed to allege that Anderson, or any other of the applied references, teach or suggest utilizing an oxide of manganese as the particulate material, as recited by claim 8. Appellants' therefore respectfully submit that the Office has failed to state a prima facie case of obviousness with regard to claim 8.

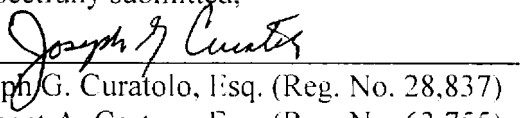
Further, Anderson does not disclose injecting a particulate material: it is merely concerned with injecting gases into an "injection volume" (Abstract). Thus, Anderson does not contemplate injecting a particulate material into the injection volume at all. Therefore, Schlichting, Edlinger and Anderson in combination do not teach or suggest all of the features of claim 8, namely injecting an oxide of manganese into a ferromanganese alloy. *See* MPEP § 2143.03 (" 'All words in a claim must be considered in judging the patentability of that claim against the prior art.' *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).").

The deficiencies with regard to the combination of Schlichting and Edlinger have been discussed in detail in Appellants' Brief. The addition of Anderson does nothing to cure these deficiencies. Therefore, Appellants respectfully request that the 35 U.S.C. § 103(a) rejection of claim 8 be reversed.

Conclusion

Appellants submit that the remarks presented in Appellants' Brief under 37 C.F.R. § 41.37, as well as the remarks presented hereinabove, address and rebut all existing allegations concerning the 35 U.S.C. § 103 rejections of claims 1-21. Appellants respectfully request that the Board reverse the 35 U.S.C. § 103 rejection of these claims. Appellants further respectfully request that the Board reverse the Final Office Action in this case and require the Office to indicate the allowability of the claims 1-21 over the art of record.

Respectfully submitted,



Joseph G. Curatolo, Esq. (Reg. No. 28,837)
Vincent A. Cortese, Esq. (Reg. No. 63,755)
Curatolo Sidoti Co., LPA
24500 Center Ridge Road, Suite 280
Cleveland, OH 44145
Telephone: 440.808.0011
Facsimile: 440.808.0657
Attorneys for Appellants

Date: May 25, 2010

Correspondence Address of Record:
Joshua L. Cohen, Esq. (Reg. No. 34,307)
Attorney of Record
Linde North America, Inc.
IP Department
575 Mountain Avenue
Murray Hill, NJ 07974-2064
Telephone: (908) 771-6167
Facsimile: (908) 771-6159

Electronic Acknowledgement Receipt

EFS ID:	7679640
Application Number:	10517906
International Application Number:	
Confirmation Number:	6895
Title of Invention:	Refining ferroalloys
First Named Inventor/Applicant Name:	Andrew Miller Cameron
Customer Number:	20411
Filer:	Vincent Anthony Cortese
Filer Authorized By:	
Attorney Docket Number:	M02B129
Receipt Date:	25-MAY-2010
Filing Date:	07-NOV-2005
Time Stamp:	10:26:24
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	M02B129aTransmittal.pdf	55190 c07ac96ea79d15098bb0752f4c26b7acce78ddd4	no	1

Warnings:	
Information:	

2	Reply Brief Filed	M02B129bReplyBrief.pdf	342783 b32c650098e312ee122e551ee85852da87b10505	no	7

Warnings:	
Information:	
Total Files Size (in bytes):	397973

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Andrew Miller CAMERON, et al.	Docket No.	M02B129
Serial No.	10/517,906	Examiner:	Jie YANG
Filed:	November 7, 2005	Group Art Unit:	1793 Conf. No. 6895
Title:	REFINING FERROALLOYS		

MAIL STOP AMENDMENT
COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

Certificate of Electronic Transmission

I hereby certify that this correspondence is being transmitted to the United States Patent and Trademark Office via the Office Electronic Filing System in accordance with 37 C.F.R. §1.6(a)(4).

Vincent A. Cortese		May 25, 2010
(type or print name of person signing paper)	(signature of person transmitting paper)	(date)

TRANSMITTAL SHEET

Electronically transmitted are:
Transmittal Sheet with Certificate of Electronic Transmission and Authorization to Charge Deposit Account (1 page)
Appellants' Reply Brief (7 pages)

AUTHORIZATION TO CHARGE DEPOSIT ACCOUNT

In the event an additional fee is applicable to the filing of this document and the required fee is not enclosed, or the fee submitted is insufficient, the Commissioner is hereby authorized to charge any fees for M02B129 that might be required to effect the filing of this (these) documents to Account No. 50-3275.

Respectfully submitted,

Joseph G. Curatolo, Esq. (Reg. No. 28,837)
Vincent A. Cortese, Esq. (Reg. No. 63,755)
Curatolo Sidoti Co., LPA
24500 Center Ridge Road, Suite 280
Cleveland, OH 44145
Telephone: 440.808.0011
Facsimile: 440.808.0657
Attorneys for Applicants

Date May 25, 2010

Correspondence Address of Record:
Joshua L. Cohen, Esq. (Reg. No. 34,307)
Attorney of Record
Linde North America, Inc.
IP Department
575 Mountain Avenue
Murray Hill, NJ 07974
Telephone: 908-771-6167
Facsimile: 908-771-6159

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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,906	11/07/2005	Andrew Miller Cameron	M02B129	6895

20411 7590 03/29/2010

The BOC Group, Inc.
575 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974-2082

EXAMINER	
YANG, JIE	

ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
03/29/2010	PAPER

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.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/517,906
Filing Date: November 07, 2005
Appellant(s): CAMERON ET AL.

Joseph G. Curatolo
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 1/20/2010 appealing from the Office action mailed 10/02/2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

None.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct. However, in view of the Appeal Brief filed on 1/20/2010, **a new ground rejection based on Schlichting (US 5,366,537, thereafter US'537) in view of Edlinger (US 6,409,793 B1, thereafter, US'793), and further in view of the new evidence reference, Anderson et al (US 6,241,510 B1, thereafter US'510) for the instant claim 8 under 35 U.S.C. 103(a) is applied in this Examiner's answer.**

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,366,537	Schlichting	11-1994
6,409,793 B1	Edlinger	6-2002
6,558,614 B1	Fritz	5-2003
6,241,510 B1	Anderson	6-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims, and a **new rejection** based on a new evidence reference is applicable to the appealed claim 8:

Claim Rejections - 35 USC § 103

Claims 1-7, 9-14 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlichting (US 5,366,537, thereafter US'537) in view of Edlinger (US 6,409,793 B1, thereafter, US'793).

Regarding claim 1, US'537 teaches a process for smelting iron ore and /or refining molten iron by oxygen and a carbonaceous fuel (Abstract of US'537) with supersonic speed (Col.3, lines 10-22 of US'537), which reads on the refining ferroalloy by blowing oxygen and metallurgical acceptable particle material with supersonic gas jets as recited in the

instant claim. US'537 specifies: "The coal is preferably delivered in a stream at a speed of between about Mach 0.75 and about Mach 2, surrounded by the nitrogen or argon stream delivered at about Mach 0.5 to Mach 1.5, and the oxygen outer stream is preferably delivered at a speed of about Mach 0.75 to Mach 2.0." (Col.3, lines 14-19 of US'537), which read on the first and second supersonic gas jets as recited in the instant claim. The speeds of gas jets overlap the velocities of the first and the second supersonic gas jets, which is a prima facie case of obviousness. SEE MPEP 2144.05 I. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed velocity of the second supersonic gas jet being from 10% less to 10% greater than the velocity of the first supersonic gas jet from the disclosures of US'537 because US'537 discloses the same utility throughout the disclosed ranges.

Still regarding claim 1, US'537 does not specify adding metallurgical acceptable particular material, capable of providing a cooling effect as recited in the instant claim 1. US'793 teaches a method for producing steel slags containing chromium (title and Abstract of US'793). US'793 teaches chromium ores or chromium-containing dusts are top blown onto the bath via a hot blast lance by the aid of jet of suitable speed

(Col.2, lines 13-30 of US'793), which is the same metallurgical acceptable particular material as recited in the instant invention (refer to the instant claim 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the chromium-containing dusts as taught by US'793 in the process of US'537 in order to obtain high-grade ferrochromium alloy (Abstract of US'793). At the same time, the introduction of the same metallurgical acceptable particular material as recited in the instant invention, for example, chromium ores or chromium-containing dusts as demonstrated by US'793 would inherently lead to the cooling effect to the molten metal process of US'537 in view of US'793. MPEP 2112 III&IV.

Regarding claim 2, US'537 does not specify that the metallurgical acceptable material includes metals for example refined alloy, alloys of said metals, oxides of said metals, and mixtures thereof. US'793 teaches a method for producing steel slags containing chromium (title and Abstract of US'793). US'793 teaches chromium ores or chromium-containing dusts are top blown onto the bath via a hot blast lance by the aid of jet of suitable speed (Col.2, lines 13-30 of US'793). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the chromium-containing

dusts as taught by US'793 in the process of US'537 in order to obtain high-grade ferrochromium alloy (Abstract of US'793).

Regarding claim 3, US'793 teaches that the high grade metal include 35wt% Fe (Col.4, lines 30-37 of US'793), which is within the at least 30wt% Fe range as recited in the instant claim.

Regarding claims 4-7, the chromium-containing dusts (Col.2, lines 13-30 of US'793) read on the chromium-containing metallurgical acceptable material as recited in the instant claims.

Regarding claim 9, US'537 teaches charging metallurgical acceptable material, for example carbonaceous material including of coal, coke, graphite, char, and hydrocarbon gases or liquids (claim 8 of US'537); or charging in the form of solid plugging (Col.6, lines 10-22 of US'537), which reads on the limitation of introducing metallurgical acceptable particular material in fine particular form as recited in the instant claim.

Regarding claim 10, US'793 teaches that the particle sizes of below 4mm, preferably 0.5-2mm, which overlaps the particle size of 1 mm or less as recited in the instant claim.

Regarding claims 11-14, US'537 teaches inert gas flow and oxygen gas flow (Col.2, line 39 to Col.4, line 60 of US'537), which reads on the oxidizing gas (claims 11, 12, 14) and non-oxidizing gas (claims 11 and 13).

Regarding claims 19-21, US'793 teaches followed by ensured rapid mass transfer, suitable post-combustion will be applied (Col.2, lines 13-31 of US'793). US'793 teaches that in order to ensure the appropriate post-combustion, the hot blast is enriched with oxygen (Col.2, lines 31-33 of US'793), which reads on the limitation of first introducing metallurgical acceptable material (claim 19); then introducing oxygen by gas jet (Claim 20); and finishing the refine operation (claim 21).

NEW REJECTION GROUND

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over US'537 in view of US'793, and further evidenced by Anderson et al (US 6,241,510 B1, thereafter US'510).

The Appellant first time pointed out that US'537 in view of US'793 does not teaches refine ferromanganese in the instant Appeal brief filed on 1/20/2010. However, the ferromanganese is one of generic specie of ferroalloy and refining ferromanganese using coherent gas jet is a well-known as evidenced by US'510. US'510 teaches a process of providing gases into an injection volume in one or more coherent gas jets (Abstract of US'510). US'510 teaches the technique is applied to ferromanganese refine

furnace (Col.3, lines 10-24 of US'510). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the well-known ferroalloy, for example ferromanganese as demonstrated by US'510 in the process of US'537 in view of US'793 to obtain the expected success.

Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US'537 in view of US'793 as applied on claims 1-14 and 19-21, and further in view of Fritz (WO 0012767 used hereinafter with US 6,558,614, US'614).

Regarding claim 15, US'537 specifies: "The coal is preferably delivered in a stream at a speed of between about Mach 0.75 and about Mach 2, surrounded by the nitrogen or argon stream delivered at about Mach 0.5 to Mach 1.5, and the oxygen outer stream is preferably delivered at a speed of about Mach 0.75 to Mach 2.0." (Col.3, lines 14-19 of US'537), which overlap the velocity of Mach 1.5 to Mach 4 of the first nozzle and the second nozzle as recited in the instant claim.

Still regarding claim 15 and claims 16-18, US'537 teaches co-axial different streams (Fig.5-6, Col.6, line 60 to Col. 7, line 26 of US'537), but US'537 does not specify the use of Laval nozzles in the supersonic jet streams. US'614 teaches a method for producing a metal melt involving the charging of solid metal

oxides and a lance for use in the described method. US'614 teaches a lance comprising a first axial gas supply tube terminating at its outlet wherein the mouth part of the tube is designed as a first Laval nozzle, a second tube surrounding the first tube terminating at is outlet, wherein the mouth part of the tube is designed as a second Laval nozzle, and a third tube for forming a supply duct, in particular for solid, fine grained to dust-like substances, wherein the outlet of the third tube is in a divergent part of the first Laval nozzle. The Laval nozzle facilitates high velocities (Col.1, lines 5-15; Col.5, lines 6-14; Col.7, lines 18-23; and Fig.5 of US'614). It would have been obvious to one of ordinary sill in the art to combine process taught by US'537 and the lance of US'614 in order to facilitate the refining of a ferroalloy in term of speed (i.e. shorter processing time). Regarding the combustion chamber in the instant claim 18, US'614 teaches a cavity formed at the end of the lance seen in Fig.5 allows for the combustion of the fuel and oxygen (Fig.5 and Col.5, lines 5-24 of US'614).

(10) Response to Argument

The appellant's arguments filed on 1/20/2010 have been fully considered but they are not persuasive.

In the remarks, appellant argues:

1) The office action has not established a prima facie case of obviousness because the purpose of Schlichting (US'537) is to maintain and/or increase the heat of combustion occurring within the smelting or refining operation being performed by adding a carbonaceous fuel and oxygen; the purpose of Edlinger (US'793) is to improve previous processes of producing steel in order to produce environmentally friendly slags; Schlichting (US'537) and Edlinger (US'793) are not properly combinable Schlichting (US'537) teaches away from any combination with Edlinger (US'793) and the modifying would render each reference unsatisfactory for its intended purpose.

2) The office's burden of providing inherency has not been met. The Office cannot prove that the cooling effect is necessarily provided by the combination of Schlichting (US'537) and Edlinger (US'793), nor can it prove that a person of ordinary skill in the art would recognize the necessary presence of a cooling effect because the amount of carbon in the process of the Schlichting (US'537) /Edlinger (US'793) combination is maintained or increases.

3) Regarding claim 8, Edlinger nowhere discloses the use of manganese, and thus cannot teach or suggest a ferroalloy or metallurgically acceptable particulate material containing manganese as recited in present claim 8.

4) Regarding claims 9 and 10, it is unclear as to how the disclosures of Schlichting (US'537) discussed in the rejection of claim 9 read on the subject matter of claim 9 because the materials taught by US'537 is charged in the form of solid plugging, do not teach or suggest in fine particulate form as recited in the instant claims.

5) Regarding claim 14, the Office has failed to allege the "burning gases" that either Schlichting (US'537) or Edlinger (US'793), alone or in combination teach or suggest the feature of claim 14.

6) Regarding claims 15-18, Fritz (US'614) does noting to correct the deficiencies of the alleged Schlichting (US'537) /Edlinger (US'793).

In response,

Regarding the argument 1), as pointed out in the rejection for the instant claim 1, US'537 teaches a process for smelting iron ore and /or refining molten iron by oxygen and a carbonaceous fuel with supersonic speed, which reads on the process of refining a ferroalloy. Adding different raw materials as taught by Edlinger (US'793) does not change the purpose of US'537's application. US'537 in view of US'793 teaches chromium ores or chromium-containing dusts are top blown onto the bath via a hot blast lance by the aid of jet of suitable speed, which is the same metallurgical acceptable particular material as recited in the instant invention (refer to the instant claim 2), which is a prima facie of obviousness.

Regarding the argument 2), the Examiner notes that: the exothermaically reaction and the cooling effect depend on the applied materials and the process. It is the Examiner's position that the similar material in a similar working conditions would inherently lead to the similar chemical reaction and effect. Further more, the Examiner notes that the amount of carbon in the process of the Schlichting (US'537) /Edlinger (US'793) combination (3wt%-9wt%C) overlap the range of up to 6wt%C as recited in the

instant invention. The Appellant has not provided any evidence to show the criticality of carbon content in the process to the exothermaically reaction and the cooling effect.

Regarding the argument 4), the limitation of a metallurgically acceptable particulate material in fine particulate form is analyzed with its broadest meaning. As pointed out in the rejection for the instant claims, US'537 teaches charging metallurgical acceptable material, for example carbonaceous material including of coal, coke, graphite, char, and hydrocarbon gases or liquids; or charging in the form of solid plugging, which reads on the metallurgically acceptable material. Because most of these material blow charging into the furnace, for example blow oxygen with the particulate coal (Col.6, lines 63-64 of US'537), which reads on the particulate material in fine particulate form in the instant claims.

Regarding the argument 5), as pointed out in the rejection for the instant claims 1 and 14 above, US'537 teaches a process for smelting iron ore and /or refining molten iron by oxygen and a carbonaceous fuel (Abstract of US'537), which allege the "burning gases" in the instant claim.

Regarding the arguments 1), 2), and 4)-6), the apellant's arguments are against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In the instant case, US'537 in view of US'793 teaches the limitations of instant claims 1-7, 9-14 and 19-21; and US'537 in view of US'793 and further in view of US'614 teaches the limitations of instant claims 15-18. All of the

recorded prior arts teach the process of introducing oxygen gas and metallurgical acceptable material into the molten metal. "Cooling effect" is recognized as a result which depends on the effective variables, for example, speed of gas, kind of gas, and introducing materials (Refer to page 4, lines 12-29 of the instant specification). As discussed in the rejection for the instant claim 1, US537 in view of US'793 teaches the similar top blowing oxygen and/or mixing gas with the same supersonic speed and using the similar chromium-containing dusts as recited in the instant invention, which would inherently lead to the similar cooling effect as claimed to the molten metal process of US'537 in view of US'793.

Reagrding the argument 3), the Appellant first time pointed out that US'537 in view of US'793 does not teaches refine ferromanganese in the Appeal Brief filed on 1/20/2010. The Appellant's arguments with respect to claim 8 can refer to the new ground rejection as listed above.

This examiner's answer contains a new ground of rejection set forth in section **(9)** above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR

41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jie Yang/

Jie Yang, Art Unit 1793

Conferees:

/ Roy King/

Supervisory Patent Examiner, Art Unit 1793

/Gregory L Mills/

Supervisory Patent Examiner, Art Unit 1700

A Technology Center Director or designee must personally approve the new ground(s) of rejection set forth in section (9) above by signing below:

/Gregory L Mills/
Supervisory Patent Examiner, Art Unit 1700