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Evento :378
Actuación :444

Referencia : Expediente No. 08.001.559
Asunto : SOLICITUD DE PATENTE PARA BROCA DE
BARRENA
Solicitante : IRWIN INDUSTRIAL TOOL COMPANY
Clase : E21B 10/00
Fecha de solicitud : 09 de enero de 2008

Yo, Emilio FERRERO, obrando como apoderado del solicitante en el asunto antes identificado, atentamente presento el siguiente documento:

1. **Prioridad:** Presento con este escrito la copia certificada de la solicitud No. 11/621,308 del 9 de enero de 2007 cuya prioridad se reivindica en el asunto de la referencia.

2. Atentamente solicito a su Despacho que se continúe con el tramite de la presente solicitud de patente.

Señora Jefe,

EMILIO FERRERO

T.P.A. No. 31.929

COLO-14342-801-002-7
MVN\SCT\ID-121566\WPC14342
No. M-2008-121566\MVN

PA 1693882

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

February 08, 2008

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 11/621,308

FILING DATE: January 09, 2007

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US11/621,308

**By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office**



T. Wallace
T. WALLACE
Certifying Officer

Electronic Acknowledgement Receipt

EFS ID:	1421967
Application Number:	11621308
International Application Number:	
Confirmation Number:	1899
Title of Invention:	DRILL BIT
First Named Inventor/Applicant Name:	Laverne R. Durfee
Customer Number:	24239
Filer:	Dennis J. Williamson/Katie Efland
Filer Authorized By:	Dennis J. Williamson
Attorney Docket Number:	014881-000822
Receipt Date:	09-JAN-2007
Filing Date:	
Time Stamp:	15:13:27
Application Type:	Utility

Payment information:

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Payment was successfully received in RAM	\$ 1000
RAM confirmation Number	90
Deposit Account	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)
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1	Drawings	drawings.pdf	50719	no	4
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Warnings:

Information:

2	Oath or Declaration filed	declaration.pdf	78856	no	2
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Warnings:

Information:

3		specification.pdf	393129	yes	10
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	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	7	
	Claims		8	9	
	Abstract		10	10	

Warnings:

Information:

4	Fee Worksheet (PTO-06)	fee-info.pdf	8342	no	2
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Warnings:

Information:

Total Files Size (in bytes):			531046		
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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.

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below-named inventor, I hereby declare that my residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled "**DRILL BIT**," the specification of which is attached hereto unless one of the following boxes is checked

(check one)

- ☐ was filed on _____ as U.S. Application Serial No.
☐ and was amended _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I hereby claim foreign priority benefits under Title 35, United States Code Section 119(a-d) or 365(b) of any foreign application(s) for patent or inventor(s) certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor(s) certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NO.	DATE FILED	PRIORITY CLAIMED UNDER 35 U.S.C. 119
			YES:___ NO:___
			YES:___ NO:___

I hereby claim the benefit under Title 35, United States Code, §119(e) and/or §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this specification is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

APPLICATION NO.	DATE FILED	PRIORITY CLAIMED UNDER 35 U.S.C. 119(e)/120
		YES:___ NO:___
		YES:___ NO:___

I hereby appoint all of the registered practitioners associated with customer number

Customer Number 24,239

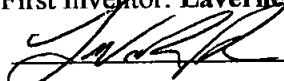
to prosecute this application and to transact all business in the U.S. Patent and Trademark Office connected therewith. All correspondence in connection with this application should be sent to the address noted below:

**Dennis J. Williamson
Moore & Van Allen PLLC
PO Box 13706
430 Davis Drive, Suite 500
Research Triangle Park, NC 27709
PHONE: 919-286-8000**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine and/or imprisonment under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent hereafter issued that is based on or claims priority to or the benefit of the present application.

Full Name of Sole or First Inventor: **Laverne R. Durfee**

Inventor's Signature



Date

1-5-07

Residence Address: 255 Fox Hunter Road, Harmony, NC 28634

Citizenship: USA

Mailing Address: Same as above

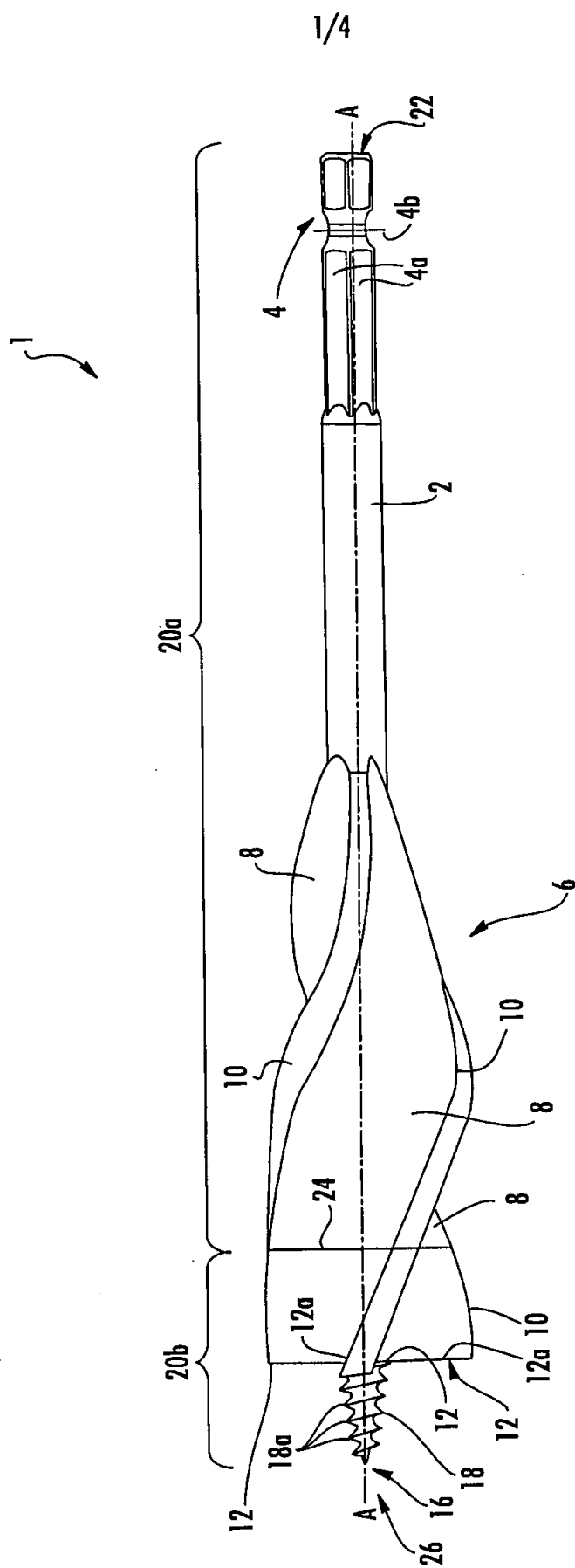
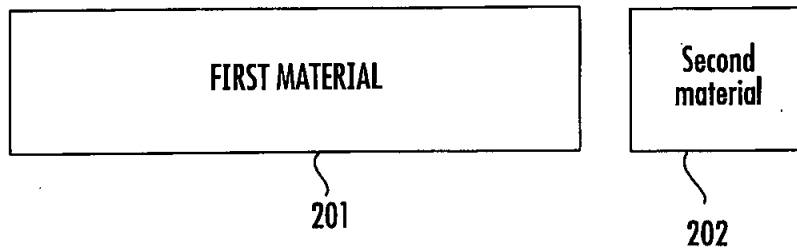


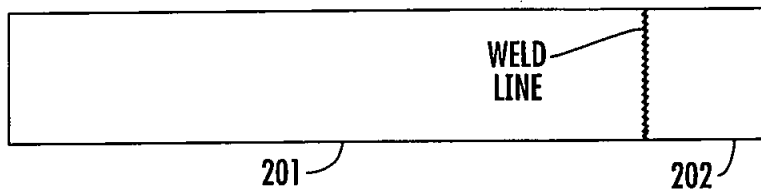
FIG. 1

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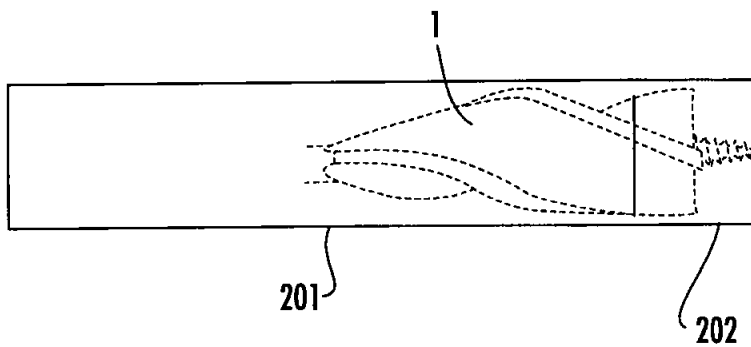
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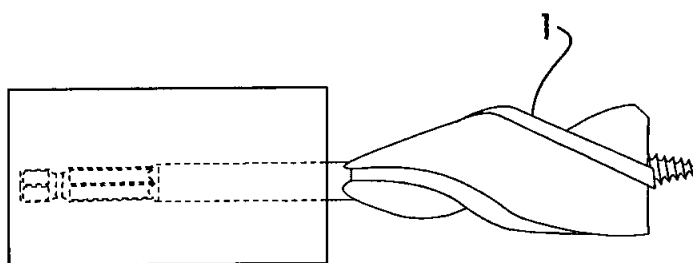
BLANKS



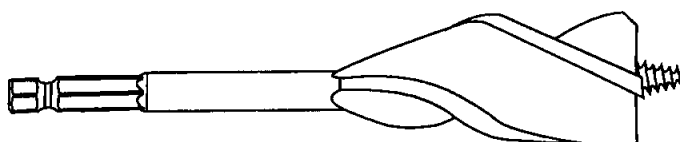
WELD BLANKS



MILL BIT



FORM SHANK



HEAT TREAT
&
GRIND EDGES

FIG. 2

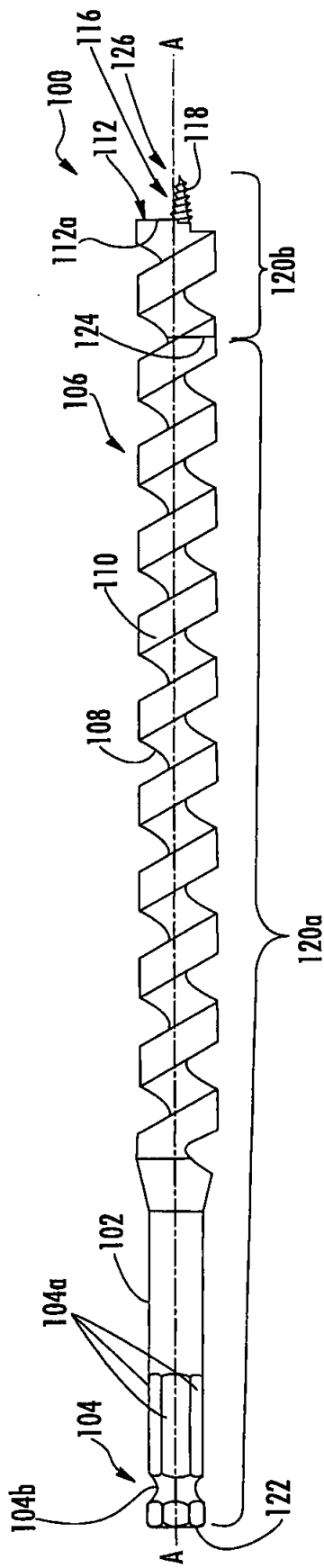


FIG. 3

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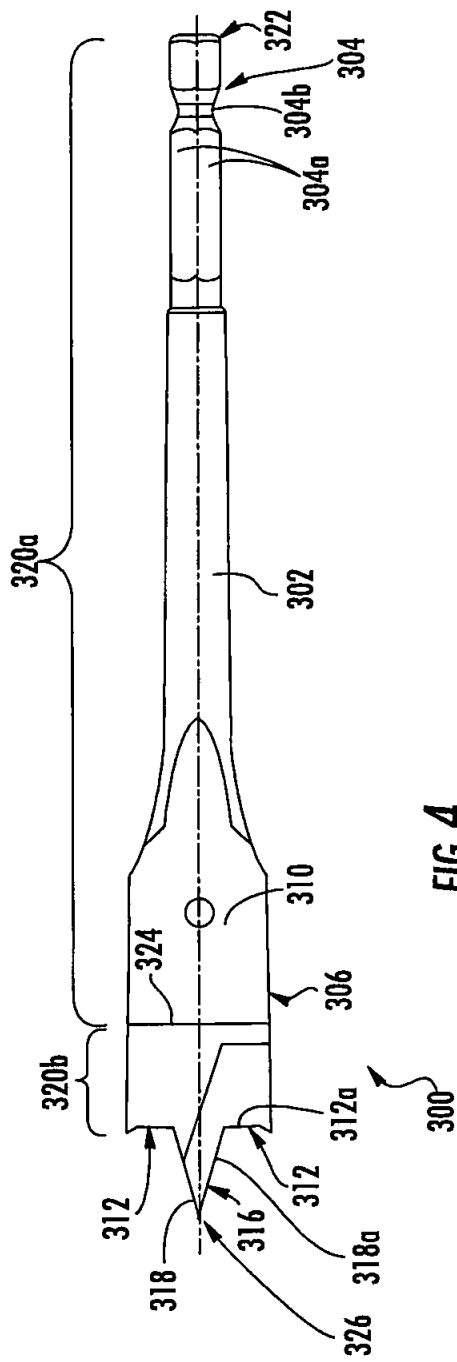


FIG. 4

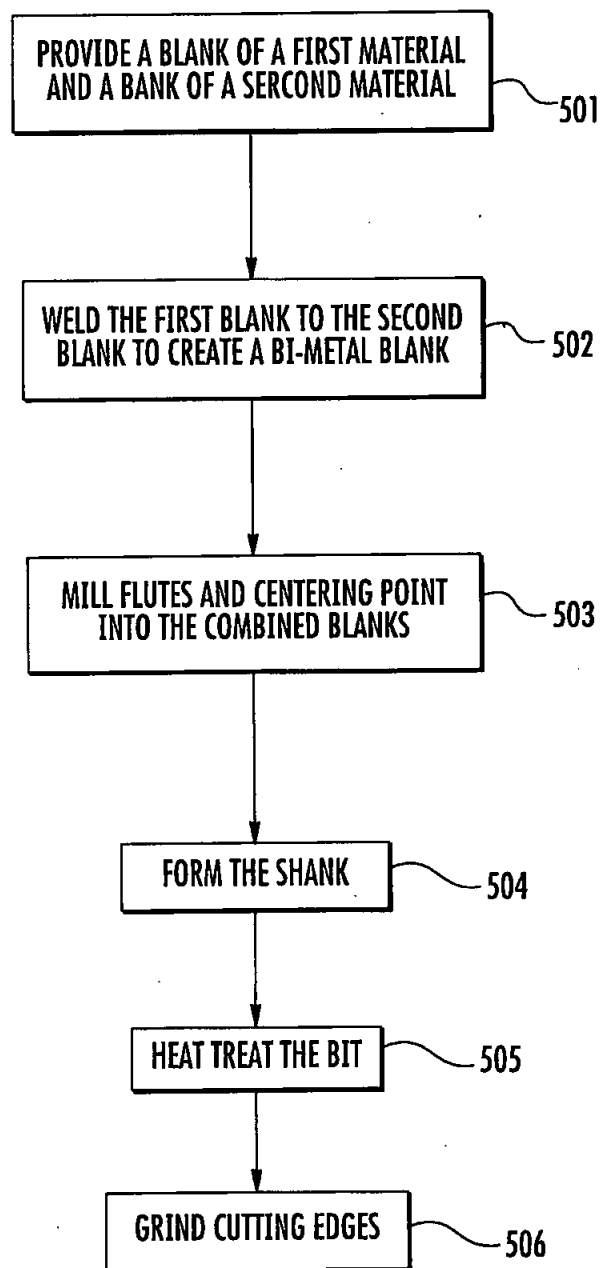


FIG. 5

DRILL BIT

[0001] The invention relates generally to wood boring tools and more particularly to drill bits.

Background of the Invention

[0002] Drill bits for boring holes of preselected diameters in a workpiece are known. Such bits come in a variety of styles. One type of bit is known as a wood auger. This type of bit includes a shank that has one end adapted to be connected to a chuck of a rotary tool such as a drill or power driver. The opposite end of the shank supports a wood auger that comprises a flute that terminates in a cutting face for cutting a bore in the workpiece. The cutting member may also be formed with a pilot point along its longitudinal axis for guiding the bit into and through the workpiece. Another type of bit is known as a spade bit or paddle bit. This type of bit includes a shank that has one end adapted to be releasably connected to a chuck of a rotary tool such as a drill or driver. The opposite end of the shank supports a cutting member where the cutting member is a substantially flat, relatively thin blade. Yet another type of bit is a fluted bit that has a plurality of flutes formed in spirals around the longitudinal axis of the bit. The flutes define cutting edges for cutting the workpiece.

[0003] While various types of drill bits are known, an improved wood bit is desired.

Summary of the Invention

[0004] A drill bit comprises a shank defining a longitudinal axis. A cutting head is formed at one end of the shank. At least one cutting edge and a centering point are formed on the cutting head. The shank and a portion of the cutting head are formed of a first material. The cutting edge, centering point and a portion of the

cutting head are formed of a second material. A weld joins the first material and the second material.

[0005] A method of making a drill bit comprises providing a first blank of a first material and a second blank of a second material. The first blank is welded to the second blank. A cutting head is milled into the first blank and second blank such that the cutting head is formed of both of the first material and the second material. The method may further comprise heat treating the milled cutting head.

Brief Description of the Drawings

[0006] Fig. 1 is a side view of one embodiment of the drill bit of the invention.

[0007] Fig. 2 is a schematic drawing illustrating the major manufacturing processes for making the drill bit of the invention.

[0008] Fig. 3 is a side view of another embodiment of the drill bit of the invention.

[0009] Fig. 4 is a side view of yet another embodiment of the drill bit of the invention.

[0010] Fig. 5 is a flow chart illustrating one embodiment of a method of manufacturing the bit of the invention.

Detailed Description of Embodiments of the Invention

[0011] Referring to Fig. 1 an embodiment of a bi-metal drill bit is shown generally at 1 and comprises a shank 2 having a quick coupling 4 disposed at a first end thereof. The quick connect coupling 4 may comprise a plurality flat faces 4a adapted to be received and retained in a chuck of a rotary tool such as a screwdriver or power driver. A recess 4b may be formed around the

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circumference of the shank to be releasably engaged by the quick connect coupler of the rotary tool. Other configurations of shank 2 may also be used for coupling the drill bit to a rotary drive tool.

[0012] A cutting head 6 is formed on the opposite end of shank 2 from quick connect coupling 4. The cutting head 6 is intended to cut wood and may include a plurality of flutes 8 defining a plurality of ribs 10 therebetween. In the embodiment of Fig. 1 three flutes and ribs are shown although the cutting head may have a different number flutes and a variety of designs. Each rib 10 has a cutting face 12 formed at the distal end thereof. The cutting face typically extends from the side edges of ribs 10 to a centering or pilot point 16 located along the longitudinal axis A-A of the drill bit. In the illustrated embodiment the centering point 16 is a lead screw 18 having threads 18a for centering the bit and feeding the bit through the wood. The lead screw 18 may be replaced by a lead point as shown in Fig. 4. The centering point 16 may be made removable such that a broken point may be replaced. With a replaceable centering point the centering point would preferably be made out of high speed steel (HSS) as a separate component. Each cutting face 12 may be formed with a bevel angle to create a sharp cutting edge 12a on each of the ribs for cutting the material as the drill bit rotates.

[0013] The drill bit 1 is formed of at least two different portions made of different materials permanently joined together to create a unitary single piece drill bit. The first portion 20a is formed of a first material such as 1065 carbon steel. The first portion 20a extends from the proximal end 22 of the bit to a weld line 24. The second portion 20b is formed of a second material such as high speed steel (HSS). The second portion 20b extends from the distal end 26 of the bit to weld line 24 and includes the cutting edges 12a and centering point 16. In one embodiment the weld line 24 is located in the cutting head 6 such that the flutes 8 and ribs 10 have a first portion that is formed of the first material and a second portion that is formed of the second material. In one embodiment the size of the

second portion is determined to minimize the amount of HSS used yet allow a good weld between the first portion and the second portion. The second material that makes up the cutting edges and centering point is harder and/or stronger than the first material. While weld line 24 is shown in Fig. 1 to illustrate the weld between the first portion 20a and second portion 20b, the transition between these portions is smooth, uniform and uninterrupted such that the first portion transitions smoothly into the second portion.

[0014] A second embodiment of a drill bit is shown in Fig. 3 comprising a single flute wood auger 100. Wood auger 100 comprises a shank 102 having a quick coupling 104 disposed at a first end thereof. The quick connect coupling 104 may comprise a plurality flat faces 104a and a recess 104b, as previously described, that may be releasably engaged by the quick connect coupler of the rotary tool.

[0015] A cutting head 106 is formed on the opposite end of shank 102 from quick connect coupling 104. The cutting head 106 is intended to cut wood and may include a single flute 108 defining a rib 110. Rib 110 has a cutting face 112 formed at the distal end thereof. The cutting face 112 typically extends from the side edge of rib 110 to a centering or pilot point 116 located along the longitudinal axis A-A of the auger. In the illustrated embodiment the centering point 116 is a lead screw 118 having threads for centering the auger and feeding the auger through the wood. The lead screw 118 may be replaced by a lead point as shown in Fig. 4. The lead screw may also be made detachable as previously described. Cutting face 112 is formed with a bevel angle to create a sharp cutting edge 112a for cutting the material as the auger rotates.

[0016] The auger is formed of at least two different portions made of different materials permanently joined together to create a unitary, single piece auger. The first portion 120a is formed of a first material such as 1065 carbon steel. The first portion 120a extends from the proximal end 122 of the auger to a weld

line 124. The second portion 120b is formed of a second material such as high speed steel (HSS). The second portion 120b extends from the distal end 126 of the auger to weld line 124 and includes the cutting edge 112a and centering point 116. In one embodiment the weld line 124 is located in a central portion of the cutting head 106 such that a first portion of the flute and rib are formed of the first material and a second portion of the flute 108 and rib 110 are formed of the second material. In one embodiment the second material that includes the cutting edges and centering point is harder and/or stronger than the first material. While weld line 124 is shown in Fig. 3 to illustrate the weld between the first portion 120a and second portion 120b, the transition between these portions is smooth, uniform and uninterrupted such that the first portion transitions smoothly into the second portion.

[0017] A third embodiment of a drill bit is shown in Fig. 4 comprising a spade bit 300. Spade bit 300 comprises a shank 302 having a quick coupling 304 disposed at a first end thereof. The quick connect coupling 304 may comprise a plurality flat faces 304a and a recess 304b, as previously described, that may be releasably engaged by the quick connect coupler of the rotary tool.

[0018] A cutting head 306 is formed on the opposite end of shank 302 from quick connect coupling 304. The cutting head 306 is intended to cut wood and may include a relatively wide flat blade 310. Blade 310 has a pair of cutting faces 312 formed at the distal end thereof. The cutting faces 312 typically extend from the side edges of cutting head 306 to a centering or pilot point 316 located along the longitudinal axis A-A of the drill bit. In the illustrated embodiment the centering point 316 is a lead point 318 having substantially straight cutting edges 318a formed on opposite sides of lead point 318 for boring a pilot hole in the material being drilled to center and guide the bit. The lead point 318 may be replaced by a screw point as shown in Figs. 1 and 3. The lead point may also be made detachable as previously described. Cutting faces 312 are formed with a bevel

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angles to create sharp cutting edges 312a for cutting the material as the bit rotates.

[0019] The drill bit is formed of at least two different portions made of different materials permanently joined together to create a unitary, single piece drill bit. The first portion 320a is formed of a first material such as 1065 carbon steel. The first portion 320a extends from the proximal end 322 of the bit to a weld line 324. The second portion 320b is formed of a second material such as high speed steel (HSS). The second portion 320b extends from the distal end 326 of the bit to weld line 324 and includes the cutting edges 312a and centering point 316. In one embodiment the weld line 324 is located in a central portion of the cutting head 306 such that a first portion of the blade 310 is formed of the first material and a second portion of the blade 310 is formed of the second material. In one embodiment the second material that includes the cutting edges and centering point is harder and/or stronger than the first material. While weld line 324 is shown in Fig. 5 to illustrate the weld between the first portion 320a and second portion 320b, the transition between these portions is smooth, uniform and uninterrupted such that the first portion transitions smoothly into the second portion.

[0020] Drill bits constructed as described above may be used in any wood boring application but are particularly suitable in applications where the drill bit may contact obstructions in the wood such as buried nails, screws, other fasteners or other foreign bodies including metal objects. Drill bits made in accordance with the invention have been found to be over four times more durable than existing carbon steel wood bits while being inexpensive enough for use as wood boring tools. For example, a carbon steel bit will become ineffective for drilling wood after encountering one to two dozen buried nails. The drill bit of the invention is able to bore through over one hundred buried nails and still be effective for cutting holes in pine 2x4 studs.

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[0021] Referring to Figs. 2 and 5 the process for making the bi-metal drill bit will be described. In one embodiment a cylindrical blank 201 of the first material and a cylindrical blank 202 of the second material are provided (block 501). While in one embodiment the blanks are cylindrical, blanks having other shapes may be used. Blank 201 is welded to a blank 202 to create a bi-metal blank (block 502). Any suitable welding technique may be used including electric, brazing, spin, induction or resistance. The shank is typically formed by turning the blanks on a lathe (block 503). After the blanks are welded together, the flutes and centering point are milled into the combined blanks (block 504). The flutes may be milled into both materials in a single milling operation. The weld line is located in a center portion of the cutting head such that the cutting head has a portion made of the first material and a portion made of the second material. The transition between the material of the first portion and the material of the second portion is smooth and uniform such that the joint between the two materials does not create an obstruction or irregularity on the surface of the bit. After the milling operation the entire bit is heat treated to harden the material of the bit (block 505). After heat treatment the bit is ground to a true diameter and sharp cutting edges are ground into the cutting head (block 506).

[0022] While the process for manufacturing the bit has been described with respect to the bit of Fig. 1, the process may be used with bits having different configurations. Further, while three such bit configurations are shown, the bi-metal construction may be provided on any wood bit configuration.

[0023] While embodiments of the invention are disclosed herein, various changes and modifications can be made without departing from the spirit and scope of the invention. One of ordinary skill in the art will recognize that the invention has other applications in other environments. Many embodiments are possible. The following claims are in no way intended to limit the scope of the invention to the specific embodiments described above.

Claims:

1. A drill bit comprising

a shank defining a longitudinal axis;

a cutting head formed at one end of the shank;

at least one cutting edge and a centering point formed on the cutting head;

said shank and a portion of the cutting head formed of a first material;

said cutting edge, centering point and a portion of the cutting head formed of a second material;

a weld connecting said first material and said second material.

2. The bit of claim 1 wherein the centering point is a screw.

3. The bit of claim 1 wherein the centering point is a lead point having at least one substantially straight cutting edge.

4. The bit of claim 1 wherein a smooth transition is provided between the first material and the second material.

~~5. The bit of claim 1 wherein the cutting head includes a plurality of flutes.~~

6. The bit of claim 1 wherein the cutting head is an auger.

7. The bit of claim 1 wherein the cutting head is a spade bit.

8. The bit of claim 5 wherein a first portion of the flutes is formed of the first material and a second portion of the flutes is formed of the second material.

9. The bit of claim 6 wherein a first portion of the auger is formed of the first material and a second portion of the auger is formed of the second material.

10. The bit of claim 7 wherein a first portion of the spade bit is formed of the first material and a second portion of the spade bit is formed of the second material.

11. The bit of claim 6 wherein the auger has a single flute.

12. The bit of claim 7 wherein the spade bit includes a thin blade.

13. The bit of claim 1 wherein the centering point is detachable.

14. A method making a drill bit comprising:

providing a first blank of a first material;

providing a second blank of a second material;

welding the first blank to the second blank; and

milling a cutting head into the first blank and second blank such that the cutting head is formed of the first material and the second material.

15. The method of claim 14 further comprising heat treating the milled cutting head.

16. The method of claim 14 wherein the milling operation creates a smooth transition between the first blank and the second blank.

17. The method of claim 14 further including grinding a cutting edge on the cutting head.

18. The method of claim 14 further including forming a shank said shank having a quick connect coupling at one end thereof.

Abstract

A drill bit comprises a shank defining a longitudinal axis. A cutting head is formed at one end of the shank. At least one cutting edge and a centering point are formed on the cutting head. The shank and a portion of the cutting head are formed of a first material. The cutting edge, centering point and a portion of the cutting head are formed of a second material. A weld joins the first material and the second material. A first blank is welded to a second blank. A cutting head is milled into the first blank and second blank such that the cutting head is formed of the first material and the second material.

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LOS ESTADOS UNIDOS DE AMÉRICA

A TODO AQUEL A QUIEN CONCIERNA LO PRESENTE
DEPARTAMENTO DE COMERCIO DE LOS ESTADOS UNIDOS

Oficina de Patentes y Marcas de los Estados Unidos

Febrero 08, 2008

LA PRESENTE ES PARA CERTIFICAR QUE ADJUNTA A LA MISMA HAY UNA COPIA FIEL DE LOS REGISTROS DE LA OFICINA DE PATENTES Y MARCAS DE LOS ESTADOS UNIDOS DE LOS DOCUMENTOS DE LA SOLICITUD DE PATENTE IDENTIFICADA EN LO QUE SIGUE, QUE CUMPLE LOS REQUISITOS PARA OTORGARLE UNA FECHA DE PRESENTACIÓN BAJO EL 35 USC 111.

NÚMERO DE SOLICITUD: 11/621,308
FECHA DE PRESENTACIÓN: Enero 09, 2007

EL CÓDIGO DE PAÍS Y NÚMERO DE SU SOLICITUD DE PRIORIDAD, PARA SER USADA PARA PRESENTACIÓN EN EL EXTRANJERO DE ACUERDO CON LA CONVENCIÓN DE PARIS, ES US11/621,308



Por la Autoridad del
De acuerdo con la Secretaría de Comercio para la
Propiedad Intelectual y el Director de la Oficina de
Marcas y Patentes de los Estados Unidos

(Aparece firma ilegible)
T. WALLACE
Funcionario Certificador

Gustaf A. Lopez M.B.
Official Translator and Interpreter
Resolution 264 Ministry of Justice
1996

REIVINDICACIONES:

1. Una broca de taladro que comprende

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un vástago que define una eje longitudinal;

una cabeza de corte formada en un extremo del vástago;

por lo menos un borde de corte y un punto de centro formado en la cabeza
de corte;

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dicho vástago y una porción de la cabeza de corte formado de un primer
material;

dicho borde de corte, punto central y una porción de la cabeza de corte
formado de un segundo material;

una soldadura que conecta dicho primer materia y dicho segundo material.

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2. La broca de la reivindicación 1 en donde el punto de centro es un
tornillo.

3. La broca de la reivindicación 1 en donde el punto de centro es un punto

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de plomo que tiene por lo menos sustancialmente un borde de corte
recto.

4. La broca de la reivindicación 1 en donde la transición liza se
proporciona entre el primer material y el segundo material.

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5. La broca de la reivindicación 1 en donde la cabeza de corte incluye una
pluralidad de ranuras.

6. La broca de la reivindicación 1 en donde la cabeza de corte es una barrena.

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7. La broca de la reivindicación 1 en donde la cabeza de corte es una broca de pala.

8. La broca de la reivindicación 5 en donde una primera porción de las ranuras se forma del primer material y una segunda porción de las ranuras se forma del segundo material.

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9. La broca de la reivindicación 6 en donde una primera porción de la barrena se forma del primer material y una segunda porción de la barrena se forma el segundo material.

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10. La broca de la reivindicación 7 en donde una primera porción de la broca de pala se forma del primer material y una segunda porción de la broca de pala se forma del segundo material.

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11. La broca de la reivindicación 6 en donde la barrena tiene una única ranura.

12. La broca de la reivindicación 7 en donde la broca de pala incluye una cuchilla delgada.

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13. La broca de la reivindicación 1 en donde el punto central es desmontable.

14. Un método para elaborar una broca de taladro que comprende:

proporcionar un primer blanco de un primer material;

proporcionar un segundo blanco de un segundo material;

soldar el primer blanco con el segundo blanco; y

- 5 moler una cabeza de corte en el primer blanco y segundo blanco de tal manera que la cabeza de corte se forma del primer material y el segundo material.

- 10 15. El método de la reivindicación 14 que comprende adicionalmente tratar con calor la cabeza de corte molida.

16. El método de la reivindicación 14 en donde la operación de molido crea una transición liza entre el primer blanco y el segundo blanco.

- 15 17. El método de la reivindicación 14 que incluye adicionalmente moler un borde de corte en la cabeza de corte.

- 20 18. El método de la reivindicación 14 que incluye adicionalmente formar un vástago de dicho vástago que tiene un acoplamiento de conexión rápido en un extremo de este.