

Search history

Search 1: FT=(Method and apparatus and continuous and fabrication and shaped and metal and articles) (Results 11074)

Search 2: FT=(Method and apparatus and continuous and fabrication and shaped and metal and articles) and IC=(c21d) (Results 116)

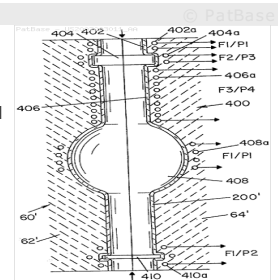
1) Family number: 31169245 (US2002003011A)

METHOD OF FORMING A TUBULAR BLANK INTO A STRUCTURAL COMPONENT AND DIE THEREFOR

Abstract: Source: US2002003011A A **method** of forming an elongated tubular blank into a tubular structural component having a predetermined outer configuration, the **method** comprising: providing a **shape** imparting shell formed from a low permeability, rigid material which includes an inner surface defining the predetermined **shape**, plugging the open ends of the tubular blank, placing the plugged blank into the shell, and forming the tubular blank into the tubular component by inductively heating axial portions of the blank by axially spaced conductors adjacent the shell while or before forcing gas at a high pressure into the plugged blank until the blank conforms to at least a portion of the inner surface of the shell to form the structural component.

Probable Assignee: TEMPER IP LLC

Earliest Publication Date: 20010329



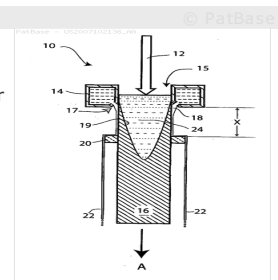
2) Family number: 34443984 (US2007102136A)

HOMOGENIZATION AND HEAT-TREATMENT OF CAST METALS

Abstract: Source: US2007102136A A **method** of casting a **metal** ingot with a microstructure that facilitates further working, such as hot and cold rolling. The **metal** is cast in a direct chill casting mold, or the equivalent, that directs a spray of coolant liquid onto the outer surface of the ingot to achieve rapid cooling. The coolant is removed from the surface at a location where the emerging embryonic ingot is still not completely solid, such that the latent heat of solidification and the sensible heat of the molten core raises the temperature of the adjacent solid shell to a convergence temperature that is above a transition temperature for in-situ homogenization of the **metal**. A further conventional homogenization step is then not required. The invention also relates to the heat-treatment of such ingots prior to hot working.

Probable Assignee: NOVELIS INC

Earliest Publication Date: 20070503



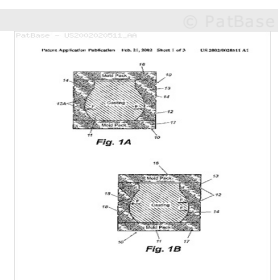
3) Family number: 30319399 (US2002020511A)

METHOD AND APPARATUS FOR ASSISTING REMOVAL OF SAND MOLDINGS FROM CASTINGS

Abstract: Source: US2002020511A Disclosed is a **method** for dislodging a mold from a casting formed within the mold. The mold may be removed from the casting by scoring the mold and applying a force sufficient to cause the mold to fracture and break into pieces. Additionally, the mold may be fractured by either explosive charges placed in the mold pack or by high energy pulsations directed at the mold. Once the mold is fractured and broken into various pieces it may then be dislodged from the casting.

Probable Assignee: CONSOLIDATED ENGINEERING CO INC

Earliest Publication Date: 20010208



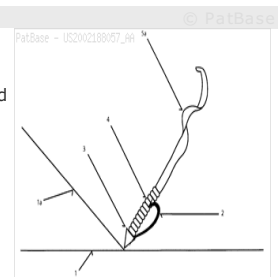
4) Family number: 31497173 (US2002188057A)

GELATINOUS ELASTOMER COMPOSITIONS AND ARTICLES FOR USE AS FISHING BAIT

Abstract: Source: US2002188057A A soft gelatinous elastomer composition and article useful as fishing bait formed from one or a mixture of two or more of a poly(styrene-ethylene-butylene-styrene) block copolymer(s) and one or more plasticizers being in sufficient amounts to achieve a gel rigidity of from about 20 gram Bloom to about 800 gram Bloom

Probable Assignee: APPLIED ELASTOMERICS INC

Earliest Publication Date: 19830118



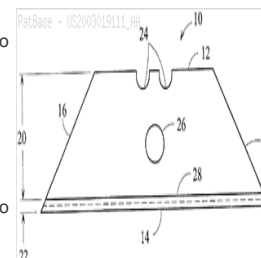
5) Family number: 30937919 (US2003019111A)

COMPOSITE UTILITY KNIFE BLADE, AND METHOD OF MAKING SUCH A BLADE

Abstract: Source: US2003019111A A composite utility knife blade and **method** of making such a blade involves butt joining a high speed steel wire to a front edge of a carbon steel backing strip. Electron beam welding the wire to the backing strip and, in turn, forming a composite strip defining a first **metal** portion formed by the steel backing strip, a second **metal** portion formed by the high speed steel wire, and a weld region joining the first and second **metal** portions. The composite strip is then annealed, and the annealed strip is straightened to eliminate any camber therein. Then, a plurality of notches are formed, such as by punching, in axially spaced locations relative to each other along the back edge of the first **metal** portion of the annealed composite strip. The annealed and punched composite strip is then hardened such that the first **metal** portion defines a surface hardness within the range of approximately 38 Rc to approximately 52 Rc, and the second **metal** portion defines a surface hardness within the range of approximately 60 Rc to approximately 75 Rc. The hardened strip is then subjected to at least two tempering and quenching cycles. Then, facets are formed on the edge of the second **metal** portion by grinding, honing and stropping to, in turn, form an approximately straight, high speed steel cutting edge along the side of the composite strip opposite the back edge of the first **metal** portion. The composite strip is then die cut along shear lines axially spaced relative to each other. Each shear line is oriented at an acute angle relative to the back edge of the first **metal** portion, and two notches are located between adjacent shear lines. The die cutting of the composite strip forms a plurality of utility knife blades, wherein each utility knife blade defines an approximately trapezoidal peripheral configuration.

Probable Assignee: IRWIN INDUSTRIAL TOOL CO

Earliest Publication Date: 20030130



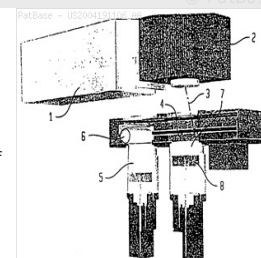
6) Family number: 30562617 (US2004191106A)

LASER-PRODUCED POROUS SURFACE

Abstract: Source: US2004191106A A **method** of **fabricating** a porous or partially porous three-dimensional **metal** article for use as a tissue ingrowth surface on a prosthesis. The porous article is formed using direct laser remelting in a cross section of a layer of metallic powder on a build platform without fusing thereto. The power, speed, spot size and beam overlap of the scanning laser is coordinated so that a predetermined porosity of the metallic powder can be achieved. Laser factors also vary depending from the thickness of the powder layer, type of metallic powder and size and size distribution of the powder particles. Successive depositing and remelting of individual layers are repeated until the article is fully formed by a layer-by-layer fashion. In an additional embodiment, a first layer of metallic powder may be deposited on a solid base or core and fused thereto.

Probable Assignee: HOWMEDICA OSTEONICS CORP

Earliest Publication Date: 20040508



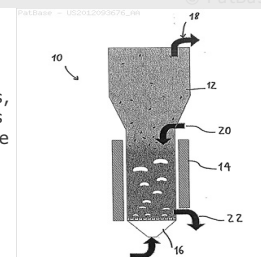
7) Family number: 46560155 (US2012093676A)

COMPOUND MATERIAL COMPRISING A **METAL** AND NANO PARTICLES AND A **METHOD** FOR PRODUCING THE SAME

Abstract: Source: US2012093676A Disclosed herein is a composite material comprising a **metal** and nanoparticles, in particular carbon nano tubes as well as a **method** of producing the same. A **metal** powder and the nanoparticles are processed by mechanical alloying, such as to form a composite comprising **metal** crystallites having an average size in the range of 1-100 nm, preferably 10 to 100 nm or in a range of more than 100 nm and up to 200 nm at least partly separated from each other by said nanoparticles.

Probable Assignee: BAYER AG

Earliest Publication Date: 20100819



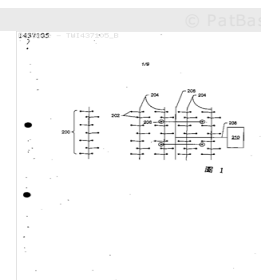
8) Family number: 42611974 (TW200817526A)

HIGH STRENGTH ALLOYS

Abstract: Source: TW200817526A High strength **metal** alloys are described. At least one composition of a **metal** alloy includes chromium, nickel, copper, manganese, silicon, niobium, tungsten and iron. A heater system may include a canister at least partially made from material containing at least one of the **metal** alloys. A system for heating a subterranean formation may include a tubular that is at least partially made from a material containing at least one of the **metal** alloys.

Probable Assignee: SHELL INT RESEARCH

Earliest Publication Date: 20071227



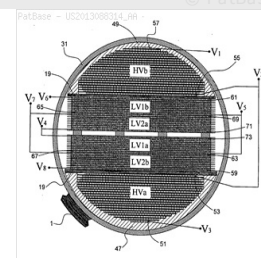
9) Family number: 48959290 (US2013088314A)

ELECTRICAL TRANSFORMER ASSEMBLY

Abstract: Source: US2013088314A A support frame for an electrical transformer assembly, comprising two loop-**shaped** parts, each loop-**shaped** part having a plurality of limbs, each limb having a peripheral recessed portion in which a primary electrical coil is mountable, and at least one secondary coil is mountable in piggyback on the primary electrical coil, one limb of each loop-**shaped** part having a straight section. The frame also includes an adjustable attaching means for attaching one of the loop-**shaped** parts with respect to the other loop-**shaped** part and adjusting a distance therebetween, so that only the straight sections are adjacent and form a central leg, the central leg being for receiving a magnetic core distinct from the attaching means. The frame provides a means and a **method** to efficiently secure adjacent windings in a circular core transformer kernel.

Probable Assignee: HYDRO QUEBEC

Earliest Publication Date: 20110526



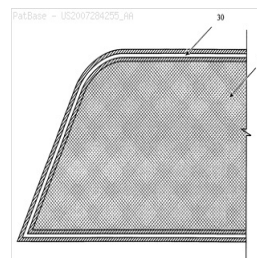
10) Family number: 40845441 (US2007284255A)

WEAR RESISTANT VAPOR DEPOSITED COATING, **METHOD** OF COATING DEPOSITION AND APPLICATIONS THEREFOR

Abstract: Source: US2007284255A A low friction top coat over a multilayer **metal**/ceramic bondcoat provides a conductive substrate, such as a rotary tool, with wear resistance and corrosion resistance. The top coat further provides low friction and anti-stickiness as well as high compressive stress. The high compressive stress provided by the top coat protects against degradation of the tool due to abrasion and torsional and cyclic fatigue. Substrate temperature is strictly controlled during the coating process to preserve the bulk properties of the substrate and the coating. The described coating process is particularly useful when applied to **shape** memory alloys.

Probable Assignee: G AND H TECHNOLOGIES LLC

Earliest Publication Date: 20071129



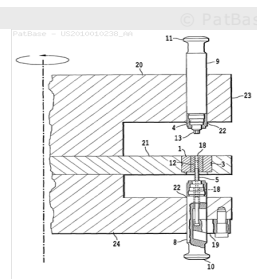
11) Family number: 42669100 (US2010010238A)

PROCESS FOR PRODUCING A RINGLIKE OXIDIC **SHAPED** BODY

Abstract: Source: US2010010238A A process for producing a ringlike oxidic **shaped** body by mechanically compacting a pulverulent aggregate introduced into the fill chamber of a die, wherein the outer face of the resulting compact corresponds to that of a frustocone.

Probable Assignee: BASF SE

Earliest Publication Date: 20081218



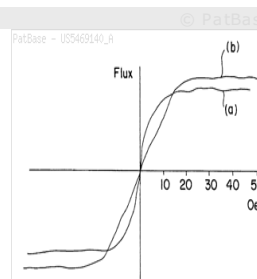
12) Family number: 11492558 (US5469140A)

TRANSVERSE MAGNETIC FIELD ANNEALED AMORPHOUS MAGNETOMECHANICAL ELEMENTS FOR USE IN ELECTRONIC ARTICLE SURVEILLANCE SYSTEM AND **METHOD** OF MAKING SAME

Abstract: Source: US5469140A A ribbon-**shaped** strip of an amorphous magnetic alloy is heat treated, while applying a transverse saturating magnetic field. The treated strip is used in a marker for a pulsed-interrogation electronic article surveillance system. A preferred material for the strip is formed of iron, cobalt, silicon and boron with the proportion of cobalt exceeding 30 percent by atomic percent.

Probable Assignee: SENSORMATIC ELECTRONICS CORP

Earliest Publication Date: 19951121



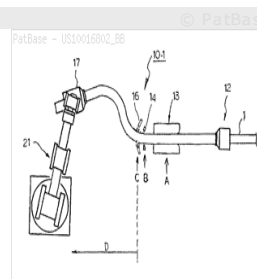
13) Family number: 44967253 (US10016802B)

METHOD AND **APPARATUS** FOR MANUFACTURING A BENT PRODUCT

Abstract: Source: US10016802B A bent product having a three-dimensionally bent portion intermittently or **continuously** in the lengthwise direction is manufactured by supporting a steel pipe at a first position A while feeding it in the lengthwise direction, locally heating the steel pipe being fed at a second position B, cooling the heated portion of the steel pipe at a third position C, and varying the position of a gripping means, which grips the steel pipe in a region ID downstream of the third position C, in a three-dimensional direction including the feed direction of the steel pipe in a workspace including a space on the upstream side of the third position C in the feed direction of the steel pipe to impart a bending moment to the heated portion of the steel pipe.

Probable Assignee: NIPPON STEEL AND SUMITOMO METAL CORP

Earliest Publication Date: 20100506



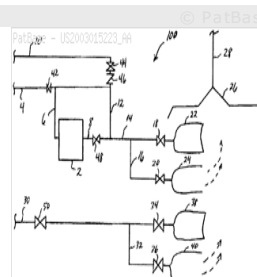
14) Family number: 28018968 (US2003015223A)

METHODS OF CLEANING CONTAINERS USING OZONE COMPOSITIONS

Abstract: Source: US2003015223A **Methods** of cleaning **metal** containers, and containers having internal **metal** linings are described. The **methods** comprise the steps of exposing the internal metallic surface to a composition comprising ozone, the internal metallic surface having thereon a residue, contacting the composition comprising ozone with the internal metallic surface for a time sufficient to either remove the residue, chemically modify the residue to form a modified residue that may be removed by other means, or deactivate the residue.

Probable Assignee: AIR LIQUIDE

Earliest Publication Date: 20030123



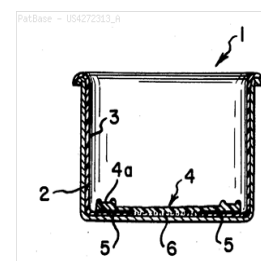
15) Family number: 1377734 (US4272313A)

METHOD OF MANUFACTURING A **METAL** CAP WITH A LINING AFFIXED THERETO AT SELECTED AREAS

Abstract: Source: US4272313A A **metal** cap having a primer layer thereon which has a thermal adhesiveness with respect to a lining layer and wherein part of the lining at the bottom of a cap is thermally adhesively fixed to the primer layer. A **method** of manufacturing a **metal** cap including steps of applying a primer to the cap which has a thermal adhesiveness with respect to a lining layer and heating only a portion of the bottom of the cap to cause only part of the lining to become affixed to the primer.

Probable Assignee: TOYO SEIKAN KAISHA LTD

Earliest Publication Date: 19790911



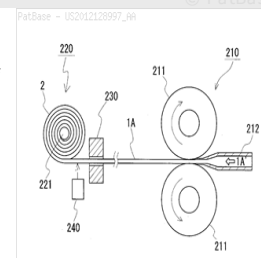
16) Family number: 49706257 (US2012128997A)

COIL MATERIAL AND METHOD FOR MANUFACTURING THE SAME

Abstract: Source: US2012128997A A coil material capable of contributing to an improvement of the productivity of a high-strength magnesium alloy sheet and a **method** for manufacturing the coil material are provided. Regarding the **method** for manufacturing a coil material through coiling of a sheet material formed from a **metal** into the **shape** of a cylinder, so as to produce the coil material, the sheet material is a cast material of a magnesium alloy discharged from a **continuous** casting machine and the thickness t (mm) thereof is 7 mm or less. The sheet material 1 is coiled with a coiler while the temperature T (degrees centigrade) of the sheet material 1 just before coiling is controlled to be a temperature at which the surface strain $((t/R) \times 100)$ represented by the thickness t and the bending radius R (mm) of the sheet material 1 becomes less than or equal to the elongation at room temperature of the sheet material 1.

Probable Assignee: SUMITOMO ELECTRIC IND LTD

Earliest Publication Date: 20111006



17) Family number: 50750930 (US2012055588A)

7XXX ALUMINUM ALLOYS, AND METHODS FOR PRODUCING THE SAME

Abstract: Source: US2012055588A New 7xxx aluminum alloy bodies and **methods** of producing the same are disclosed. The new 7xxx aluminum alloy bodies may be produced by preparing the aluminum alloy body for post-solutionizing cold work, cold working by at least 25 percent, and then thermally treating. The new 7xxx aluminum alloy bodies may realize improved strength and other properties.

Probable Assignee: ARCONIC INC

Earliest Publication Date: 20120308



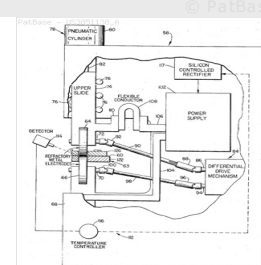
18) Family number: 30380475 (US3851138A)

DIFFUSION BONDING OF BUTT JOINTS

Abstract: Source: US3851138A **Methods** of forming a diffusion bond between butted edges of metallic components. Pressure for forming the bond is developed by thermal expansion of the **metal** adjacent the joint with constraint on the top and bottom of the components in the bonding region. An elevated temperature is produced by passing an electric current through the components in the bonding region. The faying surfaces can be activated to increase the efficiency of the process as by passing hydrogen across them, for example.

Probable Assignee: SOLAR TURBINES INC

Earliest Publication Date: 19720222



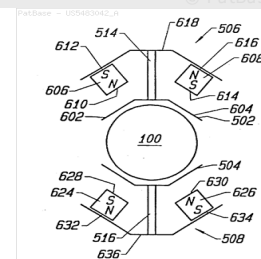
19) Family number: 11481796 (US5483042A)

MAGNETIC SEPARATOR

Abstract: Source: US5483042A **Apparatus** for spacing a plurality of substantially plate-like ferromagnetic workpieces such as can lids, in face-to-face relationship along a row, comprises a plurality of magnetic elements, each extending longitudinally along the row and different ones of the elements being disposed at different angular positions around the row, each of the magnetic elements being disposed and oriented to prevent the workpieces from pivoting about a distal edge of the workpiece due to the combined magnetic attraction of the workpiece by all others of the magnetic elements.

Probable Assignee: NORDSON CORP

Earliest Publication Date: 19920611



20) Family number: 32754649 (US7842142B)

HIGH STRENGTH PART AND METHOD FOR PRODUCING THE SAME

Technical drawing of a sheet metal part with the following labels and dimensions:

- PartBase - US784142_B9**
- CUTTING BLADE**
- BLADE VERTICAL WALL ANGLE: θ**
- BLADE SHOULDER CURVATURE RADIUS: R**
- BLADE BASE**
- PARALLEL PART**
- SHEET HOLDER**
- WORKED MATERIAL**
- STEP DIFFERENCE HEIGHT: H**
- TOP PARALLEL PART LENGTH: L_P**
- THICKNESS: t**
- WATER CUT PART II**
- CLEARANCE: C**
- BENDING LINE HEIGHT: H_B**
- STEP DIFFERENCE**
- RADIUS DIFFERENCE OR NOT: DIFFERENCE: D**
- BLADE BOTTOM SURFACE (GRASP TYPE)**

[illegible]

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graph TD
    A[STEP A  
MOLDED  
VARIFORM  
SLAB] --> B[STEP B  
DIFFUSE  
COMPOSITE  
MATERIAL]
    A --> D[STEP D  
CONVERSION  
ZONE]
    A --> E[STEP E  
SECONDARY  
SOURCE]
    A --> F[STEP F  
MULTI-LAYER  
COATING]
    B --> C[STEP C  
STOP]
    D --> C
    D --> E
    D --> F
    E --> G[STEP G  
FORMA  
COATING]
    F --> G
    G --> H[STEP H  
STOP]
    G --> I[STEP I  
BYPASS]
  
```

The flowchart illustrates the manufacturing process for a multi-layer composite material. It begins with Step A (MOLDED VARIFORM SLAB), which branches into four paths: Step B (DIFFUSE COMPOSITE MATERIAL), Step D (CONVERSION ZONE), Step E (SECONDARY SOURCE), and Step F (MULTI-LAYER COATING). Step B leads to Step C (STOP). Step D leads to Step C, Step E, Step F, and Step I (BYPASS). Step E leads to Step G (FORMA COATING). Step F leads to Step G. Step G leads to Step H (STOP) and Step I (BYPASS).

PatBase - www.patbase.com

Figure Application Pathways: FIG. 5, 2002 Sheet 1 of 2

US 2002/0081819 A1

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graph TD; A[Provide Particles] -- 200 --> B[Create Particles]; B -- 200 --> C[Provide Solution]; C -- 200 --> D[Reactivate with Agitation]; D -- 200 --> E[Create Solution]; E -- 200 --> F[Form Cluster 200]; F -- 200 --> G[Recover Cluster 200]; G -- 200 --> H[" $200 = \frac{200}{200}$ "]; H -- 200 --> I[Strong Solution];
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The flowchart illustrates a series of steps for creating a strong solution. It begins with 'Provide Particles' (200), followed by 'Create Particles' (200), 'Provide Solution' (200), 'Reactivate with Agitation' (200), 'Create Solution' (200), 'Form Cluster 200' (200), 'Recover Cluster 200' (200), and finally a calculation $200 = \frac{200}{200}$ (200), leading to 'Strong Solution' (200). The number 200 is consistently associated with each step.

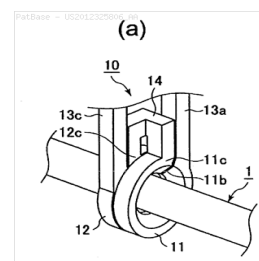
Fig. 5

PatBase PDF Export - Page: 5 08/08/2018

Abstract: Source: US2012325806A An induction heating coil for stably heating a steel tube which is being fed in its axial direction without rotating, the heating being uniform in the circumferential direction and in a narrow range in the axial direction has at least two 1-turn coils in the form of a first turn coil body and a second turn coil body. The inner peripheral length L_n (the non-effective coil length) where the effective number of coil turns is less than the total number of coil turns when the coil is projected in the axial direction and the inner peripheral length L_0 of the projected coil bodies (the inner coil length) satisfy $L_n/L_0 < 0.05$. First and second coil bodies have insulating portions on their connecting portions, and the insulating portions are present in locations separated by a central angle of 5-45 degrees measured from the center of the coil bodies.

Probable Assignee: NIPPON STEEL AND SUMITOMO METAL CORP

Earliest Publication Date: 20110714



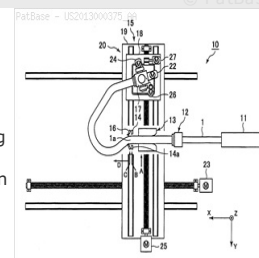
26) Family number: 49239030 (US2013000375A)

METHOD AND APPARATUS FOR MANUFACTURING A BENT MEMBER

Abstract: Source: US2013000375A A bent member having excellent dimensional accuracy is manufactured by stably forming a high temperature portion uniformly in the circumferential direction of a steel tube and in a narrow region in the axial direction of the steel. The bent member is manufactured by supporting a steel tube at a first position while feeding it, performing induction heating of the steel tube at a second position with an induction heating coil, cooling the steel tube at a third position to form a high temperature portion which moves in the axial direction of the steel tube, and three-dimensionally varying the position of a gripping mechanism for the steel tube in a region to apply a bending moment to the high temperature portion.

Probable Assignee: NIPPON STEEL AND SUMITOMO METAL CORP

Earliest Publication Date: 20110714



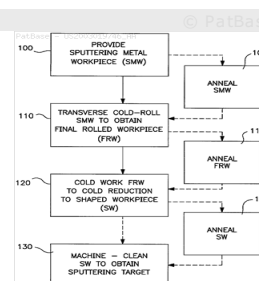
27) Family number: 29960579 (US2003019746A)

HOLLOW CATHODE TARGET AND METHODS OF MAKING SAME

Abstract: Source: US2003019746A Sputtering targets and methods of making sputtering targets are described. The method includes the steps of: providing a sputtering metal workpiece made of a valve metal; transverse cold-rolling the sputtering metal workpiece to obtain a rolled workpiece; and cold-working the rolled workpiece to obtain a shaped workpiece. The sputtering targets exhibits a substantially consistent grain structure and/or texture on at least the sidewalls.

Probable Assignee: GLOBAL ADVANCED METALS USA INC

Earliest Publication Date: 20020530



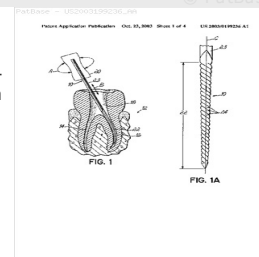
28) Family number: 30008335 (US2003199236A)

METHOD OF MANUFACTURING AN ENDODONTIC INSTRUMENT

Abstract: Source: US2003199236A Method for manufacturing endodontic instruments having either helical or non-helical flutes. A method is provided for forming superelastic endodontic instruments having helical flutes, wherein a wire of superelastic material is formed into an instrument blank, and before twisting, the superelastic alloy is brought to an annealed state comprising a phase structure including a rhombohedral phase alone or in combination with austenite and/or martensite, or a combination of martensite and austenite. In this annealed state, the instrument blank is twisted at low temperature, for example less than about 100 degrees centigrade, and advantageously at ambient temperature to the final desired twisted configuration. The twisted instrument is then heat treated and rapidly quenched to a superelastic condition. A method is further provided for manufacturing endodontic instruments having either helical or non-helical flutes with hard surfaces and resilient cutting edges by either an EDM or ECM process, wherein material is removed from the instrument blank in the desired flute pattern. The EDM or ECM process disintegrates the surface material, and as it cools, at least a portion of the removed material re-deposits onto the surface being machined to form a recast layer having a surface hardness that is at least about 15 percent greater than the hardness of the material forming the instrument blank. A method is further provided in which an EDM or ECM process is used to form an instrument blank, followed by twisting at low temperature.

Probable Assignee: ORMCO CORP

Earliest Publication Date: 20031022



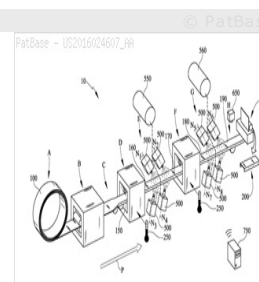
29) Family number: 61539302 (US2016024607A)

SYSTEM AND METHOD FOR PRODUCING A HARDENED AND TEMPERED STRUCTURAL MEMBER

Abstract: Source: US2016024607A System and methods relating to in-line heat-treating, hardening and tempering of material, such as for example, coiled steel into a roll-formed, hardened and tempered structural member having uniform or different targeted properties in selected zones of the structural member. The different targeted properties may be achieved by heating and/or cooling the material subject to certain parameters.

Probable Assignee: ROLL FORMING CORP

Earliest Publication Date: 20160128



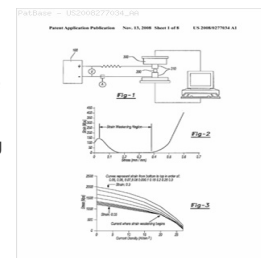
30) Family number: 42496557 (US2008277034A)

STRAIN WEAKENING OF METALLIC MATERIALS

Abstract: Source: US2008277034A A **method** for controlling the work hardening of a **metal** component during cold forming by using an electric current passing through the component is provided. The **method** can include providing a cold forming machine with at least a pair of dies, the machine operable to perform a cold forming operation and apply an electric direct current to a **metal** component placed in contact with the dies. In addition, the **method** includes providing a **metal** component and placing the **metal** component between the at least a pair of dies. Thereafter, cold forming of the **metal** component is performed with an electric direct current applied to the component during at least part of the time the component is being cold formed. In some instances, the cold forming is compressive cold forming. The direct current can be applied before or after the cold forming has started and/or be terminated before or after the cold forming has stopped.

Probable Assignee: NORTHWESTERN UNIV

Earliest Publication Date: 20081113



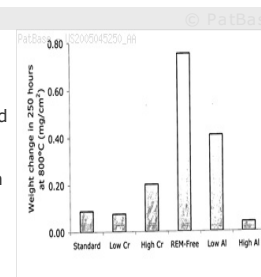
31) Family number: 31719013 (US2005045250A)

OXIDATION RESISTANT FERRITIC STAINLESS STEELS

Abstract: Source: US2005045250A A **method** for making a ferritic stainless steel article having an oxidation resistant surface includes providing a ferritic stainless steel comprising aluminum, at least one rare earth **metal** and 16 to less than 30 weight percent chromium, wherein the total weight of rare earth **metals** is greater than 0.02 weight percent. At least one surface of the ferritic stainless steel is modified so that, when subjected to an oxidizing atmosphere at high temperature, the modified surface develops an electrically conductive, aluminum-rich, oxidation resistant oxide scale comprising chromium and iron and a having a hematite structure differing from Fe₂O₃, alpha Cr₂O₃ and alpha Al₂O₃. The modified surface may be provided, for example, by electrochemically modifying the surface, such as by electropolishing the surface.

Probable Assignee: ATI PROPERTIES INC

Earliest Publication Date: 20050303



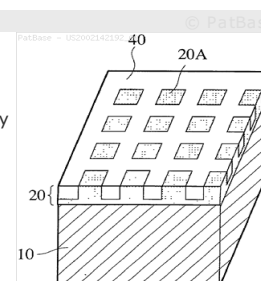
32) Family number: 23980332 (US2002142192A)

METHOD OF PATTERNING MAGNETIC PRODUCTS USING CHEMICAL REACTIONS

Abstract: Source: US2002142192A A **method** of patterning magnetic material includes forming a ferromagnetic material layer containing one element selected from the group consisting of Fe, Co and Ni on a substrate, selectively masking a surface of the ferromagnetic material layer, and making nonferromagnetic. The making nonferromagnetic step includes exposing an exposed portion in halogen-containing reaction gas, changing magnetism of the exposed portion and a lower layer thereof by chemical reaction, and making the exposed portion a nonferromagnetic material region. A magnetic recording medium is **fabricated** by using the magnetic material patterning **method** and includes a plurality of recording regions made of ferromagnetic materials, each containing at least one element selected from the group consisting of Fe, Co and Ni, and a nonferromagnetic material region for separating the recording regions from each other. The nonferromagnetic material region is a compound region of the ferromagnetic material and halogen.

Probable Assignee: TOSHIBA KK

Earliest Publication Date: 20021003



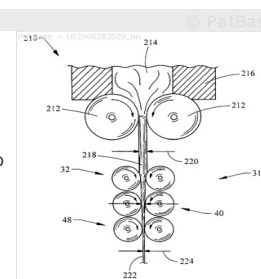
33) Family number: 34024312 (US2006283529A)

APPARATUS AND METHOD OF PRODUCING NET-SHAPED COMPONENTS FROM ALLOY SHEETS

Abstract: Source: US2006283529A A **method** and **apparatus** for producing ultra-fine grained **metal** material sheets. The **apparatus** molds and rapidly solidifies a **metal** material to form a fine grain precursor. The precursor is then subjected to a series of successive alternating tensile and compressive strains that alter the grain structure of the precursor so as to form a ultra fine grained structure in sheet form. The sheet form may then be subjected to superplastic forming to form a net **shaped** article.

Probable Assignee: THIXOMAT INC

Earliest Publication Date: 20061221



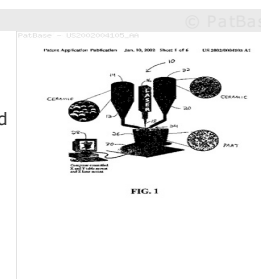
34) Family number: 28173999 (US2002004105A)

LASER FABRICATION OF CERAMIC PARTS

Abstract: Source: US2002004105A A **method** of **fabricating** ceramic parts is disclosed using a laser deposition process to produce highly dense ceramic parts. A **metal** substrate is preferably used and ceramic powder deposited in layers on the substrate, while varying the power of the laser beam to bond the layers together without cracking the substrate or causing a plasma reaction in the ceramic powder. Dense structures which are about 96 percent to about 100 percent ceramic can be produced. A part can be graded using different types and mixtures of ceramic powders to produce the part of a desired composition.

Probable Assignee: TRITON SYSTEMS INC

Earliest Publication Date: 20010628



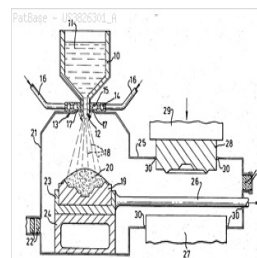
35) Family number: 24048980 (US3826301A)

METHOD AND APPARATUS FOR MANUFACTURING PRECISION ARTICLES FROM MOLTEN ARTICLES

Abstract: Source: US3826301A A **method** and **apparatus** for manufacturing **shaped** precision **articles** from molten **metals** (including alloys), which **articles** may either be effectively non-porous or have a controlled degree of porosity and may be finished (i.e. no further processing is required) or may require a small amount of finish machining (e.g. trimming of flash and/or heat treatment), wherein the **method** comprises directing a stream of molten **metal** or molten **metal** alloy at a collecting surface to form a deposit, and working the deposit by means of a die to form a precision **metal** or **metal** alloy article.

Probable Assignee: OSPREY METALS LTD

Earliest Publication Date: 19730215



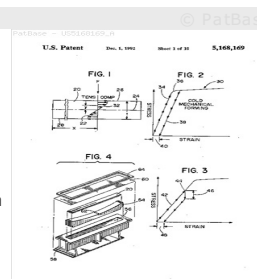
36) Family number: 4429077 (US5168169A)

METHOD OF TOOL DEVELOPMENT

Abstract: Source: US5168169A A **method** is disclosed for developing the contour of tools employed for forming aluminum alloy members exhibiting complex **shapes**. The members are precipitation, heat-treatable, aluminum alloys which are age formed. The resulting member is formed to the desired contour and, simultaneously, is heat treated to reduce residual stresses while improving its strength characteristics. The invention is particularly concerned with a new tool contour prediction **method** which is based upon the relationship, for a particular aluminum alloy, of the strain retained in a part after it has been subjected to an applied strain while constrained to a desired **shape**, then released after being heat treated in an autoclave or furnace.

Probable Assignee: AEROSTRUCTURES CORP

Earliest Publication Date: 19921201



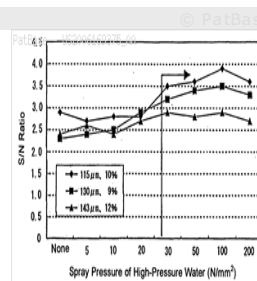
37) Family number: 31830631 (US2006169375A)

MARTENSITIC STAINLESS STEEL TUBE AND MANUFACTURING METHOD THEREOF

Abstract: Source: US2006169375A In a martensitic stainless steel tube according to the present invention, the content is determined by each of elements C, Si, Mn and Cr, and the bubble content ratio is further prescribed in accordance with the scale thickness on the outer surface of the steel tube, so that defects can be detected with high precision in the non-destructive inspection, such as ultrasonic test or the like. This allows the non-destructive inspection to be carried out with high efficiency. Moreover, there is another advantage that the weather resistance can be enhanced. The steel tube according to the present invention and the manufacturing **method** thereof can be suitably used in all of the technical fields in which a martensitic stainless steel tube having equal chemical composition is treated.

Probable Assignee: SUMITOMO METAL IND LTD

Earliest Publication Date: 20050421



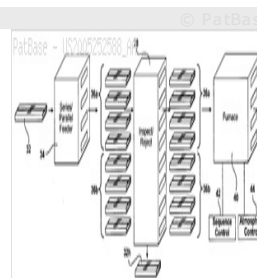
38) Family number: 32130547 (US2005252588A)

METHOD AND APPARATUS FOR THE CONTINUOUS FABRICATION OF SHAPED METAL ARTICLES

Abstract: Source: US2005252588A A **continuous** process for producing a **shaped metal** member from a feedstock comprising a flat web of **metal** includes a roll-forming station for **shaping** the web, a cutting station for cutting the **shaped** web into individual members, and a processing station for altering a physical characteristic of the **metal** comprising the members. The processing may include heat treating and/or **shaping**. The process may also be operable to carry out further operations such as marking, inspection, sorting and the like. Also disclosed is an **apparatus** for carrying out the process.

Probable Assignee: MULTIMATIC INC

Earliest Publication Date: 20050811



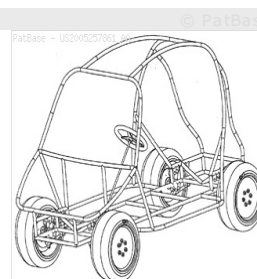
39) Family number: 32069386 (US2005257861A)

DUAL SEAM-WELDED AIR HARDENABLE STEEL TUBING AND STRUCTURAL MEMBERS

Abstract: Source: US2005257861A The present invention provides seam-welded, air hardenable steel tubes, **methods** of manufacturing seam-welded air hardenable steel tubes, tube mills for practicing such **methods** and applications for using seam-welded, air hardenable steel tubing of the present invention.

Probable Assignee: CODD DANIEL SHAWN

Earliest Publication Date: 20040108



40) Family number: 15939278 (US2003082066A)

METHOD OF MANUFACTURING ALUMINIDE SHEET BY THERMOMECHANICAL PROCESSING OF ALUMINIDE POWDERS

Abstract: Source: US2003082066A A powder metallurgical process of preparing a sheet from a powder having an intermetallic alloy composition such as an iron, nickel or titanium aluminide. The sheet can be manufactured into electrical resistance heating elements having improved room temperature ductility, electrical resistivity, cyclic fatigue resistance, high temperature oxidation resistance, low and high temperature strength, and/or resistance to high temperature sagging. The iron aluminide has an entirely ferritic microstructure which is free of austenite and can include, in weight percent, 4 to 32 percent Al, and optional additions such as less than or equal to 1 percent Cr, greater than or equal to 0.05 percent Zr less than or equal to 2 percent Ti, less than or equal to 2 percent Mo, less than or equal to 1 percent Ni, less than or equal to 0.75 percent C, less than or equal to 0.1 percent B, less than or equal to 1 percent submicron oxide particles and/or electrically insulating or electrically conductive covalent ceramic particles, less than or equal to 1 percent rare earth **metal**, and/or less than or equal to 3 percent Cu. The process includes forming a non-densified **metal** sheet by consolidating a powder having an intermetallic alloy composition such as by roll compaction, tape casting or plasma spraying, forming a cold rolled sheet by cold rolling the non-densified **metal** sheet so as to increase the density and reduce the thickness thereof and annealing the cold rolled sheet. The powder can be a water, polymer or gas atomized powder which is subjected to sieving and/or blending with a binder prior to the consolidation step. After the consolidation step, the sheet can be partially sintered. The cold rolling and/or annealing steps can be repeated to achieve the desired sheet thickness and properties. The annealing can be carried out in a vacuum furnace with a vacuum or inert atmosphere. During final annealing, the cold rolled sheet recrystallizes to an average grain size of about 10 to 30 μm . Final stress relief annealing can be carried out in the B2 phase temperature range.

Probable Assignee: PHILIP MORRIS INT INC

Earliest Publication Date: 19990610

41) Family number: 32540909 (US2006009047A)

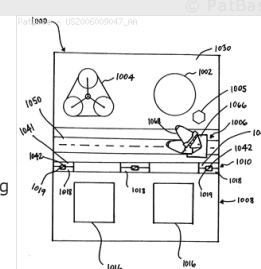
MODULAR TOOL UNIT FOR PROCESSING MICROELECTRONIC WORKPIECES

Abstract: Source: US2006009047A A modular **apparatus** for thermally processing a microelectronic workpiece is provided. The modular **apparatus** comprises a mounting module having a rotatable carousel assembly configured to support at least one workpiece. A driver is coupled to the carousel assembly and rotates the carousel assembly, moving the workpiece between a loading station, a heating station and a cooling station. The thermal processing modular **apparatus** has a front docking unit for removably connecting it to a load/unload module and a rear docking unit for removably connecting it to a wet chemical processing tool, or another tool for otherwise processing a workpiece. A transport system (i.e., robot) services the modular tool units that can be automatically calibrated to work with individual processing components of the tool units.

Probable Assignee: APPLIED MATERIALS INC

Earliest Publication Date: 20060112

US2006009047A
GAS ATOMIZED PREALLOYED POWDER
SIEVING POWDER
MIXING POWDER WITH ORGANIC BINDER AND SOLVENT
TAPING CHARGING POWDER WITH GLEDS TO 0.001" THICK GREEN STRIP
BURNING OUT BINDER & HOURS AT 2200°F IN VACUUM FURNACE
PRIMARY SINTERING 1 HOUR AT 2200°F IN VACUUM FURNACE
COLD ROLLING STRIP TO 0.015" IN 4 HIGH ROLLING MILL
ANNEALING 1 HOUR AT 2015°F IN VACUUM FURNACE
TRIMMING STRIP IN HALF
COLD ROLLING STRIP TO 0.015" IN 4 HIGH ROLLING MILL
ANNEALING 1 HOUR AT 2015°F IN VACUUM FURNACE
TRIMMING 1/8" OFF CRACKED ENDS AND EDGES AS NEEDED
COLD ROLLING STRIP TO 0.015" IN 4 HIGH ROLLING MILL
ANNEALING 1 HOUR AT 2015°F IN VACUUM FURNACE
FINAL TRIMMING TO DESIRED LENGTH AND WIDTH
STRESS RELIEVING 2 HOURS AT 2015°F IN VACUUM FURNACE
FORMING TUBULAR HEATING ELEMENT



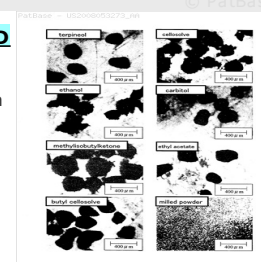
42) Family number: 32558323 (US2008053273A)

METHOD FOR PRODUCING RAW MATERIAL POWDER FOR RARE EARTH SINTERED MAGNET, METHOD FOR PRODUCING RARE EARTH SINTERED MAGNET, GRANULE AND SINTERED BODY

Abstract: Source: US2008053273A A **method** for producing a rare earth sintered magnet uses granules having an excellent fluidity to improve the dimensional accuracy and production of a compact formed of the granules without significant property losses. The granules are formed by adding an organic liquid to primary alloy particles having a predetermined composition to produce granules having the primary alloy particles adhered together by the organic liquid. Preferably, from 1.5 to 15.0 percent by weight of the organic liquid is added to the primary alloy particles.

Probable Assignee: TDK CORP

Earliest Publication Date: 20060112



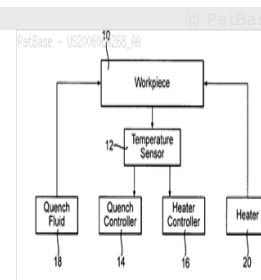
43) Family number: 32751474 (US2006060268A)

METHOD OF MAKING HIGH STRENGTH BAINITE ARTICLE, AND ARTICLE MADE THEREBY

Abstract: Source: US2006060268A A bainite phase is formed in a body of a ferrous alloy by heating the workpiece to a temperature above an austenizing temperature of the alloy and thereafter contacting the workpiece with a quenching medium. Heat is input to the workpiece during at least a portion of the time it is in contact with the quenching medium. The quenching medium and/or the source of heat are regulated so that they work in combination to maintain the workpiece at a holding temperature which is no more than 350 degrees centigrade but above the temperature at which the martensite phase forms in the alloy. After maintaining the alloy at the holding temperature for a predetermined period of time, it is cooled to ambient. Also disclosed are systems for implementing the **method**.

Probable Assignee: NOBLE ADVANCED TECHNOLOGIES INC

Earliest Publication Date: 20060323



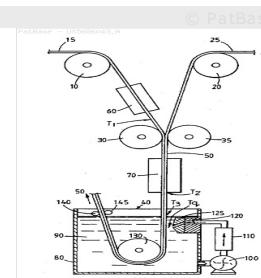
44) Family number: 8463125 (US5686043A)

PROCESS AND APPARATUS FOR PRODUCING COATED METAL

Abstract: Source: US5686043A PCT No. PCT/GB94/00538 Sec. 371 Date Nov. 29, 1995 Sec. 102(e) Date Nov. 29, 1995 PCT Filed Mar. 17, 1994 PCT Pub. No. WO94/21458 PCT Pub. Date Sep. 29, 1994An **apparatus** for and a **method** of forming a **metal** coated with a polymer is achieved through the provision of a reservoir containing a cooling liquid having a relative undisturbed upper surface. A **metal** coated with a polymer is introduced into the cooling liquid through the upper surface and is subject to quenching liquid at a temperature T_q directed at the polymer coated **metal** substantially immediately below the cooling liquid upper surface and substantially along the entire predetermined width thereof. This achieves rapid and uniform cooling in the absence of bubble formation and/or quenching liquid surface agitation to assure desired crystalline formation of the polymer absent the polymer blemishes.

Probable Assignee: CARNAUDMETALBOX PLC

Earliest Publication Date: 19940929



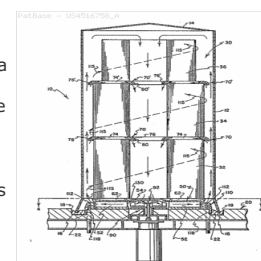
45) Family number: 29380912 (US4516758A)

DIFFUSER SYSTEM FOR ANNEALING FURNACE

Abstract: Source: US4516758A A convection diffuser and charge support system for an annealing furnace utilizes a diffuser base, a base-encircling ring, and convector plates which are preferably formed as castings of nodular iron. The diffuser base defines an array of horizontally-extending gas circulation passages which are shielded from above by an integrally-formed, overlying top wall. The top wall prevents debris and other undesirable substances from dropping into and accumulating within the primary flow passages. Vane extension formations project above the top wall and have their upper edges arranged to engage and support a charge of material to be annealed. The ring structure extends perimetrically about the base structure and defines an array of curved, upwardly opening grooves which cooperate with the primary flow passages to direct gases which discharge from the base structure so that the gases flow upwardly, along a generally helical flow paths about a charge of material being annealed. The ring structure may have one or more cast-in-situ cooling passages. The ring structure may be provided with a depending, perimetrically-extending skirt. Where the charge takes the form of a vertical stack of coils of **metal**, the convector plates are interposed between end regions of adjacent ones of the coils to provide flow paths for ducting gases therebetween. The casting or castings of the ring structure have cast-in-situ cooling conduit formations for ducting cooling fluid therethrough, and depending formations which provide a **continuous**, downwardly-extending skirt. A novel and improved **method** is provided for forming nodular iron castings for use in high heat environments and incorporating cast-in-situ cooling conduits.

Probable Assignee: COBLE GWENDOLYN J

Earliest Publication Date: 19850514



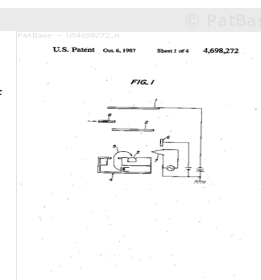
46) Family number: 9497926 (US4698272A)

EXTRA-LOW IRON LOSS GRAIN ORIENTED SILICON STEEL SHEETS

Abstract: Source: US4698272A An extra-low iron loss grain oriented silicon steel sheet comprises a base **metal** of silicon steel and a thin coat of nitride or carbide of Ti, Zr, Hf, V, Nb, Ta, Mn, Cr, Mo, W, Co, Ni, Al, B and Si and strongly adhered to a finished surface of the base **metal** through a mixed layer of the base **metal** and the thin coat, and has excellent electrical and magnetic properties as well as good compressive stress dependence of magnetostriction and lamination factor.

Probable Assignee: KAWASAKI STEEL CORP

Earliest Publication Date: 19860828



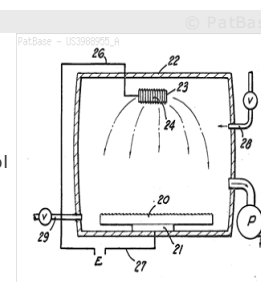
47) Family number: 4817233 (US3915757A)

ION PLATING METHOD AND PRODUCT THEREFROM

Abstract: Source: US3915757A An ion plating **method** and product therefrom wherein ions of a **metal** are implanted into or/and plated onto a substrate to increase the hardness of the surface. After plating, the product can be reacted with carbon, boron, nitrogen or another **metal**, thereby forming the carbide, boride, nitride or **metal** compound of the plating **metal** coating. Hardening of the product by quenching follows which produces a cutting tool of superior qualities.

Probable Assignee: NIELS NIKOLOJ ENGEL

Earliest Publication Date: 19740209



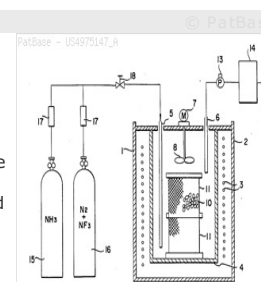
48) Family number: 11989902 (US4975147A)

METHOD OF PRETREATING METALLIC WORKS

Abstract: Source: US4975147A The primary object of the invention is to clean and activate the surface of metallic works prior to such thermal treatment as nitriding, thermal spraying or dip plating by removing oxidized and other passive layers and foreign matters from the metallic work surface. The **method** of pretreating metallic works comprises heating a metallic work in a furnace and introducing a fluorine- or fluoride-containing gas into the furnace in that state to thereby cause destruction and elimination of the foreign matters adhering to the metallic work surface and of the oxidized layer occurring on the metallic work surface and simultaneous formation of a fluorinated layer. Just prior to the main thermal treatment, for example nitriding, the fluorinated layer is decomposed and eliminated by introducing an appropriate gas, for example H₂, into the furnace. In this way, the metallic work reveals its cleaned and activated surface.

Probable Assignee: AIR WATER INC

Earliest Publication Date: 19901204



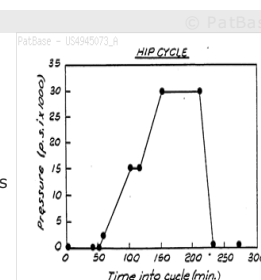
49) Family number: 3214537 (US4945073A)

HIGH HARDNESS, WEAR RESISTANT MATERIALS

Abstract: Source: US4945073A A powdered admixture of a boron, carbon, nitrogen or silicon derivative of a first **metal**, e.g., tungsten carbide, and a source of a second **metal**, e.g., molybdenum subcarbide when the second **metal** is molybdenum, is, when subjected to densification conditions, partially reacted and converted to a hard, wear resistant material. Such a material, formed from an admixture of tungsten carbide and molybdenum subcarbide, contains tungsten monocarbide and at least one mixed tungsten/molybdenum carbide. This material has a Vickers hardness of at least about 2200 kg/mm² measured using a 1 kg load. **Articles** formed from this material can be useful as, for example, nozzles in abrasive or nonabrasive waterjet cutting machines and various parts of wire drawing **apparatus**.

Probable Assignee: THE DOW CHEMICAL COMPANY

Earliest Publication Date: 19900328



50) Family number: 29409110 (US6620262B)

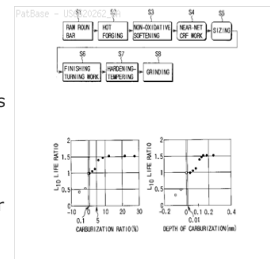
CONTINUOUS ANNEALING FURNACE, ROLLER BEARING, ANNEALING METHOD AND METHOD FOR

MANUFACTURING AN INNER RING AND AN OUTER RING FOR DEEP GROOVE BALL BEARING

Abstract: Source: US6620262B The **continuous** annealing furnace has two or more treatment chambers sequentially connected with each other and respectively filled with a gas atmosphere differing in carburizing property, which includes a carburizing chamber wherein roller members to be treated are carburized at 750 degrees centigrade to 820 degrees centigrade, a slow cooling chamber wherein the roller members are cooled at said temperature or less of the carburizing chamber, an intermediate chamber including atmosphere gas blocking doors that can open/close an exit of the carburizing chamber and an entrance of the slow cooling chamber independently, and transferring means, and each chambers is filled to satisfy a relationship of $K1-K2$ greater than or equal to 2 where $K1$ represents a partial pressure ratio between CO and CO₂ in an atmosphere within the carburizing chamber and $K2$ represents a partial pressure ratio between CO and CO₂ in an atmosphere within the slow cooling chamber.

Probable Assignee: NSK LTD

Earliest Publication Date: 19990708



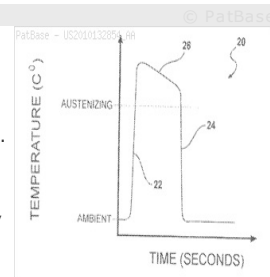
51) Family number: 41695358 (US2010132854A)

MICROTREATMENT OF IRON-BASED ALLOY, **APPARATUS** AND **METHOD** THEREFOR, AND **ARTICLES** RESULTING THEREFROM

Abstract: Source: US2010132854A Iron-based alloys and **articles** in strips, sheets, workpieces and the like are converted into high strength steel with a minimum of cost, time and effort, including producing dual phase materials. This is achievable by extremely rapid micro-treating of low, medium, and high carbon iron-based alloys and **articles** by rapid heating and rapid cooling at least a portion of the alloy/article. This heating step involves nearly immediately heating the iron-based alloy to a selected temperature above its austenite conversion temperature. Then, the alloy is immediately quenched, also at an extremely fast rate, on at least a portion of the iron-based alloy in a quenching unit adjacent the heating unit. This procedure forms high strength alloy in a desired area, depending upon where the treatment was performed.

Probable Assignee: MANUFACTURERS AND TRADERS TRUST CO

Earliest Publication Date: 20080410



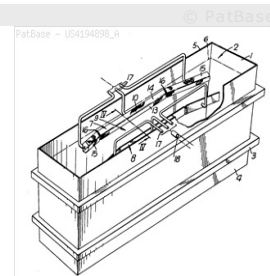
52) Family number: 1279085 (US4194898A)

METHOD AND **APPARATUS** FOR TREATMENT OF **ARTICLES** IN A FLUIDIZED BED

Abstract: Source: US4194898A An article, for example a glass sheet, is treated in a gas-fluidized particulate material by advancing the article along a path leading into the gas-fluidized particulate material and extracting gas from a region of the path at a rate sufficient to pack the particulate material in that region and thereby obturate the path. An opening leading into a container for a gas-fluidized bed of particulate material may be obturated in this way. The packed state of the material obturating the opening is such that an article can pass through the opening.

Probable Assignee: PILKINGTON BROTHERS LTD

Earliest Publication Date: 19781001



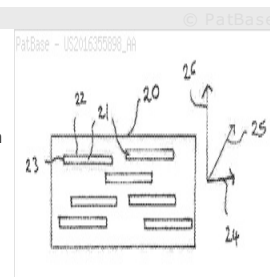
53) Family number: 60015501 (US2016355898A)

METHOD OF **FABRICATING** AN ARTICLE FOR MAGNETIC HEAT EXCHANGER

Abstract: Source: US2016355898A In an embodiment, a **method** of **fabricating** a working component for magnetic heat exchange comprises arranging at least two **articles** comprising a magnetocalorically active phase and an elongated form with a long axis having a length l and a shortest axis having a length s , wherein $l \geq 1.5s$, such that the shortest axes of the at least two **articles** are substantially parallel to one another and securing the at least two **articles** in a position within the working component such that the shortest axes of the at least two **articles** are substantially parallel to one another within the working component.

Probable Assignee: VACUUMSCHMELZE GMBH AND CO KG

Earliest Publication Date: 20161207



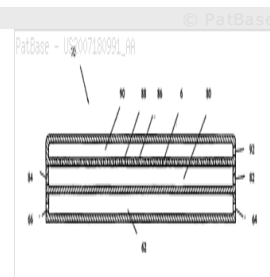
54) Family number: 31767012 (US2007180991A)

METHODS FOR PROVIDING THIN HYDROGEN SEPERATION MEMBRANES AND ASSOCIATED USES

Abstract: Source: US2007180991A The present disclosure is generally related to providing thin hydrogen separation membranes coated on porous substrates that are useful in membrane steam reformers and **methods** for making same. These reformers can be integrated with protein exchange membrane (PEM) fuel cells to form power systems.

Probable Assignee: INTELLIGENT ENERGY INC

Earliest Publication Date: 20050324



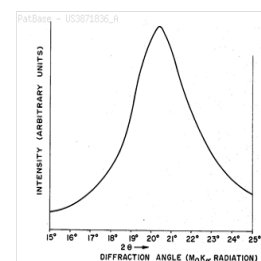
55) Family number: 24050741 (US3871836A)

CUTTING BLADES MADE OF OR COATED WITH AN AMORPHOUS **METAL**

Abstract: Source: US3871836A **Metal** alloys in an amorphous state are employed in the **fabrication** of cutting implements such as razor blades or knives. The implement may be formed from the amorphous **metal** or a coating of the amorphous **metal** may be applied. Such products may be formed from a ribbon of the amorphous **metal** alloy which has been prepared by quenching the molten **metal** or by coating the amorphous **metal** alloy on a suitable substrate such as by a sputtering procedure or vapor, chemical or electro-deposition of the alloy on the substrate.

Probable Assignee: ALLIED CHEM

Earliest Publication Date: 19740329



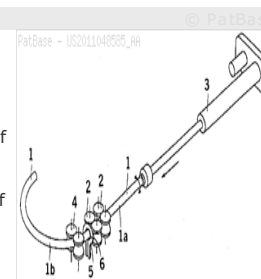
56) Family number: 43574084 (US2011048585A)

HEAT TREATED GALVANNEALED STEEL MATERIAL AND A METHOD FOR ITS MANUFACTURE

Abstract: Source: US2011048585A A heat treated galvanized steel material having excellent post-painting corrosion resistance and a high strength which is suitable for use as an automotive part and a method for its manufacture are provided. A galvanized steel material having a galvanized coating on at least one side thereof is heat treated by heating at least a portion thereof to a temperature range in which hardening is possible. The coating remaining on the surface of at least a part of the portion which underwent heat treatment has a coating weight of at least 20 grams per square metre and at most 80 grams per square metre per side and an Fe content of at least 15 percent and at most 35 percent, an eta phase is present in the coating, and the centerline average roughness Ra of the surface of the coating is at most 1.5 micro m.

Probable Assignee: NIPPON STEEL AND SUMITOMO METAL CORP

Earliest Publication Date: 20090806



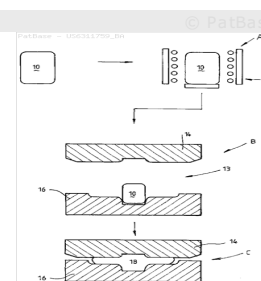
57) Family number: 20599415 (US6311759B)

SEMI-SOLID METAL PROCESSING

Abstract: Source: US6311759B A process for producing a shaped metallic article includes the steps of melting a metal alloy, reducing the temperature of the molten metal to the liquidus temperature, casting the molten metal at the liquidus temperature into a mould and solidifying the molten metal to obtain a feedstock material. The feedstock material is subsequently heated to a temperature between the liquidus and solidus temperatures to produce a self-supporting thixotropic material which is then formed to the desired shape. Casting the feedstock material from a melt at substantially the liquidus temperature produces a microstructure that is especially suitable for subsequent forming of the thixotropic material and this allows use of slower forming speeds and lower forming pressure during the forming step.

Probable Assignee: MELBOURNE UNIV OF

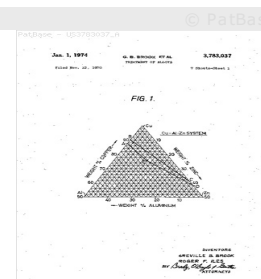
Earliest Publication Date: 19980129



58) Family number: 30268260 (US3783037A)

TREATMENT OF ALLOYS

Abstract: Source: US3783037A ABSTRACT OF THE DISCLOSURE A method of making a heat-recoverable article in which an alloy comprising an intermetallic compound, which on cooling transforms into a banded martensite by shear with or without working, deformed after appropriate heat treatment so that on reheating it at least partly resumes its original shape. It is preferred to use a copperbase alloy which transforms into a martensite of pseudocubic symmetry. This invention is concerned with methods of treating alloys. It is known that certain alloys are heat-recoverable, that is to say, when a suitably heat-treated article of one shape made from the alloys is caused to deform into another shape at an appropriate temperature and the temperature is subsequently raised sufficiently, the article will recover its original shape at least in part. This change of shape on reheating corresponds to a change of phase in the alloy from a low-temperature to a high-temperature phase. We have discovered that this property of change of shape with temperature can be obtained with certain alloys comprising an intermetallic compound in which it is possible by rapid quenching or other suitable heat treatment to produce a martensitic transformation and in which the martensite exhibits a high apparently elastic hysteresis. We have also discovered that it is advantageous, but not necessary, if ordering of the constituents takes place before transformation. These alloys can be made to undergo a reversible shape change with temperature reversal. If the alloys are deformed at a suitable temperature after appropriate cooling and then reheated to above a certain temperature the alloys will transform to a stable high temperature phase and revert to their original shape. Provided the alloys are not reheated to too high a temperature they will revert to or towards the shape to which they were deformed after cooling again. According to the present invention, there is provided a method of making a heat-recoverable article, which method comprises cooling an alloy in a first shape from a first temperature to a lower temperature, said alloy comprising an intermetallic compound which on cooling from said first temperature undergoes a shear transformation to a banded martensite or which retains its first temperature structure or a related ordered structure as cooled from said first temperature but transforms into a banded martensite by shear on working in the cooled condition in such a way that the transformation is not fully reversible by unloading and which in the cooled condition has an anomalously low modulus of elasticity during loading, and then plastically deforming the alloy into a second shape at the lower temperature, the temperatures and rate of cooling being such that on reheating the article at least partly, resumes its first shape. Preferably the alloy contains at least 50 percent by weight of copper in the form of an intermetallic compound and said martensite has pseudo-cubic symmetry. In one manner of performing the invention, said rate of cooling and lower temperature are such that the alloy has undergone (preferably fully, but in some cases partially) a shear transformation to a banded martensite before being plastically deformed into said second shape. Thus, the alloy is plastically deformed into the second shape at or below the temperature at which the martensite transformation starts in the absence of externally applied stress (the M_s temperature) and preferably below the temperature at which the martensite transformation is completed in the absence of externally applied stress (the M_f temperature). On reheating above a certain temperature (the A_s temperature), the alloy will start to transform back to the high temperature phase and this transformation will be accompanied by a change in shape towards said first shape. Above a certain temperature (the A_f temperature), the transformation to the high temperature phase will be complete. In another manner of performing the invention, said rate of cooling and lower temperature are such that the alloy retains its first temperature structure or a related ordered structure at said lower temperature and the plastic deformation into said second shape causes a shear transformation into a banded martensite. Thus, the alloy in its stable (0) or metastable high temperature phase is plastically deformed into the second shape above the M_s temperature. The application of the deforming stress produces a martensite similar to that obtained by cooling below the M_s temperature. On reheating, the stress-induced martensite transforms back to the original high-temperature phase and the alloy changes in shape towards said first shape. If desired, after said plastic deformation above the M_s temperature (and before



reheating), the alloy may be cooled further below the M_s (and preferably below the M_f) temperature, with or without the application of external stress. The transformation into martensite (if not already completed by the application of the deforming stress) will continue with a further change in **shape** in the direction dictated by said deforming stress. On reheating above the A_s temperature the **shape** will change towards the first **shape**. Whichever of the above **methods** is used, the amount of heat-recoverable strain is greater when the plastic deformation is effected at temperatures closer to the M_s and M_f temperatures. The copper-containing intermetallic compounds which give the best results are those in which the high temperature body centred cubic phase of A2 structure transforms on rapid cooling ultimately to a martensite which, though of complex crystal structure such as an orthorhombic structure, has pseudo-cubic symmetry. Such martensites are characterized by having a metallographic structure containing high densities of stacking faults. Alloys with this structure can be readily deformed at and near the M_s and F_f temperatures with extensive ductility as will be described hereinafter. Such an alloy may be found, for example, in the copper-zinc system where the β phase of appropriate composition of A2 BCC structure first orders to a B2 (CsCl type) BCC structure which subsequently transforms on further cooling to a faulted martensite of pseudo-cubic symmetry. Another example may be found in the copper-aluminium system where the structure of the final martensite is dependent on composition. An alloy with 10-11 percent aluminium does not order before transforming to a faulted martensite of pseudo-cubic symmetry. An alloy with 11 to 13 percent aluminium first orders to a BCC (Fe_3Al type) structure based on the theoretical composition Cu_3Al before subsequent transformation to a faulted martensite of pseudo-cubic symmetry. These structures in copper-aluminium alloys have less ductility than those rising from alloys having the structural sequence found in copper-zinc alloys. The above-mentioned alloys containing 10 to 13 percent aluminium are to be distinguished from those containing higher aluminium contents, in which the ordered BCC phase transforms to a twinned martensite with a structure of pseudo-hexagonal symmetry and these alloys have insufficient ductility to be of practical value. Thus the alloys preferably used in the present invention are those which transform martensitically to a faulted martensite of pseudo-cubic symmetry. Such structures may be found, for example, in a binary copper-zinc alloy, a binary copper-aluminium alloy, a ternary copper-aluminium-zinc alloy, a ternary copper-zinc-tin alloy, a ternary copper-zinc-silicon alloy, a ternary copper-zinc-manganese alloy, a ternary copper-aluminium-iron alloy and a ternary copper-aluminium-nickel alloy. The alloy may of course contain impurities and/or other incidental elements included to modify the properties of the alloy provided that an intermetallic compound of copper exhibiting the required martensite transformation is maintained, and the alloy is not necessarily a binary or ternary alloy. The alloy may be a two-phase or multi-phase alloy in which at least one phase is an intermetallic compound of copper as hereinbefore defined. The other phase or at least one of the other phases may consist of a primary solid solution which is heat-recoverable as described in our co-pending patent application No. 55,481/69. A primary solid solution as meant in this specification is obtained when atoms of one or more different elements can be added to a pure **metal** without producing a change of crystal structure, by replacing atoms in the various sites of the pure **metal** crystal structure. An intermetallic compound as meant in this specification is the single phase produced, other than a primary solid solution, when two or more elements are alloyed together in the correct proportions. It usually has a crystal structure different from that of any of the pure elements and usually includes a composition corresponding to a simple ratio of atoms e.g. A_xB_y , where A and B are elements and x and y are numbers usually below 10. It includes such phases which also exhibit a range of solubility for the component elements around the simple atomic ratio without a change of crystal structure. The anomalously low modulus of elasticity on loading and the high elastic hysteresis of alloys used in the present invention are illustrated in the stress/strain curves shown in FIGS. 7 and 8. Fig. 7 shows the behavior of many of the alloys found on deformation below M_f temperature and Fig. 8 shows the behavior of many of the alloys found on deformation between M_s and M_f temperatures. As the temperature of deformation is increased above M_s towards M_d , the behavior of many of the alloys on deformation is represented by Fig. 9 in which significant amounts of retained strain are only obtained if the alloy is deformed beyond the limit of pseudo elasticity as indicated in Fig. 9. We have found that alloys used in this invention have high internal frictions or damping capacities when heat-treated in the manner described i.e. cooled from the appropriate temperature in such a manner that they undergo the martensitic transformation. This internal friction or damping capacity reaches its highest value at temperatures near to the M_s and F_f temperatures. In alloys with an M_s temperature above room temperature we have discovered that when they are quenched to -196 degrees C. in the martensitic condition and are deformed at -196 degrees C. in the manner of the invention, the restoration of the original **shape** on heating above the A_s temperature takes place in two stages. If the alloy is deformed in tension at -196° C., a contraction occurs slowly on heating from -196° C. to 20° C. so as to balance the thermal expansion normally expected. Thus the alloy behaves as if it has zero or near zero thermal expansion over this range of temperature. We have also discovered that the extent of the **shape** change on heating an article made of alloys treated according to this invention, can be reduced or even prevented by applying sufficient stress to oppose the **shape** change. The removal of this stress after heating to the upper temperature (i.e. above the A_s temperature) allows the **shape** change to occur spontaneously instead of over a range of temperature as would have occurred in the absence of the opposing stress. The stress required to prevent the **shape** change whilst heating to a specific temperature is a measure of the force which can be developed by the alloy for doing external work. This discovery can be used in several ways. One **method** is to suppress or partially suppress the **shape** change by an applied stress and then to use the force or energy released when the restraining force is removed suddenly to operate a device, for example, through a lever or by impact on a pin or by deforming or fracturing a suitable element of the device. Another **method** is to use the force developed is to heat the part made from the heat recoverable material slowly through the A_s temperature range when it will exert a sustained and progressively increasing force on the operating element of the device as mentioned before. By control of the temperature, the rate and amount of increase of force or of movement can be controlled. The **methods** described in our co-pending U.K. patent application No. 22,372/69 are applicable in connection with the present invention. Thus, in carrying out the present invention, there may be applied to the alloy in its high-temperature phase a strain which produces a stress which induces a desired **shape** of its low-temperature phase. Said strain may be applied by deforming the alloy in its high-temperature phase partly towards the **shape** required for the low-temperature phase, the temperature being subsequently lowered so that the alloy changes into its low-temperature phase. The change into the low-temperature phase is accompanied by a continued change of **shape** into the desired **shape** without the application of an external force. This form of the invention is of great practical value since it provides a means of putting an alloy at a comparatively high temperature into a condition in which it will deform spontaneously at lower temperatures to a new **shape** which is dictated by the initial high temperature deformation. It is therefore unnecessary to effect working of the alloy at low temperatures. In practice, the metastable high temperature phase of the alloy is cooled to between its M_d and M_s transformation temperatures. M_j is the temperature of the start of the martensitic transformation under stress and M_s is the temperature of the start of the transformation without applied stress. With some alloys the temperature should be as close to the M_s transformation temperature as possible, e.g. within 100° C., to obtain the desired residual internal stress by said partial deformation. In other alloys a greater margin of temperature above M_s is possible. A suitable temperature for a given alloy can readily be found by experiment. The alloy is then deformed a small amount (i.e. less than the final strain it is desired to put into the low temperature phase). Cooling is continued to below the M_s transformation temperature when the alloy will continue to change in **shape** in the direction indicated by the prior deformation. On reheating this change of **shape** is wholly or partly reversed and on cooling again the change in **shape** towards the low temperature **shape** occurs spontaneously. Continued heating and cooling is accompanied by continued changes in **shape**. In another **method**, the alloy is deformed into a desired **shape** in its low-temperature phase and said strain is applied by raising the temperature so that the alloy changes into its high-temperature phase while restraint is applied to the alloy to prevent a change in **shape**. Thus, according to one aspect of the invention, there is provided a **method** of making a heat-recoverable article from a heat-recoverable alloy, which **method** includes the steps of **shaping** the alloy at an elevated temperature into a first **shape**, cooling to a lower temperature, deforming the alloy at the lower temperature into a second **shape**, said temperatures being such that if reheated without restraint to an appropriate temperature the alloy would at least partly resume its first **shape**, and reheating the alloy to said appropriate temperature while subjecting it to restraint which prevents a change of **shape**. Depending on the temperature involved and the intended use of the article, the alloy may be cooled to the lower temperature after reheating, still retaining the second **shape**. Then if the alloy is reheated without restraint it will change wholly or partly to its first **shape** but on cooling will revert wholly or partly to its second **shape**. Continued heating and cooling is accompanied by continued changes in **shape**. The provision of restraint when reheating induces a residual internal stress as aforesaid in the alloy at high temperature so that, it is considered, on cooling,

the nuclei which are activated on transformation are those which caused the original change in **shape** on deformation at the low temperature. The same activation is thought to be obtained by partial initial deformation before cooling to the low-temperature phase, when it is considered that sufficient nuclei of the low temperature martensitic phase are activated by the initial deformation on such orientations that on cooling the alloy continues its change of **shape**. Reheating under restraint is particularly useful since it enables the upper temperature to which the alloy is heated to be so far above the transformation temperature that continued reversibility of **shape** would be lost in the absence of restraint. Nevertheless, the upper temperature must not be sufficient for relaxation of stress to occur by plastic deformation, e.g. creep, or reversibility will be lost. In all cases, the temperature to which the alloy is heated should be too low for ageing or tempering of the alloy to take place. If precipitation occurs, the alloy assumes its high temperature **shape** permanently. We have found that the restraint need not always be applied by external mechanical means such as a jig. In some cases, an oxide skin, a **metal** coating or the like can provide the necessary restraint. EXAMPLES (i) Binary copper-zinc alloys containing 38.6 weight percent to 41.5 weight percent zinc The lower limit of zinc corresponds to the minimum solubility for zinc at which the α phase is stable. The upper limit of zinc corresponds to a Metemperature of about -250°C. Preferred alloys had compositions between 39.3 percent and 41.5 percent zinc. These alloys normally have an $\alpha+\beta$ phase structure if cooled slowly to room temperature. To obtain heat recoverable properties the alloys must be quenched from at least 8700 C. to retain a β phase which will transform martensitically when cooled below room temperature. Alloys within the range 39.3 percent to 40.7 percent Zn were all below their M_s temperatures when deformed at -196° C., and the strain thus caused was partly or wholly recoverable when they were heated above their A_s temperature. The results for an alloy containing 40.7 wt. percent zinc which was deformed at a temperature 15° C. below its M_s are given in Table I,

TABLE I Retained strain at 15° C. Heat recoverable below M_s (percent): strain (percent)	
1.6	1.6
1.6 4.0...	3.9 5.4
5.2 7.2	5.2 7.2
6.7 8.9...	8.3

These experiments were conducted upon specimens with a grain size of approximately 3-4 mm. A similar series of experiments in which samples were strained at a temperature 150 C. below the M_s were performed upon an alloy containing 39.5 wt. percent of zinc and which had a grain size of approximately 1 mm. The results are given in Table II. TABLE II e_0 Heat recoverable Retained strain (percent): strain (percent) 4.7 3.7 6.2 4.7 8.3 5.5 11.3 5.5 The results of these two series of experiments demonstrate that in binary CuZn alloys, the grain size is an important variable, and for a specific strain at a specific temperature below the M_s , the amount of heat recoverable strain increases as the grain size increases. Experiments were performed upon both alloys in which specimens were deformed the same amount at progressively lower temperatures below the M_s . The results for the 39.5 wt. percent zinc alloy shown in Table III demonstrate that the amount of recovery decreases as the difference between the M_s and deformation temperature is increased. TABLE III Percent Heat re Retained coverable Temp. below M_s at which strained strain strain 50.-----

5 4.2 850 C	
5 4.0 1110	5 3.2

An alloy containing 41.5 wt. percent zinc had an M_s of -250°C. and was deformed at -196° C., i.e. 54 degrees C. above its M_s . When, after deformation at this temperature, the load was released there was an extremely large elastic springback which left little residual deformation. However, as soon as the specimen was heated a large amount of this permanent deformation was recovered. The results for the complete series of experiments performed upon this alloy are given in Table IV. TABLE IV Percent Strain re Apparent Retained covered on Permanent Total strain elastic strain at heating to plastic at -196° 0. contraction -196° 1 C. +200 0. strain 6 4.6 1.4 1.05 0.35 8 5.0 8.0 2.60 0.40 5.5 4.5 4.15 0.35 12 6.0 6.0 5.4 0.6 This extremely large elastic springback was due to deformation of the alloy above its M_s . At such temperatures, a stress induced martensite phase is produced. Upon release of the stress, this phase partly reverts back to the original stable parent phase causing the high apparently elastic recovery. (ii) Binary copper aluminium alloys containing 10.0 percent to 13.0 weight percent aluminium The lower aluminium limit corresponds to the minimum solubility of Al in the β phase at 9500 C. which gives an alloy of Metemperature about 5000 C. when quenched from 9500 C. The addition of aluminium made the alloy progressively more brittle until beyond 13 percent it became difficult to deform the alloy without causing fracture. Whilst heat recovery properties exist in alloys with more than 13 percent Al, an alloy with 13 percent Al represented a practical upper limit beyond which the invention cannot be performed satisfactorily. The alloys were tested by a simple bending technique since some of them were too brittle to test in tension. The amount of deformation which could be produced in these alloys before failure was approximately 2 percent which corresponds to a right angle bend on a $\frac{1}{2}$ " thick strip of alloy. A series of alloys was studied in the composition range wt. percent to 13 wt. percent Al. The M_s of the 10 wt. percent Al alloy was +500° C. and that of the 13 wt. percent Al alloy +240° C. The alloys were quenched into water from 10000 C. and consequently at room temperature they were martensitic. The grain size was large which contributed to the lack of ductility. Each alloy was bent to a 60° bend from its original position at a temperature just below its M_s and heated above the A_s . All of the alloys recovered very closely to their original straight position (within 0-5 degrees), the temperature of the start of recovery corresponding very closely to the A_s temperature. In these alloys, the amount of heat recoverable strain was less dependent on the deformation temperature below the M_s than in the case of the Cu-Zn binary alloys, and in fact, recovery was obtained from an alloy with an M_s of +320° C. after deformation at +20° C. (iii) Ternary copper-aluminium-zinc alloys Ternary alloys within the preferred composition range in this ternary system showed a gradation in heat recoverable properties from those of one binary alloy to the other. An advantage of this ternary system was that alloys with Metemperatures intermediate between the high ones of the Cu-Al system and the low ones of the Cu-Zn system were possible. The preferred composition limits of this system are given below in conjunction with Fig. 1. Wt. percent (A) 87, Cu; 13, Al (B) 90, Cu; 10, Al (C) 61.4, Cu; 38.6, Zn (D) 58.5, Cu; 41.5, Zn (E) 76, Cu; 13.5, Zn; 10.5, Al After quenching from 950° C. and then deformation at temperatures either above or below the M_s , all alloys within this preferred composition range exhibited heat recoverable properties when they were heated above their A_s . Alloy 493 of nominal composition 65.75 wt. percent Cu, 2.5 wt. percent Al, 31.75 wt. percent Zn had an M_s of -105 degrees C. Recovery experiments were conducted upon specimens deformed over a range of temperatures both above and below the M_s ; the results are shown in Table V. TABLE V Percent Apparent Heat elastic Retained recoverable Def. temp.,° C. Def. contraction strain. strain ----- 5. -----

1.2 1.8 0.1 -84-----	13 -84 -----	3 2.8 0.2 0.1 -84 -----	6 5.4 0.6
0.5 -84 -----	10 6.8 3.2 2.0 -104 -----	-16 -104 -----	1 0 3.8 6.2 5.4 -104 -----
14 4.4 9.4 7.3 -125 -----	16;		

Probable Assignee: FULMER RES INST LTD

Earliest Publication Date: 19540531

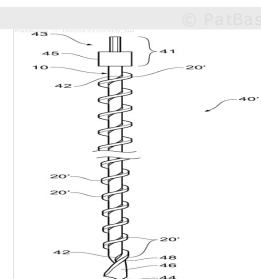
59) Family number: 60580694 (US2017120315A)

SOIL AUGER AND **METHOD** OF MANUFACTURE

Abstract: Source: US2017120315A An auger useable for creating an opening in the ground for a soil sensor housing wherein the sensor housing has a predetermined volume and a tapered outer surface, includes an auger made in accordance with the **methods** described and defined in this specification. The auger having a shaft having an outer surface of circular cross-section having a larger outer diameter at one end than the other end and a strip material having a helical **shape** with an inner wall having a larger inner diameter at one end than the other end of the helical **shape** wherein the helically **shaped** material is fixed over the outer diameter of the shaft to form a tapered auger with helical flighting. The volume of the opening created by an auger in the ground will provide a matching volume for a sensor housing of a predetermined volume such that substantially the full length of the tapered outer surface of the sensor is adjacent the ground along the full length/depth of the created opening.

Probable Assignee: SENTEK PTY LTD

Earliest Publication Date: 20151015



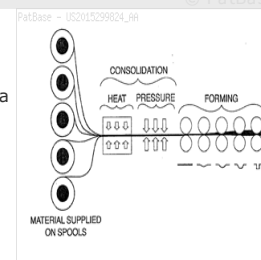
60) Family number: 54821746 (US2015299824A)

AMORPHOUS ALLOY ROLL FORMING OF FEEDSTOCK OR COMPONENT PART

Abstract: Source: US2015299824A Embodiments herein relate to a **method** of making roll formed objects of a bulk solidifying amorphous alloy comprising a **metal** alloy, and **articles** thereof. The roll forming includes forming a portion of the bulk solidifying amorphous alloy at a temperature greater than a glass transition temperature (T_g) of the **metal** alloy. The roll forming is done such that a time-temperature profile of the portion during the roll forming does not traverse through a region bounding a crystalline region of the **metal** alloy in a time-temperature-transformation (TTT) diagram of the **metal** alloy.

Probable Assignee: APPLE INC

Earliest Publication Date: 20130926



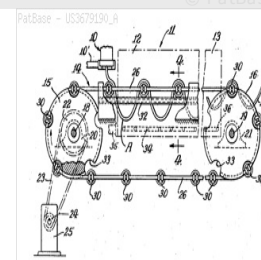
61) Family number: 30243126 (US3679190A)

APPARATUS FOR HANDLING SHRINKABLE MATERIAL

Abstract: Source: US3679190A **Apparatus** for conveying an elongated component, characterized by being shrinkable upon being heat treated, providing for the support and passage of the elongated component in a sinuous configuration to compensate for shrinkage upon heating, and for utilization of heating means of short length.

Probable Assignee: NAT STANDARD CO

Earliest Publication Date: 19700731



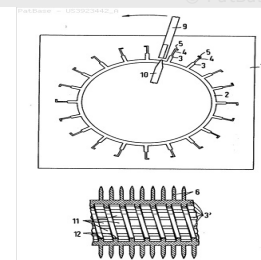
62) Family number: 6740176 (US3923442A)

APPARATUS FOR THE PRODUCTION OF THERMOPLASTIC ARTICLES WITH BURDOCK-LIKE HOOKS

Abstract: Source: US3923442A An **apparatus** for the production of thermoplastic **articles** with bristles or spikes. The **apparatus** performs the steps of extruding a profile form, particularly with a rod-, tube- or ribbon-like carrier, having a plurality of longitudinal ribs tapering outwardly and ending in thin hooked portions, repeatedly cutting said ribs transversely to the extruding direction while still in a plastic state, simultaneously stretching the profile form so as to form bristles or spikes with hooked ends, cooling the extruded form, and cutting it into **articles** of desired length.

Probable Assignee: KREIDLER WERKE GMBH

Earliest Publication Date: 19731116



63) Family number: 51688292 (US2012199255A)

HIGH STRENGTH STEEL PIPES WITH EXCELLENT TOUGHNESS AT LOW TEMPERATURE AND SULFIDE STRESS CORROSION CRACKING RESISTANCE

Abstract: Source: US2012199255A Low-alloy steels and **methods** of manufacturing pipes having a wall thickness greater than or equal to about 8 mm and less than or equal to about 35 mm therefrom are provided. In one embodiment, a steel composition is processed that yields an average prior austenite grain size greater than about 15 or 20 micro m and smaller than about 100 micro m. A quenching sequence has been determined that yields a microstructure of greater than or equal to about 60 percent martensite by volume, and less than or equal to about 40 percent by volume lower bainite, without substantial formation of ferrite, upper bainite, or granular bainite. The yield strength of the quenched and tempered pipes may be greater than about 70 ksi, 80 ksi, or 90 ksi. The quenched and tempered pipes are suitable for 70 ksi, 80 ksi, and 90 ksi grades and resistant to sulfide stress corrosion cracking.

Probable Assignee: DALMINE SPA

Earliest Publication Date: 20120807



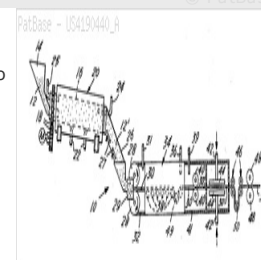
64) Family number: 5146954 (US4190440A)

PROCESS FOR FABRICATING STEEL FROM FERROUS METAL PARTICLES

Abstract: Source: US4190440A A process for conditioning ferrous particles with heat and a reducing atmosphere to reduce the oxygen content of the particles in a non-agglomerative manner and to make the conditioned particles readily pourable and free-flowing, and to process the particles into steel strip.

Probable Assignee: AMERICAN CAN CO

Earliest Publication Date: 19790118



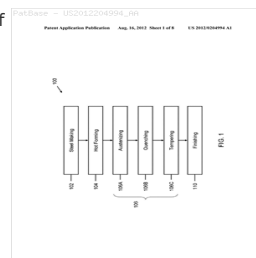
65) Family number: 51690481 (US2012204994A)

HEAVY WALL STEEL PIPES WITH EXCELLENT TOUGHNESS AT LOW TEMPERATURE AND SULFIDE STRESS CORROSION CRACKING RESISTANCE

Abstract: Source: US2012204994A Embodiments of the present disclosure comprise carbon steels and **methods** of manufacturing thick walled pipes (wall thickness greater than or equal to about 35 mm) there from. In one embodiment, a steel composition is processed that yields an average prior austenite grain size greater than about 15 or 20 micro m and smaller than about 100 micro m. Using this composition, a quenching sequence is provided that yields a microstructure of greater than or equal to about 50 percent by volume, and less than or equal to about 50 percent by volume, lower bainite, without substantial ferrite, upper bainite, or granular bainite. After quenching, pipes may be tempered. The quenched and tempered pipes may exhibit yield strengths greater than about 450 MPa (65 ksi) or 485 MPa (70 ksi). Mechanical property measurements find the quenched and tempered pipes suitable for 450 MPa grade and 485 MPa grade, and resistance to sulfide stress corrosion cracking.

Probable Assignee: DALMINE SPA

Earliest Publication Date: 20120807



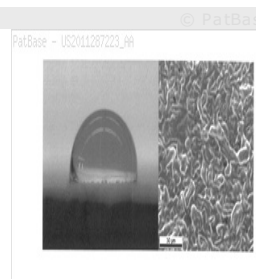
66) Family number: 49963948 (US2011287223A)

METALLIC **ARTICLES** WITH HYDROPHOBIC SURFACES

Abstract: Source: US2011287223A **Articles** containing fine-grained and/or amorphous metallic coatings/layers on at least part of their exposed surfaces are imprinted with surface structures to raise the contact angle for water in the imprinted areas at room temperature by equal to or greater than 10 degrees, when compared to the flat and smooth metallic material surface of the same composition.

Probable Assignee: INTEGRAN TECHNOLOGIES INC

Earliest Publication Date: 20111124



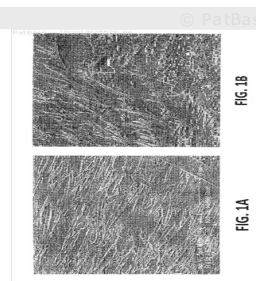
67) Family number: 61184349 (US2017145528A)

HIGH STRENGTH IRON-BASED ALLOYS, PROCESSES FOR MAKING SAME, AND **ARTICLES** RESULTING THEREFROM

Abstract: Source: US2017145528A A new iron based alloy prepared by extremely rapid heating followed substantially immediately by extremely rapid cooling. **Methods** and materials made by optionally initially spheroidized annealing of raw iron based alloys into a precursor material are disclosed. After optional spheroidized annealing, the precursor material is rapidly heated to a temperature above the austenitizing temperature of the material and rapidly cooled to yield a high strength iron based alloy. **Methods** and materials for realizing a corrosion resistant high strength iron based alloy are disclosed, as are **methods**, materials and **articles** which exhibit the ability to form bend radii of nearly folding over itself.

Probable Assignee: COLA JR GARY

Earliest Publication Date: 20151223



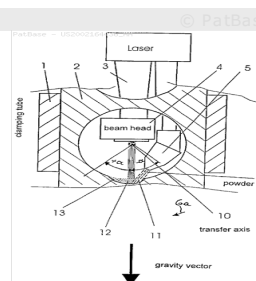
68) Family number: 30509685 (US2002164436A)

METHOD FOR PRODUCING A SURFACE-ALLOYED CYLINDRICAL, PARTIALLY CYLINDRICAL OR HOLLOW CYLINDRICAL COMPONENT AND A DEVICE FOR CARRYING OUT SAID **METHOD**

Abstract: Source: US2002164436A The invention relates to a **method** for manufacturing a surface-alloyed cylindrical, partly cylindrical or hollow cylindrical structural member where in the zone of incidence of the energy beam there is formed a locally bounded melting bath with a heating and melting front, a solution zone and a solidification front. At the side of the energy beam the hard material powder is deposited via a conveyor device in the direction of gravity and is supplied co-ordinated with the feed movement of the workpiece in a width which corresponds to the width of the linear focus and a layer height of 0.3-3 mm is thereby produced. The hard-material powder supplied to the workpiece surface in the heating front of the melting bath is heated by an energy beam at a wavelength of 780-940 nm and in contact with the liquefied matrix alloy the powder is immediately dissolved in the melting bath. Convection is produced in the solution zone by the energy beam having a specific power of at least 104 W/cm², so that the homogenisation process in the melting zone is accelerated, where the linear focus acts on the solution zone until the hard material powder is uniformly distributed in the melting bath. In front of the energy beam the uniformly distributed powder material, which has gone into solution metallurgically in the solution zone, is subjected to directional solidification in the solidification front at a high cooling rate of 200-600 K/s at a feed rate of 500-10,000 mm/min. The invention also relates to a device for implementing the **method**, consisting of a workpiece clamping device, on which a workpiece is aligned and clamped above index holes and/or above working surfaces, onto whose surface a powder supply and a focusable beam from a beam head are directed.

Probable Assignee: VAW ALUMINUM AG

Earliest Publication Date: 20000525



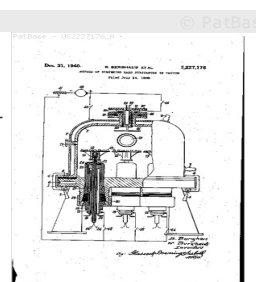
69) Family number: 30140558 (US2227176A)

METHOD OF SINTERING HARD SUBSTANCES IN VACUUM

Abstract: Source: US2227176A 1. A **method** of manufacturing relatively hard **metal articles** from **metal** powder which comprises, pressing the **metal** powder into the desired article **shape**, supporting the **shaped metal** powder in a sealed housing, evacuating the housing to remove gases from the pressed **metal** powder, introducing an inactive gas into the housing, and thereafter creating a negative glow discharge within the housing to surround the **shaped metal** powder to sinter the pressed **metal** powder. - . ,

Probable Assignee: BERGHAUS

Earliest Publication Date: 19390421



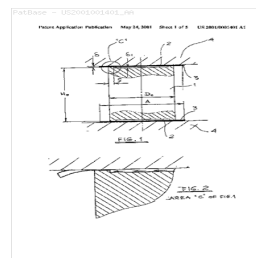
70) Family number: 30265053 (US2001001401A)

PROCESS FOR PRODUCING A METAL ARTICLE

Abstract: Source: US2001001401A Described is the production of a metal article with fine metallurgical structure and texture by a process that includes forging and rolling and control of the forging and rolling conditions. Also described is a metal article with a minimum of statically crystallized grain size difference in grain size at any location of less than about plus or minus 3 percent, as well as a dispersion in orientation content ratio of textures of less than about plus or minus 4 percent at any location.

Probable Assignee: HONEYWELL INT INC

Earliest Publication Date: 19990121



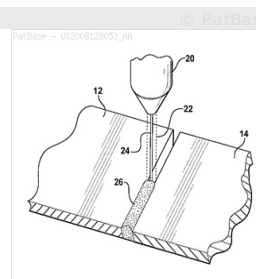
71) Family number: 41882790 (US2008128053A)

METHOD OF MANUFACTURING A WELDED METAL PANEL HAVING A HIGH QUALITY SURFACE FINISH

Abstract: Source: US2008128053A In a method for preparing a welded metal panel having a high surface quality a first metal blank and a second metal blank are disposed so that edge portions of the blanks are in an abutting relationship. The blanks are laser welded together utilizing a powdered metal filler so as to produce a weld seam which is convex. A portion of the seam is removed to produce a flush weld seam between the blanks. The hardness of the weld seam is determined, and if the hardness of the weld seam is more than the hardness of the remainder of the panel, the weld seam is tempered so as to reduce its hardness. The thus produced welded metal panel may be subjected to a further shaping operation such as stamping, bending or the like. After shaping, the article may be plated, painted or otherwise finished.

Probable Assignee: NOBLE ADVANCED TECHNOLOGIES INC

Earliest Publication Date: 20080605



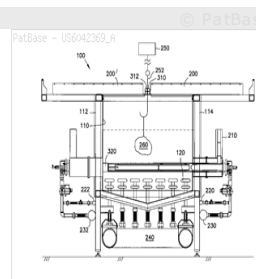
72) Family number: 11434550 (US6042369A)

FLUIDIZED-BED HEAT-TREATMENT PROCESS AND APPARATUS FOR USE IN A MANUFACTURING LINE

Abstract: Source: US6042369A A method for rapid heat treatment, quenching and aging of an article includes placing the article in a fluidized bed and conveying the article through the bed. Heat treatment, quenching and aging of the part can be done in less than two hours using this method. The method also includes removing fluidizing media from the article as the article is removed from the fluidized bed. An elevator is used to remove the article from the fluidized bed. The elevator may include a conveyor for moving the article into another fluidized bed. The article can then be placed into the second fluidized bed and conveyed through that bed. Each fluidized bed is controlled so that a specific heat treatment can be applied to the article by the fluidized bed. The fluidized bed can be used as a portion of an automated production line. The retort of the fluidized bed includes a system for recycling the air passed through the fluidizing media in the furnace. The recycling system includes a fan positioned above the fluidizing media in the retort, a filter for removing any fluidizing media within the recycled air, and piping for reintroducing the recycled air to the retort. The heaters are placed within the retort and include heat exchangers for heating the incoming combustion air. The heaters are rigidly attached at one end and fit within sleeves attached to another portion of the retort. The heater tubes can be replaced with refrigeration tubes or units so that articles may be quenched.

Probable Assignee: TECHNOMICS LLC F K A JRS NEWCO LLC

Earliest Publication Date: 19990930



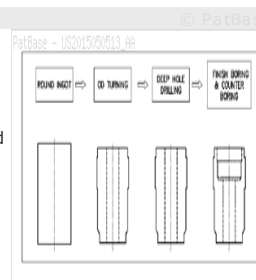
73) Family number: 54258154 (US2015050513A)

METHOD FOR MANUFACTURING HOLLOW SHAFTS

Abstract: Source: US2015050513A The present invention describes a method of manufacturing a near-net shaped hollow shaft useful for high power applications such as gearboxes for wind energy industry. The method involves providing a concast bloom (of a round or rectangular or of any polygonal cross section) or an as-cast round ingot from which a hollow perform is prepared using hollow die punching, followed by process of heat treatment, proof-machining and stress relieving.

Probable Assignee: BHARAT FORGE LTD

Earliest Publication Date: 20130704



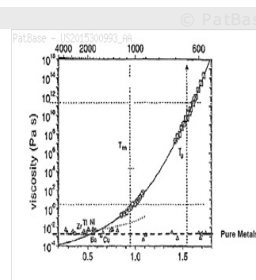
74) Family number: 55049218 (US2015300993A)

ULTRASONIC INSPECTION

Abstract: Source: US2015300993A One embodiment provides a method comprising: providing a sample comprising a bulk amorphous alloy; scanning ultrasonically at least a portion of the sample to determine a parameter of the sample in the portion; and comparing the parameter to a predetermined standard to derive a property related to the sample.

Probable Assignee: APPLE INC

Earliest Publication Date: 20131031



75) Family number: 52211004 (US2003057614A)

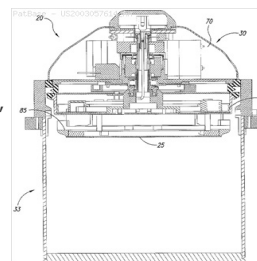
METHOD AND APPARATUS FOR PROCESSING A MICROELETRONIC WORKPIECE INCLUDING AN

APPARATUS AND METHOD FOR EXECUTING A PROCESSING STEP AT AN ELEVATED TEMPERATURE

Abstract: Source: US2003057614A An **apparatus** for thermally processing a microelectronic workpiece is set forth. The **apparatus** comprises a first assembly and a second assembly, disposed opposite one another, with an actuator disposed to provide relative movement between the first assembly and second assembly. More particularly, the actuator provides relative movement between at least a loading position in which the first assembly is in a state for loading or unloading of the microelectronic workpiece, and a thermal processing position in which the first assembly and second assembly are proximate one another and form a thermal processing chamber. A thermal transfer unit is disposed in the second assembly and has a workpiece support surface that is heated and cooled in a controlled manner. As the first assembly and second assembly are driven to the thermal processing position by the actuator, an arrangement of elements bring a surface of the microelectronic workpiece into direct physical contact with the workpiece support surface of the thermal transfer unit. In a preferred embodiment, the thermal transfer unit is comprised of a low thermal mass heater and a high thermal mass cooler disposed to controllably cool the low thermal mass heater.

Probable Assignee: SEMITool INC

Earliest Publication Date: 20030327



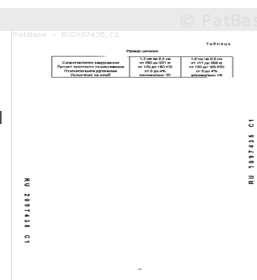
76) Family number: 8574683 (US5656103A)

STEEL STRAP AND METHOD OF MAKING

Abstract: Source: US5656103A A non-heat treated, high tensile strength, highly formable steel strap that may be applied in a tensioned loop about packaged **articles** with a strapping machine. The strap is **fabricated** from a steel comprising approximately, 0.20 to 0.25 percent carbon, 0.30 to 0.60 percent manganese, 0.04 percent maximum phosphorus, 0.05 percent maximum sulfur, an aluminum in an amount sufficient for full aluminum kill, 0.10 percent maximum silicon, and a boron to free nitrogen ratio of approximately between 1.07 to 1.43. The steel is coiled at a coiling temperature of approximately 1100 degrees Fahrenheit to reduce self-annealing that occurs during air cooling after coiling. The coiled steel is then reduced approximately 80 percent by cold rolling to increase tensile strength before it is **fabricated** into steel strap which may be protected with a zinc coating.

Probable Assignee: PREMARK PACKAGING LLC

Earliest Publication Date: 19951029



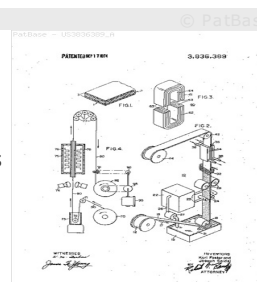
77) Family number: 1020054 (US3533861A)

METHOD OF IMPROVING THE MAGNETOSTRICTION AND CORE LOSS OF CUBE-ON-FACE ORIENTED MAGNETIC STEELS

Abstract: Source: US3533861A ABSTRACT OF THE DISCLOSURE The **method** is set forth for improving the magnetostriction and core loss of cube-on-face oriented silicon steels. A glass coating is fused to the steel while the same is under tension. Data is included illustrating magneto- 20 striction, core loss and other magnetic data. CROSS REFERENCE TO RELATED APPLICATION This invention is a continuation-in-part of our copending application Ser. No. 576,963, filed Sept. 2, 1966 in the names of Karl Foster and Joseph Seidel and entitled Glass Coated Electrical Steel Sheet and **Articles** Prepared Therefrom, "which is a continuation-in-part of go application Ser. No. 556,337, filed June 9, 1966 in the names of Karl Foster and Joseph Seidel, now abandoned. B

Probable Assignee: WESTINGHOUSE ELECTRIC CORP

Earliest Publication Date: 19671116



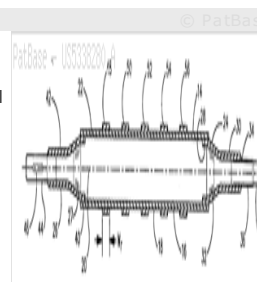
78) Family number: 11653997 (US5338280A)

ANNEALING AND TUNNEL FURNACE ROLLS

Abstract: Source: US5338280A An annealing roll for transferring steel strips from an annealing furnace has several spaced rings along the body of the roll. The rings have a width and diameter chosen such that the load on each ring is optimized depending upon the material of the strip and the ring material. The selected ring material is relatively insoluble with the strip material.

Probable Assignee: ALPHATECH INC

Earliest Publication Date: 19940816



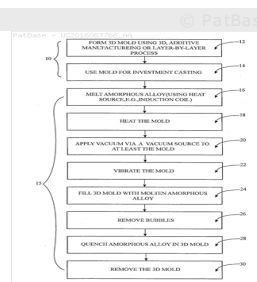
79) Family number: 61842083 (US2016067766A)

3D PRINTED INVESTMENT MOLDS FOR CASTING OF AMORPHOUS ALLOYS AND METHOD OF USING SAME

Abstract: Source: US2016067766A Described herein is a **method** of forming a 3D investment mold using a layer-by-layer construction (3D printing). The mold is configured for receipt of a molten alloy having a composition configured to form a bulk metallic glass (BMG) on cooling. The mold has a hollow interior between inner and outer walls. The hollow interior receives the molten alloy for molding it between the inner and outer walls of the mold. A **method** of casting using the 3D investment mold is also disclosed, which may include filling the mold with molten alloy, removing bubbles, quenching the molten alloy in the mold, and then removing the mold.

Probable Assignee: CRUCIBLE INTELLECTUAL PROPERTY LLC

Earliest Publication Date: 20160310



80) Family number: 21439193 (FR1522350A)

TRAITEMENT D'AMELIORATION DE METAUX TREATMENT OF METAL IMPROVEMENT (MACHINE TRANSLATION)

Abstract: Source: FR1522350A (Claim 1) 1. On porte dans la chambre separee, la temperature a 704 [deg]C et on la maintient a cette valeur pendant tout le traitement thermique. On place ensuite, a l'exterieur, les radiateurs sur le couvercle interieur et l'on porte la temperature de l'acier a 857 [deg]C et on la maintient a cette valeur durant 1 heure. Il ne se forme pas d'oxyde sur l'acier. Le HF produit par hydrolyse des produits de decomposition du TFE est effectivement epure ou fixe par la magnesie. RESUME A. Procede pour reduire la formation des oxydes a la surface des metaux' et alliages metalliques durant les operations du traitement thermique, ce procede etant caracterise par les points suivants, pris isolement ou en combinaisons: 1. On conduit le traitement thermique en presence des produits gazeux de la decomposition d'au moins un hydrocarbure halogene et d'un agent de fixation d'hydracide halogene ou d'un agent d'epuration de cet hydracide halogene;

Machine translation: (Claim 1) 1. It bears in separate room, the temperature at 704 [deg] C and maintained at this value throughout the heat treatment. Then placed on the outside, the radiators on the cover and inside the door is the temperature of the steel is 857 [deg] C and maintained at this value for 1 hour. It does not form oxide on steel. HF produced by the hydrolysis products of decomposition of TFE is actually fixed by the working drawing or magnesia. SUMMARY A. **Method** for reducing the formation of oxides on the surface of **metals**, and **metal** alloys during heat treatment of operations, said process being characterized by the following, taken alone or in combination: 1. Heat treatment is conducted in the presence of gaseous products of decomposition of at least one hydrocarbon and a halogen scavenger of hydrogen halide or an agent of purification of the hydrogen halide;

Probable Assignee: DU PONT

Earliest Publication Date: 19680426

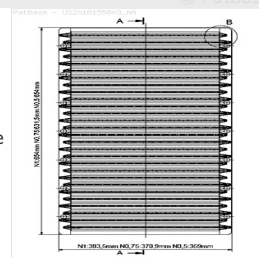
81) Family number: 64157219 (US2018155803A)

METHOD FOR THE HOMOGENEOUS NON-CONTACT TEMPERATURE CONTROL OF NON-ENDLESS SURFACES WHICH ARE TO BE TEMPERATURE-CONTROLLED, AND DEVICE THEREFOR

Abstract: Source: US2018155803A The present invention relates to an **apparatus** for tempering hot **articles**, in particular an **apparatus** for homogeneous, contactless tempering of primarily non-endless surfaces that are to be tempered; the tempering **apparatus** has at least one tempering blade or a tempering cylinder; the tempering blade or tempering cylinder is embodied as hollow and has a tempering blade nozzle edge or a plurality of tempering cylinders arranged in a row; in the nozzle edge at least one nozzle is provided, which is aimed at an article to be tempered; and at least seven tempering blades are arranged in such a way that the flow pattern on the surface to be tempered forms a honeycomb-like structure; and to a **method** thereof.

Probable Assignee: VOESTALPINE STAHL GMBH

Earliest Publication Date: 20161201



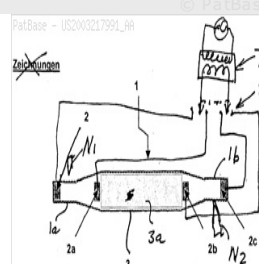
82) Family number: 29994988 (US2003217991A)

METHOD OF AND APPARATUS FOR THE ELECTRICAL RESISTANCE HEATING OF METALLIC WORKPIECES

Abstract: Source: US2003217991A An electrode pattern is used to apply preheating and final heating electric current to a workpiece whose smaller regions are bridged, or otherwise controlled as to the temperature so that for the final heating, all parts of the workpiece have substantially the same temperature and hence substantially the same electrical conductivity.

Probable Assignee: BENTELER AUTOMOBILTECHNIK GMBH

Earliest Publication Date: 20030417



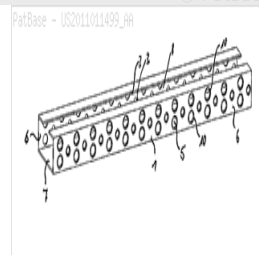
83) Family number: 43042163 (US2011011499A)

METHOD AND DEVICE FOR HARDENING PROFILES

Abstract: Source: US2011011499A The invention relates to a **method** for producing hardened profiles, in particular hardened open profiles, wherein the component is at least partly heated to above the austenitizing temperature of the base material and after heating the component is cooled at a rate above the critical hardening rate, the energy necessary for the heating being introduced at least partly by induction, wherein free edges are provided in the component to adjust a temperature or hardness gradient over the cross section of the component, the size, type and extension of the edges being set for a desired degree of hardness and/or hardness gradient.

Probable Assignee: VOESTALPINE KREMS GMBH

Earliest Publication Date: 20090319



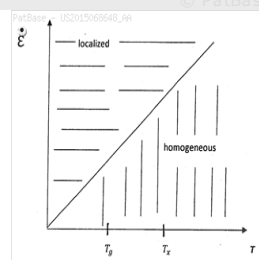
84) Family number: 54788139 (US2015068648A)

MULTI STEP PROCESSING METHOD FOR THE FABRICATION OF COMPLEX ARTICLES MADE OF METALLIC GLASSES

Abstract: Source: US2015068648A In one embodiment, the invention provides a process for thermoplastic forming of a metallic glass. For example, in one embodiment, the invention provides a process for thermoplastic forming of a metallic glass ribbons having a thickness of between about 50 to about 200 microns. Related **articles** of manufacture and processes for customizing **articles** in accordance with the process as described herein are also provided.

Probable Assignee: UNIV YALE

Earliest Publication Date: 20130919



85) Family number: 2970085 (US4827099A)

METHOD AND APPARATUS FOR CONTINUOUS PRODUCTION OF TUBULAR BODIES BY MEANS OF LASER LONGITUDINAL SEAM WELDING

Earliest Publication Date: 19880406

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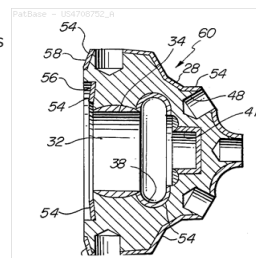
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PROCESSING]
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ESTABLISH POSSIBLE  
POOR-QUALITY  
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    B50C --> B50D[B20  
DETERMINE  
DEFINITIVE  
BETTER-  
QUALITY  
CRITERIA]
    B50D --> B50E{B30  
DOES  
DEFINITIVE  
BETTER-  
QUALITY  
CRITERIA  
EXIST?}
    B50E -- YES --> B50F[B35  
EXAMINE SET  
REJECT PRODUCT?]
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UPDATE CRITERIA  
TO  
INCLUDE  
POOR-QUALITY  
PRODUCT  
QUALITY]
    B50G --> B50D
    B50E -- NO --> B50H[B30  
NO  
DEFINITIVE  
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TO  
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PRODUCT]
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NEXT  
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QUALITY]
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PatBase PDF Export - Page: 20 08/08/2018

Abstract: Source: US4708752A A medium to high carbon steel body of a roller cone for a drilling bit is machined to final dimensions, and is thereafter rendered absorbent to laser light by application of black paint or black etch. Holes for hard tungsten carbide or like inserts are drilled in the light absorbent steel body. The entire steel body, including the holes, is subjected to a laser treatment which, however, is effective to raise to above austenitizing temperature only the dark light absorbent surfaces. Walls of the insert holes, being shiny, reflect the laser light and are not effected by it. Rapid self-quenching of the laser heated surfaces results in a hard martensitic layer in the external surface, with a surface hardness of 57 to 60 Rockwell C units. The seal gland, heel, and spindle bore areas of the roller cones are hardened similarly by exposure to laser light. In an alternative process, the hard tungsten carbide or like inserts are press fitted into the holes before the laser treatment. The subsequent laser treatment does not affect the inserts adversely, because the inserts, too, have shiny light reflective surfaces, and therefore do not absorb the laser light.

Probable Assignee: SMITH INT INC A DE CORP

Earliest Publication Date: 19870914



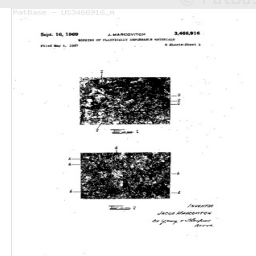
91) Family number: 316096 (US3466916A)

WORKING OF PLASTICALLY DEFORMABLE MATERIALS

Abstract: Source: GB1186201A 1,186,201. Altering physical structure; making metal articles; twisting; rolling. ROTARY PROFILE ANSTALT. 21 April, 1967 [5 May, 1966], No. 18373/67. Headings B3A, B3E, B3M and B3V. The fibrous inclusions in a material, e.g. steel rod or tube, are fragmented by applying torque to an isolated zone of the heated metal. In one embodiment, Fig. 5, a heated tube 20 is chucked and clamps 28 applied along its length. The chuck 26 is held stationary whilst chuck 24 is rotated and the clamps 28 progressively released so that zones of the tube are progressively isolated and twisted. The clamps 28 may be replaced by a heating coil (32), (Fig. 6, not shown), and a water spray (40) which are traversed along the heated tube. The tube may be simultaneously rolled by skewed rollers (48), (Fig. 7, not shown), traversing the tube, twisting being confined to the zone between the rollers and water spray (50). In another embodiment, Fig. 8, two grippers 62 in each zone 56, 60, 58 co-operate to continuously advance a preheated bar 54, the middle gripper holder 66 being rotated to twist the bar in the middle zone 60. The bar may alternatively be rolled through three pairs of rollers (72, 74, 76), (Fig. 9, not shown), the middle pair (74) of which is caused to orbit; the rollers may be skewed in which case the outer pairs are caused to orbit (Fig. 10, not shown). The bar may be twisted in opposite directions as it is passed between two pairs of skewed rollers (88, 90), (Fig. 11, not shown). Wire (100), (Fig. 12, not shown), may be continuously wound around three side-by-side capstans, the middle of which is caused to orbit. In a further embodiment, Fig. 13, a closed end cylinder 106, e.g. gas pressure tank, is formed by drawing the material between skewed rollers 122 and a sleeve 112 surrounding a movable plunger 110. To effect twisting, one end of the cylinder 106 is clamped at 124 whilst the opposite end is rotated by a headpiece 114 surrounding the sleeve 112. Alternatively, the rollers 122, plunger 110 and clamp 124 may rotate whilst the headpiece 114 is stationary.

Probable Assignee: ROTARY PROFILE ANSTALT

Earliest Publication Date: 19681031



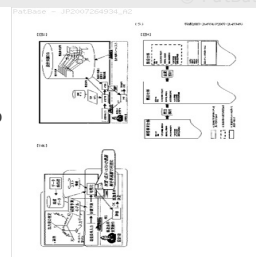
92) Family number: 40477103 (US2009065102A)

HIGH STRENGTH SEAMLESS STEEL PIPE FOR MACHINE STRUCTURE USE SUPERIOR IN TOUGHNESS AND WELDABILITY, AND METHOD OF PRODUCTION OF THE SAME

Abstract: Source: US2009065102A A high strength seamless steel pipe for machine structure use superior in toughness and weldability characterized by containing, by mass percent, C: 0.03 to less than 0.1 percent, Mn: 0.8 to 2.5 percent, Ti: 0.005 to 0.035 percent, Nb: 0.003 to 0.04 percent, and B: 0.0003 to 0.003 percent, limiting Si: 0.5 percent or less, Al: 0.05 percent or less, P: 0.015 percent or less, S: 0.008 percent or less, and N: 0.008 percent or less, further containing one or more of Ni: 0.1 to 1.5 percent, Cr: 0.1 to 1.5 percent, Cu: 0.1 to 1.0 percent, and Mo: 0.05 to 0.5 percent, and having a balance of Fe and unavoidable impurities, the metallurgical structure being a single phase structure of self-tempered martensite or a mixed phase structure of self-tempered martensite and lower bainite.

Probable Assignee: NIPPON STEEL AND SUMITOMO METAL CORP

Earliest Publication Date: 20071011



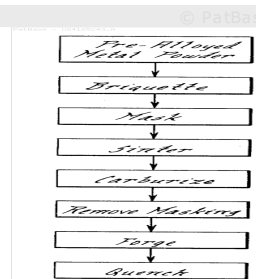
93) Family number: 1547239 (US4165243A)

METHOD OF MAKING SELECTIVELY CARBURIZED FORGED POWDER METAL PARTS

Abstract: Source: US4165243A A powder metallurgical process for producing dense low-alloy ferrous parts having selected carburized surface portions in which a metal powder of the desired composition is briquetted into a shape-retaining preform, the preform is sintered, carburized whereafter the mask is removed and the resultant preform is forged to a desired final shape. The forged part is then quenched immediately following the forge operation for hardness or if desired it can be further heat treated in another manner to obtain other mechanical properties.

Probable Assignee: GKN SINTER METALS INC

Earliest Publication Date: 19790821



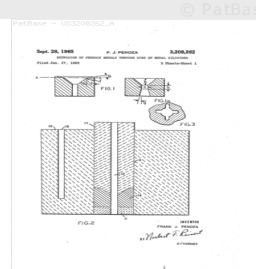
94) Family number: 22802821 (US3208262A)

EXTRUSION OF FERROUS METALS THROUGH DIES OF METAL SILICIDES

Abstract: Source: US3208262A (Claim 1) 1. A method for the hot extrusion of ferrous alloys 25- comprising beatin.- a ferrous alloy billet to a temperature -conferring plasticity to said billet and forcing said billet through the orifice of a die nib comprising a metal silicide composition consisting essentially of from 14-57% by weight Si, from 10-60% by weight of a metal elected from the group consisting of Group IV-B, V-B, VI-B, VII-B, and VIII of the Periodic Table, and at least one additional element in an individual amount of from 1- 65% by weight selected from the group consisting of Group IV-B, V-B, VI-B, VII-B, and VIII of the Periodic Table, nitrogen, boron, and carbon.

Probable Assignee: DU PONT

Earliest Publication Date: 19650928



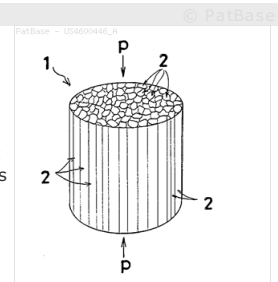
95) Family number: 29311192 (US4600446A)

METHOD FOR TEMPERING AND WORKING HIGH STRENGTH LOW DUCTILE ALLOY

Abstract: Source: US4600446A A high strength low ductile alloy is formed in a desired **shape** with high accuracy by bundling a multiplicity of fine wires made of the high strength low ductile alloy, consolidating the bundle of fine wires into a prescribed **shape** thereby giving rise to a formed product wherein the interiors of the fine wires comprises aggregates of very fine grains resulting from primary recrystallization and subjecting the formed product to thermal treatment for grain growth at the temperature of secondary recrystallization whereby the very fine grains undergo grain growth.

Probable Assignee: KOGYO GIJUTSUIN

Earliest Publication Date: 19850510



96) Family number: 22984926 (FR1343026A)

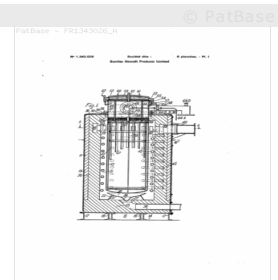
PROCEDE ET APPAREIL POUR LE TRAITEMENT THERMIQUE DES METAUX METHOD AND APPARATUS FOR HEAT TREATMENT OF METALS (MACHINE TRANSLATION)

Abstract: Source: FR1343026A (Claim 1) 1. Procédé de traitement thermique des métaux consistant à placer le **metal** dans une chambre étanche au gaz, à remplir cette chambre d'un gaz inerte, à traiter thermiquement le **metal** dans l'atmosphère constituée par le gaz inerte tout en maintenant un équilibre au moins approximatif entre la pression du gaz inerte dans la chambre et la pression externe environnante, puis à faire passer un fluide de refroidissement autour de la chambre pour accélérer son refroidissement et permettre le dégagement du **metal** traité thermiquement.

Machine translation: (Claim 1) 1. Process for heat treating **metals** consisting in placing the **metal** in a sealed gas chamber, the chamber was filled with an inert gas, a heat treating the **metal** in the atmosphere constituted by the inert gas while maintaining a balance at least approximate between the inert gas pressure in the chamber and the external surrounding pressure, then passing a cooling fluid around the room to speed cooling and allow the release of heat treated **metal**.

Probable Assignee: BURNLEY AIRCRAFT PRODUCTS LTD

Earliest Publication Date: 19631115



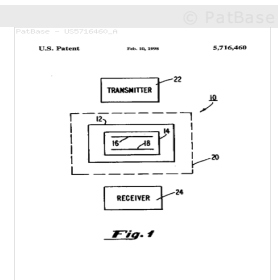
97) Family number: 10652079 (US5716460A)

METHODS FOR MAKING MAGNETIC STRIPS

Abstract: Source: US5716460A **Methods** for preparing magnetic strips are provided in which the strips are manufactured to a thickness of less than about 0.005 inches and are made of a iron-based alloy having a manganese content of from about 8 to about 18 weight percent. The thin strips can be prepared by annealing the alloy, then cold rolling the alloy to reduce its thickness by at least about 40 percent to produce an initial strip, thermally treating the initial strip between about 400 DEG C. and its austenitizing temperature, cold rolling the initial strip to reduce its thickness by at least 75 percent to below about 0.005 inches, and thermally treating this strip at a temperature of at least 525 DEG C. for a period of time between about 0.1 and about 3 minutes. The strips are particularly useful in electronic article surveillance systems.

Probable Assignee: ARNOLD ENGINEERING CO

Earliest Publication Date: 19971108



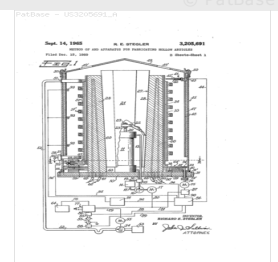
98) Family number: 22798282 (US3205691A)

METHOD OF AND APPARATUS FOR FABRICATING HOLLOW ARTICLES

Abstract: Source: US3205691A (Claim 1) 1. The **method** of **fabricating** a hollow **metal** article in situ from a preform of the article havin.- undersized, transverse dimensions, consisting in uniformly heating the pxeform throughout to the heat treat temperature of the **metal**, cooling the preform at a predetermined rate, constantly monitoring said cooling, and expanding the pref-orm uniformly at a rate coordinated with and corresponding to the rate of cooling to produce the ultimate article.

Probable Assignee: REPUBLIC AVIAT CORP

Earliest Publication Date: 19650914



99) Family number: 23509721 (US2003066581A)

METHOD OF MAKING A HARDENED SHEET METAL ARTICLE

Abstract: Source: US2003066581A In a **method** of making a hardened sheet **metal** article, a blank is formed with at least one through-passage with a projecting collar. Thereafter, the blank is heated and hot-formed in a press mold to a sheet **metal** article. Still within the press mold, the sheet **metal** article is hardened. The **shaping** of the blank in the press mold is accompanied by a calibration of the through-passage to final **shape**.

Probable Assignee: BENTELER AUTOMOBILTECHNIK GMBH

Earliest Publication Date: 20020808

