US 20090242598A1

(19) **United States**

(12) **Patent Application Publication**

**Dormaar**

(10) **Pub. No.: US 2009/0242598 A1**

(43) **Pub. Date: Oct. 1, 2009**

(54) **PORTABLE HAND TOOL CARRIER HARNESS**

(76) Inventor: **Brent Ronald Dormaar**, Pender Island (CA)

Correspondence Address:
**OYEN, WIGGS, GREEN & MUTALA LLP**
**480 - THE STATION**
**601 WEST CORDOVA STREET**
**VANCOUVER, BC V6B 1G1 (CA)**

(21) Appl. No.: **12/390,672**

(22) Filed: **Feb. 23, 2009**

**Related U.S. Application Data**

(60) Provisional application No. 61/040,812, filed on Mar. 31, 2008.

**Publication Classification**

(51) **Int. Cl.**
*A45F 3/14* (2006.01)

(52) **U.S. Cl.** ..... **224/257**; 224/254

(57) **ABSTRACT**

This invention relates to a novel design of portable hand drill carrier harness for use by workers in the construction industry. More specifically, the invention pertains to a cord powered or cordless drill carrier harness which combines a quick-draw drill carrying holster with a harness which fits about the torso of a cordless drill user. A drill carrier apparatus comprising: (a) a harness for fitting about the torso and over the shoulders of a person; (b) a portable tool carrier connected to the chest area of the harness; and (c) a mechanism which enables the elevation of the tool carrier to be adjusted relative to the elevation of the harness.



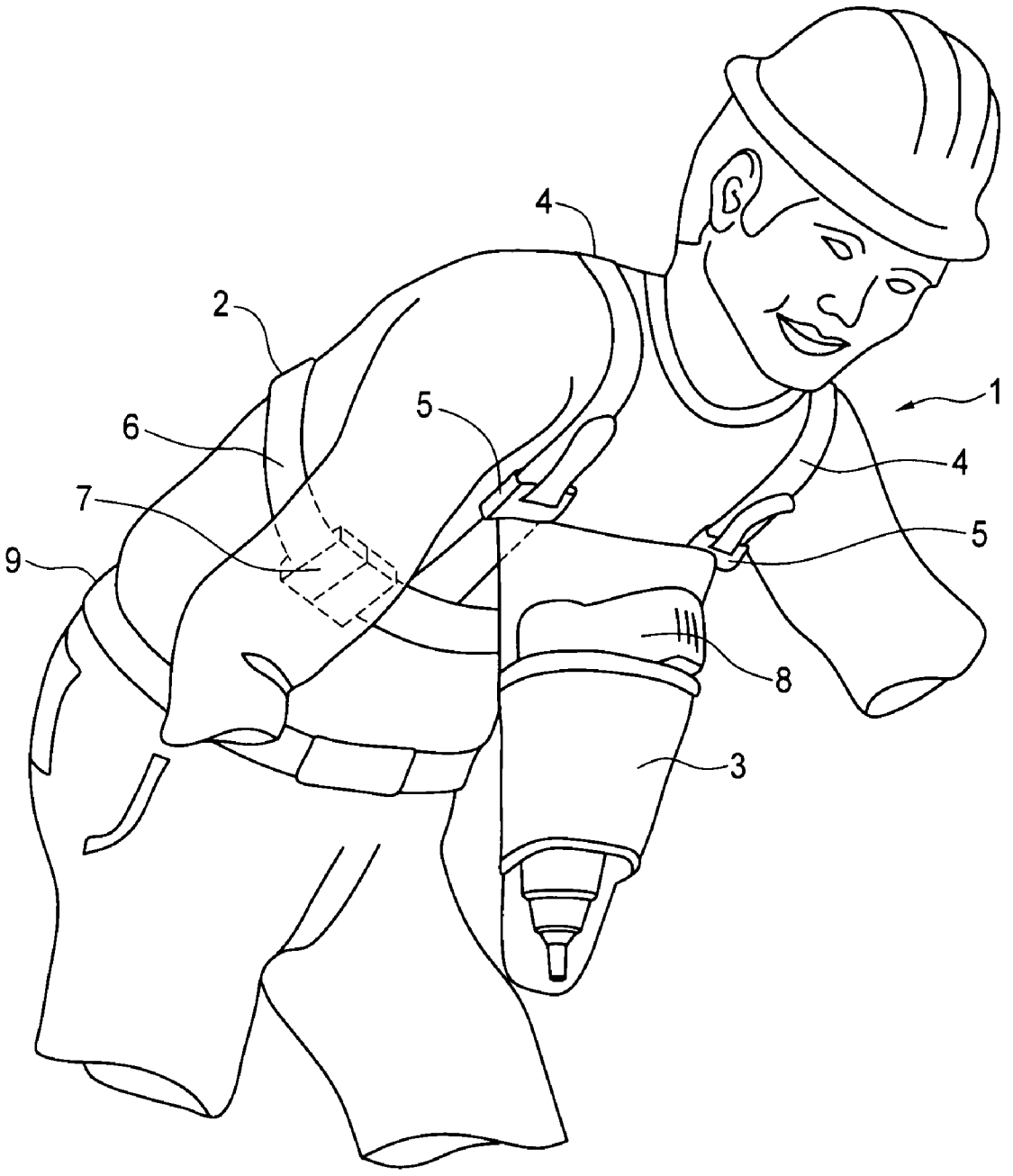



FIG. 1

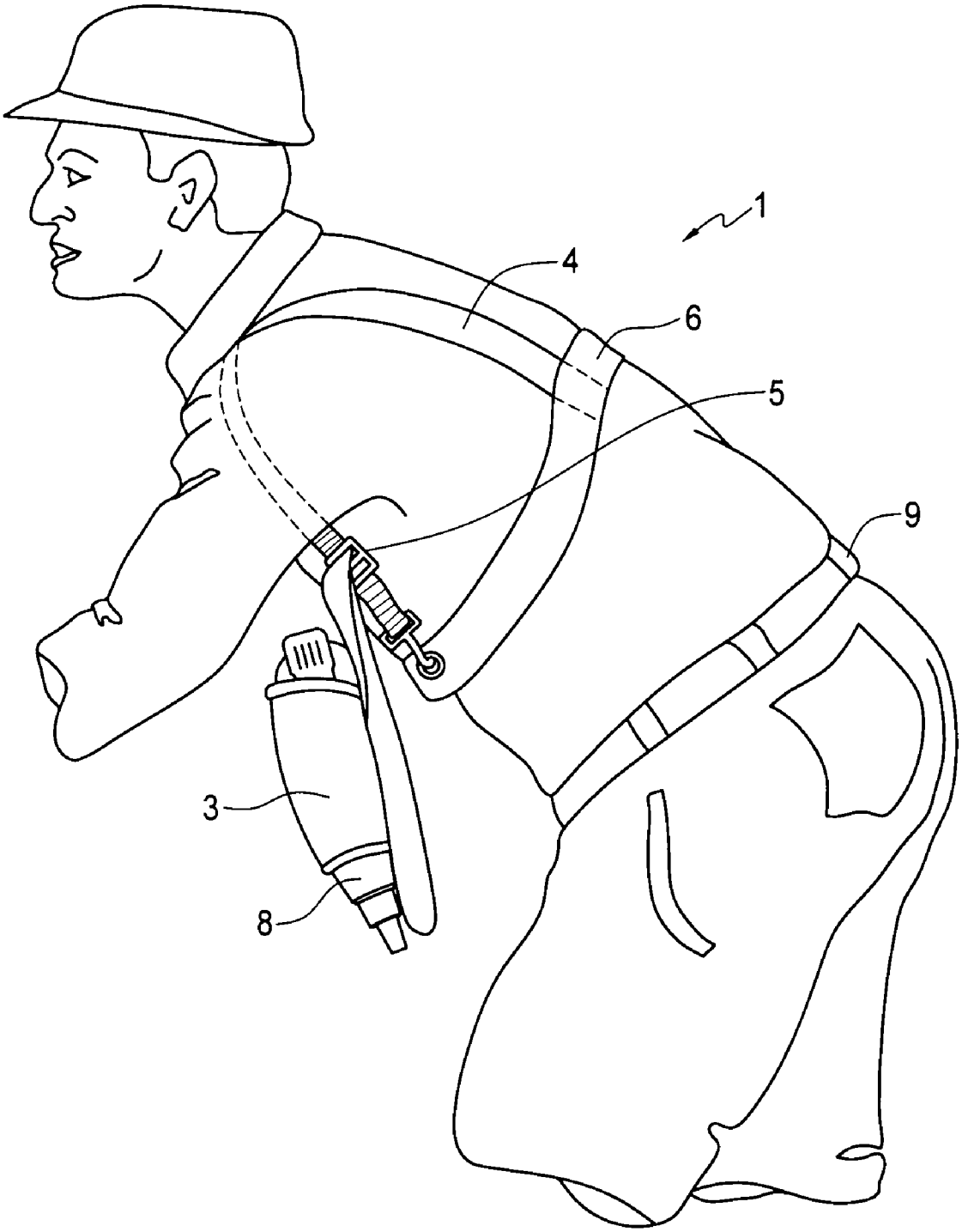



FIG. 2

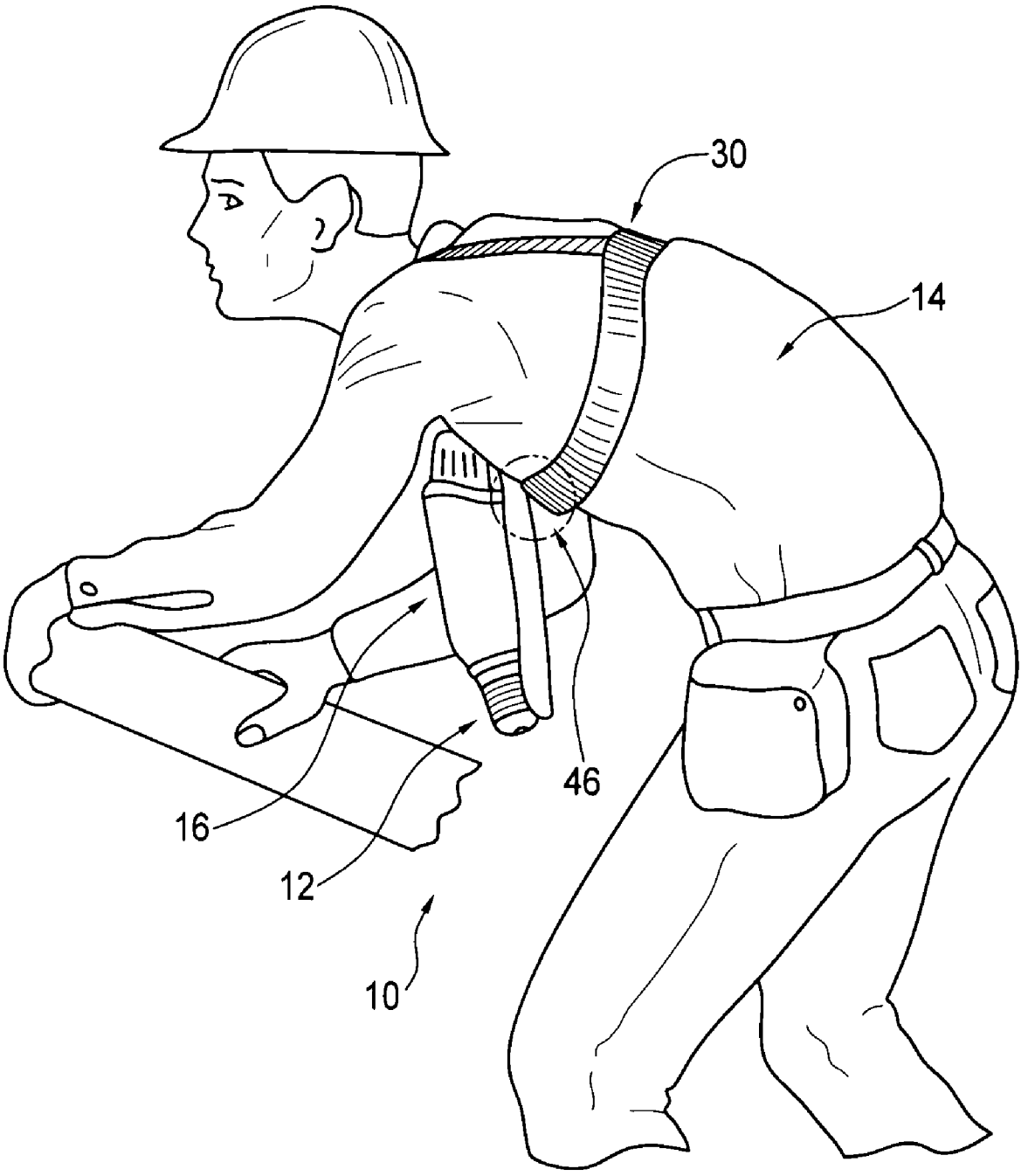



FIG. 3

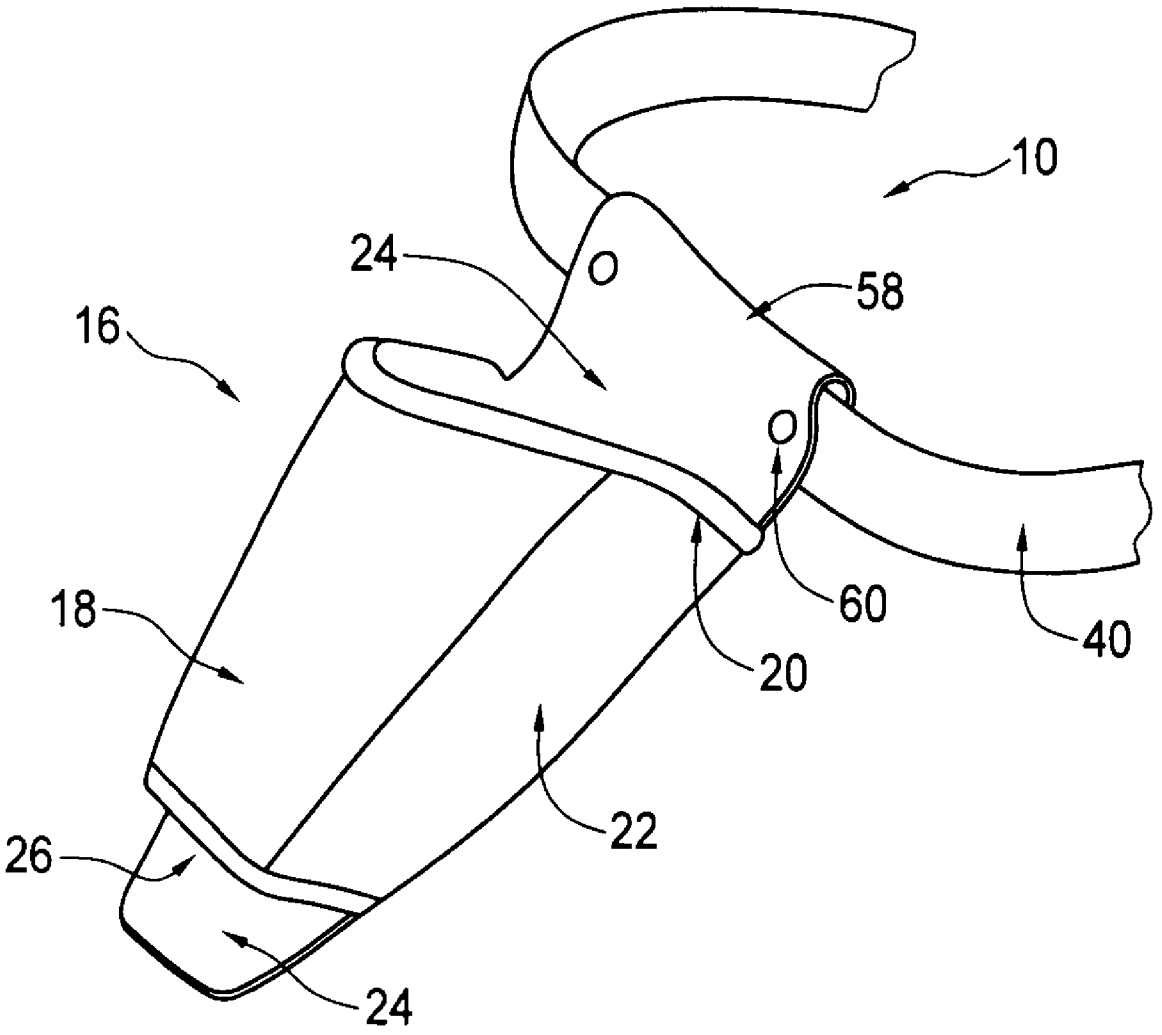



FIG. 4

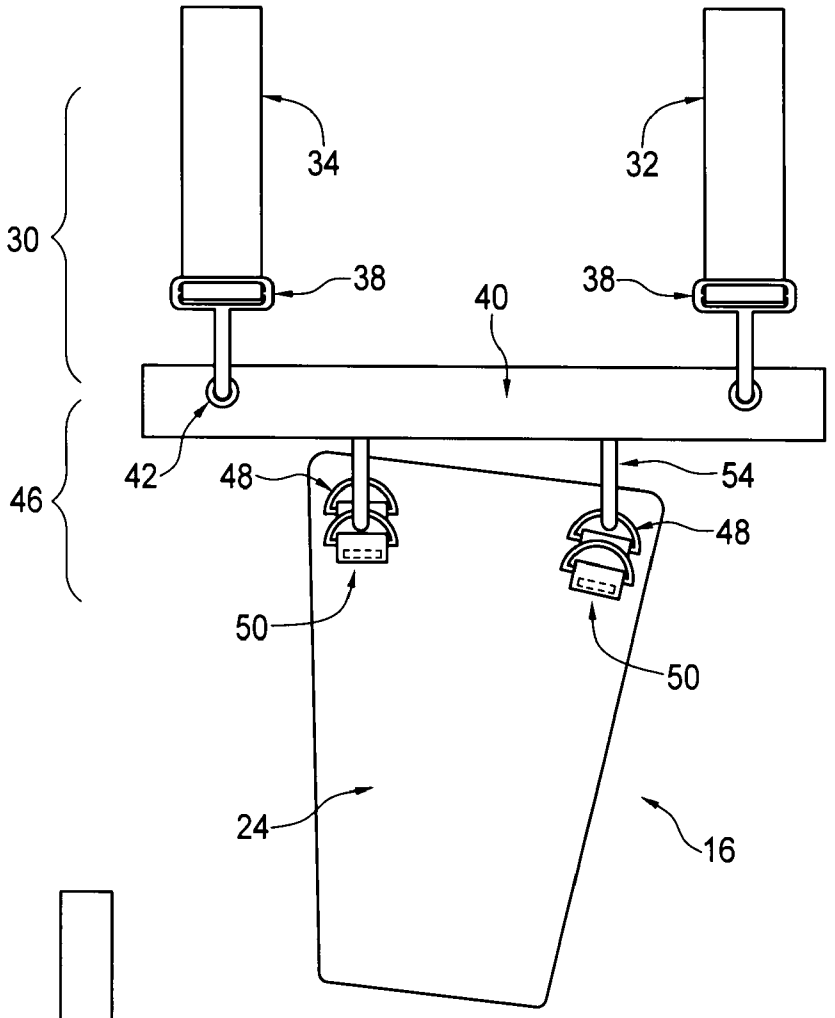



FIG. 5

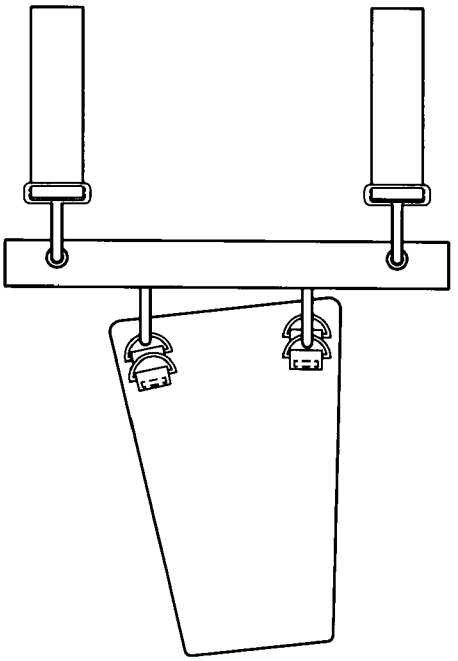


FIG. 5a

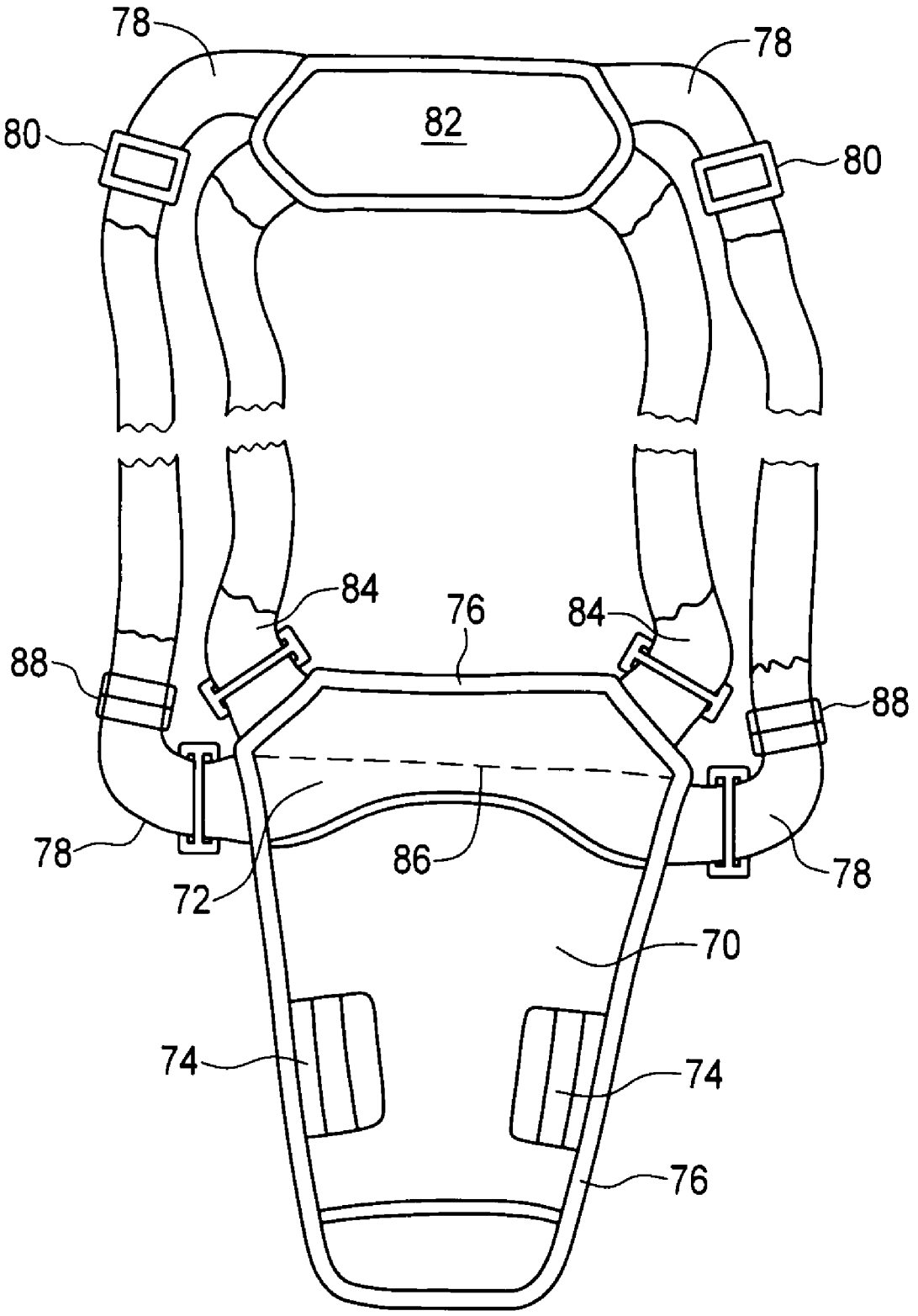



FIG. 6

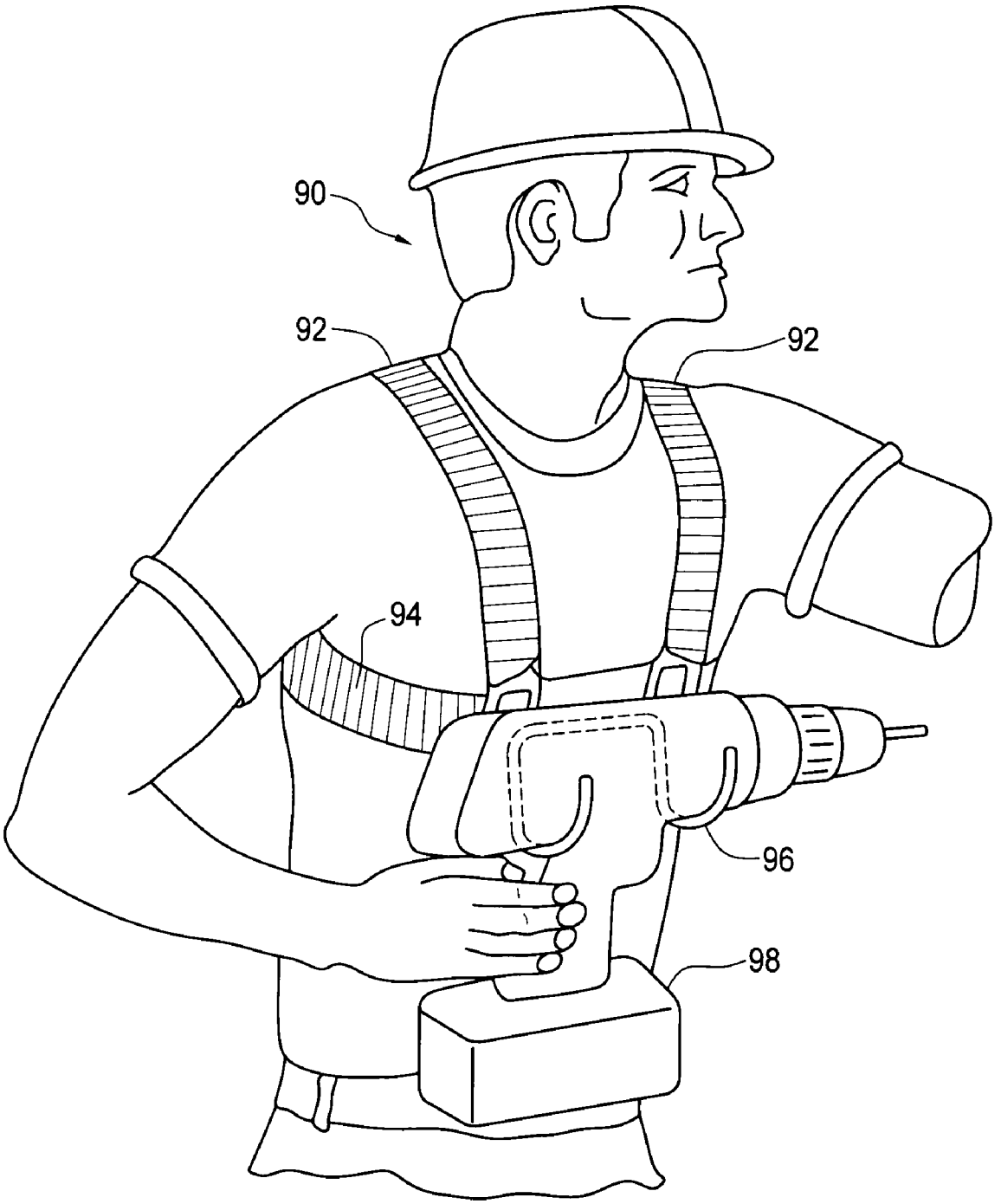



FIG. 7

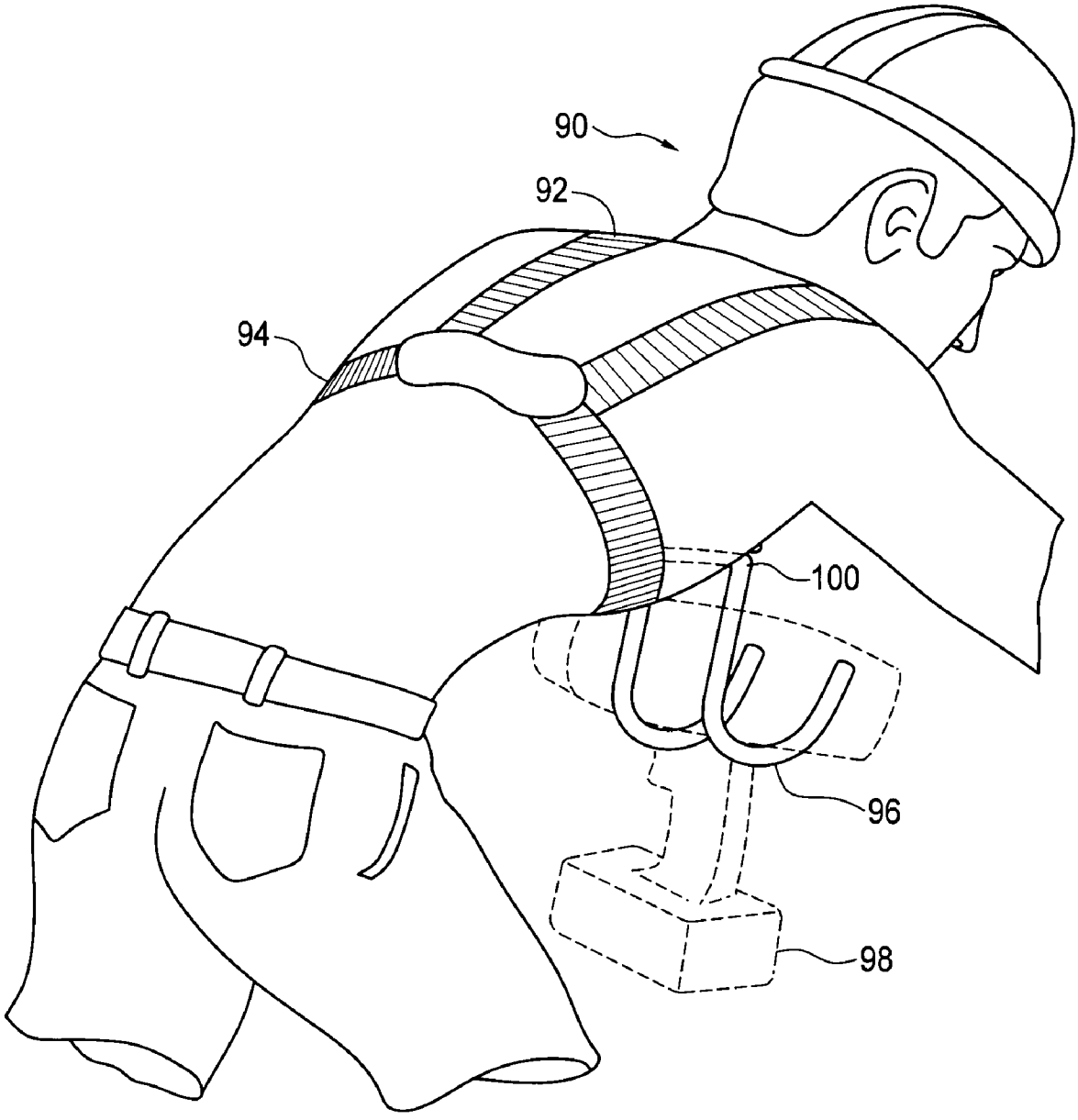



FIG. 8

# PORTABLE HAND TOOL CARRIER HARNESS

## REFERENCE TO RELATED APPLICATION

**[0001]** This application claims Convention priority on U.S. provisional patent application Ser. No. 61/040,812, filed Mar. 31, 2008.

## FIELD OF THE INVENTION

**[0002]** This invention relates to a novel design of portable hand tool carrier harness for use by workers in the construction industry. More specifically, the invention pertains to a portable hand drill carrier harness. The carrier harness combines a quick-draw drill carrying holster with a harness which fits about the torso of a hand drill user. The carrier harness can be used for holding portable hand operated equipment such as a portable hand drill, which can either be powered by a power cord or a rechargeable battery.

## BACKGROUND OF THE INVENTION

**[0003]** Over the years, in the construction industry, a large number of products have been invented which have made construction work less labor intensive and more efficient. Some examples are the retractable tape measure, the skill saw, the chop saw, the air powered nailing gun and portable cord powered or cordless hand drills.

**[0004]** Among portable drills, the cordless drill has been improved in design and power since it first appeared on the market and has become a standard and indispensable piece of equipment to workers in the construction industry. This is true to the extent that many construction tradespeople have the drill constantly "at hand". Most trades people in North America possess a cordless drill and appreciate its advantages and assistance in performing jobs such as screwing screws into construction components. Such trades people experience frustration in constantly having to find a safe place to put down the drill when not in use. This problem is particularly true if the worker is on a ladder. In such situations, there is a risk that the cordless drill will fall off the ladder and break or damage something or hurt someone below. Another problem is that dropped cordless drills often break and cease to function once they drop on a hard object. There is a continuing problem that a tool such as a cordless drill, which is frequently used in the construction industry, must have a convenient and handy location to be placed when not in use. The tool must also be oriented appropriately and conveniently for regular, safe and convenient access in all situations. A potential location is on the body of the worker.

**[0005]** Carrier systems for portable construction equipment such as cordless drills have been developed over the years and have included work belt drill holsters, side sling drill holsters and combination drill holsters with tool carriers. A common problem with cordless drill holsters in the art is that they are modeled on a gun holster which is snugly secured to the body of the user so that it does not move. This restricts its versatility. Construction work is usually performed by the workers in positions other than upright. Such work usually involves the worker bending over, crawling or climbing at various angles. A cordless drill holster must therefore include a securement means, such as straps, clips, etc., to hold the drill in the holster and ensure the drill does not fall out of the holster during movement of the worker or when the worker bends forward. Such straps and the like must be continuously secured or disengaged. This process is tedious and inconvenient and is soon abandoned. The result is that when the drill is left unsecured in a conventional body mounted drill holster with securing strap, the drill falls free virtually any time the worker bends over or leans sideways. Thus drill holsters that are secured to the body, and rely on conscientious use of the drill securement means, are not safe when the drill is not secured.

**[0006]** Another problem with conventional drill holsters available on the market is that they are usually designed to be secured to a tool belt worn by a worker. The tool belt provides a convenient pre-existing place where tools are carried. However, due to the rising complexity of construction, as well as the requirements of increasingly technical trades, the conventional tool belt is usually cluttered with holders and tools and there is little or no room to accommodate a holster for a large portable cordless drill. A drill holster mounted in a sling or harness under the arm of the worker that allows a side draw still requires a securement means to prevent the drill from falling out of the holster when the worker bends over or leans to the side. A drill holster mounted in the center of the chest of the worker is a potential convenient solution because it allows the worker access to the drill while also permitting the use of a full tool belt around the waist of the worker for holding other tools. However, prior art describing chest mounted article carriers still suffer from the flaw that the drill holster must be snug against the body of the worker and the tool must be secured by a step or other mechanism.

**[0007]** Ergonomically designed equipment maximizes both user productivity and safety because it is physically easier and safer for the worker to use on a daily basis. Unfortunately, it seems that equipment designers seldom consult end users such as workers during the design or re-design process, nor are their concerns addressed in a comprehensive or integrated fashion. This propensity to ignore the trade worker often results in a product that is inadequate in some fundamental way for the use intended.

**[0008]** The following patents disclose apparatus for carrying items on the body of a person.

**[0009]** U.S. Pat. No. 6,719,178, Taylor, issued on Apr. 13, 2004, discloses a chest mounted paint carrier. The paint carrier is removably attached to a chest and shoulder strap so that the paint receptacle is held at chest level. The paint receptacle is hinged and adapted to pivot from the chest strap so that it is maintained in an upright or near upright position. The device is designed for efficient placement of the paint receptacle for access and use by the wearer. Taylor is unsuitable as a holder for a cordless drill.

**[0010]** Canadian Patent No. 1,282,381, Rowledge, issued Apr. 2, 1991, discloses a harness for carrying items on the chest of the wearer. Rowledge discloses a simple, comfortable, silent apparatus to carry binoculars and cameras and includes a pair of identical shoulder straps which extend from approximately the center of the chest of a user over the shoulders, cross in the back and pass under the arms of the user to the chest area. The apparatus includes swivel hooks which are slidable on the shoulder straps for releasably retaining the article suspended from the chest area of the shoulder straps, so that the article can be slid smoothly and silently from the carrying to the use position without disconnecting the article from the carrier.

**[0011]** U.S. Pat. No. 5,307,967, Seals, May 3, 1994, discloses a harness carrier similar to Rowledge. The carrier comprises an inverted U-shaped sling strap carried over a

shoulder of a user. The carrier can be configured into a strip system which extends around the torso and over both shoulders of the user.

**[0012]** U.S. Pat. No. 6,155,471, Lichtenberger, Dec. 5, 2000, discloses a cordless drill holster mounted on a shoulder strap assembly. The assembly can be adopted for a left or right-handed person. The drill holster is mounted on the upper torso but it is not mounted in the center of the chest. The holster relies upon a retaining strap to keep the drill within the holster. The holster is not adapted to pivot on the strap. It does not remain in a vertical position when the wearer bends over or leans to the side.

**[0013]** U.S. Pat. No. 6,016,944, Girbert, Jan. 25, 2000, discloses a combined shoulder harness with a pouch for containing a cordless drill. The drill is placed at chest height but it is not placed at the chest center. The drill holster can be made to be right or left-handed but does not possess an inclination mechanism to suit the handedness of the wearer. Girbert also discloses the placement of another storage pouch on the same harness for such things as extra batteries.

**[0014]** U.S. Pat. No. 6,065,658, Hashimoto, May 23, 2000, discloses an apparatus for holding an electric drill that is worn by a user. The apparatus includes a pair of shoulder straps that pass over opposite shoulders of the user and attach to a belt that is worn about the waist of the user at the front and back of the user. The belt is adjustable about the waist of the user. A holster adapted to receive the electric drill therein is attached to one of the pair of shoulder straps intermediate the waist and one of the opposite shoulders of the user. Hashimoto shows a cross-strap (**30**). The holster is left or right hand positioned. The holster does not sit center-chest and does not appear to be adapted for pivoting.

**[0015]** U.S. Pat. No. 6,561,402, Holland et al., May 13, 2003, discloses a waist belt mounted drill holster that can be used left or right-handed. The drill holster is accessible for both a left-handed or a right-handed user. A reinforcement type material is provided for strengthening the tool belt pass-through neck of the weight bearing pouch.

**[0016]** The foregoing examples of the related art and limitations related thereto are intended to be illustrative and not exclusive. Other limitations of the related art will become apparent to those of skill in the art upon a reading of the specification and a study of the drawings.

## SUMMARY OF THE INVENTION

**[0017]** The following embodiments and aspects thereof are described and illustrated in conjunction with systems, tools and methods which are meant to be exemplary and illustrative, not limiting in scope. In various embodiments, one or more of the above-described problems have been reduced or eliminated, while other embodiments are directed to other improvements.

**[0018]** The invention disclosed herein provides a novel integrated, inventive solution to the various securement and ergonomic challenges that face a construction worker using a portable tool such as a cordless drill while working in various positions during the day. The invention bypasses problems associated with belt mounted drill holders which are cumbersome and awkward when attached to a tool belt carrying other tools. The invention comprises a central harness that is worn around the torso of an individual. In one embodiment, the open top drill holster is mounted on the harness in the middle chest area of the individual for efficient and ready access. The drill holster is hinged to the harness and is adapted to tilt forward when the individual leans forward or to one side. Gravity holds the drill within the open top holster. The holster is canted at a predetermined angle to the right or to the left depending on the handedness of the worker for ergonomic and convenient grasping and replacement of the cordless drill when not in use. In an alternative embodiment, the holster is replaced with a pair of curved hooks which support the portable tool.

**[0019]** The invention is directed to a portable tool carrier apparatus comprising: (a) a harness for fitting around the torso and over the shoulders of a person; (b) a tool carrier apparatus connected to a front chest area of the harness; and (c) a mechanism which enables the elevation of the tool carrier apparatus to be adjusted relative to the harness.

**[0020]** The tool carrier apparatus can be pivotal relative to the harness and can remain in a substantially vertical orientation when the person bends forward. The elevation of the tool carrier apparatus can be adjustable by means of one or more slidable mechanisms attached to the harness. The tool carrier apparatus can include a mechanism whereby the vertical axis of the tool carrier apparatus can be offset to the right or to the left to accommodate a right-handed or left-handed worker.

**[0021]** The harness can include a chest belt, a pair of shoulder straps and at least one quick release mechanism for enabling the harness to be removed from the torso of the person. The chest strap and the shoulder straps can include mechanisms which permit the lengths of the chest strap and the shoulder straps to be adjusted.

**[0022]** The tool carrier apparatus can be a holster that has top and bottom openings and the tool can be inserted in the holster through a top opening and the bottom of the tool can protrude through a bottom opening. The tool carrier apparatus can be a pair of curved open top hooks which can be connected to the front of the harness. The pair of curved open top hooks can be pivotal relative to the harness. The tool can be a cordless drill.

**[0023]** The mechanism for offsetting the carrier holster can comprise a tilt-mounting mechanism which can include a belt loop extending from the top area of the carrier holster for enveloping the chest belt of the harness, the loop being secured in place on the chest belt by a fastening mechanism. The tilt-mounting mechanism can comprise two pairs of orientation rings attached to the rear of the carrier holster, the rings being releasably attached to a chest belt by means of clips, the clips removably fitting within the appropriate rings to adjust the vertical offset orientation of the carrier holster.

**[0024]** The apparatus can include tool receptacles on the front area of the carrier holster. The apparatus can include reinforcing material around the top opening in the carrier holster. A rear panel of the carrier holster and a front area of the harness can be one piece and a horizontal hinge line can be formed in the rear panel to enable the carrier holster to pivot relative to the harness.

**[0025]** The invention is also directed to a cordless drill carrier apparatus comprising: (a) a harness for fitting about the torso and over the shoulders of a person, the harness including a chest belt, a pair of shoulder straps and at least one quick release mechanism for enabling the harness to be removed from the torso of the person; (b) a carrier holster connected to the front chest area of the harness, the carrier holster being pivotal relative to the harness and remaining in a substantially vertical orientation when the person bends forward, the carrier holster having openings at the top and

bottom, the drill being inserted in the carrier holster through the top opening so that the chuck of the drill protrudes through the bottom opening; and (c) a mechanism whereby the elevation of the carrier holster can be raised or lowered relative to the chest area of the harness.

**[0026]** The mechanism can be used to tilt the vertical axis of carrier holster to one side or the other. The carrier holster can be replaced by a pair of curved open top hooks for supporting the drill.

**[0027]** The invention is also directed to a method of enabling a cordless drill to be carried on the chest of a person by fitting the torso of the person with a harness that carries a pivotal drill carrier apparatus on the front of the harness, the carrier apparatus being adjustable in elevation relative to the harness, the carrier apparatus comprising either a holster which remains substantially vertical when the person bends forward, or a pair of curved open top hooks for carrying the drill.

**[0028]** In addition to the exemplary aspects and embodiments described above, further aspects and embodiments will become apparent by reference to the drawings and by study of the following detailed descriptions.

## BRIEF DESCRIPTION OF DRAWINGS

**[0029]** Exemplary embodiments are illustrated in referenced figures of the drawings. It is intended that the embodiments and figures disclosed herein are to be considered illustrative rather than restrictive.

**[0030]** FIG. **1** illustrates a front perspective view of a worker bending forward while wearing a portable hand drill carrier holster according to a first embodiment of the invention.

**[0031]** FIG. **2** illustrates a left side perspective view of a worker bending forward while wearing a portable hand drill carrier holster according to a first embodiment of the invention.

**[0032]** FIG. **3** illustrates a left side perspective view of a worker bending forward and wearing a cordless drill carrier holster according to a second embodiment of the invention.

**[0033]** FIG. **4** illustrates an isometric view of a third embodiment of the cordless drill carrier holster.

**[0034]** FIG. **5** illustrates a rear view of a fourth embodiment of the drill carrier holster, wherein the holster is tilted off its vertical axis to accommodate a cordless drill for a right-handed worker.

**[0035]** FIG. **5***a* illustrates an opposite image of FIG. **5** wherein the holster is tilted off its vertical axis to accommodate a cordless drill for a left-handed worker.

**[0036]** FIG. **6** illustrates a front view of a fifth embodiment of a cordless drill holster carrier with drill holster and adjustable shoulder and back straps.

**[0037]** FIG. **7** illustrates a perspective view of a sixth embodiment of tool carrier apparatus comprising a cordless drill open top hook carrier.

**[0038]** FIG. **8** illustrates a perspective view of a seventh embodiment of the cordless open top drill hook carrier with pivot attachment.

## DETAILED DESCRIPTION

**[0039]** Throughout the following description specific details are set forth in order to provide a more thorough understanding to persons skilled in the art. However, well known elements may not have been shown or described in detail to avoid unnecessarily obscuring the disclosure. Accordingly, the description and drawings are to be regarded in an illustrative, rather than a restrictive, sense. The following discussion, for purposes of illustration, focuses on cord powered or cordless power drills but it is understood other portable power tools can be adapted to the system.

**[0040]** FIG. **1** illustrates a front perspective view of a worker bending forward and wearing a portable hand drill carrier holster according to a first embodiment of the invention. As seen in FIG. **1**, the worker **1** is wearing a chest harness **2** which comprises a pair of adjustable length shoulder straps **4** and an adjustable width chest strap **6**. The pair of shoulder straps **4** have a respective pair of slide fasteners **5** mounted on the front of each of the two shoulder straps **4**. Pivotally secured to the pair of slide fasteners **5** is a holster **3** which holds a cordless drill **8**. The chest strap **6** can be readily detached and released by a detachment buckle **7**. As seen in FIG. **1**, the holster **3**, by being pivotally attached to the respective slide fasteners **5**, rather than being secured snugly to the body of the worker, is encouraged by gravity to maintain a relatively vertical position. This action holds the cordless drill **8** in place within the holster **3**. The points where the top two ends of the holster **3** are pivotally secured to the pair of slide fasteners **5** can be constructed of any reasonable hinge-like attachment. The elevation of the holster **3** relative to the vertical position on the front sides of the two shoulder straps **4** can be altered by moving the respective pair of slide fasteners **5** up or down in order to suit the specific needs of the worker **1**. Also, the vertical axis of the holster **3** can be tilted to the right or left by setting the slide fasteners **5** at different elevations. This enables the holster **3** to be adjusted to accommodate right or left-handed workers.

**[0041]** FIG. **2** illustrates a left side perspective view of a worker bending forward and wearing a portable hand drill carrier holster according to a first embodiment of the invention. FIG. **2** is particularly useful in that it clearly illustrates the manner in which the holster **3** and cordless drill **8** are maintained in a near vertical orientation by means of the pivotal attachment of the top ends of the holster **3** to the adjustable elevation slide fasteners **5** on the front region of the respective shoulder straps **4**. It can be noted that in the embodiments illustrated in FIGS. **1** and **2**, the belt **9** of the worker **1** remains separate and can be used to hold various pouches, holders and the like to enable the worker **1** to carry other tools. The pivotally attached holster **3** secured to the front region of the pair of shoulder straps **4** of the chest harness **2** does not interfere with tools carried on the belt **9**.

**[0042]** FIG. **3** shows a left side perspective view of a worker **14** bending forward while wearing a cordless drill carrier holster according to a second embodiment of the invention. The ergonomic cordless drill carrier holster system **10** is constructed of a quick-draw drill carrier holster **16** which holds a cordless drill **12**. The holster **16** is hingedly or pivotally connected to the central area of a chest, back and shoulder harness **30** at hinge point **46**. The hinge point **46** should be at a reasonably high elevation to ensure that the holster **16** remains in a reasonably vertical position as the worker **14** moves about or bends over. In FIG. **3**, it can be seen that the hinge point **46** is at the top rather than the bottom of the front chest position of the harness **30**.

**[0043]** While not shown, the chest harness **30** can include a quick action separating buckle for a chest belt and length adjusters for the shoulder belts. It is understood that any suitable buckle or quick release fastening attachment or

shoulder belt length adjusting mechanism can be used in place of the separating buckle **44** or length adjuster within the spirit of the invention.

**[0044]** As illustrated in FIGS. **1**, **2** and **3**, the holster with the drill remains basically vertical even though the worker is bending over forwardly or to the side. This ensures that the cordless drill **12** remains securely in the holster **14** and does not fall out. The drill **12** can be readily inserted into or removed from the holster **14**. Holding the drill **12** in the holster **16** by gravity minimizes the risk of damaging the cordless drill **12** or anything that the drill drops on, such as an object or a person, if the drill **12** falls out. Having the holster and drill remain in a vertical position eliminates the need to have a releasable strap or fastener on the holster to hold the drill in place. However, if required, a releasable securing strap can be included with the holster **16** to ensure the drill remains in the holster. It is preferable that the holster be hingedly attached to the belt or harness at a top region of the belt to ensure that the majority of the mass and the center of gravity of the drill and holster remains below the hinge point. The elevation of the holster can be adjusted and pivotally joined to the chest belt at the top, middle or bottom of the belt. This enables the holster to be positioned at an optimum elevation to accommodate different sizes of workers and weights of cordless drills and ensure that the holster remains vertical while being worn by the worker. The dimensions of the chest harness can be altered to accommodate different sizes of workers by incorporating adjustable fasteners and buckles in the chest harness

**[0045]** FIG. **4** shows an isometric view of a third embodiment of the carrier holster system **10**, wherein the quick-draw carrier holster **16** is releasably mounted onto the chest belt **40** by a belt loop **58**, that is formed from an upward extension of the rear panel **24** of the holster **16**. The belt loop **58** is affixed in a loop configuration by rivets or fasteners **60** or similar means of loop securement. FIG. **4** also shows elements of the quick-draw carrier holster **16**, such as its front panel **18**, top lip **20**, which can be reinforced to withstand wear, side panel **22**, rear panel **24**, and chuck hole **26**. The rim of the chuck hole **26** can be reinforced to withstand wear. The base of the rear panel **24** extends below the bottom hole **26** in the holster **16** and keeps the chuck of the drill **12** and any tool mounted in the chuck from rubbing on the clothing of the worker, or on other tools carried by the worker.

**[0046]** FIG. **5** shows a rear view of a fourth embodiment of the drill carrier system **10** including the quick-draw carrier holster **16**, a tilt-mounting connection **46** for a right-handed worker (not shown), and a front section of the components of the chest harness **30** (shown from the inside). The carrier holster **16** is attached to the chest harness **30**, by means of any one of a vertical series of orientation rings **48** affixed to the rear panel **24** of the holster **16**. The rings **48** are secured to the rear panel **24** with appropriate stitching, riveting, or similar means of ring securement **50**, to strap clips **54** attached to the front of the chest belt **40**. As shown in FIG. **5**, by attaching strap clips **54** to the appropriate elevation of orientation rings **48**, the drill carrier holster **16** can be correctly oriented (tilted) to the right for ready ergonomic access to the handle of the drill **12** (not shown) by a right-handed worker **14**. FIG. **5** also shows the inside of a front section of the chest belt **40** which is supported by a right shoulder belt **32**, and a left shoulder belt **34**, each of which terminate in length adjustable shoulder belt clips **38** which are attached to the chest belt **40**, for example, by respective reinforced grommet holes **42**. FIG. **5***a* shows a reverse image of FIG. **5**, wherein the holster **16** is tilted to the opposite side according to the tilt-mounting **46** configuration required for use by a left-handed worker.

**[0047]** FIG. **6** illustrates a front perspective view of a fifth embodiment of a portable drill carrier system with drill holster and adjustable shoulder and back straps. As seen in FIG. **6**, this embodiment is constructed of a front holster panel **70**, and a rear holster panel **72**, which are secured together to form a drill carrying holster. The front of the panel **70** has formed therein tool pockets **74** for holding worker tools. A reinforcing border **76** is sewn around the periphery of panels **70** and **72**. The ends of a pair of adjustable length shoulder straps **78** with movable buckles **80** are affixed to each side of the rear panel **72**. A quick release buckle or dagger fastener **88** can be installed in one or both straps **78**. The opposite ends of the adjustable length shoulder straps **78** are affixed to a back pad **82**. A pair of lower torso straps **84** are connected between the back pad **82** and the respective sides of the rear panel **72**. This embodiment of the drill carrier system is designed so that there is a horizontal hinge or pivot line **86** formed in the rear panel **72** so that the major area of the front and rear panels **70** and **72** can remain in a vertical position when the worker bends over to the front or the side. It will be appreciated that the elevation of the hinge line **86**, which is typically a weakened or flexible region in the panel **72**, can be set to accommodate different sizes and weights of tools. The interior of the holster can be padded to protect and cradle the drill (not shown).

**[0048]** FIG. **7** illustrates a perspective view of a sixth embodiment of a carrier apparatus comprising a cordless drill open top hook carrier. As seen in FIG. **7**, a worker **90** is wearing a chest harness comprising a pair of shoulder straps **92** and horizontal chest strap **94**. The front of the chest strap **94** is equipped with a dual open top hook system **96** which cradles a cordless drill **98** or other portable power tool. The pair of hooks of the hook system **96** are curved and enable the drill **98** to pivot within the pair of hooks and remain in a virtually vertical orientation when the worker **90** bends forward.

**[0049]** FIG. **8** illustrates a perspective view of a seventh embodiment of the cordless drill hook carrier with pivot attachment. The chest harness and hook system illustrated in FIG. **8** is basically the same as illustrated in FIG. **7** except that the front of the chest strap **94** includes a pivot mechanism **100** which enables the pair of hooks **96** and drill **98** to maintain basically a vertical orientation when the worker **90** bends forward.

Operation

**[0050]** Fundamentally, there are four basic interdependent components of the ergonomic portable power tool carrier system in all embodiments of the invention, namely a quick-draw carrier holster or hook harness, an adjustable length and width chest, shoulder and back harness, a holster or hook elevation adjustment mechanism and a holster or hook tilt mounting mechanism.

**[0051]** The carrier system with the quick-draw carrier holster or carrier in the various embodiments discussed and shown provides a convenient means for a worker to carry and easily use a portable power tool such as a cord powered or cordless drill in a manner which does not interfere with other equipment worn by the worker such as tool belts, tool vests, and the like. The carrier system allows the worker to quickly and easily remove and replace the drill in the holster or in the

pair of hooks without a need for additional drill securement means. It eliminates the need for the worker to mount a holster or hooks on a waist belt or failing that, find a place to lay down the drill when not in use.

**[0052]** The carrier with the holster has a durable rear panel which forms the rear surface of the body of the holster. This protects the worker and his clothing from wear due to the repeated insertion of the drill into and removal from the holster. The front panel is durably and strongly attached to the back panel to form the body of the drill carrier holster. It will be understood that these two elements can be combined and formed as one unit, depending on the materials used to construct the carrier system. The top lip, which is the top edge of the front panel, can be reinforced to withstand wear from repeated insertion and extraction of the drill. Likewise, the chuck hole, which is at the bottom of the front panel, is reinforced to withstand wear from various sharp edge tools that are inserted in the chuck of the drill and which protrude from the bottom of the carrier holster. The accessory slots or pockets on the front panel of the carrier provide a convenient place for the worker to store and access drill bits, pencils, chuck keys, etc.

**[0053]** The adjustable length and width chest harness provides a means for positioning the carrier holster or the hook system and a tool such as a drill when placed in the holster or hook system, on the chest of the worker at convenient adjustable elevation for optimal ergonomic access to the tool by the worker. At chest level, it prevents interference with tool belts or tool aprons or coats that may be worn by the worker.

**[0054]** The vertical axis of the holster or hooks can be offset by setting each side of the top of the holster hooks at a different elevation on the respective front and chest areas of the pair of shoulder straps.

**[0055]** The third embodiment of the drill carrier system shown in FIG. **4** is the simplest to manufacture, but it can have the tendency to prevent consistent orientation of the chest belt during repeated use. It may cause alignment creep due to the amount of play in the belt loop. An advantage of this embodiment is that the play in the belt loop allows for ambidextrous use of the carrier holster since it tends to be pulled into a convenient orientation for easy removal and replacement by the weight of the drill when it the carrier holster.

**[0056]** The fourth embodiment of the cordless drill carrier system shown in FIG. **5** uses a "ring and clip mount" version of the tilt-mounting feature. The tilt-mounting feature allows the drill to stay in its carrier holster even when the worker bends forward, by allowing the carrier holster to tilt forward and remain essentially vertical. The tilt-mounting mechanism also enables the vertical axis of the holster to be canted to the left or right as required so that the horizontal balance point of the drill allows quicker, more convenient ergonomic access by either left or right-handed workers.

**[0057]** It will be understood that in place of the tilt-mounting mechanism, a hinge assembly can be used to achieve the same objectives as the "ring and clip" embodiment. A hinge assembly shown in FIG. **6** connects the front of chest belt to the rear of rear panel and allows the carrier holster to tilt forward when the worker bends forward. In this case, a thicker rear panel that supports the straps in the center of the chest and allows proper righting action might be necessary. It is understood that other embodiments or similar methods leading to the same result of enabling the holster to remain essentially vertical are included within the scope of the invention.

**[0058]** The body of the quick-draw carrier holster can be made of leather or semi-rigid durable plastic to give it a reasonably rigid shape. The plastic or leather can be covered with cordura or ballistic nylon to give it durability in a construction environment. The top lip and chuck hole of the holster can have durable taping stitched into the edges of the carrier. The accessory slots or pockets can be made of cordura or elastic material and stitched into the front wall of he carrier holster. Rivets may be used to reinforce the carrier in areas of potential wear, and as a backup to stitching. The belts of the chest harness can be constructed of a woven nylon material similar to that used for automobile driver restraints or backpack hip belts. Similarly, the length adjusters, grommets, quick action separating buckles, orientation rings, and strap or belt clips can be items which are commonly used in constructing durable portable man-carried equipment for outdoors or construction uses. Securement of these items is by means of nylon or polypropylene straps stitched into appropriate carrier or belt materials, or by self-securing methods such as used in separating buckles or belt clips. A hinge style tilt-mounting may be constructed of durable rigid plastic or similar materials, as long as it achieves similar objectives to the preferred embodiments. Similarly, the entire quick-draw carrier may be constructed of durable strong plastic materials as one unit, or multiple interconnecting pieces, and may or may not include the alternate hinge tilt-mounting. It will be understood that the carrier system can be adapted and used for carrying other portable power or manual tools instead of cordless drills.

**[0059]** In the dual hook embodiments illustrated in FIG. **7** and **8**, the pair of hooks removably cradle the drill and provide an alternative method of mounting the drill on the front of the chest harness at selected elevation. The dual hooks can be fixed to the front of the chest harness or secured by a hinge system. The curved dual hooks enable the cordless drill to pivot and remain in an essentially vertical position when the worker bends forward. However, a hinge system can be utilized when preferred to enable the dual hooks to remain substantially vertical when the worker bends forward.

**[0060]** The foregoing description of the preferred apparatus and materials used in its construction should be considered as illustrative only, and not limiting. Other techniques and other materials may be employed towards similar ends. Various changes and modifications will occur to those skilled in the art, without departing from the true scope of the invention as defined in the above disclosure, and the following general claims. Those of skill in the art will recognize certain modifications, permutations, additions and sub-combinations thereof. It is therefore intended that the following appended claims and claims hereafter introduced are interpreted to include all such modifications, permutations, additions and sub-combinations as are within their true spirit and scope.

What is claimed is:

**1**. A portable tool carrier apparatus comprising:

(a) a harness for fitting around the torso and over the shoulders of a person;

(b) a tool carrier apparatus connected to a front chest area of the harness; and

(c) a mechanism which enables the elevation of the tool carrier apparatus to be adjusted relative to the harness.

**2**. A tool carrier apparatus as claimed in claim **1** wherein the tool carrier apparatus is pivotal relative to the harness and remains in a substantially vertical orientation when the person bends forward.

**3**. A tool carrier apparatus as claimed in claim **1** wherein the elevation of the tool carrier apparatus is adjustable by means of one or more slidable mechanisms attached to the harness.

**4**. A tool carrier apparatus as claimed in claim **1** including a mechanism whereby the vertical axis of the tool carrier apparatus can be offset to the right or to the left to accommodate a right-handed or left-handed worker.

**5**. A tool carrier apparatus as claimed in claim **4** wherein the harness includes a chest belt, a pair of shoulder straps and at least one quick release mechanism for enabling the harness to be removed from the torso of the person.

**6**. A tool carrier apparatus as claimed in claim **5** wherein the chest strap and the shoulder straps include mechanisms which permit the lengths of the chest strap and the shoulder straps to be adjusted.

**7**. A tool carrier apparatus as claimed in claim **4** wherein the tool carrier apparatus is a holster that has top and bottom openings and the tool is inserted in the holster through a top opening and the bottom of the tool protrudes through a bottom opening.

**8**. A tool carrier apparatus as claimed in claim **1** wherein the tool carrier apparatus is a pair of curved open top hooks which are connected to the front of the harness.

**9**. A tool carrier apparatus as claimed in claim **8** wherein the pair of curved open top hooks is pivotal relative to the harness.

**10**. A tool carrier apparatus as claimed in claim **1** wherein the tool is a cordless drill.

**11**. A tool carrier apparatus as claimed in claim **7** wherein the mechanism for offsetting the carrier holster comprises a tilt-mounting mechanism which includes a belt loop extending from the top area of the carrier holster for enveloping the chest belt of the harness, said loop being secured in place on the chest belt by a fastening mechanism.

**12**. A tool carrier apparatus as claimed in claim **11** wherein the tilt-mounting mechanism comprises two pairs of orientation rings attached to the rear of the carrier holster, said rings being releasably attached to a chest belt by means of clips, the clips removably fitting within the appropriate rings to adjust the vertical offset orientation of the carrier holster.

**13**. A tool carrier apparatus as claimed in claim **7** including tool receptacles on the front area of the carrier holster.

**14**. A tool carrier apparatus as claimed in claim **13** including reinforcing material around the top opening in the carrier holster.

**15**. A tool carrier apparatus as claimed in claim **7** wherein a rear panel of the carrier holster and a front area of the harness are one piece and a horizontal hinge line is formed in the rear panel to enable the carrier holster to pivot relative to the harness.

**16**. A cordless drill carrier apparatus comprising:

(a) a harness for fitting about the torso and over the shoulders of a person, said harness including a chest belt, a pair of shoulder straps and at least one quick release mechanism for enabling the harness to be removed from the torso of the person;

(b) a carrier holster connected to the front chest area of the harness, said carrier holster being pivotal relative to the harness and remaining in a substantially vertical orientation when the person bends forward, said carrier holster having openings at the top and bottom, the drill being inserted in the carrier holster through the top opening so that the chuck of the drill protrudes through the bottom opening; and

(c) a mechanism whereby the elevation of the carrier holster can be raised or lowered relative to the chest area of the harness.

**17**. A drill carrier apparatus as claimed in claim **16** wherein the mechanism can be used to tilt the vertical axis of carrier holster to one side or the other.

**18**. A drill carrier apparatus as claimed in claim **16** wherein the carrier holster is replaced by a pair of curved open top hooks for supporting the drill.

**19**. A method of enabling a cordless drill to be carried on the chest of a person by fitting the torso of the person with a harness that carries a pivotal drill carrier apparatus on the front of the harness, said carrier apparatus being adjustable in elevation relative to the harness, said carrier apparatus comprising either a holster which remains substantially vertical when the person bends forward, or a pair of curved open top hooks for carrying the drill.

* * * * *