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Inventor(s)	Calvert; William

Geared chalk line

Abstract

The present invention is directed to a geared chalk line preferably configured for a left-handed user. The geared chalk line may comprise an enclosure, a reel, a string line, a hook, a plurality of gears, and a crank. The geared chalk line may be a tool for striking a straight line across a work surface using chalk. The enclosure may comprise a chalk box and a gear box. The chalk box may house the reel and the chalk. The string line may be deployed from the reel for use. The plurality of gears may be configured for the crank to rewind the string line faster than if ungeared. The plurality of gears be housed in the gear box separate from the chalk such that the chalk does not impede the plurality of gears. The string line may be stretched across the work surface and snapped to deposit the chalk on the work surface.

Inventors: **Calvert; William (Lake Stevens, WA)**

Applicant: **Calvert; William** (Lake Stevens, WA)

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Primary Examiner: Guadalupe-McCall; Yaritza

Attorney, Agent or Firm: Cramer Patent & Design, PLLC.

Background/Summary

RELATED APPLICATIONS
(1) Non-applicable.
FIELD OF THE INVENTION
(2) The present invention relates to a chalk line and more specifically to a geared chalk line having a specific rotation.
BACKGROUND OF THE INVENTION
(3) Construction projects require a variety of tools and accessories in order to ensure proper measurements for sizing pieces prior to performing cuts and/or assembly. As a result, there are a variety of core or base tools that are required when performing virtually any measuring or marking task and especially those tasks that require the determination of a perfectly level line or vertical line. One common tool found in almost every carpenter's toolbelt is that of a chalk line. They are used to mark absolutely straight lines over very long distances using a line or string that is impregnated with fine ground up chalk.
(4) However, for as simple of a device as they are, they are not without problems. Such problems include a string line that does not hold adequate chalk, thus causing faint and hard-to-see lines, and a wind-up crank that takes forever to operate as well as being prone to binding up as chalk jams the crank mechanism. Accordingly, there exists a need for a means by which usage of chalk line can be enhanced to address the above-mentioned deficiencies and improve utilization of a chalk line. The development of the geared chalk line fulfills this need.
SUMMARY OF THE INVENTION
(5) To achieve the above and other objectives, the present invention provides for a geared chalk line that is a tool that has an enclosure with a chalk box and a gear box. It houses a reel within the chalk box which contains a line of chalk, and a string line is wound around it. The string line has a hook on one end that is used to attach to a work surface and the other end is attached to the center of the reel. The tool also includes gears within the gear box and a crank that can be used to rewind the string line. The chalk box includes an aperture for inserting chalk and a separate aperture for the string line to pass through. The reel is mounted on an axle that is connected to gears which can be disengaged with a release tab. The axle passes through an aperture between the gear box and the chalk box.
(6) The axle aperture may include a seal to prevent the chalk from entering the gear box from the chalk box. The string line may pass through the chalk as the string line enters the chalk box and the string line accumulates a coating of the chalk. The string line may be stretched across the work surface and snapped to deposit the chalk on the work surface. The string line may include a diamond braided cotton to increase the ability to carry the chalk. The gears may provide a mechanical speed advantage while rewinding the string line. The crank may be folded at a crank hinge for storage and unfolded for use. The crank may include a crank post that couple the crank to the gears to pass through the crank aperture. The crank may include a crank armature and a finger grip. The finger grip may be oriented to be perpendicular to the crank armature. The geared chalk line in a preferred embodiment is configured for operation by a left-handed user. The finger grip may be free to rotate as the crank is used.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) The advantages and features of the present invention will become better understood with reference to the following more detailed description and claims taken in conjunction with the

accompanying drawings, in which like elements are identified with like symbols, and in which:
(2) FIG. **1** is an isometric view of a geared chalk line, according to an embodiment of the present invention;
(3) FIG. **2** is a left side view of a geared chalk line, according to an embodiment of the present invention;
(4) FIG. **3** is a front view of a geared chalk line, according to an embodiment of the present invention;
(5) FIG. **4** is a top view of a geared chalk line, according to an embodiment of the present invention;
(6) FIG. **5** is a bottom view of a geared chalk line, according to an embodiment of the present invention;
(7) FIG. **6** is a rear view of a geared chalk line, according to an embodiment of the present invention; and
(8) FIG. **7** is an in-use view of a geared chalk line, according to an embodiment of the present invention.

DESCRIPTIVE KEY

(9) **100** geared chalk line **200** enclosure **210** chalk box **212** line aperture **214** chalk aperture **216** door **220** gear box **222** axle aperture **224** seal **226** crank aperture **230** reel **240** string line **250** hook **260** gear **262** axle **264** crank post **266** release tab **270** crank **272** crank armature **274** finger grip **276** crank hinge **900** chalk **910** work surface **912** first mark **914** second mark

DESCRIPTION OF THE INVENTION

(10) The present invention is directed to a geared chalk line (herein described as the "invention") **100**. The invention **100** may comprise an enclosure **200**, a reel **230**, a string line **240**, a hook **250**, a plurality of gears **260**, and a crank **270**. The invention **100** may be a tool for striking a straight line across a work surface **910** using chalk **900**. The enclosure **200** may comprise a chalk box **210** and a gear box **220**. The chalk box **210** may house the reel **230** and the chalk **900**. The string line **240** may be deployed from the reel **230** for use. The plurality of gears **260** may be configured for the crank **270** to rewind the string line **240** faster than if ungeared. The plurality of gears **260** can be housed in the gear box **220** separate from the chalk **900** such that the chalk **900** does not impede the plurality of gears **260**. The string line **240** may be stretched across the work surface **910** and snapped to deposit the chalk **900** on the work surface **910**.
(11) The enclosure **200** may be a housing that may be divided into the chalk box **210** and the gear box **220**. The chalk box **210** may hold the chalk **900** and the string line **240** wrapped around the reel **230**. The reel **230** may be mounted on an axle **262** such that the reel **230** may revolve.
(12) The chalk box **210** may comprise a chalk aperture **214** located on a side of the chalk box **210** through which the chalk **900** may be inserted into the chalk box **210**. The chalk aperture **214** may be covered by a door **216**. The door **216** may be opened to add the chalk **900** into the chalk box **210** and may be closed to retain the chalk **900** within the chalk box **210**. In some embodiments, the door **216** may slide to open and close.
(13) The chalk box **210** may comprise a line aperture **212** located at the bottom end of the chalk box **210** through which the string line **240** may enter and exit the chalk box **210**. The string line **240** may pass through the chalk **900** as the string line **240** enters the chalk box **210**, exits the chalk box **210**, or both. As the string line **240** passes through the chalk **900**, the string line **240** may accumulate a coating of the chalk **900**. The string line **240** may mark the straight line onto the work surface **910** by depositing the chalk **900** from the string line **240** onto the work surface **910** when the string line **240** is stretched across the work surface **910** and snapped.
(14) In some embodiments, the chalk box **210** may separate into two portions such that the reel **230** may be accessed for maintenance. As a non-limiting example, the chalk **900** may be emptied from the chalk box **210** and the chalk box **210** may be separated in order to access the reel **230** for replacement of the string line **240** when the string line **240** breaks.

(15) The gear box **220** may house the plurality of gears **260**. The axle **262** that passes through the reel **230** may be coupled to the plurality of gears **260**. The axle **262** may pass through an axle aperture **222** between the gear box **220** and the chalk box **210**. The axle aperture **222** may comprise a seal **224** to prevent the chalk **900** from entering the gear box **220** from the chalk box **210**.
(16) The gear box **220** may comprise a crank aperture **226**. A crank post **264** that may couple the crank **270** to the plurality of gears **260** may pass through the crank aperture **226**.
(17) The string line **240** may be a flexible line that may be stretched across the work surface **910** and snapped in order to deposit the chalk **900** carried by the string line **240** onto the work surface **910**. In some embodiments, the string line **240** may comprise a diamond braided cotton to increase the ability to carry the chalk **900**.
(18) The hook **250** may be a bent armature configured to detachably couple to the work surface **910**. The distal end of the string line **240** may be coupled to the hook **250** such that the string line **240** may be stretched between the hook **250** at a first location on the work surface **910** and the line aperture **212** of the chalk box **210** at a second location on the work surface **910**. The proximal end of the string line **240** may be coupled to the center of the reel **230**.
(19) The plurality of gears **260** may be adapted to provide a mechanical speed advantage to a user while rewinding the string line **240**. The plurality of gears **260** may cause a single revolution of the crank **270** to produce more than one (1) revolution of the reel **230** when rewinding the string line **240**. In some embodiments, a gear ratio measuring revolutions of the reel **230** for each revolution of the crank **270** may be between two-to-one (2:1) and eight-to-one (8:1). In a preferred embodiment, the gear ratio may be seven-point-one-to-one (7.1:1). As non-limiting examples, the plurality of gears **260** may comprise an epicyclic gear train, planetary gearset, ring gear, or any combination thereof.
(20) The plurality of gears **260** may comprise a release tab **266** that may be accessible outside of the gear box **220**. The release tab **266** may be operable to disengage the plurality of gears **260** from the axle **262** such that the axle **262** may turn freely. The release tab **266** may be automatically reset when the crank **270** is turned.
(21) The crank **270** may be adapted to be turned by the user in order to rewind the string line **240**. The crank **270** may comprise a crank armature **272** and a finger grip **274**. The finger grip **274** may be oriented to be perpendicular to the crank armature **272** and the finger grip **274** may be free to rotate as the crank **270** is used. The crank **270** may hingedly couple to the crank post **264** via a crank hinge **276**. The crank **270** may be folded at the crank hinge **276** for storage and unfolded for use. When unfolded, the finger grip **274** may point away from the enclosure **200** and may therefore be accessible for grasping. When folded, the finger grip **274** may point towards the enclosure **200** and may therefore reduce the overall dimensions of the invention **100**.
(22) In use, the chalk box **210** may be filled with chalk **900** through the chalk aperture **214** and the door **216** may be closed. The release tab **266** may be pressed to disengage the reel **230** from the plurality of gears **260** and the string line **240** may be pulled from within the chalk box **210**. The hook **250** may be coupled to a first location on the work surface **910** and the string line **240** may be pulled across the work surface **910** such that the string line **240** passes over a first mark **912** and a second mark **914**. The crank **270** may be turned to engage the plurality of gears **260** and stop the string line **240** from pulling out of the chalk box **210**. The string line **240** may be stretched across the first mark **912** and the second mark **914** and then snapped to deposit the chalk **900** onto the work surface **910** under the string line **240**. The user may turn the crank **270** to rewind the string line **240** onto the reel **230** and may fold the crank **270** for storage.
(23) Although the illustration and depictions herein appear to refer to left-handed embodiments, it remains a scope of the invention to provide the teachings herein to provide embodiments that operate in right-handed operations.
(24) The exact specifications, materials used, and method of use of the invention **100** may vary upon manufacturing. The foregoing descriptions of specific embodiments of the present invention

have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to best explain the principles of the invention and its practical application, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated.

Claims

1. A geared chalk line comprising: an enclosure including a chalk box and a gear box separated from one another; a reel mounted on an axle within the chalk box, the reel configured to revolve about the axle; a string line wrapped around the reel, the string line comprising a diamond braided cotton material and extending through a line aperture in the chalk box; a hook coupled to a distal end of the string line, the hook configured to detachably secure the string line to a work surface; a crank coupled to the gear box, the crank comprising a crank armature, a crank hinge, and a finger grip oriented perpendicular to the crank armature, the finger grip being free to rotate as the crank is turned; a plurality of gears housed within the gear box and operably coupled to the axle, wherein the plurality of gears provide a gear ratio between approximately two-to-one (2:1) and eight-to-one (8:1) such that a single revolution of the crank produces multiple revolutions of the reel; a release tab positioned external to the gear box and operably connected to the plurality of gears, the release tab configured to selectively disengage the plurality of gears from the axle to permit the axle to rotate freely; an axle aperture positioned between the chalk box and the gear box through which the axle passes, the axle aperture including a seal configured to prevent chalk from entering the gear box; and, a chalk aperture located on a side wall of the chalk box configured to receive chalk into the chalk box, the chalk aperture covered by a sliding door configured to open and close; and, wherein the string line passes through chalk housed in the chalk box to accumulate a coating of the chalk before exiting the chalk box, and wherein the crank is foldable about the crank hinge for storage.