APPARATUS FOR PACKAGING AND PRESENTING ROTARY DRILL BITS

RELATED APPLICATION

This application is a U.S. national stage application of International Application No. PCT/US2007/078847 filed Sep. 19, 2007, which designates the United States of America, which claims the benefit of U.S. Provisional Patent Application Ser. No. 60/826,313 entitled "Apparatus and Method for Packaging and Presenting Rotary Drill Bits" filed Sep. 20, 2006. The contents of which are hereby incorporated by reference in their entirety.

TECHNICAL FIELD

The present disclosure is related to packaging, storing, shipping and presenting rotary drill bits.

BACKGROUND OF THE DISCLOSURE

U.S. Pat. No. 6,536,192 entitled "Drill Bit Packages and Methods" shows one example of a two piece container for packaging, shipping, storing and presenting a rotary drill bit.

SUMMARY OF THE DISCLOSURE

In accordance with teachings of the present disclosure, apparatus and methods are provided for packaging, storing, shipping and/or presenting both roller cone drill bits and fixed cutter drill bits. One embodiment may include a generally hollow, elongated container having a first component which may be partially disposed within and releasably engaged to a second component. The first component may include one end of the container. The second component may include another end of the container. A pair of respective lifting handles may be provided on both ends of the container.

For some applications, a container incorporating teachings of the present disclosure may be shipped in a generally vertical position defined in part by a first end facing down and a second end extending upwardly therefrom. For other applications the container may be shipped in a generally vertical position defined in part by the second end facing down and the first end extending upwardly from the second end. A container incorporating teachings of the present disclosure may be used to package, store, ship and/or present rotary drill bits having a nominal diameter between approximately three (3) inches and eighteen (18) inches. However, containers incorporating teachings of the present disclosure may be modified to accommodate larger drill bits.

For some embodiments a container for a rotary drill bit may include a first component operable to be slidably disposed within a generally hollow, elongated second component. An API threaded connection may be formed in the first component for use in releasably engaging the rotary drill bit with the first component. Nozzle holders and/or tool holders may be provided in the first component for use in storing nozzles, service tools and other accessory components associated with the rotary drill bit. A latch assembly may also be provided to allow varying spacing between the first component and the second component to accommodate installing rotary drill bits having varying lengths within the container.

Containers incorporating teachings of the present disclosure may be formed from high strength plastic materials operable to withstand dropping and/or other rough handling of the container. The use of high strength plastic materials may be particularly appropriate for shipping, storing and handling fixed cutter drill bits. High strength, plastic materials may reduce shipping costs as compared to containers formed from metal alloys and previously used to store and ship fixed cutter drill bits. For some applications the cost of refurbishment and/or repair of a container may be reduced.

For some applications a bit breaker adapter may be provided to releasably engage a bit breaker with one end of a container in accordance with teachings of the present disclosure. Such bit breaker adapters may be used to releasably engage bit breakers for different sizes of drill bits in accordance with teachings of the present disclosure with the container.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete and thorough understanding of the present embodiments and advantages thereof may be acquired by referring to the following description taken in conjunction with the accompanying drawings, in which like reference numbers indicate like features, and wherein:

FIG. **1** is a schematic drawing in section and in elevation with portions broken away showing examples of wellbores which may be formed using rotary drill bits;

FIG. **2**A is a schematic drawing showing an isometric view of a container incorporating teachings of the present disclosure;

FIG. **2**B is a schematic drawing showing an isometric view of another example of a container having a bit breaker attached thereto in accordance with teachings of the present disclosure;

FIG. **3** is a schematic drawing showing an exploded, isometric view of a rotary drill bit and container incorporating teachings of the present disclosure;

FIG. **4** is a schematic drawing in section with portions broken away showing a container modified to accommodate exterior portions of a fixed cutter drill bit in accordance with teachings of the present disclosure;

FIG. **5** is a schematic drawing showing an exploded view of a fixed cutter drill bit aligned for engagement with a bit holder and other components of a container incorporating teachings of the present disclosure;

FIG. **6** is a schematic drawing showing an isometric view with portions broken away of a base or elongated, hollow tubular component of a container incorporating teachings of the present disclosure;

FIG. **7** is a schematic drawing showing an isometric view with portions broken away of the base of FIG. **6** with a first bit breaker releasably engaged therewith in accordance with teachings of the present disclosure;

FIG. **8** is a schematic drawing showing an exploded isometric view with portions broken away of an adapter operable to releasably engage the first bit breaker with a container in accordance with teachings of the present disclosure; and

FIG. **9** is a schematic drawing showing an exploded isometric view with portions broken away of the adapter of FIG. **8** operable to releasably engage a second bit breaker with the container in accordance with teachings of the present disclosure.

DETAILED DESCRIPTION OF THE DISCLOSURE

Preferred embodiments of the disclosure and various advantages may be understood by referring to FIGS. **1**-**9** of the drawings, like numerals being used for like and corresponding parts of the various drawings.