

The terms “rotary drill bit” and “rotary drill bits” may be used in this application to include various types of roller cone drill bits, rotary cone drill bits, three cone drill bits, rock bits, hammer drill bits, fixed cutter drill bits, drag bits and matrix drill bits.

Rotary drill bits, associated nozzles and other components having many different designs, configurations and dimensions may be packaged, shipped, stored and/or presented using a container incorporating teachings of the present disclosure. Rotary drill bits having one, two, three or more than three cones may be packaged, shipped, stored and/or presented in accordance with teachings of the present disclosure. Rotary drill bit **40** as shown in FIGS. **1**, **2B** and **3** and rotary drill bit **240** as shown in FIGS. **4** and **5** represent only two examples of rotary drill bits which may be satisfactorily packaged, shipped, stored and/or presented using a container incorporating teachings of the present disclosure.

FIG. **1** is a schematic drawing in elevation and in section with portions broken away showing examples of wellbores or bore holes which may be formed in accordance with teachings of the present disclosure. Drilling rig **20** and various types of drilling equipment such as a rotary table, mud pumps and mud tanks (not expressly shown) may be located at well surface **22**. Drilling rig **20** may have characteristics and features associated with a “land drilling rig.” However, apparatus and methods incorporating teachings of the present disclosure may be satisfactorily used to package, store, ship and/or present rotary drill bits for use with drilling equipment located on offshore platforms, drill ships, semi-submersibles and drilling barges (not expressly shown).

Rotary drill bit **40** such as shown in FIGS. **1**, **2A**, **2B** and **3** or rotary drill bit **240** such as shown in FIGS. **4** and **5** may be attached with the extreme end of drill string **24** extending from well surface **22**. Drill string **24** may be formed from sections or joints of generally hollow, tubular drill pipe (not expressly shown). Drill string **24** may also include bottom hole assembly **26** formed from a wide variety of components. For example components **26a**, **26b** and **26c** may be selected from the group consisting of, but not limited to, drill collars, rotary steering tools, directional drilling tools and/or downhole drilling motors. The number of components such as drill collars and different types of components in a bottom hole assembly will depend upon anticipated downhole drilling conditions and the type of wellbore which will be formed by drill string **24** and rotary drill bit **40** or **240**.

Rotary drill bit **40** or **240** may be attached with bottom hole assembly **26** at the extreme end of drill string **24**. Bottom hole assembly **26** will generally have an outside diameter compatible with other portions of drill string **24**. Drill string **24** and rotary drill bit **40** or **240** may be used to form various types of wellbores and/or bore holes. For example, horizontal wellbore **30a**, shown in FIG. **1** in dotted lines, may be formed using drill string **24** and rotary drill bit **240**. Various directional drilling techniques may be used to form horizontal wellbore **30a**.

Wellbore **30** may be defined in part by casing string **32** extending from well surface **22** to a selected downhole location. As shown in FIG. **1** remaining portions of wellbore **30** may be described as “open hole” (no casing). Various types of drilling fluid may be pumped from well surface **22** through drill string **24** to attached rotary drill bit **40** or **240**. The drilling fluid may be circulated back to well surface **22** through annulus **34** defined in part by outside diameter **25** of drill string **24** and inside diameter **31** of wellbore **30**. Inside diameter **31** may also be referred to as the “sidewall” of

wellbore **30**. Annulus **34** may also be defined by outside diameter **25** of drill string **24** and inside diameter **31** of casing string **32**.

Rotary drill bit **40** may include bit body **60** with three substantially identical support arms **62** extending therefrom. See FIG. **3**. Bit body **60** may be formed from three segments (not expressly shown) which include respective support arms **62**. The segments may be welded with each other using conventional techniques to form bit body **60**. An enlarged cavity (not expressly shown) may be formed within bit body **60** adjacent to upper portion **42**. Drilling fluid may be communicated from drill string **24** to the enlarged cavity through upper portion **42**.

API threads **44** may be formed on the exterior of upper portion **42**. API threads **44** may be used to releasably engage rotary drill bit **40** with the extreme end of drill string **24** extending from well surface **22**. Corresponding API threads (not expressly shown) may be formed within the extreme end of drill string **24** to form a threaded connection operable to allow rotation of rotary drill bit **40** in response to rotation of drill string **24** at well surface **22**.

Rotary drill bit **40** as shown in FIGS. **1**, **2A**, **2B** and **3** may include three support arms **62**. Respective cone assemblies **64** may be rotatably mounted on an interior surface of each support arm **62** spaced from bit body **60**. A respective shaft, bearing pin or spindle (not expressly shown) may extend generally inwardly from the end of each support arm **62** for use in rotatably mounting respective cone assembly **64** thereon. Cone assembly **64** may include a plurality of inserts **66** disposed on the exterior thereof. Inserts **66** may be formed from various types of hard materials associated with rock bits and/or rotary cone drill bits. The inserts or cutting elements **66** are shown generally arranged in rows on the exterior of each cone assembly **64**. Cone assembly **64** may also be described as roller cone assemblies, cutter cone assemblies or rotary cone assemblies.

A plurality of nozzle receptacles or nozzle housings **68** may be formed on exterior portions of bit body **60**. Respective fluid flow passageways (not expressly shown) may be formed in bit body **60** to communicate drilling fluid from the enlarged cavity to respective nozzle housings **68**. A nozzle (not expressly shown) may be disposed within each nozzle receptacle **68**. The nozzles may be used to direct drilling fluid from drill string **24** to exit from bit body **60** to remove formation cuttings from end **36** of wellbore **30**, to clean cutting structures associated with cone assemblies **64** and/or to cool various components such as bearing surfaces (not expressly shown) associated with rotary drill bit **40**.

Containers **80** and **80a** incorporating various teachings of the present disclosure are shown in FIGS. **2A-9**. Containers **80** and **80a** may be described as having a generally elongated, hollow configuration with interior dimensions satisfactory for packaging, storing, shipping and/or presenting a rotary drill bit releasably disposed therein. For some embodiments containers **80** and **80a** may include first component **100** and second component **200**. Portions of first component **100** with a rotary drill bit releasably attached thereto may be slidably disposed within second component **200**. See for example FIGS. **2A** and **2B**.

Bit breaker adapter **300** incorporating teachings of the present disclosure is shown in FIGS. **2B**, **3**, **7**, **8** and **9**. Some of the differences between containers **80** and **80a** may include techniques used to releasably engage bit breaker adapter **300** and an associated bit breaker with containers **80** and **80a**. See for example end **202** of container **80** as shown in FIG. **3** and end **202a** of container **80a** as shown in FIGS. **8** and **9**.