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Remote Operable Coke Drum

U.S. Pat. No. 5,908,210

U.S. Pat. No. 6,022,454

United States Patent

[1] Patent Number: 5,908,210

Inventor: Kirk Pfeifer, 107 Westwood, No.
1435, Houston, Tex. 77006

Assignee: Cryogenics Engineers & Services, Ltd.

Primary Classification: 124/925

Abstract

A remotely operable coke drum is provided. The coke drum is separated into multiple chambers by a plurality of removable elements. Each of the chambers is operable by remote control. The removable elements can be made of various materials, such as metal, plastic, or ceramic. The drum can be used in various industries, including petroleum and chemical processing.

United States Patent

[1] Patent Number: 6,022,454

Inventor: Andrew F. Neyer, 210 Kirkwood Drive
Andorra, PA 18036

Assignee: Cryogenics Engineers & Services, Ltd.

Primary Classification: 124/925

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Foreign Patents Pending

ACH & HII
Remote Operable Flange

Close to Seal Drum

Proven 72" ID Flange

Open to Release Head
Remote Operable Drum-bottom Deheader

Remote Controlled Equipment

1. Disconnect Feed-pipe
2. Disconnect Bottom-head
3. Position Bottom-head
4. Deploy Floor & Chute
Remote Operable Drum-top Deheader

- Remote Operable Flange
- Drill Stem
- Heavy Duty Screen
- Centralizer
- Centralizer Bushing
- Release & Position Top-head
- Lower Drill Stem
- Lock Centralizer with Flange
Remote Operable Flange

Advantageous Installation

Existing Drum Flange

Mounting Plate

Installation Pins (3) (Attach to Existing Flange)

Automatic Flange (Portable Assembly)

Quickly Installs on Existing Drum Flange
Remote Operable Flange

- Fully Operational 72” ID Flange
- Pressure Tested
- Cycle Tested

Hydraulic Bulkhead
(Supplies all Cylinders)

Safety Interlock

Lock Actuator

Tie-rod Actuator

(2) Step Remote Operation

Proven Technology
**Seal Mechanics**

- **Optional Feature**: Accounts for Irregular Flange
- **Conventional Gaskets**
- **Mechanical Advantage**

(Flange Cross-section)
- **Jackscrews**
- **Bearing**

F<sub>seal</sub> > 15 × F<sub>bolt</sub>

(Bolt Actuators)
Remote Operable Flange

Manual (Backup)  Safety Interlock  Lock  Wedge Nut  Flange Nut

Lock Actuator

Tie-rod Actuator
**Seal Mechanics**

- Large Initial Contact Area

**Account for Deflection (Correct)**
- Uniform Gasket Force
- Elimination of Wear
  - Negligible Dynamic Engagement
  - Large Initial Contact
  - Low Contact Stress

**Incorrect**
To Close & Lock

- Retract Tie-rod Actuators

- Extend Lock Actuators

- Engage Safety Interlock
To Disengage Interlocks

- Retract Tie-rod Actuators
- Extend Lock Actuators
- Disengage Safety Interlock
To Open

- Retract Positive Lock Actuators
- Extend Tie-rod Actuators
Characteristics

- Remote Unlock
- Remote Open
- Self-limiting
  Open Position
- Remote Close
- Remote Lock
- Manual Interlock
- Self-adjusting
  Closed Position
- Actuators Off-line
- Stored Energy
  Locked in Tie-rods
Steam Purge System

Open & Close While Steam Cleaning