United States Patent

Amelung et al.

[15] **3,681,811**

[45] **Aug. 8, 1972**

[54] **APPARATUS FOR CLEANING IRON MOULDS**

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[22] Filed: **Nov. 20, 1970**

[21] Appl. No.: **91,348**

[52] **U.S. Cl.** **15/165,** 15/56, 15/104.05

[51] **Int. Cl.** **A46b 3/00**

[58] **Field of Search**.....15/56–58, 71, 72, 15/75, 76, 101, 104.1, 104.1 C, 164, 165

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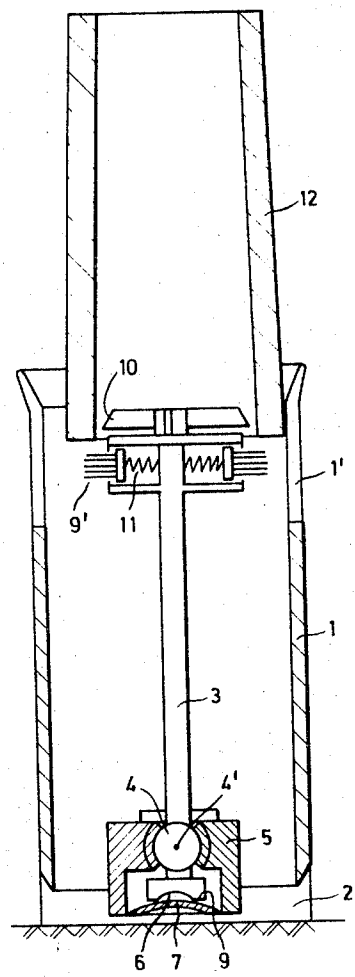
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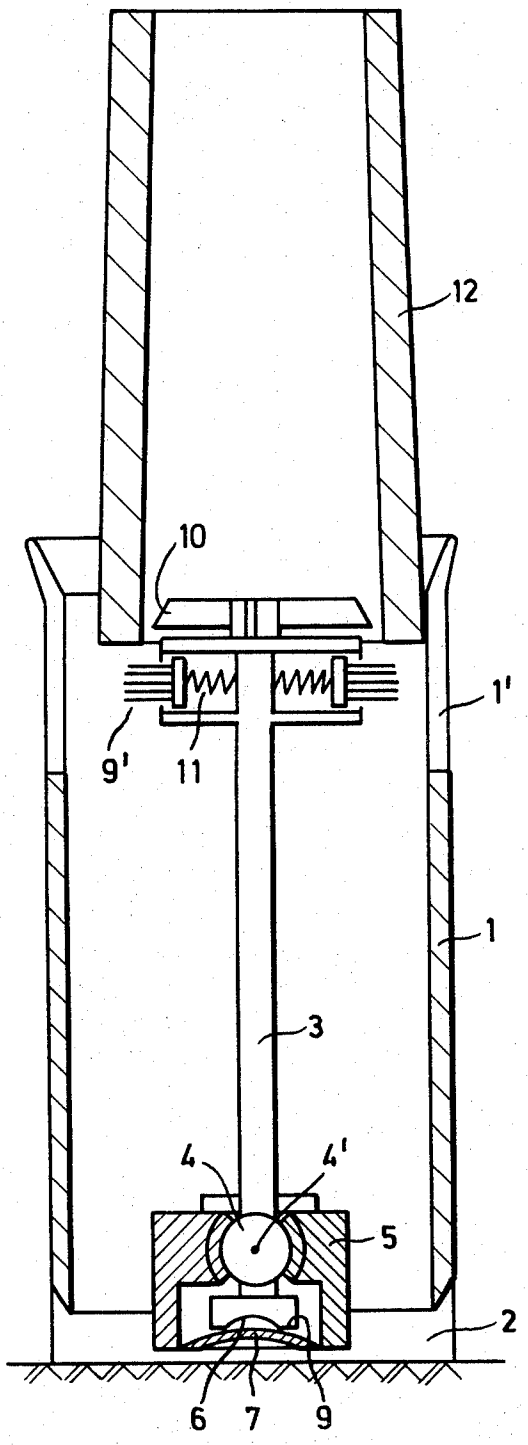
Attorney—Holman & Stern

[57] **ABSTRACT**

This invention relates to apparatus for cleaning iron moulds used in steel works. Such apparatus comprises a base plate, a guide tube mounted on the base to extend upwardly therefrom, a frusto-conical upwardly projecting lip portion at the upper end of said guide tube, a rod, means at or adjacent the lower end of said rod whereby the rod is movable to described a cone of revolution, resilient means which coact with said base plate and the lower end of said rod, to bias said rod to urge it into a vertical orientation, brush means flexibly secured proximate the upper end of said rod so as to extend laterally therefrom and a frusto-conical portion at the upper end of said rod. Said frusto-conical portion tapers inwardly in an upward direction.

5 Claims, 1 Drawing Figure





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APPARATUS FOR CLEANING IRON MOULDS

The invention relates to apparatus for cleaning iron moulds used in steel works.

Hitherto known apparatus for cleaning such iron moulds comprise a rod which has at one end a disc having indentations formed in its circumference. Said indentations engage with mountings which are connected to a base plate of the apparatus. These mountings permit a limited vertical movement of the aforesaid disc to allow said rod to perform swinging motions. A plurality of brushes are flexibly connected to the top of said rod which extends upwardly in a generally vertical direction from the base plate, said brushes extending in a generally horizontal direction. The base plate supports a guide tube which surrounds said rod. Since the mass of said brushes, which are provided for the cleaning of the iron moulds, determine the center of gravity in such a way that it is positioned in the upper part of the rod, and since the rod often swings away from the vertical while the iron mould is lowered over said rod, the rod may not return to its vertical position after the iron mould has been lowered over the rod. The chance that said rod will not return to the vertical as aforesaid increases with usage, because the mountings and the disc gradually wear due to abrasion.

The object of the present invention is to provide such apparatus wherein the rod will return to the vertical after the iron mould has been positioned over it.

In accordance with the present invention, there is provided apparatus for cleaning iron moulds used in steel works comprising a base plate, a guide tube mounted on the base plate to extend upwardly therefrom, a frusto-conical outwardly projecting lip portion at the upper end of said guide tube, an upwardly extending rod mounted in the guide tube, means adjacent the lower end of said rod mounting said rod in said guide tube whereby the rod is movable to describe a cone of revolution, resilient means which coats with said base plate and the lower end of said rod to bias said rod to urge it into a vertical orientation, brush means flexibly secured proximate the upper end of said rod so as to extend laterally therefrom and a frusto-conical portion at the upper end of said rod, said frusto-conical portion tapering inwardly in an upward direction.

The invention will now be more particularly described with reference to the accompanying drawing which is a diagrammatic view of apparatus for cleaning iron moulds in accordance with the present invention.

Referring now the drawing the apparatus shown therein comprises a base plate **2** on which is mounted a guide tube **1** which has at its upper end a frusto-conical outwardly projecting lip portion so that an iron mould **12** which is not lowered exactly centrally into the tube **1** slides along the inner wall of said lip portion and into the guide tube **1**. For reception and interlocking of fastening elements (not shown) of a mould-handling crane (not shown), the guide tube **1** possesses axially extending slots **1'**.

The upper end of a rod **3** carries brushes **9'** which are provided for the cleaning of the iron moulds, and for their part are flexibly connected by springs **11** to the rod **3** so as to extend horizontally therefrom. The brushes **9'** act upon the iron mould **12** and are mounted so that they can adjust themselves to the unevenness of the mould **12** as well as to the differing measurements

of the inside wall of iron moulds. The upper end of the rod **3** terminates with a frusto-conical disc **10** which is tapered inwardly as it extends upwardly so that even when the iron mould **12** is not lowered centrally, a centering effect occurs. The disc **10** may be interchangeable for other discs of different diameter such that iron moulds of different sizes can be centered within the guide tube **1**. Furthermore, the brushes may also be interchangeable if desired.

Proximate the lower end of the rod **3** is a spherical portion **4** which is supported in a socket bearing **5** which is connected to the base plate **2**. The lowermost portion of the rod **3** has connected thereto a disc **6** which has a dish-shaped recess formed in its bottom surface and the radius of curvature of said recess is smaller than the radius of curvature of a dish-shaped resilient plate **7** which engages the base plate **2**. The dish-shaped plate **7** has its apex directed upwardly and is movable on the base plate **2** within certain limits. As can be seen from the drawing, the peripheral area **9** of the bottom surface of the disc **6** always rests on the dish-shaped plate **7**, as a result of the differences of radii of curvature of the dish-shaped plate **7** and the recess in the disc **6** of the rod **3**. Since, as a result of the universal joint, constituted by the spherical portion **4** and the socket bearing **5** swinging movement of the rod **3** can occur about a pivot **4'**, so as to describe a cone of revolution wherein the peripheral area **9** is always acted upon at this point by the force of the resilient dish-shaped plate **7**. Therefore the rod **3** always returns to its vertical position independent of the center of gravity thereof.

Instead of the dish-shaped plate **7** which constitutes a spring, one can also use a Belville washer whereby in general the characteristic of the spring is more flexible.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. Apparatus for cleaning iron moulds used in steel works comprising a base plate, a guide tube mounted on the base plate to extend upwardly therefrom, a frusto-conical outwardly projecting lip portion at the upper end of said guide tube, an upwardly extending rod mounted in the guide tube, means adjacent the lower end of said rod mounting said rod in said guide tube whereby the rod is movable to describe a cone of revolution, resilient means which coacts with said base plate and the lower end of said rod to bias said rod to urge it into a vertical orientation, brush means flexibly secured proximate the upper end of said rod so as to extend laterally therefrom and a frusto-conical portion at the upper end of said rod, said frusto-conical portion tapering inwardly in an upward direction.

2. Apparatus as claimed in claim **1** wherein the upper end of said guide tube is provided with axially extending slots for the reception of fastening elements of a mould-handling crane.

3. Apparatus as claimed in claim **1** wherein said resilient means is a resilient dish-shaped plate which is arranged with its apex pointing upwards and which is arranged on said base plate whereby the lower end of said rod is widened and only touches the cup-shaped disc with its peripheral area.

4. Apparatus as claimed in claim **3** wherein said rod is provided with a spherical portion proximate its lower end, said spherical portion being supported in a socket bearing.

5. Apparatus as claimed in claim 1 wherein said resilient means is a Belville washer.

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