My invention relates generally to bore cleaners and more particularly to a novel and useful bore cleaner for bores of bowling balls.

The bores of bowling balls collect undesirable grease and resin which impair the effectiveness of a player's game.

The object of this invention, therefore, is to provide a novel and useful bore cleaner particularly suitable for removing undesirable grease and resin from the bore of a bowling ball.

Another object of this invention is to provide a bore cleaner which can be used for cleaning a wide range of bore sizes.

Another object of this invention is to provide a bore cleaner which will not leak or saturate the cleaning swab while in use.

A further object of this invention is to provide a bore cleaner in which the saturation of the cleaning member can be easily controlled.

Other objects, advantages and capabilities of the invention will become apparent from the following description, taken in conjunction with the accompanying drawings showing only a preferred embodiment of the invention.

In the drawings:

**FIG. 1** is a longitudinal sectional view of an embodiment according to this invention;

**FIG. 2** is a view of the bore cleaner shown in FIG. 1 which is inverted and inserted into the bore hole of a bowling ball shown partially in section; and

**FIG. 3** is a view of the swab of the bore cleaner shown in FIG. 1 in an expanded state.

Referencing FIG. 1 in the drawings, there is shown an embodiment according to this invention illustrated in the shape of a tampion and generally indicated by numeral 1.

The bore cleaner comprises a hollow flexible container 2 with an elongated cover 3 detachably mounted in a forced-fit arrangement. Threads in both members 2 and 3 would also be suitable for making a detachable fit therebetween.

The flexible container 2 encloses a cleaning fluid 4 which is supplied through a suitable opening normally covered by a plug 5. Container 2 has a flat bottom portion 6 which supports the entire bore cleaner in an upright position. The flexible container 2 includes a neck extension 7 which has a central passage 8. The upper portion of neck extension 7 has threads 9 cut therein. A jam nut 10 screws over threads 9 providing a shoulder for controlling the external diameter of the swab to be described later.

A conduit 11 or other suitable fluid conducting means is disposed in central passage 8 and has one end extending to the bottom of container 2 where it is surrounded by fluid 4 when the container is in an upright position.

When the container is supported in an inverted position the fluid level will normally be below the lower end of the conduit 11.

At the opposite end of conduit 11 is a head member 12 which has minute orifices 13 and 14 communicating with conduit 11 to pass a fluid therefrom. The head member tapers outwardly and upwardly from the orifices in a tapered portion 12a and terminates at its upper end in a shoulder portion 15. Tapered portion 12a also extends inwardly below the orifices. Head member 12 can be made integral with conduit 11 or detachable therefrom as desired.

Surrounding the threads 7 is an expandable swab or cleaning member 16 of a doughnut-like shape for absorbing a substantial amount of cleaning fluid 4. Shoulder 15 and jam nut 10 confine the swab at its upper and lower extremities, respectively. Preferably, the inner diameter of swab 16 is smaller than the outer diameter of threads 9, thereby assuring a tight fitting relationship to preclude the swab from slipping vertically or circumferentially when cleaning the bore. Swab 16 can be made of any suitable expandable material having high absorbing qualities such as felt, synthetic sponges or the like.

The cover member 3 has a cylindrical inside surface 17 having a diameter which passes over shoulders 15 and of a length greater than the length of swab 16. This surface 17 is of substantially less diameter than swab 16 when expanded and therefore compresses the swab when fitted thereover.

In FIG. 2 there is shown in an inverted position, the bore cleaner illustrated in FIG. 1 when inserted into a bore hole 19 of a bowling ball 20. Swab or cleaning member 16 has an outer dimension greater than the largest bore diameter and because it is compressible it facilitates the cleaning of various sizes of bores. The outer diameter of the swab 16 can be increased or decreased by adjusting jam nut 12 on threads 9. By moving jam nut 19 toward head 15, swab 16 will be forced up the tapered portion 12a, thereby increasing the external diameter of the swab. Conversely, movement of the jam nut away from the head will decrease the diameter. This feature allows adjustment of the diameter of the swab to more effectively clean a particular size of bore.

Prior to insertion of swab 16 into the bore, the container 2 is squeezed, forcing the cleaning fluid up conduit 11 and through orifices 13 and 14 where it is absorbed by swab 16. Swab 16 is then inserted into the bore and reciprocated and rotated to clean the bore. In this cleaning action, it is apparent from the structure disclosed that when the swab 16 is pulled from the bore of the ball that the surface friction between the inside of the bore and the swab will tend to pull the swab up the tapered portion 12a, thereby causing a tighter fit in the bore facilitating a better cleaning action on the bore. Orifices 13 and 14 are small enough to prevent the fluid from leeking therethrough until the container is squeezed. This prevents flooding of the swab when in operation.

FIG. 3 illustrates the general doughnut-like shape of the swab 16 when the cover member 3 is removed. It is apparent that jam nut 10 can be conventionally adjusted in this position.

Although the bore cleaner has been illustrated in the shape of a tampion, it is understood that this is merely a convenient shape, allowing a practical cover for the swab but that the invention is not limited to this configuration and could also be of various shapes, such as cylindrical, rectangular or the like.

The container will preferably be made as a unitary molded assembly of sufficient flexibility to allow squeezing action to discharge the cleaning fluid. If the top portion of the container is desired to be detachable, suitable cementing or spin welding can be used to prevent leakage. A single material can be used for the entire assembly with the exception of the swab. A durable plastic or the like would be preferred. The cleaning fluid will be capable of cutting grease and resin and rapid drying. Tri-chloroethylene or the like would be suitable.

While I have particularly shown and described one particular embodiment of the invention, it is distinctly understood that the invention is not limited thereto but that modifications may be made within the scope of the invention and such variations as are covered by the scope of the appended claims.
I claim:
1. A bore cleaner for bowling balls or the like comprising a flexible container enclosing a cleaning fluid, said container having a neck extension with a central passage, an expandable means having an inner surface surrounding and attached to a portion of said neck extension for insertion into the bore, means for conducting the cleaning fluid through the central passage to said inner surface of said expandable means upon depressing the flexible container, and a cover detachably mounted on the container having a portion for compressing the expandable means when not in use.
2. A bore cleaner for bowling balls or the like comprising a hollow flexible container enclosing a cleaning fluid, said container having a neck extension terminating at one end in a tapered portion and a central passage, an expandable swab surrounding and attached to a portion of said neck extension for insertion into the bore, the tapered portion forcing the swab toward the bore when removed from the bore, means for conducting the cleaning fluid through said central passage to the interior surface of the swab upon depression of the flexible container, and a cover detachably mounted on the container having a portion for compressing the swab when not in use.
3. A bore cleaner for bowling balls or the like comprising a hollow flexible container enclosing a cleaning fluid, said container having a neck extension with a central passage, a conduit positioned in the passage having one end extending into the cleaning fluid so that upon depressing said container the fluid is forced up the conduit, a head attached to the other end of the conduit, said head having at least one orifice communicating with the conduit, an expandable swab for insertion into the bore attached to a portion of the neck exterior and having an inner surface surrounding the orifice to receive fluid from said conduit, and a cover detachably mounted on the container having a portion fitting over and compressing the swab when not in use.
4. A bore cleaner for bowling balls or the like comprising a hollow flexible container enclosing a cleaning fluid, said container having a neck extension including a tapered portion at one end and a central passage, a conduit positioned in the passage and extending into the cleaning fluid so that upon depressing the container fluid is forced up the conduit, an expandable swab for insertion into the bore and having an inner surface attached to and surrounding said portion of the neck extension, the tapered portion forcing the swab toward the bore when removed from the bore, means for passing a limited spray of fluid from the conduit to said inner surface of the swab but preventing flow when the container is inverted, and a cover member detachably mounted on the container having a portion fitting over and compressing the swab when not in use.
5. A bore cleaner for bowling balls or the like comprising a hollow flexible container enclosing a cleaning fluid, said container having a neck extension with a central passage and a flat bottom for supporting the container in an upright position, a conduit positioned in the passage having one end extending into the cleaning fluid so that upon depressing the container when in an upright position the fluid will be forced up the conduit, a head tapering outwardly from the neck extension and attached to the other end of the conduit and having orifices communicating with the conduit, the orifices being of such small size to prevent leakage of the cleaning fluid when the container is inverted, an expandable swab for insertion into the bore for cleaning therein having an inner surface surrounding and attached to a threaded portion of the neck and which extends over a portion of said head and, the orifices so that the fluid is conducted to said inner surface of said swab with the threaded portion preventing the fluid from flowing when the container is inverted, a nut screwed on the threaded portion for adjusting the outer diameter of the swab, and a cover detachably mounted on the top of the container having a portion fitting over the swab and cooperating with the container for compressing the swab when not in use.
6. A bore cleaner for bowling balls or the like comprising a hollow flexible container enclosing a cleaning fluid, said container having a neck extension with a central passage and terminating in a tapered head portion, a conduit positioned in the passage and extending into the cleaning fluid so that upon depressing the container fluid is forced up the conduit, an expandable swab for insertion into the bore and having an inner surface attached to and surrounding the neck extension, said head portion having at least one orifice for passing the fluid from the conduit to said inner surface of the swab when the container is inverted, and a cover member detachably mounted on the container having a portion fitting over and compressing the swab when not in use.
7. A bore cleaner for bowling balls or the like comprising a flexible container enclosing a cleaning fluid, said container having a neck extension with a central passage, an expandable means having an inner surface attached to and surrounding said neck extension for insertion into the bore, means for adjusting the exterior dimension of the expandable means, means for conducting the cleaning fluid from the conduit to said inner surface of said expandable means upon depressing the flexible container, and a cover detachably mounted on the container having a portion for compressing the expandable means when not in use.
8. A bore cleaner for bowling balls or the like comprising a hollow flexible container enclosing a cleaning fluid, said container having a neck extension with a central passage and a flat bottom for supporting the container in an upright position, a conduit positioned in the passage having one end extending into the cleaning fluid so that upon depressing the container when in an upright position the fluid will be forced up the conduit, a head tapering outwardly from the neck to receive fluid from the conduit to said inner surface of the swab with the threaded portion preventing the fluid from flowing when the container is inverted, a nut screwed on the threaded portion for adjusting the outer diameter of the swab, and a cover detachably mounted on the top of the container having a portion fitting over the swab and cooperating with the container for compressing the swab when not in use.
9. A bore cleaner for bowling balls or the like comprising a hollow flexible container enclosing a cleaning fluid, said container having a neck extension with a central passage and a threaded portion, a conduit positioned in the passage having one end extending into the cleaning fluid so that upon depressing the container when in an upright position the fluid will be forced up the conduit, a head means attached to the other end of the conduit with a tapered portion and having at least one orifice communicating with the conduit and of such small size to prevent leakage of the cleaning fluid when the container is inverted, an expandable swab for insertion into the bore for cleaning therein having an inner surface surrounding and fitted over said threaded portion and said tapered portion and surrounding said orifice so that the fluid is conducted to said inner surface of said swab with the threaded portion preventing the swab for slipping and the tapered portion forcing the swab toward the bore when removed from the bore, a cover member detachably mounted on the top of the container having a portion
fitting over the swab and compressing the swab when
not in use.

10. A bore cleaner for bowling balls or the like comprising a hollow flexible container enclosing a cleaning fluid, said container having a neck extension with a central passage, a conduit positioned in the passage having one end extending into the cleaning fluid so that upon depressing said container the fluid is forced up the conduit, a head attached to the other end of the conduit, said head having at least one orifice communicating with the conduit, an expandable swab for insertion into the bore and having an inner surface attached to the neck exterior and surrounding a portion of the head and orifice so that the fluid is introduced to said inner surface of said swab, the head having a tapered portion for forcing the swab toward the bore when removed from the bore, and a cover detachably mounted on the container having a portion fitting over and compressing the swab when not in use.

References Cited by the Examiner
UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Patent</th>
<th>Date</th>
<th>Inventor</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>268,004</td>
<td>11/82</td>
<td>Davis</td>
<td>15—104.16</td>
</tr>
<tr>
<td>2,315,054</td>
<td>3/43</td>
<td>Heber</td>
<td>15—210</td>
</tr>
<tr>
<td>2,587,382</td>
<td>2/52</td>
<td>Pyns</td>
<td>15—541</td>
</tr>
<tr>
<td>2,612,894</td>
<td>10/52</td>
<td>Akins</td>
<td>15—541 X</td>
</tr>
<tr>
<td>2,629,888</td>
<td>3/53</td>
<td>Sauer</td>
<td>15—511</td>
</tr>
</tbody>
</table>

CHARLES A. WILLMUTH, Primary Examiner.