Solving the Chinese Ring Puzzle

In solving the Chinese ring puzzle, two important facts have to be known.

1. The first ring can be put on or released from the handle (or the "sword") at any time.

2. If the first up to the \((n - 1)\)th rings are released but the \(n\)th ring is not, then the \((n + 1)\)th can be released or put back onto the handle.

Using these two facts, we can somehow develop an induction or a coding method to solve the problem.
Solving the Chinese Ring Puzzle

Start
Code: 11111

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Release the first ring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code: 01111</td>
<td>Remark: We try to release the fifth ring. However, basing on Fact 2, we have to remove the first, second, and third rings first. In other words, we have to solve a 3-ring puzzle first.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2</th>
<th>Release the third ring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code: 01011</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>Put back the first ring</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>Code: 11011</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 4</th>
<th>Release both the first and second rings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Code: 00011</td>
</tr>
<tr>
<td></td>
<td>Remark: The first three rings are released.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 5</th>
<th>Release the fifth ring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Code: 00010</td>
</tr>
</tbody>
</table>
Step 6
Put back the first and second rings
Code: 11010

Remark: In order to release the fourth ring, we need to put back the first three rings and start the algorithm again.

Step 7
Release the first ring
Code: 01010

Step 8
Put back the third ring
Code: 01110
Step 9
Put back the first ring
Code: 11110

Remark: Actually, we are now solving a 4-ring puzzle!

Step 10
Release the first and second rings
Code: 00110

Step 11
Release the fourth ring
Code: 00100
Step 12
Put back the first and second rings
Code: 11100
Remark: Here is a 3-ring puzzle again!

Step 13
Release the first ring
Code: 01100
Compare this with step 1

Step 14
Release the third ring
Code: 01000
Compare this with step 2
Step 15
Put back the first ring
Code: 11000
Compare this with step 3

Step 16
Release both the first and second rings and finish
Code: 00000
Compare this with step 4

A Chinese (BIG 5 Code) version of this homepage:

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