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ELECTRICAL APPARATUS FOR DISINFECTING CASINGS (INTESTINES) ESPECIALLY CATGUT
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Diagram with labeled parts: 1, 2, 3, 4, 5, 6, 6', 6"
Intestines, both in the raw state as well as in a manufactured state, as used in the sausage industry, as catgut for surgery and other uses, contain numerous species of pathogenic germs which it is advisable to eliminate or destroy, as being dangerous to human beings.

In some industries, as for example, the sausage industry, the cooking to which the products obtained are submitted, although it tends to diminish the danger from the pathogenic germs, does not completely eliminate the danger that the existence of such germs presents to the human race, especially in the case of intestines proceeding from animals attacked by some illness. The danger due to not having thoroughly disinfected the intestines is extremely great in the surgical catgut industry.

In general, the intestines used in the sausage industry are only submitted to a salting treatment, the only object of which is the preservation of intestines, especially during transport. In general they are not submitted to any special process of disinfection, which on the other hand is somewhat difficult to carry out in view of the purpose for which they are intended, since it is difficult to eliminate the residual traces of the disinfectant employed.

Disinfection should be of a rigorous character in the case of intestines manufactured in the form of a thread to be used in surgery and known by the name of catgut. For the disinfection of these intestines up to the present time disinfectants of different kinds have been used in a gaseous or liquid state, or in solution. All of these disinfectants penetrate the intestines with difficulty and there is no assurance that they have become completely aseptic.

As a means of complete sterilization for intestines, heat is recommended, but it must be borne in mind that owing to the organic composition of the intestines, it is impossible to obtain the temperature necessary for complete sterilization without the risk of a decomposition or deterioration of the intestines.

The problem of perfect sterilization of the intestines, both in the raw state as well as in a manufactured state (catgut) is completely solved by the employment of the electrical apparatus which is claimed as the object of this patent.

In order to enable the electrical apparatus which is claimed to be described in the fullest possible detail, an example of the apparatus is shown in the figure of the accompanying sheet of drawing in a vertical longitudinal section. It must be observed that the apparatus may be of any form, either laboratory or industrial, combining the characteristics which are mentioned below.

The apparatus is characterized as having a receptacle 1 in general a bad conductor of electricity, destined to receive the intestines to be disinfected, both in a raw state as well as in a manufactured state. Apart from the intestines there is an electrolytic bath of sodium chloride covering the intestines completely and not having any harmful effect on the human organism. Through the electrolytic bath is passed a high frequency and high tension electric current introduced into the same by the electrodes 2 and 3 of which, at least one, the electrode 3 for example, may be moved to penetrate more or less into the bath.

The apparatus also includes a support on which the intestines to be disinfected are placed, this support remaining submerged in the electrolytic bath. An alcohol or neral thermometer 5 is also provided showing at any instant the temperature to which the intestines are exposed during their treatment for disinfection.

As will be noted the receptacle is in the form of a tubular member the upper and lower ends of which are open while a removable bottom member 4 is provided therefor which carries the electrode 2, the support 4 and the thermometer 5, so that upon the removal of this bottom member 4, all of the elements arranged within the tubular treatment member 1, excluding the upper electrode 3, are removed with it and can be cleansed simultaneously to remove any sediment or other deposit which may have accumulated upon them during the sterilization treatment. Of course, it is apparent that the contents of the receptacle are also removed on the removal of the bottom member, and subsequently to the cleansing and replacement of the bottom member a fresh supply of liquid may be inserted in the open upper end of the tubular member 1.

The receptacle 1 is surrounded by a casing 6 through which water or other fluid is circulated with the object of cooling the electrolyte and consequently, the intestines during the disinfection treatment. By properly graduating the amount of water or fluid passing through the aperture 6", it is possible to prevent the intestines becoming overheated and consequently decomposed.

Finally, the apparatus described may be constructed in any size and of any suitable material or materials, it being possible to vary any detail.
of construction that does not influence the essential parts of the apparatus just described; consequently the form may be different from that shown and the apparatus may be constructed to deal with any suitable quantity of intestines, both in the raw state as well as in a manufactured state, the intestines being rolled on glass tubes which are arranged in the interior of the apparatus for their sterilization.

Claim:

1. An electrical apparatus for sterilizing intestines especially catgut, comprising in combination, a receptacle made of a poor conductor of electric currents, such as glass, adapted to contain the intestines to be sterilized, and having an electrolyte therein of sufficient quantity to submerge the intestines contained in the receptacle, the receptacle being in the form of an opened tubular member, a removable bottom member for the tubular member made of a poor conductor of electric currents, such as rubber, means comprising electrodes arranged to extend into the receptacle and the electrolyte therein for passing the electric current through the electrolyte, a support within the receptacle for the intestines, the support and the lower electrode being carried by and removable with the bottom member, and a jacket carried by and surrounding the receptacle and having inlet and outlet apertures, respectively, for enabling a cooling fluid to circulate through the jacket for cooling the electrolyte.

2. An electrical apparatus for sterilizing intestines especially catgut, comprising in combination, a receptacle made of a poor conductor of electric currents, such as glass, adapted to contain the intestines to be sterilized and having an electrolyte therein of sufficient quantity to submerge the intestines contained in the receptacle, the receptacle being in the form of a tubular member open at the upper and lower ends, a removable bottom member for the tubular member made of a poor conductor of electric currents, such as rubber, a support for the intestines carried by the removable bottom, means comprising upper and lower electrodes arranged to extend into the receptacle and the electrolyte therein for passing an electric current through the electrolyte, the lowermost of the electrodes being also carried by the removable member, and a jacket surrounding the tubular member from a point adjacent the lower end to the upper end, leaving the lower end free so as to permit removal of the bottom member, the jacket having inlet and outlet apertures, respectively, for enabling a cooling fluid to circulate through the jacket for cooling the electrolyte.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,754,574</td>
<td>Sater</td>
<td>Apr. 15, 1930</td>
</tr>
<tr>
<td>657,207</td>
<td>Washburn</td>
<td>Sept. 4, 1900</td>
</tr>
<tr>
<td>1,067,567</td>
<td>Mauldin</td>
<td>Apr. 1, 1913</td>
</tr>
<tr>
<td>1,984,966</td>
<td>Anglin</td>
<td>Dec. 18, 1934</td>
</tr>
<tr>
<td>2,282,024</td>
<td>Bitner</td>
<td>May 5, 1942</td>
</tr>
<tr>
<td>1,522,188</td>
<td>Hull</td>
<td>Jan. 6, 1925</td>
</tr>
</tbody>
</table>