United States Patent [19]

Patterson

[11] **3,750,646**

[45] **Aug. 7, 1973**

[54] **TRANSPORT SYSTEM FOR BACTERIA WITH PROVISIONS FOR CARBOGENOPHILIC ORGANISMS**

[76] Inventor: **Charles C. Patterson,** 4315 Ridgecrest Dr., El Passo, Colo. 80907

[22] Filed: **Dec. 16, 1971**

[21] Appl. No.: **208,620**

[52] **U.S. Cl.** ..... **128/2 B,** 128/2 W, 195/103.5 R

[51] **Int. Cl.** **A61b 10/00**

[58] **Field of Search** ..... 128/2 B, 2 W, 2 R, 128/304; 195/103.5 R; 56/44, 178; 272/27 N

[56] **References Cited**

UNITED STATES PATENTS

2,701,559	2/1955	Cooper	128/2 B
3,540,432	11/1970	Aure	128/2 B
3,388,043	6/1968	Ingvorsen	128/2 W X
2,851,270	9/1958	Ball	272/27 N
530,909	12/1899	Stone	46/178
3,368,549	2/1968	Barr et al.	128/2 W
3,308,039	3/1967	Nelson	128/2 W X
3,450,129	6/1969	Avery et al.	128/2 W

FOREIGN PATENTS OR APPLICATIONS

215,350	10/1909	Germany	128/2 B

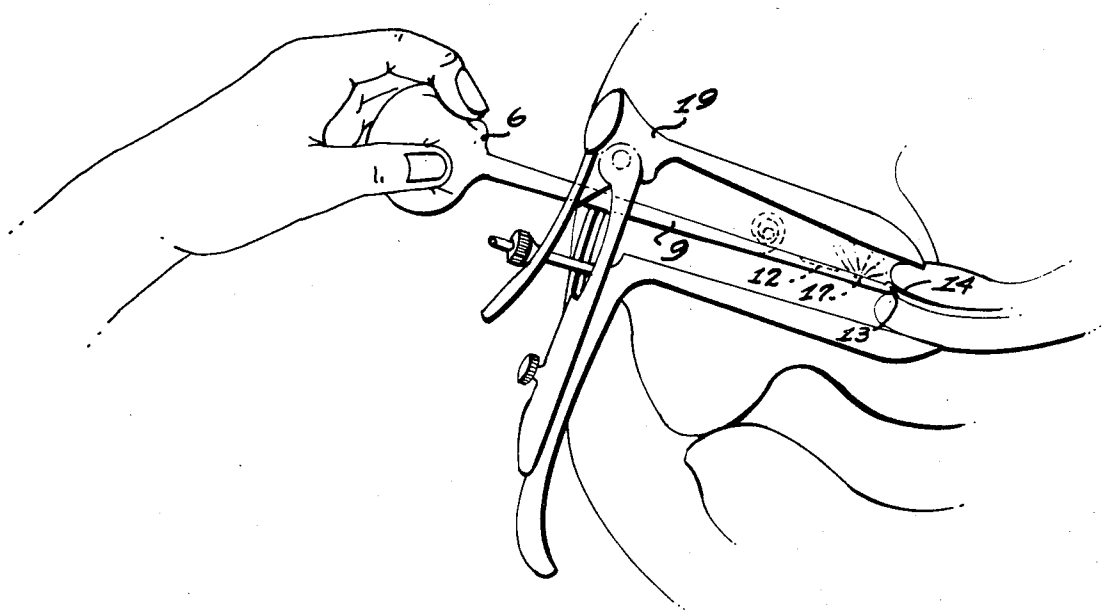
Primary Examiner—Kyle L. Howell

Attorney—Richard W. Hanes

[57] **ABSTRACT**

The present invention pertains to instruments for the collection and transport of bacterial specimens and more particularly to means for collection of body secretions, comprising a collapsible bulb filled with a gas, a flexible tubular extension carried by the bulb, wherein the interior of the tubular extension is in communication with the interior of the bulb, and means for carrying a culture medium for bacteria at the free end of said extension, and wherein said extension is extendable upon exhausting the gas from the interior of the bulb.

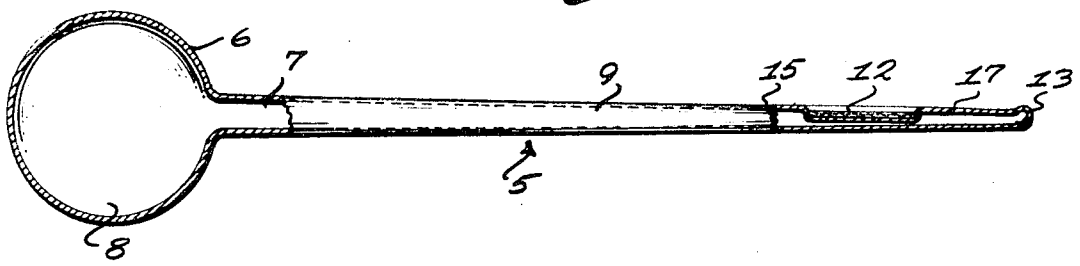
3 Claims, 5 Drawing Figures



PATENTED AUG 7 1973

3,750,646

Fig. 1



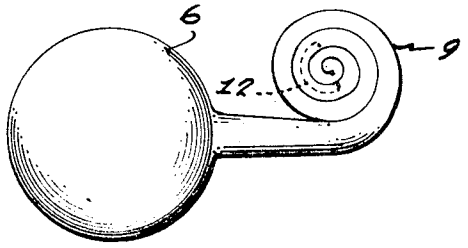


Fig. 2

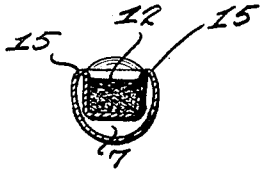


Fig. 3

Fig. 4



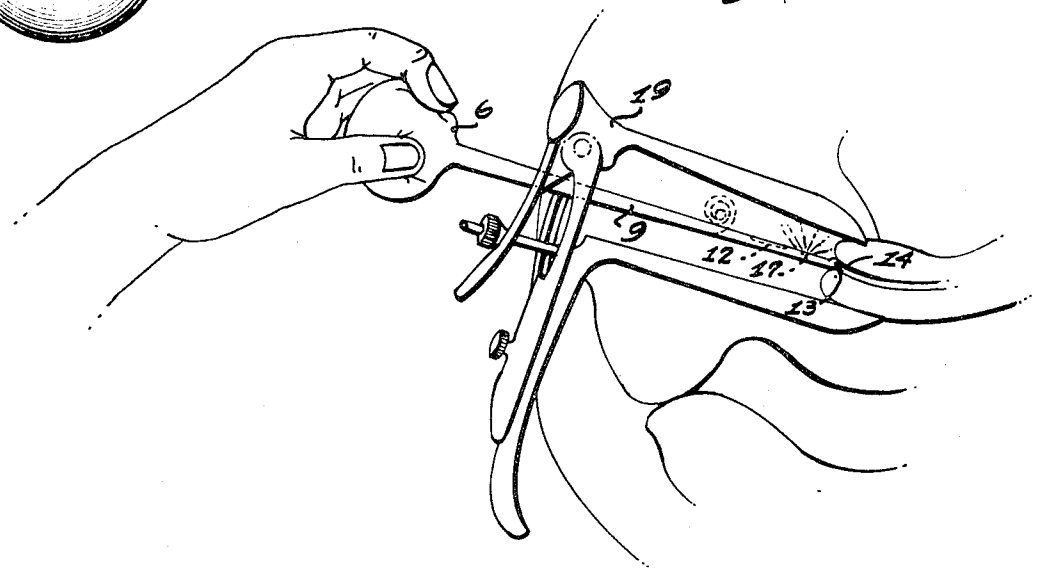


Fig. 5

INVENTOR
CHARLES C. PATTERSON
BY
Richard W. Hanes
ATTORNEY

TRANSPORT SYSTEM FOR BACTERIA WITH PROVISIONS FOR CARBOGENOPHILIC ORGANISMS

The primary object of the invention is to provide a disposable and expendable devise for the one-time collection of bacterial organisms where the collecting probe, culture media and transport device are embodied in a single unit.

A second object of the invention is to provide a device of the character described which also provides the required gaseous environment for maximum growth of the specimen bacteria once they are streaked across the culture medium by the collecting tip of the device.

A further object of the invention is to provide a collecting device of the type described which is capable of extension into body cavities while at the same time being compact for transport.

Other and still further objects, features and advantages of the device of the present invention will be recognized from a reading of the following detailed description of a preferred form of the invention taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a longitudinal cross-sectional view of the transport device of the present invention showing the tube in extended position.

FIG. 2 is a side view of the device of the present invention in its recoiled position.

FIG. 3 is a cross-sectional view taken along lines 3—3 in FIG. 4.

FIG. 4 is a top view of the device of the present invention with the tube shown in its elongated position.

FIG. 5 is a perspective view of the device in use with the aid of a speculum.

When it becomes necessary or desirable in the diagnosis of disease to identify or classify bacterial organisms, at least two methods are in common use. One is by microscopic examination of a direct smear of exudate or other substance. When identification is impossible by such a method, the organisms may be visualized by a process of incubation in a culture medium where the bacteria multiply rapidly and form macroscopic colonies which can be seen and identified by various processes such as staining. Growth of such colony formations can be accomplished in many instances in 24 to 48 hours when the bacteria is supplied with adequate food, proper temperature, moisture, and a solid or semi-solid supporting base, the latter often being called the culture media.

The current increase in incidence of Neiserria organisms in the general population necessitates prompt diagnosis, which implies efficient means of gathering bacterial specimens and identifying the same with the least possible cost and time expenditure.

One of the most prevalent and fastest growing of such organisms in current society is Neiserria Gonorrhea. In order to collect and identify these organisms in a female, the prior art requires that a specimen be taken by swabing the cervical or endocervical area of the vaginal vault with a cotton-tipped swab, after which the swab cotton is rolled directly onto a Thayer-Martin or Chocolate Agar culture medium in order to transfer the organisms from the swab to the medium. Inasmuch as Neiserria Gonorrhea organisms grow and multiply best in an atmosphere of carbon dioxide, the culture medium is placed in a jar or other container filled with CO_2. Placing the swab in such a container in order to

streak the media therein presents a problem of leveling and capping the container so as not to spill or dilute the carbon dioxide therein. Once the medium has been streaked and the container capped, the jar may be sent to a laboratory where, if sufficient incubation time has elapsed, the culture is examined and identified.

The physical problems involved with swabing, streaking, placing and containing the culture within a specified gaseous environment are basicly the problems to be solved by the present invention. The preferred embodiment will be described in terms of a device designed for collection of Neiserria Gonorrhea specimens using an atmosphere of carbon dioxide, however, the device is not restricted to such limited use.

The collection and transport device **5** of the present invention includes a flexible and collapsible reservoir or bulb **6** adapted to be pressed or squeezed with finger pressure. The bulb **6** is generally spherical in shape and contains a gas with which it is desireable to create a favorable environment for the culture to be taken. In the case of Neiserria Gonorrhea organisms, the gas would preferably be carbon dioxide.

Integrally connected to and formed as a part of the wall of the bulb **6** is an elongated tubular extension **9** having a central bore **7** in communication with the interior **8** of the bulb **6**. The extreme, or free end of the extendable tube **9** is provided with a collecting tip **13** which may be inserted into the endocervical canal **14** or swabbed across the cervix for collecting specimens, as more fully appears in FIG. **5** where the device is shown being used with a speculum **19**.

In order to achieve extension of the specimen gathering tube **9**, the bulb **6** is squeezed to increase the gas pressure within the base **7** of the tube and to hence roll the tube **9** out from its convoluted natural state (FIG. **2**) to an extended state (FIGS. **1**, **3** and **5**) in the same manner as paper party favors are blown into extended lengths.

Once the tube **9** has been extended and the tip **13** has been appropriately swabbed across or into a given area of body tissue, the pressure on the bulb **6** is relaxed, allowing the tube **9** to roll up upon itself and back into its natural state as shown in FIG. **2**.

The tube **9** is constructed in a generally flat configuration as seen in the view of FIG. **3** and near the end thereof is disposed a slab of culture media **12**, for example, Chocolate Agar. The media is held in place by cement or other means within a slightly recessed area in the top surface of the tube **9** and also by the raised side edges **15** of the tube **9**.

Somewhat forward of the media culture site on the tube **9** is a small aperture **17** which opens the interior of the tube **9** to the atmosphere and allows the gas within the bulb **6** to escape into the surrounding area.

In operation, the tip **13** is immersed in an atmosphere of the gas being exhausted by the bulb **6**, for example CO_2, all during the collection of the specimens by swabbing with the tip **13**. Once the specimen is collected and the pressure on the bulb is released, the end of the tube **9** and the tip start to coil and as this is done the tip **13** comes into sliding contact with the culture media **12**, thus streaking the media with the bacterial organisms present on the tip **13**. As the tube **9** coils upon itself under the influence of relaxed gas pressure from the bulb **6**, the raised sides **15** tend to act as sealing means, thus trapping and holding the CO_2 or other gas which has been expelled from the aperture **17**. The

trapped gas continues to create a favorable atmosphere in which to grow colonies of the organisms under study.

When completely recoiled, the entire device, including the streaked culture media, may be placed inside a plastic bag or other container for shipment to a laboratory for examination.

It is to be understood that unless a certain gaseous environment is necessary or desireable for incubating the specimens taken, the bulb **6** may be filled with air, in which case there would be no requirement for the aperture **17** in the tube **9.**

I claim:

1. An article of manufacture for collecting and transporting bacteria, comprising:

a flexible bulb having an opening therein and containing a gas;

a normally spirally wound elongated (flattened) tubular member (carried by) connecting to the opening in said bulb, said tubular member having an internal bore in communication with the interior of said bulb at one end thereof and having the free end thereof closed, (and said tubular member having elastic property means whereby said tubular member will recoil upon itself when in a state of rest) whereby gas forced out of the bulb into the said tubular member will inflate and straighten the same;

bacterial culture medium carried by said tubular member near the free end thereof.

2. The article of claim **1** and further including a small aperture near the free end of said tubular member.

3. The article of claim **2** wherein the (sides of the) tubular member is substantially flat along its topmost surface and having raised edges along both sides of said flat top surface forming sealing means around the said culture medium when the tubular member is in its spirally wound recoiled position.

* * * * *