United States Patent [19]

Rose

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[54] **BLOOD WITHDRAWING MEANS**

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[52] **U.S. Cl.** ..... **128/2 F,** 128/DIG. 5, 128/276, 128/281

[51] **Int. Cl.** **A61b 5/14,** A61m 1/00

[58] **Field of Search** ..... 128/281, 282, 278, 2 F, 128/2 R, DIG. 5, 276, 278, 281, 282

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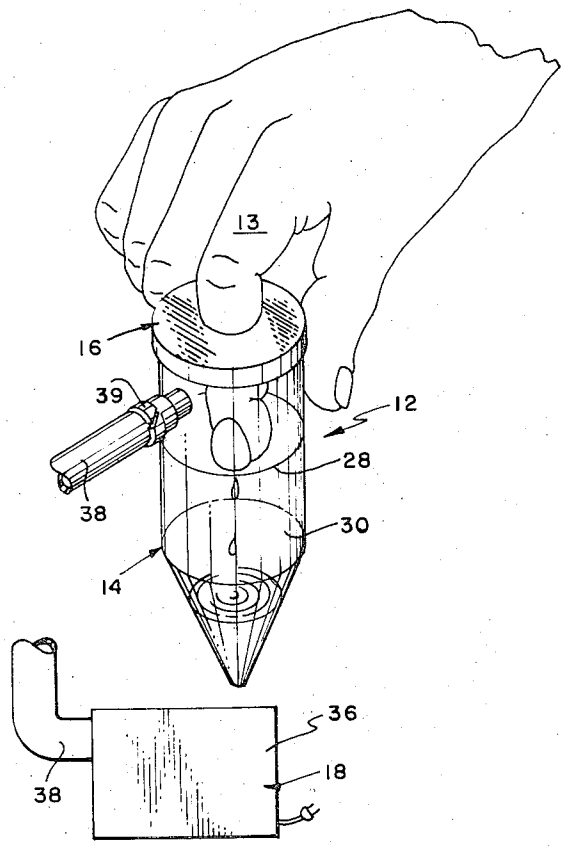
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Primary Examiner—Kyle L. Howell

[57] **ABSTRACT**

A blood withdrawing means including a housing means provided with a cover thereon and having vacuum means connected thereto whereupon one's pricked finger may be placed through the cover means and the vacuum pressure acts to draw blood rapidly therefrom. More particularly, the housing means has a serration interconnection or a screw type connection so that a lower portion can be removed for use in a centrifuge or other similar type medical testing equipment. In another embodiment of this invention, a blood withdrawing means is provided having a flask-like housing means with a cover means, a hanger assembly mounted in the housing means and a vacuum means connected to the housing means. A portion of an animal, such as an ear member, may be pricked and plaaced within the housing means and the vacuum pressure is utilized to remove the blood therefrom. The hanger structure is adjustable so as to be usable for various sizes of animals.

4 Claims, 10 Drawing Figures



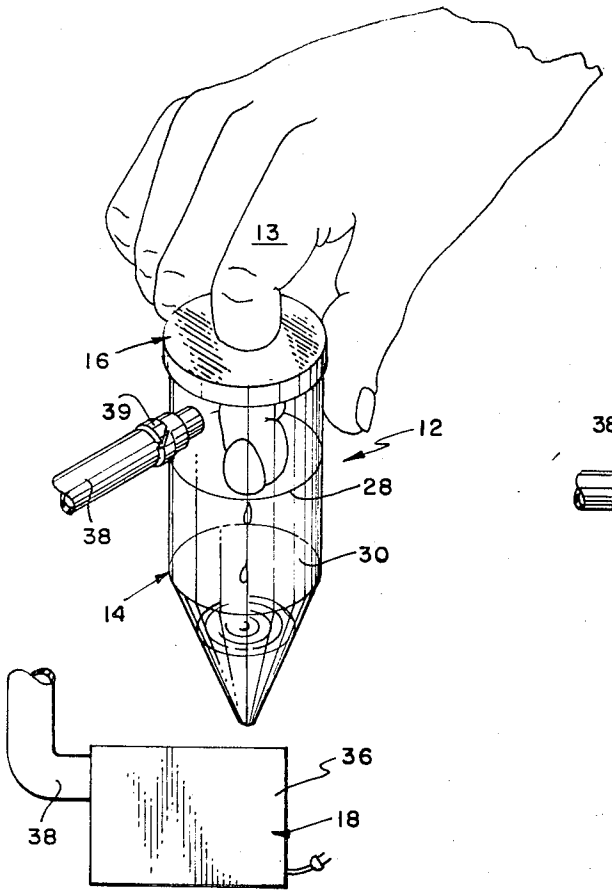


FIG. 1

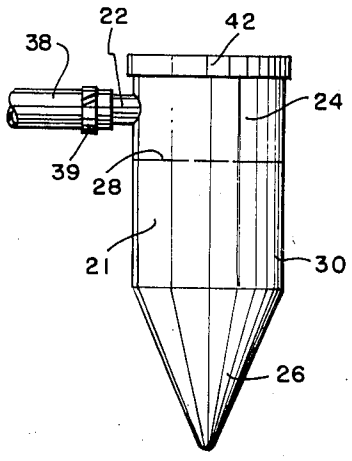


FIG. 2

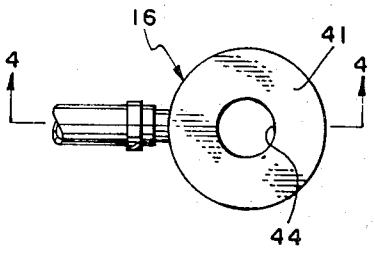


FIG. 3

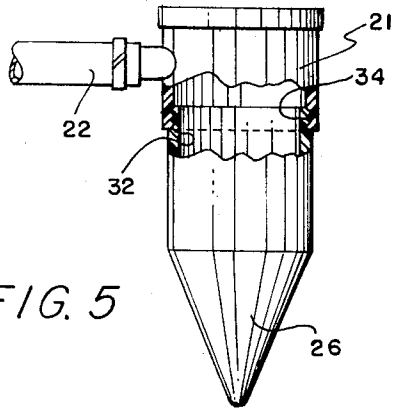


FIG. 5

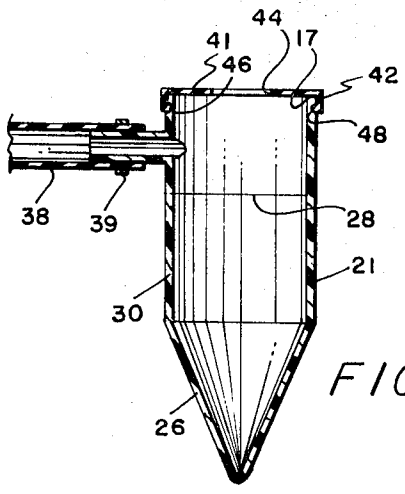
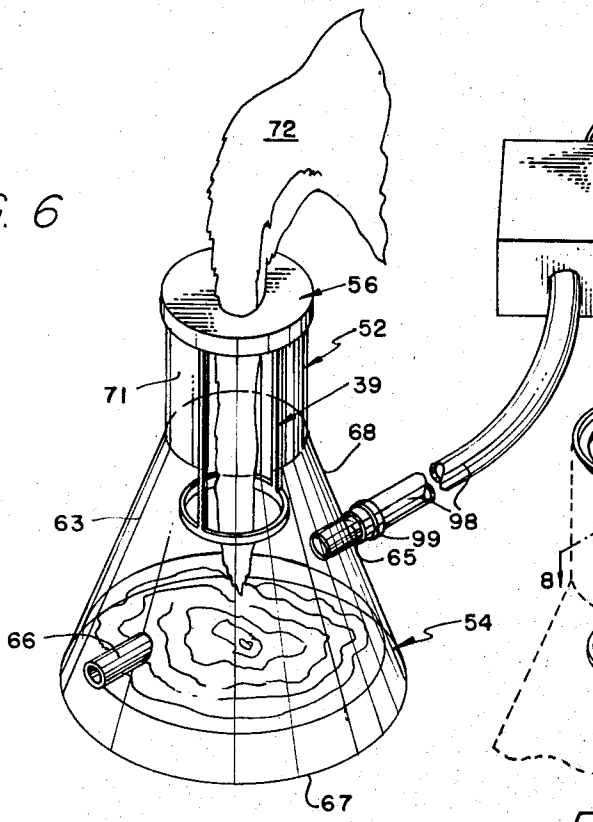


FIG. 4

FIG. 6



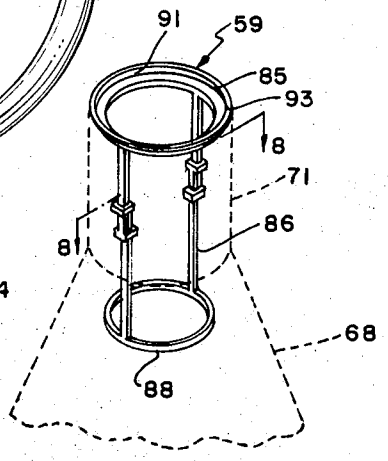


FIG. 7

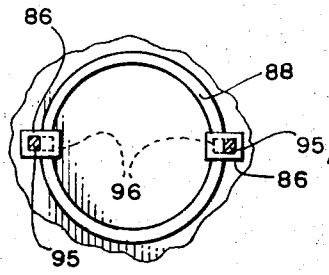


FIG. 8

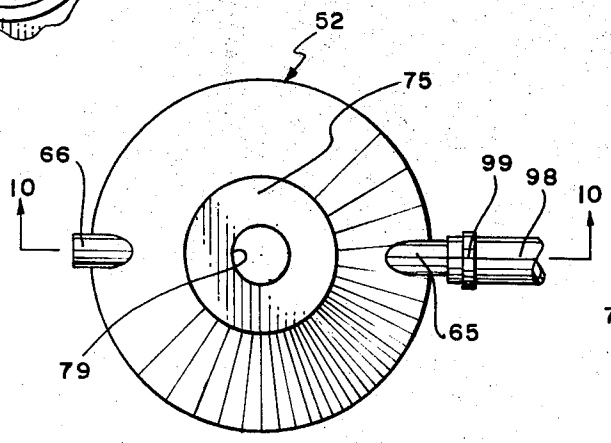
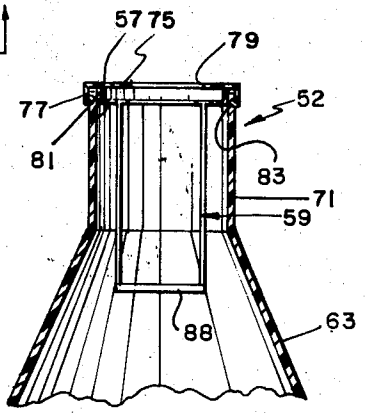


FIG. 9

FIG. 10



BLOOD WITHDRAWING MEANS

BACKGROUND OF THE INVENTION

Although other blood withdrawing structures are shown to the prior art, they are not operable in a manner so as to be easily regulated as to vacuum pressure in order to control the amount of blood flow therefrom. Additionally, the prior art structures are not readily adaptable for use with other laboratory equipment nor able to be constructed of a plastic material in a manner to be readily disposable after each usage.

In one preferred embodiment of this invention, a blood withdrawing means is provided including a first housing means; a cover means to be placed over an open end of the housing means; and a vacuum means operably connected to the housing means. The housing means is of a generally cylindrical shape having the open end and a lower tapered forward section to receive the blood therein. The housing means includes a laterally extended pipe section near the top portion which is attachable to the vacuum means. The cover means is preferably constructed of a resilient type material having a main body with a central hole therein and formed with a downward depending cap section around its outer periphery. The cap section is adapted to be placed about the open end of the housing means so as to provide a seal therewith. In operation, one places a pricked finger through the central hole in the cover member to form an air seal with the person's finger. The vacuum means includes a pump member with a suction line connectable to the pipe member and held thereon by a band member to provide an air tight seal.

In one other preferred embodiment of this invention, a blood withdrawing means is provided having a housing means; a cover means connected to an open end of the housing means; a hanger structure connected to said housing means; and a vacuum means operably connected to said housing means to achieve a vacuum pressure therein. The housing means includes a housing member of a generally flask-shape having a flat bottom and upwardly, inwardly tapered side wall into an upper, integral cylindrical section. Additionally, the housing means is formed with two opposing pipe members integral therewith near a central portion adapted to receive the vacuum means on one and the other pipe member is operable to regulate vacuum pressure during operation. The cover means includes a cover member having a main body with a hole in the center thereof and having downwardly extended, outer flange or cap adapted to engage and seal with the upper opening of the housing member. The hanger assembly includes a first hanger portion having an upper portion engagable with the upper rim of the housing member and having a pair of downwardly depending arms secured at the lowermost ends to diametrically opposed portions of a circular ring. The arms having first and second portions telescopingly engaged to provide for vertical adjustment on using with various animals. It is seen that the hanger assembly could be constructed of various sizes if necessary. The vacuum means includes a pump and motor structure connected by a hose member and a band member to one of the pipe members on the housing means. By closing off the other pipe member with one's finger, the vacuum pressure is regulated within the housing means.

One object of this invention is to provide a blood withdrawing means having a housing means to which a person's finger that has been pricked may be placed in a sanitary condition and utilizing vacuum pressure to achieve rapid withdrawal of the blood which is very necessary in small children.

Another object of this invention is to provide a blood withdrawing means having a housing means; a cover means connected to the housing means and operable to seal one's finger therein; and a vacuum means operable connected to the upper portion of the housing means to create a vacuum pressure therein for the withdrawing of blood.

One other object of this invention is to provide a blood withdrawing means having a housing means formed in two sections which may be separated either by a serration and breaking apart or by having a threaded connector thereon so that the upper portion can be utilized many times while the lower portion may be disposed.

A further object of this invention is to provide a blood withdrawing means usable with one's finger which is economical to manufacture; sanitary in usage; and adapted for use with other test equipment.

One further object of this invention is to provide a blood withdrawing means usable to withdraw blood from animal's ears having a flask-like housing means; a cover means mounted on a housing means to seal with the animal's ear placed therethrough; a hanger assembly mounted within the housing means operable to limit movement of the animal's ear to prevent contamination; and a vacuum means connected to the housing means to achieve vacuum pressure for the removal of a blood sample from the subject animal.

One further object of this invention is to provide a blood withdrawing means having a housing means provided with a control structure to regulate the level of vacuum pressure therewithin.

Still, one further object of this invention is to provide a blood withdrawing means which is simple in construction; economical to use; and subject to foolproof operation.

Various other objects, advantages, and features of the invention will become apparent to those skilled in the art from the following discussion, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a blood withdrawing means of this invention illustrating its use and operation on having a person's finger therein;

FIG. 2 is a fragmentary, side elevational view of the blood withdrawing means of this invention;

FIG. 3 is a fragmentary, top plan view of the blood withdrawing means of this invention;

FIG. 4 is a sectional view taken along line 4—4 in FIG. 3;

FIG. 5 is a view similar to FIG. 2 having a portion broken away illustrating another connection embodiment;

FIG. 6 is a perspective view of a second embodiment of a blood withdrawing means of this invention usable to take samples from animals;

FIG. 7 is a perspective view of a hanger assembly of the blood withdrawing means of this invention having a fragmentary view of the housing shown in dotted lines;

FIG. 8 is an enlarged, sectional view taken along line 8—8 in FIG. 7 illustrating the telescoping adjustment of the hanger assembly;

FIG. 9 is a top plan view of the second embodiment blood withdrawing means of this invention; and

FIG. 10 is a fragmentary, sectional view taken along line 10—10 in FIG. 9.

The following is a discussion and description of preferred specific embodiments of the new blood withdrawing means of this invention, such being made with reference to the drawings, whereupon the same reference numerals are used to indicate the same or similar parts and/or structure. It is to be understood that such discussion and description is not to unduly limit the scope of the invention.

Referring to the drawings in detail and in particular to FIG. 1, the blood withdrawing means of this invention, indicated generally at 12, is illustrated as being utilized by having a person's finger 13 inserted therein. The blood withdrawing means 12 includes a housing means 14; a cover means 16 mounted about an open end 17 of the housing means 16; and a vacuum means 18 operably connected to a portion of the housing means 14.

As noted in FIGS. 1 to 5, the housing means 14 includes a main housing body 21 having a laterally extended pipe member 22 adjacent the open end 17 thereof. The housing body 21 is provided with a cylindrical main section 24 having its lower end formed in a funnel or tapered end section 26 to receive the blood or other fluid sample therein. The main section 24 may be provided with a circumferential serration indicated generally at 28 so that a lower section 30 may be broken loose for placing in a centrifuge for testing of the sample. In the alternative as shown in FIG. 5, it is seen that the housing body 21 is constructed of a plastic material provided with a male thread 32 and a female thread 34 so that the lower section 30 can be removed. With this threaded connection, the lower section 30 can be removed for sampling and that the cylindrical main section 24 can be readily attached to other such lower sections 30 for taking blood and fluid samples.

The vacuum means 18 can be of various types but is shown here as a pump and motor structure 36 which may be battery operated or through a conventional 110 volt electrical current. The vacuum means 18 could be a hand operated pump if desired. It is noted that the vacuum means 18 is operable in a conventional manner so as to provide a vacuum suction within a connector line 38 which is secured to the laterally extended pipe member 22 by a band member 39 to provide an air tight seal therewith.

The cover means 16 includes a main body section 41 having a downwardly extended cap or flange 42 about its periphery. A hole 44 is formed in the center of the main body section 41 so as to receive a person's finger 13 therein as shown in FIG. 1. The flange 42 is provided with an outer, inwardly extended rim portion 46 so as to provide the proper seal with the open end 17 in a groove 48 of the housing means 14 as shown in FIG. 4.

In the use and operation of the blood withdrawing means 12 of this invention, it is intended to remove a blood sample from one with the least amount of discomfort and receive a sufficient amount of blood or fluid sample on a single pricking of one's finger. The blood withdrawing means 12 may be constructed of a glass material or an inexpensive plastic material and packaged in sterilized cellophane containers so as to be disposable after usage.

On usage, it is seen that the finger 13, having been pricked, is placed through the central hole 44 on the cover means 16 whereupon the vacuum means 18 is activated. The cover means 16 seals about the finger 13 and, with the vacuum pressure thereon, the blood readily flows. After the sample has been obtained, it is obvious that the person's finger 13 can be removed therefrom and the connector line 38 disconnected from the pipe stem 22. Thereupon, the lower section 30 if constructed of glass can be readily detached along the serration 28 and placed within a centrifuge for testing. In the alternative as shown in FIG. 5, it is seen that the lower section 30 may be removed due to the threaded connection for sampling. In this embodiment, the entire structure can be sterilized and re-used.

In the second embodiment of this invention as shown in FIG. 6, a blood withdrawing means 52 is provided for withdrawing blood samples from animal's such as through their ears. The blood withdrawing means 52 includes a housing means 54; a cover means 56 to cover an open end 57 of the housing means 54; and a vacuum means 61 connected to the housing means 54 to create a vacuum pressure therein.

The housing means 54 includes a main flask-shaped housing member 63 having a pair of opposed laterally extended pipe stems 65 and 66 connected thereto. The flask or housing member 63 is provided with a flat bottom 67 with upwardly, inwardly, tapering side walls 68 to an upper cylindrical section 71 having the enlarged open end 57 at the top thereof. The cylindrical section 71 and open end 57 is of such a size as to readily receive an animal's ear 72 for taking a blood sample therefrom. The open end 57 may be formed with a top rim to receive the cover means 56 thereon in a sealed condition as will be explained. The pipe stems 65 and 66 are integral portions of the housing member, one adapted to receive the vacuum means 61 connected thereto and the other to regulate the vacuum pressure as will become obvious.

The cover means 56 is constructed of a flexible material having a main body 75 and a downwardly extended cap or flange 77 about its outer periphery. The main body 75 is provided with a central hole 79 to receive the animal's ear therewithin and seal against air flow thereabout for necessity in operation as will be explained. The outer flange 77 is provided with an integral, inwardly extended rim portion 81 adapted to fit within a groove 83 in the upper cylindrical main section 71 of the housing means 54 for sealing therewith.

The hanger assembly 59 includes an upper rim section 85 having two downwardly depending leg sections 86 interconnected on opposite sides of a horizontally disposed ring member 88. The rim section 85 is provided with an upright cylindrical wall 91 and an outwardly extended flange section 93 whereupon the flange section 93 is adapted to rest on the upper surface of the cylindrical main section 71 of the housing means 54 as shown in FIG. 7.

The leg sections 86 are each formed in upper and lower telescoping portions 95 and 96 so that the positioning of the horizontal ring member 88 can be varied vertically depending on the size and length of animal's ear utilizing same. The hanger assembly 59 is necessary in order to maintain cleanliness and prevent the ani-

mal's ear from touching the side walls **68** of the housing member **63.**

The vacuum means **61** is a pump and motor assembly **97** operable to create a vacuum pressure through connector line **98** which is secured to the pipe stem **65** and sealed therewith as by a band member **99.**

In the use and operation of the blood withdrawing means **52** of this invention, the animal's ear structure **72** is punctured and then placed within the central hole **79** in the cover means **56** as shown in FIG. **6.** Next, the vacuum means **61** is energized with the connector line **98** connected to the housing member **63** to create a vacuum pressure therewithin. The vacuum pressure is created and regulated by the closing of the other opening through the pipe stem **66** by placing one's finger thereupon. It is noted that by varying the size of the opening of the pipe stem **66** through one's finger, or other means, the vacuum pressure therewithin can be regulated so that the desirable amount of blood or fluid sample can be obtained in the housing means **54.** It is noted that the hanger assembly **59** and, more specifically, the ring member **88** can be varied in a vertical position so as to be utilized on animal's ears of various sizes.

It is obvious that the housing means **54** can be sterilized in this instance and used many times over as the cover means **56** and hanger assembly **59** are readily disassembled for cleansing purposes.

It is seen that the first embodiment of the blood withdrawing means of this invention is utilized on one's finger for drawing a blood sample and presents a structure which is economical to manufacture and package; simple in operation; and effective to remove a large portion of blood from the patient's finger in the minimum amount of time and effort. The blood withdrawing means can be provided with a permanent or a throw away type structure as desired. In this second embodiment of the invention, the blood withdrawing means for utilization on animals presents a compact structure whereupon the vacuum pressure can be readily adjusted by variation of an opening into the housing means. This could also be achieved by a variable valve member to regulate an exhaust part.

While the invention is described in conjunction with preferred specific embodiments thereof, it will be understood that this description is intended to illustrate and not to limit the scope of the invention, which is defined by the following claims.

I claim:

1. A blood withdrawing means, comprising:

a. a housing means providing a container structure having an open end and a laterally extended connector portion,

b. a cover means mounted on said open end of said housing means and having an opening therein adapted to receive and seal about a portion of a person from which a fluid sample is to be taken,

c. a vacuum means mounted through a connector line to said connector portion on said housing means operable to create a vacuum pressure within said housing means wherein said cover means creates an air pressure seal about said person's portion placed through said central opening for withdrawing the sample therefrom, and

d. said housing means having a main body portion integral with a lower tapered end portion, said body portion having a serration about its circumference above said end portion whereupon said end portion could readily be removed from said body portion and placed in a centrifuge machine for testing purposes.

2. A blood withdrawing means, comprises:

a. a housing means providing a container structure having an open end and a laterally extended connector portion,

b. a cover means mounted on said open end of said housing means and having an opening therein adapted to receive and seal about a portion of a person from which a fluid sample is to be taken,

c. a vacuum means mounted through a connector line to said connector portion on said housing means operable to create a vacuum pressure within said housing means wherein said cover means creates an air pressure seal about said person's portion placed through said central opening for withdrawing the sample therefrom,

d. said housing means having a main body portion integral with an end portion, and

e. said body portion having connector means above said end portion, whereupon said end portion could readily be removed from said body portion and placed in a centrifuge machine for testing purposes.

3. A blood withdrawing means as described in claim **2,** wherein: said connector means includes thread means.

4. A blood withdrawing means as described in claim **1,** wherein:

a. said cover means including a main section having said opening being a hole therewithin adapted to receive a finger member of said person's portion for sampling and having a downwardly, depending wall rim portion to sealingly engage with said open end of said housing means so that the vacuum pressure therewithin is adapted to be directed against said finger member without air leakage thereabout.

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