Aug. 23, 1966 A. W. TALLEY 3,268,160

CENTRIFUGE

Filed April 6, 1964

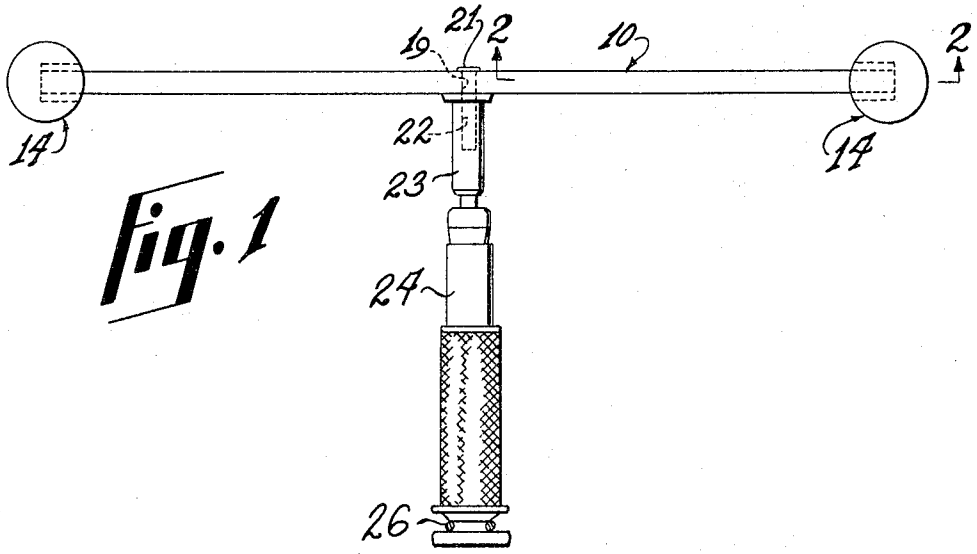


Fig. 1

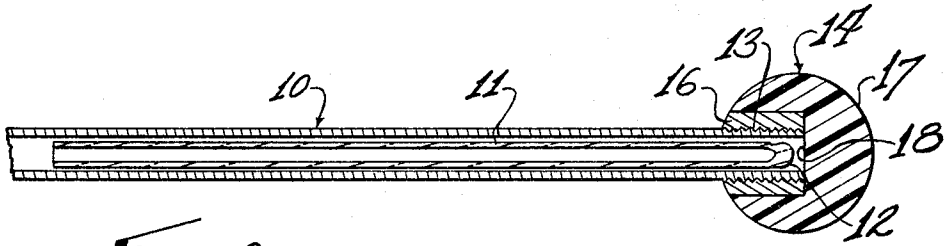


Fig. 2

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CENTRIFUGE

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This invention relates to a centrifuge and more particularly to a centrifuge for materials carried in elongated receptacles, such as capillary tubes and the like.

An object of my invention is to provide a centrifuge which may be easily and quickly mounted on a rotating tool, such as the mandrel of a dental hand-piece.

Another object of my invention is to provide a centrifuge of the character designated which shall be particularly adapted for testing blood or other specimens carried in capillary tubes with one end of each capillary tube being sealed and the other or inner end thereof being open.

A further object of my invention is to provide a centrifuge of the character designated which shall include an elongated tube-like member having removable closure members at each end thereof whereby the receptacles carrying the specimens may be readily introduced and removed from the apparatus.

A further object of my invention is to provide a centrifuge of the character designated which shall be simple of construction, economical of manufacture and one which may be operated and maintained in a clean and sanitary condition at all times.

Heretofore in the art to which my invention relates, various type centrifuges have been proposed. However, such centrifuges have been unsatisfactory due to the fact that they are complicated in structure and embody parts which must move from one position while stationary to another position upon imparting rotation thereto. In accordance with the present invention, I provide an elongated tube-like member of a size and length to receive an elongated receptacle, such as a capillary tube. The ends of the tube-like member are closed by removable closure members. A mandrel is secured non-rotatably adjacent one end to the tube-like member intermediate the ends thereof while the other end of the mandrel is adapted to be connected to a rotary drive member, such as a dental hand-piece.

Apparatus embodying features of my invention is illustrated in the accompanying drawing, forming a part of this application, in which:

FIG. 1 is a side elevational view showing the centrifuge attached to a dental hand-piece; and,

FIG. 2 is an enlarged, sectional view taken generally along the line 2—2 of FIG. 1.

Referring now to the drawing for a better understanding of my invention, I show an elongated tube-like member **10** which may be formed of a suitable material, such as stainless steel or the like. As shown in FIG. 2, the tube-like member **10** is of a size and length for each end thereof to receive an elongated receptacle, such as a capillary tube **11**. A specimen of blood or other material is drawn inwardly of the capillary tube **11** and one end thereof is closed as at **12** by suitable means, such as by heating that end of the tube above its melting point. I have found that my improved apparatus is particularly adapted for use with relatively small capillary tubes approximately 3 inches in length. Where such small capillary tubes are employed, the inside diameter of the tube-like member **10** is approximately .062 inch. However, it will be apparent that the inside diameter of the tube-like member **10** is dependent upon the outside diameter of the capillary tube or other receptacle placed therein.

Each end of the tube-like member **10** is provided with external threads **13** for receiving the internal threads of a closure member indicated generally at **14**. Each closure member **14** comprises a nut-like member **16** having internal threads which engage the external threads **13** on the tube-like member **10**, as shown in FIG. 2. The outer end of the internally threaded member **16** is closed by a backing member **17** which is preferably formed of a suitable resin, such as acrylic resin. Accordingly, the backing member **17** not only closes the outer ends of the tube-like member **10**, but forms a seat **18** which is in position to engage the outer end of the capillary tube **11** as the same is moved outwardly by centrifugal force. By forming the backing member **17** of a resin-like material, the tube **10** may be balanced by removing the required amount of the resin material.

To impart rotation to the tube-like member **10**, a centrally disposed opening **19** is provided therein for receiving a retaining element, such as a screw **21**. As shown in FIG. 1, an axially extending threaded opening **22** is provided in one end of a mandrel **23** for receiving the retaining screw **21**. The other end of the mandrel **23** is adapted to be attached to a rotary drive member, such as a dental hand-piece **24** which is driven by suitable means, such as a drive belt **26**, in a manner well understood in the art. Preferably, the mandrel **23** is secured rigidly to the tube-like member **10** by suitable means, such as by solder, to prevent unscrewing or separation of the tube-like member **10** from the mandrel **23** upon braking the apparatus.

From the foregoing description the operation of my improved apparatus will be readily understood. The removable closure members **14** are removed from the ends of the tube-like member **10** and the capillary tubes **11** containing the desired specimen are inserted into each end of the tube-like member **10**. The closure members **14** are then threaded onto the threaded ends **13** of the tube-like member whereby the seats **18** are in position to limit outward movement of the capillary tubes **11** upon imparting rotation to the tube-like member **10**. The mandrel **23** is attached to the rotary member **24**. Upon imparting rotary motion to the mandrel **23**, the tube-like member **10** revolves whereby the constituents of the material within the capillary tube **11** are separated by centrifugal action. To remove the capillary tubes **11**, the closure members **14** are removed from the threads **13** whereupon the capillary tubes are free to slide outwardly of the open threads of the elongated tube-like member **10**. In actual practice, I have found that fluids remain in the capillary tubes **11** even though the inner ends thereof are left open and the tubes are positioned in a horizontal position. By heating the outer ends of the capillary tubes at **12**, the sealed ends prevent outward movement of the fluids upon rotation of the tube-like member **10** and at the same time engage the seats **18** to limit outward movement of the capillary tubes.

From the foregoing, it will be seen that I have devised an improved centrifuge for materials carried in elongated receptacles, such as capillary tubes and the like. By providing an elongated, tube-like member for receiving the capillary tubes at each end thereof, together with means for closing the outer ends of the tube-like member, I provide a seat for the outer ends of the capillary tubes. Also, the apparatus is extremely simple to assemble and disassemble and at the same time is adapted for easy attachment to a portable tool, such as a dental hand piece. By providing a centrifuge which consists of a minimum of parts and contains no parts which must move from a vertical position to a horizontal position, the apparatus is trouble-free in operation and may be maintained in a clean and sanitary condition with a minimum of effort. Furthermore, by providing a centrifuge in which the parts thereof are adapted to lie in a single plane, my improved apparatus requires a minimum of space for storage and shipment.

While I have shown my invention in but one form, it

will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claim.

What I claim is:

In a centrifuge for materials carried in elongated receptacles:

(a) an elongated tube-like member of a size and length for each end thereof to receive one of said receptacles,

(b) said elongated tube-like member being provided with external threads adjacent each end thereof,

(c) removable closure members having internal threads engaging said external threads at the ends of said elongated tube-like member, said members comprising nuts with resin-like outer coverings to facilitate balancing of the centrifuge by removing some of the resin, and

(d) a mandrel secured non-rotatably to said tube-like member intermediate the ends of said tube-like member near the middle thereof with the other end of said mandrel having means for connecting to a rotary drive member whereby rotary motion is imparted to said mandrel and said elongated tube-like member carried thereby.

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