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BLOOD SAMPLER

Filed Sept. 21, 1961

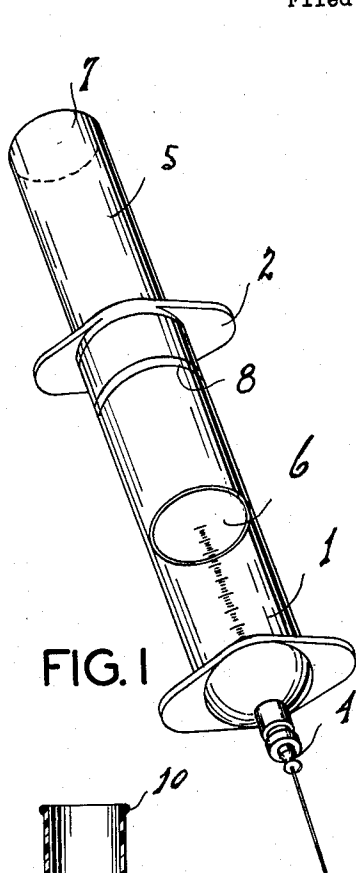


FIG. 1

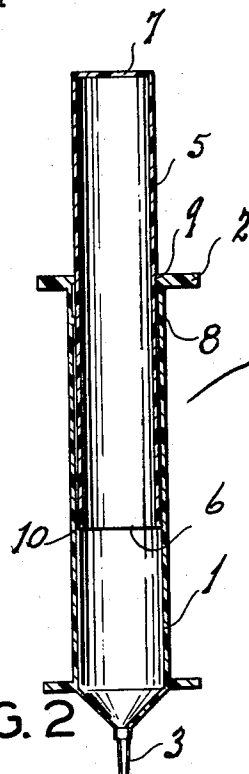


FIG. 2

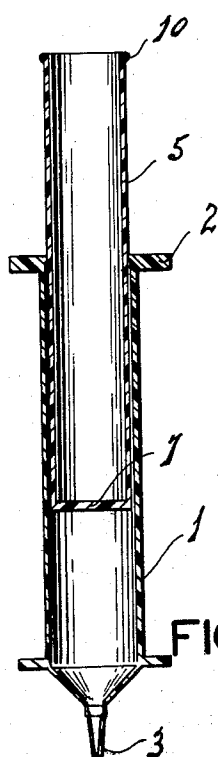


FIG. 4

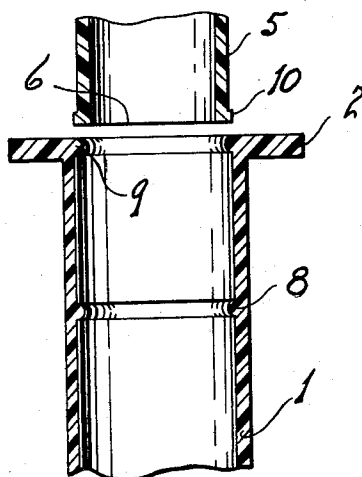


FIG. 3

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BLOOD SAMPLER

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1 Claim. (Cl. 128—220)

This invention relates to a blood sampler with which a sample of blood can be taken from a patient for purposes of examination and testing. My invention can also be used as an injection syringe if the user desires to thus use it.

An object of my invention is to provide a novel blood sampler in which the plunger portion thereof can also be used as a container or test tube for the blood after it is removed from the patient.

Another object of my invention is to provide a blood sampler of the character stated in which the hollow or open ended plunger can be closed or sealed by means of a plug if it is desired to use the sampler as a syringe.

Still another object of my invention is to provide a blood sampler in which there are no gaskets for sealing purposes, since the construction of the sampler is such that it will effectively seal without gaskets, and also without requiring hand assembly or finish grinding of any kind.

Still another object of my invention is to provide a blood sampler in which the cylinder portion thereof is provided with two adjacent inwardly projecting rings which engage the plunger or piston portion of the sampler, the lowermost ring serving as a seal and the uppermost ring serving as a stabilizer or aligning means for the plunger or piston portion.

Another feature of my invention resides in the fact that the entire blood sampler can be formed of a plastic material which requires no finishing or machining of any kind, and also where the plunger portion will compress or distort sufficiently to permit the plunger to pass the sealing rings in the cylinder portion, and also will effectively seal against pressure leakage.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

In the drawing:

FIGURE 1 is a perspective view of my blood sampler.

FIGURE 2 is a longitudinal sectional view of the same.

FIGURE 3 is a fragmentary longitudinal sectional view on an enlarged scale of the blood sampler.

FIGURE 4 is a longitudinal sectional view of a blood sampler when used as an injection syringe.

Referring more particularly to the drawing, the numeral 1 indicates the cylinder portion of my blood sampler, and this cylinder portion is formed of a plastic material which can be easily and inexpensively molded in a suitable mold. The cylinder 1 includes an outwardly projecting flange 2 at its upper end which serves as a finger hold when the sampler is in use. The lower end of the cylinder tapers to a nipple 3 on which the usual and well known hypodermic needle 4 is secured. A plunger 5 is slidably mounted in the cylinder 1 and this plunger is also formed of a suitable molded plastic material which is preferably slightly distortable or compressible, for reasons which will be subsequently described. The plunger 5 is open at its lower end, as shown at 6, and is closed at its upper end by the wall 7; thus it will be evident that when the blood sampler is filled with a quantity of blood from the patient that it can be inverted with the

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wall 7 downwardly, thus permitting the blood to drain into the plunger 5 and from which the blood can then be taken in the same manner as a test tube for testing or examination.

If it should be desired to use the device as a hypodermic or injection syringe, the opening 6 could be sealed with a plug (not shown), or the plunger 5 could be inverted as shown in FIGURE 4, in which event the wall 7 is downwardly and thus acts as a solid piston for injection purposes.

Adjacent its upper end the cylinder 1 is formed with a lower inwardly projecting ring 8 and an upper inwardly projecting ring 9. These two inwardly projecting rings engage the wall of the plunger 5 and serve to seal the plunger to prevent leakage. The rings 8—9 being spaced, will also serve to stabilize or prevent wobble of the plunger 5 while in use. The plunger 5 is also formed with an outwardly projecting sealing ring 10 at its lower end, that is, adjacent the open end 6. This ring also has a sealing function, in that it engages the inner wall of the cylinder 1.

Since the plunger 5 is formed of a yieldable or distortable plastic, it can readily be forced past the inwardly projecting rings 8 and 9 when the plunger 5 is being inserted into the cylinder 1. The projecting rings 8 and 10 will also engage when the plunger 5 is almost entirely withdrawn from the cylinder 1, and will thus act as a warning to prevent accidental and complete withdrawal of the plunger 5 from the cylinder. It will be evident that the interengaging parts of my blood sampler, namely, the inner surface of the cylinder 1, as well as the outer surface of the plunger 5 will not require any final finishing or machining of any kind in order to fit accurately together, and to provide the required partial vacuum when used as a blood sampler, or the required pressure when used as an injection syringe.

Having described my invention, I claim:

A blood sampler comprising a thin walled cylinder formed of a nonmetallic material which has a limited expansion and contraction under pressure, means mounting a hypodermic needle on one end of said cylinder, the end of the cylinder opposite said needle being open, a plunger slidably mounted in said cylinder, said plunger being formed of a nonmetallic material which has a limited expansion and contraction under pressure, the end of the plunger within the cylinder being open and the end of the plunger on the outside of the cylinder being closed, an inwardly projecting sealing ring adjacent the open end of the cylinder and integrally formed with the cylinder, said ring bearing against the plunger, and a sealing ring integrally formed on the plunger adjacent the open end of the plunger, said last named sealing ring engaging the wall of the cylinder.

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