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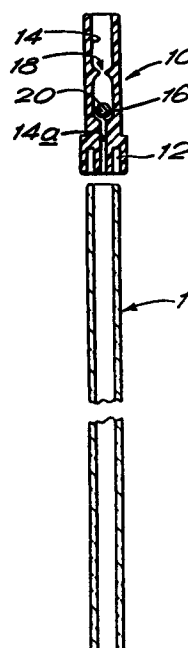
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**Sample tube valve body.**

A sample tube valve body (10) comprises a tubular body formed at one end with e.g. a socket (12) for attachment to an end of an e.g. glass tube (1), the tubular body being formed with a restriction in internal diameter at (16) and provided with a valve member (20) (e.g. a lead shot) between the restriction (16) and the opposite end of the tubular body. With the valve body (10) attached to the tube (1), a sample of e.g. blood may be drawn up to the tube by suction to above the restriction (16), then allowed to drain down, in which case the sample will be held at the level of the valve member (20) seating on the restriction (16) by surface tension effects. The valve body is simple to manufacture and may be disposed of after use, whilst the tube (1) may be washed and re-used.



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SAMPLE TUBE VALVE BODY

This invention relates to a valve body for a sample tube and to a sample tube which includes such a valve body.

My U.K. patent specification No. 2 040 183 describes a sample tube for obtaining a column of liquid (principally  
5 blood) of predetermined height in the laboratory. A particular test is then to allow sediments in the liquid to settle over a period of time and this test is applicable to blood analysis. The sample tube described in my U.K. patent specification No. 2 040 183 comprises a length of  
10 glass tube having a local restriction in internal diameter at a predetermined distance from one end and a valve member, conveniently a lead shot, disposed in the tube between the restriction and the other end of the tube: a further local restriction is formed in the tube either at  
15 that other end or between that other end and the first restriction and the lead shot is free to displace along the tube between the two restrictions. In use, the one end of the tube is dipped into the sample liquid to be tested and suction is applied to the other, upper end to  
20 draw the liquid into the tube. The lead shot unseats readily from the first, lower restriction to enable the liquid to be drawn in freely and the suction is removed when the liquid is above this restriction: the lead shot then seats down onto this restriction under its own weight  
25 and the liquid is allowed to drain, passing the lead shot

because this forms an imperfect seal with the restriction. When the liquid has drained to the level of the lead shot and the restriction on which it is seated, the liquid is retained by surface tension effects, interacting with the lead shot and lower restriction. The column of liquid thus obtained is held indefinitely by these surface tension effects.

I have now devised a sample tube arrangement, providing a sample tube which functions the same as the tube of my U.K. patent specification No. 2 040 183, but which facilitates manufacture and also has some advantage in use.

In accordance with this invention, there is provided a sample tube valve body which comprises a tubular body of plastics material formed at one end for attachment to an end of a glass tube and formed with a restriction in internal diameter at a predetermined distance from its said one end, a valve member (e.g. a lead shot) being disposed within the tubular body between the restriction and the opposite end of the tubular body, the valve member being free for movement along the tubular body.

As with the sample tube of my U.K. patent specification No. 2 040 183, the lead shot or other valve member does not need to form a perfect seal with the restriction within the plastics tubular body, as the blood or other liquid will be held to that level by surface tension effects in the same manner as described above.

Also in accordance with this invention, there is provided a sample tube comprising a glass tube having attached to one of its ends a sample tube valve body as defined above. This sample tube is then used in exactly the same manner as the sample tube of my U.K. patent specification No. 2 040 183.

The sample tube in accordance with this present invention is simpler to manufacture. The plastics valve body admits to manufacture by injection moulding and the lead shot or other valve member may be inserted automatically. The glass tube is a plain piece cut to predetermined length and simply burred over at its ends to remove sharp edges. The valve body is then simply fitted to the glass tube, conveniently by pushing the end of the glass tube into an annular socket formed in the end of the plastics tubular body. Also, the entire sample tube need not be disposed of after use: the valve body may be removed from glass tube and disposed of, but the glass tube may be retained, washed and have a fresh valve body fitted to it for re-use.

An embodiment of this invention will now be described by way of example only and with reference to the accompanying drawing, the single Figure of which is longitudinal section through a sample tube in accordance with this invention and showing the valve body about to be fitted to the glass tube.

As shown, the sample tube comprises a plain glass tube 1 of predetermined length and with its opposite ends burred over (by the application of a flame locally) to remove sharp edges. The sample tube further comprises a tubular plastics valve body 10 which is formed with an annular socket 12 at one end, so that an end of the glass tube can be push-fitted into this to assemble the sample tube: the glass tube is a tight fit into the socket 12 so as to form a seal. The longitudinal through-bore 14 of the tubular body is reduced in diameter over a length 14a at its socket end, so providing a restriction 16 at the transition in diameters, a predetermined distance from the socket end of the body. A further local restriction in the diameter of the bore 14 is formed at 18 between the transition or restriction 16 and the other end of

the valve body: a lead shot is disposed in the through-bore 14 between the two restrictions 16,18 and this lead shot 20 forms an imperfect seal when seated on 16. But in use of the sample tube, with the valve body fitted to the end of the glass tube, the function is the same as that of the sample tube described in my U.K. patent specification No. 2 040 183 and the blood or other liquid is retained at the level of the lead shot 20 and its seat 16 by surface tension effects once the liquid has drained down to that level.

The valve body is manufactured by injection moulding and the lead shot is inserted automatically, being pushed in from the top end of the tubular body and past the restriction 18, which thereafter prevents the lead shot from escaping.

It will thus be seen that both the valve body and the glass tube 10 are straightforward to manufacture and fit together, whilst as explained above the valve body is for disposal after use but the glass tube may be washed and fitted with a fresh valve body for re-use.

**CLAIMS:**

1. A sample tube valve body which comprises a tubular body (19) having one end (12) formed for attachment to an end of an e.g. glass tube (1), the tubular body being formed with a restriction (16) in internal diameter at a predetermined distance from its said one end, a valve member (20) being disposed within the tubular body between the restriction (16) and the opposite end of the tubular body and the valve member being free for movement along the tubular body.
2. A sample tube valve body as claimed in claim 1, in which its said one end is formed with an annular socket (12) for receiving said end of said tube (1).
3. A sample tube valve body as claimed in claim 1 or 2, in which the tubular body is formed with a second restriction (18) in internal diameter, spaced from the first restriction (16) towards the opposite end of the tubular body, serving to retain the valve member (20).
4. A sample tube valve body as claimed in any preceding claim, which is manufactured by injection moulding of plastics material.
5. A sample tube valve body as claimed in claim 2, arranged such that the valve member (20) is a push-fit into the valve body from said opposite end and past said second restriction (18).
6. A sample tube valve body as claimed in any preceding claim, in which the valve member (20) comprises a round member (e.g. a lead shot) forming an imperfect seal with the first restriction (16) when the valve body is vertical.

7. A sample tube comprising a length of plain tube (1) having attached to one of its ends a sample tube valve body (10) as claimed in any preceding claim.

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