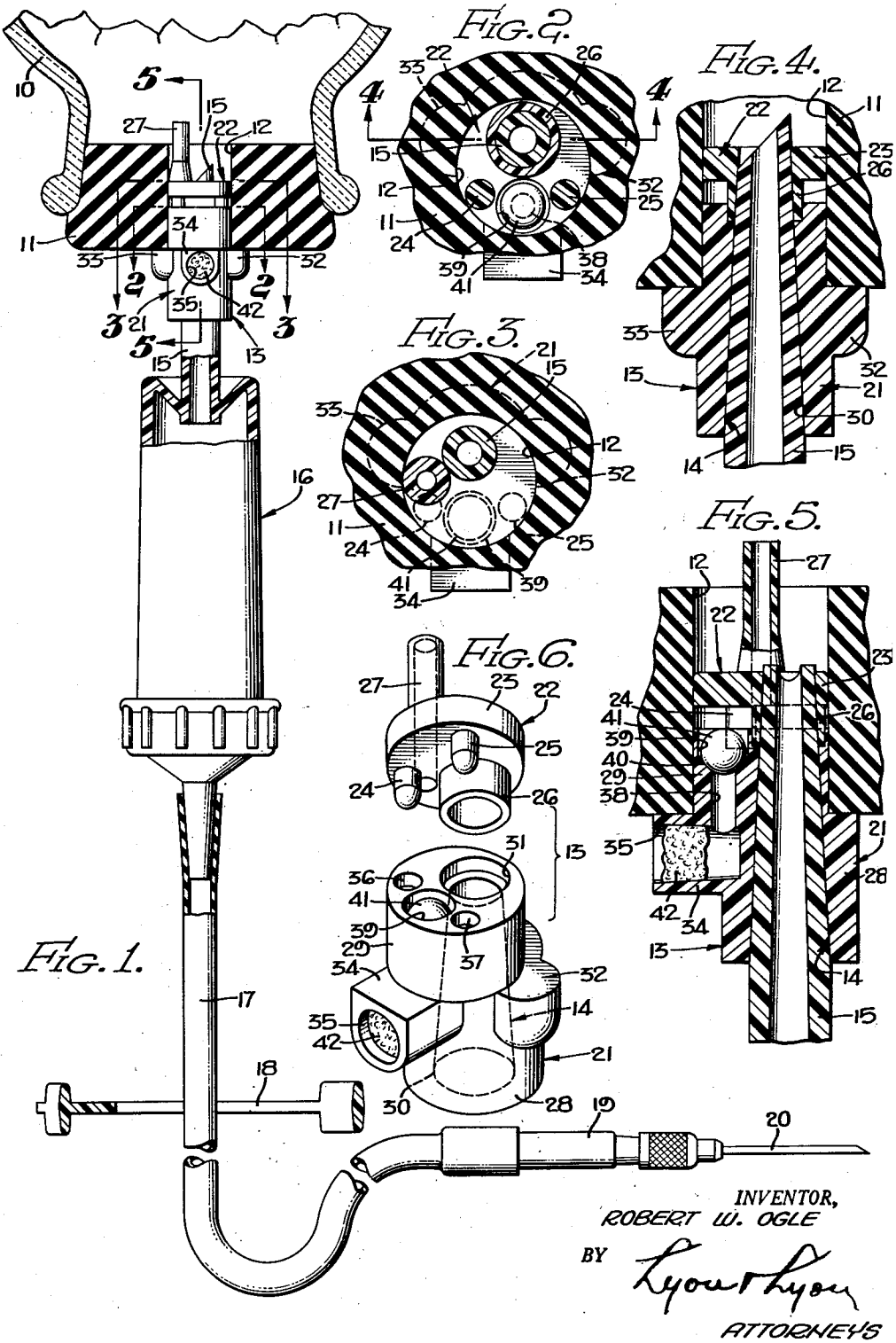
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INTRAVENOUS INJECTOR ADAPTER

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INTRAVENOUS INJECTOR ADAPTER

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4 Claims. (Cl. 128—214)

This invention relates to apparatus for the intravenous injection of medical fluids and more particularly to an adapter for use with respect to such intravenous injection sets permitting the adaptation of the device to dispensing containers of the type having a stopper provided with a single central opening such as is common in the commercial systems known as Fenwal or American Hospital Supply Company systems.

While there are existing devices suitable for this purpose it has been noted that the air inlet means of existing devices is so arranged in many cases so that in response to a reduced pressure in the container a sudden surge or series of bubbles of air will be drawn into the container with an audible sound. While there is no common physical harm resulting from this sudden surge of air into the dispensing bottle it is commonly known that it is dangerous to inject into the body of a patient and particularly directly into the veins of a patient any substantial quantity of air, and the patient receiving the injection when seeing and hearing this sudden surge of air into the bottle often becomes worried and suffers distinct psychological effects.

It is accordingly one object of this invention to provide and adapter of the type described, having what is termed a cavitation chamber capable of reducing and eliminating the sudden surge of air above referred to.

It is another object of the present invention to provide a device of the type described which is simple and economical to manufacture being formed for the most part entirely of a molded plastic material reducing the cost of the device to a point which renders it feasible to use the device only once and then discard it.

These and other objects, features and advantages of the invention will be apparent from the next specification in which:

Figure 1 is a side view partly in section of the device embodying the present invention.

Figure 2 is a section taken along the line 2—2 of Figure 1.

Figure 3 is a section taken along the line 3—3 of Figure 1.

Figure 4 is a section taken along the line 4—4 of Figure 2.

Figure 5 is a section taken along the line 5—5 of Figure 1.

Figure 6 is an exploded perspective view of the adapter per se.

Referring now more particularly to the drawings, there is shown a container **10** having a rubber stopper **11** provided with a single central hole **12**. An adapter **13** extends into the hole **12** and is provided with a longitudinal extending tapered passage **14** in which is cemented the needle-like portion **15** of a drip meter **16**. As is common the drip meter is connected by a tube **17** provided with a clamp **18** to a connector **19** adapted to receive an administration needle **20**.

The adapter **13** is manufactured of two separate plastic parts **21** and **22** which are cemented together in the final assembly. Part **22** comprises essentially a disk **23** having a pair of depending pins **24** and **25** and a depending annular ring **26** and an upstanding cylindrical hollow tube **27** as most clearly shown in Figure 6.

The part **21** comprises a single piece of plastic material constituting a base portion **28** in the form of a hollow cylinder and an upper portion **29** also in the form of a cylinder but having its center offset from the center of the cylinder **28** as shown in Figures 5 and 6.

The base portion **28** is provided with a tapered opening **30** connecting with an opening **31** in the upper portion **29**. The opening **31** is adapted to receive the annular ring **26** when the parts **21** and **22** are assembled together and the interior of the ring **26** is beveled to the same degree as the opening **30** so that the opening **30** and the interior of the ring **26**, when joined together, form the tapered opening **14** which is adapted to receive the needle-like portion **15** of the drip meter **16**.

The base member **28** is provided with a pair of strengthening ears **32** and **33** and with a laterally extending portion **34** having a bore **35**. The upper portion **29** is provided with a pair of holes **36** and **37** extending only part way therethrough and with a bore **38** communicating with the bore **35**. Bore **38** is enlarged as at **39** and provided with a tapered seat **40** for a ball valve **41**.

When the parts **21** and **22** are assembled the annular ring **26** fits in the opening **31**, the pins **24** and **25** are seated respectively in the holes **36** and **37** with the disk **22** spaced from the top of the cylinder **29** as most clearly shown in Figure 1. It will be appreciated that before assembling the two parts together the ball valve **41** is placed upon the valve seat **40** and is retained thereafter in the device as the space between the disk **22** and the top of the cylinder **39** is insufficient to permit the ball to escape from the region of the valve seat but is sufficient to allow the ball to raise from the seat when required. The bore **35** conventionally houses a wad of absorbent cotton **42** acting as an air filter.

When the device is assembled, as shown in Figure 1 and inserted in the hole **12** of the stopper **11** and the clamp **18** is relaxed, fluid in the bottle **10** will pass down the needle-like portion **15** into the drip meter **16** hence through the tube **17** to the administration needle **20**. This will cause a reduction of pressure within the bottle **10** sufficient to unseat the ball **41** from the seat **40**. Air is thus drawn through the bores **35** and **38** into the cavitation chamber. This cavitation chamber is formed by the walls of the hole **12** of the stopper **11** and the spaced apart disk **22** and the top of cylinder **39**. Air coming from the bore **38** fills this cavitation chamber and circulates across the top of the cavitation chamber to the tube **27** from which it emerges into the bottle **10**.

While it is impossible at this time to state exactly the reason for the result achieved, tests have shown that this particular arrangement has resulted in a continual uniform bubbling of the air into the bottle and the elimination of any sudden bursts of air into the bottle. This effect is believed to be a function of the cavitation chamber though it is impossible at this time to assign an exact explanation therefor.

While there has been described what is at present considered a preferred embodiment of the present invention, it will be appreciated by those skilled in the art that various changes and modifications can be made therein without departing from the essence of the invention and it is intended to cover herein all such changes and modifications as come within the true spirit and scope of the appended claims.

I claim:

1. In an apparatus for intravenous administration of fluids an adapter for insertion into the single hole of a single hole stopper of a bottle comprising: an upper

disk like portion and a lower portion; a spacer means extending between said two portions; said two portions being spaced apart to form an open transverse passage; said top and bottom portions having a longitudinal tapered opening adapted to receive the tapered inner end of a drip meter to form a continuous fluid outlet; said bottom portion having a laterally extending boss provided with a bore and a second longitudinally extending bore communicating with said first bore; said second bore being enlarged at its inner end and provided with a tapered valve seat and communicating with said transverse passage; a ball arranged on said seat; a hollow tube extending inwardly from said upper portion and communicating with said transverse passage.

2. In an apparatus for intravenous administration of fluids an adapter for insertion into the single hole of a single hole stopper of a bottle comprising: an upper disk like portion and a lower portion; a spacer means extending between said two portions; said two portions being spaced apart to form an open transverse passage; said top and bottom portions having a longitudinal tapered opening adapted to receive the tapered inner end of a drip meter to form a continuous fluid outlet; said bottom portion having a laterally extending boss provided with a bore and a second longitudinally extending bore communicating with said first bore; said second bore being enlarged at its inner end and provided with a tapered valve seat and communicating with said transverse passage; a ball arranged on said seat; a hollow tube extending inwardly from said upper portion and communicating with said transverse passage, at a point spaced laterally from said second bore.

3. In an apparatus for intravenous administration of fluids an adapter for insertion into the single hole of a single hole stopper of a bottle comprising: an upper disk like portion and a lower portion; a spacer means extending between said two portions; said two portions being spaced apart to form an open transverse passage; said top and bottom portions having a longitudinal tapered opening adapted to receive the tapered inner end of a drip meter to form a continuous fluid outlet; said bottom portion having a laterally extending boss provided with a bore and a second longitudinally extending bore communicating with said first bore; said second bore being enlarged at its inner end and provided with a tapered valve seat and communicating with said transverse passage; a ball arranged on said seat; said portions being spaced apart a distance insufficient to allow said ball to escape from said enlarged bore; a hollow tube extending inwardly from said upper portion and communicating with said transverse passage, at a point spaced laterally from said second bore.

4. In an apparatus for intravenous administration of fluids an adapter for insertion into the single hole of a single hole stopper of a bottle comprising: an upper disk like portion and a lower portion; a spacer means extending between said two portions; said two portions being spaced apart to form an open transverse passage; said top and bottom portions having a longitudinal tapered opening adapted to receive the tapered inner end of a drip meter to form a continuous fluid outlet; said bottom portion having a laterally extending boss provided with a bore and a second longitudinally extending bore communicating with said first bore; said second bore being enlarged at its inner end and provided with a tapered valve seat and communicating with said transverse passage; a ball arranged on said seat; a hollow tube extending inwardly from said upper portion and communicating with said transverse passage, at a point spaced laterally from said second bore; said first and second bores, said transverse passage and said hollow tube, when said adapter is inserted into said single hole in said stopper constituting a tortous air inlet passage.

No references cited.