Oct. 20, 1964 D. S. SHERIDAN 3,153,415

INFANT FEEDING TUBE

Filed Feb. 23, 1961

Fig. 1.

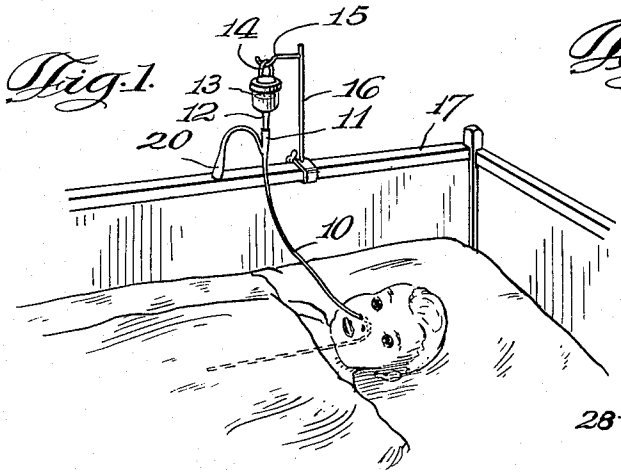


Fig. 2.

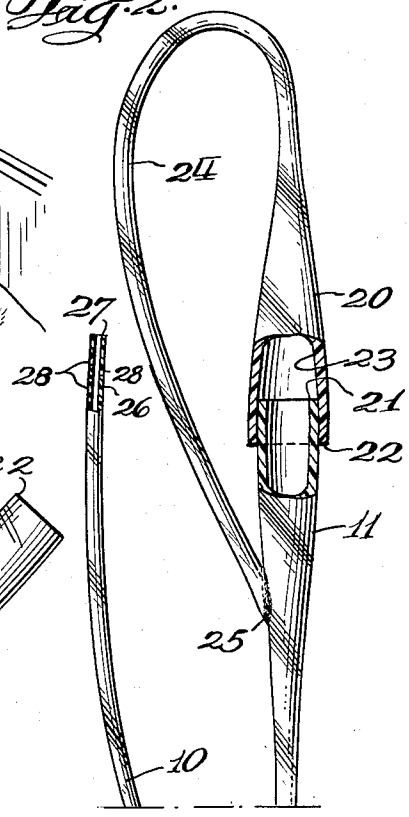


Fig. 4.

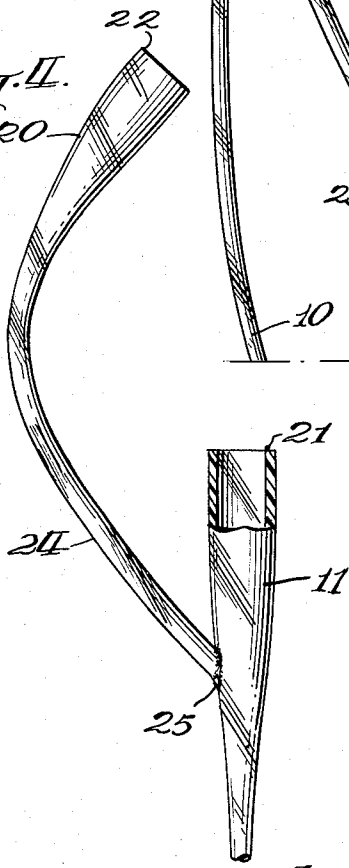
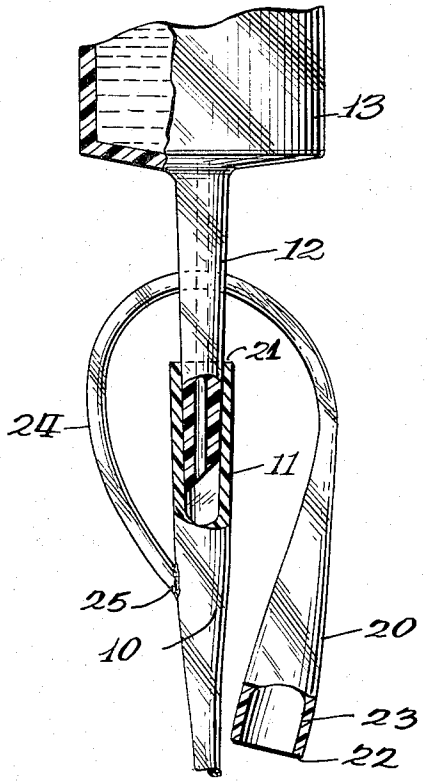


Fig. 3.



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United States Patent Office 3,153,415 Patented Oct. 20, 1964

3,153,415

INFANT FEEDING TUBE

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Filed Feb. 23, 1961, Ser. No. 91,174
5 Claims. (Cl. 128—348)

The present invention relates to an infant feeding tube and more particularly to feeding tubes having a cap to seal off the end of the tube when it is not being used to feed an infant in order to prevent dehydration of the infant.

For sometime it has been the practice to feed young infants by inserting a flexible tube through the nose and troat of an infant into his stomach. Many of these tubes presently in use have a reduced diameter towards the end inserted into the stomach to make the insertion as easy as possible. The end portion placed in the stomach is usually open or may have various apertures near the end portion to allow the food to be distributed into the stomach. After the tube is inserted a food container is attached to the noninserted end of the tube and fluid food is introduced by gravity flow from the container into the infant's stomach. When the tube is not in use between feedings it is disconnected from a fluid food container and usually left in the infant until the next feeding. It is desirable to seal off the noninserted end of the tube whenever it is left in the infant. Sealing off the end of the tube prevents the tube from acting as an air passage from the stomach which would normally cause unwanted dehydration of the stomach area. The general practice at the present time is to seal off the noninserted end of the tube with a male plug which fits into the internal diameter of the tube. These male plugs often come in contact with various objects and are contaminated. When they are then inserted in the end of the tube, the inside of the tube becomes contaminated. The contamination once deposited on the inside of the tube may be washed down the tube by the fluid food at the next feeding into the infant's stomach.

Therefore, it is an object of the present invention to provide a new and improved infant's feeding tube.

Another object is to provide a feeding tube having a cap which will not cause a sterile break of the inside of the tube wall.

A further object is to provide a cap for an infant's feeding tube which fits over the outside of an end portion of the tube and which resists inadvertent removal.

An additional object is to provide a cap for an infant's feeding tube which is constructed of a hollow flexible cone having an internal diameter at the open base end of the cone slightly larger than the external diameter of an end of the feeding tube.

Further objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 illustrates the placement of an embodiment of the present invention through the nose and throat of an infant into its stomach and its attachment to a fluid food container.

FIG. 2 is a partial sectional view of the embodiment of the present invention with the end of the tube sealed by the cap.

FIG. 3 is a partial sectional view of the embodiment of the present invention connected to a fluid food container.

FIG. 4 is a partial sectional view of the embodiment of the present invention with the cap removed.

While this invention is susceptible of embodiments in many different forms, there is shown in the drawings and will herein be described in detail an embodiment of the

invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

Referring first to FIGURE 1, a clear plastic feeding tube **10** is inserted through one nostril of a small infant, through his throat and into his stomach. A flared cone shaped end portion **11** referred to as the proximal end is passed over a cannula like tube portion **12** of a fluid food container **13** to form an airtight seal. A ring portion **14** of the fluid food container **13** is used to support the container on a hook **15** which is secured to a mounting stand **16**. The mounting stand **16** is secured to a portion of an infant's crib **17**.

A cap **20** is secured to the end portion **11**. The construction of the noninserted portion **11** may be more clearly seen in FIGURE 2. The end portion **11** is flared to form a cone with an increasing diameter which increases to a maximum at the end **21** of the tube **10**. The cap **20** is constructed of a transparent plastic in the form of a hollow cone having an open base end **22**. The internal diameter of the open base end **22** is slightly larger than the external diameter of the end **21**. This allows the cap **20** to be slid over the end of the tube **11** until the decreasing diameter of an interior portion **23** equals the external diameter of the end **21**. The pressed fit thus created between the tube end **21** and the interior portion **23** provides an airtight seal for the end **21** of the tube **10**.

Both the tube **10** and cap **20** are composed of a flexible material having considerable resiliency such as a plastic. When the cap **20** is pressed onto the end of the tube **11**, the end of the tube is compressed slightly and the interior portion **23** of the cap **20** opposite the end **11** is expanded slightly. Because of the resiliency of these elements a force exists to hold them together and thereby increases a friction force which resists efforts to pull them apart. If the baby should toss about or attempt to pull off the cap, such inadvertent opening which might occur therefrom, would be resisted and in most such situations prevented by the friction force between the cap and end of the tube. Those skilled in the art will recognize that only one element, either the cap or the end of the tube is required to have resiliency for them to resist an inadvertent opening. However a better seal is accomplished, when both the cap and the tube have resiliency.

An elongated flexible apex portion **24** of the cone formed by the cap **20** has an end **25** welded to the end portion **11**. The welding of the apex portion **24** at its end **25** insures that the apex end of the cap **20** is closed and airtight. An inserted end **26** referred to as the distal end of the tube **10** has an open end **27** and several apertures **28** near the end **27** to distribute the fluid food into the infant's stomach.

Referring now to FIGURE 3, the end portion **11** of the tube **10** is shown pressed onto the tube portion **12** of the fluid container **13** to form an airtight seal.

The tube portion **12** is tapered at the same angle as the internal wall of the tube portion **11**. Therefore the tube portion **12** will slide into the end portion **11** until a press fit is accomplished.

Referring now to FIGURE 4, the cap **20** is shown removed from the end portion **11**. When the cap **20** is free to be moved around it may strike various objects or may be handled by the person utilizing the tube. Any contamination which reaches the cap **20** will probably be deposited on its external surfaces. If the end portion **20** has been a plug instead of a cap as shown in the present invention, the probability of such a plug picking up contamination from striking other objects and from the hands of the nurse would be relatively high. However

with the present invention all such contamination is prevented since the portion **23** of the cap **20** which fits over the end of the tube end portion **11** does not come in contact with other objects. Thus no sterile break occurs to the inside of the tube **10** which could pass contamination to the stomach of the infant.

With the cap **20** attached to the tube **10** as shown in the figures, the cap is always immediately available to be placed on the tube as soon as a feeding is completed. Therefore there is no wasted time between the removal of the fluid food container **13** from the tube **10** and its being capped.

I claim:

1. A medical device for fluid delivery comprising an elongated, resilient, flexible tube having inner and outer wall surfaces, a proximal end and a distal end, said proximal end terminating with a given outer wall surface circumference, a manually removable cap mounted on said proximal end composed of a hollow body having an open base and inner and outer wall surfaces, said open base being the only aperture between said inner and outer surfaces of said cap, said cap inner wall surface having an annular cross section which tapers from a circumference at said open base greater than said proximal end given outer wall circumference to a circumference smaller than said proximal end given outer wall circumference, said hollow body having no projections extending within said tapered annular wall, said tube outer wall surface at said proximal end forming an acute angle with said cap inner wall surface when said cap is pressed onto said proximal end to cause said proximal end given outer wall circumfer ence to engage said cap inner wall surface between its greater circumference at the open base and its smaller circumference.

2. A medical device for fluid delivery as specified in claim 1, wherein said cap is composed of a resilient material and the resiliency of said tube and said cap resist inadvertent removal of said cap from said proximal end of the tube when said cap has been pressed onto said proximal end to form an airtight seal.

3. A medical device for fluid delivery as specified in claim 1, wherein said outer wall surface of said cap has a smooth conical shape having a base and an apex with the open base of said body forming the base of said conical shape.

4. A medical device for fluid delivery as specified in claim 3, wherein said apex of said conical shaped outer wall surface of said cap is elongated, flexible and connected to the outer wall of said tube to allow said cap to be pressed onto and removed from said proximal end of said tube without interference between the open base and the apex and without disconnection of said cap from said tube.

5. A medical device for fluid delivery comprising an elongated, resilient, flexible tube having inner and outer wall surfaces, a proximal end and a distal end, said outer wall surface tapering outwardly at said proximal end to terminate with a given outer wall surface circumference, a manually removable cap mounted on said proximal end composed of a hollow body having an open base and inner and outer wall surfaces, said open base being the only aperture between said inner and outer surfaces of said cap, said cap inner wall surface having an annular cross section which tapers from a circumference at said open base greater than said proximal end given outer wall circumference to a circumference smaller than said proximal end given outer wall circumference, said outer wall surface at said proximal end forming an acute angle with said cap inner wall surface when said cap is pressed onto said proximal end to cause said proximal end given outer wall circumference to engage said cap inner wall surface between its greater circumference at the open base and its smaller circumference.

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