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TUBING CLAMP FOR PARENTERAL ADMINISTRATION SET

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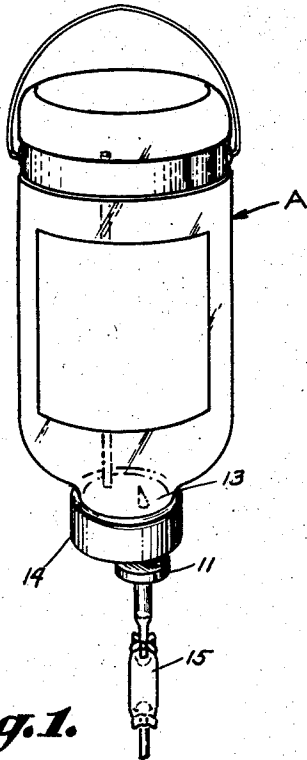


Fig. 1.

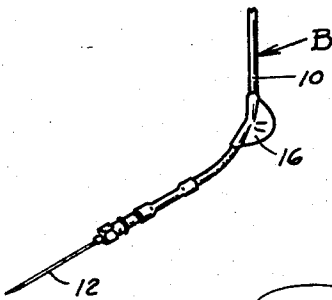


Fig. 2.

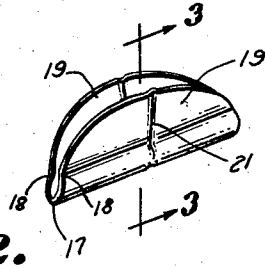


Fig. 3.

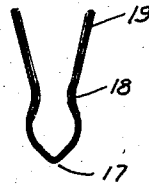


Fig. 4.

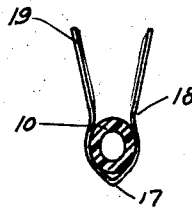


Fig. 5.

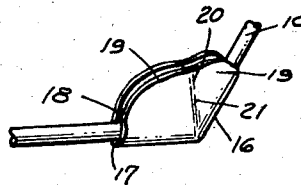
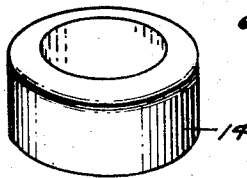


Fig. 6.



Fig. 7.



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TUBING CLAMP FOR PARENTERAL
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2 Claims. (Cl. 251—4)

This invention relates to a tubing clamp and, more particularly, to a clamp for the flexible tubing of a parenteral administration set.

In the administration of parenteral liquids, a conduit consisting of flexible tubing connects the source of parenteral liquid with the recipient. The source of parenteral liquid is generally a glass bottle which is provided with an air-tight closure to keep the contents free of contamination.

The usual procedure followed prior to the actual administration involves the following steps. First, the flexible tubing of the administration set is clamped so that no liquid can flow therethrough. Second, one end of the tubing, having been previously provided with insertion means, is inserted into the air-tight closure of the bottle containing the parenteral liquid. Third, the clamp is then opened and the tubing flushed out with a small amount of the parenteral liquid to insure complete removal of air. After these steps have been performed, the tubing is then clamped against further flow of liquid and a puncture made into the body of the intended recipient with the other end of the administration set which is usually provided with a hypodermic needle.

From the foregoing procedure, it is to be noted that some form of clamping means is essential to the proper administration of parenteral liquids. However, the clamps used heretofore have either been costly if mounted directly on the tubing or laborious to attach if provided separately.

It is therefore an object of my invention to provide an inexpensive clamp for tubing which is assembled directly thereon. Other objects and advantages of my invention will be seen as the specification proceeds.

Essentially, the clamp of my invention is a metal disc formed on itself to provide an arcuate portion adapted to loosely grip the flexible tubing on which it is mounted.

My invention will be explained in conjunction with the accompanying drawing, in which Fig. 1 is an elevational view of a parenteral administration hook-up equipped with the clamp of my invention; Fig. 2 is a perspective view of the clamp of my invention before attachment to the flexible tubing of a parenteral administration set; Fig. 3 is a cross-sectional view taken along the line 3—3 of Fig. 2; Fig. 4 is a view similar to Fig. 3 but differing therefrom in showing the clamp mounted on flexible tubing; Fig. 5 is an enlarged perspective view of the clamp portion of Fig. 1; Fig. 6 is a perspective view of a metal disc useful in forming the clamp of my invention; and Fig. 7 is a perspective view of the inner clamping ring of a parenteral container closure from which the disc of Fig. 6 can be salvaged.

Referring to the drawing, and in particular Fig. 1, the letter A generally designates a parenteral solution container having a parenteral solution contained therein. In the usual practice of administration of such a solution, the container is suspended in a mouth-downward position. Leading from container A to a patient (not shown) is administration set generally designated B, which pro-

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vides the conduit for communicating the liquid solution contained in container A to the patient.

Administration set B includes flexible tubing 10, and affixed to one end thereof, insertion means 11, and affixed to the other end thereof, recipient needle 12. Insertion means 11, which may be a plastic plug-in fitting, is inserted into stopper 13 lodged in the neck portion of container A. Stopper 13 is secured in the neck portion of container A by means of inner clamping ring 14. Prior to use, container A is provided with additional closure elements to insure air-tightness, but since these are not relevant to my invention, they are not shown.

Intermediate the end portions of tubing 10 is mounted drip tube 15, which is useful in determining the rate of parenteral solution administration by counting the drops passing therethrough. Also mounted on flexible tubing 10, and intermediate the ends thereof, is clamp 16.

Clamp 16 of Fig. 1 is shown in enlarged perspective view in Fig. 2 in its form before assembly on flexible tubing 10. In the preferred embodiment, clamp 16 is formed from a flat circular metal disc of the nature shown in Fig. 6 by being bent on itself along a diameter as at 17. It is to be noted that the bend along the diameter is not sharp but rather arcuate or curved in nature, as best seen in Fig. 3, the radius of curvature of bend 17 approximating the flexible tubing on which the clamp is to be mounted, as shown in Fig. 4.

It is to be further noted that the bend 17 extends over more than 180° of arc, providing nipped-in portions 18 which permit loose gripping of tubing 10 by clamp 16. Thus, clamp 16 is adapted to slide along tubing 10 without any substantial chance of becoming detached therefrom. Although parenteral administration set clamps made from metal discs have been used in the past, it has been the uniform practice to provide them in a flat state, hence not mounted on the tubing of the set. Thus, the nurse or physician attending the administration must manually form the disc into a clamp as by bending it along a diameter and then must attach it to the tubing. Bending a metal disc to produce a clamp sometimes results in cutting the fingers of the attendant, but even if this disadvantage is not experienced, the bending operation is time-consuming. Further, and more importantly, the bend made by the aforementioned manual operation is sharp, as contrasted to the arcuate bend found in the clamp of my invention. The sharp bend permits the possibility of kinking or bending of the flexible tubing. Also in the case of a sharp bend without the nipped-in portions 18 which characterize my clamp, there is the possibility that the clamp may become detached from the flexible tubing.

Referring now to Fig. 5, it is seen that the upstanding portions 19 of clamp 16 have been bent as at 20 to close tubing 10 to further passage of liquid therethrough. Since in the embodiment pictured the upstanding portions 19 are approximately semi-circular, it is preferred that secondary bend 20 be made along a radius perpendicular to the diameter along which bend 17 is made.

Although the aforementioned secondary bend has been known to the art, having been used when flat metal discs were provided separate from the flexible tubing, my clamp is superior to those formed previously in that its pre-formed nature permits a sharper secondary bend. Thus, a smaller amount of bending is required in the secondary bending operation to completely shut off the flow of fluid through tubing 10. In addition, the provision of nipped-in portions 18 prevents tubing 10 from being squeezed out of primary bend 17 during the secondary bending operation. I have found that the secondary bend at 20 can be materially improved by the provisions of indentations or crimps 21, which are located along a radius of upstand-

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ing portions 19 approximately perpendicular to the diameter along which bend 17 is made.

An inexpensive source of the disc which is used to form the clamp of my invention is the disc member 22 of Fig. 6, which has been struck or punched from inner clamping ring 14 shown in enlarged view in Fig. 7.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitation is to be inferred therefrom, as modifications will be obvious to those skilled in the art.

I claim:

1. A clamp for flexible tubing, comprising a substantially flat metal disc bent upon itself, the bent portion thereof being arcuate in nature and having a desired radius of curvature, the said bent portion extending over more than 180° of arc, said bent disc being so arranged and constructed as to be partially bent on itself, the up-standing disc portions above said bent portion being provided with indentations approximately perpendicular to the said bent portion.

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2. A clamp for flexible tubing, comprising a substantially flat metal disc bent upon itself, the bent portion thereof being arcuate in nature and having a desired radius of curvature, said bent portion extending over more than 180° of arc, whereby said clamp is adapted to be positionably mounted on flexible tubing, said bent disc being so arranged and constructed as to be partially bent on itself.

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