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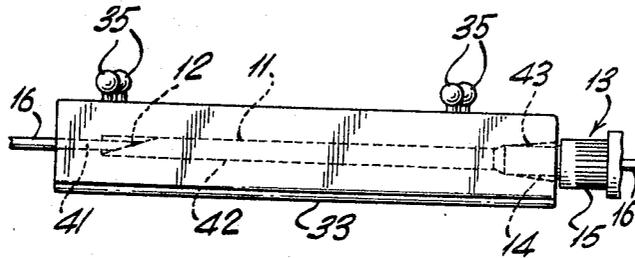
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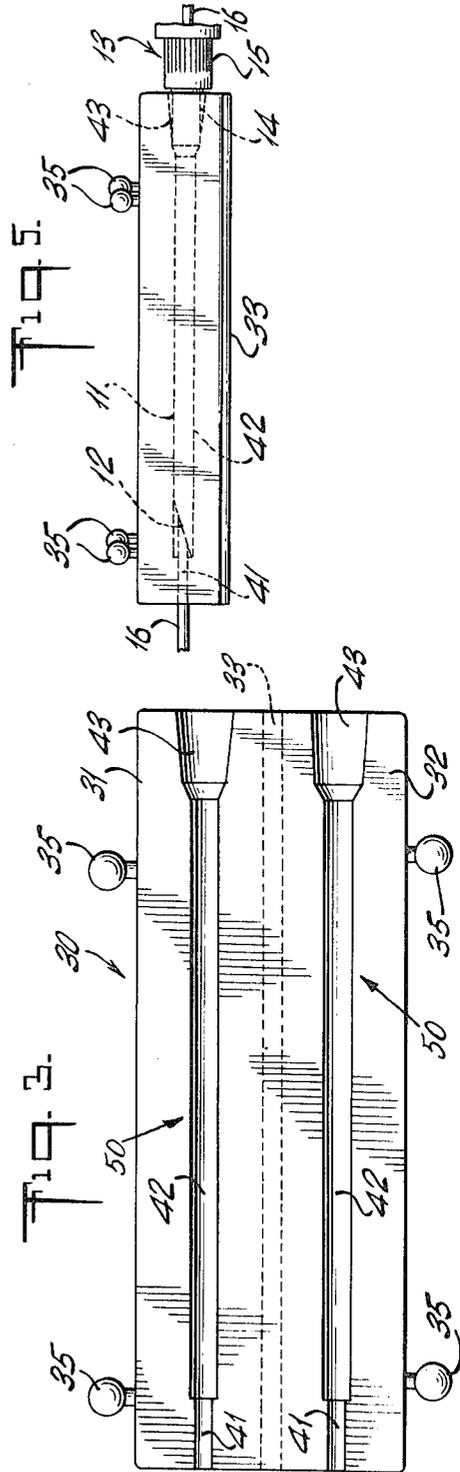
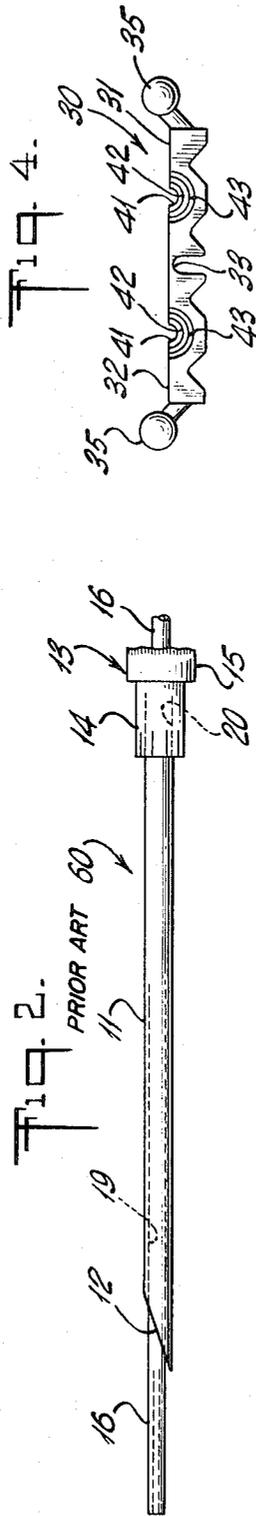
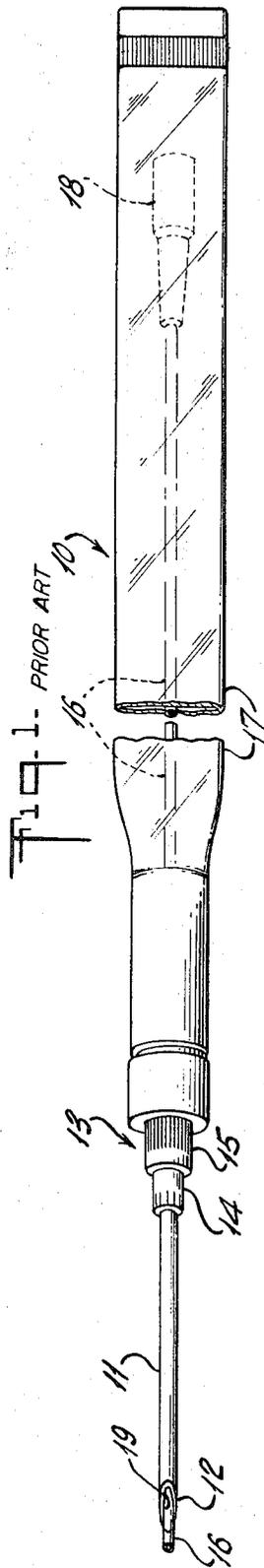
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[54] **NEEDLE BEVEL GUARD FOR INTRAVENOUS CATHETER**  
 6 Claims, 5 Drawing Figs.

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 128/348  
 [51] Int. Cl..... **A61m 5/00**  
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 214.4, 215, 221, (I.C. Digest)

**ABSTRACT:** A hinged and closeable guard for maintaining the sterility of an intravenous needle prior to use and for maintaining the catheter in axial alignment with the needle during use.





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## NEEDLE BEVEL GUARD FOR INTRAVENOUS CATHETER

This invention relates to a needle bevel guard for an intravenous catheter and in particular to means whereby the sterile discipline of the catheter and needle can be maintained prior to catheter use and means whereby the catheter and patient can be protected from injury during use.

When it is necessary to administer parenteral liquids, such as in intravenous feeding and the like, it is common to make a venipuncture with a needle and then to thread a sterile plastic catheter through the needle and into the vein. The needle is then withdrawn from the vein and taped to the patient's body proximate the entry point, and administration apparatus is attached to the catheter. In such surgical and hospital procedures, it is extremely important to avoid contamination of the intravenous catheter and needle unit prior to use. It is also important that the needle be maintained in axial alignment with said catheter after it has been withdrawn from the patient to prevent the accidental cutting of the catheter by the sharp edges of the needle bevel.

Existing methods for effecting these dual purposes are not entirely satisfactory. One method utilizes a tubular sleeve which fits onto the needle, fully enclosing it, for preuse sterility maintenance and utilizes an annular band which fits firmly around the needle and is slid axially so that it extends over the sharp end of the needle thereby maintaining the catheter in axial alignment with the needle. To achieve proper annular band positioning axial force is required. This often results in the axial displacement of the catheter and this movement is undesirable. In addition, since the annular band is small, manipulation of it is often difficult.

Another method utilizes a symmetrical two portion needle guard which is integrally formed with the needle hub. This method is complex and therefore expensive and impractical since it is desirable to dispose of the catheter assembly after initial usage.

Accordingly, it is an object of the present invention to provide a needle bevel guard which will serve to maintain the sterile discipline of the needle and catheter assembly after the assembly has been removed from the protective envelope in which it is shipped to the consumer.

It is also an object to provide a means whereby the catheter is protected from the sharp edge of the needle bevel while it is extending therethrough.

It is a further object to provide a needle guard which will not interfere with catheter insertion.

It is a further object to provide a needle guard which can be positioned without applying any axially oriented force to the catheter-needle assembly.

It is also an object to provide a guard which can be utilized without the need of relying on complicated and detailed instructions.

It is a further object to provide a guard which can be manufactured at little cost, and is therefore disposable after use.

It is also an object to provide a guard which is operable with little inconvenience or discomfort to the patient and with little difficulty to the person effecting the intravenous connection.

Further objects and advantages of the invention will become apparent and the invention will be fully understood from the following description and drawings in which:

FIG. 1 is a perspective view of a known type of intravenous catheterization device;

FIG. 2 is a side elevational view of the needle-hub-catheter portion of the assembly illustrated in FIG. 1;

FIG. 3 is a plan view of the preferred embodiment of the needle bevel guard with the two hinged portions lying in a single plane;

FIG. 4 is an end view from the right of FIG. 3; and

FIG. 5 is a plan view of the catheter and needle assembly with the guard in closed position.

A typical 30 of the intravenous administration device, as shown in FIGS. 1 and 2, is of the type illustrated in U.S. Pat. No. 3,055,361. This device generally indicated at 10, has a needle 11, the needle being rigid in form, having a bore 19

therethrough, terminating at one end in a beveled sharp and 12 and provided at its other end with a hub 13. The hub 13 is made up of two continuous cylindrical portions having different diameters; the smaller diametered cylinder 14 and the larger diametered cylinder 15. The hub 13 has a bore 20 therethrough which forms a passageway with the needle bore 19 through which the catheter 16 passes. The catheter 16, usually made of a flexible plastic, terminates at one end in an adapter 18 for connection to a suitable fluid supply in a well-understood manner.

The catheter-needle-hub unit 60 of the device 10 is shown in FIG. 2. This unit 60 is enclosed within a plastic guard 30, shown in FIGS. 3, 4 and 5. Before use, the remaining portions of the catheter assembly 10, whose sterile discipline must be maintained, are enclosed by a pliant plastic guard sleeve 17, as shown in FIG. 1.

The needle guard 30 consists of two approximately rectangular portions 31, 32 having approximately the same shape. These two portions are hinged together at 33 along one long side of each and have "purse snap" closure means 35 on their free sides whereby, when the two portions 31, 32 are rotated about the hinge 33 into facing contact with each other, they will be releaseably locked in closed position.

Each guard portion 31, 32 has a groove 50 formed therein parallel to the hinge 33. Upon folding together of the two portions these grooves combine to form a passageway from end to end of the closed guard. Each groove has three discrete zones: a zone 41 having a diameter approximately the same as or slightly less than that of the catheter 16, a zone 42 having a diameter slightly greater than the diameter of the needle 11, and a zone 43 having a diameter approximately equal to the diameter of the hub portion 14 and preferably flaring slightly to accommodate manufacturing variations in hub size. When the guard portions 31, 32 are folded together so that the catheter-needle-hub unit 60 in enclosed firmly within the passageway 41-42-43, the catheter 16 is thereby maintained in axial alignment with the needle 11 and the accidental cutting of the catheter 16 is prevented. FIG. 5 illustrates the assembly 60 with the needle guard in place. The zone 41 should be small enough to prevent free movement of the catheter therethrough at all times, so that the end of the catheter cannot accidentally move to an exposed position during shipment.

The entire unit comprising guard 30 and catheter assembly 10 is shipped to the consumer enveloped in a sterile container. When the unit is removed from this envelope prior to use, the guard 30 is in place about the assembly 60 whereby the assembly 60 may be placed on a contaminated field without sterility violation, since that portion of the assembly not enclosed by the guard 30 is enclosed by the protective sheath 17. The guard 30 is then removed from the assembly 10 by separating the "purse snaps" 35 and rotating the guard portions 31, 32 about the hinge 33 into an open position permitting removal from the needle and hub. The needle 11 is then inserted into the vein, the catheter 16 is advanced into the vein to the desired extent, the needle 11 is withdrawn in the usual manner and the guard 30 is repositioned about the catheter-needle-hub unit 60 by replacing the guard, rotating the guard portions 31, 32 into closed position with the "purse snap" joinder means 35 locking the guard portions 31, 32 in contact, and the catheter-needle-hub unit 60 securely enclosed within the guard passageway. The catheter 16 is thereby maintained in axial alignment with the needle 11 and the accidental cutting of the catheter by the sharp edges of the needle bevel 12 will be prevented.

I claim:

1. A needle bevel guard for use with an intravenous catheterization assembly comprising a hollow needle having a beveled point and a hub and a plastic catheter movable through said needle to project beyond said point, constituted by two elongated portions hinged together along one edge to permit bringing faces of said portions substantially into contact flatwise, each of said faces being substantially flat and

provided with a medial groove spaced from the hinged edges and said grooves being complementary to form, when the faces are substantially in contact, a passageway having zones sized to accommodate, respectively, the hub, the needle and the catheter, and to retain the needle and catheter in axial alignment when the catheter is moved to a projecting position, the thickness of the sections in a direction perpendicular to the plane of said faces being substantially less than the width of said sections in said plane.

2. A needle bevel guard according to claim 1, in which the zone sized to accommodate the catheter includes at least a part engaging the catheter to prevent axial displacement thereof with respect to the needle.

3. A needle bevel guard according to claim 1, in which the zone sized to accommodate the hub is of outwardly flaring cross section.

4. A needle bevel guard according to claim 1, in which the zone sized to accommodate the catheter includes at least a part engaging the catheter to prevent axial displacement thereof with respect to the needle, and the zone sized to accommodate the hub is of outwardly flaring cross section.

5. A needle bevel guard according to claim 1, which includes complementary snap-acting releasable fastening devices projecting from the edges of said portions opposite the hinged edges and automatically engageable when said faces are moved toward contacting position for holding the portions in closed position.

6. A needle bevel guard according claim 1 in which the portions are hinged together along substantially the entire length of one edge.

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