

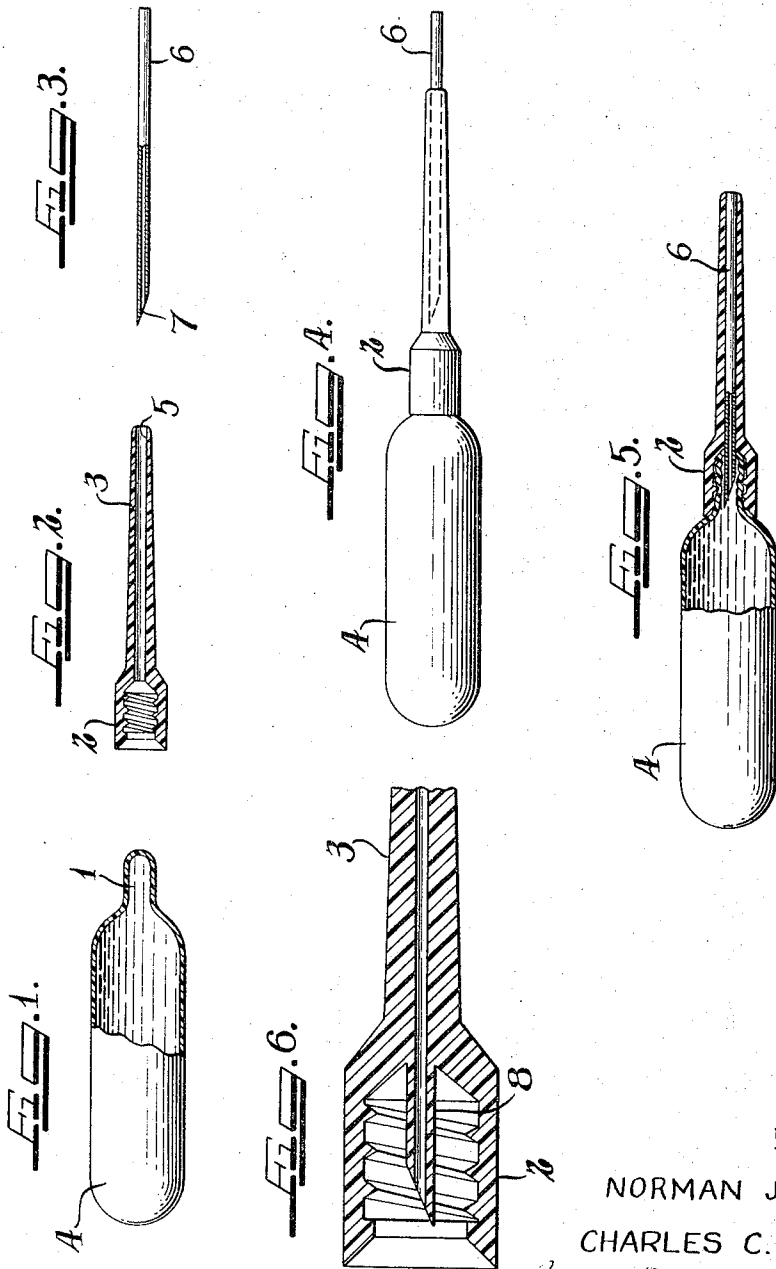
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GELATIN CAPSULE WITH DISPENSER

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GELATIN CAPSULE WITH DISPENSER

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2 Claims. (Cl. 128—232)

This invention relates to tube-type capsules for holding fluid medicaments and the like and in particular to an improved technique for extracting the fluid from such capsules.

Tube-type capsules of e.g. gelatin are well known in the art and are used to hold salves, adhesives, oils and other fluid materials. Such capsules terminate in an end, which may be of reduced diameter, to provide a neck and the enclosed fluid normally is released by puncturing or snipping off the tip of the neck. Such capsules are advantageous for dispensing the fluid in desired quantities by squeezing the body to expel liquid from the opening in the neck.

It is often desirable to release fluids as a ribbon through an aperture as e.g. ointments or creams. It is also desirable to be able to insert medicaments internally into animals, as well as externally. For example, in treating mastitis in cows where medication must be inserted into an infected udder in which case it is necessary to provide the normally stubbed-nose capsule with means to apply the medicament through the teat.

It is thus an object of this invention to provide an inexpensive, safe and reliable device for releasing fluid from a tube capsule through an elongated discharge passage.

It is a further object of this invention to provide a combination tube-type capsule and extension which is free of leakage at the juncture of the capsule and extension in which the extension is held secure from inadvertent axial removal from the capsule.

Another object is to provide an extension or cannula of this type which includes means for puncturing the end of the capsule as the cannula is being affixed to the capsule, or after cannula has been affixed.

In the drawing:

FIG. 1 is a side view, partially in section, of a conventional tube-type capsule containing liquid;

FIG. 2 is a sectional axial view of a cannular extension for the capsule;

FIG. 3 is a side view, partly in section, of a puncture rod adapted to fit within the extension of FIG. 2;

FIG. 4 is a side view of the capsule, extension and puncture rod in assembled relation;

FIG. 5 is a view like FIG. 4 broken away to show the puncture rod fully extended into the cannula and through the neck of the capsule; and

FIG. 6 is an enlarged sectional view of a cannula having an integrally molded puncture needle in the base thereof.

In accordance with our invention a cannula of plastic or other suitable material is attached to the neck portion 1 of a tube capsule 4 by properly deforming the neck. Polyethylene is a particularly good material from which to mold the cannula as it is cheap, easily molded and of the proper hardness to deform properly the capsule neck. However, polystyrene, cellulose acetate or other plastic materials are also suitable. The cannula has a nozzle or tip 3 and a large base portion 2 which is internally threaded and of such internal diameter as to engage snugly the smooth-surfaced neck 1 of the capsule 4 when twisted thereon. The capsule material, e.g. plasticized gelatin, must be sufficiently soft and pliable so that it readily deforms to mate closely with the threads of the

base. In this way the cannula is firmly secured to the capsule to prevent removal by axial stress and leakage of fluid. A suitable gelatin composition contains by weight from about 27 to 36% gelatin, about 47 to 25% glycerin and the balance water. This material possesses the property of cold flow and thus deforms upon application of pressure without heat.

Prior to inserting the capsule into the cannula base it may be punctured at the neck tip to permit later discharge of fluid through the cannula. However, because of difficulty in preventing fluid seepage prior to securing the extension when the capsule is prepunctured, we have found it more convenient to puncture the capsule after mating with the extension by providing in the cannula opening a needlelike puncture tool. A suitable tool may take the form of a hollow metal needle 6 with pointed end 7 slidably disposed in the opening 5 in the cannula tip 3. The needle also may be made of rigid plastic such as polystyrene and if desired may be integrally formed with the cannula rather than as a separate part. When it is desired to expel the contents of the capsule 4, the needle 6 is pushed down to pierce the end of capsule neck 1, thus providing a passage from the interior of the capsule into the cannula through the needle. The capsule contents may be expelled through the needle within the cannula by squeezing the capsule 4, when the parts are assembled as shown in FIG. 5. If integrally formed, the needle will extend only from the inner end of the cannula as indicated at 8 in FIG. 6. Since the needle 8 does not move with respect to the base, it will pierce the capsule only as the cannula is screwed on to the capsule, just prior to use.

When the capsule contains medicament which must be used under sterile conditions, the capsule and the cannula-needle device 3, 6 are sterilized and packed in a sterile package. Care must be taken in piercing to apply pressure to the needle 6 with sterile means since the medicament flows through the needle. When adhesive or other non-sterile materials are being handled this is not necessary, of course.

The tool may be of any cross-sectional shape as long as it is sufficiently pointed to puncture the capsule easily. An alternative means for puncturing the capsule is a solid pointed rod or needle which may replace the hollow 6 in the cannula. The rod may be inserted in the capsule at the time of assemblage of the parts and may remain in such position as a seal or plug until later withdrawal for release of fluid contents of the capsule.

Because of the cold flow properties of the gelatin, the opening formed by the solid needle will remain open after the needle is removed. It should be pointed out however, that piercing the capsule and immediately removing the needle does not permit free flow from the capsule because the gelatin closes again. After the needle has been in the gelatin for some time, the gelatin takes a set and will remain open when the needle is removed.

Still another alternative is to use a hollow puncture die into which a slug of capsule material lodges upon puncture. The slug is removed upon withdrawal of the tube thus providing free flow to the cannula.

Cannula extensions of the type described may be used with any size capsules as long as there is sufficient neck length and diameter to provide a proper seal with threads of the cannula base. The capsule may be of substantially uniform diameter provided of course the diameter is slightly smaller than the base of the cannula so that the cannula will fit. In other words a capsule with a neck is not necessary for purposes of the invention.

We claim:

1. A dispensing device to be used with medication filled

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capsules for treatment of mastitis and the like comprising, in combination;

a vessel part of which is a smooth surfaced cylindrical shaped portion of cold flow deformable material, an elongated cannula constructed of a material harder than said deformable material, said cannula having an enlarged internally threaded base end and a tip end, said base end being screwed onto and forming threads on said vessel at said smooth surfaced portion in fluid tight relationship,

a separate and removable pointed needle, shaped to conform to and slidably mounted in the tube of said cannula with said pointed end extending into said base end of said cannula, said needle extending the length of said tube and protruding from said tip end

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so that it may be manually displaced to pierce said vessel and then removed from said cannula.

2. The combination of claim 1 wherein said needle is hollow and is flush with said tip end when positioned to pierce said vessel.

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